Signature Copy

Seismic Reflection Survey: Health and Safety Plan

Kansas Geological Survey
Exploration Services Section

Safety Plan
Norcal Geophysical Consultants
San Jose, California
June 2019

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KGS Open-file Report 2023-62

Kansas Geological Survey Exploration Services

Accident Prevention Plan

Project Name: High-Resolution Seismic Reflection to Characterize Quaternary and Younger Sediments Associated with the Silver Creek Fault Beneath the Santa Clara Valley, California

Location: San Jose, California

Plan prepared by _____ 6/10/19
Signature Date

Plan approved by _____ _____
KGS Safety Officer Date

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KANSAS GEOLOGICAL SURVEY EXPLORATION SERVICES
ACCIDENT PREVENTION PLAN

I. PROJECT DESCRIPTION

Project Name: High-Resolution Seismic Reflection to Characterize Quaternary and Younger Sediments Associated with the Silver Creek Fault Beneath the Santa Clara Valley, California

Location: San Jose, California

KGS Safety Officer: Kathy Sheldon

Plan Prepared by: Richard D. Miller

Estimated Duration of Field Work: 10 days

II. STATEMENT OF WORK

Introduction

Surface rupture resulting from movement along buried faults represent a significant engineering challenge and one with potentially devastating environmental and health ramifications if not properly accounted for. Seismic reflection has long been a front-line subsurface imaging tool keenly suited for delineating geologic structures. Historically, applications have principally been focused on exploration for and development of petroleum reservoirs (Dragoset, 2005). Applications to shallow and small targets have been a catalyst in the evolution of high-resolution seismic techniques (Steeples, 2005). Most of these high-resolution targets on land have been within the upper 1000 m (Miller et al., 1995). Improvements in resolution and signal-to-noise ratio of high-resolution seismic reflection sections over the last couple of decades and increased efficiency of acquisition and processing have allowed delineation of shallow and sometimes subtle structures previously only speculated about or grossly inferred (Steeples and Miller, 1990; Miller et al., 2005; Miller et al., 2006).

Understanding all aspects of basement structures and how they manifest in overlying sediments can be key to discerning complex and cumulative structures and associated stress regimes and mechanisms. High-resolution seismic reflection has been highly effective imaging both principal and secondary structures associated with the Nemaha Ridge (Humboldt Fault system) in Kansas, Nebraska, and Iowa (Geier, 1999; Miller et al., 2004) at depths less than 1000 m as well as the Meer Fault in Oklahoma (Myers et al., 1987). Basin and range faulting has long been a subject of shallow high resolution seismic reflection surveying (Treadway et al., 1986). A convincing indicator of the power of current high-resolution seismic reflection technologies is the resolution and subtle detail that can be imaged around and through shallow (upper 500 m), dissolution-instigated subsidence features representing a potential hazard (Miller, 2003; Miller et al., 2006). The most challenging fault imaging problems involve extrapolating fault segments into Quaternary sediments and distinguishing tectonic driven bed displacement from depositional or erosional features (Miller et al., 1989; Miller et al., 2010).

Improvements in the methodology necessary to image complex structures and their extreme spatial characteristics has opened the door for applications using high-resolution seismic imaging to temporally segregate different episodes of movement within fault zones. A fault zone inferred from sparse drill data represented a modern mystery in Brown County, Wisconsin (Miller et al., 2013). Complex and unexpected structural features were observed on high resolution seismic reflection sections from the upper 100 m of sediments that were well beyond current concepts and conceptual interpolation derived from local water wells borings alone. Unknown Quaternary faults beneath an earthen dam in ancient Lake Bonneville lacustrine sediments were imaged within the upper 200 m using high resolution seismic methods. These unexpected features clearly demonstrate the amazing potential of the method when using an approach that relies on extreme attention to detail and noise removal even if a small portion of signal is lost (Bailey et al., 2013). Distinguishing post Tertiary movement on a suspected Basin and Range fault in southern Oregon at depths less than 75 m represented a milestone in shallow fault mapping (Figure 1).

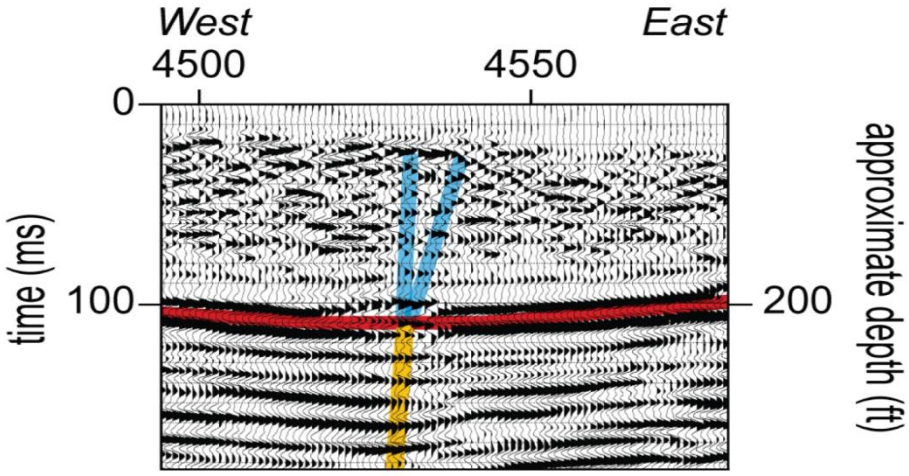

Figure 1. High resolution seismic section with basal Quaternary contact interpreted in red.

Faults within the Santa Clara Valley in northern California are within the San Andreas Fault system and are sandwiched between the San Andreas and Calaveras Faults (Jachens et al., 2002). An important strike-slip component of the San Andreas Fault system is the Silver Creek Fault, which is described as a steeply dipping feature that was an active participant in the San Andrea Fault system prior to a couple million years ago (Graymer et al., 2005). Properly designed and engineering structures, proposed to pass over the inferred trace of the Silver Creek Fault require an understanding and quantifying of the last movement on this fault.

With over 1500 ft of Quaternary alluvial sediments overlying an early Pleistocene unconformity in the Santa Clara Basin, accurate imaging of the Silver Creek Fault is well suited for high resolution seismic reflection methods (Wentworth et al., 2010). With sediment grain sizes ranging from coarser sediments in the upper 1000 ft of the Quaternary section to several sequences of fining upwards intervals in the lower 500 ft of the section (Newhouse et al., 2004). The Silver Creek Fault is a long, steep, basement-cutting fault that bounds the west margin of the Evergreen Basin. Mapping this buried fault has involved several different methods (mainly gravity, but also shallow well cuttings and magnetic data) and resulted in several different representations.

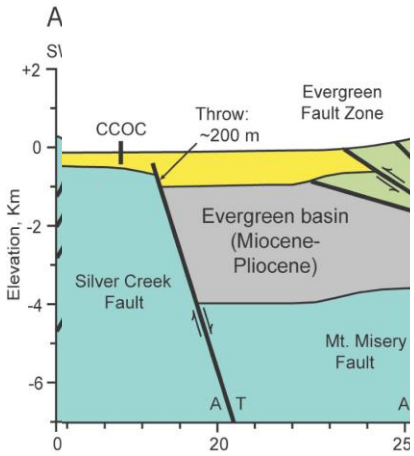

Figure 2. Generalized cross section beneath proposed seismic profiles (modified from Wentworth et al., 2010).

Current orientation and location of the fault is inferred from gravity and InSAR data. The trace of the fault is interpreted on top of a gravity boundary and defined on InSAR with a well-defined subsidence area west of the interpreted fault trace due to groundwater withdrawal (Ikehara et al., 1998). Seismic reflection data provides for a reasonable interpretation of the fault location with the eastward termination of a reflection interpreted as returning from the basement reflector. The Silver Creek Fault as currently defined has no surface exposure across most of the Santa Clara Valley. Since there is no conclusive evidence of topographic or Holocene offset associated with the Silver Creek Fault, as of 2010, it was not zoned by the State (Bryant, 1981).

Previous seismic reflection surveying in this area maps the Silver Creek Fault from the Quaternary/Basement contact at 500 m to slightly above the mid-Quaternary unconformity at around 300 m (Wentworth et al., 2010) (Figure 3C). These data have been suggested to be the strongest evidence for any continued activity along the northern Silver Creek Fault. Based on the seismic sections, structural deformation above 300 m is of questionable origin and timing. It has been suggested a shallow 'sag' structure manifest as upward spreading synform marked by both normal and reverse faults above the strike-slip fault was a negative flower structure suggesting strike-slip motion well into late Quaternary. Other possible interpretations have been ruled out based on depositional arguments. With a reported minimum imaging depth of 50 m, the key question as it relates to timing of most recent movement is: What do reflectors between the ground surface and 50 m look like? What is their relative orientation and geometry? Has there been movement on the Silver Creek Fault during Holocene? Are any of these Quaternary features subsidence related as a result of groundwater withdrawal? Alternately, is the flower structure real or artifact of processing the very shallow part of the section?

Guided by the 2002 minivib reflection profile, a shallow, higher resolution seismic reflection profile was attempted along a section of Jackson Street coincident with the portion of the minivib line (Wentworth et al., 2010). Along this section of the profile is where the vertical projection of the Silver Creek Fault and associated flower structure were interpreted on the minivib sections. That hammer stacked section (Figure 3B) suffers from a variety of negative data characteristics which are likely a combination of geology and approach.

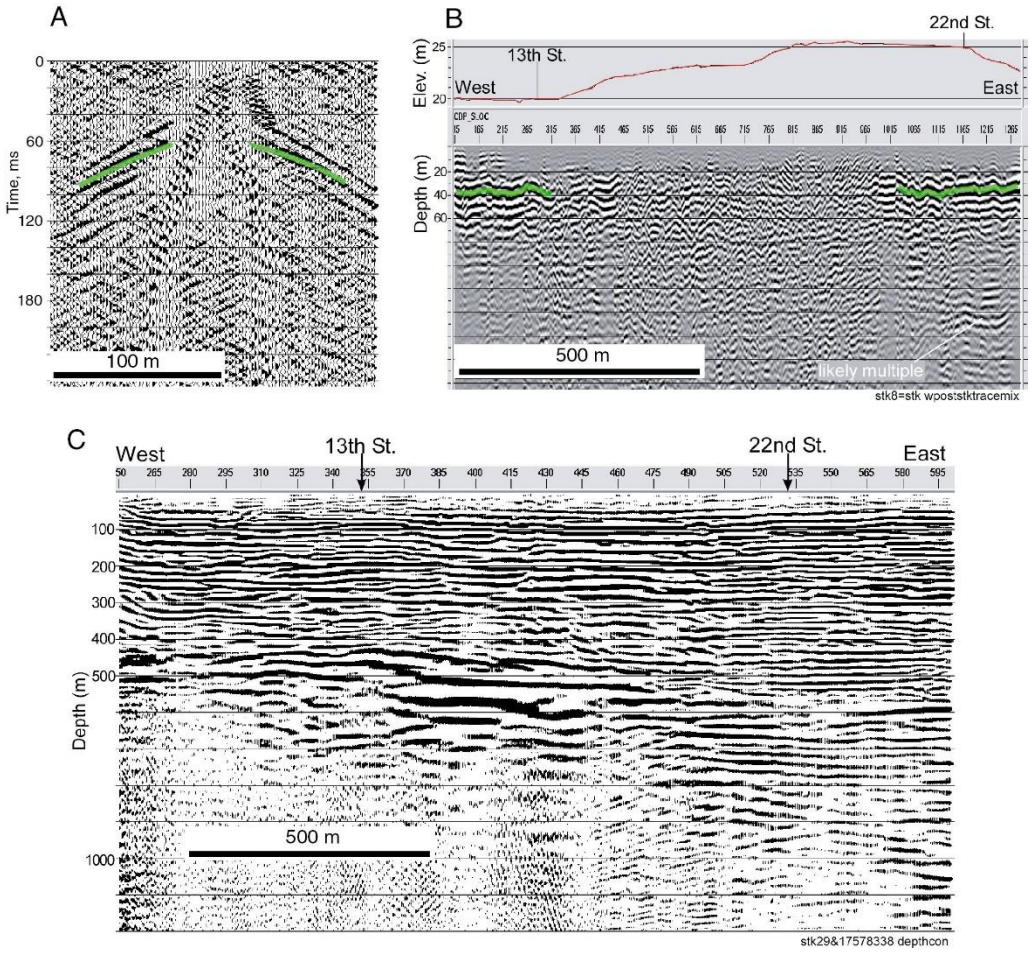

Figure 3. Spatial coincident Jackson Street hammer and minivib seismic reflection profile (Wentworth et al., 2010) across the structural sag (figure from Wentworth et al., 2010). These sections were lifted directly from Wentworth et al., 2010, and include a CMP gather (*A*), the stacked hammer profile referencing 13th and 22nd Streets (*B*) correlating the event colored in green between (*A*) and (*B*). The equivalent length and spatial location of the 2002 minivib's line (*C*), are shown for comparison.

- First, the data appear to have a narrow bandwidth, which manifests itself in a stacked section with very ringy coherent events (cyclic).
- Second, the dominant frequency is below that necessary to image reflectors in the upper 50 m.
- Third, limited penetration of seismic energy inhibited imaging above and below 50 m upper boundary of the minivib data set.
- Finally, it is unclear the processing focused sufficiently on noise suppress and removal over signal enhancement and therefore encountered problems in the middle portion of the section.

Based on the limited amount of unstacked data available to review there do appear to be several modifications that can be made to the acquisition approach and line location to provide an improved image of the upper 300 m and a higher confidence opinion as to whether the Silver Creek Fault has been active at any point during Holocene.

Without going into a detailed breakdown of the rationale for making acquisition and processing changes, revising the specifics of the approach taken by Wentworth et al., 2010, as well as moving the line should allow acquisition of a dataset suited for integration with previously acquired seismic reflection data (after reprocessing), and development of likely scenarios approximating last movement on the Silver Creek Fault. Key to the revised acquisition approach is source energy spectrum and coupling. To that end, testing will include a range of sources (impulsive and explosive) to establish clarity in potential wavelet properties. Due to the apparent abundance of ground roll at this site, suggested by the velocity filtering and surface wave footprint on the hammer data (Figure 3A), a customized explosive source with unique coupling potential on both paved (asphalt or concrete) and soil surfaces and a high resolution upper corner frequency will likely be the source of choice. Sensors will possess a higher natural frequency that the previous survey and be grouped in sets of three for each receiver station. Testing and permits will ultimately determine the source configuration and type.

Processing of high resolution shallow reflection data must be driven by noise suppression and signal isolation with a pessimistic view of every coherent event. In the early time portion of the seismic record the wavefield is underdeveloped and very unique to the setting. Reprocessing of previous reflection data and the first time processing of data acquired during this study will rely on continuous tracking of likely reflection energy through each step in the workflow.

Acquiring seismic reflection data in an urban environment is always challenging and increases the chances for signal degradation due to cultural noise, poor and inconsistent coupling, and coverage skips. Experience and attention to specific details is key to producing representative images. Delineating the Silver Creek Fault expression within the Quaternary will best be accomplished with two intersecting profiles in areas with minimal buried utilities and breaks in line continuity. A 1 km profile along 22nd Street and a similar length section parallel to I-280 have been suggested (Figure 4). The northern end of the 22nd Street line will be in close proximity to the southern end of a previous reflection profile acquired by the USGS under the direction of Rufus Catchings. Each profile has positive and negative characteristics. The 22nd Street transect has fewer noise sources, but it is at a somewhat oblique angle to the fault projection and requires most of the profile to be on asphalt surfaces. The I-280 profile is almost entirely in green space, but the noise from the interstate highway could be overwhelming.

Although faults in Kansas with potential for significant ground motion and rupture have classically been identified with the Humboldt fault system and associated Nemaha ridge, recent felt ground motion associated with earthquake swarms have been detected and measured in south central Kansas. Key to understanding the mechanism, rupture depths, and associated magnitude potential of the faults responsible for the ground motion is incorporation of high resolution seismic reflection mapping of the affected geologic strata. Development and improving of the geophysical tools available to image and understand these fault structures in Kansas has been limited. Therefore, use of analogs, such as this northern California site, for technique enhancements and developments are critical to effective mitigation of the risk these buried fault structures represent.

Capturing and identifying the seismic character and variability of reflected energy from these offset features in Santa Clara, California, at these higher-than-conventional frequencies, will provide essential data for model development focused on problems in Kansas. This relatively thick alluvium over basalt bedrock setting provides an outstanding sequence for extrapolating any faults interpreted to sever the mid-Quaternary unconformity, identified in wells and interpreted on the minivib seismic section, through the Holocene and to the ground surface if such a fault expression exists. Mapping faults through unlithified sediments is extremely

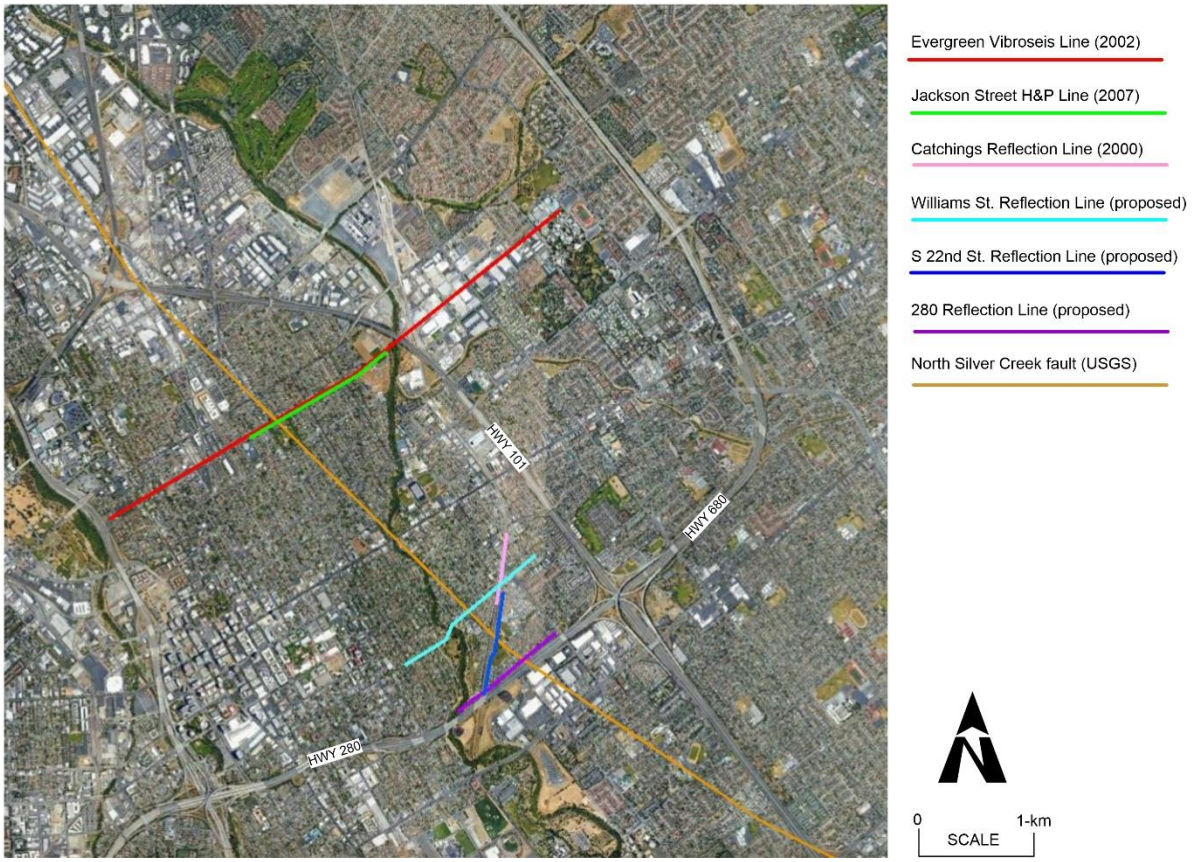

Figure 4. Proposed seismic lines relative to agricultural and infrastructure developments.

challenging and considering the amplification potential of alluvium compared to lithified rock, identification and characterization of faults with movement during Quaternary is critical to hazard mitigation. In Kansas, alluvial valleys have the greatest population densities on a per acre basis in comparison to any other surficial geology. It is therefore paramount to identify areas with ground motion potential (induced or natural) and delineate the extent of faults that sever the basal contact of the Quaternary interval.

Seismic Investigation

Two properly placed (based on fault projection, associated/related subsurface structures, linearity, coupling potential, contiguous coverage, cultural noise, and local impact) and intersecting 2-D high-resolution seismic-reflection profiles would provide cross-sectional images with sufficient quality to address many of the key structural and stratigraphic questions about the inferred fault and its associated structures. The 2-D profiles will total around 2 km and will intersect south of the fault trace to allow confident reflection correlations between lines. They will allow the USGS profile collected by Rufus Catchings to be reprocessed and incorporated into the interpretation. They will also be far enough from the Williams et al., 2002, and Wentworth et al., 2010, profiles to establish the lateral extent of the so called "flower structure" and a high resolution stacked seismic reflection section that could be interpreted to either a confirm or refute estimates of last movement on the Silver Creek Fault in this area.

The two seismic profiles will intersect the fault at slightly different angles. One will be acquired nearly orthogonal to the trace of the inferred fault and run parallel to I-280. The second profile will serve as an extension of the Catchings seismic section and will intersect the inferred surface projection of the fault at an oblique angle (~50 degrees). These profiles will allow any offset in the upper 100 m to be mapped and associated slip structures (negative flower structure) to be observed and evidence of Holocene movement established. The line intersecting the fault at a slight angle will introduce some distortion in the representation of the flower structure but will not preclude determinations of vertical extent of the feature.

Data will be acquired with a 480-channel Geometrics Geode recording system, with triple-30 Hz L28A Sercel geophones with 14cm spikes where dirt or sod is accessible or custom triple-leg rock plates where hard surface prohibits spike penetration, and a high-frequency impulse source. The exact configuration of the source will depend on pre-survey testing and permit limitations. A source currently being assembled will allow 10 gauge black powder type Class C loads to be detonated at the ground surface with near total containment of air blast and shrapnel while providing a high frequency pulse to a preloaded ground surface. This new source will be preferred if during testing explosive sources prove to provide better frequency content and penetration, which has been our experience in the past.

Nominal 60-fold data within the optimum source offset range will result from this acquisition approach, with CMPs separation of 0.5 m. It is anticipated signal will have a dominant frequency around 150 Hz from the mid-Quaternary unconformity reflector and over 200 Hz from any reflectors within the Holocene. The bandwidth is anticipated to exceed 2 octaves which should minimize changes of generated narrow banded (<1 octave) stacked sections being narrow banded with a filter enhanced dominant frequency of around 100 Hz as was the case on the sledgehammer data presented in Wentworth et al., 2010. From experience using high resolution seismic reflection to map erosional, depositional, and structural features within Quaternary sediments (Miller et al, 2010; Miller et al., 2007; Miller et al., 1996; Miller et al., 1990; Miller et al., 1989) the increase in resolution and imaging clarity proposed here will be possible with improved coupling, source modal partitioning, receiver bandwidth and sensitivity increase, and source energy focusing.

Line locations allow for generating the optimum signal to noise ratio sections, correlation with previous seismic surveys, and discerning shallow structures in proximity and above to the subsurface expression of the fault. Correlations with mapped structures and other geophysical data should help provide a comprehensive interpretation of not only the controlling structures at the mid-Quaternary boundary, but also some support for the regional significance of these features and the deposition character within the alluvial sediments.

Experimental (Testing) Phase

Experimentation will focus on a series of tests designed to evaluate a variety of acquisition methods, equipment, and parameters. These experiments will mainly consist of walkaway noise tests, which involve recording data from a fixed spread using a variety of sources and source parameters. These data will be recorded on a 24-bit, 48-channel Geometrics seismograph and be completed sufficiently in advance of the production portion of the data acquisition to appropriately adjust equipment and deployment plans. The test spread needs to be located in an area with a uniform, relatively undisturbed subsurface, and as far away from the any noise sources as feasible to minimize the recording of non-source noise. It will likely take around half a day to complete each deployment (one along each proposed profile is expected) for this aspect of the testing.

If access is possible to a nearby well/borehole, a vertical velocity survey measuring the acoustic travel time from the ground surface to various depths in the subsurface would greatly enhance the correlation of reflections to reflectors. The resulting velocity function would be used to establish the accuracy of the velocity function determined from curve fitting and semblance routines during the processing of the CMP data. A velocity survey in a borehole located near the survey line would greatly improve the interpretations of depth and bed thickness on CMP stacked section. Downhole information represents a measure of true average velocity and ground truth for the time-to-depth conversions. We will come prepared to collect uphole data for correlation to CMP stacked sections.

A testing series designed to fine tune the acquisition parameter in advance of the production survey will take place immediately prior to beginning production acquisition. These tests will include a series of shot (impact or explosive) sequences designed to establish the impact of cultural noise and the effects of vertically stacking source pulses. Based on experience the triple 30Hz Sercel L-28A geophones wired in series will likely provide the best response and will be used to record all seismic data. Receiver spacing will be 1 m and if testing proves to be consistent with rules of thumb and experience, the three receivers per station will be spaced in a 1 m inline array for the production data. The source stations will likely be spaced at the same interval as the receiver stations, but that determination and the number of impacts/pulses recorded per station will be based on pre-production testing. If at any point during the noise testing an optimum parameter or component is identified, the remaining tests could be bypassed.

Production Acquisition

The two profiles will be collected using the optimal parameters and equipment based on walkaway testing, both during preliminary and final on-site tuning prior to production acquisition. A 480-channel rolling-spread, compressional-wave survey will be acquired along the proposed profiles. The profiles will each be approximately 1 km and oriented preferentially in areas with the best possible cultural conditions and where intersection with the fault projections provides the opportunity for reasonable interpretations of the depth (time) of last movement.

Source and receiver selection and operation will rely heavily on previous experience. A customized 10 gauge, fully encapsulated, surface, class C non-projectile, rapid burn source should provide the highest amplitude and frequency energy pulse without requiring invasive placement and will result in minimal surface disturbance. Alternately, we will be prepared with a bounce suppressing, highly repeatable mechanical weightdrop on small footprint UTV, several sledge hammers, as well as downhole projectile and rapid burn sources. These high frequency sources will provide optimum mobility with ample high frequency energy. Receiver spacing will likely be 1 m; this suggestion is based on analysis of seismic profiles acquired nearby and a broad range of experiences around the world with similar near-surface lithologies and depths of interest.

The very high fold (redundant) data proposed here should result in sufficient split-spread source/receiver geometries to produce velocity profile maps at accuracy levels of 10% or better and cells sizes as small as 0.5 m horizontal and 2 m vertical. The data along both lines should be acquired in seven days or less. Acquisition equipment and parameters will be a qualitative choice based on frequency, potential penetration depths, quantity of ground roll relative to body waves, and physical site and near-surface constraints. All equipment used for this study will be owned, operated, maintained, and frequently used by the KGS.

The data will be acquired using a standard CMP fixed rolling spread technique resulting in a variable fold (averaging around 50) CMP stack section. The geophone station interval will

be confirmed by computations and qualitative judgments made from data acquired during the testing phase and from previous surveys in this area. The data will probably be acquired using an asymmetric split-spread source/receiver geometry to enhance continuity and increase velocity and dip control. The source-to-nearest receiver offset will probably be on the order of 1 m with a maximum source-to-receiver offset range from about 100 m to approximately 300 m. Modifications to the source/receiver geometries and offsets may be necessary after analysis of the data acquired during the testing phase.

Final design of the field geometries will be based on analysis of potential (using physical properties derived from the test data) versus required resolution (Miller et al., 1995). The quarter-wavelength criteria of Widess (1973) will be used to determine the best vertical resolution with equipment and near-surface conditions present during the acquisition of the test data. The potential versus actual horizontal resolution will be based on the radius of the theoretical Fresnel zone. Oversampling of the first Fresnel zone will not exceed 15 times (Miller et al., 1990) while a minimum of four times will be maintained throughout the survey (Knapp and Steeples, 1986).

QA/QC

The data acquired and processed on this survey will be managed to ensure the highest quality and most accurate acoustic representation of the geologic setting possible. Current state-of-the-art techniques will be used in a fashion that is appropriate and verified with step-by-step QA/QC. The most important (possibly even essential) information that will be provided (besides the CDP stacked section itself) are data in a shot gather format as they look after application of each intermediate step. This information allows the geophysicist and geologist to make determinations as to the authenticity of processed seismic sections. Seismic processing software and techniques are very power tools that, if not used properly, can and most likely will result in bogus interpretations.

The equipment and recorded data will be continuously monitored during acquisition to ensure the highest quality CMP stacked section. The response amplitude of receivers will be monitored using a modified tap test performed after the planting of each geophone or group of geophones. The continuity and leakage of each active station will be meter monitored prior to each shot. Visual analysis of general signal-to-noise ratio, environmental noise, DC bias, and variations in the optimum recording window will be performed on at least every fifth field plot.

Production Processing

High-resolution seismic reflection data, by its very nature, lends itself to over-processing, inappropriate processing, and minimal involvement processing. Interpretations of high-resolution shallow reflection data must take into consideration not only the geologic information available, but also each step of the processing flow and the presence of reflection events on raw unprocessed data. Processing for the reflection portion of this study will include only operations or processes that enhance signal-to-noise-ratio and/or resolution as determined by evaluation of high confidence reflections interpreted directly on shot gathers. For the most part, processing of high-resolution shallow-reflection data is a matter of scaling down conventional processing techniques and methods; however, without extreme attention to details, conventional processing approaches will produce undesirable artifacts.

The basic architecture and sequence of processing steps to be followed during the generation of the final stacked sections will be similar to conventional petroleum exploration flows (Yilmaz, 1987). The primary exceptions relate to the step-by-step QC necessary for the highest

confidence interpretations of shallow features and realization of full resolution potential (Miller et al., 1989; Miller et al., 1990; Miller and Steeples, 1991). Specific distinctions relate to the emphasis placed on velocity analysis (Miller, 1992), lack of extensive wavelet processing, care and precision placed on muting, step-by-step analysis of effects of each operation on reflected energy, limiting statics operations to maximum shifts no greater than one-quarter wavelength of the dominant reflection energy with large correlation windows, and coincident iterative velocity and statics analysis.

Special emphasis will be placed on all the analysis portions of the processing flow. It has been proved necessary and most effective to do velocity, spectral, and on certain occasions deconvolution analysis on every CMP (Steeples and Miller, 1990). Many times, variability in near-surface materials and/or conditions require changes in processing parameters over distances of less than 20 m. To insure the highest quality geologically representative stacked section, velocity analysis of every CMP is necessary. In association with point-by-point analysis, care must be taken to ensure that all coherent events on stacked sections interpreted as reflections are reflections. Biasing processing parameters to enhance events interpreted as reflections that are actually coherent noise must be avoided at all cost. Differentiating reflections from direct wave, refractions, air wave, and ground roll in the early portion of a stacked section is an extremely difficult task and must not be taken lightly (Steeples and Miller, 1990).

Geologic Interpretation

Geological interpretations will, for the most part, be consistent with well-established concepts and practices placing particular emphasis on velocity analysis, layer resolution, and reasonable bed distortion in making geologic inferences. It will be the intent of this survey to provide a geologic interpretation of the subsurface, loosely correlating major reflections with reflectors. Any distortion in otherwise uniform bedding related to variations in deposition or faulting will be identified and attempts made to track reflections across disturbed zones. Time-to-depth estimates will be made based on NMO velocity functions and velocity measurements calculated from a borehole checkshot survey is possible.

Overall Project Goal

The goal of this study is to determine the feasibility of imaging and resolving structural and stratigraphic features principally within the upper 50 m and in close proximity (300 m) to the inferred fault system (including ‘negative flower structure’) at high resolution. The results of this study will include: an appraisal of the high-resolution seismic method (resolution/signal-to-noise); an empirically based estimation of horizontal and vertical layer distortion and variability; time-to-depth converted interpreted CMP stacked sections focusing on correlation with geologic units across the proposed fault; structural features and potential growth history (including likely last movement) of this fault zone; evaluation of effort and potential to extrapolate structural and/or stratigraphic characteristics between stacked section at an oblique angle to each other and the fault; and evaluation of current equipment and methodologies and how they might be optimized for applications in Kansas.

Research Products

This seismic profile will provide an unprecedented image of a dramatic, yet to be fully delineated structure that—once fully incorporated into the existing geologic data—will undoubtedly enhance current geologic models for this area. Lessons learned here and techniques developed during the acquisition, processing, and interpretation will be valuable assets if and

when funding becomes available for similar studies in Kansas where secondary features have not been fully explored because of a lack of petroleum development potential.

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Appendix A
Equipment Planned to Deploy

Computer system mounted on a 6-wheel John Deere Gator with rear operator seat is the heart of the 720-channel Geometrics Geode distributed seismograph. Also mounted in this aluminum operator's shell is an IVI Vib controller, time break conditioners, VHF radio, and charging systems powered by four deep-cycle marine batteries that are charged by a roof-mounted solar panel.

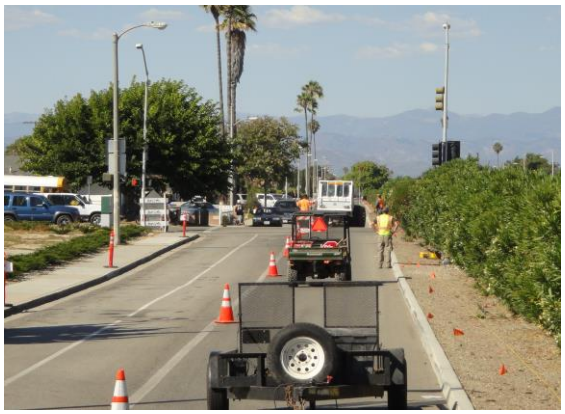
Twenty-four channel Geodes with high speed digital accelerator connected to digital line (Ethernet, yellow cables) and then to the controller. Current system includes 720 channels with 100Mbit transmission speeds.

Triple 23 Hz Sensor geophones planted in a 3 ft array.

Field deployments in Oxnard CA. Tremble rover unit collecting receiver station locations in advance of the source along a tidal surge area within 250 m of the beach (picture on left). Picture on right shows sensors planted along a moderate use high-way with the right shoulder closed for UTV and source travel.

Mobile processing center (MPC) and utility trailer in a field in Oxnard, CA. MPC mounted on a semi tractor pulling covered utility trailer hauling three 6-wheel ATVs, complete spare parts, and mobile shop (including welder, air compressor, hand tools, etc.). The MPC is fully self-contained, heated and cooled by 1900 BTU heat pump, powered by a 20-KW gas generator. Larger mechanical sources are transported on flatbed trailer in right photo.

Field pictures from Oxnard CA with crew using UTVs and setting up DGPS rtk tripod.



UTVs used to transport seismic cables and seismographs. UTVs are speed restricted to 15 mph and operate within designated transects. Closing off one lane of traffic to work along cement drainage canal.

III. RESPONSIBILITIES

The responsibility for providing each employee a safe working environment rests with each employee's respective employer. This plan, therefore, applies only to KGS for the survey activities. Each employee of KGS will strive to identify and mitigate any safety hazards encountered. All parties will cooperate in working as safely as possible and will comply with all applicable safety requirements as set forth by Norcal Geophysical Consultants (hereinafter "Norcal") as well as those included in this document.

In addition to the safety procedures indicated herein, we will adhere to the following:

1. In the event of electrical storms in the vicinity, all surface operations will cease if lightning strikes are closer than three miles (determined by 15 second count between lightning and thunder and/or by lightning detector).

2. If conditions become excessive (i.e., temperature > 100° < 30° F), continuous day operations may be modified to minimize chances for heat- or cold-related medical problems. Breaks of up to one hour after every hour of work might be necessary in extreme situations (i.e., temperature > 110° < 0° F). Maximum hydration of staff will be strived for at all times.

3. Appropriate steel-toed field boots will be worn and due caution will be exercised with respect to snakes, ditches, swampy areas, and ground debris. Steel toes will be worn by all field crew members.

4. Safety glasses with side shields will be worn at all times when on-site. Gloves will be with each crew member. Hard hat will be worn at all times.

5. At least one gallon of fresh water will be on hand at the beginning of each day for each crew member. An ice chest for keeping foodstuff cold and an ice chest for medical use in case of injury or overheating will be available on-site.

6. In the case of excessive cold weather, a sheltered area will be available with inside temperatures above 32° F.

7. The seismic crew will operate with an established protocol for initiating seismic sources. The safety plan will be approved by the Norcal Representative prior to initiation of field operations.

8. Appropriate driver's licenses will be held by operators of vehicles at all times (KDOT regulations). All KGS staff will have appropriate utility vehicle (UTV) training. All vehicles will be operated in accordance with manufacturer's documented procedures.

9. All explosive or flammable materials will be properly stored in vehicles and labeled in accordance with KDOT regulations during transport. MSDSs will be in this safety plan for all regulated, controlled, or potentially hazardous materials.

10. High pressure systems will be identified and will be maintained to meet or exceed manufacturer's specifications.

11. Work along roads will comply with regulations as established by KDOT (in Kansas) or local department of transportation (for out-of-state). An FRC-rated high-visibility safety vest will be worn when working within 100 ft of public roads and at construction sites that involve heavy equipment.

IV. FIRE PREVENTION AND PROTECTION PROGRAM

The overall objective of the KGS field fire prevention and protection program is to maintain a consistent awareness of fire potential in our various areas of responsibility. It is imperative to be ever vigilant in identifying ignition sources and potential spark-advancing fuels. These concerns span not only flammable materials brought on-site by the KGS, but also any combustible or explosive materials already on the site or naturally present within the study area.

Seismic operations involve the controlled release of large quantities of energy. Some sources of that energy require explosions that are an ignition source, while others generate sufficient heat in the presence of flammable liquids to potentially exceed the ignition point of many combustible materials. Therefore, when site conditions are conducive to sustaining combustion, extreme caution is required when operating seismic sources.

All gasoline engines have spark arrest exhausts to reduce the threat of igniting any combustible or flammable materials.

Smoking is only allowed in designated areas and all cigarette butts and ashes are disposed of in sand-filled cans provided in smoking areas. Under no circumstances are lit cigarettes discarded on the ground in work areas.

Several areas of specific concern and operational awareness are:

a) handling and storage of flammable materials
   No flammable solids will be transported or used during normal seismic surveying. Flammable liquids will be limited to petroleum products such as diesel, gasoline, lubricating oils, etc.
b) containment of flammable liquids
   Flammable liquids will be transported to the site in steel, U.S. Government approved nurse tanks, mounted in the bed of a truck, and labeled appropriately (and a single 5-gal. can to allow fill-up remote from nurse tanks). These flammable liquids include diesel and gasoline used for fuel in the seismic vibrator and support UTVs. Quantities transported in nurse tanks will not exceed 100 gallons of either type. Petroleum operated engines will have fuel supplied via manufacture provided and certified fuel tanks. Transfer pumps will be installed and maintained in accordance with manufacturer specifications.
c) fire protection at storage locations
   The nature of seismic work prohibits effective use of fixed storage locations. All mobile facilities (trailers) will have fire extinguishers at or near doors. Vehicles will have fire extinguishers located in accord with KDOT regulations.
d) how fires shall be handled on project
   All personnel will be educated on the fire triangle and matching extinguisher types with fires. All on-site KGS staff will have been instructed, prior to arrival on site, to the appropriate procedures for fire containment and extinguishing, making the removal of any one side of the fire triangle the principal objective.
e) fire watch or hot work permits
   No hot work will be undertaken on-site. Fire watch will be a supplemental task of every member of the seismic crew.

V. SAFETY PERSONNEL

Safety Personnel and Emergency Contacts

1. Rick Miller (KGS)—Site Safety Officer
2. Brett Wedel (KGS)—Operations
3. Bill Black (Norcal Geophysical Consultants)—Technical and Site Representative
4. Ken Johnson (WSP)—Technical Representative
5. Kate Zeiger (WSP)—Site Contact
6. Paul Hetu (HNTB/VTA)—Client Contact

Safety Meeting at Survey Site Date: 6/17/19

- ☑ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☑ Vehicle safety (road travel, warning signs, traffic control)
- ☑ Civilian/bystander safety (safe distances, visitor check-in)
- ☑ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☑ Emergency procedures (injuries, property damage, potential problems)
- ☑ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☑ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☑ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Rick Mott	KGS	
Sarah Morton Rupert	KGS	
Mike Farwell	KGS	Mike Farwell
Joe Anderson	KGS	
Bill Beack	NORCAL	
David Bissiri	NORCAL	
Kristen Burke	KGS	
Brent Wood	KGS	
Cole Bunker	KGS	Cole Bunker
Brent Bennett	KGS	

Site Safety Officer

Safety Meeting at Survey Site Date: 6/18/19

- [x] Environmental hazards (heat, plants, animals [snakes, etc.])
- [x] Vehicle safety (road travel, warning signs, traffic control)
- [x] Civilian/bystander safety (safe distances, visitor check-in)
- [x] Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- [x] Emergency procedures (injuries, property damage, potential problems)
- [x] Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- [x] First Aid (heat stroke, frostbite, animal bites, etc.)
- [x] Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Rick Mahan	KGS	
Joe Anderson	KGS	
Kristen Burke	KGS	
Sarah Morton Rupert	KGS	
Mike Farwell	KGS	
Cole Bunker	KGS	
Bruce Bennett	KGS	
Bill Black	NORCAL	
David Bossio	NORCAL	
Brett Wood	KGS	
James Luht	GTI	

Site Safety Officer

Safety Meeting at Survey Site Date: 6/19/19

- ☑ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☑ Vehicle safety (road travel, warning signs, traffic control)
- ☑ Civilian/bystander safety (safe distances, visitor check-in)
- ☑ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☑ Emergency procedures (injuries, property damage, potential problems)
- ☑ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☑ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☑ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Rick Miller	KGS	
Joe Anderson	KGS	
Brett Boone	KGS	
James Luhd	GTI	
Sarah Morton Rupert	KGS	
Kristen Burke	KGS	
Brad Usted	KGS	
Mike Farwell	KGS	Mike Farwell
DAVID BISSIRI	NORCAL	
Bill Black	NORCAL	
Cole Bunker	KGS	

Site Safety Officer

8:15 - 4:15
8:30 - 3:30
9:00 - 3:00

Safety Meeting at Survey Site Date: 6/20/19

- ☑ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☑ Vehicle safety (road travel, warning signs, traffic control)
- ☑ Civilian/bystander safety (safe distances, visitor check-in)
- ☑ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☑ Emergency procedures (injuries, property damage, potential problems)
- ☑ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☑ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☑ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Brett Bennett	KGS	
James Luhr	GTI	
Brett Wood	KGS	
Sarah Morton Rupert	KGS	
Joe Anderson	KGS	
Kristen Burke	KGS	
Mike Farwell	KGS	
Cole Bunker	KGS	
Ryan Miller	KGS	
David Bissiri	NORCAL	

Site Safety Officer

Safety Meeting at Survey Site Date: 6/21/19

- ☑ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☑ Vehicle safety (road travel, warning signs, traffic control)
- ☑ Civilian/bystander safety (safe distances, visitor check-in)
- ☑ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☑ Emergency procedures (injuries, property damage, potential problems)
- ☑ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☑ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☑ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Joe Anderson	KGMGS	
Brett Bennett	KGS	
Mike Farwell	KGS	
Kristen Burke	KGS	
James Luhr	GTI	
Cole Bunker	KGS	
Sarah Morton Rupert	KGS	
Brett Wood	KGS	
DAVID BISSIRI	NORCAL	
BILL BLACK	NORCAL	

Site Safety Officer

Safety Meeting at Survey Site Date: JUNE 24, 2019

- ☑ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☑ Vehicle safety (road travel, warning signs, traffic control)
- ☑ Civilian/bystander safety (safe distances, visitor check-in)
- ☑ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☑ Emergency procedures (injuries, property damage, potential problems)
- ☑ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☑ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☑ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Joe Andrews	KGS	
Mike Farwell	KGS	
Cole Bunker	KGS	
Brett Wild	KGS	
Brett Bennett	KGS	
Kristen Burke	KGS	
Rick Mueller	KGS	
Sarah Morton Rupert	KGS	

Site Safety Officer

Safety Meeting at Survey Site Date: 6/25/19

- ☑ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☑ Vehicle safety (road travel, warning signs, traffic control)
- ☑ Civilian/bystander safety (safe distances, visitor check-in)
- ☑ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☑ Emergency procedures (injuries, property damage, potential problems)
- ☑ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☑ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☑ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Sarah Morton Rupert	KGS	
Kristen Burke	KGS	
Brad Bunch	KGS	
Ricke Muller	KGS	
Joe Anderson	KGMES	
Brett Wohld	KGS	
Mike Farwell	KGS	Mike Farwell
Cole Bunker	KGS	Cole Bunker

Ricke Muller
Site Safety Officer

Safety Meeting at Survey Site Date: 6/26/19

- ☐ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☐ Vehicle safety (road travel, warning signs, traffic control)
- ☐ Civilian/bystander safety (safe distances, visitor check-in)
- ☐ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☐ Emergency procedures (injuries, property damage, potential problems)
- ☐ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☐ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☐ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature
Sarah Morton Rupert	KGS	
Mike Farwell	KGS	
Joe Anderson	KGS	
Kristen Burke	KGS	
Cole [redacted] Bunker	KGS	
Rick Miller	KGS	
Brent Wood	KGS	
Brett Bennett	K.G.S.	

Rick Miller
Site Safety Officer

Safety Meeting at Survey Site Date: _____

- ☐ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☐ Vehicle safety (road travel, warning signs, traffic control)
- ☐ Civilian/bystander safety (safe distances, visitor check-in)
- ☐ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☐ Emergency procedures (injuries, property damage, potential problems)
- ☐ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☐ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☐ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature

_____
Site Safety Officer

Safety Meeting at Survey Site Date: _____

- ☐ Environmental hazards (heat, plants, animals [snakes, etc.])
- ☐ Vehicle safety (road travel, warning signs, traffic control)
- ☐ Civilian/bystander safety (safe distances, visitor check-in)
- ☐ Site requirements (PPC) (gloves, hats, boots, hearing protector, safety glasses)
- ☐ Emergency procedures (injuries, property damage, potential problems)
- ☐ Equipment hazards (safe use of UTV, vibrator, augers, etc.)
- ☐ First Aid (heat stroke, frostbite, animal bites, etc.)
- ☐ Gun/explosives safety (handling of ammo, use of sources, cleaning and maintenance)

The following people were present today:

Name (PRINT)	Company	Signature

_____
Site Safety Officer

VI. EMERGENCY INFORMATION

California Highway Patrol	General Information in San Jose, CA, [408-467-5400] Highway Emergencies Cellular 911
Police/Ambulance	911; police/fire dispatch
San Jose Fire Department	Station 8 [408-794-7000] 802 E Santa Clara St, San Jose, CA 95112
San Jose Police Department	Edgardo Garcia [408-277-8900] 201 W Mission St, San Jose, CA 95110
Santa Clara County Sheriff	Laurie Smith [408-808-4400] 55 West Younger Avenue San Jose, CA 95110
Regional Medical Center (24/7)	Main [408-259-5000] Emergency [408-259-5000 ext. 226] 255 North Jackson Street, San Jose, CA 95116

WSP Contacts

Technical Contact	Ken Johnson ph 415-243-4698 / cell 415-412-7181
Site Manager	Kate Zeiger ph 415-402-2230 / cell 925-285-4194

HNTB/VTA

Project Manager	Paul Hetu ph 408-882-3683 / cell 425-577-0994

Norcal Geophysical Consultants Contact

Technical Contact and Site Manager (Norcal)	Bill Black ph 707-796-7170 / cell 707-338-5274

KGS Emergency Contacts

Safety Coordinator and Project Manager
Rick Miller, Kansas Geological Survey
Office ph: 785-864-2091
Cell (in the field): 785-766-8638

KGS Safety Officer
Kathy Sheldon, Kansas Geological Survey
Office ph: 785-864-2109
Cell ph: 785-766-0120

Lodging

Holiday Inn Express San Jose – Central City, CA
2660 Monterey Road
San Jose, CA 95111 ph 408-279-6600 / fax 408-279-1064
Manager: holiday2660@gmail.com

PLEASE NOTE: If you have electronic means of getting directions, such as on your phone, I suggest you use that method. If you do not have directions from some other method, these should get you there.

From Reno, follow I-80 W toward and through Sacramento. In/around Cordelia use the right 2 lanes to take Exit 40 for I-680 S toward Benicia/San Jose. Stay on I-680 for ~70 mi.

Use the right 3 lanes to merge onto US-101 S toward Los Angeles (2.1 mi). Then use the right 2 lanes to take Exit 383 for Tully Road (0.3 mi).

Turn right onto Tully Rd and then left (south) from Tully Rd onto Senter Rd. Then turn right (west) onto Umbarger Rd. Then turn right (north) onto Monterey Rd. The hotel is on the right side of the road past Papa Johns and a garden supply store.

A map from Google Earth, including the location of the two seismic lines, is on the next page.

Seismic lines
Downtown
San Jose
Holiday Inn Express San Jose –
Central City
2660 Monterey Rd
Santa Clara G21
© 2018

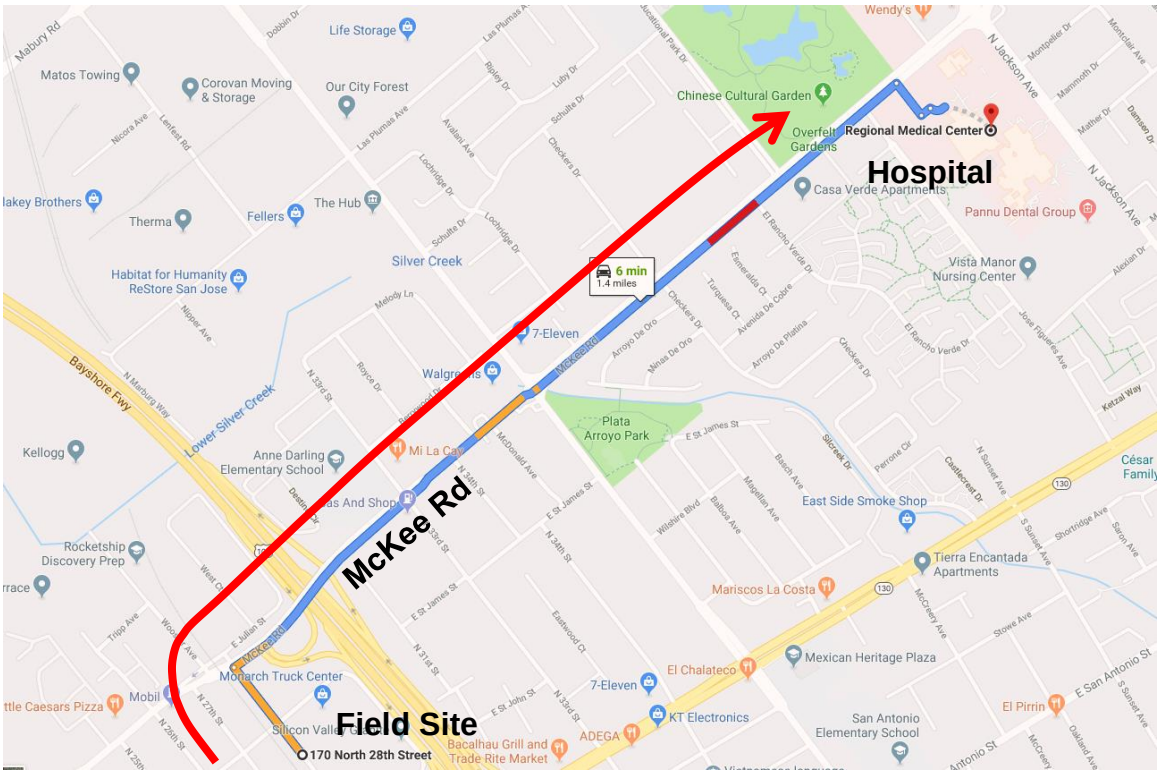
Emergency Route to Hospital

Regional Medical Center of San Jose
255 North Jackson Avenue
San Jose, CA 95116
Main Hospital: (408) 259-5000
Emergency Room: (408) 259-5000, Ext. 226

DRIVING DIRECTIONS FROM FIELD SITE

From **field staging area** to **Regional Medical Center of San Jose**
Distance: Approx. 1.5 miles
Driving time: Google Maps says approx. 5 minutes.

Head northwest on **N 28th St** toward **E St James St**
Turn right onto **McKee Rd**
Turn right onto **N Jackson Ave** (Emergency Entrance is at 225 N Jackson Ave)



Procedures

Accidents/Injury: If any serious injury does occur, the appropriate authorities shall be notified immediately. All accidents will also be reported.

Several members of the KGS crew have certification in CPR/First Aid. This certification was received through participation in the "First Aid Basics" and "Adult CPR" programs presented by the Red Cross of Lawrence, Kansas. These classes are approved by the U.S. Department of Labor, Mine Safety, and Health Administration and meet or exceed OSHA requirements. 40hr OSHA certifications are provided by Genesis Environmental of Blue Springs, Missouri, and meet or exceed 29 CFR 1910.120.

The following persons are certified as indicated (strikethrough denotes no current certification):

Certified in:	First Aid	CPR	40hr OSHA	10hr OSHA	Rick Miller, KGS
Certified in:	First Aid	CPR	40hr OSHA	10hr OSHA	Kate Zeiger, WSP
Certified in:	First Aid	CPR	40hr OSHA		Joe Anderson, KGS
Certified in:	First Aid	CPR	40hr OSHA	10hr OSHA	Brett Wedel, KGS
Certified in:	First Aid	CPR	40hr OSHA		Brett Bennett, KGS
Certified in:	~~First Aid~~	~~CPR~~	40hr OSHA		Sarah Morton Rupert, KGS

Fire/Explosion: Upon notification of a fire or accidental explosion on site, the fire department or appropriate first responders shall be notified and all personnel shall leave the area. **Bill Black from Norcal will be the contact for any on-site emergency**.

At least one KGS (owned or rented) vehicle will be on-site during the performance of all work. This vehicle will be used for medical evacuation of project personnel, if necessary.

Permits: All necessary and appropriate permits, fees, and licenses will be obtained by Norcal, with copies available on-site for inspection by local authorities.

VII. ALCOHOL AND DRUG POLICY

The University of Kansas (of which the KGS is a part) is a drug and alcohol free workplace with stringent controls and penalties associated with the use and distribution of controlled substances and alcohol in the workplace regardless of whether it is at a remote field location or on campus. The University of Kansas and Kansas Geological Survey consider alcohol and drug use (non-doctor prescribed) while "on-duty" a health and safety risk. The following section details the University and Survey policy as it relates to drug and alcohol abuse and misuse, enforcement of policies, and penalties for violating those policies.

Policy on Prevention of Illegal Drug and Alcohol Use on Campus and in the Workplace

The University of Kansas prohibits the unlawful possession, use, manufacture, or distribution of alcohol or drugs by students and employees on its property or as part of its activities. The University is committed to a program to prevent the illegal use of drugs and alcohol by students and employees. Any student or employee found to be using, possessing, manufacturing, or distributing controlled substances or alcohol in violation of the law on University property or at University events shall be subject to disciplinary action in accordance with applicable policies of the State of Kansas, the Board of Regents, and the University of Kansas. For employees, the University will take appropriate personnel action for such infractions, up to and including termination. Students who violate this policy will be subject to sanctions, which include suspension and expulsion from the University.

As a condition of employment, all employees of the University of Kansas shall abide by the terms of this policy statement and will notify the University of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction. The University will, in turn, notify as appropriate, the applicable federal agency of the conviction within ten days of receipt of notification of the conviction. The University will initiate personnel action, up to and including termination, within thirty days of receiving notice of such conviction. Employees may also be required to satisfactorily participate, at their own expense, in a drug abuse assistance or rehabilitation program before being allowed to return to work. For purposes of this policy, "conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the federal or state criminal drug statutes.

Kansas Law

Students and employees are reminded that illegal possession or use of drugs or alcohol may also subject individuals to criminal prosecution. The University will refer violations or proscribed conduct to appropriate authorities for prosecution. Kansas law provides that any person who violates the criminal statutes on controlled substances by possessing, offering for sale, distributing, or manufacturing opiates and narcotics, such as cocaine and heroin, shall be guilty of a drug severity Level 3 felony. For a conviction of such a felony, the court may sentence a person to a term of imprisonment in accordance with the Kansas Sentencing Guidelines Act and a fine of up to $300,000. Unlawful possession of a depressant, stimulant or hallucinogenic drug is punishable as a Class A nonperson misdemeanor, with a penalty of imprisonment and a fine of $2,500. Depressants include barbiturates, Valium, and barbital. Hallucinogens include LSD, marijuana, and psilocybin. State law classifies amphetamines and methamphetamines as stimulants. Kansas statutes also provide for criminal penalties for conviction of certain alcohol-related offenses. These penalties include imprisonment of up to six months and fines of up to $1,000.

Federal Law

The Federal Controlled Substances Act provides penalties of up to life imprisonment and fines up to $4,000 for intentional unlawful distribution or possession with intent to distribute controlled substances. For unlawful possession of a controlled substance, a person is subject to up to twenty years of imprisonment and fines up to $5,000. Any person who unlawfully distributes a controlled substance to a person under twenty-one years of age or who distributes a controlled substance on or within 1,000 feet of the University may be punished by up to twice the term of imprisonment and fine otherwise authorized by law.

Health Risks

Accidents and injuries are more likely to occur if alcohol and drugs are used on University property or as part of University activities. Every year in the United States, over 200,000 people are treated in hospitals for drug-related accidents and mental and physical illness; another 25,000 die every year from drug-related accidents or health problems. Drug users can lose resistance to disease and destroy their health. Drug tolerance and psychological dependence can develop after sustained use of drugs. More specifically, physical dependency, heart problems, infections, malnutrition, and death may result from continued high doses of amphetamines. Chronic use of narcotics can cause lung damage, convulsions, respiratory paralysis and death. Depressants such as tranquilizers and alcohol can produce slowed reactions, a slowed heart rate, damage to liver and heart, respiratory arrest, convulsions, and accidental overdoses, because the abuser is unaware of how much the drug or alcohol has been taken. Use of hallucinogens may cause psychosis, convulsions, coma, and psychological dependency.

Alcoholism is the number one drug problem in the United States. Alcoholism takes a toll on personal lives by affecting finances, health, social relationships, and families. It can have significant legal consequences. Abuse of alcohol or use of drugs may cause an individual driving a motor vehicle to injure others and may subject the abuser to criminal prosecution. Drunk drivers are responsible for more than half of all traffic fatalities.

Counseling & Treatment Resources

At the University of Kansas, alcohol and drug counseling and treatment are available to students at the University Counseling and Psychological Services, Watkins Health Center, and the Psychological Clinic. The Student Assistance Center and the University Information Center are excellent sources for information about University and community resources for counseling and treatment. The Health Education Department of Watkins Health Center can provide further information about health problems and treatment related to alcohol and drug problems.

University employees may contact the Counseling and Psychological Services and the Psychological Clinic for counseling and treatment. Faculty and staff members may also contact the State LIFEline, a 24-hour toll-free assistance line (1-800-284-7575) for a referral. If referred through the LIFEline program, the first counseling session is paid by the State. Please refer to page 63 for additional resources.

Definitions

The term “controlled substance” as used in this policy means those substances included in Schedules I through V as defined by Section 812 of Title 21 of the United States Code and as further defined by the Code of Federal Regulations, 21 C.F.R. 1300.11 through 1300.15. The term does not include the use of a controlled substance pursuant to a valid prescription or other uses authorized by law.

The term "alcohol" as used in this policy means any product of distillation or a fermented liquid which is intended for human consumption and which is more than 3.2% alcohol by weight as defined in Chapter 41 of the Kansas statutes.

Policy on Substance Abuse

The University recognizes that problems related to the abuse of substances such as alcohol and drugs may be resolved through cooperation between the employer and the affected employee. The policy set forth here for handling substance-abuse problems is intended to enhance cooperation and to protect both the individual and the University.

The University has a right to expect that employees will perform their jobs appropriately and to insist that job-performance standards be met. The University may properly intervene only when impairment affects job performance.

- These problems are defined as those in which an employee's use of alcohol or drugs has become part of a pattern of deteriorating job performance.
- This policy does not supersede any regulations or standard administrative practices applicable to job performance requirements.
- It is the employee's right and responsibility to seek professional assistance for a substance-abuse problem.
- All employees, especially department chairpersons and supervisors, should work to engender an enlightened attitude toward and a realistic recognition of the nature of substance abuse and to encourage employees to take advantage of available treatments whenever needed.
- Responsibility for implementing this policy rests with all department chairpersons and supervisory personnel. Procedures must be followed to assure that no employee with a substance-abuse problem will have his or her job security or promotional opportunities jeopardized by a request for diagnosis and treatment.
- A chairperson or supervisor may wish to consult with a professional in the treatment of substance-abuse *WITHOUT IDENTIFYING THE CONCERNED EMPLOYEE* before attempting intervention with the employee.
- Before attempting intervention, a supervisor of classified staff should discuss with his or her own supervisor and the Department of Human Resources the rules and requirements protecting the rights of the person believed to be suffering from alcoholism or drug abuse.
- Departmental chairpersons and supervisors should not attempt diagnosis. When an employee's job performance is deteriorating and there is reason to suspect that the source may be the use of alcohol or drugs, the chairperson or supervisor will meet informally with the employee, make an appropriate referral to a professional agency and encourage him or her to seek help for the problem. At this meeting, a date will be set by which improvement in job performance will be assessed.
- The employee is responsible for complying with the referral for diagnosis and for cooperating in any prescribed treatment. He or she should be assured that the referral agency will treat all discussions with strict confidentiality. (Most agencies will, with the consent of their client, report to a supervisor that the client has followed up on a referral.)
- Between the time of the meeting and the date set for assessing improvement in job performance, the chairperson or supervisor will continue to monitor the performance but will in all other respects leave the initiative for further discussions to the employee.

- If, by the date set at the first meeting, the employee's job performance has improved to an acceptable level, no further official action is required.
- The University expects that employees with a possible problem of substance abuse, even in its early stages, will be encouraged to seek diagnosis and treatment. The employee should be assured that seeking help will not interfere with job status, promotional opportunities or other privileges.
- If the job performance remains below accepted standards and the employee has refused to accept diagnosis and treatment, or has failed to respond to treatment, the chairperson or supervisor should suggest that he or she use one of the ***options available to any employee with an illness*** that interferes with job performance:
    a. ***Being placed on sick leave***. This option is for those with accrued leave. It would allow the employee to enter an inpatient treatment center and adopt a treatment program. Under this option, a written plan should be developed between the staff member and the University and properly executed by the chairperson or supervisor in consultation with Human Resources. The plan will spell out specifically the terms of the employee's return to his or her duties at the end of treatment (e.g., how the University is to be informed of the progress made in treatment and the appropriateness of a return to duty and how job performance is to be assessed).
    b. ***Being granted a leave of absence without pay for up to twelve months***. This option is for classified employees, upon approval of the Department of Human Resources.
    c. ***Taking early retirement***. This option is for those otherwise eligible. It is, of course, a drastic solution for both the individual and the University.
    d. ***Resigning***. If a classified employee can make no progress, recommendations to demote or dismiss are to be submitted to the Department of Human Resources for review and action.

Information revealed by the employee while receiving professional services will remain confidential and separate from University employee records. All record-keeping and access procedures will meet the federal regulations governing the confidentiality of patient records and the state law protecting treatment records.

VIII. TASK SPECIFIC HAZARDS

The purpose of the geophysical investigation is to acquire seismic data that can be used to extract key physical properties of the near surface.

Downhole Auger Gun

One of the geophysical tests proposed to be employed requires the use of an auger gun (shotgun type device) to introduce energy into the ground (Healey et al., 1991). This device consists of a small skid-steer loader with an attached auger/screw. The operation consists of (1) screwing the hollow stem auger approximately 3 ft into the ground, (2) retrieving the center bit, (3) loading the shell in the firing tube and lowering the tube until it latches in place, (4) firing the gun by impacting the top of the firing tube with a small hammer, and (5) unscrewing the auger from the ground. The auger gun uses a *blank* 8-gauge or 12-gauge shotgun shells fired below the ground surface in a downward direction. The device is built to minimize any danger to persons handling and moving the device, as well as avoid leaving any residual materials in the ground. The shotgun shells will be secured in a specially designed steel, lockable, explosives box attached to a vehicle at all times. The operation/safety rules and regulations for the auger gun are presented as an appendix to this plan.

Not in Use on this Project

30.06 Downhole Projectile Source

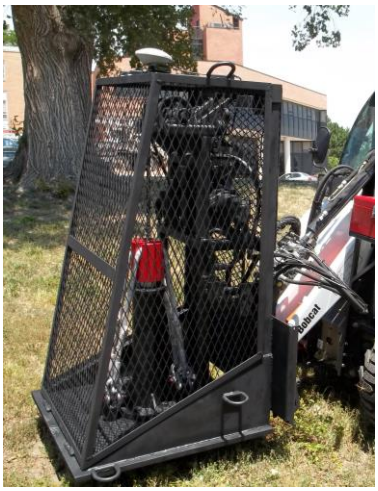
Experiments will be carried out with a downhole projectile source. This source is a specially modified 30.06 rifle designed to be loaded and fired while secured to the ground in a downward direction. The firing tube is lowered about one foot into a 1" hole. A standard 30.06 rifle shell is loaded in the above-ground breech and then detonated so that air coupled wave (blast), gas, projectile, and shrapnel are contained within the 1" hole. The procedure calls for 1) drilling a 1" x 1' hole, 2) placing the firing tube in the hole (covering the end of the tube with a finger cot), 3) loading a 30.06 round into the above-ground breech, 4) locking the bolt in place, 5) assuming the firing position, 6) detonation, and 7) removal from the hole. The device has successfully and safely fired over 30,000 rounds since 1985. All rounds are stored in a secure steel box.

Not in Use on this Project

Sledgehammer

The sledgehammer is a well understood and available source of acoustic energy. The sledgehammer will be used with a hard-wire time break and will be operated by physically capable KGS staff members. An area twice the length of the hammer handle will be cleared prior to use. The hammer will be 1) raised above the operator's head using a two-hand grip, 2) accelerated with full arm extension toward the ground, 3) contact striker plate with hammer, and 4) lifted into split two-hand carry grip. Activities such as changing broken handles and attaching new hammer switches should only be done by experienced KGS staff. A minimum clear area directly in front of the operator of at least 25 ft must be maintained in case operator loses grip on hammer or hammer head breaks free from the handle. Gloves, safety glasses, steel toed boots, and hearing protection are required for operating this source.

Accelerated Weight Drop



The accelerated weight drop is a high energy, hydraulically operated source. All moving parts are shielded and designed to minimize risk of injury to operator and bystanders. By its very nature the weight drop represents a hearing danger. The source is powered by a standard commercial loader. A single operator runs the device from inside a protective cab. Operation simply requires 1) the base plate to be placed on the ground and loader/weight drop weight applied for hold down, 2) idle at medium rpm and initiate the hydraulic valve, 3) weight is raised against resistive force (bungies), 4) dropped once maximum pre-set height is reached, and 5) source is hydraulically lifted and carried to next shot point by tracked loader. The source is sufficiently shielded that only in a very unusual situation will pieces of the source come free from the source and represent a threat to safety. By maintaining a minimum 30 ft for hearing safety, the danger of fragments is all but eliminated.

10 Gauge Seismic Source

The contained pulse compulsive source is a 10 gauge bolt and breech with 800 lbs of down pressure to muffle the noise and confine the energy to a 18" diameter surface area. Shells are manually placed in a detonation vessel and electronically fired after a minimum pressure load has been place on the device. Expanding gas from the detonation is captured in expansion chambers where the overpressure is gradually reduced to atmospheric. Maximum sound levels remain below 85 dB at 20 ft while maintaining noninvasive and nondestructive coupling to the ground surface.

Specific Hazards

1) Detonation outside breech
    a. Detonation while loading
    b. Detonation while placing bolt
    c. Detonation while lowering vessel to contact ground surface
    d. Detonation after removing a miss fire round
2) Airblast from source expected after detonated on unlevel ground
3) Contact with transport vehicle
4) Impact by loader arm while maneuvering vehicle

Control Measures

1) Load breech and slide bolt in compliance with manufacturer's instructions
2) Insure breech is clear of any debris
3) Shell should load into breech with gentle pressure, otherwise change shells
4) Keep breech and bolt well oiled with WD-40
5) Select source locations that are as level as possible
6) Operate transport vehicle in accordance with manufacturer's specifications

Bolt LSS-6 Land Air Gun

The Bolt Land Air Gun has been in routine use in oil exploration for more than 20 years. The device consists of a 3-cylinder diesel engine, a four-stage air compressor, and an enclosed water filled chamber (housing the "gun"). The safe operation of the gun is well documented in the operator's manual. The entire device is transported as the bed of an F-350 4-wheel drive truck. The 3-cylinder diesel engine powers not only the air compressor but also a hydraulic system designed to raise and lower the gun chamber to the ground. The gun chamber is hydraulically lowered to the ground with the weight of the truck used to hold the device to the ground. The gun is electrically detonated from the cab of the truck with no moving parts exposed during detonation. The engine and air compressor are enclosed in a protective shroud. The gun generates a thump to the ground surface approximately equivalent to 1/8 of a pound of high explosive buried 3 to 4 ft beneath the ground surface.

Not in Use on this Project

IVI Minivib

The MiniVib is a hydraulically powered vibrator designed to shake the ground in a very controlled fashion over about a 4 to 8 second time duration. The device is hydraulically powered with no moving parts that possess an entanglement potential. Energy is delivered to the ground by this device through a hydraulically powered pad approximately 3 ft in diameter mounted on the belly of the vehicle. The pad is lowered from beneath the vehicle using the vehicle's weight as hold-down pressure. The pad is vibrated by a hydraulic servo delivering frequency-varying energy to the plate over a preset time duration. No moving parts are exposed with the maximum movement of the pad relative to the vehicle less than 2 in.

Not in Use on this Project

50-cal. Downhole

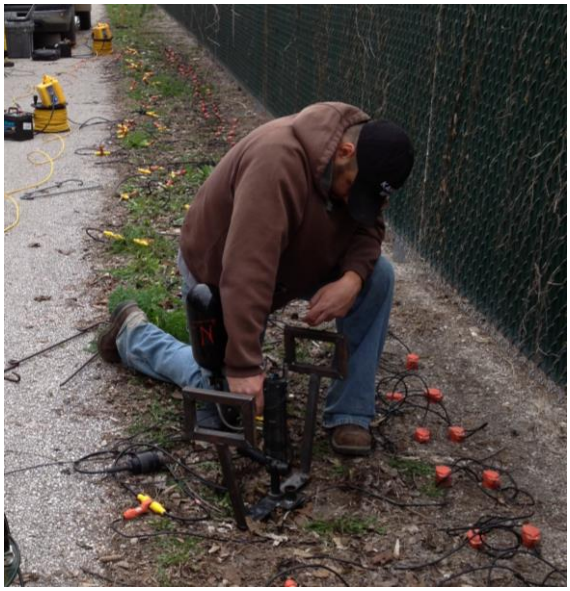
The downhole .50-caliber seismic source consists of a .50-cal. rifle bolted to a 0.6 cm thick steel plate. The rifle itself is a standard .50-cal. breech and bolt, built by Texas Gun and Machine Company, attached to a standard .50-cal. machine gun barrel. Machined grooves in the barrel are used in conjunction with a pressure clamp to attach the rifle to a 30 cm by 90 cm steel plate. The rifle barrel is lowered into a 60 cm to 80 cm deep borehole

Not in Use on this Project

4 cm in diameter until the plate is flush with the ground surface. This steel plate acts as a ground seal and a platform to stand on while firing the gun. The weight of the shooter on the plate and the snug fit of the barrel to the borehole walls help seal the gun to the ground. The rifle can be equipped with a source sensor or closure switch to generate a time break. Firing can be done either electrically by solenoid or manually by pulling the trigger. The downhole .50-cal. weighs about 30 kg and is easily two-person portable. Safety rules for the use of the .50-cal. seismic gun are presented as an appendix to this plan.

Not in Use on this Project

Paintball Impulsive Seismic Source



A standard of-the-shelf paintball marker has been modified to impart a series of high frequency air pulses into the ground through a specially modified barrel. The pulse sequence is electronically controlled to optimize its use as a coded seismic source. The barrel was designed and built at the Kansas Geological Survey and it has no single opening at the end of the barrel. The barrel is plugged at the end with around 50 small holes drilled in the sides of the barrel to release the gas pulse below ground surface.

The seismic paintball source is pushed by hand to a predetermined and measured depth (~6 inches). The discharge valve is electronic and controlled by a computer circuit. Operation of the commercially available portion of this source is completely consistent with manufacturer's instructions as they relate to the use, storage, and transportation of the compressed air cartridges. This seismic source cannot launch a projectile of any kind. This source is treated like all other sources—with maximum concern for safety.

Not in Use on this Project

Downhole Firing Rod

Detonation of black powder blank shells (shotgun shells) has proven a reliable and energetic seismic source. Originally developed by the Canadian Geological Survey and Bison Instruments, the Buffalo Gun was a cheap and efficient delivery system for subterranean detonation of blank load shotgun shells. The current configuration of the downhole detonation system is 'downhole firing rod,' a term coined by Betsy Seisgun.

The system we use includes a 4 ft long, thick walled steel tube with a stainless steel chamber that screws onto to the downhole end. Inside the thick walled tubing is a stainless steel rod that acts as the firing rod. The firing rod is locked in place away from the shell chamber using a set screw device. The shell is placed in the chamber and screwed onto the end of the rod.

Not in Use on this Project

The rod is lowered into a pre-drilled 2" hole and seated with water. A blast mat is placed at the ground surface and the firing rod is freed from its locked position. The top handle of the firing rod is then impacted with a small rubber mallet and the firing rod detonates the percussion-style shotgun shell.

General

Field operations will consist of geophysical investigations to determine the effectiveness of shallow seismic survey methods at this site to delineate the structures and stratigraphy. The introduction of acoustic energy into the ground in a controlled fashion involves equipment or material with the potential to do harm if not properly handled and operated. Good common sense, training, and experience are the rule for seismic field operations. These can usually be easily accomplished if manufacturers' operating and use instructions are followed.

The field investigations will involve project personnel performing geophysical surveys of the study area utilizing the aforementioned pressure pulse, impacting, and vibratory seismic sources. The principal hazards associated with the use of sources mentioned here consist of handling or moving the equipment, improper use, fragments from high pressure impacts, and elevated sound levels.

IX. ACTIVITY HAZARD ANALYSIS

A. Work Item: *Traffic Control*

All regulation concerning right-of-way and traffic directions will be observed.

Specific Hazards–The specific hazard involves accidents with vehicular traffic within the survey area.

Control Measures–All personnel will minimize activity along trafficked roadways to the extent possible. Traffic cones will be used to identify and buffer the work area with respect to on-coming traffic. Care will be used while working on or around driveways. If appropriate, signs and/or flagmen will be used to alert and slow traffic through the survey area. Flagmen will be used along roadways with limited sight areas or speed limits exceeding 45 mph. For sites with traffic speeds above 45 mph and work requiring shoulder access, lane closure must be considered.

B. Work Item: *Use of Class "C" Shotgun Ammunition* **(Auger gun / Buffalo gun / 50 cal. / 30.06 Muffled Impulsive Seismic Source)**

Specific Hazards–The specific hazards involve injuries to persons or property damage arising from normal or accidental detonation or improper handling of the shotgun ammunition.

Control Measures–All project personnel working with or around the shotgun ammunition, seismic guns, and associated equipment will exercise all appropriate and reasonable precautions to prevent or limit accidents arising from use of explosives. All explosive devices will be Class "C," consisting of fully containerized smokeless black powder in the form of shotgun ammunition. Site work will conform with appropriate and reasonable Class "C" explosives handling, storage, communication, and detonation procedures. All seismic shots will occur in shallow boreholes 2 to 4 feet below ground level.

Rick Miller of the Kansas Geological Survey will be responsible for the safe use of the shotgun ammunition to be used. He will review the blasting communications and safety procedures at the initial site safety meeting and again prior to the initiation of the first seismic shots. All project personnel must become familiar with and abide by these protocols.

Specific shotgun ammunition safety measures when KGS is managing ammo are as follows:

- Storage: All shotgun ammunition will be stored in a locked metal container. The storage container will have proper DOT labels for Class "C" shotgun ammunition.

- Transportation: The ammunition vehicle will carry proper DOT labels and will be operated by Rick Miller or Joe Anderson on or near site. The vehicle will contain a fire extinguisher,

First Aid kit, and will be parked far enough off any road to minimize the potential for a collision with other vehicles.

- Handling: Only Rick Miller or qualified alternate, KGS, will be allowed to access, handle, and load the shotguns. Shotgun loading and firing will be conducted in accordance with the attached "Operations/Safety Rules and Regulations for the Auger Gun."

- Firing Communication: Rick Miller or Joe Anderson shall establish a series of warning signals to be used prior to and following each shot. An audio signal or voice command will indicate the beginning of a shot (or prior site specified requirements). He will review the precise warning procedures with all project participants at the initial site safety meeting, and will monitor compliance with these procedures.

- Safe Distances: All project personnel not authorized to handle the shotgun ammunition and guns must stay a distance of 10 feet away from the guns and shot locations. Non-project personnel will not be allowed in the work area.

Blasting shall not commence if any of these protocols is not met.

Ammunition safety measures on-site are the responsibility of KGS staff. The previous protocols are KGS minimums and can serve as fall-back measures if site staff do not have more stringent requirements.

Transportation–Transportation of the auger guns and ammunition is on a standard 2-ton flatbed truck and enclosed gooseneck trailer. The ammunition is carried in .50-caliber military-style ammo boxes. The ammo boxes are locked in 10-gauge steel boxes that are permanently bolted to the truck bed. The ammunition is classified as "Class C Explosive" by the U.S. Department of Transportation. No more than 2,500 rounds of ammunition will be transported to this project, packed in quantities of around 160 per container.

C. <u>Work Item</u>: *Modified Auger Gun*

Specific Hazards–Detonation outside downhole environment, crush by motorized-moving vehicle, and hand entanglement in moving parts.

Control Measures–
1) Safe gun practices (detailed in supporting documents),
2) care and inspection of firing mechanism,
3) only load shell immediately prior to downhole insertion,
4) maintain at least 10 ft separation from vehicle when moving, and
5) maintain minimum 5 ft standoff distance from source when under hydraulic power.

Not in Use on this Project

D. Work Item: *Downhole 50-cal.*

The downhole .50-caliber seismic source consists of a .50-cal. rifle bolted to a 0.6 cm thick steel plate. The rifle itself is a standard .50-cal. breech and bolt, built by Texas Gun and Machine Company, attached to a standard .50-cal. machine gun barrel. Machined grooves in the barrel are used in conjunction with a pressure clamp to attach the rifle to a 30 cm by 90 cm steel plate. The rifle barrel is lowered into a 60 cm to 80 cm deep borehole 4 cm in diameter until the plate is flush with the ground surface. This steel plate acts as a ground seal and a platform to stand on while firing the gun. The weight of the shooter on the plate and the snug fit of the barrel to the borehole walls help seal the gun to the ground. The rifle can be equipped with a source sensor or closure switch to generate a time break. Firing can be done either electrically by solenoid or manually by pulling the trigger. The downhole .50-cal. weighs about 30 kg and is easily two-person portable. Safety rules for the use of the .50-cal. seismic gun are presented as an appendix to this plan.

Not in Use on this Project

Specific Hazards

1) Above ground detonation
2) Plugged barrel and barrel chamber rupture
3) Pinch appendages between bolt and breech
4) Drop live shell and freak detonation outside chamber
5) Back strain from improper lifting of source

Control Measures

1) Use good gun sense (detailed in appendix)
2) Never transport with bolt in locked position
3) Never transport with shell (live or spent casing) in chamber
4) Keep barrel clear of all foreign material
5) Us condom to insure fluids do not gain access to barrel
6) Two people lift from handles using bent knees and straight backs

E. Work Item: *Bolt LSS-6 Land Air Gun*

The Bolt Land Air Gun has been in routine use in oil exploration for more than 20 years. The device consists of a 3-cylinder diesel engine, a four-stage air compressor, and an enclosed water filled chamber (housing the "gun"). The safe operation of the gun is well documented in the operator's manual. The entire device is transported as the bed of an F-350 4-wheel drive truck. The 3-cylinder diesel engine powers not only the air compressor but also a hydraulic system designed to raise and lower the gun chamber to the ground. The gun chamber is hydraulically lowered to the ground with the weight of the truck used to hold the device to the ground. The gun is electrically detonated from the cab of the truck with no moving parts exposed during detonation. The engine and air compressor are enclosed in a protective shroud. The gun generates a thump to the ground surface approximately equivalent to 1/8 of a pound of high explosive buried 3 to 4 ft beneath the ground surface.

Not in Use on this Project

Specific Hazards

1) Reckless use of transport truck
2) Air line rupture
3) Pinch or smashed appendages during raising or lowering of tower
4) Arm or hand entanglement in belt driven compressor
5) Rupture of diaphragm
6) Hearing loss from diesel engine
7) Compressed air cylinder breech

Control Measures

1) The careful and safe operation of the standard 4 wheel drive truck is well documented in the owner's manual.
2) It is critical to always be aware of anyone near the device.
3) The raising of the gun for transport and lowering of the gun just prior to detonation is done with only part of the gun visible to the operator. It is critical that no one comes within 50 ft of the gun while in operation.
4) Hearing protection (down 30 dB) is required by anyone within 50 ft of the truck.
5) Keep all shields in place and moving parts serviced.
6) Daily inspect all air lines and connectors holding pressures in excess of 500 psi.

F. Work Item: *MiniVib*

The MiniVib is a hydraulically powered vibrator designed to shake the ground in a very controlled fashion over about a 4 to 8 second time duration. The device is hydraulically powered with no moving parts that possess an entanglement potential. Energy is delivered to the ground by this device through a hydraulically powered pad approximately 3 ft in diameter mounted on the belly of the vehicle. The pad is lowered from beneath the vehicle using the vehicle's weight as hold-down pressure. The pad is vibrated by a hydraulic servo delivering frequency-varying energy to the plate over a preset time duration. No moving parts are exposed with the maximum movement of the pad relative to the vehicle less than 2 in.

Not In Use on this Project

Specific Hazards

1) Crush hazard for anyone near baseplate or wheels when turning steering wheel.
2) Hydr0static drive responds different than standard mechanical drivetrains, making personal injury from rolling over possible.
3) Center-articulating vehicles can easily roll over on steep side hills when turning uphill.
4) High pressure accumulators, pumps, motors, and transmission lines can rupture, spewing hot oil and, if in physical skin contact, fluid can be injected under the skin.
5) Mass moves at extremely high rate of speed and if valve malfunctions, mass can slam into stops, potentially crushing any appendage between the mass and stops.
6) With 15,000 lbs of down pressure on baseplate, baseplate can crush.
7) Vehicle has no suspension and therefore at top speed (15 mph) driver can be tossed into ceiling on bumpy roads.
8) Vehicle's diesel engine is exposed with the fan belt and pulleys moving at a high rate of speed when operating.

Not In Use on this Project

Control Measures

1) This vehicle is center articulating and requires care when turning that no one is within 20 ft of the vehicle and no sharp turns are made on steep hill sides.
2) Safe operation of the vehicle is documented in the operator's manual provided by the manufacturer.
3) Hearing protection is required within 50 ft of the vehicle.
4) All shields are to remain in place while the vehicle is in operation
5) Hydraulic pressures of more than 3000 psi are routine during operation. No maintenance or service will take place while vehicle engine is running.
6) Quick inspection is necessary prior to lowering the pad.
7) Switch to low pressure setting when operator is not in cab.

G. Work Item: *Downhole Firing Rod*

The downhole firing rod is a 4 ft long pipe with a sleeve designed to hold and contain a shotgun type shell. Gauges can range from 8 to 12. The sleeve holds the shotgun shell, which for seismic applications is routinely a black powder blank. Once a ~3ft deep hole, 2" in diameter is drilled the firing rod is lowered into the hole and the hole is fluided with water. The water acts to improve dissipation of energy and partially contains the upward directed energy. After the source is properly loaded into the borehole a firing rod impacts the primer of the shotgun shell via firing rod that extends through the center of the pipe. Accelerating this firing rod inside the pipe is accomplished with a rubber mallet by impacting the top of the rod. The mallet is instrumented with a contact closure devise that acts as a time zero indicator.

Not in Use on this Project

Specific Hazards

5) Detonation above ground
   a. Detonation while loading sleeve
   b. Detonation while screwing sleeve onto rod
   c. Detonation while lowering into borehole
6) Airblast from source detonated downhole without water cover
7) Recoil of rod projecting it out of hole and into air.

Control Measures

7) Operate firing rod in compliance with manufacturer's instructions
8) Insure (double check) firing rod is locked in place prior to screwing sleeve onto rod
9) Shell should load into sleeve with gentle pressure, otherwise change shells
10) Add water until running onto ground surface
11) Inspect to insure water is in annular space around firing rod prior to unlocking firing rod
12) Weight firing rod to counter recoil energy

H. Work Item: *Accelerated Weight Drop*

The accelerated weight drop (AWD) generates acoustic energy by accelerating a 50 to 100 lb weight through a 2 ft stroke impacting an 18 in diameter steel plate held to the ground surface by the weight of a skid-steer style loader. The weight is accelerated within an enclosed steel guide. The drive mechanism consists of a hydraulic motor turning a set of sprockets that deliver power to a cycling lift arm that pulls the weight against the resisting force of an industrial rubber band. Simply envisioned, this device is analogous to a slingshot. All moving parts are shielded, with the contact area between the weight and plate sufficiently enclosed to avoid the possibility of debris becoming airborne and representing a risk to the

operator or bystanders. The winch located at the back of the Toolcat is a standard winch in a custom built bracket. The bracket serves two purposes: 1. To protect bystanders during operation, and 2. To protect the winch itself. The bracket has a fairlead consisting of four rollers; the top roller slides up and down during operation. When the roller slides upward it trips a switch that kills the power to the winch immediately. The reel located in the bed of the Toolcat (which holds the land streamer when not in operation) is a custom built belt-driven reel with an electric motor. The controls for the motor are located at the back end of the Toolcat bed to insure safe operation for the operator. The belts and pulleys are located on the inside of the bed and are shielded from bystanders by the support structure of the reel itself.

Specific Hazards

1) Roll over on steep terrain possible with loader carrying weight drop in elevated position
2) Hearing damage from impact of hammer and anvil
3) Entanglement of operator in streamer wench
4) Entanglement in streamer reel
5) Running over and crushing feet under wheels
6) Collision with traffic when working along roads
7) Hydraulic fluid leak or high pressure release

Control Measures

1) The operator wears hearing protection (30 dB down) while the loader is running.
2) No bystanders can be within 30 ft of the device while it is in operation and within 50 ft without hearing protection.
3) All shields are to remain in place while in operation. Routine maintenance, requiring removing shields, can take place only when the loader engine is off.
4) The operator can exit the vehicle only when the weight drop is in the full down position and solid contact is made with the ground surface.
5) Operation of the Toolcat will be consistent with those published in the owner's manual.
6) The fully bracketed winch keeps extremities away from moving parts.
7) The emergency kill switch on the reel, when triggered, cuts power to the reel motor immediately.
8) The reel's pulleys and belts are installed on the inside of the support structure of the reel to separate the crew and the belts while in operation.
9) All controls of the winch are located in the cab of the Toolcat, which limits control of the winch to just one person, the operator of the Toolcat.
10) Operating power to the winch and reel can be cut from the cab when not in use or when the operator feels it necessary.
11) The Toolcat is to be operated by only a qualified trained individual.
12) Only move Toolcat when weight drop is carried low to maintain low center of gravity and minimize tip-over risk.
13) Operate along road shoulders with proper traffic safety precautions and with hazard lights flashing.

I. **Work Item**: *All Terrain Vehicles/Utility Vehicles (UTVs)*

UTVs that could be on site include the 4x6 John Deere Gator and three Polaris 4x6s. These UTVs all serve a very specific purpose and are critical to smooth and efficient operations. The UTVs never obtain speeds in excess of 15 mph and therefore do not represent risk of injury due to excessive speeds. The tip-over potential is minimized by the 6-wheel design of the vehicles, but tip-over potential does exist. Care is always taken to properly load the vehicles and only traverse grades within the acceptable limits of the vehicle as defined by the manufacturer.

1) The Yamaha has a specially designed cable winding device (not used for this survey). The Yamaha has a Power Take-Off that is used to power a winding device mounted on the front of the vehicle and is used for the rolling of seismic cable. Operation of the PTO requires the operator to be on the seat and traveling in the lowest speed range (this is controlled by safety overrides that "kill" the engine when these conditions are not met).

2) The Gator is designed to carry the seismograph and 12-volt batteries. This vehicle never travels more than 10 mph and spends over 99% of its time parked along the survey line.

3) The Polaris is the primary work horse of the UTVs. It transports cables and geophones in a 3x3 steel box mounted behind the seat. The vehicle has 6 wheels with 4 drive wheels. The 6-wheel design makes the vehicle very stable with a large safe payload capacity (>700 lbs). This vehicle never travels more than 15 mph and is therefore at low risk of injury from excessive speed.

Specific Hazards

1) Roll over at high speeds
2) Roll over while operating in reverse
3) Run over observers or co-workers
4) Loss of control with heavy loads
5) Brake failure
6) Collision with other vehicles, especially automobiles when working along road sides

Control Measures

1) Every UTV operator shall possess a valid Kansas driver's license and shall have completed an appropriate training course prior to operation of the vehicle. The following persons have training and authorization to operate the UTVs: *Rick Miller, *Joe Anderson, *Brett Wedel, and Brett Bennett. *Authorized trainers.

2) The manufacturer's recommended payload shall not be exceeded at any time.
3) Gloves, eye protection, and an approved motorcycle helmet shall be worn at all times while operating a UTV at speeds in excess of 15 mph.
4) UTVs are to be used to haul equipment and supplies only.
5) Only UTVs with four or more wheels are permitted to be used.
6) All UTVs shall be equipped with a warning signal device (horn).
7) UTVs will be operated and maintained in accordance with the manufacturer's operating manual.

J. <u>Work Item</u>: *Slide Hammer and Sledgehammers*

A sledgehammer is a large metal mass, elongated and fitted to a wood or fiber shaft.

Slide hammers are custom made and designed to accelerate a weighted hammer along a fixed guide and impact a contained anvil. A slide hammer is normal much less energetic than a sledge hammer but the moving parts are all contained and all motion is in the vertical plain. A sledge hammer is a symmetric weight mounted to the end of a handle made of wood, vinyl, or plastic and accelerated by swinging through an arc that ends with contact on a striker plate. A sledge hammer is completely disconnected from the striker plate while the slide hammer and striker plate are connected.

Specific Hazards–
1) Uncontrolled swing and fragmenting of hammer or plate or handle/mass failure.
2) Glancing impact of striker plate
3) Tangled in time zero cable

Control Measures–
1) Only experienced operators,
2) power hammer into ground at a controllable level,
3) no bystanders within the distance of two hammer handle lengths side-to-side and behind and 25 ft in front.
4) Keep time zero cable securely taped to hammer handle from head to heel of handle
5) Keep time zero cable behind operator and away from striker plate
6) Wear appropriate safety gear; eye protection, steel toe boots, and eye protection

K. Work Item: *Geophones and Land Streamer*

Geophones are electromechanical devices that respond to earth movement, producing an electric pulse representative of the ground motion. They are coupled to the ground with 3-5 inch spikes. The land streamer is a collective group of geophones connected by a single belt and dragged along the ground surface, maintaining pressure contact with the ground.

Specific Hazards

1) Geophone spikes can puncture the skin and string or groups of geophones can be excessively heavy and represent a lifting hazard.
2) The land streamer is large, heavy, and awkward to handle. Muscle strains and pulls are possible.
3) Land streamer is transported on a reel mounted in the bed of the Bobcat Toolcat. The streamer is reeled on and off with an electric motor with a safety switch. Operator can get tangled in streamer and pulled into reel.

Control Measures

1) Keep geophone strings away from legs while walking and carrying.
2) Never carry more than one hasp of geophones per arm.
3) Always bend knees and use proper lifting techniques when loading or unloading land streamer.
4) Wear gloves and safety shoes to protect extremities from smash or crush hazards.
5) Always operate streamer pick-up reel within arm's length of speed regulator and safety shut off switch.

L. Work Item: *Paintball Impulsive Seismic Source*

Specific Hazards–Uncontrolled release of pressurized air.

Control Measures–Store cartridges in a secure area and keep full cartridges separated from empty. Installation of cartridges will be done with appropriate safety gear including gloves, earplugs, and safety glasses. Canisters will be kept closed and always pointed away from operator.

Not in Use on this Project

M. **<u>Work Item</u>:** ***Microvibrator***

Specific Hazards–Electric shock.

Control Measures–Operator will have an assistant responsible for moving, untangling, and general care of the electric power cord.

N. **<u>Work Item</u>:** ***Hole Lock Geophone***

This downhole device contains three passive sensors contained in a stainless steel tube. A 36 V screw-style electric motor extends and contracts a ½" diameter band that acts to form a pressure contact with the walls of a borehole.

Specific Hazards–pinch from extraction or contraction of steel band outside borehole.

Control Measures–borehole clamp will only be operated when tool is in a cased borehole. The device can be and should be tested at the top of the borehole, within view of the operator, to insure system is working properly. The tool will not be operated outside the borehole.

Not in Use on this Project

X. TRAINING

At least one KGS personnel working at the site in connection with the project shall have received hazardous waste worker training in accordance with 29 CFR 1910.120(e), be certified in First Aid, and CRP trained. This includes 40-hour initial training and yearly 8-hour refresher training. All KGS personnel will have appropriate experience and training with each source, vehicle, and method used.

XI. PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) protects employees from the hazards and potential hazards they are likely to encounter as identified during previous site characterization activities. PPE consists of a combination of protective clothing and respiratory protection equipment. Selection of PPE is based on an evaluation of the performance characteristics of the PPE relative to the requirements of the site and the task specific conditions and duration. The level of protection is upgraded when site monitoring or conditions indicate that increased protection is necessary to reduce employee potential for exposure.

Based on the available information assessing the current condition of the sites, minimal skin protection is required for general access. The prescribed working uniform for all personnel engaged in activities related to the project is a modified EPA level D and shall consist of:

Long-sleeved shirts and full-length pants
Leather steel toed safety boots
Hard hat
Gloves
Eye protection
Hearing protection as required by OSHA for certain tasks (identified by work item)
Reflective clothing or orange vests along roadways

No respiratory protection equipment is required. At the present time based on all available information, the atmosphere contains no known hazards. There is no expected potential for inhalation or contact with hazardous levels of any chemical.

Added protection from the sun and insects might be necessary. All workers will be encouraged, but not required, to use sunscreen and insect repellant. These protective chemicals will be available for use on-site.

XII. SAFETY ANALYSIS

The following analysis list postulates hazards, consequences of those hazards, and the means of prevention or mitigation of each hazard associated with this survey activity.

A. Mobilization – Loading & Unloading

Potential Hazards	*Recommended Safe Procedures*
Sprained back	Use proper lifting technique, get help
Backing vehicle into equipment or personnel	Use spotter, back-up alarms on vehicles. Driver to ensure that rear-view mirrors are adjusted properly.

B. Mobilization – Travel To / From Site

Potential Hazards	*Recommended Safe Procedures*
Traffic accidents	Use proper defensive driving technique.
Livestock or other animals on road	Watch sides of the road, especially at dawn & dusk; try to avoid larger animals.
Equipment falling off of trucks	Check load before leaving shop or overnight lodging, after first 25 miles, then after every 150 miles.
Losing control or falling asleep at the wheel	Watch driving speed versus road condition and posted legal limits. Get good rest, use buddy system on long drives, pull over if necessary.

C. Vibroseis Operations – See also IAGC Manual

Potential Hazards	*Recommended Safe Procedures*
Vibrating over buried natural gas, electric, or telephone lines	Use utility location if needed before commencing work. Look for posted notices of buried utilities.
Lightning in area	If thunder is within 5 seconds of lightning, shut down operations, get into truck cab.
Slips, trips, falls	Clear work area of obstacles, be sure of your footing.

D. Working Along Highways – This section highlights some of the more common issues. It is not meant to be a guide to traffic control, which should be conducted only by qualified personnel.
Traffic signs, cones, and flaggers should be used as appropriate when working on road shoulders. Signs, cones, and flaggers must be used when working in a closed traffic lane.

Potential Hazards	*Recommended Safe Procedures*
Pedestrian / Automobile accident	Wear high-visibility vests. Watch traffic. Don't assume traffic control will keep cars & trucks out of area. Work <u>facing</u> traffic, <u>not</u> back to traffic. If traffic drifts into the lane you are working in, ***drop what you are doing and get away to safety.***
Slips, trips, falls	Clear work area of obstacles, be sure of your footing.

E. Laying Out and Picking Up Seismic Cables and Geophones

Potential Hazards	*Recommended Safe Procedures*
Slips, trips, falls	Clear work area of obstacles, be sure of your footing.
Back or neck injury	Get assistance with heavy cables, use proper lifting technique.
Tangled cables	Use proper winding / unwinding technique, get help with untangling heavy cable or untangling cable where footing is slippery or steep.
Lightning in area	If thunder is within 5 seconds of lightning, get away from cables, shut down operations, disconnect cables from any recording equipment mounted in truck, get into truck cab. Keep an eye on the weather if thunder storms are forecast.

F. Environmental Concerns

Potential Hazards	*Recommended Safe Procedures*
Fuel & hydraulic fluid leaks	Check equipment for leaks and repair as needed. Use absorbent materials, clean up any spills.

XIII. ENVIRONMENTAL IMPACT ANALYSIS

The environmental impact of this activity has been evaluated and determined minimal ("small footprint") at more than six U.S. Government facilities (Y-12 ORNL, Oak Ridge, TN; WAG-10, ORNL, Oak Ridge, TN; Paducah Gaseous Diffusion Plant, Paducah, KY; Nevada Test Site, Las Vegas, NV; Fort Ord, CA; Berkeley Nat'l Lab, Berkeley, CA; INEL, Idaho Falls, ID) as well as multiple BLM and DOD sites.

XIV. HANDLING AND DISPOSAL OF UNEXPLODED ROUNDS

The handling of live ammunition will be in complete compliance with sections VIII.A and B and seismic gun operation procedures (both sections of this report). In the event a round does not detonate using standard operating procedures, the seismic source will be left in place undisturbed for a minimum of 1 minute. After this initial minute, the shell will be extracted to insure minimal contact with operators. The unexploded round will be placed in the metal container used for the storage of spent rounds. If the round is an 8-gauge it will remain in the sleeve for a minimum of 20 minutes after placement in the metal can prior to being placed in a metal can and locked in the steel containers attached to the truck. If it is a 50-cal. round it will remain in the can for 20 minutes before it will be removed and re-stored in a metal can in the metal transport boxes attached to the truck. Shotgun style shells will be directly placed in safety container.

XV. REFERENCES

Applicable portions of the following documents form the basis for this safety plan.

From the United States Department of Energy:
DOE Order 5480.16, *Firearms Safety*.
DOE Report DOE/EV/06194-3, *DOE Explosives Safety Manual*.
ID Appendix 0550, *Standard Operational Safety Requirements*, Part III, Subpart I, "Explosives"

From the United States Department of Defense:
DOD 6055.9-STD, *Ammunition and High Explosive Safety Standards*
AR-385-63, *Safety Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat*

Kansas Geological Survey
Incident Report Form

Date of incident: _____

Location of incident: _____

Was anyone injured? Yes ☐ No ☐ If yes, name(s) of injured person(s):

_____

_____

Uninjured person(s) involved in incident: _____

_____

_____

Other witnesses (not involved): _____

_____

_____

Equipment involved in incident: _____

_____

_____

_____

Narrative of what happened (continue on reverse of this page and draw a diagram if it helps explain what happened):

_____

_____

_____

_____

_____

_____

_____

_____

Site Safety Officer

KGS 05/1999

Kansas Geological Survey
Incident Report Form

Date of incident: _____

Location of incident: _____

Was anyone injured? Yes ☐ No ☐ If yes, name(s) of injured person(s):

_____

_____

Uninjured person(s) involved in incident: _____

_____

_____

Other witnesses (not involved): _____

_____

_____

Equipment involved in incident: _____

_____

_____

_____

Narrative of what happened (continue on reverse of this page and draw a diagram if it helps explain what happened):

_____

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_____

_____
Site Safety Officer

KGS 05/1999

Kansas Geological Survey
Incident Report Form

Date of incident: _____

Location of incident: _____

Was anyone injured? Yes ☐ No ☐ If yes, name(s) of injured person(s):

_____

_____

Uninjured person(s) involved in incident: _____

_____

_____

Other witnesses (not involved): _____

_____

_____

Equipment involved in incident: _____

_____

_____

_____

Narrative of what happened (continue on reverse of this page and draw a diagram if it helps explain what happened):

_____

_____

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_____

_____

_____

_____
Site Safety Officer

KGS 05/1999

Certificate Of T

Environmental Protection Instruction/Consulting

Hereby Certifies that

Richard D. Miller

has successfully completed

OSHA's HAZARDOUS WASTE OPERATIONS

work practices standard 1910.120

OSHA Compliance Training 40 hour

in witness whereof this certificate is awarded

on the **17th** *day of* **Jan., 1992**

Director of Training

Educational Administrator

Instructor

Certificate of Training

GES Training Services

Hereby Certifies

RICK MILLER

Has Completed

OSHA's 29 CFR 1910.120

HAZWOPER Refresher Training

01 April 2020 — Expiration Date

Robert L. McChan — Director of Training

Certificate of Training

GES Training Services

Hereby Certifies

JOE M. ANDERSON

Has Completed

OSHA's 29 CFR 1910.120

HAZWOPER Refresher Training

01 April 2020 — *Robert L. McChan*

xpiration Date — Director of Training

Certificate Of T...ining

EPIC Training
Evnironmental Service

Hereby Certifies that

Joe M. Anderson

has successfully completed

OSHA's HAZARDOUS WASTE OPERATIONS

work practices standard 1910.120

40 Hour Hazardous Waste Operations

in witness whereof this certificate is awarded

on the ***18th*** *day of* ***February 1994***

Jack Humefeld

Director of Training

Educational Administrator

Jack Humefeld III

Instructor

Certificate of Trai

Genesis Environmental Solution

Hereby Certifies that

Brett Wedel

Has successfully completed

OSHA's Hazardous Waste Operations and Emergency Response

Work practices standard 29 CFR 1910.120

40 Hour Hazardous Waste Operation Training

In witness whereof this certificate is awarded

On the 8th *day of* June, 2007

Robert L. McChan II

Director of Training

Michael S. Thomas

Director of Operations

Robert L. McChan II

Instructor

Certificate of Training

GES Training Services

Hereby Certifies

BRETT WEDEL

Has Completed

OSHA's 29 CFR 1910.120

HAZWOPER Refresher Training

01 April 2020 — *Robert L. McChan*

xpiration Date — Director of Training

Certificate of Tra

Genesis Environmental Solution

Hereby Certifies that

Brett Bennett

Has successfully completed

OSHA's Hazardous Waste Operations and Emergency Response

Work practices standard 29 CFR 1910.120

24 Hour Hazardous Waste Operation Training

In witness whereof this certificate is awarded

On the **6th** *day of* **February, 2014**

Robert L. McChan II

Director of Training

Michael S. Thomas

Director of Operations

Robert L. McChan II

Instructor

SEAL 2004 Missouri

Certificate of Training

GES Training Services

Hereby Certifies

BRETT BENNETT

Has Completed

OSHA's 29 CFR 1910.120

HAZWOPER Refresher Training

01 April 2020 — *Robert L. McChan*

xpiration Date — Director of Training

Certificate of Tra

Genesis Environmental Solutio

Hereby Certifies that

Sarah Morton

Has successfully completed

OSHA's Hazardous Waste Operations and Emergency Response

Work practices standard 29 CFR 1910.120

24 Hour Hazardous Waste Operation Training

In witness whereof this certificate is awarded

On the **6th** *day of* **February, 2014**

Robert L. McChan II

Director of Training

Michael S. Thomas

Director of Operations

Robert L. McChan II

Instructor

SEAL 2004 Missouri

Certificate of Training

GES Training Services

Hereby Certifies

SARAH MORTON

Has Completed

OSHA's 29 CFR 1910.120

HAZWOPER Refresher Training

01 April 2020 — *Robert L. McChan*

Expiration Date — Director of Training

Certificate of Completion

Presented to:

RICK MILLER

On 3/11/2011, RICK MILLER successfully completed the 10-Hour OSHA Outreach Training Course for the Construction Industry.

Taylor Alan Sikes

OSHA Authorized Trainer

USF UNIVERSITY OF SOUTH FLORIDA

OSHA TRAINING INSTITUTE EDUCATION CENTER

American Safety Council .com

Certificate of Completion

Presented to:

BRETT WEDEL

On 3/11/2011, BRETT WEDEL successfully completed the 10-Hour OSHA Outreach Training Course for the Construction Industry.

Taylor Alan Sikes

OSHA Authorized Trainer

USF UNIVERSITY OF SOUTH FLORIDA

OSHA TRAINING INSTITUTE EDUCATION CENTER

American Safety Council .com

Certificate of Completion

Brett Wedel
has completed requirements for

Adult First Aid/CPR/AED

conducted by
American Red Cross

Date completed: 05/29/2019
Validity Period: 2 Years

Certificate ID: GXUMA9

American Red Cross

Scan code or visit:
redcross.org/confirm

Certificate of Completion

Brett Bennett
has completed requirements for

Adult First Aid/CPR/AED

conducted by
American Red Cross

Date completed: 05/29/2019
Validity Period: 2 Years

Certificate ID: GXUMAA

American Red Cross

Scan code or visit:
redcross.org/confirm

Certificate of Completion

Joe Anderson
has completed requirements for

Adult First Aid/CPR/AED

conducted by
American Red Cross

Date completed: 05/29/2019
Validity Period: 2 Years

Certificate ID: GXUMAB

American Red Cross

Scan code or visit:
redcross.org/confirm

Certificate of Completion

Kathy Sheldon
has completed requirements for

Adult First Aid/CPR/AED

conducted by
American Red Cross

Date completed: 05/29/2019
Validity Period: 2 Years

Certificate ID: GXUMAC

American Red Cross

Scan code or visit:
redcross.org/confirm

Certificate of Completion

Rick Miller
has completed requirements for

Adult First Aid/CPR/AED

conducted by
American Red Cross

Date completed: 05/29/2019
Validity Period: 2 Years

Certificate ID: GXUMAD

American Red Cross

Scan code or visit:
redcross.org/confirm

Certificate of Completion

Shelby Peterie
has completed requirements for

Adult First Aid/CPR/AED

conducted by
American Red Cross

Date completed: 05/29/2019
Validity Period: 2 Years

Certificate ID: GXUMAE

American Red Cross

Scan code or visit:
redcross.org/confirm

TRAINING OUTLINE FOR USE OF SEISMIC GUNS
"GOOD GUN SENSE"

I. **Handling (always assume loaded and ready to fire)**

A. Transporting (vehicle, on foot, etc.)

1. In field:

Always point down or away from populated areas
Always avoid lodging foreign material in barrel
Never strain to carry, get a second person
Never assume anything

2. To and from site and storage:

Must be storage in a metal locked container
Must be stored with bolt and gun in separate locations
Must be completely broke down and cleaned prior to storage
Access to guns and ammo must be limited to trained personnel only
Live rounds cannot be stored closer than 5 ft from guns

B. Cleaning

1. Daily:

Must be inspected for unusual wear, signs of metal fatigue, or structural weakness at the beginning and end of each days service
Bolt and breech must be oiled and check for mechanical operation
At the end of each 1/2 day service the barrel will be carefully inspected and checked for signs of fatigue.
The bolts that secure the gun to the protective steel plate are checked at least 3 times a day.

2. Seasonal:

R/R springs in extraction system and those associated with the firing rod
R/R bolts and nuts that attach to protective steel plate.
R/R mounting bracket as necessary

C. *Firing*

1. Assumptions

NONE

2. Never Do's

Move from downhole placement with shell in chamber
Gun loaded with no one standing on plate
With one person on plate
With knees locked
Extract a shell in less than 2 minutes that does not detonate
Without both operators aware of detonation
Drop a loaded round
Return a mis-fire to live round canisters

March 24, 1987

MANDATORY SAFETY RULES FOR USE OF THE .50-CALIBER SEISMIC GUN

The .50-cal seismic gun is powerful and must be securely positioned when fired. Danger exists not only with the bullet projectile, but also with the recoil of a loose gun. Be sure that all mounting bolts are tight. Never strike the gun or bolt with a metal object. If the gun is jamming or sticking, clean it thoroughly with WD-40. Wiping down cleaned parts will help avoid the cohesion of dirt and sand to the parts.

Operational Safety Rules

1. Each day the Party Chief must make sure all personnel are fully trained in safety rules.
2. Arm the gun ONLY when the gun is in position to be fired.
3. ALWAYS unlock the bolt when moving the gun (disarm it).
4. NEVER move the gun with a live round loaded.
5. ALWAYS remove the bolt completely from the gun for transportation and storage.
6. ALWAYS double check safety procedures.
7. Use common gun sense.

Downhole Mode

Be sure all mounting bolts are tight. Do not force the gun down an augered hole. Re-auger the hole, if necessary. Be sure that the base plate rests on the ground. Have two people stand on the plate when firing (flex knees to absorb the shock).

If the hole has water in it, seal the muzzle of the gun with tape or a balloon to keep water from seeping into the barrel. Avoid this situation, if possible. Water in the barrel may seriously damage the gun when fired. Injury is possible.

Surface Mode

Be sure all mounting bolts are tight. Carefully protect the breech, trigger, and bolt when moving the apparatus. THE TRIGGER IS EASILY BROKEN.

5/10/92

OPERATION/SAFETY RULES AND REGULATIONS
FOR THE

AUGER GUN

The auger gun is a multi-component shallow seismic source which is designed for safe operation. The auger gun can detonate up to a 400 grain black powder load (approximately equivalent to one-twelfth of a pound of high explosive). Improper handling or operation of the auger gun or any of its components can potentially result in serious injury. Proper use of the auger gun includes not only safe operation and handling of the gun mechanism (firing rod) itself but also the skid-steer loader that transports and powers the device. The auger gun is not intended to fire projectiles but it has been designed to do so safely with no damage to the gun or operators. Proper maintenance is critical to the longevity and smooth operation of the auger gun. As with operating any firearm or explosive device, maintenance, transportation, and storage handlers must always assume the firing rod is loaded and the safety is off.

Operation and Safety Regulations

1) Each day the Site Safety Officer (SSO) must brief all members of the seismic crew on the proper operation and maintenance of the auger gun.

2) Prior to set-up on any location the site must be cleared of all potential underground hazards and utilities. The 'tip-over' potential of a site (directly related to topography) must also be considered prior to access with the loader.

3) The firing rod is never transported or stored loaded or in firing mode (locked into the auger) prior to downhole placement of the auger.

4) The firing rod is stored unloaded (no sleeve snapped onto the bottom) in the left side storage holster during downhole placement and in-field movement.

5) Only after the auger has been screwed into the ground and the center bit extracted and placed in the right side storage holster will the firing rod be removed from the left side storage holster. The shells should be pre-loaded into metal sleeves and ready for loading prior to removing the firing rod from the storage holster. Once the firing rod has been removed from the holster, the firing rod should be pointed toward the ground and the loaded sleeve snapped into place making certain that nothing (hand, finger, etc) is covering the powder end of the sleeve. The firing rod should then be immediately lowered downhole and locked into place.

6) Firing of the device should only take place after the hole has been water flooded and the firing rod handles securely locked in the J notches. If after a sharp blow with a hammer the shell does not detonate wait for at least 5 min. prior to removing the firing rod from its locked position. Once the firing rod is removed from the auger, the unfired round should be released from the firing rod and dropped into the empty shell casing can on the right side of the devise making certain not to touch the sleeve itself. The unfired round should not be removed from the metal sleeve for at least 20 minutes after placement in the empty shell casing can.

7) The skid-steer loader should be operated with good common sense taking no chances that would compromise the safety of either the operator or any other crew member. No one should be allowed to operate the loader without proper training.

8) The firing rod should always be handled as if it is loaded. The firing rod has an automatic safety that will only allow the firing pin to travel through the rod if the gun is locked into place in the auger.

Improved Shallow Seismic-Reflection Source: Building a Better Buffalo

John Healey, Joe Anderson, Richard Miller, Dean Keiswetter, Don Steeples, and Brett Bennett, Kansas Geological Survey

SUMMARY

An improved design of the buffalo gun, incorporating hole drilling and shooting into one operation with almost total blast containment, provided nearly 50 percent more recordable seismic signal than the traditional buffalo gun. The 'auger gun' is designed to optimize field efficiency, source couple, and safety. The auger gun consists of three main parts: power source, auger/screw, and modified buffalo gun. Amplitude spectra indicate the auger gun delivers approximately 20 percent more total energy and 50 percent more reflection energy with no noticeable increase in recorded ground roll at a test site in Lawrence, Kansas. Subtle changes in source environment, such as a 15 cm gap between the detonation point and the base of the hole or inclusion of water as opposed to air at the detonation point, have a significant effect on the quality of the recorded data. The auger gun should increase field efficiency by over 50 percent on most shallow surveys, while improving the signal-to-noise ratio and total energy in comparison to the buffalo gun.

INTRODUCTION

Increasing environmental and engineering applications of reflection seismology have spurred research and development of shallow high-resolution reflection techniques and equipment. Resolution on the order of a meter is necessary to detect ultrashallow targets—generally the goal of most environmental and engineering studies (Steeples and Miller, 1990). Resolution can be increased by boosting the recorded frequency and the signal-to-noise ratio of reflection wavelets. Recent advances in engineering seismographs have made possible cost-effective acquisition of 15-bit or greater floating point data. Generating a high-frequency seismic source pulse has been accomplished in a multitude of different ways in the past (Miller et al., 1986).

The most commonly used seismic sources on shallow engineering surveys have fallen under two main categories: explosives or weight drops. The explosive category includes both high explosives and 'guns'. Weight-drop sources include everything from mechanically assisted vertical mass impacts (usually >20 kg mass) to human-assisted vertical mass impacts (sledge hammers, malls, and thors). Recent advances in high-frequency engineering sources have come predominantly under the 'gun' classification. Development of a downhole shotgun capable of generating a consistently high frequency source wavelet with only minimal increase in expense and effort over hammers, spurred the shallow seismic-reflection industry. Downhole shotgun sources possess significantly more energy in the 200 to 600 Hz range in comparison to hammer sources (Pullan and MacAulay, 1987).

DESIGN AND TECHNIQUE

The auger gun is designed to optimize field efficiency, source couple, and safety. A measure of success with the downhole shotgun source (as with any downhole explosive source) can be related to efficiency in generation of broad-band, high-frequency energy. Improved energy transfer is obtained when downhole placement of the shotgun shell includes a water stem and restricted recoil (Miller et al. 1989). Containment of the air-coupled wave has been at least partially accomplished for downhole projectile sources with a steel containment plate (Steeples et al., 1987). To obtain proper downhole placement of existing gun sources, a minimal diameter pilot hole (generally 6 cm, or so) approximately 80 cm deep must be bored. The auger gun described here incorporates all the previous operations and configurations into a single pass source.

The auger gun consists of three main parts: power source (skid-steer loader), auger/screw, and modified buffalo gun (Figure 1). The power source for testing described here is a 25 hp, 4-wheel drive, 1.2 m wide, hydraulic loader. The auger/screw is a modified hydraulic auger that receives its hydraulic drive power from the loader. The buffalo gun used for these tests was elongated to slightly over 2 m in length, is designed for bottom loading (as opposed to the standard screw-on head), solenoid firing, time break from a downhole sensor. The firing pin has an automatic (spring-loaded) safety. These components when assembled represent approximately 1500 kg and are transportable in the bed of a standard pick-up truck.

Operation of the auger gun is a three-step process: (1) screwing the auger flight into the ground, (2) loading and firing the gun, and (3) unscrewing the auger flight from the ground. Once the 4-wheel-drive loader is in place, the containment plate is lowered to the ground surface with the weight of the loader placed on the plate. The hollow-stem auger flight is then screwed into the ground using a gaging device designed to ensure the flight is screwed into the ground at a fixed rate and no material is removed from the hole. Screwing the auger flight into the ground accomplishes both exceptional blast containment and minimal residual borehole. After the auger flight is securely screwed into the ground 80+ cm, the modified buffalo gun is loaded (by sliding the gun over a shotgun shell), lowered down the center of the hydraulic drive head, through the hollow stem auger flighting, and seated into a sleeve at the base of the auger flight. Water can be poured through the hollow stem auger prior to downhole

placement of the buffalo gun to improve source couple. Once positioned, the gun can be fired by either a hammer impact on the top of the firing pin or with an electric solinoid.

Safety must be of the utmost concern in any operation involving seismic sources. Designed into the auger gun are several critical safety improvements over the traditional buffalo gun. First, is the improved loading design that does not require the operator's hand to come any closer than a meter from the shell either during loading or while the live shell is in the firing chamber. Another improvement is related to containment of the entire gun mechanism in its downhole position throughout the firing operation. Finally, the firing-pin lock or safety is spring-loaded and does not require operator intervention prior to firing. The entire design and operation of the auger gun revolves around maximizing the recorded reflection energy without compromising the safety of the operator or bystanders.

The auger gun incorporates several key characteristics designed and previously shown to enhance high-frequency seismic signal at the expense of air-coupled wave and ground roll while maximizing mobility, operator safety, field efficiency, and ground coupling. Containment of the explosion is optimized by screwing the auger into the ground and positioning most of the loader weight on the gun. Field efficiency is maximized by incorporating the borehole preparation with the gun placement and detonation. The massive nature of the design and improved shell-loading procedure minimizes risk to the operator. Mobility is only restricted by the 1.2 m wide, 4-wheel-drive loader. Environmental impact is minimal with remnants of the operation restricted to a nominal 4 cm corkscrew hole approximately 80 cm deep.

RESULTS

Data acquired for this test were recorded on an Input/Output DHR-2400 seismograph with no analog low-cut filtering. The sampling interval was 1/2 ms and record length was 500 ms. The receivers were three L-28E Mark Products 40-Hz geophones wired in series and arranged in a 1 m in-line array. The source-to-closest-receiver was 20 m with a geophone station interval of 4 m. The shells used for this test were 8 gauge, 400 grain black powder blanks. The recording environment was consistent throughout the comparison.

Auger gun and buffalo gun field files acquired under identical conditions allows for comparison of several key source characteristics (Figure 2). The amplitude of the data is noticeably higher with the auger gun with very little difference in the dominant frequency on either field file. Reflection information is not directly interpretable on these shot gathers. A 150 Hz digital low-cut filter reveals a strong reflection present on both files at approximately 80 ms (Figure 3). The low-cut filter does a good job of removing the ringy refraction arrival clearly dominating the upper 120 ms of the unfiltered files. Some subtle indications of 50 Hz ground roll are still present on filtered files. The general characteristics of the 80 ms reflection seem to be consistent for both sources.

Amplitude spectra suggest the auger gun produces more useable seismic energy per grain of explosive than the traditional buffalo gun (Figure 4). Almost 25 percent more energy is present on the auger gun spectra in the 30- to 70-Hz range than the equivalent buffalo gun spectrum. Little or no observable increase in the amount of recorded ground roll can be observed on spectra of unfiltered data. Peaks in the spectra around 90 Hz represent reflection energy at this site. The auger gun delivers almost double the recordable high-frequency reflection energy of the buffalo gun.

Subtle changes in source environment make considerable difference in the amplitude spectrum of auger gun data. Leaving a 15-cm air-filled space between the base of a shell loaded in the auger gun and the bottom of the screw hole reduced total recorded reflection energy almost an order of magnitude. A water column placed in the hollow stem auger flight just prior to loading the shell tight against the base of the screw hole increased recorded reflection energy by over 50 percent. Significant variability in frequency and amplitude of the recorded energy resulted from slight changes in the downhole environment. These subtle changes and their resulting effect on the seismic data are indicative of how the near surface acoustically responds to gun powder explosions.

CONCLUSION

The auger gun should represent a 50 percent improvement in acquisition rates and recorded reflection energy at most sites when compared to the traditional buffalo gun. The auger gun is a modification of the original buffalo gun design (Pullan and MacAulay, 1987), and at some sites will represent an improvement. As with all seismic equipment and techniques, site characteristics dictate relative effectiveness. One characteristic of the auger gun that is not site-dependent and does represent an improvement over the buffalo gun is overall safety. The massive nature of the auger gun should allow detonation of series charges totally as much as 1000 grains of black powder. Preliminary testing indicates that at some sites it may be possible to acquire over 500 shotpoints a day when station spacings are 5 m or less.

ACKNOWLEDGMENTS

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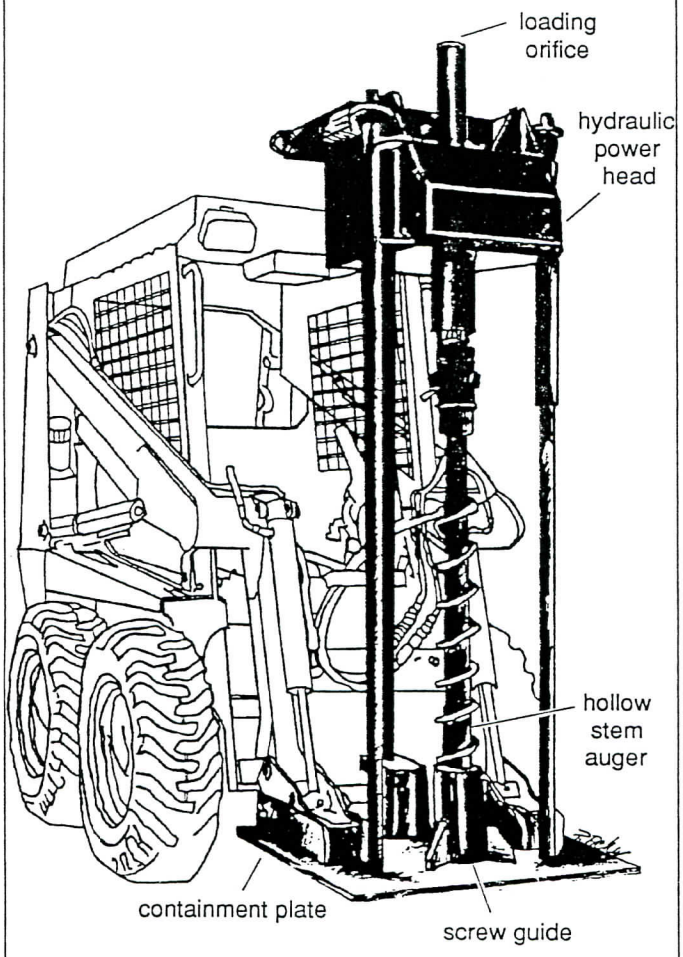

Fig. 1 Diagram represents the auger gun in above-ground position. Modified buffalo-gun portion of the auger gun is not shown, but is conceptually the same as previously documented (Pullan and MacAulay, 1987).

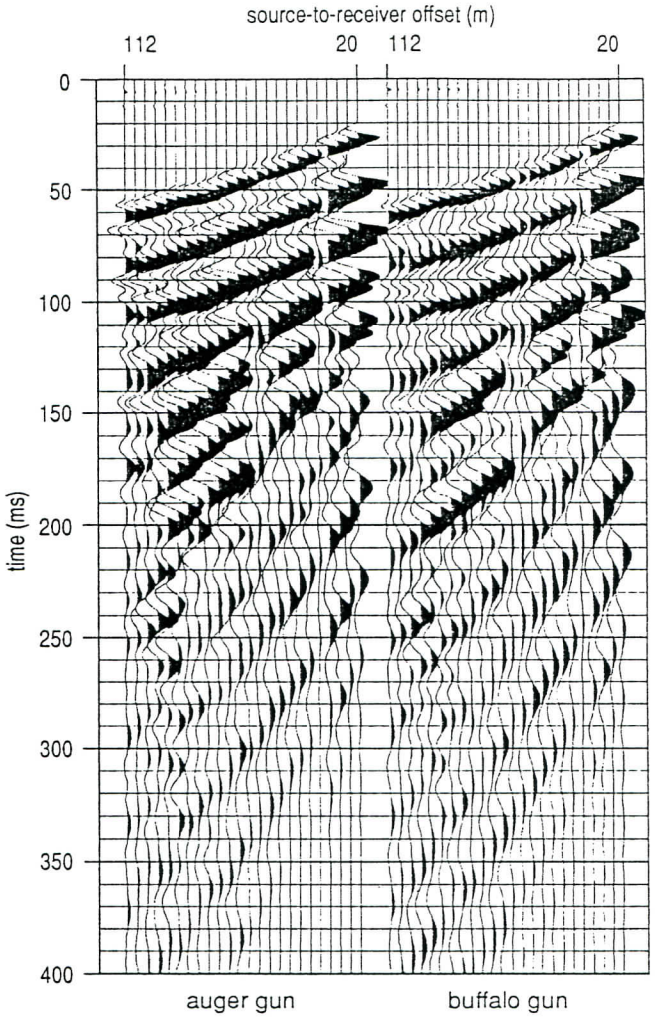

Fig. 2 Auger gun field file (left) compared to the buffalo gun (right).

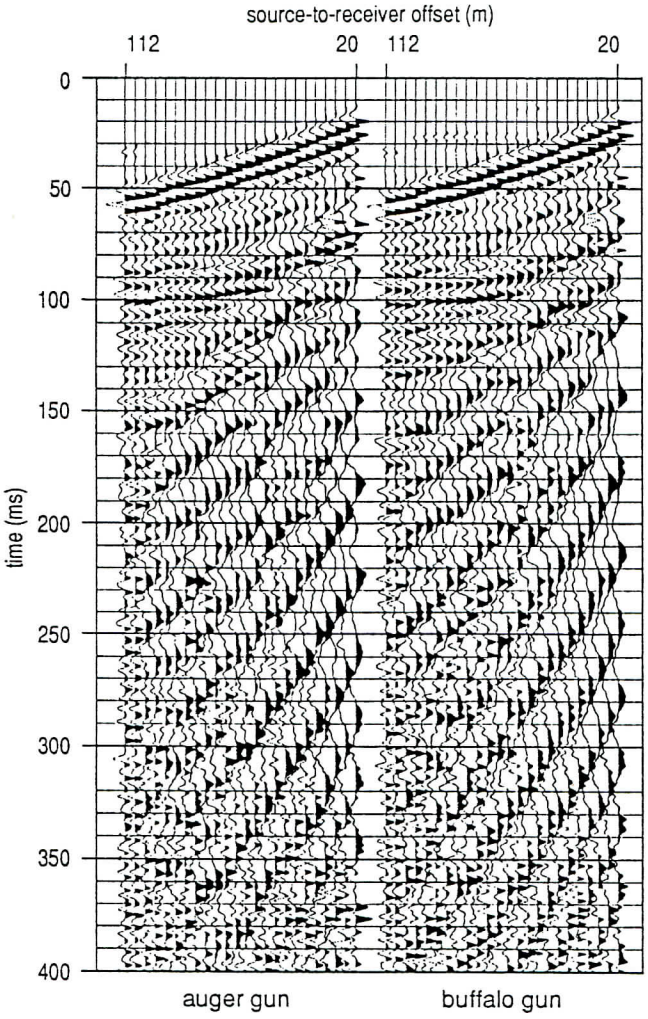

Fig. 3 A 150 Hz digital low-cut filter enhanced the 80 ms reflection event on both the auger (left) and buffalo (right) guns.

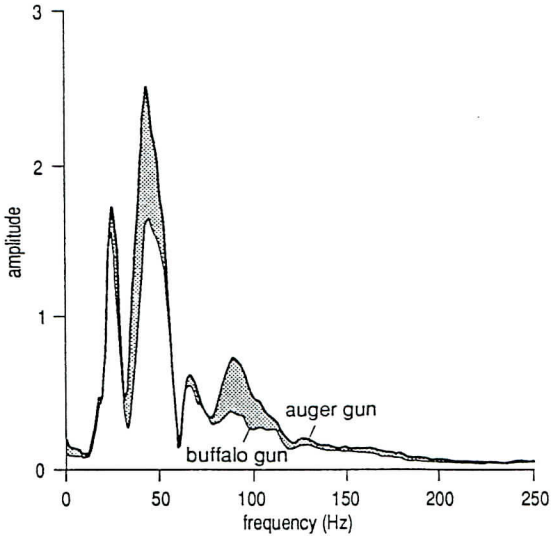

Fig. 4 The darkened area represents the difference between the lower curve (buffalo gun) and the upper curve (auger gun).

Downhole .50-caliber Rifle—an Advance in High-resolution Seismic Sources

Don W. Steeples, Richard D. Miller, Ralph W. Knapp,
Kansas Geological Survey.

SUMMARY

In a direct comparison, the downhole .50-caliber seismic source produced more seismic energy, a broader body-wave frequency spectrum, an amplitude drop in the air-coupled wave, and a higher dominant frequency of the recorded body-wave energy than the silenced surface .50-caliber source. The recorded seismic energy of the downhole rifle showed an increased amplitude of 6 to 12 dB over that recorded by the silenced surface rifle. The dominant frequency of the recorded reflection energy was consistently 20 to 40 Hz higher than the surface rifle. The air-coupled wave amplitude was decreased over 12 dB by subsurface firing of the rifle. The frequency spectrum of the body-wave pulse was broadened by almost a half octave on the high end. The safety of operation of the source is not compromised. Reflectors with a dominant frequency in excess of 180 Hz can be easily identified on field files at depths of less than 30 m using the downhole .50-caliber rifle. Identification of 100-Hz reflectors from 1,100 m is possible on field files of multiple vertically stacked downhole .50-caliber shots. The source will operate in an efficient manner collecting CDP data, common-offset data, or spot-correlation data.

INTRODUCTION

Increasing environmental and engineering applications of reflection seismology have spurred research and development of shallow high-resolution reflection techniques and equipment. Resolution on the order of a meter is necessary to detect ultra-shallow targets which are generally the goal of most environmental and engineering studies. This increased resolution can be obtained by boosting the frequency of the source pulse which, in turn, increases the dominant frequency of the recorded seismic-reflection energy. Generating the high-frequency seismic source pulse necessary for shallow applications has been accomplished in a multitude of different ways in the past (Miller et al., 1986).

Recent seismic source advances at the Kansas Geological Survey (KGS) have mainly revolved around surface projectile-type sources (Steeples and Knapp, 1982; Miller and Steeples, 1986; Seeber and Steeples, 1986). A .50-caliber rifle, which was designed and built to safely fire a 750-grain bullet vertically into the ground, has more recently been adapted to operate partially underground with only the firing apparatus above ground. This allows safe operations, a higher-frequency source pulse, and an increased signal-to-noise ratio.

DESIGN AND TECHNIQUE

The general design centers around optimizing the conversion of energy produced by a .50-caliber rifle bullet into seismic (acoustic) waves. The majority of the energy produced by a .50-caliber round goes into accelerating the projectile and into exhaust gases. Previously, with above-ground sources, we have silenced and dispersed the exhaust gases in hopes of eliminating or at least greatly reducing the effects of the air-coupled wave on seismic data. The downhole .50-caliber rifle nearly simultaneously excites the earth with a projectile and with exhaust gases while containing most of the air-coupled wave, resulting in increased frequency and signal-to-noise ratio on seismic record sections.

The downhole .50-caliber seismic source consists of a .50-caliber rifle bolted to a 0.6-cm-thick steel plate. The rifle itself is a standard .50-caliber breech and bolt, built by Texas Gun and Machine Company, attached to a standard .50-caliber machine-gun barrel. Machined grooves in the barrel are used in conjunction with a pressure clamp to attach the rifle to a 30-cm by 90-cm steel plate. The rifle barrel is lowered into a 60- to 80-cm-deep borehole 4 cm in diameter until the plate is flush with the ground surface. This steel plate acts as a ground seal and a platform to stand on while firing the gun. The weight of the shooter on the plate and the snug fit of the barrel to the borehole walls help seal the gun to the ground. The rifle can be equipped with a source sensor or closure switch to generate a time break. Firing can be done either electrically by solenoid or manually by pulling the trigger. The downhole .50-caliber weighs about 30 kg and is easily two-person portable.

FREQUENCY AND AMPLITUDE

The downhole .50 caliber produces from 6 to 12 dB greater recordable seismic energy at equivalent offsets than the silenced surface .50 caliber (fig. 1). The increased recorded energy boosts the signal-to-noise enough to substantially clean up the record section. The source-to-closest geophone offset in fig. 1 is 43 m. Besides this noticeable increase in recorded seismic energy, a consistent 20-40 Hz boost in the dominant frequency of the source wavelet is characteristic.

In previous shallow-source comparisons (Miller et al., 1986), the surface .50-caliber performed comparably to Mini-Primacord and a 10-gauge Buffalo gun in total energy and frequency spectrum. The noted increase in frequency and energy would make the downhole .50-caliber rifle comparable to the 8-gauge Buffalo gun which was among the best sources tested for reflection energy versus ground roll, total energy, and frequency content.

SAFETY

Safety should be of the utmost concern in any operation involving seismic sources. The rifle is

mounted on a 0.6-cm-thick steel plate to protect the operator from fragments and to help hold the gun securely in place. Since the projectile is fired from a bolt and breech, originally designed as a standard firearm, the utmost in safety has already been designed into the actual firing mechanism. The bolt and breech manufacturer designed the apparatus not to fragment even if the barrel was completely obstructed. The barrel is in standard use by the U. S. military on .50-caliber machine guns. The extra thickness of a machine-gun barrel serves to dissipate heat and, especially in our case, protects from blow-out if foreign material gets into the barrel. This makes continuous operations safe and consistent.

CASE STUDY

Silenced surface .50-caliber vs Downhole .50-caliber.

The direct comparison of the surface and the downhole .50-caliber rifles was performed near Winter Park, Colorado, in an attempt to detect the Moffat railroad tunnel, 85 m below the surface. The receivers were single 100-Hz geophones with a 1.2-m station interval. The sources were 43 m from the closest receiver station. The resulting recorded field files plotted, using true amplitude, clearly show the increased amplitude and the increased signal-to-noise ratio of the downhole rifle as compared to the surface source (fig. 1). A glaring difference is the absence of air-coupled wave on the field file using the downhole rifle. The frequency difference is obvious on the amplitude spectra (fig. 1).

Downhole .50-caliber Field Files and Spectrum

The downhole .50-caliber rifle can produce a source pulse with a dominant reflection frequency in excess of 180 Hz (fig. 2) when used with analog low-cut filters that have a −3 dB point of 220 Hz and a 24 dB/octave rolloff. Clean minimum-phase reflection wavelets, easily in excess of 150 Hz, can be identified down to 270 msec directly off the field file (fig. 3). The spectrum of the reflector at 85 msec is almost 3 octaves across with corner frequencies of 40 and 290 Hz (fig. 3).

The downhole .50-caliber rifle has not only been proven to be a useful shallow high-resolution reflection-seismic source, it also possesses the capability to penetrate as much as 1,100 m of sedimentary veneer overlain by 15 to 30 m of weathered alluvium (fig. 4). The reflection at 720 msec on the field file is Arbuckle dolomite at a depth of 1,100 m in central Kansas. This eight-shot stack was recorded with 30-Hz low-cut filters and ten 40-Hz geophones. The dominant frequency of the reflection energy is about 100 Hz.

ACKNOWLEDGMENTS

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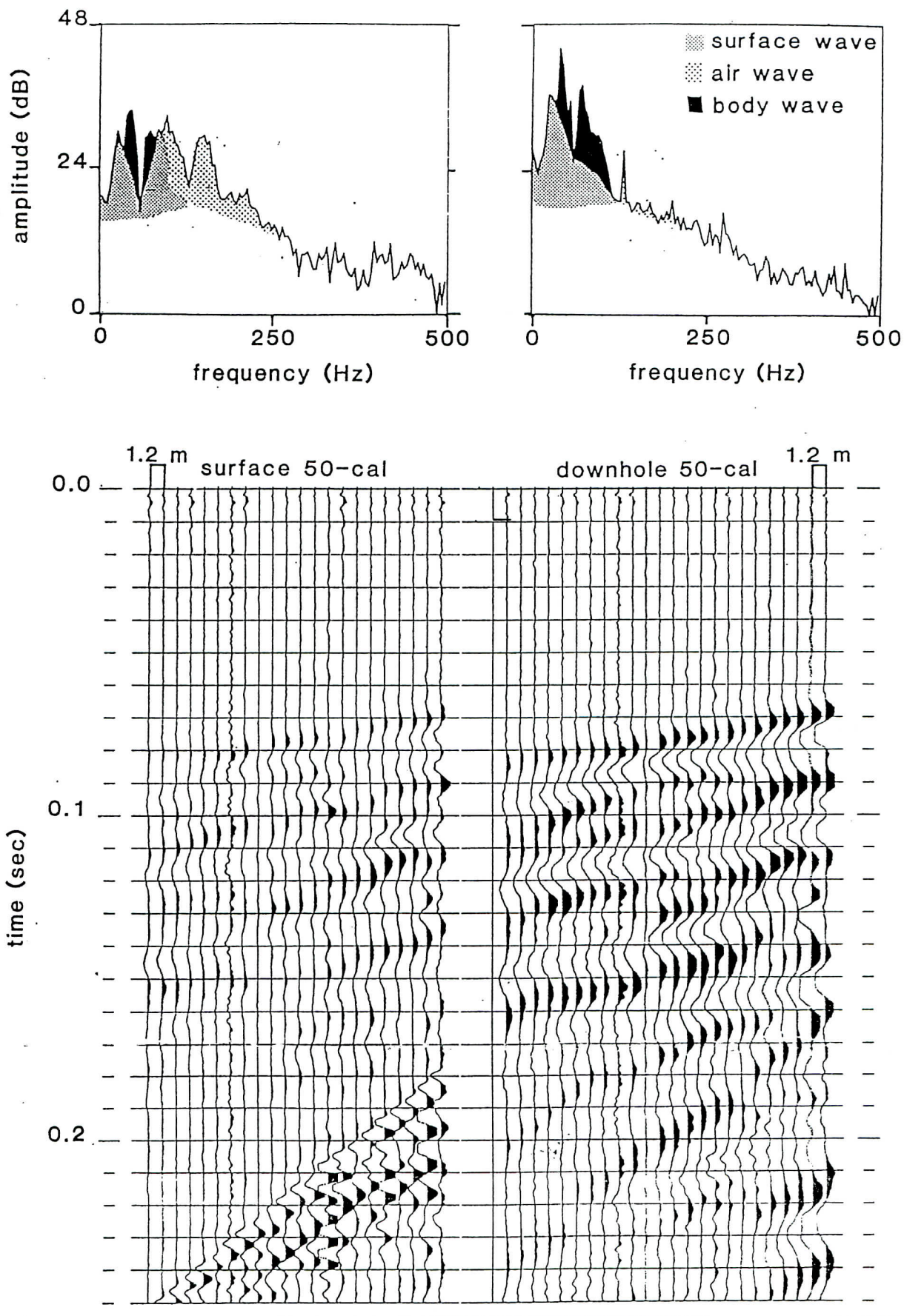

Figure captions:

FIG. 1. -This single shot comparison plotted true amplitude with identical recording parameters clearly shows the increased signal-to-noise and the improved freque

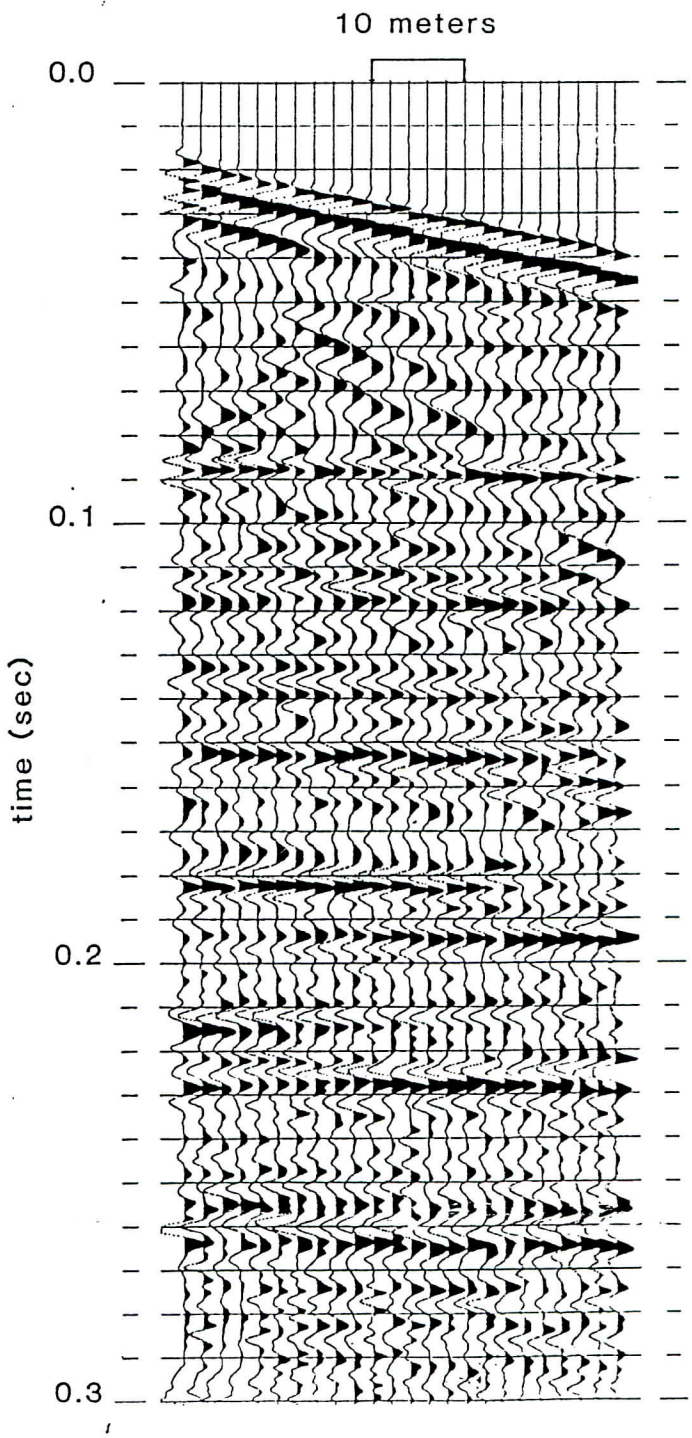

FIG. 2. This single-shot field file with an AGC applied illustrates the high frequencies and therefore the resolution easily obtainable with a downhole .50-cal.

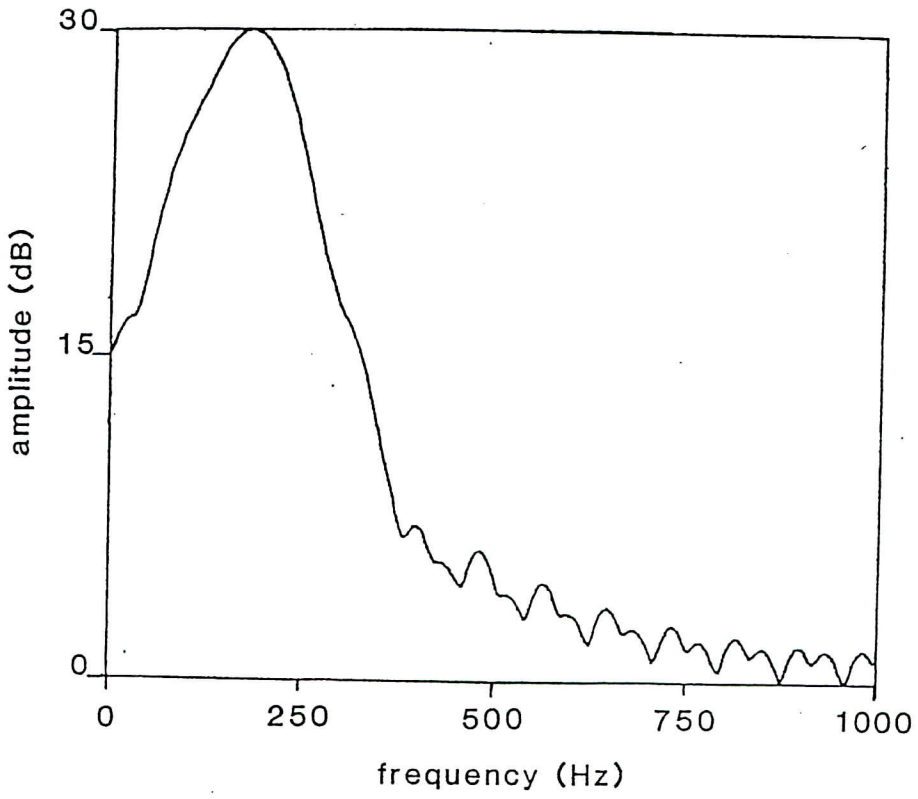

FIG. 3. -The amplitude spectrum of the reflection pulse at 85 msec is almost 3 octaves

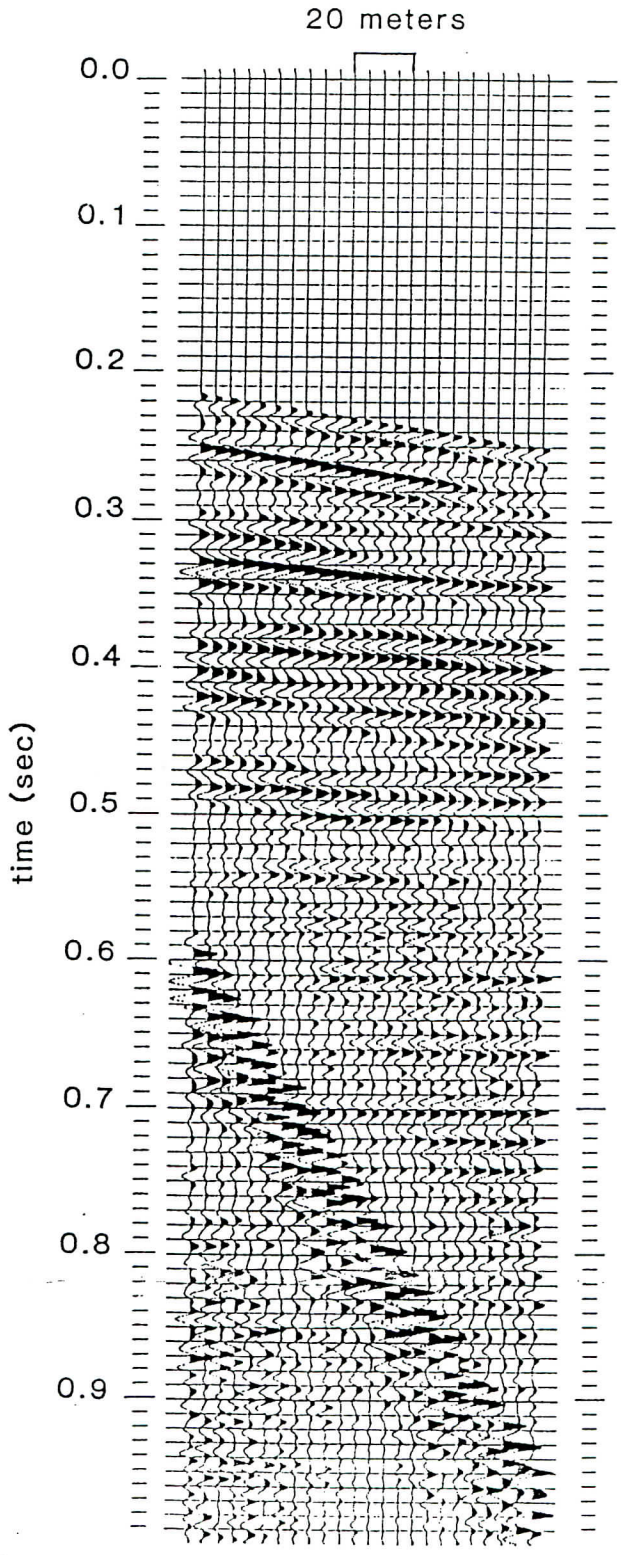

FIG. 4. —This stacked field file has 100 Hz reflection energy as deep as 1100 meters.

Advantages of wet work for near-surface seismic reflection

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Summary

Benefits of shallow water settings (0.1 to 0.5 m) are pronounced on shallow, high-resolution seismic reflection images and, for examples discussed here, range from an order of magnitude increased signal-to-noise ratio to resolution potential elevated by more than 8 times. Overall data quality of high-resolution seismic reflection data at three sites notorious for poor near-surface reflection returns was improved by coupling the source and/or receivers to a well sorted and fully saturated surface. Half-period trace-to-trace static offsets evident in reflections from receivers planted into a creek bank were eliminated by moving the geophones to the base of a shallow creek at the toe of the bank. Reflections from a dipping bedrock were recorded with a dominant frequency approaching 1 KHz from hydrophones in 0.5 m of water at the toe of a dam using a hammer impact source. A tamper impacted by a dead blow hammer in a shallow (10-20 cm) deep creek produced reflections with a dominant frequency over 400 Hz at depths as shallow as 6 ms.

Introduction

It has long been known that increased saturation in a fine grained and well sorted near-surface setting greatly enhances the overall quality and therefore usefulness of both shallow and high-resolution seismic reflection data (Pullan and Hunter, 1990). Great success has been realized using high-resolution seismic reflection to map hydrostratigraphic units by coupling both source and receiver at the base of an irrigation channel or shallow body of water (Whitely et al., 1998; Good et al., 1999). In situations where interpretable and accurate high resolution data is absolutely essential and cost is no object, increasing saturation of the source and receiver coupling zone has been accomplished artificially by building and flooding a seismic trench (defined here as a trench constructed specifically for improving the quality of seismic reflection data) (Kim, 2001; Miller et al., 1994).

Improving source and receiver coupling has long been known to have a direct and positive affect on seismic reflection data characteristics (Miller et al., 1994; Hoover and O'Brien, 1980; Krohn, 1985). The degree to which data can be improved by optimizing the type of source or site preparations is limited for many sites. However, altering survey designs to less than optimal locations for achieving project goals, but dramatically improving the data quality should at least be considered for any shallow, high-resolution seismic reflection survey.

Natural changes in saturation have proven to affect the amplitude and bandwidth of shallow reflections (Jefferson et al., 1998). Seasonal changes in soil saturations of less than 50% increase the amplitude of higher frequency components of the seismic reflection wavelets by almost an order of magnitude. It is also noted that narrowing of the bandwidth can result from seasonal increases in soil moisture. A principal question that this work addresses is how much improvement can be actualized by acquiring seismic reflection data in fully saturated soil layers in comparison to equivalent dry near-surface soils. As well based on previous work it is imperative to ascertain if there are any adverse affects on data quality as a result of using ground contact impulsive and explosive sources and land geophones in water settings.

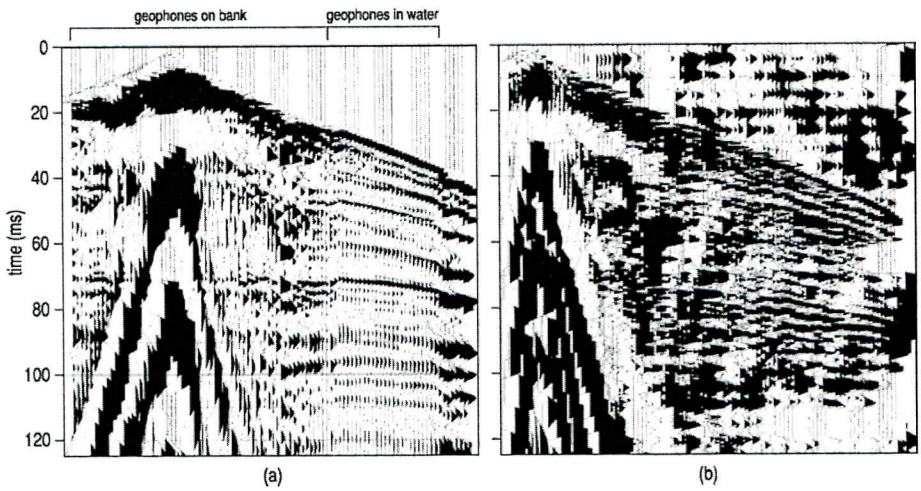

Figure 1. (a) 12-gauge Seisgun with some receivers fully submerged and others planted into the creek bank, less than 0.25 m for static water levels.
(b) Hammer and tamper data with receivers all on creek bank highlight the extreme 180° phase mismatch in some locations due to static that at over 400 Hz is a problem on shallow reflection data where a 50 Hz conventional would represent less than 15° phase shift.

Data Acquisition

Data for these studies were acquired along and within the shoreline of creeks and lakes. Investigations of geologic and hydrologic features at the toe of a dam and beneath a creek provided the opportunity to optimize data quality by slightly realigning pre-acquisition designed profiles. In one study, original survey designs called for seismic profiles to run along the down stream toe of a dam to characterize the potential of sediments to anchor the cutoff trench for a new dam. As well, at another site a planned seismic profile was to run between a creek and parking lot on a layer of rubble and other assorted fill materials ranging in depth from a meter to as much as 3 meters. Neither setting was optimal and both would likely have failed the pre-survey evaluation testing of technique feasibility. As it turns out moving the lines into saturated environments notably increased acquisition time but more dramatically and importantly improved data quality and therefore greatly benefited to overall project goals.

Hell Creek

Static problems in near-surface data can be debilitating and because of the higher frequency content of most these data the percentage of phase misalignment due to variation in near surface velocities can be in excess of 100% (Frei, 1995). A shot gather with a portion of the receivers planted under about 20 cm of water at the base of the bank line (due to surface obstacles) dramatically depict just one of the problems routinely encountered during CMP processing of high-resolution seismic reflection data (Figure 1a). With reflections posing dominant frequencies in excess of 400 Hz static of just an ms of variability in arrival time from trace to trace due to lateral changes in velocity can significantly reduce the quality and usefulness of a CMP stacked section (Figure 1b).

Shot gathers acquired from receivers beneath a few tens of centimeters of standing water retain a strong ground roll component, easily saturating close offset traces partly due to reduced attenuation in the saturated soils. With reflection from the shallowest interface possible as important as high amplitude coherent events from depth (30 m), two shot records were recorded at each station. One was recorded using a 12-gauge Seisgun pushed into the firm, saturated creek bottom and a second using a dead blow hammer impacting the top of a 1.2 m long soil tamper. The gun source generated high amplitude reflections with deeper penetration in this noisy setting (major street within 50 m) (Figure 2a). While the impact source was much less energetic and allowed reflections to be recorded in unclipped portions of the record as close as 2 m from the source (Figure 2b).

Reflections from a time-depth of around 6 ms are clearly and confidently interpretable on a high percentage of shot gathers recorded using the impact source (Figure 3). Recording, identifying, and enhancing reflections arriving at times less than 30 ms is extremely difficult and has been the reflection time window most commonly abused by inexperienced practitioners through over processing, inappropriate processing, and miss interpreting coherent source noise. Clear separation between first arrivals and reflections and unique ground roll energy provides a wedge shaped optimum window that includes about 5 traces (4 m) and 5 ms above 10 ms two way travel time on many shot gathers.

Spectral characteristics of the gun and hammer sources are very similar in spite of the more than 60 dB difference in reflection amplitudes and around 48 dB difference in ground roll (Figure 2). Increased source energy usually brings decreased dominant frequencies (Knapp and Steeples, 1986). Near offset traces are clearly clipped within the optimum window for reflections less than 15 ms two-way time on the gun data (Figure 2a). Processing this clipped portion of the record would result in coherent noise events that could be interpreted as reflections with these coherent events on CMP stacked sections having no relationship to real reflectors. Reflection bandwidths from these data span more than three octaves, with lowest useable around 30 Hz and upper corner more than 600 Hz. Considering receivers were 40 Hz geophones, some question remains as to how faithfully the signal was received by these sensors.

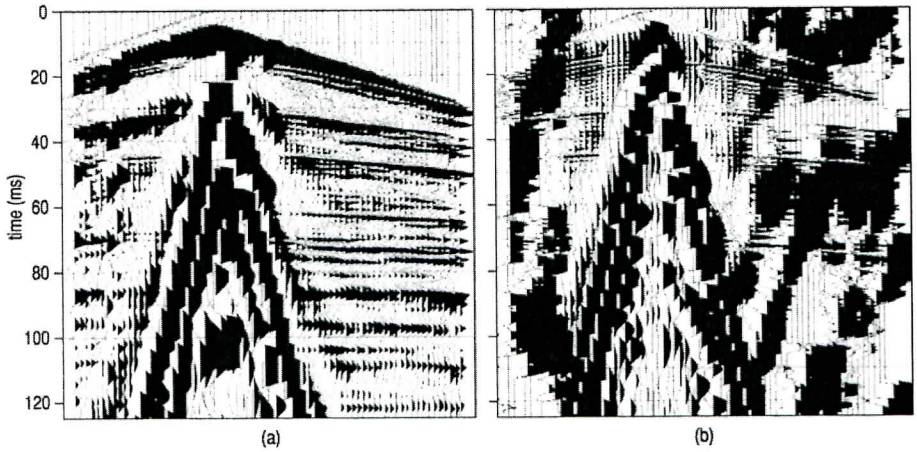

Figure 2. 12-gauge Seisgun (a) with equivalent dead blow hammer (b) shot gathers. Close offset traces overdriven and clipped on gun data but 50% less clipping on hammer data. Reflection on hammer data evident at about 6 ms. Display gains are responsible for all clipping outside groundroll wedge.

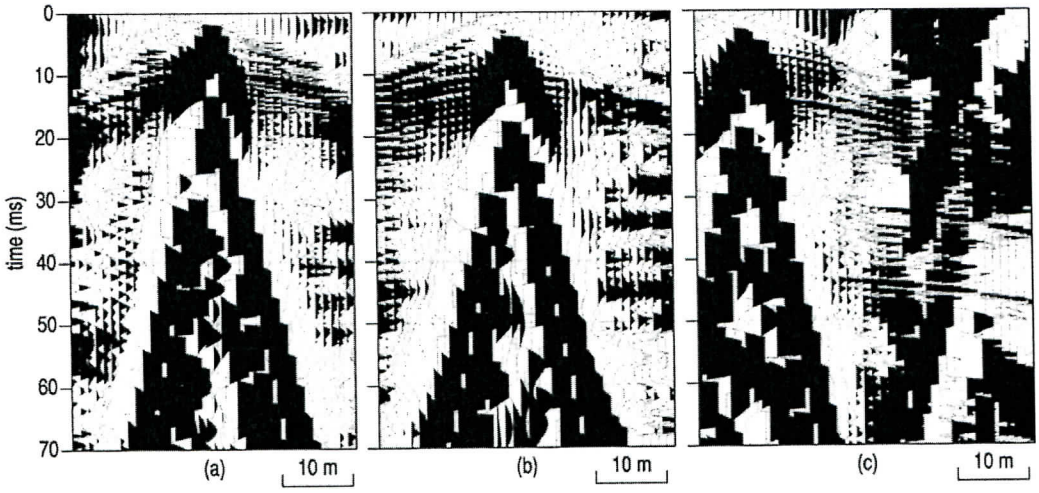

Figure 3. Raw shot gathers from different locations along the profile. Clipping of groundroll observed on a few inside traces occurred at the receiver. Clipping of other energy is the result of elevated display gains. Reflections can be interpreted on these unprocessed shot records as shallow as 6 ms.

Keechelus Dam

Sites with near-surface unsorted glacial outwash have been extremely difficult and at times impossible to image with high-resolution seismic reflection. Complicating the Keechelus Dam site were the physical presence of the dam itself and the dry near surface along the majority of the target transect. As part of the feasibility testing a hybrid land/marine spread was recorded from that incorporated active pressure transducers and a hammer impact source. Data recorded in 0.5 m or less of water on the upstream side of the dam toe possessed reflecting events with wavelet properties and therefore resolution potential and signal-to-noise ratio at the extreme limit of any data currently in the published literature (Figure 4).

An impact source in contact with boulders along the lake bottom resulted in highly irregular shot gathers along the spread, but clearly demonstrated extreme potential for this otherwise poor seismic reflection area. Low cut filtering provided clear separation between the groundroll and reflection wavelets (Figure 5). Vertical stacking improved the signal-to-noise ratio for stack counts up to about 8. Too much high frequency reflection energy in this setting can be a hindrance to CMP stacking. With the fractional millisecond accuracy necessary to get almost 1 KHz wavelets to stack coherently processing of these data to maintain this very high resolution potential would introduce a completely new set of challenges.

Observations

As is no surprise keeping the source and receivers in a fully saturated environment dramatically reduces problems with statics and boasts the dominant frequency and useable bandwidth. Improvement in spectral characteristics and signal-to-noise ratio was significantly beyond expectations when receivers were changed from magnet and coil geophones to active hydrophones. Using an impact source with low energy output was effective when coupling through the upper half meter was made using solid rock emplacements.

Dramatic increases in energy levels (>24 dB) generally comes at the price of reduced upper corner and dominant frequency. Clearly for the creek saturated setting an insignificant loose of reflection wavelet spectral properties was observed with this relatively massive increase in source energy between the Seisgun and hammer/tamper configuration. This increase in source energy equated to approximately an order of magnitude increase in recorded body wave energy. Signal from the receiver in the saturated portion of the seismogram yielded some of the shallowest time reflections documented in the literature.

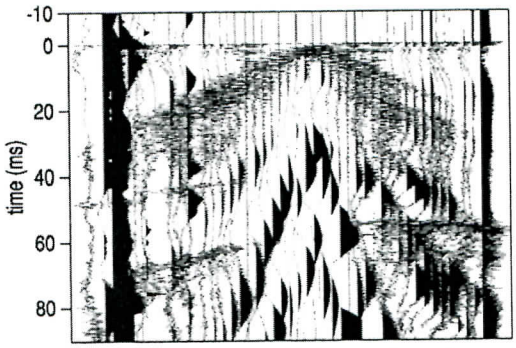

Figure 4. Raw shot gather acquired with hammer impacting steel rod and active pressure transducers.

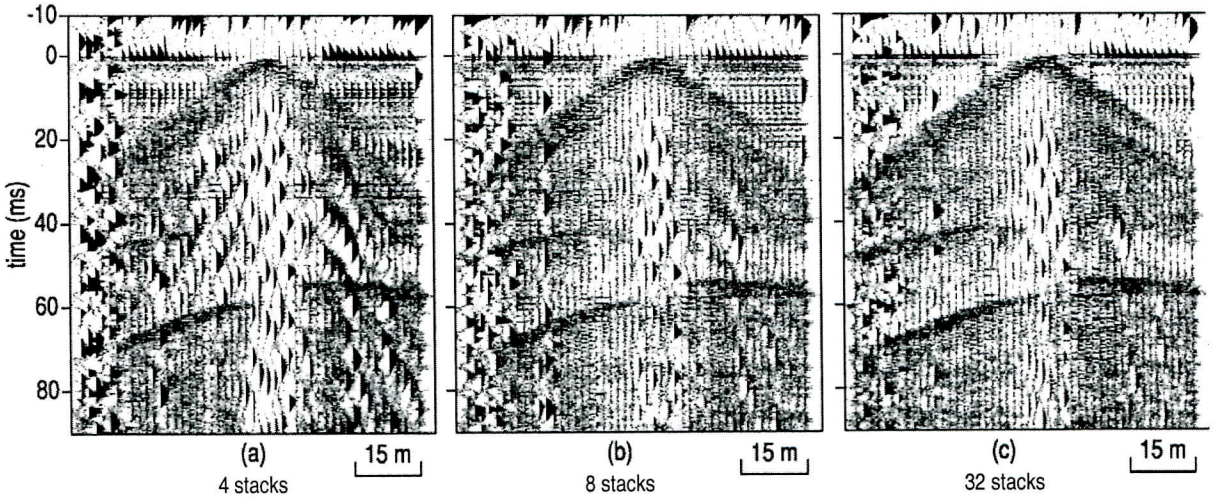

Figure 5. Vertically stacked shot gathers comparing two (a), eight (b), and thirty-two (c) impacts from 12-oz hammer on steel shaft in 0.5 m of water.

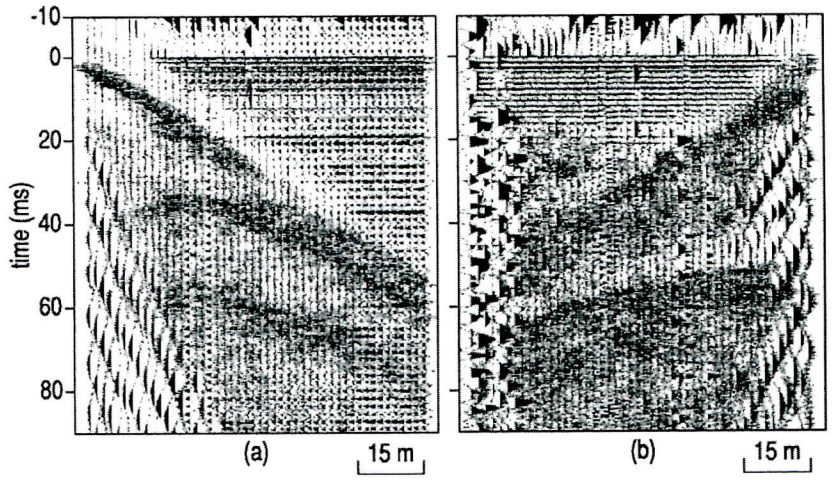

Figure 6. Four-shot vertical stacked shot gathers south to north (a) and north to south (b) with trace 1 the same station for both gathers. Source was a 12-oz hammer impacting a steel rod in 0.5 m of water with active hydrophones as sensors.

Conclusions

High-resolution shallow seismic reflection surveys have met with mixed results in settings with dry, unconsolidated, unsorted near-surface settings. Here examples are presented where seismic reflection holds substantial potential to resolve key issues when line locations and deployment schemes are modified slightly and take advantage of shallow (< 0.5 m) water environments. Using land equipment and techniques in saturated settings minimizes cost while maximizing data potential.

Reflections with dominant frequencies over 500 Hz from time depths as shallow as 6 ms were recorded in locally saturated environments where just a few tens of meters away in the absence of standing water seismic reflections possessing dominant frequencies less than 80 Hz are not interpretable above 50 ms. Potential for studying dams and dikes along the base of the upstream slope yet over the toe is quite high, with only slight operational modifications away from routine high-resolution, shallow reflection surveying techniques.

Acknowledgments

The authors thank Mary Brohammer for her graphics and manuscript preparations.

EDITED REFERENCES

Note: This reference list is a copy-edited version of the reference list submitted by the author. Reference lists for the 2007 SEG Technical Program Expanded Abstracts have been copy edited so that references provided with the online metadata for each paper will achieve a high degree of linking to cited sources that appear on the Web.

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ExxonMobil

Material Safety Data Sheets

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123455-29 DIESEL #2, OFF ROAD (LOW SULFUR)
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: DIESEL #2, OFF ROAD (LOW SULFUR)
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 613-228-1467
MSDS Internet Website: http://emmsds.ihssolutions.com/

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2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: HYDROCARBONS AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
DIESEL FUEL (68334-30-5)	95-100

COMPONENT(S) OF PRODUCT INGREDIENTS INCLUDE:

NAPHTHALENE (91-20-3) 0.5

ETHYL BENZENE (100-41-4) 0.5

NOTE: Composition may contain up to 0.5% performance additive.

See Section 8 for exposure limits (if applicable).

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3. HAZARDS IDENTIFICATION

This product is considered hazardous according to regulatory guidelines (See Section 15).

EMERGENCY OVERVIEW: Red Liquid. Material is combustible. Liquid can release vapors that readily form flammable mixtures at or above the flash point. Product can accumulate a static charge which may cause a fire or explosion. DOT ERG No. : 128

POTENTIAL HEALTH EFFECTS: Respiratory irritation, headache, dizziness, nausea, loss of consciousness, and in cases of extreme exposure, possibly death. Diesel exhaust may cause lung cancer.
Prolonged, repeated skin contact may result in skin irritation or more serious skin disorders. Low viscosity material-if swallowed may enter the lungs and cause lung damage. Note: This product contains polycyclic aromatic hydrocarbons, some of which have been reported to cause skin cancer in test animals and in humans under conditions of poor personal hygiene and prolonged repeated contact.

POTENTIAL ENVIRONMENTAL EFFECTS: Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Remove contaminated clothing. Dry wipe exposed skin and cleanse yourself with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. (See Section 16 - Injection Injury)
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.
INGESTION: Seek immediate medical attention. Do not induce vomiting.
NOTE TO PHYSICIANS: Material if aspirated into the lungs may cause chemical pneumonitis. PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE: Hydrocarbon Solvents/Petroleum Hydrocarbons- Skin contact may aggravate an existing dermatitis.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective, but water should be used to keep fire-exposed containers cool. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Material is combustible. Liquid can release vapors that readily form flammable mixtures at or above the flash point. Product can accumulate a static charge which may cause a fire or explosion.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): > 55(131) (ASTM D-93).
Flammable Limits (approx.% vol.in air) - LEL: 0.6%, UEL: 7.0%
NFPA HAZARD ID: Health: 1, Flammability: 2, Reactivity: 0

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6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Eliminate sources of ignition. Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Eliminate sources of ignition and warn other ships in the vicinity to stay clear. Notify port and other relevant authorities. Confine with booms if skimming equipment is avaliable to recover the spill. Otherwise disperse in unconfined waters, if permitted by local authorities and environmental agencies. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.
ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.
PERSONAL PRECAUTIONS: See Section 8

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7. HANDLING AND STORAGE

HANDLING: Keep product away from high energy ignition sources, heat, sparks, pilot lights, static electricity, and open flame.
Harmful in contact with or if absorbed through the skin. Avoid inhalation of vapors or mists. Use in well ventilated area away from all ignition sources. See Section 8 for additional personal protection advice when handling this product. PORTABLE CONTAINERS approved for storing fuel must be placed on the ground and the nozzle must stay in contact with the container when filling to prevent build up and discharge of static electricity.
STORAGE: Store in a cool area. Avoid sparking conditions. Ground and bond all transfer equipment.
SPECIAL PRECAUTIONS: To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Do not use electronic devices (including but not limited to cellular phones, computers,

calculators, pagers, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Use the correct grounding procedures. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.
EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

ExxonMobil recommends an 8-hour time-weighted average (TWA) exposure of 500 mg/m3 total vapor (approx. 100 ppm) or 5 mg/m3 stable aerosols.

	---TWA---		----STEL---		NOTE
Substance Name (CAS-No.)	Source	ppm	mg/m3	ppm	mg/m3
NAPHTHALENE (91-20-3)					
	OSHA	10	50	15	75
	ACGIH	10	52	15	79
ETHYL BENZENE (100-41-4)					
	OSHA	100	435	125	545
	ACGIH	100	434	125	543

NOTE: Limits shown for guidance only. Follow applicable regulations.

VENTILATION: Use in well ventilated area with local exhaust ventilation. Ventilation equipment must be explosion proof. Use away from all ignition sources.
RESPIRATORY PROTECTION: Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-contained breathing apparatus may be required for use in confined or enclosed spaces.
EYE PROTECTION: If splash with liquid is possible, chemical type goggles should be worn.
SKIN PROTECTION: Impervious gloves must be worn. If contact is likely oil impervious clothing must be worn. Good personal hygiene practices should always be followed.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Red
ODOR: Hydrocarbon
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 149(300)
MELTING POINT C(F): NA
FLASH POINT C(F): > 55(131) (ASTM D-93)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NE
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: 0.5
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.82-0.87
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: > 1.0
VISCOSITY AT 100 C, cSt: NE
POUR POINT C(F): < -7(20)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): NA
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Halogens, strong acids, alkalies, and oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

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11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---
ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary

Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---
Repeated dermal application of middle distillates, heating oils and diesel oils to rabbits for 2-4 weeks at up to 1 gm/kg resulted in strong to severe skin irritation with some weight loss at the higher dose. Toxic effects ranging from weight loss to mortality was observed in rabbits treated repeatedly with very high doses (6 gm/kg) of these oils. Repeated inhalation exposure of middle distillate and diesel vapor and aerosol to rats for 2-4 weeks at up to 6 mg/l resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and some reduction in lung function.

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---
Diesel fuel vapors were tested in an inhalation teratology (developmental toxicity) study in rats and when only minimal maternal toxicity was observed, no fetotoxic or developmental effects were observed. A developmental toxicity study of dermally applied middle distillates did indicate fetotoxicity (reduced litter size, litter weight, increased resorptions) at doses that also caused significant maternal toxicity.

---CHRONIC TOXICOLOGY (SUMMARY)---
Diesel fuel, heating oil and middle distillates have been shown to be carcinogenic in lifetime mouse skin painting bioassays. While in some cases, the tumor incidence is low in the test populations and possibly associated with skin irritation, concurrent evidence from short-term predicative tests (Modified Ames) does indicate some level of mutagenic activity associated with levels of polycylic aromatic compounds in certain test samples.

---SENSITIZATION (SUMMARY)---
Middle distillate oils were not skin sensitizers when tested in a Modified Buehler Guinea Pig Sensitization Assay.

---OTHER TOXICOLOGY DATA---
Overexposure to diesel exhaust fumes may result in eye irritation, headaches, nausea, and respiratory irritation. Animal studies involving lifetime exposure to high levels of diesel exhaust have produced variable results, with some studies indicating a potential for lung cancer. Limited evidence from epidemiological studies suggest an association between long-term occupational exposure to diesel engine emissions and lung cancer. Diesel engine exhaust typically consists of gases and particulates, including carbon dioxide, carbon monoxide, nitrogen compounds, oxides of sulfur, and hydrocarbons. Diesel exhaust composition will vary with fuel, engine type, load cycle, engine maintenance, tuning and exhaust gas treatment. Use of adequate ventilation and/or respiratory protection in the presence of diesel exhaust is recommended to minimize exposures. This product contains ethylbenzene. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as possibly carcinogenic to humans (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans.

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative substances.

ECOTOXICITY: Based on test results for similar products, this substance may be toxic to aquatic organisms such as algae and daphnia (EL50/ IrL50 =1-10 mg/L). This substance has also been shown to be toxic to specific fish species (LL50 = 1-10 mg/L for rainbow trout, Atlantic silverside).

MOBILITY: Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant.

PERSISTENCE AND DEGRADABILITY: The majority of the components in this product are expected to be inherently biodegradable. The consitituents of diesel fuels/heating oil which are volatilized will photodegrade in the atmosphere. The less volatile, more water-soluble components which are aromatic hydrocarbons will also undergo aqueous photodegradation.

BIOACCUMULATIVE POTENTIAL: Not established.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning for fuel value in compliance with applicable laws and regulations.

RCRA INFORMATION: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).
FLASH: > 55(131) C(F)

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14. TRANSPORT INFORMATION

NOTE:The flash point of this material is > 131F. Regulatory classifications vary as follows:

DOT: Flammable Liquid OR Combustible Liquid - (49CFR 173.120(b)(2))
OSHA: Combustible Liquid
IATA/IMO: Flammable Liquid

USA DOT:
SHIPPING NAME: Diesel Fuel
HAZARD CLASS & DIV: COMBUSTIBLE LIQUID
ID NUMBER: NA1993
ERG NUMBER: 128

PACKING GROUP: PG III
STCC: NE
DANGEROUS WHEN WET: No
POISON: No
LABEL(s): NA
PLACARD(s): Combustible
PRODUCT RQ: NA
MARPOL III STATUS: NA

RID/ADR:
HAZARD CLASS: 3
PACKING GROUP: III
LABEL: 3
DANGER NUMBER: 30
UN NUMBER: 1202
SHIPPING NAME: Gas Oil
REMARKS: NA

IMO:
HAZARD CLASS & DIV: 3
UN NUMBER: 1202
PACKING GROUP: PG III
SHIPPING NAME: Gas Oil
LABEL(s): Flammable Liquid
MARPOL III STATUS: NA

ICAO/IATA:
HAZARD CLASS & DIV: 3
ID/UN Number: 1202
PACKING GROUP: PG III
SHIPPING NAME: Gas Oil
SUBSIDIARY RISK: NA
LABEL(s): Flammable Liquid

STATIC ACCUMULATOR (50 picosiemens or less): YES

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.

EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: Xn Harmful.

Risk Phrase(s): R40-65-66-51/53.
Limited evidence of a carcinogenic effect. Harmful: may cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrase(s): S24-2-36/37-62-61.
Avoid contact with skin. Keep out of the reach of children. Wear suitable protective clothing and gloves. If swallowed, do not

induce vomiting: seek medical advice immediately and show this container or label. Avoid release to the environment. Refer to special instructions/Safety data sheets.

Contains: Gas oil - unspecified.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES:
FIRE CHRONIC ACUTE

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
POLYNUCLEAR AROMATIC HYDROCARBONS(COMPONENT ANALYSIS)	0.1%	
ETHYL BENZENE(COMPONENT ANALYSIS)	100-41-4	0.5%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
NAPHTHALENE (COMPONENT ANALYSIS) (0.50%)	91-20-3	16, 22
ETHYL BENZENE (COMPONENT ANALYSIS)	100-41-4	1, 8, 24
DIESEL OIL..C9-20	68334-30-5	21, 26

--- REGULATORY LISTS SEARCHED ---
1=ACGIH ALL 6=IARC 1 11=TSCA 4 16=CA P65 CARC 21=LA RTK
2=ACGIH A1 7=IARC 2A 12=TSCA 5a2 17=CA P65 REPRO 22=MI 293
3=ACGIH A2 8=IARC 2B 13=TSCA 5e 18=CA RTK 23=MN RTK
4=NTP CARC 9=OSHA CARC 14=TSCA 6 19=FL RTK 24=NJ RTK
5=NTP SUS 10=OSHA Z 15=TSCA 12b 20=IL RTK 25=PA RTK
26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Pleas contact the supplier to confirm whether the ingredients in this product currently ap a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

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16. OTHER INFORMATION

USE: DIESEL FUEL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human

health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Precautionary Label Text:

CONTAINS DIESEL OIL.. C9-20

WARNING!

COMBUSTIBLE LIQUID AND VAPOR. RESPIRATORY IRRITATION, HEADACHE, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN CASES OF EXTREME EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL-IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE.

MAY CAUSE SKIN CANCER ON PROLONGED, REPEATED SKIN CONTACT. ANIMAL SKIN ABSORPTION STUDIES RESULTED IN INCREASED MORTALITY, EFFECTS ON BODY WEIGHT, THE IMMUNE SYSTEM AND THE UNBORN CHILD. PROLONGED, REPEATED SKIN CONTACT MAY CAUSE IRRITATION. DIESEL EXHAUST MAY CAUSE LUNG CANCER.

Keep away from heat and flame. Avoid prolonged or repeated overexposure by skin contact or inhalation. Use with adequate ventilation. Keep container closed. Keep out of reach of children.

FIRST AID: If inhaled, remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. In case of contact, remove contaminated clothing. Dry wipe the exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself and others. Wear impervious gloves. If swallowed, seek immediate medical attention. Do not induce vomiting. Only induce vomiting at the instruction of a physician.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

****

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: C, TRN: 123455-29, CMCS97: EMGF29, REQ: PS+C, SAFE USE: C

EHS Approval Date: 04JUN2003
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Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

Emergency Numbers

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Trade Name : **Normal Gasoline**

1. Chemical and Company Identification

Trade Name	All normal Gasoline Fuels
Product Code	None applicable
Supplier	Gulf Oil International, 3rd Floor, 16 Charles II Street, London SW1Y 4QU, U.K.
Routine Enquiries	(44) 20 7839 2402
Fax	(44) 20 7839 2399
Emergency Contact	GMT 0900 − 1800: (44) 20 7839 2402; IST 09.30 − 1800: (91) 22 839 0789
Chemical Description	Petrol/Gasolene

2. Composition and Ingredients

Components	CAS No.	Range in %
Petrol consists of mainly straight chain and branched paraffinic hydrocarbons, olefins, cycloparafins and aromatics in the C4 to C14 carbon range	.	100
Toluene	108883	<20
Ethyl benzene	100414	<10
Xylene	1330207	<5
Benzene	71432	<5

3. Hazards Identification

Warning Statements	EXTREMELY FLAMMABLE. HARMFUL OR FATAL IF SWALLOWED. LOW VISCOSITY PETROLEUM MIXUTURE. CAN CAUS ELUNG INJURY IF INHALED OR ASPIRATED. CONTAINS BENZENE A KNOWN CANCER HAZARD. MAY BE HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. USE ONLY AS A FUEL. KEEP OUT OF REACH OF CHILDREN. AVOID PROLONGED AND REPEATED CONTACT WITH SKIN. IF SKIN CONTACT OCCURS, WASH EXPOSED AREA WITH SOAP AND WATER. LAUNDER CONTAMINATED CLOTHING.
Eyes	May cause severe eye irritation
Oral	Expected to be moderate acute toxicity by ingestion. May cause irritation of the digestive tract which may result in nausea, vomitting and diarrhea. Ingestion of this product and subsequent vomitting can result in aspiration into the lungs, causing chemical pneumonia and lung damage
Inhalation	May cause dizziness, irritationof eyes, nose and throat, vomitting and central nervous system effects upon inhalation. Convulsions, seizures and sudden loss of consciousness, coma and death are possible from extreme exposure. See Long term Toxic Effects and Section 11 for additional information.
Skin	Irritating to the skin with discomfort or pain, redness or swelling. Prolonged contact may cause more severe irritation and discomfort, seen as local redness and swelling. May produce systemic toxicity by skin absorption See Section 11 for additional information.
Long Term Toxic Effects	Cancer information available on this material or a component(s). See section 11 for additional information. This material or a component(s) may cause cardiac sensitization, including irregular hearbeats and death due to cardiac arrest. See Section 4, Advice to Doctor, for futher information

4. First Aid Measures

Eyes	Flush eyes immediately with fresh water for several minutes while holding the eyelids open. If irritation persists, see a doctor

Skin	Remove and launder contaminated clothing, including shoes. Wash skin thoroughly with soap and water. See a doctor if any signs or symptons described in this MSDS occur.
Ingestion	Do not induce vomitting. Aspiration of the material can cause serious lung injury such as chemical pnemonia. Call a doctor immediately. If spontaneous vomitting occurs, keep head below hips to prvent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person..
Inhalation	If respiratory irritation or any signs or symptons as described in this MSDS occur, mover the person to fresh air. If any of these effects continue, see a doctor
Advice to Doctor	This product may present an aspiration hazard. See related comments in this MSDS. If spontaneous vomitting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours. Severe inhalation overexposure to this material may sensitize the heart to catecholamine−induced arrhythmias. Do not adminster catecholamines to overexposed individuals. Contact a poison control center for further treatment information.

5. Fire Fighting Measures

Ignition Temperature, deg C	390
Flammable Limits (% by Volume)	1.4 − 7.6
Flash Point, deg C	−40 TAG
Fire Extinguishing Agents	According to the US National Fire Protection Assocition Guide, use dry chemical, foam or carbon dioxide. Water may be ineffective on the flames, but water may be used to keep fire−exposed containers cool. If a leak of spill has not ignited, use water to disperse the vapours
Explosion Hazards	Liquid evaporates and forms vapour which can catch fire or explode. Invisible vapour spreads easily and can be set on fire by ignition sources. Fire hazard is greater as liquid temperature rises above 29 deg C. Flowing liquid can be ignited by self−generating statif electricity − use adequate grounding. Full body flame−resistant clothing and/or turn−out gear recommended for persons attempting leak or spill control and for fire−fighting.

6. Accidential Release Measures

In case of Spill	Eliminate all ignition sources including internal combustion engines and power tools. Ventillate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapours and eye or skin contact. Use respirator and protective clothing as discussed in this MSDS (See section 8). Use supplied−air respirator for large releases in confined area. Contain spill if possible. Remove with inert absorbent and place in container for disposal at an approved facility. Prvent entry into sewers and waterways.

7. Handling and Storage

Keep away from heat, sparks and flame. Handle and store in well−ventilated area and in accordance with local regulations regarding flammable liquids. Empty contgainers retain residue (liquid and/or vapor) and can be dangerous.DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARTKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION: THEY MAY EXPLOSE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All othe containers should be disposed off in an environmentally safe manner and in accordance with governmental regulations.

8. Exposure Control/Personal Protection

Eyes	Avoid eye contact. The wearing of chemical safety goggles or face shied is recommended.
Skin	Avoid contact withskin or street clothing. Skin contact can be minised by wearing protective clothing including coveralls, gloves and boots. Gloves and boots should be resistant to chemicals and petroleum distillates. Exposed employees should exercise reasonable personal clealiness; this includes cleansing exposed skin several times daily with soap and water, and laundering or dry cleaning soiled work clothing at least weekly..
Inhalation	If operating conditions create airborne concentrations which exceed the recommended exposure standard(s), the use of an approved respirator is recommended. Wear approved respiratory protection such as organic vapour cartridge respirator with particulate prefilter. Use approved supplied air respiratory protection for cleaning large spills or upon entry into tanks, vessels, or other confined spaces.
Ventilation	No special ventialtion is usually necessary. However, if operating conditions create high airborne concentrations of this material, engineering controls may be needed. Local exhuast ventilation and/or enclosure of the processes is preferred in these cases

Exposure Limits	TheACGIH TLV for benzene is 0.5 ppm for a daily 8 hour time weighted average. The short term exposure limit (STEL) is 2.5 ppm The ACGIH TLV for toluene is 50 ppm for a daily 8 hour exposure The ACGIH TLV for xlyene is 100 ppm for a daily 8 hour exposure. Short term exposure to xylene should not exceed 150 ppm as a ceiling limit The ACGIH TLV for ethyl benzene is 125 ppm for a daily 8 hour exposure.

9. Physical and Chemical Properties

Note: The following data may represent a range of approximate or typical values for products in the same family. Precise technical information is provided in Product Bulletins and can be obtained from your Marketing Representative.	
Appearance and Odor	Color can vary with Octane grade and country. Purple, green or yellow color liquid normally, Petroleum odor
Boiling Point	30−200
Vapor Pr (mmHG @ 25 deg C)	420
Density(kg/l at 15 deg C)	0.7 − 0.75
Vapor Density (Air=1)	3−4
Undiluted product’s pH	Not applicable
Solubility in Water	Slight
Percent Volatile by Volume	100
Evaporation	Not determined
Viscosity (All Product Grades)	<1.5 mm^2/sec at 40 deg C

10. Stability and Reactivity

Hazardous Polymerizations	DO NOT OCCUR
Products of Combustion	Carbon monoxide and carbon di oxide may be formed during burning in limited air supply
Conditions to Avoid	Heat, Strong oxidisers

11. Toxicological Information

General	Experimental chronic inhalation toxicology studies showed kidney disease, kidney cancer and liver cancer in animals following exposure to wholly vaporized petrol. Additional studies limited to the volatile fraction of petrol have not resulted in kidney damage, which is generally considered to be a precursor to kidney cancer. Many scientists do not believe that the male rat is an appropriate animal model or predictor of human kidney cancer. Epidemiology studies in human exposed to hydrocarbons have not indicated excess risk of kidney or liver cancer. Petrol typically contains benzene in concentrations from about 0.t to 5%. Excessive exposure to benzene may cause headaches, loss of appepite, rapid pulse, fatigue, increased bleeding tendencies, and liver and kidney damage. Prolonged and repeated exposure to benzene has been associated with injury to and/or cancer of the bloof−forming organs including aplastic anemia and leukemia. In animal studies, benzene has also been associated with effects on the developing fetus. While the benzene content of petrol is relatively low, it is important to minimize exposure to the skin and respiratory system to well within the current expsoure standards. Engineering controls including full enclosure, vapour recovery, or local exhuast ventilation are recommended where routine exposure may exceed applicable standards. Routine or intermittent skin contact should be avoided. Neoprene or nitrile gloves are recommended for routine handling of petrol/gasoline. Whole gasoline exhuast was reviewed by the International Agency for Research on Cancer (IARC). Evidence for causing cancer was considered inadequate in animals and inadequate in humans. IARC placed whole gasoline exhuast in Category 2B, considering it possibly carcinogenic to humans.

12. Ecological Information

Environmental Effects	Appreciable volatilization to air is expected in the environment. This material or its component(s) may be toxic to aquatic organisms and should be kept out of sewage and drainage systems, and all bodies of water.

13. Disposal Considerations

Waste Disposal	It is the responsibility of the use of products to determine, at the time of disposal, whether the product meets criteria for hazardous waste. Product uses, transformations, mixuture and processes, may render the resulting material hazardous.
Remarks	Do not allow to enter drains or sewers. Can cause explosion

14. Transport Information

UN Number	1203
Dangerous Goods Class	3
Proper Shipping Name	Motor Spirit or Gasoline or Petrol
Hazchem Code	3Y
Additional Information	Transport in accordance with local regulations regarding flammable liquids.

15. Regulatory Information

Respirator Information	In the absense of local approval authorities/standards, follow US NIOSH/MSHA, UK BSI regulations. Respirators must meet either the above or local standard for approved respirators

16. Other Information − No specific notes on this product.

To the best of our knowledge, the information provided in this MSDS document is correct. Access to this information is being provided via the internet too so that it can be made available to as many potential users as possible. We do not assume any liability for consequences of the use of this information since it may be applied under conditions beyond our control or knowledge. Also, it is possible that additional data could be made available after this MSDS was issued. Certain hazards are described herein, however, these may not be the only hazards that exist. All materials may present unknown hazards and should be used with caution.
Customers are encouraged to review this information, follow precautionsl and comply with all applicable laws and regulations regarding the use and disposal of this product. For specific technical data or advice concerning this product as supplied in your country please contact your local sales representative. The final determination of the suitability of any material is the sole responsibility of the user.

****** MATERIAL SAFETY DATA SHEET ******

22204 - STABIL Fuel Stabilizer

SEC 1 - PRODUCT AND MANUFACTURER INFO
SEC 2 - COMPOSITION INFORMATION
SEC 3 - HAZARDS IDENTIFICATION
SEC 4 - FIRST AID MEASURES
SEC 5 - FIRE FIGHTING MEASURES
SEC 6 - ACCIDENTAL RELEASE MEASURES
SEC 7 - HANDLING AND STORAGE
SEC 8 - EXPOSURE, PERS. PROTECTION
SEC 9 - PHYS, CHEM PROPERTIES
SEC 10 - STABILITY, REACTIVITY
SEC 11 - TOXICOLOGY INFORMATION
SEC 12 - ECOLOGICAL INFORMATION
SEC 13 - DISPOSAL CONSIDERATIONS
SEC 14 - TRANSPORT INFORMATION
SEC 15 - REGULATORY INFORMATION
SEC 16 - ADDITIONAL INFORMATION

**** SECTION 1 - CHEMICAL PRODUCT AND MANUFACTURER IDENTIFICATION ****

Product Name: 22204 - STABIL Fuel Stabilizer
Part Number:
22204
Product CAS: Mixt-ur-e
Product Code: 22204
Synonyms: 22204 - STABIL Fuel Stabilizer

MANUFACTURER IDENTIFICATION

Name: Gold Eagle Company
Address: 4400 S. Kildare Blvd.
City: Chicago **State:** IL **Zip:** 60632-4372

For information call: 773-376-4400

Emergency Number: N/A
Emergency Agency: INFOTRAC
Agency Number: 1-800-535-5053
MSDS Effective Date: 5/3/2005
MSDS Supersedes Date: 3/11/2010
Miscellaneous:
Product CAS: Mixture

Brief Description: Fuel stabilizer for gasoline powered engines.
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**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

Chemical Name	CAS	MIN	MAX
Additive Mixture	(none)	0	5
Petroleum Distillate	64742-47-8	0	95

Miscellaneous:

CHEMICAL NAME	LIMIT VALUES
Additive Mixture (CAS#:Mixture)	N/A
Petroleum Distillate	N/A

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**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW:

NFPA: Health: 1 **Fire:** 1 **Reactivity:** 0 **Specific Hazard:** None

HMIS: Health: 1 **Flammability:** 1 **Reactivity:** 0 **PPE:** B

Miscellaneous:
This product may contain components above de minimus concentrations that are considered carcinogenic by OSHA, IARC, NTP or Proposition 65.
POTENTIAL HEALTH EFFECTS
Target Organs/Primary Route(s) of Entry:

Eye:
Mild irritant.

Skin:
Mild irritant

Ingestion:
Toxicity is relatively low, there is a risk of aspiration of product into the lungs.
On ingestion of large quantities, slight GI discomfort diarrhea, and headache may occur. Small doses may produce irritation and diarrhea.

Inhalation:
Low risk of inhalation. Mists above TLV may cause chemical pneumonitis.

Miscellaneous:

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**** SECTION 4 - FIRST AID MEASURES ****

Eye:
If the product contacts the eyes, immediately wash the eyes with large quantities of room temperature water for at least 15 minutes, occasionally lifting the lower and upper lids. Get medical attention immediately.

Skin:
If the product contacts the skin, promptly wash the contaminated skin with

soap and
water for at least 15 minutes. If this product penetrates the clothing, promptly
remove the clothing and wash the skin with soap and water.

Ingestion:
Do not induce vomiting, product contains petroleum distillate. Get medical attention immediately.

Inhalation:
Move the exposed person to fresh air at once and call emergency medical care. If
breathing has stopped, give artificial respiration. If breathing is difficult, give
humidified oxygen.

Notes to Physician:
No data available.

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****** SECTION 5 - FIRE FIGHTING MEASURES ******

Flash Point: 183 F

AutoIgnition Temperature: N/A

Flammable Limits
Lower Limit: Explosive Limit (LEL): 0.8

Upper Limit: Explosive Limit (UEL): 7.0

Extinguishing Media:
Use carbon dioxide, dry chemical, foam and/or water fog as extinguishing media.

Unusual Fire and Explosion Hazards:
Water may cause frothing

Special Fire Fighting Procedures:
Wear NIOSH approved SCBA respirator in the positive pressure mode and

chemical
protective clothing.

General Information:
Flammable Limits: 0.8 to 7.0

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****** SECTION 6 - ACCIDENTAL RELEASE MEASURES ******

Small Spill: Remove sources of heat or ignition, provide adequate ventilation,
contain leak using absorbent, inert, non-combustible material.

Large Spill: Contain spill, transfer to secure containers. In the event of an
uncontrolled material release, the user should determine if release is reportable
under applicable laws and regulations.
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****** SECTION 7 - HANDLING AND STORAGE ******

Handling:
See other sections of MSDS.

Storage:
See other sections of MSDS.

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****** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ******

GENERAL HYGIENE CONSIDERATIONS:
Use normal hygiene practices.

OTHER PRECAUTIONS:
Product is combustible, handle accordingly.

ENGINEERING CONTROLS:
Local Exhaust: Provide local ventilation to maintain exposure levels below recommended exposure limits.

Mechanical (General): In confined spaces, mechanical ventilation may be required.

Special Ventilation: OSHA TWA=5mg/m3

PERSONAL PROTECTIVE EQUIPMENT
Eyes/face:
Use splash proof chemical, safety goggles or appropriate full-face respirator.

Skin:
Use oil impervious gloves as required.

Respirators:
Normally none is required. If high vapor or mist concentration are expected, use appropriate NIOSH approved respirator for organic vapors and mists. Respirators must be selected based on the airborne levels found in the workplace and must not exceed the working limits of the respirator.

Other Protective Clothing/Equipment:
If there is a possibility of exposure of an individual's body to the product, wear body-covering work clothes to avoid prolonged or repeated exposure.

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****** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ******

Appearance/Odor:
Red liquid, solvent odor
pH: N/A

Vapor Pressure: (MM HG): LT 3.0

Vapor Density(Air=1): 4.8

Evaporation Rate: N/A

Viscosity: N/A

Boiling Point: 180 F.

Freezing/Melting Point: N/A

Decomposition Temperature: N/A

Solubility in Water: Negligible

Specific Gravity: 0.9

Molecular Formula: N/A

Molecular Weight: N/A

VOC Coating (minus water): 0 Lbs/Gallon

Coating Density : 0 Lbs/Gallon

Solvent Density : 0 Lbs/Gallon

Percent Solvent (volume): 60

Percent Solids (volume): 0

Percent Water (volume): 0

Percent Volatile by Weight: 0

Miscellaneous:
% Volatile/Volume: 100.0

Percent Solvent (Volume): N/A

Percent Solids (Volume): N/A

Percent Water (Volume): N/A

Product is combustible, keep away from sources of ignition, oxidizing materials and
acid. Store in an area equipped with automatic sprinklers or fire extinguishing
system. Empty containers contain product residues, assume emptied containers to
have same hazards as full containers.

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****** SECTION 10 - STABILITY AND REACTIVITY ******

Chemical Stability:
Stable: Yes

Conditions to Avoid:
Store below 150 F. Do not apply high heat or flame to container. Keep separate
from strong oxidizing agents.

Incompatibilities with Other Materials:
Strong oxidants.

Hazardous Decomposition Products:
Excessive heating and/or incomplete combustion will produce carbon monoxide.

Hazardous Polymerization:
Hazardous polymerization may occur: No

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**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

No data available.

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**** SECTION 12 - ECOLOGICAL INFORMATION ****

No data available.

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**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of product in accordance with local, state, and federal regulations. Before
attempting clean up, refer to other sections of MSDS for hazard warning information.

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**** SECTION 14 - TRANSPORT INFORMATION ****

Transportation Information:
Shipping Information (CFR 49 and IMDG):

Proper Shipping Name: Gasoline Additive, N.O.I.
DOT Hazard Class: Not applicable
DOT UN Number: None applicable
IMDG Shipping Name: Non-Hazardous Gasoline Additive Flashpoint GT 141.5 F.

Label Information:
No data available.

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****** SECTION 15 - REGULATORY INFORMATION ******

SARA Title III:

Section 302: None
Section 304: None
Section 311: None
Section 313: None

CERCLA:

Section 311(b)(4): Requires discharges of crude oil and petroleum products in any kind or form to waters must immediately be reported to the National Response Center at (800) 424-8802.

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****** SECTION 16 - ADDITIONAL INFORMATION ******

Disclaimer: Information presented herein is believed to be factual, as it has been derived from the works and opinions of persons believed to be qualified experts. However, nothing contained in this information is to be taken as warranty or representation for which the Gold Eagle Co. bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Prepared by: Mike Profetto

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TEXACO
MATERIAL SAFETY DATA SHEET

NOTE: Read and understand Material Safety Data Sheet before handling or disposing of product.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

Product Code and Name:
01866 ATF MERCON/DEXRON II MULTIPURPOSE AUTOMATIC TRANSMISSION FLUID
Chemical Name and/or Family or Description:
Transmission Fluids

Manufacturer's Name and Address:
TEXACO LUBRICANTS COMPANY
P.O. Box 4427
Houston, TX 77210-4427

Telephone Numbers:

Transportation Emergency-Company	:	(914) 831-3400
CHEMTREC (USA)	:	(800) 424-9300
In Canada	:	(800) 567-7455
Health Emergency -Company	:	(914) 831-3400
General MSDS Assistance	:	(914) 838-7204
Texaco FaxBack System	:	(713) 432-3383
Technical Information -Fuels	:	(914) 838-7336
-Lubricant/	:	(800) 782-7852(Option 4)
Antifreezes/Fuel Additives		
-Solvents/Chemicals	:	(800) 876-3738

2. COMPOSITION/INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION IS AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE A COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA	IARC	NTP	OTHER	NONE
–	–	–	–	X

Composition: (Sequence Number and Chemical Name)

Seq.	Chemical Name	CAS Number	Range in %
01 #	Solvent-dewaxed heavy paraffinic petroleum distillates	64742-65-0	80.00-94.99
02 #	Hydrotreated light naphthenic petroleum distillates	64742-53-6	1.00-2.99
03 #	Solvent-refined light naphthenic petroleum distillate	64741-97-5	1.00-2.99
04 #	Solvent-refined heavy paraffinic petroleum distillates	64741-88-4	1.00-2.99
05 *	Polymethacrylate	50867-55-5	1.00-2.99

PRODUCT IS NON-HAZARDOUS ACCORDING TO OSHA (1910.1200).
* COMPONENT IS HAZARDOUS ACCORDING TO OSHA.
# COMPONENT, BY DEFINITION, IS CONSIDERED HAZARDOUS ACCORDING TO OSHA BECAUSE IT CARRIES THE PERMISSIBLE EXPOSURE LIMIT (PEL) FOR MINERAL OIL MIST.

Exposure Limits referenced by Sequence Number in the Composition Section

Seq.	Limit	
01	5	mg/m3 TWA-OSHA (MINERAL OIL MIST)
01	5	mg/m3 TWA-ACGIH (MINERAL OIL MIST)
01	10	mg/m3 STEL ACGIH (MINERAL OIL MIST)
02	5	mg/m3 TWA-OSHA (MINERAL OIL MIST)
02	5	mg/m3 TWA-ACGIH (MINERAL OIL MIST)
02	10	mg/m3 STEL ACGIH (MINERAL OIL MIST)
03	5	mg/m3 TWA-OSHA (MINERAL OIL MIST)
03	5	mg/m3 TWA-ACGIH (MINERAL OIL MIST)
03	10	mg/m3 STEL ACGIH (MINERAL OIL MIST)
04	5	mg/m3 TWA-OSHA (MINERAL OIL MIST)

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

2. COMPOSITION/INFORMATION ON INGREDIENTS (CONT)

04	5	mg/m3 TWA-ACGIH (MINERAL OIL MIST)
04	10	mg/m3 STEL ACGIH (MINERAL OIL MIST)

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:
Red oil
Odor:
Petroleum odor

WARNING STATEMENT
NONE CONSIDERED NECESSARY

HMIS				NFPA			
Health:	1	Reactivity:	0	Health:	1	Reactivity:	0
Flammability:	1	Special :	-	Flammability:	1	Special :	-

POTENTIAL HEALTH EFFECTS

	EYE	SKIN	INHALATION	INGESTION
Primary Route of Exposure:	X	X	X	-

EFFECTS OF OVEREXPOSURE

Acute:

Eyes:
May cause minimal irritation, experienced as temporary discomfort.

Skin:
Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling.

Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation:
Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness.

Ingestion:
If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur.

Sensitization Properties:
Unknown.

Chronic:
No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:
Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition).

Other Remarks:
None

4. FIRST AID MEASURES

Eyes:
Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:
Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

4. FIRST AID MEASURES (CONT)

Ingestion:
If more than several mouthfuls of this material are swallowed, give two glasses of water (16 oz.). Get medical attention.

Inhalation:
If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:
Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees F):
Not determined.
Flash Point (degrees F):
374 (COC)
Flammable Limits (%):
Lower: Not determined.
Upper: Not determined.

Recommended Fire Extinguishing Agents And Special Procedures:
Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:
None

Extinguishing Media Which Must Not Be Used:
Not determined.

Special Protective Equipment for Firefighters:
Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:
Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

If more than 1,111,111 pounds of product is spilled, then report spill according to SARA 304 and/or CERCLA 102(a) requirements, unless product qualifies for the petroleum exemption (CERCLA Section 101(14)).

7. HANDLING AND STORAGE

Precautions to be Taken in Handling:
Minimum feasible handling temperatures should be maintained.

Storage:
Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)
Eye/Face Protection:
Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONT)

Skin Protection:
Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:
Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:
Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for Total Product:
None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:
Red oil

Odor:
Petroleum odor

Boiling Point (degrees F):
Not determined.

Melting/Freezing point (degrees F):
Not applicable.

Specific Gravity (water=1):
.8735

pH of undiluted product:
Not applicable.

Vapor Pressure:
Not determined.

Viscosity:
37.9 cSt at 40.0 C

VOC Content:
Not determined.

Vapor Density (air=1):
Not determined.

Solubility in Water (%):
Not determined.

Other: None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:
(If Others is checked below, see comments for details)

Air	Water	Heat	Strong Oxidizers	Others	None of These
_	_	_	X	_	_

Comments:
None

Products Evolved When Subjected to Heat or Combustion:
Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones, and combustion products or compounds of boron, nitrogen, phosphorus.

Hazardous Polymerizations: DO NOT OCCUR

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION(ANIMAL TOXICITY DATA)

Median Lethal Dose

Oral:
LD50 Believed to be > 5.00 g/kg (rat) practically non-toxic

Inhalation:
Not determined.

Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

Irritation Index, Estimation of Irritation (Species)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating

Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect

Sensitization:
Not determined.

Other:
None

12. DISPOSAL CONSIDERATIONS

Waste Disposal Methods

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated

IMDG:

Proper Shipping Name:
Not evaluated

ICAO:

Proper Shipping Name:
Not evaluated

TDG:

Proper Shipping Name:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Seq.	Chemical Name	CAS Number	Range in %

None

Section 302/304 Extremely Hazardous Substances (CONT)

Seq.	TPQ	RQ

None

Section 311 Hazardous Categorization:

Acute	Chronic	Fire	Pressure	Reactive	N/A
–	–	–	–	–	X

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration

None

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

14. REGULATORY INFORMATION (CONT)

CERCLA 102(a)/DOT Hazardous Substances: (+ indicates DOT Hazardous Substance)

Seq.	Chemical Name	CAS Number	Range in %
01+	Xylene	1330-20-7	0.009
02+	Ethylbenzene	100-41-4	0.00201

CERCLA/DOT Hazardous Substances (Sequence Numbers and RQ's):

Seq.	RQ
01+	100
02+	1000

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Other:
None.

State Regulations:
California Proposition 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None	

International Regulations:

WHMIS Classification:
Not regulated

Canada Inventory Status:
Not determined.

EINECS Inventory Status:
Not determined.

Australia Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
Not determined.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:
Not determined.

Mobility:
Not determined.

Persistence and Biodegradability:
Not determined.

Potential to Bioaccumulate:
Not evaluated.

Remarks:
Not evaluated.

16. OTHER INFORMATION

None

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT FOR PURPOSE OF HAZARD COMMUNICATION AS PART OF TEXACO'S PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL TEXACO PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL TEXACO PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

16. OTHER INFORMATION (CONT)

ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE APPLICABILITY OR EFFECT DF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, USER SHOULD CONSULT HIS LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. TEXACO DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

Date: 1997-09-05 New X Revised, Supersedes: 1997-07-15
Date printed: 1998-02-25

Inquiries regarding MSDS should be directed to:
Texaco Inc.
Manager, Product Safety
P.O. Box 509
Beacon, N.Y. 12508

PLEASE SEE NEXT PAGE FOR PRODUCT LABEL

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

17. PRODUCT LABEL

Label Date: 1997-07-15

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

01866 ATF MERCON/DEXRON II MULTIPURPOSE

WARNING STATEMENT

NONE CONSIDERED NECESSARY

PRECAUTIONARY MEASURES

-Avoid prolonged breathing of vapor, mist, or gas.
-Workers should wash exposed skin several times daily with soap and water.

FIRST AID

Eye Contact:
Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin Contact:
Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:
If more than several mouthfuls of this material are swallowed, give two glasses of water (16 oz.). Get medical attention.

Inhalation:
If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Note to Physician:
None

FIRE

In case of fire, use water spray, dry chemical, foam or carbon dioxide. Water may cause frothing. Use water spray to cool fire-exposed containers.

If more than 1,111,111 pounds of product is spilled, then report spill according to SARA 304 and/or CERCLA 102(a) requirements, unless product qualifies for the petroleum exemption (CERCLA Section 101(14)).

	Chemical Name	CAS Number	Range in %
#	Solvent-dewaxed heavy paraffinic petroleum distillates	64742-65-0	80.00-94.99
#	Solvent-refined heavy paraffinic petroleum distillates	64741-88-4	1.00-2.99
#	Solvent-refined light naphthenic petroleum distillate	64741-97-5	1.00-2.99
#	Hydrotreated light naphthenic petroleum distillates	64742-53-6	1.00-2.99
*	Polymethacrylate	50867-55-5	1.00-2.99

PRODUCT IS NON-HAZARDOUS ACCORDING TO OSHA (1910.1200).
* COMPONENT IS HAZARDOUS ACCORDING TO OSHA.
# COMPONENT, BY DEFINITION, IS CONSIDERED HAZARDOUS ACCORDING TO OSHA BECAUSE IT CARRIES THE PERMISSIBLE EXPOSURE LIMIT (PEL) FOR MINERAL OIL MIST.

Pennsylvania Special Hazardous Substance(s)	CAS Number	Range in %
None		

HMIS			NFPA		
Health:	1	Reactivity: 0	Health:	1	Reactivity: 0
Flammability:	1	Special : -	Flammability:	1	Special : -

Transportation
DOT:
Proper Shipping Name:
Not regulated

N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T. - NOT TESTED
< - LESS THAN > - GREATER THAN

17. PRODUCT LABEL (CONT)

Label Date: 1997-07-15

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place.

Manufacturer's Name and Address:
TEXACO LUBRICANTS COMPANY
P.O. Box 4427
Houston, TX 77210-4427

TRANSPORTATION EMERGENCY	Company:	(914) 831-3400
	CHEMTREC:	(800) 424-9300
HEALTH EMERGENCY	Company:	(914) 831-3400

MATERIAL SAFETY DATA SHEET

Review Date: 02/13/2007

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: Rotella® T Multigrade SAE 15W-40 (CJ-4)

MSDS NUMBER: 71630E - 15
PRODUCT CODE(S): 3194, 50012, 5001200001, 5001205203, 5001206021, 5001206205, 5001506205, 5056838, 5063444, 5063458, 5070719, 5071338, 5071352, 5071354, 5071355, 5071356, 5073235, 714072

MANUFACTURER
SOPUS Products
P.O. Box 4427
Houston, TX. 77210-4427

TELEPHONE NUMBERS
Spill Information: (877) 242-7400
Health Information: (877) 504-9351
MSDS Assistance Number: (877) 276-7285

SECTION 2 PRODUCT/INGREDIENTS

INGREDIENTS	CAS#	CONCENTRATION
Heavy Duty Motor Oil		
Highly refined petroleum oils	Mixture	90 - 99 %volume
Zinc Dialkyldithiophosphate	68649-42-3	1 - 5 %volume
Proprietary additives	Mixture	1 - 5 %volume

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Appearance & Odor: Bright and clear liquid. Mild odor.
Health Hazards: No known immediate health hazards.
Physical Hazards: No known physical hazards.
NFPA Rating (Health, Fire, Reactivity): 0, 1, 0
Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4

Inhalation:
Inhalation of vapors (generated at high temperatures only) or oil mist may cause mild irritation of the nose, throat, and respiratory tract.

Eye Irritation:
Lubricating oils are generally considered no more than minimally irritating to the eyes.

Skin Contact:
May cause slight irritation of the skin. If irritation occurs, a temporary burning sensation and minor redness and/or swelling may result.

Ingestion:
Lubricating oils are generally no more than slightly toxic if swallowed.

Other Health Effects:
The International Agency for Research on Cancer (IARC) has determined there is sufficient evidence for the carcinogenicity in experimental animals of used gasoline motor oils. Handling procedures and safety precautions in the MSDS should be followed to minimize exposure to the used product.

Signs and Symptoms:
Irritation as noted above.

Aggravated Medical Conditions:
Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

For additional health information, refer to section 11.

SECTION 4 FIRST AID MEASURES

Inhalation:
Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin:
Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye:
Flush with water. If irritation occurs, get medical attention.

Ingestion:
Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention.

Note to Physician:
In general, emesis induction is unnecessary in high viscosity, low volatility products such as oils and greases.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point [Method]: >400 ºF/>204.44 ºC [Pensky-Martens Closed Cup]

Extinguishing Media:
Material will float and can be re-ignited on surface of water. Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water.

Fire Fighting Instructions:
Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure, NIOSH approved, self-contained breathing apparatus. This material is non-flammable.

Unusual Fire Hazards:

Material may ignite when preheated.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures:
May burn although not readily ignitable.

Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.

Spill Management:
FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

Place in container for proper disposal. Remove contaminated soil to remove contaminated trace residues. Dispose of in same manner as material.

Reporting:
CERCLA: Product is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion. Releases to air, land, or water are not reportable under CERCLA (Superfund).

CWA: This product is an oil as defined under Section 311 of EPA's Clean Water Act (CWA). Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures:
Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles such as shoes or belts that cannot be decontaminated. Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking.

Storage:
Do not store in open or unlabeled containers. Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

Container Warnings:
Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical	Limit	TWA	STEL	Ceiling	Notation
Oil mist, mineral	ACGIH TLV	5 mg/m3	10 mg/m3		
Oil mist, mineral	OSHA PEL	5 mg/m3			

Exposure Controls

Provide adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

Personal Protection

Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation. Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

Eye Protection:
Chemical Goggles, or Safety glasses with side shields

Skin Protection:
Use protective clothing which is chemically resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:
Neoprene, or Nitrile Rubber

Respiratory Protection:
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:
For Mist: Air Purifying, R or P style NIOSH approved respirator.
For Vapors: Air Purifying, R or P style prefilter & organic cartridge, NIOSH approved respirator. Self-contained breathing apparatus for use in environments with unknown concentrations or emergency situations.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Bright and clear liquid. Mild odor.
Substance Chemical Family: Petroleum Hydrocarbon

Flash Point	> 400 ºF [Pensky-Martens Closed Cup]	**Pour Point**	-20 ºF
Solubility (in Water)	Insoluble	**Specific Gravity**	0.88 - 0.89
Stability	Stable	**Viscosity**	103 cSt @ 40 ºC

SECTION 10 REACTIVITY AND STABILITY

Stability:
Material is stable under normal conditions.

Conditions to Avoid:
Avoid heat and open flames.

Materials to Avoid:
Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products:

Thermal decomposition products are highly dependent on combustion conditions. A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Aldehydes, Carbon Monoxide, Carbon Dioxide, Hydrogen Sulfide, Ketones, Nitrogen Oxidesand other unidentified organic compounds may be formed upon combustion.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

TEST	Result	OSHA Classification	Material Tested
Dermal LD50	>5.0 g/kg(Rabbit)	Non-Toxic	Based on components(s)
Oral LD50	>5.0 g/kg(Rat)	Non-Toxic	Based on components(s)

Carcinogenicity Classification

Chemical Name	NTP	IARC	ACGIH	OSHA
Heavy Duty Motor Oil	No	Not Reviewed by IARC	Not Reviewed	No

SECTION 12 ECOLOGICAL INFORMATION

Environmental Impact Summary:
There is no ecological data available for this product. However, this product is an oil. It is persistent and does not readily biodegrade. However, it does not bioaccumulate.

SECTION 13 DISPOSAL CONSIDERATIONS

RCRA Information:

Under RCRA, it is the responsibility of the user of the material to determine, at the time of the disposal, whether the material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal.

SECTION 14 TRANSPORT INFORMATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

International Air Transport Association
Not regulated under IATA rules.

International Maritime Organization Classification
Not regulated under International Maritime Organization rules.

SECTION 15 REGULATORY INFORMATION

Federal Regulatory Status

OSHA Classification:
Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Ozone Depleting Substances (40 CFR 82 Clean Air Act):
This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

Superfund Amendment & Reauthorization Act (SARA) Title III:
There are no components in this product on the SARA 302 list.

SARA Hazard Categories (311/312):

Immediate Health	Delayed Health	Fire	Pressure	Reactivity
NO	NO	NO	NO	NO

SARA Toxic Release Inventory (TRI) (313):
Zinc compounds

Toxic Substances Control Act (TSCA) Status:
All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

Other Chemical Inventories:
Component(s) of this material is (are) listed on the Australian AICS, Canadian DSL, Chinese Inventory, European EINECS, Korean Inventory, Philippines PICCS,

State Regulation

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

SECTION 16 OTHER INFORMATION

Revision#: 15
Review Date: 02/13/2007
Revision Date: 12/19/2006
Revisions since last change (discussion): This Material Safety Data Sheet (MSDS) has been reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-2003). We encourage you to take the opportunity to read the MSDS and review the information contained therein.

SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

PRODUCT CODE(S): 3194, 50012, 5001200001, 5001205203, 5001206021, 5001206205, 5001506205, 5056838, 5063444, 5063458, 5070719, 5071338, 5071352, 5071354, 5071355, 5071356, 5073235, 714072

Rotella® T Multigrade SAE 15W-40 (CJ-4)

ATTENTION!

PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE OIL ACNE OR DERMATITIS. USED GASOLINE ENGINE OIL HAS BEEN SHOWN TO CAUSE CANCER IN LABORATORY ANIMALS.

Precautionary Measures:
Avoid prolonged or repeated contact with eyes, skin and clothing. Avoid breathing of vapors, fumes, or mist. Use only with adequate ventilation. Wash thoroughly after handling.

FIRST AID

Inhalation: If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.
Skin Contact: Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
Eye Contact: Flush with water. If irritation occurs, get medical attention.
Ingestion: Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention.

FIRE

In case of fire, Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water. Material will float and can be re-ignited on surface of water.

SPILL OR LEAK

Dike and contain spill.
FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

CONTAINS: Highly refined petroleum oils, Mixture; Zinc Dialkyldithiophosphate, 68649-42-3; Proprietary additives, Mixture

NFPA Rating (Health, Fire, Reactivity): 0, 1, 0

TRANSPORTATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flames or heat. Keep container closed and drum bungs in place.

Name and Address

SOPUS Products
P.O. Box 4427
Houston, TX 77210-4427

ADMINISTRATIVE INFORMATION	
MANUFACTURER ADDRESS:	SOPUS Products, P.O. Box 4427, Houston, TX. 77210-4427

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT : IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE THE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, YOU SHOULD CONSULT WITH YOUR LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. WE WILL NOT PROVIDE ADVICE ON SUCH MATTERS, OR BE RESPONSIBLE FOR ANY INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. THE UNDERLYING DATA, AND THE INFORMATION PROVIDED HEREIN AS A RESULT OF THAT DATA, IS THE PROPERTY OF SOPUS PRODUCTS AND IS NOT TO BE THE SUBJECT OF SALE OR EXCHANGE WITHOUT THE EXPRESS WRITTEN CONSENT OF SOPUS PRODUCTS.

44815-10737-100R-02/13/2007

DEERE & COMPANY
John Deere Road, Moline, IL 61265
1-800-822-8262

Material Data Safety Sheet

JOHN DEERE PRODUCT NAME: **Hy-Gard Transmission and Hydraulic Oil**

DATA SHEET NO: 8503-40,100
LATEST REVISION DATE: 15 Aug. 1999
DEERE CODE: Y3, Y38, XN, Y4
JDM PART NO: AR69444, AR69445, TY6238, TY6354, TY22028, TY22062, TY22077, TY22078, TY22079, TY22080, TY22092, TY24496, TY24761
Part Nos. TY6237 TY6278 End 12/99

SECTION I - PRODUCT IDENTIFICATION

CHEMICAL NAME AND SYNONYMS: Lubricating Oil; Hydraulic Fluid; J20C
CHEMICAL FAMILY: Hydrocarbon FORMULA: Complex

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV/PEL	V.P.	CAS.#
Solvent refined, hydrotreated, heavy paraffinic distillate	50-60	5 mg/m^3*	-	64742547
Solvent refined, hydrotreated, middle distillate	0-25	5 mg/m^3*	-	64742467
Severely hydrotreated light naphthenic distillate	0-25	5 mg/m^3*	-	64742536
Polymeric additive in oil (poly-methacrylate)	10-15	None	-	None
Additive containing zinc dialkyl dithiophosphate	5- 6	None	-	Mixture

*for oil mists

SECTION III - PHYSICAL DATA

BOILING POINT: N.A.
% VOLATILE VOLUME: N.A.
VAPOR DENSITY: N.A.
APPEARANCE/ODOR: dark amber/slight odor
SP. GRAVITY (WATER=1): 0.89
EVAPORATION RATE: N.A.
SOLUBILITY IN WATER: Insoluble
N.A. - not available

SECTION IV - FIRE & EXPLOSION HAZARD DATA

FLASH POINT: 390° F C.O.C.
FLAMMABLE LIMIT - LEL: N.A.
EXTINGUISHING MEDIA: Water fog, foam, dry chemical, carbon dioxide, or halogenated agents.
SPECIAL FIRE FIGHTING PROCEDURES: Do not use a direct stream of water. Product will float and can be reignited on surface of water. Cool fire exposed containers with water. Use NIOSH approved self-contained breathing apparatus.
UNUSUAL FIRE & EXPLOSION HAZARDS: None

Recycled Paper

SECTION V - HEALTH HAZARD DATA

EXPOSURE LIMIT: See Section II - Hazardous Ingredients
EFFECTS OF OVEREXPOSURE: Exposure to vapors or mists of this product may cause mild upper respiratory tract irritation. Prolonged or repeated contact may cause various skin disorders such as dermatitis, oil acne, or folliculitis. Eye contact is minimally irritating. Effects of ingestion are expected to be relatively non-toxic. Exposure to product may aggravate preexisting skin and respiratory conditions.
EMERGENCY & FIRST AID: Eyes - flush with water 15 minutes. Skin - remove contaminated clothing; wash skin with soap and water; if material is injected under the skin, do not wait for symptoms to develop - get medical attention promptly to prevent serious damage. Inhalation - remove victim to fresh air and provide oxygen if breathing is difficult. Ingestion - do NOT induce vomiting. In all cases seek medical attention.

SECTION VI - REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY: Avoid open flame, and oxidizing materials
HAZARDOUS POLYMERIZATION: Will not occur
DECOMPOSITION PRODUCTS: Dependent on combustion conditions. A complex mixture of airborne solid, liquid, and gas will evolve when this material undergoes pyrolysis or combustion. Oxides of carbon, sulfur, phosphorous, and other unidentified organic compounds may be formed.

SECTION VII - SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Dike and contain. Use vacuum or an absorbent such as clay or sand to pick up. Flush area with water to remove trace residue. NOTE: This product is classified as an oil under the Clean Water Act. Spills, entering surface waters or any watercourse or sewer leading to surface waters, must be reported to the National Response Center 800-424-9802.
WASTE DISPOSAL METHOD: In accord with federal, state, and local regulations

SECTION VIII - PROTECTIVE EQUIPMENT INFORMATION

VENTILATION: Local exhaust to keep TLV/PEL below acceptable levels
RESPIRATOR: NIOSH approved as needed EYE WEAR: Recommended
GLOVES: Recommended to minimize skin contact OTHER:

SECTION IX - SPECIAL PRECAUTIONS

Minimize skin contact. Wash with soap and water before eating, smoking, or using toilet facilities. Launder contaminated clothing before reuse. Properly dispose of contaminated articles including shoes that cannot be cleaned. Store in a cool, dry place with adequate ventilation. Keep away from open flames. Keep away from children.

SECTION X - DATA PREPARATION

NAME: T. M. Snyder, CIH TITLE: Industrial Hygienist

SIGNATURE: DATE: October 7, 1999

The information contained herein is believed to be accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendee assumes the risk in use of the material.

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

John Deere Hy-Gard® Transmission/Hydraulic Oil

Product Use: Transmission Fluid, Hydraulic Oil

Product Number(s): CPS240230

Company Identification

Chevron Products Company

Global Lubricants

6001 Bollinger Canyon Rd.

San Ramon, CA 94583

United States of America

www.chevronlubricants.com

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

email : lubemsds@chevrontexaco.com

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	60 - 100 %weight
Zinc alkyl dithiophosphate	68649-42-3	1 - 5 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.

Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Cleveland Open Cup) 150 °C (302 °F) Minimum

Autoignition: No data available

Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

Keep out of the reach of children.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static

electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required.

If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	--	--
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow

Physical State: Liquid

Odor: Petroleum odor

pH: Not Applicable

Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)

Vapor Density (Air = 1): >1

Boiling Point: >260°C (500°F)

Solubility: Soluble in hydrocarbons; insoluble in water

Freezing Point: Not Applicable

Specific Gravity: 0.868 - 0.88 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

Density: 0.8687 kg/l @ 15°C (59°F) (Typical)

Viscosity: 7 cSt @ 100°C (212°F) Minimum

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

ENVIRONMENTAL FATE

Ready Biodegradability: This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

Additional Information:NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO

2. Delayed (Chronic) Health Effects: NO

3. Fire Hazard: NO

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Zinc alkyl dithiophosphate	03, 06

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Automatic transmission fluid)

WHMIS CLASSIFICATION:

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:

Label Category : INDUSTRIAL OIL 1 - IND1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1,2,3,8,9,11,12,14,15,16.

Revision Date: AUGUST 20, 2010

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

MATERIAL SAFETY DATA SHEET

3-in One Drip Oil

1 IDENTIFICATION

Name of product: 3-in-One oil
Acronym/Z Code: TIOOL/Z4567
Product Type: All purpose lubricating oil
Use: The product is used for the lubrication of moving parts and is used for protecting tools and Surfaces from the effects of rust.
Appearance: A low viscosity all purpose oil, pale straw colour. The oil is contained in a tinplate container fitted with a dropper spout.
Supplied by: WD-40 Company Limited
PO Box 440, Kiln Farm, Milton Keynes, MK11 3LF
Tel: 01908 555400 Fax: 01908 266900

2 COMPOSITION

The product contains the following materials:

	% Weight	Cas No
PALE SPINDLE OIL	>98%	64742-52-5
CORROSION INHIBITOR	Less than 1.0%	N/A
CITRONELLA OIL	Less than 0.5%	N/A

Irritant
Flammable

3 HAZARDS IDENTIFICATION

EYE CONTACT – Can cause stinging and irritation
SKIN CONTACT - Prolonged contact with the oil may give rise to irritation and dermatitis
INHALATION - Aspiration into the lungs is the main hazard, which may cause chemically induced Pneumonia
INDIGESTION - May cause irritation of the mouth, oesophagus, stomach, abdominal pain and diarrhoea. Nausea and vomiting are the most likely outcome and the greatest danger would result from aspiration into the lungs.

4 FIRST AID MEASURES

SKIN - Wash copiously with soap and water – remove contaminated clothing, including shoes and launder before re-use. If skin irritation develops seek immediate medical attention.
EYES - As soon as possible irrigate thoroughly with water for at least 10 minutes, holding the eyelids apart. If in any doubt, or the irritation persists, obtain medical attention.
INHALATION Ensure that airways are clear and unobstructed. Keep warm and at rest. If there is any difficulty in breathing, or vomiting has occurred obtain medical attention urgently. If breathing stops or shows signs of failing, apply mouth to mouth ventilation and put near fresh air.
INGESTION In the event of deliberate ingestion help must be obtained urgently.

Keep at rest. *Do not induce vomiting* but seek prompt medical attention. Observe patient in case abdominal pain develops, or patient starts to vomit. Try to keep patient conscious and try to make certain the patient does not aspire vomit into lungs.

5 FIRE FIGHTING MEASURES

In the event of fire, use carbon dioxide, dry powder or foam extinguishers.

6 ACCIDENTAL RELEASE MEASURES

The oil should not be allowed to enter drains or water courses. Small spills should be soaked up with sand or earth Disposed of in accordance with local bylaws and the requirements of the Environmental Protection Act 1990

7 HANDLING AND STORAGE

Containers should be kept away from heat and oxidising agents and containers should be kept out of reach from young children

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Wear suitable gloves if excessive skin contact is likely to occur, or if there is a history of skin problems

9 PHYSICAL & CHEMICAL PROPERTIES

Physical state: Medium viscosity oil

Odour:	Citrus, oily characteristic
Product density:	0.905 @ 15^{o} Celsius
Flammability:	Flash point approx 150^{o} Celsius

10 STABILITY AND REACTIVITY

Pale spindle oil and mineral oil will give rise to a range of substances from thermal decomposition. The following substances may be expected from normal combustion:

Carbon Dioxide:	Polycyclic aromatic hydrocarbons
Carbon Monoxide:	Unburned hydrocarbons
Water:	Unidentified organic/inorganic compounds
Particular matter:	Nitrogen oxides

11 TOXICOLOGICAL INFORMATION

The product is not classified as dangerous for health effect

12 ECOLOGICAL INFORMATION

Pale spindle oil is a mixture of non-volatile components which are not expected to be released to air in any significant quantities.

If released to water the oil will form a floating layer and its components will not evaporate or dissolve to any great extent. Dissolved components will be absorbed in sediments. In aerobic water any sediments will biodegrade slowly, but in anaerobic conditions they will persist. Pale spindle oil is practically non-toxic to aquatic organisms but contains components which have a high potential to bioaccumulate. Small volumes released on land will be absorbed in the upper soil layers and biodegrade slowly. Larger volumes may penetrate into anaerobic soil layers in which the product will persist and may reach the water table on which it will form a floating layer. The more soluble components may dissolve but their high soil absorption co-efficiency and the low solubility will prevent significant contamination of ground water.

13 DISPOSAL CONSIDERATIONS

Oil based products should be disposed of to a licensed waste contractor. Any disposal route should comply with local bylaws and the requirements of environmental protection legislation.

14 TRANSPORT INFORMATION

UN number:	N/A
Description:	N/A
IMDG class:	Not classified
Packaging group:	N/A
ADR class:	N/A
Hazard class:	Flammable liquid

15 REGULATORY INFORMATION

Chemical (Hazard Information and Packaging Regulation) 1994 No 3247 and Amendment 1996 No 1092
1988 relating to the Classification of Packaging and Council Directive 75/324/EEC Relating to Aerosol Dispensers and Amendment 94/1/EC
Keep out of reach of children. If swallowed seek medical advice immediately and show this container or label.

a) Consumer Pack Label
Classification: Not classified as dangerous

.16 OTHER INFORMATION

Data sources used in the preparation of this SDS:
Raw material supplier's safety data sheets.

We believe the statements, technical information and recommendations contained herein are reliable. However, the data is provided without warranty, expressed or implied. It is the users responsibility both to determine safe conditions for use of this product and assume loss damage or expense, direct or consequential, arising from its use. Before using the product, read information printed on the label.

Material Safety Data Sheet For COMPRESSOR OIL
ACL032-P6, ACL032-P12, ACL130

Coilhose Pneumatics
19 Kimberly Avenue
East Brunswick, NJ 08816
732-390-8480

REVISION DATE: 12/28/95 DATE ISSUED: 01/01/05

IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME:
ACL032-P6, ACL032-P12, ACL130

PRODUCT #:
200278

CHEMICAL NAME:
N/A - Mixture

CAS #'S:
Mixture

PRODUCT APPEARANCE AND ODOR:
Amber liquid, petroleum odor

CHEMICAL FAMILY:
Semi-Synthetic Fluid

SYNONYMS:
Petroleum-based compressor oil

EMERGENCY TELEPHONE:
908-862-9300

COMPONENTS AND HAZARD INFORMATION

COMPONENTS:	W/W	**HAZARD DATA (TLV, LD50, LC50, ETC.):**
Water CAS #: 7732-18-5		n/e
Ethylene Glycol CAS #: 107-21-1		TLV50ppm (125 mg/meter cubed ceiling), for vapor and mist combined (ACGIH 1984-85)
Sodium Petroleum Sulfonate CAS #: 68608-26-4		PEL 5mg/meter cubed as an oil mist.
Oleic Acid Cas #: 112-80-1		n/e
Polyethylene Glycol Dioleate Cas #: 9005-07-6 For further information see Toxicity section		n/e

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health	Flammability	Reactivity
1	0	0

TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION:

ICC: Compound or lubricant. Metal cutting, drawing or drilling. Dry, liquid or paste. NOI

DOT: Not regulated.

EMERGENCY FIRST AID

EYE CONTACT: Immediately flush with water, and continue washing the eyes for several minutes.

SKIN CONTACT: Remove contaminated clothing and flush skin with water.

INHALATION: Remove to fresh air. Call a physician if discomfort persists.

INGESTION: If conscious, give two glasses of water and induce vomiting. Call a physician immediately.

NOTES TO PHYSICIAN: The principal toxic affects of ethylene glycol, when swallowed, are kidney damage and metabolic acidosis. Ethanol is antidotal, and its early administration may block the formation of nephrotoxic metabolites of ethylene glycol in the liver. Ethanol should be given intravenously, as a 5% solution in sodium bicarbonate, at a rate of about 10 ml per hour. A desired therapeutic level of ethanol in blood is 100mg/dl. Hemodialysis may be required. Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end-expiratory pressure may be required.

FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM):	AUTOIGNITON TEMPERATURE:
not applicable	n/e

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION:

Health	Flammability	Reactivity
1	0	0

FLAMMABLE OR EXPLOSIVE LIMITS (approximate percent by volume in air):
Estimated values: lower 3.2%, upper 15.3%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES:
Apply alcohol type or all purpose type foams by manufactures' recommended techniques for large fires. Use water spray, carbon dioxide or dry chemical media for small fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
n/a

"EMPTY CONTAINER WARNING":
Empty containers contain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAMES, SPARKS, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged, and returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with government regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

HEALTH AND HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT:	BASIS:
50 PPM Ceiling for vapor and mist	ACGH: 1984-85

SWALLOWING: May cause abdominal discomfort or pain, dizziness, malaise, lumbar pain, oliguria, uremia, and central nervous system depression. Severe kidney damage follows the swallowing of large volumes of ethylene glycol. May be fatal.

Coilhose Pneumatics • 19 Kimberly Road • East Brunswick, NJ 08816 • Phone 732-390-8480

HEALTH AND HAZARD INFORMATION

SKIN ABSORPTION: No evidence of adverse health effects from available information.

INHALATION: May cause irritation of the nose and throat with headache, particularly from mists. High vapor concentrations caused, for example, by heating the material in an enclosed and poorly ventilated workplace may produce nausea, vomiting, headache, and dizziness.

SKIN CONTACT: No evidence of adverse health effects from available information.

EYE CONTACT: Liquid vapor, and mist may cause discomfort in the eye with transient conjunctivitis. Serious corneal injury is not anticipated.

EFFECTS OF REPEATED OVEREXPOSURE: Inhalation of mist may produce signs of central nervous system involvement, particularly dizziness and nystagmus.

PHYSICAL DATA: The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE:
Wide range

VAPOR PRESSURE:
n/e

SPECIFIC GRAVITY (25°C/25°C):
(WATER = 1)
>1.0

VAPOR DENSITY (AIR = 1):
n/e

MOLECULAR WEIGHT:
Wide Range

PERCENT VOLATILE BY VOLUME:
80%

EVAPORATION RATE @ 1 ATM. AND 25°C (77°F) (n-BUTYL ACETATE = 1):
>1.0

SOLUBILITY IN WATER @ 1 ATM. and 25°C (77°F):
Soluble

POUR, CONGEALING OR MELTING POINT:
n/e

FREEZING POINT:
n/e

REACTIVITY

This product is stable and will NOT react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite, etc., as this represents a serious explosion hazard.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS: Fumes, smoke, carbon monoxide, oxides of sulfur, and other decomposition products, in case of incomplete combustion.

CONDITIONS TO AVOID: Open Flames.

TOXICITY

ORAL (Acute)	n/e
DERMAL (Acute)	n/e
EYE	n/e
INHALATION (Acute)	n/e
CHRONIC, SUBCHRONIC, ETC.	n/e

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TOXICITY

This product does NOT contain any ingredients identified as carcinogenic by IARC, NTP, or OSHA.

SARA Section 313 Status: This product contains the following Section 313 reportable ingredients: Component CAS# %/Ethylene Glycol 107-21-1 64

OTHER EFFECTS OF OVEREXPOSURE: Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations. There is, however, no currently available information to suggest that ethylene glycol has caused birth defects in humans. Therefore, ethylene glycol is considered an animal teratogen. Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence, or a different pattern of tumors compared with untreated controls. The absence of a carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Keep product out of sewers and watercourses by diking or impounding. Absorb with sand or inert material. Sweep or scoop up and remove. Prevent spread of spill. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with local regulations.

WASTE DISPOSAL METHOD: (Consult federal, state, or local authorities for proper disposal procedures.) Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste site or facility.

PROTECTIONS AND PRECAUTIONS

VENTILATION: (Always maintain below permissible exposure limits.) Use local exhaust to capture vapor, mist or fumes, if necessary.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.) Normally not needed at ambient temperatures.

PROTECTIVE GLOVES: Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION: Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT: Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES/ENGINEERED CONTROLS: Keep containers closed when not in use. Do not handle near heat, sparks, flame, or strong oxidants.

DO NOT MIX WITH NITRITES OR PRODUCTS, WHICH CONTAIN NITRITES.

PERSONAL HYGIENE: Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean them before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of work period. Product is readily removed from skin by waterless hand cleaners, followed by washing thoroughly with soap and water.

PREPARED BY: Erick Aho, Chemist

The above information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse beyond our control, seller makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. User should satisfy himself that he has all current data relevant to his particular use.

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ASHBURN
Cut - Clean - Protect

MATERIAL SAFETY DATA SHEET
AIR COMPRESSOR OIL

I. PRODUCT AND MANUFACTURER INFORMATION	
Product name	AIR COMPRESSOR OIL
Chemical name	PETROLEUM OIL
Synonyms	LUBRICATING OIL
CAS number	
Manufacturer	Ashburn Chemical Technologies 2911 Rusk Houston, TX 77003
Emergency phone number	713-425-3000
MSDS prepared by	
Date of last revision	5/2/05

II. HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENT	CAS NUMBER	% Optional	OSHA PEL	ACGIH TLV	CHEMICAL AND/OR COMMON NAME(S)
Distillates, petroleum, solvent-refined heavy paraffinic	64741-88-4		5 mg/m3	5 mg/m3	
Distillates, petroleum, hydrotreated heavy paraffinic	64742-54-7		5 mg/m3	5 mg/m3	

(All other products are not considered to be subject to Section 313 provisions of SARA Title III)

III. PHYSICAL AND CHEMICAL CHARACTERISTICS	
Boiling point @ 760 mm Hg	ND
Vapor pressure at 20 °C	<0.01 mmHg
Vapor density (air = 1)	>1
Solubility in water	INSOLUBLE
Appearance and odor	LIGHT AMBER LIQUID, MILD PETROLEUM ODOR
Specific gravity (H_2O = 1.0)	0.88
Melting point	ND
Evaporation rate (butyl acetate = 1)	<1

IV. FIRE AND EXPLOSION HAZARD DATA			
Combustible/Not combustible	OSHA/NFPA Class IIIB combustible liquid		
Flammable/Not flammable	Not Flammable		
Pyrophoric/Not pyrophoric	Not Pyrophoric		
Explosive/Not explosive	Not explosive		
Flash point (test method)	428 F (Pensky-Martens (ASTM D-93))		
Flammable limits (in Air % by volume)	LEL ND	UEL ND	
Extinguishing media	Water fog, foam, carbon dioxide, dry chemical.		
Special fire-fighting procedures or equipment	Treat as hot oil. Fire Fighters should wear NIOSH approved self-contained breathing apparatus.		
Unusual fire and explosion hazards	Intense heat can cause drums to rupture. Cool fire-exposed containers with water.		

V. REACTIVITY DATA	
Material is stable/unstable	Stable
Conditions to avoid	Keep away from extreme heat and open flame.
Incompatibility (materials to avoid)	Strong oxidizers

Hazardous decomposition or by-products	Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur, and or nitrogen.
Hazardous polymerization will/will not occur	Will not occur.

VI. HEALTH HAZARD DATA	
Threshold limit value	
Primary route(s) of entry	Skin
Known Hazards Under 29 CFR 1910.1200	
Mutagenic (genetic defects)	NONE
Reproductive	NONE
Systemic	NONE
Teratogenic (birth defects)	NONE
Carcinogen listed in:	
NTP (National Toxicology Program)	NO
IARC Monographs	NO
OSHA	NO
Signs and symptoms of exposure	
Inhalation	In elevated temperatures or in enclosed spaces, product mist or vapors may irritate the mucous membranes of the nose, throat, bronchi, and lungs.
Skin contact	This product may cause mild skin irritation from prolonged skin contact. Injection into the skin, muscle or blood stream requires immediate medical attention.
Eye contact	This product can cause transient eye irritation with short term contact with liquid sprays or mists.
Ingestion	If ingested, no significant adverse health effects are anticipated. Ingestion can cause mild irritation to the digestive tract or cause a laxative effect. If aspirated into the lungs, the material can cause severe lung damage or death.
Emergency first aid procedures	
Inhalation	Move victim to fresh air. If victim is not breathing, begin artificial respiration. If breathing is difficult, 100% humidified oxygen should be administered by a qualified individual. Seek immediate medical attention.
Skin contact	Remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with soap and water. Seek medical attention if tissue appears damaged or if irritation persists. Thoroughly clean clothing before re-use. Discard contaminated leather goods. Injection into the skin, muscle or blood stream requires immediate medical attention.
Eye contact	Check for and remove contact lenses. Flush eyes with cool clean low pressure water while occasionally lifting and lowering the eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
Ingestion	Do not induce vomiting unless directed by a physician. Do not give anything to drink unless directed by a physician. Never give anything by mouth to person who is unconscious. Seek medical attention immediately.
Medical conditions generally aggravated by exposure	Personnel with pre-existing skin disorders should avoid repeated or prolonged contact with this product.
Notes to physician	In the event of injection into underlying tissue, immediate treatment should include extensive incision and saline irrigation. Inadequate treatment can result in eschemia and gangrene. Early symptoms may be minimal.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE	
Steps to take if released or spilled	Treat as an oil spill. Dike area. Clean up with absorbent material. Do not flush into drain or sewers. Place in a DOT approved container for disposal.
Waste disposal method	According to federal, state and local regulations.
Precautions for handling and storing	

Other precautions		
Hazard ratings	HMIS	NFPA
Health	0	0
Flammability	1	1
Reactivity	0	0
Personal protection	B	

VIII. CONTROL MEASURES	
Protective gloves (type and material)	Use gloves that are chemical resistant such as neoprene or nitrile rubber.
Eye protection	Use safety glasses with side shields or goggles or face shield if splashing or spraying is anticipated.
Other protective clothing or equipment	Impervious protective clothing. e.g. Tyvek.
Respiratory protection (specify type)	None normally required. If TLV is exceeded, use NIOSH approved respirator.
Ventilation and conditions	General room ventilation should be satisfactory. Local exhaust ventilation may be necessary if misting is generated.
Local	
Mechanical	
Other	
Special	
Work/hygienic practices	Launder contaminated clothing before reuse. Avoid prolonged breathing of mist and vapors. Use as directed. Normal precautions common to good manufacturing should be followed in handling and storing. Store away from food. Wash hands before eating, drinking, or smoking.

IX. ADDITIONAL REGULATORY INFORMATION	
SARA hazard category (Section 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III)	NONE
Toxic chemical(s) subject to the supplier notification requirements of section 313 of the Superfund Amendment and Reauthorization Act of 1986 (SARA) and the requirements of 40 CFR part 372	NONE
Ingredient(s) regulated under the Clean Air Act Section 112 hazardous air pollutants and subject to all reporting requirements of CERCLA (Superfund)	NONE

NA – not applicable NR – not reported ND – not determined NE – not established UN – unknown

The information presented in this MSDS has been compiled from sources deemed reliable. This MSDS is presented in good faith and believed to be accurate as of the effective date shown above. No warranty, expressed or implied, is given. Regulatory requirements are subject to change and may differ from one location to another. It is the responsibility of the buyer to insure compliance with federal, state, provincial and local laws and regulations.

MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **LOCTITE SILVER GRADE ANTI-SEIZE LUBRICANT**

Proper Shipping Name: None allocated

Product code(s): 199012, 471321, 552091, 471322, 471319, 235014

Part Number(s): 76732 (236ml), 76741 (250g), 76769 (500g), 76731 (5kg), 76785 (10kg), 76779 (194kg)

Use: Anti-seize compound

Supplier: HENKEL AUSTRALIA PTY. LIMITED ABN 82 001 302 996
TECHNOLOGIES
135-141 Canterbury Road, Kilsyth, Victoria, 3137. Tel: (03) 9724 6444
24 HOUR EMERGENCY CONTACT NUMBER Tel: 1800 032 379

SECTION 2. HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE:
Hazardous according to the criteria of ASCC. This material has been classified as Irritant (Xi).
Risk phrase(s):
R36/38 Irritating to eyes and skin.

Safety phrase(s):
S24/25 Avoid contact with skin and eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 After contact with skin, wash immediately with plenty of soap suds.
S37/39 Wear suitable gloves and eye/face protection.
S46 If swallowed, seek medical advice immediately and show this container or label.

DANGEROUS GOODS INFORMATION:
Not classified as Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

SUSDP POISON SCHEDULE: None allocated

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS:

CHEMICAL ENTITY	CAS NO.	PROPORTION
Petroleum hydrocarbons		30- 60% w/w
Graphite	[7782-42-5]	10-30%w/w
Calcium oxide	[1305-78-8]	10-30%w/w
Aluminium		<10%w/w

SECTION 4. FIRST AID MEASURES

Ingestion: If swallowed, **do not induce** vomiting. Seek medical attention or contact a Poisons Information Centre (Phone 13 11 26).

Skin: Remove contaminated clothing and wash affected areas with plenty of soap and water. If irritation occurs, seek medical attention.

Eyes: Hold eyes open and flush with water for at least 15 minutes. Seek medical attention or contact a Poisons Information Centre (Phone 13 11 26).

Inhalation: If inhaled, remove from contaminated area. For all but the most minor symptoms, arrange for patient to be seen by a doctor.

Advice to doctor: Treat symptomatically.

First Aid facilities: Eye wash and normal washroom facilities

SECTION 5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Carbon dioxide, foam, dry chemical.

Hazards from combustion products: Combustible paste. In a fire, it will emit oxides of carbon and irritating fumes.

Precautions for fire fighters and special protective equipment: If there is a risk of exposure to products of combustion, then fire-fighters should wear full protective clothing and self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Wear impervious gloves, chemical goggles and waterproof boots. Contain and collect spillage with inert absorbent materials (e.g. sand, earth, vermiculite). Transfer to sealable containers suitable for storing spilled material. Use a non-flammable solvent or detergent and excess water to clean up areas in contact with spilled material. Do not contaminate watercourse. Dispose of residues in chemical waste disposal area in accordance with relevant State and Federal requirements.

SECTION 7. HANDLING AND STORAGE

Safe Handling: Observe recommendations made under SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION. Wear neoprene gloves and safety goggles.

Storage: Store indoors at ambient temperatures. Keep containers sealed when not in use. Protect from physical damage.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National exposure standards: TWA : 5 mg/m³ as aluminium (fumes)
2 mg/m³ as calcium oxide

Engineering controls: If processing vapours or dusts are produced, use a local mechanical exhaust system.

Personal protective equipment: Use good industrial hygiene. Avoid contact with skin and eyes. Wear overalls, safety footwear, neoprene gloves and chemical splash goggles. Use in a well ventilated area. If inhalation risk exists, wear a respirator complying with the requirements of AS 1715 and AS 1716.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical data:

Appearance:	Silver coloured smooth paste
Specific gravity:	1.25
Solubility:	Insoluble in water
Flash point:	>150°C

SECTION 10. STABILITY AND REACTIVITY

Chemical stability: Stable under normal conditions of temperature and pressure.
Conditions to avoid: Avoid sources of ignitions.
Incompatible materials: Keep away from strong bases, alcohols and oxidising agents.
Hazardous decomposition products: When heated to decomposition, it will emit oxides of carbon and irritating fumes.

Hazardous reactions: No polymerisation will occur.

SECTION 11. TOXICOLOGICAL INFORMATION

HEALTH EFFECTS:

Acute:

Ingestion:	If swallowed, this product will cause irritation to the mouth, throat and digestive tract.
Skin:	Contact with the skin may cause irritation.
Eyes:	Contact with the eyes can cause irritation.
Inhalation:	Inhalation of vapour from the heated product may cause irritation to the nose and throat.
Chronic:	Repeated skin contact may lead to dermatitis. Repeated inhalation of graphite dusts may cause pulmonary disease. Exposure to free graphite dust is not anticipated during normal use of this product. However, grinding or machining of coated parts may release dust/fumes. Under such circumstances wear an approved respirator.

Toxicity information: None available.

SECTION 12. ECOLOGICAL INFORMATION

Do not contaminate waterways and soil.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal of this material should be undertaken by a registered chemical disposal company. Empty containers should be cleaned by a registered contractor and then recycled or disposed of at an approved land waste site.

SECTION 14. TRANSPORT INFORMATION

Not classified as Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

SECTION 15. REGULATORY INFORMATION

SUSDP POISON SCHEDULE: None allocated

SECTION 16. OTHER INFORMATION

Abbreviations/acronyms:
ASCC - Australian Safety and Compensation Council
SUSDP - Standard for the Uniform Scheduling of Drugs and Poisons
TWA – Time weighted average

DISCLAIMER:
The percentage weight (% w/w) of ingredients is not to be taken as a specification guaranteed by Henkel Australia Pty. Limited, but only as an approximate guide to the content of hazardous ingredients in the material. The information contained herein does not constitute a guarantee by Henkel Australia Pty. Limited concerning the properties of the material.

The information contained in this Material Safety Data Sheet is offered in good faith and has been developed from what is believed to be accurate and reliable sources. The information is offered without warranty, representation, inducement or licence and Henkel Australia Pty. Limited assumes

no legal responsibility for reliance upon same. Henkel Australia Pty. Limited disclaims any liability for loss, injury or damage incurred in connection with the use of the material or its associated Material Safety Data Sheet.

This information is not to be construed as a representation that the material is suitable for any particular purpose or use except those conditions and warranties implied by either Commonwealth or State statutes. Customers are encouraged to make their own enquiries as to the material's characteristics and, where appropriate, to conduct their own tests in the specific context of the material's intended use.

MATERIAL SAFETY DATA SHEET

REVISION DATE: 18/02/2010

MSDS No: GDL

Garage Door Lube Part #: 16-GDL

Hazardous According to Criteria of Worksafe Australia.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Garage Door Lube Part #: 16-GDL
Product Description: Track & Cable Lube
Product Formulation Name: Track & Cable Lube

DISTRIBUTOR:

The Blaster Group Pty Ltd
Unit 30, 8 Victoria Avenue
Castle Hill NSW 2174
Emergency Phone: 02 8794 7360
Customer Service: 02 8794 7360

24 HR. EMERGENCY TELEPHONE NUMBERS:
POISONS INFORMATION CENTRE
PHONE:**13 11 26**

2. COMPOSITION/INFORMATION ON INGREDIENTS

	wt.%	CAS Registry #	OSHA PEL	ACGIH TLV
Polydimenthylsiloxane	+15	63148-62-9	Not established	
Alkylation Naptha, Heavy	+90	64741-65-7	100ppm	100ppm
Zinc Alkyldithiophosphate Mixture	+5	68649-42-3	Not determined	
Carbon Dioxide	+2	124-38-9	5000ppm	5000ppm

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

EYES:
Direct contact with eyes may cause irritation, redness, tearing

SKIN:
Prolonged or repeated contact with skin may cause mild skin irritation, oil acne, folliculitis, and possible dermatitis in sensitive individuals

INGESTION:
Will cause nausea, vomiting and diarrhoea

INHALATION:
Mist may irritate mucous membranes, which may be pronounced at elevated temperatures

PHYSICAL HAZARDS:
Aerosol containers are pressurized (even when empty!) Do not expose to temperatures above 50^{o}C. Do not puncture or burn can. Failure to observe these precautions may result in a rapid and violent decompression of the container producing projectiles and atomization of the liquid contents.

4. FIRST AID MEASURES

EYES:
Flush with plenty of clear water. Seek medical attention

SKIN:
Remove contaminated clothing immediately. Wash skin with soap and water. If irritation develops seek medical attention.

INGESTION:
If swallowed, do **NOT** induce vomiting. Give victim a glass of water or milk. Call a physician or poison control centre immediately. Never give anything by mouth to an unconscious person.

INHALATION:
Remove to fresh air. Seek medical attention.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: 46^{o}C TAG CC
Autoignition Temperature: Not available

GENERAL HAZARD:
This material can be ignited by heat. sparks. flames. or other sources of ignition (static electricity.) Vapours are heavier than air and will collect in low areas (sewers) or travel considerable distances to a source of ignition. If containers are not cooled in a fire. they may ignite and explode.

EXTINGUISHING MEDIA:
Dry chemical, carbon dioxide, halon, or foam is recommended. Water spray may be used to cool containers or structures. Halon may decompose into toxic materials and carbon dioxide will displace oxygen. Take proper precautions when using these materials.

FIRE FIGHTING PROCEDURES:
Emergency responders in the danger area should wear bunker gear and self-contained breathing apparatus for fires beyond the incipient stage. Wear other protective gear as conditions warrant. Stop leaks, if it can be done with minimal risk. Water spray may be useful in dispersing vapours or cooling equipment and containers. Material will float on water. Avoid spreading fire with water.

FIRE FIGHTING EQUIPMENT:
As in any fire, wear self-contained breathing apparatus pressure-demand, (MS HA/NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL:
Absorb the liquid and scrub the area with detergent and water.

LARGE SPILL:
Avoid vapours and ignition sources. Use appropriate protective equipment. Stop and contain the discharge if it can be done safely. Keep out of drains and waterways. Handle only with trained personnel. Notify authorities as necessary.

GENERAL PROCEDURES:
Dispose of liquid and absorbents in accordance with local, state, and federal law.

7. HANDLING AND STORAGE

GENERAL PROCEDURES:
Use in accordance with good industrial workplace practices. Open containers slowly to relieve pressure.

HANDLING:
Avoid unnecessary contact. Wash thoroughly after handling. Do not wear contaminated clothing or shoes.

STORAGE:
Store in a dry place away from excessive heat. Store containers tightly closed and properly labelled.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

PERSONAL PROTECTION

EYES AND FACE:
Standard safety glasses with splash shields are adequate protection. Where excessive splashing is possible, a face shield should be used.

SKIN:
Excessive contact should be avoided. Neoprene gloves and aprons will provide adequate protection when contact cannot be avoided.

RESPIRATORY:
Good general ventilation should be sufficient to control airborne levels. Maintain airborne concentrations below the established exposure limits of ingredients in Section 2.

PROTECTIVE CLOTHING:
Chemical resistant aprons and boots are suggested when contact with material cannot be avoided. Remove and wash any contaminated clothing immediately.

WORK HYGIENIC PRACTICES:
Wash thoroughly after handling.

OTHER USE PRECAUTIONS:
Eye wash stations and emergency showers should be available.

COMMENTS:
The BLASTER GROUP PTY LTD takes no responsibility for determining what measures are required for personal protection in any specific application. The information provided should be used with discretion.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Odour: Slight
Appearance: Transparent
Colour: Clear
Boiling Point: +175^{o} C
Solubility in Water: Insoluble

10. STABILITY AND REACTIVITY

STABLE: YES

HAZARDOUS POLYMERIZATION: NO

CONDITIONS TO AVOID:
Avoid high temperatures.

STABILITY:
Stable.

POLYMERIZATION:
Will not occur.

11. TOXICOLOGICAL INFORMATION

COMMENTS:
Toxicological information on this product as a mixture has yet to be determined. See section 15 for reportable ingredients.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA:
No data available.

ECOTOXICOLOGICAL INFORMATION:
No data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Used or unused product should be disposed of in accordance with local, state, and federal regulations.

EMPTY CONTAINER:
Empty containers will contain residual product and should be handled in the same manner as the product. Containers should be returned to a reputable container recycler.

14. TRANSPORT INFORMATION

Proper Shipping Name: Aerosols, flammable Class 2.1 PG III
Hazchem: 2Y
UN Number: 1950
Other Shipping Information:

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

313 Reportable ingredients: This product contains the following chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of CFR 372:

68649-42-3 Zinc Alkydithiophosphate Mixture 3.0% by weight

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

CERCLA RQ: This product has no CERCLA Reportable Quantity. However, release into a waterway may require reporting to the National Response Centre.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA Regulatory: This product complies with all TSCA inventory requirements.

16. OTHER INFORMATION

Approval date: 03/01/2005

REVISION SUMMARY

New MSDS

NFPA CODES

Fire: 1 Health: 1 Reactivity: 0

HMIS CODES

Fire: 1 Health: 1 Reactivity: 0 Protection: C

MANUFACTURER DISCLAIMER:

To the best of our knowledge, the information contained herein is accurate. However, neither The Blaster Chemical Companies nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.

MATERIAL SAFETY DATA SHEET

21010
03 00

DATE OF PREPARATION
Aug 12, 2012

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER
21010
PRODUCT NAME
TRI-FLOW™ Superior Lubricant with PTFE, 21021 22025 26020 29200
MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
Consumer Group - Industrial
Cleveland, OH 44115

Telephone Numbers and Websites

Product Information	www.triflowlubricants.com
Regulatory Information	(216) 566-2902 www.paintdocs.com
Medical Emergency	(216) 566-2917
Transportation Emergency*	(800) 424-9300
**for Chemical Emergency ONLY (spill, leak, fire, exposure, or accident)*	

SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

% by Weight	CAS Number	Ingredient	Units	Vapor Pressure
30	**64742-47-8**	**Heavy Aliphatic Solvent**		
		ACGIH TLV	Not Available	1.53 mm
		OSHA PEL	Not Available	
51	**64742-52-5**	**Heavy Naphthenic Petroleum Oil**		
		ACGIH TLV	5 mg/m3 as Mist	
		OSHA PEL	5 mg/m3 as Mist	
3	**64741-97-5**	**Naphthenic Oil**		
		ACGIH TLV	5 mg/m3 as Mist	
		OSHA PEL	Not Available	
4	**64742-65-0**	**Heavy Paraffinic Oil**		
		ACGIH TLV	5 mg/m3 as Mist	
		OSHA PEL	5 mg/m3 as Mist	
3	**34590-94-8**	**2-Methoxymethylethoxypropanol**		
		ACGIH TLV	100 ppm (Skin)	0.4 mm
		ACGIH TLV	150 ppm (Skin) STEL	
		OSHA PEL	100 ppm (Skin)	
		OSHA PEL	150 ppm (Skin) STEL	
3	**628-63-7**	**Amyl Acetate**		
		ACGIH TLV	100 PPM	4 mm
		OSHA PEL	100 PPM	

SECTION 3 — HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.
EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

HMIS Codes

Health	2
Flammability	2
Reactivity	0

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.
CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

SECTION 4 — FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

SECTION 5 — FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL	FLAMMABILITY CLASSIFICATION
194 °F PMCC	0.6	14.0	Combustible, Flash above 99 and below 200 °F

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

SECTION 7 — HANDLING AND STORAGE

STORAGE CATEGORY
DOL Storage Class IIIA
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Contents are COMBUSTIBLE. Keep away from heat and open flame.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section 2.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	7.36 lb/gal	881 g/l
SPECIFIC GRAVITY	0.89	
BOILING POINT	288 - 500 °F	142 - 260 °C
MELTING POINT	Not Available	
VOLATILE VOLUME	38%	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

2.59 lb/gal	310 g/l	Less Water and Federally Exempt Solvents
2.59 lb/gal	310 g/l	Emitted VOC

SECTION 10 — STABILITY AND REACTIVITY

STABILITY — Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

SECTION 11 — TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

CAS No.	Ingredient Name			
64742-47-8	**Heavy Aliphatic Solvent**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
64742-52-5	**Heavy Naphthenic Petroleum Oil**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
64741-97-5	**Naphthenic Oil**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
64742-65-0	**Heavy Paraffinic Oil**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
34590-94-8	**2-Methoxymethylethoxypropanol**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		5135 mg/kg
628-63-7	**Amyl Acetate**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		6500 mg/kg

SECTION 12 — ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

SECTION 13 — DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

SECTION 14 — TRANSPORT INFORMATION

Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (ocean, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport.

No data available.

SECTION 15 — REGULATORY INFORMATION

SARA 313 *(40 CFR 372.65C)* SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
	Zinc Compound	1	0.1
	Barium Compound	3	0.07

CALIFORNIA PROPOSITION 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

SECTION 16 — OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

Mystik® JT-6® Hi-Temp Grease NLGI No. 2

Material Safety Data Sheet

CITGO Petroleum Corporation
P.O. Box 4689
Houston, TX 77210

MSDS No. 665005002
Revision Date 12/17/2012

IMPORTANT: This MSDS is prepared in accordance with 29 CFR 1910.1200. Read this MSDS before transporting, handling, storing or disposing of this product and forward this information to employees, customers and users of this product.

Hazard Rankings

	HMIS	NFPA
Health Hazard	1	1
Fire Hazard	1	1
Reactivity	0	0

*** = Chronic Health Hazard**

Protective Equipment

Minimum Recommended
See Section 8 for Details

Emergency Overview

Physical State Semi-solid to solid (Smooth texture)
Color Red. **Odor** Mild petroleum odor

WARNING:
Injection under the skin can cause severe injury.
Most damage occurs in the first few hours.
Initial symptoms may be minimal.
Hot grease will cause thermal burns upon contact.
Spills may create a slipping hazard.

SECTION 1. PRODUCT IDENTIFICATION

Trade Name	Mystik® JT-6® Hi-Temp Grease NLGI No. 2	**Technical Contact**	(800) 248-4684
Product Number	665005002 (Formula GP-8477)	**Medical Emergency**	(832) 486-4700
CAS Number	Mixture.	**CHEMTREC Emergency (United States Only)**	(800) 424-9300
Product Family	Lubricating grease		
Synonyms	Lubricating grease; CITGO® Material Code: 665005002		

SECTION 2. COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
Highly-refined mineral oils (petroleum)	Various	60 - 100
Lithium carboxylates	Various	7 - 13
Zinc and zinc compounds	15337-18-5	<1

SECTION 3. HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact.

Signs and Symptoms of Acute Exposure

Inhalation No significant adverse health effects are expected to occur upon short-term exposure at ambient temperatures. At elevated temperatures, product vapor may cause respiratory tract irritation. Repeated or prolonged overexposure to product mists can result in respiratory tract inflammation and an increased risk of infection.

Eye Contact	This product can cause transient mild eye irritation with short-term contact with liquid sprays or mists. Symptoms include stinging, watering, redness, and swelling.
Skin Contact	This material can cause mild skin irritation from prolonged or repeated skin contact. Injection under the skin can cause inflammation and swelling. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention. Skin contact with hot material may result in severe burns.
Ingestion	This material can cause a laxative effect. If swallowed in large quantities, this material can obstruct the intestine.
Chronic Health Effects Summary	This product contains a petroleum-based mineral oil. Prolonged or repeated skin contact can cause mild irritation and inflammation characterized by drying, cracking, (dermatitis) or oil acne. Repeated or prolonged inhalation of petroleum-based mineral oil mists at concentrations above applicable workplace exposure levels can cause respiratory irritation or other pulmonary effects.
Conditions Aggravated by Exposure	Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include: Skin
Target Organs	May cause damage to the following organs: skin.
Carcinogenic Potential	This product is not known to contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification					
Irritant		Sensitizer		Combustible		Explosive		Pyrophoric	
Toxic		Highly Toxic		Flammable		Oxidizer		Water-reactive	
Corrosive		Carcinogenic		Compressed Gas		Organic Peroxide		Unstable	

SECTION 4. FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Inhalation	Vaporization is not expected at ambient temperatures. This material is not expected to cause inhalation-related disorders under anticipated conditions of use. In case of overexposure, move the person to fresh air.
Eye Contact	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
Skin Contact	If burned by hot material, cool skin by quenching with large amounts of cool water. For contact with product at ambient temperatures, remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Clean or discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately.
Ingestion	Do not induce vomiting unless directed to by a physician. Rinse out mouth with water. Never give anything by mouth to a person who is not fully conscious. Allow small quantities to pass through the digestive system. If large amounts are swallowed or irritation or discomfort occurs, seek medical attention immediately.

Notes to Physician

SKIN: In the event of injection in underlying tissue, immediate treatment should include extensive incision, debridement and saline irrigation. Inadequate treatment can result in ischemia and gangrene. Early symptoms may be minimal.

INGESTION: Check for possible bowel obstruction with ingestion of large quantities of material.

SECTION 5. FIRE FIGHTING MEASURES

NFPA Flammability Classification NFPA Class-IIIB combustible material.

Flash Point Open cup: >150°C (>302°F) (Estimated).

Lower Flammable Limit No data. **Upper Flammable Limit** No data.

Autoignition Temperature Not available.

Hazardous Combustion Products Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and oxides of sulfur, phosphorus, zinc and/or nitrogen.

Special Properties Fight the fire from a safe distance in a protected location. Open any masses with a water stream to prevent reignition due to smoldering. Cool surface with water fog. Molten material can form flaming droplets if ignited. Water or foam can cause frothing. Use of water on product above 100° C (212° F) can cause product to expand with explosive force. Do not allow liquid runoff to enter sewers or public waters.

Extinguishing Media Use dry chemical, foam, carbon dioxide or water fog. Water or foam may cause frothing. Carbon dioxide and inert gas can displace oxygen. Use caution when applying carbon dioxide or inert gas in confined spaces.

Protection of Fire Fighters Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

SECTION 7. HANDLING AND STORAGE

Handling If this product is stored or applied in high-pressure systems such as grease guns or hydraulic lines, there is the potential for accidental injection into the skin and underlying tissues. Hydrocarbons injected into skin or underlying tissues are not readily removed by body fluids and can cause pain, swelling, chemical irritation, infection and tissue destruction. Early symptoms may be minimal. Workers must be aware of the significant hazards associated with a hydrocarbon injection injury. In the event of an injection injury, workers should seek medical treatment immediately. Avoid water contamination and elevated temperatures to minimize product degradation. Empty containers may contain product residues that can ignite

with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

Storage

Keep container tightly closed. Store in a cool, dry, well-ventilated area. Store only in approved containers. Do not store with strong oxidizing agents. Do not store at elevated temperatures. Avoid storing product in direct sunlight for extended periods of time. Storage area must meet OSHA requirements and applicable fire codes. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

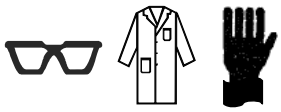
SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

Ventilation controls are not normally required under anticipated conditions of use. Provide exhaust ventilation or other engineering controls if airborne mists or vapors concentrations exceed recommended occupational exposure limits listed below. An eye wash station and safety shower should be located near the work-station.

Personal Protective Equipment

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.



Eye Protection

Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Wear goggles if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available.

Hand Protection

None required for incidental contact. Use gloves constructed of chemical resistant materials such as heavy nitrile rubber if frequent or prolonged contact is expected. Use heat-protective gloves when handling product at elevated temperatures.

Body Protection

Use clean protective clothing if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated clothing before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures.

Respiratory Protection

The need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).

General Comments

Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines.

Occupational Exposure Guidelines

Substance	Applicable Workplace Exposure Levels

Oil, Mineral (Mist)	**ACGIH (United States).** TWA: 5 mg/m^3 STEL: 10 mg/m^3 **OSHA (United States).** TWA: 5 mg/m^3
Stearates	**ACGIH TLV (United States).** TWA: 10 mg/m^3 8 hour(s).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

Physical State	Semi-solid to solid (Smooth texture)	**Color**	Red.	**Odor**	Mild petroleum odor
Specific Gravity	0.93 (Water = 1)	**pH**	Not applicable	**Vapor Density**	>10 (Air = 1)
Boiling Range	Not available.			**Melting/Freezing Point**	Not available.
Vapor Pressure	<0.001 kPa (<0.01 mm Hg) (at 20°C)			**Volatility**	Negligible volatility.
Solubility in Water	Negligible solubility in cold water.			**Viscosity (cSt @ 40°C)**	Not available.

Flash Point Open cup: >150°C (>302°F) (Estimated).

Additional Properties NLGI Grade: 2
Thickener: Lithium
Texture: Smooth

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability Stable. **Hazardous Polymerization** Not expected to occur.

Conditions to Avoid Keep away from extreme heat, sparks, open flame, and strongly oxidizing conditions.

Materials Incompatibility Strong oxidizers.

Hazardous Decomposition Products No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.

SECTION 11. TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data

Highly-refined mineral oils (petroleum)
ORAL (LD50): Acute: >5000 mg/kg [Rat].
DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

Grease:

Injection of pressurized hydrocarbons under the skin, in muscle or into the blood stream can cause irritation, inflammation, swelling, fever and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity Ecotoxicity data are not available for this product.

Environmental Fate An environmental fate analysis is not available for this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum products. Petroleum-based (mineral) lubricating oils normally will float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway may be sufficient to cause a fish kill or create an anaerobic environment.

SECTION 13. DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a "hazardous waste" at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact your regional US EPA office for guidance concerning case specific disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

SECTION 14. TRANSPORT INFORMATION

The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.

US DOT Status Not regulated by the U.S. Department of Transportation as a hazardous material.

Proper Shipping Name Not regulated.

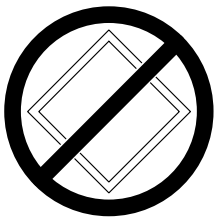
Hazard Class Not regulated.

Packing Group Not applicable.

UN/NA Number Not regulated.

Reportable Quantity A Reportable Quantity (RQ) has not been established for this material.

Placard(s)



Emergency Response Guide No. Not applicable.

MARPOL III Status Not a DOT "Marine Pollutant" per 49 CFR 171.8.

Oil: The product(s) represented by this MSDS is (are) regulated as “oil” under 49 CFR Part 130. Shipments by rail or highway in packaging having a capacity of 3500 gallons or more or in a quantity greater 42,000 gallons are subject to these requirements. In addition, mixtures containing 10% or more of this product may be subject to these requirements.

SECTION 15. REGULATORY INFORMATION

TSCA Inventory	This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.
SARA 302/304 Emergency Planning and Notification	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
SARA 311/312 Hazard Identification	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: No SARA 311/312 hazard categories identified.
SARA 313 Toxic Chemical Notification and Release Reporting	This product contains the following components in concentrations above *de minimis* levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are: Zinc and Zinc Compounds, Concentration: <1%
Clean Water Act (CWA)	This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.
California Proposition 65	This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): Cumene: <0.001%
New Jersey Right-to-Know Label	Petroleum Oil
Additional Remarks	No additional regulatory remarks.

SECTION 16. OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION

Version Number	6.0
Revision Date	12/17/2012

ABBREVIATIONS

AP: Approximately EQ: Equal >: Greater Than <: Less Than

NA: Not Applicable ND: No Data NE: Not Established

ACGIH: American Conference of Governmental Industrial Hygienists

AIHA: American Industrial Hygiene Association

IARC: International Agency for Research on Cancer

NIOSH: National Institute of Occupational Safety and Health

NPCA: National Paint and Coating Manufacturers Association

EPA: US Environmental Protection Agency

HMIS: Hazardous Materials Information System

OSHA: Occupational Safety and Health Administration

NTP: National Toxicology Program

NFPA: National Fire Protection Association

DISCLAIMER OF LIABILITY

THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESSED OR IMPLIED REGARDING ITS CORRECTNESS. SOME INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE SUBSTANCE ITSELF. THIS MSDS WAS PREPARED AND IS TO BE USED ONLY FOR THIS PRODUCT. IF THE PRODUCT IS USED AS A COMPONENT IN ANOTHER PRODUCT, THIS MSDS INFORMATION MAY NOT BE APPLICABLE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION OR PRODUCTS FOR THEIR PARTICULAR PURPOSE.

THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE, AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

* * * * * END OF MSDS * * * * *

MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT IDENTIFICATION

PRODUCT NAME: Air, compressed

CHEMICAL NAME: Air

MANUFACTURER: Air Products and Chemicals, Inc.

7201 Hamilton Boulevard

Allentown, PA 18195-1501

PRODUCT INFORMATION: (800) 752-1597

MSDS NUMBER: 1002 **REVISION:** 8

REVIEW DATE: May 1999 **REVISION DATE:** May 1999

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Air is sold as a pure product >99%.

CAS NUMBER: 132259-10-0

EXPOSURE LIMITS:

OSHA: PEL = None **ACGIH:** TWA/TLV = None **NIOSH:** IDLH = None

Comments: Before using for any breathing application, ensure the cylinder label states "breathing quality."

Atmospheric air that is compressed is composed of Nitrogen, 78%, Oxygen, 21%, and Argon, 0.9%. Compressed air is also synthetically produced by mixing 79% Nitrogen and 21%Oxygen. The actual oxygen content can range between 19.5% and 23.5%.

SECTION 3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

This product is a nontoxic, odorless, colorless, nonflammable compressed gas stored in cylinders at high pressure. High pressure gas may accelerate combustion.

EMERGENCY TELEPHONE NUMBERS

(800) 523-9374 Continental U.S., Canada, and Puerto Rico

(610) 481-7711 other locations

ACUTE POTENTIAL HEALTH EFFECTS:

ROUTES OF EXPOSURE:

EYE CONTACT: No adverse effect.

INHALATION: At atmospheric pressure, air has no adverse health effects.

SKIN CONTACT: No adverse effect.

TARGET ORGANS: None

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POTENTIAL HEALTH EFFECTS OF REPEATED EXPOSURE:

ROUTE OF ENTRY: Inhalation

SYMPTOMS: None

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None

CARCINOGENICITY: This product is not listed as a carcinogen or potential carcinogen by NTP, IARC, or OSHA.

SECTION 4. FIRST AID MEASURES

EYE CONTACT: Not applicable

INHALATION: Not applicable

SKIN CONTACT: Not applicable

NOTES TO PHYSICIAN: None

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT: AUTOIGNITION: FLAMMABLE RANGE:

Not applicable Not applicable Nonflammable

EXTINGUISHING MEDIA: Product is nonflammable, but will support combustion. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING INSTRUCTIONS: Evacuate all personnel from area. If possible, shut off flow of air which is supporting the fire. If possible, remove cylinders from fire area or cool with water. SCBA may be required by rescue workers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Compressed air at high pressures may accelerate combustion. Most cylinders are designed to vent contents when exposed to elevated temperatures. Pressure in a cylinder can build up due to heat and it may rupture if pressure relief devices should fail to function.

HAZARDOUS COMBUSTION PRODUCTS: None

SECTION 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate immediate area. Shut off source of leak if possible. Isolate any leaking cylinder. If leak is from container, pressure relief device or its valve, contact your supplier. If leak is in user s system, close cylinder valve, safely vent pressure before attempting repairs.

SECTION 7. HANDLING AND STORAGE

STORAGE: Store cylinders in a well-ventilated, secure area, protected from the weather. Cylinders should be stored upright with valve outlet seals and valve protection caps in place. Do not allow storage temperature to exceed 125 ° F (52 ° C). Storage should be away from heavily

traveled areas and emergency exits. Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time.

HANDLING: Do not drag, roll, slide or drop cylinder. Use a suitable hand truck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times. Use a pressure reducing regulator to safely discharge gas from cylinder. Use a check valve to prevent reverse flow into cylinder. Use piping and equipment adequately designed to withstand pressures to be encountered. Never apply flame or localized heat directly to any part of the cylinder. Do not allow any part of the cylinder to exceed 125 ° F (52 ° C). Once cylinder has been connected to process, open cylinder valve slowly and carefully. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g.,

wrench, screwdriver, etc.) into valve cap openings. Doing so may damage valve causing a leak to occur. Use an adjustable strap-wrench to remove over-tight or rusted caps.

This product is compatible with all common materials of construction. Pressure requirements should be considered when selecting materials and designing systems.

SPECIAL PRECAUTIONS: Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, Inc. (telephone 703-412-0900) pamphlet CGA P-1, *Safe Handling of Compressed Gases in Containers*. Local regulations may require specific equipment for storage or use.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

VENTILATION: Not required

RESPIRATORY PROTECTION:

Emergency Use: Not required

EYE PROTECTION: Safety glasses are recommended.

SKIN PROTECTION: Leather work gloves recommended when handling cylinders.

OTHER PROTECTIVE EQUIPMENT: Safety shoes recommended when handling cylinders.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE, ODOR AND STATE: Colorless, odorless and tasteless gas at normal temperature and pressure.

MOLECULAR WEIGHT: 28.975

BOILING POINT (At 1 atm): -317.8 ° F (-194.3 ° C)

SPECIFIC GRAVITY (also called vapor density) (Air =1): 1.00

FREEZING POINT / MELTING POINT: -357.2 ° F (-216.2 ° C)

VAPOR PRESSURE (At 70 ° F (21.1 ° C)): Not applicable

GAS DENSITY (At 70 ° F (21.1 ° C) and 1 atm): 0.0749 lb/ft^3 (1.2 kg/m^3)

SOLUBILITY IN WATER (Vol./Vol. at 32 ° F (0 ° C) and 1 atm): 0.0292

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: Cylinders should not be exposed to temperatures in excess of 125 ° F (52 ° C). Avoid the use of oil in systems at full cylinder pressure.

INCOMPATIBILITY (Materials to Avoid): None

REACTIVITY:

A) HAZARDOUS DECOMPOSITION PRODUCTS: None

B) HAZARDOUS POLYMERIZATION: Will not occur

SECTION 11. TOXICOLOGICAL INFORMATION

LC_{50} (Inhalation): None

LD_{50} (Oral): None

LD_{50} (Dermal): None

°

SKIN CORROSIVITY: None

ADDITIONAL NOTES: Air is nontoxic and is necessary to support life. Inhalation of air in high pressure environments can result in symptoms similar to overexposure to oxygen. These include tingling of fingers, impaired coordination, and confusion. Decompression sickness (Bends) is possible following rapid decompression. Decompression equipment may be required if exposed to high pressure environment.

SECTION 12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: Not applicable

MOBILITY: Not applicable

PERSISTENCE AND BIODEGRADABILITY: Not applicable

POTENTIAL TO BIOACCUMULATE: Not applicable

REMARKS: No adverse ecological effects are expected. Air does not contain any Class I or Class II ozone depleting chemicals.

SECTION 13. DISPOSAL CONSIDERATIONS

UNUSED PRODUCT / EMPTY CONTAINER: Return container and unused product to supplier. Do not attempt to dispose of residual or unused quantities.

DISPOSAL INFORMATION: For emergency disposal, secure the cylinder and slowly discharge gas to the atmosphere in a well ventilated area or outdoors.

SECTION 14. TRANSPORT INFORMATION

DOT SHIPPING NAME: Air, compressed

HAZARD CLASS: 2.2

IDENTIFICATION NUMBER: UN1002

SHIPPING LABEL(s): Nonflammable Gas

PLACARD (When required): Nonflammable Gas

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure upright position in a well-ventilated truck. Never transport in passenger compartment of a vehicle. Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.

CAUTION: Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner s written consent is a violation of federal law (49 CFR 173.301).

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (NAERG #): 122

SECTION 15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

EPA - ENVIRONMENTAL PROTECTION AGENCY

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980

(40 CFR Parts 117 and 302)

Reportable Quantity (RQ): None

°

SARA TITLE III: Superfund Amendment and Reauthorization Act

SECTIONS 302/304: Emergency Planning and Notification (40 CFR Part 355)

Extremely Hazardous Substances: Air is not listed.

Threshold Planning Quantity (TPQ): None

Reportable Quantity (RQ): None

SECTIONS 311/312: Hazardous Chemical Reporting (40 CFR Part 370)

IMMEDIATE HEALTH: No PRESSURE: Yes

DELAYED HEALTH: No REACTIVITY: No

FIRE: No

SECTION 313: Toxic Chemical Release Reporting (40 CFR Part 372)

This product does not require reporting under Section 313.

CLEAN AIR ACT:

SECTION 112 (r): Risk Management Programs for Chemical Accidental Release

(40 CFR PART 68)

This product is not listed as a regulated substance.

Threshold Planning Quantity (TPQ): None

TSCA: Toxic Substance Control Act

This product is listed on the TSCA inventory.

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR Part 1910.119: Process Safety Management of Highly Hazardous Chemicals

This product is not listed in Appendix A as a highly hazardous chemical.

Threshold Planning Quantity (TPQ): None

STATE REGULATIONS:

CALIFORNIA:

Proposition 65: This product is not a listed substance which the State of California requires warning under this statute.

SECTION 16. OTHER INFORMATION

NFPA RATINGS: HMIS RATINGS:

HEALTH: 0 HEALTH: 0

FLAMMABILITY: 0 FLAMMABILITY: 0

REACTIVITY: 0 REACTIVITY: 0

PROTECTION: 0

AGA

AGA GAS, INC. (216) 642-6600
5555 ROCKSIDE WOODS BLVD
P.O. BOX 94737
CLEVELAND, OH 44101-4737

MATERIAL SAFETY DATA SHEET

No. 002

PRODUCT NAME Compressed Air	CAS # N/A
TRADE NAME AND SYNONYMS Compressed Air; Air; Compressed Air, Breathing Quality	DOT I.D. No.: UN 1002
CHEMICAL NAME AND SYNONYMS Air, compressed (D.O.T.) See Page 4	DOT Hazard Class: Division 2.2
ISSUE DATES AND REVISIONS Revised January 1995	Formula See page 4
	Chemical Family: N/A

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT

No TWA established (ACGIH 1994-1995). No PEL (8 Hr. TWA) listed by OSHA 1993.

SYMPTOMS OF EXPOSURE

Air is nontoxic and necessary to support life. Inhalation of air in a high pressure environment such as underwater diving, caissons or hyperbaric chambers can result in symptoms similar to overexposure to pure oxygen. These include tingling of fingers and toes, abnormal sensations, impaired coordination and confusion. Decompression sickness, pains or "bends" are possible following rapid decompression.

TOXICOLOGICAL PROPERTIES

High pressure effects (greater than two atmospheres of oxygen) are on the central nervou~ system. Improper decompression results in the accumulation of nitrogen in the blood.

Air is not listed in thP IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Persons in ill health when such illness would be aggravated by exposure to high pressure air should not be allowed to work with or handle this product.

RECOMMENDED FIRST AID TREATMENT

Facilities or practices at which air is breathed in a high pressure environment should be prepared to deal with the illnesses associated with decompression (bends or caisson disease). Decompression equipment may be required.

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.
Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

N/A

PHYSICAL DATA

BOILING POINT -317.8ºF (-194.3ºC)	LIQUID DENSITY AT BOILING POINT 54.56 lb/ftt³ (874 kg/mt³)
VAPOR PRESSURE @70ºF (21.1ºC): Above the critical temp. of -221.1ºF (-140.6ºF)	GAS DENSITY AT 70ºF, 1 atm .0749 lb/ft³ (1.200 kg/mt³)
SOLUBILITY IN WATER Very slightly	FREEZING POINT N/A (Gas Mixture)
EVAPORATION RATE N/A Gas	SPECIFIC GRAVITY (AIR=1) @70ºF (21.1ºC) = 1.0
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LE N/A UEL N/A
EXTINGUISHING MEDIA Nonflammable gas		ELECTRICAL CLASSIFICATION Nonhazardous

SPECIAL FIRE FIGHTING PROCEDURES

If cylinders are involved in a fire, safely relocate or keep cool with water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Compressed air at high pressures will accelerate the burning of materials to a greater rate than they burn at atmospheric pressure.

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	

INCOMPATIBILITY (Materials to avoid) None

HAZARDOUS DECOMPOSITION PRODUCTS None

HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID None
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

N/A

WASTE DISPOSAL METHOD

N/A

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) N/A		
VENTILATION N/A	**LOCAL EXHAUST** N/A	**SPECIAL** N/A
	MECHANICAL (Gen.) N/A	**OTHER** N/A
PROTECTIVE GLOVES Any material		
EYE PROTECTION Safety goggles or glasses		
OTHER PROTECTIVE EQUIPMENT Safety shoes		

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Air, Compressed — DOT Hazard Class: Division 2.2
DOT Shipping Label: Nonflammable Gas — I.D. No.: UN 1002

SPECIAL HANDLING RECOMMENDATIONS

Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3,000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional handling recommendations, consult the Compressed Gas Association's Pamphlets P-1, G-7, and G-7.1.

SPECIAL STORAGE RECOMMENDATIONS

Protect rylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125ºF (52ºC). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional storage recommendations, consult the Compressed Gas Association's Pamphlets P-1, G-7, and O-7.1.

SPECIAL PACKAGING RECOMMENDATIONS

Dry air is noncorrosive and may be used with all materials of construction. Moisture causes metal oxides which are formed with air to be hydrated so that they increase in volume and lose their protective role (rust formation). Concentrations of SO_2, Cl_2, salt, etc. in the moisture enhances the rusting of metals in air.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

(Continued on Page 4)

*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to assure that he is in full compliance.

CHEMICAL FORMULA: (Continued)
Atmospheric air which is compressed is composed of the following concentrations of gases:

Gas	Molar %
Nitrogen	78.09
Oxygen	20.94
Argon	0.93
Carbon Dioxide	0.033*
Neon	18.18×10^{-4}
Helium	5.239×10^{-4}
Krypton	1.139×10^{-4}
Hydrogen	0.5×10^{-4}
Xenon	$0.086 \times ^{-4}$
Radon	6×10^{-18}
Water vapor	Varying concentrations

*Concentrations may have slight variations.

Compressed air is also produced by reconstitution using only oxygen and nitrogen. This product contains 79 molar percent nitrogen and 21 molar percent oxygen plus trace amounts of other atmospheric gases which are present in the oxygen and nitrogen.

SPECIAL PRECAUTIONS
OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Reporting under SARA, Title III, Section 313 not required.

NFPA 704 No. for gaseous air = 0 0 0 None

Effective Date: 1/21/00

PRODUCT IDENTITY: ADVANCE ANTIFREEZE & COOLANT

1. SUPPLIER

OLD WORLD INDUSTRIES, INC.
4065 COMMERCIAL AVENUE
NORTHBROOK, ILLINOIS 60062
PHONE: 847-559-2000
EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC)

2. INGREDIENTS

MATERIAL	*CAS#*	*% BY WT*	*PEL (OSHA)*	*TLV (ACGIH)*
Ethylene Glycol	107-21-1	90 - 95	50 ppm	50 ppm
Diethylene Glycol	111-46-6	0 - 5	None	None
Di Potassium Phosphate	7758-11-4	1 - 2	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Slight odor. ***May be fatal if swallowed.*** ***Vapors can cause eye irritation.***

LOWEST KNOWN LD50 (ORAL)	107-21-1	5840 mg/kg (Rats)
LOWEST KNOWN LD50 (SKIN)	107-21-1	9530 mg/kg (Rabbits)

HAZARD RATING SYSTEM

NFPA:	**HEALTH: 1**	**FLAMMABILITY: 1**	**REACTIVITY: 0**
HMIS:	**HEALTH: 2**	**FLAMMABILITY: 1**	**REACTIVITY: 0**

KEY: 0 - Minimal, 1 - Slight, 2 - Moderate, 3 - Serious, 4 - Severe

POTENTIAL HEALTH EFFECTS

Routes of Exposure: Inhalation, Ingestion, Skin Contact/Absorption, Eye Contact

EYE: May cause slight transient (temporary) eye irritation. Corneal injury is unlikely. Vapors or mists may cause eye irritation.

SKIN: Prolonged or repeated exposure not likely to cause significant skin irritation. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated skin exposure may result in absorption of harmful amounts. Massive contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potential lethal amounts.

INGESTION: Single dose oral toxicity is considered to be moderate. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing amounts larger than that may cause serious injury, even death.

INHALATION: At room temperature, exposures to vapors are minimal due to physical properties; higher temperatures may generate vapor levels sufficient to cause adverse effects.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Repeated excessive exposures may cause severe kidney and also liver and gastrointestinal effects. Signs and symptoms of

excessive exposure may be central nervous system effects. Signs and symptoms of excessive exposure may be nausea and/or vomiting. Signs and symptoms of excessive exposure may be anesthetic or narcotic effects. Observations in animals include formation of bladder stones after repeated oral doses of ethylene glycol. Reports of kidney failure and death in burn patients suggest the ethylene glycol may have been a factor. The use of topical applications containing this material may not be appropriate in severely burned patients or individuals with impaired renal function.

CANCER INFORMATION: Based on data from long-term animal studies, ethylene glycol is not believed to pose a carcinogenic risk to man.

TERATOLOGY (BIRTH DEFECTS): Exposure to ethylene glycol has caused birth defects in laboratory animals only at doses toxic to the mother.

REPRODUCTIVE EFFECTS: Ethylene glycol has not interfered with reproduction in animal studies except at very high doses.

4. FIRST AID MEASURES

Ensure physician has access to this MSDS.

Eyes: Immediately flush eyes with large amounts of water for 15 minutes, lifting lower and upper lids. Get medical attention as soon as possible. Contact lenses should never be worn when working with this chemical.

Skin: Flush area of skin contact immediately with large amounts of water for at least 15 minutes while removing contaminated clothing. If irritation persists after flushing, get medical attention promptly. Wash clothing before re-use.

Inhalation: If inhaled, immediately remove victim to fresh air and call ***emergency medical care.*** If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion: Obtain medical attention immediately. If patient is fully conscious, give two glasses of water. Do not induce vomiting. If medical advice is delayed, and if the person has swallowed a moderate volume of material (a few ounces), then give three to four ounces of hard liquor, such as whisky. For children, give proportionally less liquor, according to weight.

Notes to Physician: It is estimated that the lethal oral dose to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenate to various metabolites including glyceraldehydes, glycolic acid and oxalic acid which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression, and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and metabolites, correction of metabolic acidosis and prevention of kidney injury. It is essential to have immediate and follow up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis. As a competitive substrate for alcohol dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formulation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100-150 mg/dl, and should be achieved by a rapid loading dose and maintained by intravenous infusion. For severe and/or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood ethylene glycol concentration greater than 25 md/dl, or compromise of renal functions.

A more effective intravenous antidote for physician use is 4-methylpyrazole, a potent inhibitor of alcohol dehydrogenases, which effectively blocks the formation of toxic metabolites of ethylene glycol. It has been used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis coma, seizures, and renal failure have occurred. A generally recommended protocol is a loading dose of 15 mg/kg followed by 10 mg/kg every 12 hours for 4 doses and then 15 mg/kg every 12 hours until ethylene glycol

concentrations are below 20 mg/100 ml. Slow intravenous infusion is required. Since 4-methyplyrozole is dialyzable, increased dosage may be necessary during hemodialysis. Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end expiratory pressure may be required. There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing and dysphasia.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASH POINT: 119°C (247°F)
METHOD USED: Setaflash
AUTO IGNITION TEMPERATURE: Auto ignition temperature for ethylene glycol is 398° C (748°F).

FLAMMABILITY LIMITS - % of vapor concentration at which product can ignite in presence of spark.
Lower Flammability Limit: 3.2%
Upper Flammability Limit: 22%

HAZARDOUS COMBUSTION PRODUCTS: Hazardous combustion products may include and are not limited to carbon monoxide, carbon dioxide and trace amounts of aldehydes and organic acids. When available oxygen is limited, as in a fire or when heated to very high temperatures by a hot wire or plate, carbon monoxide and other hazardous compounds such as aldehydes might be generated.

EXTINGUISHING MEDIA: Water fog or fine spray. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Carbon dioxide. Dry chemical. Do not use direct water stream. May spread fire.

FIRE FIGHTING INSTRUCTIONS: No fire and explosion hazards expected under normal storage and handling conditions (i.e. ambient temperatures). However, ethylene glycol or solutions of ethylene glycol and water can form flammable vapors with air if heated sufficiently. Keep people away. Isolate fire area and deny unnecessary entry.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire-fighting helmet, coat, pants, boots and gloves).

6. ACCIDENTAL RELEASE MEASURES

PROTECT PEOPLE: Material is moderately toxic when ingested. Take adequate precautions to keep people, especially children away from spill site. PVC-coated rubber gloves and monogoggles or faceshield can be used during cleanup of spill site.

PROTECT THE ENVIRONMENT: Do not dump used product or diluted material into sewers, on the ground, or into any body of water.

CLEANUP: Small spills: Soak up with absorbent material. Large spills: Dike and pump into suitable containers for disposal. Ensure compliance with all applicable statues that require notification of appropriate government officials.

7. HANDLING AND STORAGE

Product on surfaces can cause slippery conditions. Practice reasonable care and

cleanliness. Avoid breathing spray mists if generated. Keep out of reach of children. Product may become a solid at temperatures below -18°C (0°F). Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory Protection:	Respiratory protection is required if airborne concentration exceeds TLV. At any detectable concentration, any self-contained breathing apparatus with a full facepiece and operated in a pressure-demand or other positive pressure mode or any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode. Escape: Any air-purifying full facepiece respirator (gas mask) with a chin-style or front - or back-mounted organic vapor canister or any appropriate escape-type self-contained breathing apparatus.
Skin Protection:	Protective gloves recommended when prolonged skin contact cannot be avoided. Polyethylene; Neoprene; Nitrile; Polyvinyl alcohol; Natural Rubber, Butyl Rubber. Safety shower should be available.
Eye Protection:	Safety goggles and face shield. Emergency eyewash should be available. Contact lenses should not be worn when working with this chemical.
Engineering Controls:	Use general or local exhaust ventilation to meet TLV requirements.

EXPOSURE LIMITS

Component	Exposure Limits	Skin Form
Ethylene glycol	100 mg/m3 CEILING ACGIH	Aerosol
Ethylene glycol	125 mg/m3 CEILING OSHA-vacated	
	50 ppm CEILING OSHA – vacated	
	100 mg/m3 CEILING UCC	Aerosol and Vapor
Diethylene glycol	50 ppm TWA8 AIHA WEEL	Aerosol and Vapor
Diethylene glycol	10 mg/m3 TWA8 AIHA WEEL	Aerosol

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

9. PHYSICAL PROPERTIES

BOILING RANGE:	171 - 175°C (339 - 348°F)
FREEZE POINT:	-18°C (0°F)
SPECIFIC GRAVITY (Water =1):	1.12
POUNDS/GALLONS	9.3
VAPOR PRESSURE (mm of Hg) @ 20C:	<0.1
VAPOR DENSITY (air=1):	2.1
WATER SOLUBILITY:	Complete
EVAPORATION RATE (BuAc = 1):	Nil
% VOLATILE BY VOLUME:	97.0
APPEARANCE:	Green
ODOR:	Mild

10. STABILITY and REACTIVITY

STABILITY:	Stable
CONDITIONS TO AVOID:	Isolate from oxidizers, heat & open flame.
MATERIALS TO AVOID:	Isolate from strong oxidizers such as permanganates, chromates & peroxides.
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon monoxide, carbon dioxide from burning.
HAZARDOUS POLYMERIZATION:	Material is not known to polymerize.

II. TOXICOLOGICAL INFORMATION

SKIN: The dermal LD50 has not been determined.

INGESTION: The lethal dose in humans is estimated to be 100 ml (3 ounces). The oral LD50 for rats is in the 6000-13,000-mg/kg range.

MUTAGENICITY (THE EFFECTS ON GENETIC MATERIAL): In vitro mutagenicity studies were negative. Animal mutagenicity studies were negative.

SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMANS

Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. The no-effect doses for developmental toxicity for ethylene glycol given by gavage over the period of organogenesis has been shown to be 150 mg/kg/day for the mouse and 500 mg/kg/day for the rat. Also, in a preliminary study to asses the effects of exposure of pregnant rats and made to aerosis at concentrations of 150, 1000 and 25000 mg/m3 for 6 hours a day throughout the period of organogenesis, teratogenic effects were produced at the highest concentration, but only in mice. The conditions of these latter experiments did not allow a conclusion as to whether the developmental toxicity was mediated by inhalation of aerosol percutaneous absorption of ethylene glycol from contaminated skin, or swallowing ethylene glycol as a result of grooming the wetted coat. In a further study, comparing effects from high aerosol concentration by whole-body or nose-only exposure, it was shown that nose-only exposure resulted in maternal toxicity (1000 and 25000 mg/m3) and developmental toxicity with minimal evidence of teratogenicity (2500 mg/m3). The no-effects concentration (based on maternal toxicity) was 500 mg/m3. In a further study in mice, no teratogenic effects could be produced when ethylene glycol was applied to skin of pregnant mice over the period of organogenesis. The above observations suggest that ethylene glycol is to be regarded as an animal teratogen. There is currently no available information to suggest that ethylene glycol has caused birth defects in humans. Cutaneous application of ethylene glycol is ineffective in producing developmental toxicity. Exposure to high aerosol concentrations is only minimally effective in producing developmental toxicity. The major route for producing developmental toxicity is perorally. Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence or a different pattern of tumors compared with untreated controls. The absence of carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects.

A chronic dietary feeding study of diethylene glycol with rats showed mild kidney injury at 1%, while concentrations of 2% and 4% caused more marked kidney injury. In addition, at 2% and 4% of diethylene glycol in the diet, some rats developed benign papillary tumors in the urinary bladder. These have been attributed to the presence of urinary bladder calcium oxalate stones. No evidence for carcinogenicity was found with a chronic skin-painting study with diethylene glycol in mice. The absence of a direct chemical carcinogenic effect addords with the results in vitro genotoxicity studies that show that it does not produce mutagenic or clastogenic effects. A feeding study employing up to 5.0% diethylene glycol in the diet failed to produce any teratogenic effects. In a mouse continuous breeding study with large doses of diethylene glycol in drinking water, there was evidence for reproductive toxicity at 3.5% (equivalent to 6.1 g/kg/day) as reduced number of litter, live pups per litter and live pup weight. No such effects were seen at 1.75% (approximately 3.05 g/kg/day). The relevance of these very high dosages to human health is uncertain. Pregnant rats receiving undiluted diethylene glycol by gavage over the period of organogenesis had toxic effects at 4.0 and 8.0 ml/kg/day as mortality, decreased body weight, decreased food consumption increased water consumption and increased liver and kidney weights. Fetotoxicity was seen only at these maternally toxic dosages. Decreased fetal body weight

occurred at 8.0 ml/kg/day, and increased skeletal variants at 4.0 and 8.0 ml/kg/day. No embryotixic or teratogenic effects were seen. Neither maternal toxicity nor fetotoxicity occurred at 1.0 ml/kg/day. In a study with mice also receiving undiluted diethylene glycol over the period of organogenesis, maternal toxicity occurred at 2.5 and 10.0 ml/kg/day, but not at 0.5 ml/kg/day. Definitive developmental toxicity was not seen in this species.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING: Bioconcentration potential is low (BCF less than 100 or Log Kow less than 3). Log octanol/water partition coefficient (log Kow) is -1.36. Henry's Law Constant (H) is 6.0E-08 atm-m3/mol. Bioconcentration factor (BCF) is 10 in golden orfe.

DEGRADATION & TRANSFORMATION: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD greater than 40%). 5-Day biochemical oxygen demand (BOD5) is 0.78 p/p. 10-Day biochemical oxygen demand (BOD10) is 1.06 p/p. 20-Day biochemical oxygen demand (BOD20) is 1.15 p/p. Theoretical oxygen demand (ThOD) is calculated to be 1.29 p/p. Biodegradation may occur under both aerobic and anaerobic conditions (in either the presence or absence of oxygen). Inhibitory concentration (IC50) in OECD "Activated Sludge, Respiration Inhibition Test" (Guideline # 209) is < 1000 mg/L. Degradation is expected in the atmospheric environment within days to weeks.

ECOTOXICOLOGY: Material is practically non-toxic to aquatic organisms on an acute basis (LC50 greater than 100 mg/L in most sensitive species). Acute LC50 for fathead minnow (Pimephales promelas) is 51000 mg/L. Acute LC50 for bluegill (Lepomis macrochirus) is 27549 mg/L. Acute LC50 for rainbow trout (Oncorhynchus mykiss) is about 18000-46000 mg/L. Acute LC50 for guppy (Poecilia reticulata) is 49300 mg/L. Acute LC50 for water flea (Daphnia magna) is 46300-51100 mg/L. Acute LC50 for the cladoceran Ceriodaphnia

dubia is 10000-25800 mg/L. Acute LC50 for crayfish is 91430 mg/L. Acute LC50 for brine shrimp (Artemia salina) is 20000 mg/L. Acute LC50 for golden orfe (Leuciscus idus) is greater than 10000 mg/L. Acute LC50 for goldfish (Carassius auratus) is greater than 5000 mg/L. Growth inhibition EC50 for green alga Selenastrum capricornutum is 9500-13000 mg/L.

13. DISPOSAL CONSIDERATIONS

DO NOT discharge to sewer. Wear appropriate personal protection. Take up with sand, vermiculite, or similar inert material. Dispose in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

U.S. D.O.T.

NON-BULK
Proper shipping name: NOT REGULATED
BULK
Proper shipping name: OTHER REGULATED SUBSTANCES, LIQUID NOS
Technical name: CONTAINS ETHYLENE GLYCOL
ID Number: NA3082
Hazard Class: 9
Packing Group: PG III
Reportable Quantity: 5,313 lb.

15. REGULATORY INFORMATION

THIS PRODUCT CONTAINS COMPONENT(S) CITED ON THE FOLLOWING REGULATIONS.

	CHEMICAL NAME	*CAS NUMBER*
	Ethylene Glycol	107-21-1
UNITED STATES - TSCA - Inventory:	Listed	
WATER STANDARDS:	No data available	
ATMOSPHERIC STANDARDS:	Clean Air Act (1990) - List of Hazardous Air Contaminants: listed	
	Reportable Quantity (RQ): 5,000 pounds (532 gallons)	
CERCLA:	Section 311/312 - Categories: Acute hazard; chronic hazard	
SARA Title III:	Section 312 - Inventory Reporting: Ethylene glycol is subject to Tier I and/or Tier II annual inventory reporting.	
	Section 313 - Emission Reporting: Ethylene glycol is subject to Form R reporting requirements.	
	Section 302 - Extremely Hazardous Substances: Ethylene glycol is not listed.	

STATE RIGHT-TO-KNOW:

California - Exposure Limits - Ceilings:	vapor-50 ppm ceiling; 125 mg/m3 ceiling
Director's List of Hazardous Substances:	listed
Florida - Hazardous Substances List:	listed
Massachusetts - Right-to-Know List:	listed
Minnesota - Haz. Subs. List:	listed (particulate and vapor)
New Jersey - Right-to-Know List (Total):	Present greater than 1.0%
Pennsylvania Right-to-Know List:	environmental hazard

CANADIAN REGULATIONS:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required.

WHMIS INFORMATION: D2A - material has potential toxic effects.

Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains the following chemical(s) known to the State of California to cause cancer:

Component	CAS #	Amount
1,4 – Dioxane	123-91-1	<=0.0086%
Acetaldehyde	75-07-0	<=0.1000PPM

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains the following chemical(s) known to the State of California to cause birth defects and/or other reproductive harm.

Component	CAS #	Amount
Ethylene glycol monomethyl ether	109-86-4	<=0.0009%

California SCAQMD Rule 443.1 (South Coast Air Quality Management District Rule 443.1, Labeling of Materials Containing Organic Solvents)

VOC: Vapor pressure 0.06 mmHg at 20°C

1113.38 g/l

16. OTHER INFORMATION

Contact: Technical department Phone: (847) 559-2000

Old World Industries, Inc. makes no warranty, representation or guarantee as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of this product. Since actual use by others is beyond our control, no warranty, expressed or implied, is made by Old World Industries, Inc. as to the effects of such use, the results to be obtained or the safety and toxicity of this product, nor does Old World Industries, Inc. assume liability arising out of the use by others of this product referred to herein. The data in this MSDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

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1-800-323-5440

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Contact Us
owitech@oldworldind.com

****** MATERIAL SAFETY DATA SHEET ******

28201 - HEET Gas Line Antifreeze

SEC 1 - PRODUCT AND MANUFACTURER INFO
SEC 2 - COMPOSITION INFORMATION
SEC 3 - HAZARDS IDENTIFICATION
SEC 4 - FIRST AID MEASURES
SEC 5 - FIRE FIGHTING MEASURES
SEC 6 - ACCIDENTAL RELEASE MEASURES
SEC 7 - HANDLING AND STORAGE
SEC 8 - EXPOSURE, PERS. PROTECTION
SEC 9 - PHYS, CHEM PROPERTIES
SEC 10 - STABILITY, REACTIVITY
SEC 11 - TOXICOLOGY INFORMATION
SEC 12 - ECOLOGICAL INFORMATION
SEC 13 - DISPOSAL CONSIDERATIONS
SEC 14 - TRANSPORT INFORMATION
SEC 15 - REGULATORY INFORMATION
SEC 16 - ADDITIONAL INFORMATION

**** SECTION 1 - CHEMICAL PRODUCT AND MANUFACTURER IDENTIFICATION ****

Product Name: 28201 - HEET Gas Line Antifreeze

Part Number:

28201

Product CAS: (None)

Product Code: 28201

Synonyms: 28201 - HEET Gas Line Antifreeze

MANUFACTURER IDENTIFICATION
Name: Gold Eagle Company
Address: 4400 S. Kildare Blvd.
City: Chicago **State:** IL **Zip:** 60632-4372

For information call: 773-376-4400

Emergency Number: N/A

Emergency Agency: INFOTRAC

Agency Number: 1-800-535-5053

MSDS Effective Date: 1/1/1980

MSDS Supersedes Date: 8/5/2005
Miscellaneous:
Product CAS: Mixture

Brief Description: Gas line dryer and antifreeze for automobiles.
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**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

Chemical Name	CAS	MIN	MAX
Methanol	67-56-1	99	99
Proprietary Additive	(none)	1	1

Miscellaneous:

CHEMICAL NAME	LIMIT VALUES
Methanol	PEL 200 ppm PEL 260 mg/m3
Proprietary Additive (CAS#:Mixture)	N/A

Return to top

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW:

NFPA: Health: 1 **Fire:** 3 **Reactivity:** 0 **Specific Hazard:** None

HMIS: Health: 1 **Flammability:** 3 **Reactivity:** 0 **PPE:** B

Miscellaneous:
This product does not contain any components above de minimus concentrations that
are considered carcinogenic by OSHA, IARC or NTP.

POTENTIAL HEALTH EFFECTS

Target Organs/Primary Route(s) of Entry:

Eye:
Mild irritant.

Skin:
Prolonged or repeated skin contact may cause dermatitis, scaling and possible
systemic effects.

Ingestion:
POISON-Oral human lowest lethal dose = 6.4 g/kg

Inhalation:
Poisonous, narcotic chemical affecting central nervous system resulting in:
dizziness, nausea, visual impairment, narcosis and muscular impairment.

Miscellaneous:

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**** SECTION 4 - FIRST AID MEASURES ****

Eye:
If the product contacts the eyes, immediately wash the eyes with large quantities of
room temperature water for at least 15 minutes, occasionally lifting the lower and
upper lids. Get medical attention immediately. A follow up visit to an
ophthalmologist should be made. Contact lenses should not be worn when working with
this chemical.

Skin:
If the product contacts the skin, promptly wash the contaminated skin with soap and
water for at least 15 minutes. If this product penetrates the clothing, promptly
remove the clothing and wash the skin with soap and water. Systemic effects may be
delayed 18 to 72 hours, therefore keep individual under observation.

Ingestion:
If this product is ingested and the person is conscious, induce vomiting, then give
2 teaspoons of baking soda in a glass of water. DO NOT INDUCE AN UNCONSCIOUS PERSON
TO VOMIT. Get medical attention immediately.

Inhalation:
Move the exposed person to fresh air at once and call emergency medical care. If
breathing has stopped, give artificial respiration. If breathing is difficult, give
humidified oxygen.

Notes to Physician:
No data available.

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**** SECTION 5 - FIRE FIGHTING MEASURES ****

Flash Point: 52 F. (11 C.) TOC

AutoIgnition Temperature: N/A

Flammable Limits

Lower Limit: Explosive Limit (LEL): 6.0

Upper Limit: Explosive Limit (UEL): 36.5

Extinguishing Media:
Use halon replacement or carbon dioxide extinguishers or alcohol foam for small fires. Water spray or fog can cool fire but may not be effective in extinguishing fire. Large fires should be extinguished with alcohol foam. Use water spray to cool containers exposed to fire. Containers may explode in heat or fire.

Unusual Fire and Explosion Hazards:
Dangerous fire and explosion hazard when exposed to heat or flame. Methanol is extremely flammable and forms explosive mixtures with air. Methanol vapors may travel considerable distance to a source of ignition and flash back.

Special Fire Fighting Procedures:
Wear NIOSH approved SCBA respirator in the positive pressure mode and chemical protective clothing.

General Information:
Flammable Limits: 6.0 to 36.5

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**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

Small Spill: Remove sources of heat or ignition, provide adequate ventilation, contain leak using absorbent, inert, non-combustible material.

Large Spill: Contain spill, transfer to secure containers. In the event of an uncontrolled material release, the user should determine if release is reportable under applicable laws and regulations.

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**** SECTION 7 - HANDLING AND STORAGE ****

Handling:
See other sections of MSDS.

Storage:
See other sections of MSDS.

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****** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ******

GENERAL HYGIENE CONSIDERATIONS:
Use normal hygiene practices.

OTHER PRECAUTIONS:
Methanol waste and material contaminated with methanol would be regulated as a
hazardous waste material under the hazardous waste number U154.

ENGINEERING CONTROLS:
Local Exhaust: Provide local ventilation to maintain exposure levels below
recommended exposure limits.

Mechanical (General): In confined spaces, mechanical ventilation may be required.

Special Ventilation: N/A

Other Ventilation: N/A

PERSONAL PROTECTIVE EQUIPMENT
Eyes/face:
Use splash proof chemical, safety goggles or appropriate full-face respirator.
Contact lenses should not be worn when working with this chemical.

Skin:
Use natural rubber or neoprene gloves as required.

Respirators:
Do not use air purifying respirator. Use NIOSH approved respirator approved
supplied or self contained respirator. Respirators must be selected based on the
airborne levels found in the workplace and must not exceed the working limits of the
respirator.

Other Protective Clothing/Equipment:
If there is a possibility of exposure of an individual's body to methanol, wear body
covering work clothes to avoid prolonged or repeated exposure.

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****** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ******

Appearance/Odor:
Yellow liquid, solvent odor
pH: N/A

Vapor Pressure: (MM HG): 97.0

Vapor Density(Air=1): 1.1

Evaporation Rate: N/A

Viscosity: N/A

Boiling Point: 148 F. (65 C.) N/A

Freezing/Melting Point: N/A

Decomposition Temperature: N/A

Solubility in Water: Soluble

Specific Gravity: 0.795

Molecular Formula: N/A

Molecular Weight: N/A

VOC Coating (minus water): 0 Lbs/Gallon

Coating Density : 0 Lbs/Gallon

Solvent Density : 0 Lbs/Gallon

Percent Solvent (volume): 0

Percent Solids (volume): 0

Percent Water (volume): 0

Percent Volatile by Weight: 0

Miscellaneous:
% Volatile/Volume: 100.0

Specific Gravity (H2O = 1): N/A

Percent Solvent (Volume): N/A

Percent Solids (Volume): N/A

Percent Water (Volume): N/A

Product is flammable, keep away from sources of ignition, combustibles, oxidizing
material and acid. Store in an area equipped with automatic sprinklers or fire
extinguishing system. Empty containers contain product residues, assume empty
container to have the same hazards as full containers.

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****** SECTION 10 - STABILITY AND REACTIVITY ******

Chemical Stability:
Stable: Yes

Conditions to Avoid:
Store in a well ventilated place away from sources of ignition, combustibles,
oxidizing materials and acid.

Incompatibilities with Other Materials:
Strong oxidizing agents, aluminum, zinc, or metals that displace hydrogen, rubber
and rubber based coatings, chromic anhydride, lead perchlorate and perchloric acids.

Hazardous Decomposition Products:
Excessive heating and/or incomplete combustion will produce carbon monoxide.

Hazardous Polymerization:
Hazardous Polymerization May Occur: No

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**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

No data available.

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**** SECTION 12 - ECOLOGICAL INFORMATION ****

No data available.

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**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of product in accordance with local, state, and federal regulations. Before
attempting clean up, refer to other sections of MSDS for hazard warning information.

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**** SECTION 14 - TRANSPORT INFORMATION ****

Transportation Information:
Shipping Information (CFR 49 and IMDG):

Proper Shipping Name: Gasoline Additive, N.O.I.
DOT Hazard Class: Consumer commodity, ORM-D
DOT UN Number: None required.
IMDG Shipping Name: Dangerous Goods in Limited Quantities of Class 3.2 (Methanol),
PGII

Label Information:
No data available.

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**** SECTION 15 - REGULATORY INFORMATION ****

SARA Title III:

Section 302: None

Section 304: None
Section 311: Hazard categories-Fire Hazard-Yes; Acute=Yes and Chronic=Yes
Section 313: Methanol, CAS# 67-56-1, 99.0%

CERCLA:

Section 311(b)(4): Requires discharges of crude oil and petroleum products in any kind or form to waters must immediately be reported to the National Response Center at (800) 424-8802.

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****** SECTION 16 - ADDITIONAL INFORMATION ******

Disclaimer: Information presented herein is believed to be factual, as it has been derived from the works and opinions of persons believed to be qualified experts. However, nothing contained in this information is to be taken as warranty or representation for which the Gold Eagle Co. bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Prepared by: Mike Profetto

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****** MATERIAL SAFETY DATA SHEET ******

LT14 - HEET Windshield De-Icer

SEC 1 - PRODUCT AND MANUFACTURER INFO
SEC 2 - COMPOSITION INFORMATION
SEC 3 - HAZARDS IDENTIFICATION
SEC 4 - FIRST AID MEASURES
SEC 5 - FIRE FIGHTING MEASURES
SEC 6 - ACCIDENTAL RELEASE MEASURES
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SEC 8 - EXPOSURE, PERS. PROTECTION
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SEC 15 - REGULATORY INFORMATION
SEC 16 - ADDITIONAL INFORMATION

**** SECTION 1 - CHEMICAL PRODUCT AND MANUFACTURER IDENTIFICATION ****

Product Name: LT14 - HEET Windshield De-Icer
Part Number:
LT14
Product CAS: (None)
Product Code: LT14
Synonyms: LT14 - HEET Windshield De-Icer

MANUFACTURER IDENTIFICATION

Name: Gold Eagle Company
Address: 4400 S. Kildare Blvd.
City: Chicago **State:** IL **Zip:** 60632-4372

For information call: 773-376-4400

Emergency Number: N/A
Emergency Agency: INFOTRAC
Agency Number: 1-800-535-5053
MSDS Effective Date: 7/17/2003
MSDS Supersedes Date: 2/3/2011
Miscellaneous:
Product CAS: Mixture

Brief Description: Aerosol windshield de-icer.
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**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

Chemical Name	CAS	MIN	MAX
Carbon Dioxide	124-38-9	0	5
Methanol	67-56-1	90	97
PROPYLENE GLYCOL	57-55-6	0	3

Miscellaneous:

CHEMICAL NAME	LIMIT VALUES
Carbon Dioxide	PEL 5,000 ppm
	PEL 9,000 mg/m3
Methanol	PEL 200 ppm

PEL 2260 mg/m3

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****** SECTION 3 - HAZARDS IDENTIFICATION ******

EMERGENCY OVERVIEW:

NFPA: Health: 1 **Fire:** 3 **Reactivity:** 0 **Specific Hazard:** None

HMIS: Health: 1 **Flammability:** 3 **Reactivity:** 0 **PPE:** B

Miscellaneous:
This product does not contain any components above de minimus concentrations that
are considered carcinogenic by OSHA, IARC or NTP.
POTENTIAL HEALTH EFFECTS
Target Organs/Primary Route(s) of Entry:

Eye:
Mild irritant.

Skin:
Prolonged or repeated skin contact may cause dermatitis, scaling and possible systemic effects.

Ingestion:
POISON-Oral human lowest lethal dose = 6.4 g/kg.

Inhalation:
Poisonous, narcotic chemical affecting central nervous system resulting in: dizziness, nausea, visual impairment, narcosis and muscular impairment.

Miscellaneous:

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****** SECTION 4 - FIRST AID MEASURES ******

Eye:
If the product contacts the eyes, immediately wash the eyes with large quantities of
room temperature water for at least 15 minutes, occasionally lifting the lower and
upper lids. Get medical attention immediately. A follow up visit to an ophthalmologist should be made. Contact lenses should not be worn when working with
this chemical.

Skin:
If the product contacts the skin, promptly wash the contaminated skin with soap and
water for at least 15 minutes. If this product penetrates the clothing, promptly
remove the clothing and wash the skin with soap and water. Systemic effects may be
delayed 18 to 72 hours, therefore keep individual under observation.

Ingestion:
If this product is ingested and the person is conscious, induce vomiting, then give
2 teaspoons of baking soda in a glass of water. DO NOT INDUCE AN UNCONSCIOUS PERSON
TO VOMIT. Get medical attention immediately.

Inhalation:
Move the exposed person to fresh air at once and call emergency medical care. If
breathing has stopped, give artificial respiration. If breathing is difficult, give
humidified oxygen.

Notes to Physician:
No data available.

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**** SECTION 5 - FIRE FIGHTING MEASURES ****

Flash Point: 54 F. (11 C.) TOC

AutoIgnition Temperature: N/A

Flammable Limits
Lower Limit: Explosive Limit (LEL): 6.0

Upper Limit: Explosive Limit (UEL): 36.5

Extinguishing Media:
Use halon replacement or carbon dioxide extinguishers or alcohol foam for small
fires. Water spray or fog can cool fire but may not be effective in

extinguishing
fire. Large fires should be extinguished with alcohol foam. Use water spray to
cool containers exposed to fire. Containers may explode in heat or fire.

Unusual Fire and Explosion Hazards:
Dangerous fire and explosion hazard when exposed to heat or flame. Isopropanol is
extremely flammable and forms explosive mixtures with air. Isopropanol vapors may
travel considerable distance to a source of ignition and flash back.

Special Fire Fighting Procedures:
Wear NIOSH approved SCBA respirator in the positive pressure mode and chemical
protective clothing.

General Information:
Flammable Limits: 6.0 to 36.5

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****** SECTION 6 - ACCIDENTAL RELEASE MEASURES ******

Small Spill: Remove sources of heat or ignition, provide adequate ventilation,
contain leak using absorbent, inert, non-combustible material.

Large Spill: Contain spill, transfer to secure containers. In the event of an
uncontrolled material release, the user should determine if release is reportable
under applicable laws and regulations.
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****** SECTION 7 - HANDLING AND STORAGE ******

Handling:
See other sections of MSDS.

Storage:
See other sections of MSDS.

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**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

GENERAL HYGIENE CONSIDERATIONS:
Use normal hygiene practices.

OTHER PRECAUTIONS:
Methanol waste and waste material contaminated with methanol would be regulated as a
hazardous waste material under the hazardous waste number U154.

ENGINEERING CONTROLS:
Local Exhaust: Provide local ventilation to maintain exposure levels below recommended exposure limits.

Mechanical (General): In confined spaces, mechanical ventilation may be required.

Special Ventilation: N/A

Other Ventilation: N/A

PERSONAL PROTECTIVE EQUIPMENT
Eyes/face:
Use splash proof chemical, safety goggles or appropriate full-face respirator.
Contact lenses should not be worn when working with this chemical.

Skin:
Use natural rubber or neoprene gloves as required.

Respirators:
Do not use air purifying respirator. Use NIOSH approved respirator approved supplied or self contained respirator. Respirators must be selected based on the
airborne levels found in the workplace and must not exceed the working limits of the
respirator.

Other Protective Clothing/Equipment:
If there is a possibility of exposure of an individual's body to the product, wear
body covering work clothes to avoid prolonged or repeated exposure.

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**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Appearance/Odor:
Water white liquid, solvent odor

pH: N/A

Vapor Pressure: (MM HG): 97.0

Vapor Density(Air=1): 1.1

Evaporation Rate: N/A

Viscosity: N/A

Boiling Point: 148 F. (65 C.)N/A

Freezing/Melting Point: N/A

Decomposition Temperature: N/A

Solubility in Water: Soluble

Specific Gravity: 0.795

Molecular Formula: N/A

Molecular Weight: N/A

VOC Coating (minus water): 0 Lbs/Gallon

Coating Density : 0 Lbs/Gallon

Solvent Density : 0 Lbs/Gallon

Percent Solvent (volume): 0

Percent Solids (volume): 0

Percent Water (volume): 0

Percent Volatile by Weight: 0

Miscellaneous:
% Volatile/Volume: 95.0

Specific Gravity (H2O = 1): N/A

Percent Solvent (Volume): N/A

Percent Solids (Volume): N/A

Percent Water (Volume): N/A

Product is flammable, keep away from sources of ignition, combustibles, oxidizing
material and acid. Store in an area equipped with automatic sprinklers or

fire
extinguishing system. Empty containers contain product residues, assume empty
container to have the same hazards as full containers.

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**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable: Yes

Conditions to Avoid:
Store in a well ventilated place away from sources of ignition, combutibles, oxidizing materials and acid.

Incompatibilities with Other Materials:
Strong oxidizing agents, aluminum, zinc, or metals that displace hydrogen, rubber
and rubber based coatings, chromic anhydride, lead perchlorate and perchloric acids.

Hazardous Decomposition Products:
Excessive heating and/or incomplete combustion will produce carbon monoxide.

Hazardous Polymerization:
Hazardous Polymerization May Occur: No

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**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

No data available.

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**** SECTION 12 - ECOLOGICAL INFORMATION ****

No data available.

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**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of product in accordance with local, state, and federal regulations. Before
attempting clean up, refer to other sections of MSDS for hazard warning information.

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**** SECTION 14 - TRANSPORT INFORMATION ****

Transportation Information:
Shipping Information (CFR 49 and IMDG):

Proper Shipping Name: Alcohol, antifreeze
DOT Hazard Class: Consumer commodity, ORM-D
DOT UN Number: None required.
IMDG Shipping Name: UN1950, Aerosols, 2.1, Limited Quantity (&lt1000ml/can)

Label Information:
No data available.

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**** SECTION 15 - REGULATORY INFORMATION ****

SARA Title III:

Section 302: None
Section 304: None
Section 311: Hazard categories-Fire Hazard-Yes; Acute=Yes and Chronic=Yes
Section 313: Methanol, CAS# 67-56-1, 95.0%

CERCLA:

Section 311(b)(4): Requires discharges of crude oil and petroleum products in any
kind or form to waters must immediately be reported to the National Response Center
at (800) 424-8802.

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**** SECTION 16 - ADDITIONAL INFORMATION ****

Disclaimer: Information presented herein is believed to be factual, as it has been derived from the works and opinions of persons believed to be qualified experts. However, nothing contained in this information is to be taken as warranty or representation for which the Gold Eagle Co. bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Prepared by: Mike Profetto

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MATERIAL SAFETY DATA SHEET

EMERENCY MEDICAL
TELEPHONE NUMBER
1-800-228-5635 ext. 111

HAZARD RATING

0=Fire **0=Reactivity** **4=Extreme**
0=Health **=Special** **3=High**
2=Moderate
1=Slight
0=Insignificant

N/A=Not Applicable **N.D.=**No Data **N.E.=**Not Established

SECTION I–IDENTITY AND MANUFACTURER'S INFORMATION

PRO-LINK
510 Chapman Street
Canton, MA 02021
Telephone Number 781-828-9550
Product Name: Pro-Link Ice Melter
Prepared by Regulatory Affairs Department – July 1994

SECTION II-HAZARDOUS INGREDIENTS/IDENTITY INFORMATION:

N/A=Not Applicable N/E=Not Est ablished

Hazardous Components:	Cas #'s	osha pel	acgih	other limits	%optional
Calciumchloride	10043-52-4	N/E	N/E	N/E	N/E
Sodium chloride	07647-14-5	N/E	N/E	N/E	N/E

No toxicological data is available on this specific mixture; rather the health effects stated below are based on information that is available on the calcium chloride component.

SECTION III-PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: 175"C for CacI2
1413"C for NaCI
Vapor Pressure 0.37 kPa (40"C) for CaCI2
1.0 mm Hg(865"C) for NaCI
Vapor Density (AIR=1) N/A
Solubility in Water: 97.7 g/100 ML @ 0'C
1g/2.8 ml @ 25'C
Appearance and Odor: solid, white to faint pink granular – odorless
Specific Gravity: (H2O=1) 1.85 @ 25'C for CaCI2, 2.16 for NaCI
pH: Neutral to slightly alkaline for CaCI 2; 6.7-7.3 for NaCI

Evaporation Rate: (ether=1.0)N/A
% Volatilize by volume:(At 20'C)N/A
Molecular Weight:110.99 for CaCI2
58.45 for NaCI
Freezing Point: 176' for CaCI2
(Melting Point) 804'C for NaCI

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

Flash Point : N/A
Flammability Limits: N/A LEL-N/A UEL-N/A
Extinguishing Media: Use extinguishing media appropriate for surrounding fire.
Special Fire Fighting Procedures: For fire fighting wear NIOSH-approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: A potential explosion hazard exists when calcium chloride is mixed with furan 2-peroxy-carboxylic acid.

SECTION V-PHYSICAL HAZARDS

Stability: Stable X **Conditions to Avoid:** N/A
Unstable __ **Conditions to Avoid:** N/A

Incompatibility (Materials to Avoid): For CaCI2" reacts violently with bromine trifluoride (BrF3), or a mixture of boron trioxide and calcium oxide (B2O+CaO). Sulfuric acid: yields hydrogen chloride gas, which is corrosive, irritating, and reactive. Water-reactive materials, such as sodium: causes an exothermic reaction. Methyl vinyl ether: starts runaway polymerization reaction. Zinc as in galvanized iron: yields hydrogen gas with solutions, which may explode under these conditions. Sodium chloride undergoes violent reactions with BrF3 and lithium.
Hazardous Decomposition: When heated to decomposition it emits toxic fumes of CI 2 and Na2O. **Products or Byproducts:** None
Hazardous Polymerization: __ May occur **Conditions to Avoid:** N/A
X Will not occur **Conditions to Avoid:** N/A
Other Precautions: CaCi2 will undergo violent polymerization with methyl vinyl ether. The anhydrous, monohydrate, dehydrate and tertrahydrate forms of calcium chloride when dissolved in water, produce considerable amount of heat

SECTION VI-HEALTH HAZARDS

Routes of Entry:_____ Inhalation ____ Skin X Ingestion X
Health Hazards (Acute and Chronic): **Eyes:** Direct contact will cause irritation. **Skin:** Prolonged or repeated skin contact may cause irritation. **Ingestion:** May cause gastroinestinal irritation. **Inhalation:** Prolonged exposure in poorly ventilated areas may irritate nasal mucous membranes.
Carcinogenicity: NTP? N/A IARC Monographs? N/A OSHA Regulated? N/A
Signs and Symptoms of Exposure: See Health Hazarads.
Medical conditions Generally Aggravated by Exposure: None Known
Emergency and First Aid Procedures: Eyes: Flush promptly with large amounts of water, for 15 min, occasionally lifting eyelids. Skin: Remove contaminated clothing. Wash with mild soap and water. Ingestion: If conscious, immediately give 2 to 4 large glasses of water. Include vomiting. Inhalation: Promptly remove to fresh air and rest. Restore and/or support breathing

SECTION VII-PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is released or spilled:
Shovel up dry chemical and place in metal drum with cover, reuse if possible. Always wear personal protective equipment.
Waste Disposal Method: Dispose of container and unwanted product as permitted by all local, state, and federal regulation.
Precautions to be taken in Handling and Storage: Avoid contact with eyes, skin or clothing. Avoid breathing dust. Use good personal hygiene and housekeeping. Store in cool, dry area. Prolonged storage may cause product to cake and become wet from atmospheric moisture.
Aquatic Toxicity:
CaCI2 is harmful to aquatic life at concentrations greater thand 500ppm. CaCI2 does not bioaccumulate. TLm 96:>1000mg/I. For NaCI Tim 96:>1000ppm.
Other Precautions:
Keep out of reach of Children.

SECTION VIII-CONTROL MEASURES

Respiratory Protection: For dusty conditions, wear NIOSH-approved dust respirator.
Ventilation: **Local Exhaust: O.K.** **Special: N/A**
Mechanical (Gen): Satisfactory **Other: N/A**
Protective Gloves: Rubber or plastic
Eye Protection: For dusty conditions, wear chemical safety goggles. Under these conditions do not wear contact lenses.
Other Protective Clothing or Equipment: Long-sleeve shirt and trousers.
Work/hygienic Practices: Wash hands after use

NOTICE: NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OR MERCHANTABILIY, FITNESS FOR A PARTICULAR PURPOSE, OR OF ANY OTHER NATURE, ARE MADE WITH RESPECT TO INFORMATION CONCERNING THE PRODUCT REFERRED TO IN THIS MATERIAL SAFETY DATA SHEET. The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. The information and recommendations contained n this Material Safety Data Sheet is supplied pursuant to 29 C.F.R. 1910. 1200 of the Occupational Safety and Health Standards Hazard Communications Rule. The information and recommendations set forth herein are presented in good faith and believed to be correct as of the date hereof. Preferred Distributors, Inc. however, makes no representations as to the completeness or accuracy thereof, and information is supplied upon the express condition that the persons receiving the same will be required to make their own determination as to its suitability for their purposes prior to use. In no event will PRO-LINK be responsible for any damages of any nature whatsoever resulting from the use of, reliance upon, or the misuse of this information. The information as supplied herein is simply to be informative and intended solely to alert the user of the substance which is the subject matter of this Material Safety Data Sheet. The ultimate compliance with federal, state or local regulations concerning the use or disposal of this compound, or compliance with respect to product's liability, rests solely upon the purchaser thereof.

MATERIAL SAFETY DATA SHEET

HMIS CODES:	H	F	R	P
	0	2	0	A

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administrator
(Non-Mandatory Form)
Form Approved OMB No. 1218-0072

IDENTITY (AS USED ON LABEL AND LIST):	NOTE: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.
BLUE MONSTER™ THREAD SEAL COMPOUND	

Section I

Manufacturer's Name: THE MILL-ROSE COMPANY	Emergency Telephone Number: (800) 321-3598
Address (Number, Street, City, State, and ZIP Code): 7310 CORPORATE BLVD.	Telephone Number for Information: (800) 321-3598
	Date Prepared: January 1, 2008
MENTOR, OHIO 44060	Signature of Preparer (optional):

Section II - Hazardous Ingredients/Identity Information

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY: COMMON NAME(S)	OSHA PEL	ACGIH TLV	OTHER LIMITS Recommended	% (optional)
ISOPROPYL ALCOHOL [CAS#67-63-0]	400	400	N/A	5 - 10
ETHYLENE GLYCOL [CAS#111-76-2]	50	25	N/A	13 - 18

Section III - Physical/Chemical Characteristics

Boiling Point:	180˚F	Specific Gravity (H20 =1):	1.41
Vapor Pressure (mm Hg):	.88	Melting Point:	N/A
Vapor Density (AIR = 1):	> 1	Evaporation Rate (Butyl Acetate = 1):	.6
Solubility in Water:	SLIGHT	VOC Content:	310 g/l

Appearance and Odor: BLUE PASTE - MILD ODOR

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used):	Flammable Limits:	LEL:	UEL:
82˚F (28˚C) ASTM METHOD D93-80	921˚F (494˚C) IGNITION TEMPERATURE	0.9%	6.0%

Extinguishing Media: CARBON DIOXIDE OR DRY CHEMICAL OR WATER.

Special Fire Fighting Procedures: NONE

Unusual Fire and Explosion Hazards: CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRES OR EXPLOSIONS. CARBON MONOXIDE MAY BE RELEASED.

Section V - Reactivity Data		BLUE MONSTER™ THREAD SEAL COMPOUND	
Stability:	Unstable:		Conditions to Avoid: N/A
	Stable:	X	

Incompatibility (Materials to Avoid):
LIQUID OXYGEN SYSTEMS, LIQUID SODIUM, GASEOUS FLUORINE, STRONG OXIDIZERS.

Hazardous Decomposition or Byproducts:

Hazardous Polymerization:	May Occur:		Conditions to Avoid: N/A
	Will Not Occur:	X	

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation? YES	Skin? YES	Ingestion? YES

Health Hazards (Acute and Chronic): N/A

Carcinogenicity:	NTP? NO	IARC Monographs? NO	OSHA Regulated? NO

Signs and Symptoms of Exposure:
INHALATION: POSSIBLE DIZZINESS IF USED IN CONFINED AREA. SKIN: MAY CAUSE MILD IRRITATION TO SENSITIVE SKIN.

Medical Conditions Generally Aggravated by Exposure: NONE KNOWN

Emergency and First Aid Procedures:
EYE CONTACT: FLUSH EYES WITH WATER. SKIN CONTACT: WASH SKIN WITH SOAP AND WATER. WASH CLOTHING BEFORE REUSE. INHALATION: MOVE TO WELL VENTILATED AREA. INGESTION: CALL PHYSICIAN.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled:
NORMAL GOOD HOUSEKEEPING PROCEDURES.

Waste Disposal Method:
DISPOSE OF ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS.

Precautions to Be Taken in Handling and Storing:
STORE AWAY FROM HEAT OR OPEN FLAME. CLOSE CONTAINER AFTER USE.

Other Precautions:
WEAR PROTECTIVE GLOVES TO PREVENT POSSIBLE SKIN ABSORPTION AND DERMATITIS. KEEP OUT OF REACH OF CHILDREN.

Section VIII - Control Measures

Respiratory Protection (Specify Type):
AVOID BREATHING OF FUMES. IF USED IN A CONFINED AREA, A RESPIRATOR MAY BE NECESSARY.

Ventilation:	Local Exhaust: NORMAL VENTILATION IS ADEQUATE.	Special: N/A
	Mechanical (General): N/A.	Other: N/A

Protective Gloves: MAY BE NECESSARY FOR SENSITIVE SKIN.	Eye Protection: KEEP OUT OF EYES. WEAR PROTECTIVE GOGGLES WHERE NECESSARY.

Other Protective Clothing or Equipment: N/A

Work/Hygienic Practices: WASH UP WITH SOAP AND WATER AFTER USE.

Material Safety Data Sheet

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PRODUCT NAME: 3M™ Bondo® Professional Gold Body Repair Kit PN 01313, 01313C
MANUFACTURER: 3M
DIVISION: Automotive Aftermarket

ADDRESS: 3M Center, St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 12/27/11
Supercedes Date: 03/04/11

Document Group: 29-1566-8

ID Number(s):

60-4550-5493-6, 60-4550-6626-0

This product is a kit or a multipart product which consists of multiple, independently packaged components. An MSDS for each of these components is included. Please do not separate the component MSDSs from this cover page. The document numbers of the MSDSs for components of this product are:

29-1496-8, 24-7436-9

Revision Changes:
Kit: Component document group number(s) was modified.
Page Heading: Product name was modified.
Kit: Product name was modified.
Kit: ID Number(s) was modified.
Section 1: Manufacturer name was added.
Section 16: Disclaimer (first paragraph) was added.
Section 16: Disclaimer (second paragraph) was added.
Section 16: Web address was added.
Section 1: Address was added.
Copyright was added.
Company logo was added.

Telephone header was added.
Company Telephone was added.
Section 1: Emergency phone information was added.
Company Logo was deleted.
Copyright was deleted.
Kit: Manufacturer's name was deleted.
Kit: Emergency phone information was deleted.
Kit: Disclaimer (first paragraph) was deleted.
Kit: Disclaimer (second paragraph) was deleted.
Kit: Address line 1 was deleted.
Kit: Address line 2 was deleted.

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M™ Red Cream Hardener
MANUFACTURER: 3M
DIVISION: Automotive Aftermarket

ADDRESS: 3M Center, St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 10/01/12
Supercedes Date: 08/08/12

Document Group: 24-7436-9

Product Use:
Intended Use: Automotive

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
BENZOYL PEROXIDE	94-36-0	30 - 60
WATER	7732-18-5	10 - 30
BENZOIC ACID, C9-11-BRANCHED ALKYL ESTERS	131298-44-7	10 - 20
ZINC STEARATE	557-05-1	3 - 7
OXIRANE, POLYMER WITH METHYLOXIRANE, MONOBUTYL ETHER	9038-95-3	1 - 5
CALCIUM SULFATE	7778-18-9	1 - 5
IRON OXIDE (FE2O3)	1309-37-1	1 - 5

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Viscous
Odor, Color, Grade: Red paste with slight ester odor
General Physical Form: Solid
Immediate health, physical, and environmental hazards: Closed containers exposed to heat from fire may build pressure and explode. Dust clouds of this material in combination with an ignition source may be explosive. May cause severe eye irritation. May cause allergic skin reaction.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Skin Contact:
Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, and itching.

Inhalation:
Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Prolonged or repeated exposure may cause:
Pneumoconiosis: Sign/symptoms may include persistent cough, breathlessness, chest pain, increased amounts of sputum, and changes in lung function tests.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May be absorbed following ingestion and cause target organ effects.

Target Organ Effects:
Prolonged or repeated exposure may cause:
Liver Effects: Signs/symptoms may include loss of appetite, weight loss, fatigue, weakness, abdominal tenderness and jaundice.

Kidney/Bladder Effects: Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.
Skin Contact: Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. Get medical attention. Wash contaminated clothing and clean shoes before reuse.
Inhalation: Remove person to fresh air. If signs/symptoms develop, get medical attention.
If Swallowed: Do not induce vomiting unless instructed to do so by medical personnel. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	*No Data Available*
Flash Point	111 ºC [*Test Method:* Estimated]
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*

5.2 EXTINGUISHING MEDIA

Ordinary combustible material. Use fire extinguishers with class A extinguishing agents (e.g., water, foam). Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Closed containers exposed to heat from fire may build pressure and explode. Dust clouds of this material in combination with an ignition source may be explosive.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Remember, adding an absorbent material does not remove a toxic, corrosivity or flammability hazard.

6.2. Environmental precautions

For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Place in a metal container approved for use in transportation by appropriate authorities. The container must be lined with polyethylene plastic or contain a plastic drum liner made of polyethylene. Dispose of collected material as soon as possible.

Clean-up methods

Refer to other sections of this MSDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment. Contain spill. Cover spill area with a fire-extinguishing foam. An aqueous film forming foam (AFFF) is recommended. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible using non-sparking tools. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and MSDS. Seal the container.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Keep away from heat, sparks, open flame, pilot lights and other sources of ignition. No smoking while handling this material. Avoid static discharge. Avoid eye contact with vapors, mists, or spray. Keep out of the reach of children. Avoid breathing of dust created by cutting, sanding, grinding or machining. Do not breathe vapors. Avoid eye contact with dust or airborne particles. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

7.2 STORAGE

Store away from heat. Store out of direct sunlight. Keep container tightly closed. Do not heat under confinement to avoid risk of explosion

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Use in an enclosed process area is recommended. Provide appropriate local exhaust for cutting, grinding, sanding or machining. Do not use in a confined area or areas with little or no air movement. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control dust, fume, or airborne particles. If ventilation is not adequate, use respiratory protection equipment.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

Avoid eye contact with vapors, mists, or spray.
The following eye protection(s) are recommended: Safety Glasses with side shields
Indirect Vented Goggles
.

8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.
Gloves made from the following material(s) are recommended: Polymer laminate
. Use an additional glove (e.g. supported PVC or Nitrile) over the PE/EVAL glove, and change the over-glove frequently.

8.2.3 Respiratory Protection

Avoid breathing of dust created by cutting, sanding, grinding or machining. Do not breathe vapors.
An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Do not ingest.

8.3 EXPOSURE GUIDELINES

Ingredient	Authority	Type	Limit	Additional Information
BENZOYL PEROXIDE	ACGIH	TWA	5 mg/m3	
BENZOYL PEROXIDE	OSHA	TWA	5 mg/m3	
CALCIUM SULFATE	ACGIH	TWA, inhalable fraction	10 mg/m3	
CALCIUM SULFATE	OSHA	TWA, respirable fraction	5 mg/m3	
CALCIUM SULFATE	OSHA	TWA, as total dust	15 mg/m3	
IRON OXIDE (FE2O3)	ACGIH	TWA, respirable fraction	5 mg/m3	
IRON OXIDE (FE2O3)	OSHA	TWA, as fume	10 mg/m3	
ROUGE	OSHA	TWA, respirable fraction	5 mg/m3	

ROUGE	OSHA	TWA, as total dust	15 mg/m3
STEARATES	ACGIH	TWA	10 mg/m3
ZINC STEARATE	OSHA	TWA, respirable fraction	5 mg/m3
ZINC STEARATE	OSHA	TWA, as total dust	15 mg/m3

SOURCE OF EXPOSURE LIMIT DATA:
ACGIH: American Conference of Governmental Industrial Hygienists
CMRG: Chemical Manufacturer Recommended Guideline
OSHA: Occupational Safety and Health Administration
AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Viscous
Odor, Color, Grade:	Red paste with slight ester odor
General Physical Form:	Solid
Autoignition temperature	*No Data Available*
Flash Point	111 ºC [*Test Method:* Estimated]
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*
Boiling Point	*No Data Available*
Density	1.2 g/cm3
Vapor Density	*Not Applicable*
Vapor Pressure	*Not Applicable*
Specific Gravity	1.2 [@ 25 ºC] [*Ref Std:* WATER=1]
pH	*No Data Available*
Melting point	*No Data Available*
Solubility in Water	Negligible
Evaporation rate	*No Data Available*
Hazardous Air Pollutants	0 % weight [*Test Method:* Calculated]
Volatile Organic Compounds	0 lb/gal [*Test Method:* calculated SCAQMD rule 443.1]
Volatile Organic Compounds	0 g/l [*Test Method:* calculated SCAQMD rule 443.1]
Volatile Organic Compounds	0 % weight [*Test Method:* calculated per CARB title 2]
Kow - Oct/Water partition coef	*No Data Available*
Percent volatile	20 % [*Details:* Water is the volatile component]
VOC Less H2O & Exempt Solvents	0 g/l [*Test Method:* calculated SCAQMD rule 443.1]
Viscosity	*No Data Available*

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable. Stable unless exposed to heat, flames and drying conditions.

Materials and Conditions to Avoid:
10.1 Conditions to avoid
Heat

10.2 Materials to avoid
Accelerators

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	Not Specified
Carbon dioxide	Not Specified
Toxic Vapor, Gas, Particulate	Not Specified

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not determined.

CHEMICAL FATE INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Incinerate in a permitted hazardous waste incinerator. As a disposal alternative, dispose of waste product in a permitted hazardous waste facility.
This product has been classified on the basis that it is stable as sold. Material may become unstable if allowed to dry out. Classify appropriately before disposal.

EPA Hazardous Waste Number (RCRA): D001 (Ignitable)

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

ID Number(s):
LB-K100-0514-1, LB-K100-0530-2, LB-K100-0530-3, LB-K100-0530-4, LB-K100-0530-5, LB-K100-0926-4, 41-0003-6561-3, 41-0003-6569-6, 41-0003-6570-4, 41-0003-6571-2, 41-0003-6572-0, 41-0003-6639-7, 41-0003-6641-3, 41-0003-6685-0, 41-0003-6686-8, 41-0003-6687-6, 41-0003-6768-4, 41-0003-6794-0, 41-3701-1487-2, 41-3701-1494-8

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:
Fire Hazard - No Pressure Hazard - No Reactivity Hazard - Yes Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
ZINC STEARATE (ZINC COMPOUNDS)	557-05-1	3 - 7
BENZOYL PEROXIDE	94-36-0	30 - 60

STATE REGULATIONS
Contact 3M for more information.

CHEMICAL INVENTORIES
The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

INTERNATIONAL REGULATIONS
Contact 3M for more information.

WHMIS: Hazardous

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification
Health: 2 **Flammability:** 1 **Reactivity:** 1 **Special Hazards:** Oxidizer

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification
Health: 2 **Flammability:** 1 **Reactivity:** 1 **Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS®) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint and Coatings Association (NPCA).

Revision Changes:
Section 13: Waste disposal method information was modified.

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within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M™ Bondo Professional Gold 233
MANUFACTURER: 3M
DIVISION: Automotive Aftermarket

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 03/04/11
Supercedes Date: 03/04/11

Document Group: 29-1496-8

Product Use:
Intended Use: Automotive

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
LIMESTONE	1317-65-3	10 - 30
STYRENE MONOMER	100-42-5	10 - 30
TALC	14807-96-6	10 - 30
1,3-ISOBENZOFURANDIONE, POLYMER WITH 2,5-FURANDIONE AND 2,2'-OXYBIS[ETHANOL]	26123-45-5	10 - 30
SODIUM SILICATE	1344-09-8	3 - 7
TRIMETHYLOLPROPANE TRIACRYLATE	15625-89-5	1 - 5
SODIUM METABORATE	7775-19-1	0.5 - 1.5
QUATERNARY AMMONIUM COMPOUNDS, BIS(HYDROGENATED TALLOW ALKYL)DIMETHYL, SALTS WITH MONTMORILLONITE	68911-87-5	0.5 - 1.5
TITANIUM DIOXIDE	13463-67-7	0.1 - 1
QUARTZ SILICA	14808-60-7	0.01 - 1

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Paste

Odor, Color, Grade: Green/gold paste with pungent solvent odor
General Physical Form: Liquid
Immediate health, physical, and environmental hazards: Flammable liquid and vapor. Vapors may travel long distances along the ground or floor to an ignition source and flash back. Closed containers exposed to heat from fire may build pressure and explode. May cause severe eye irritation. May cause severe skin irritation. May cause allergic skin reaction. May cause target organ effects. Contains a chemical or chemicals which can cause cancer.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Skin Contact:
Severe Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.

Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

May be absorbed through skin and cause target organ effects.

Inhalation:
Intentional concentration and inhalation may be harmful or fatal.

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Prolonged or repeated exposure may cause:

Pneumoconiosis: Sign/symptoms may include persistent cough, breathlessness, chest pain, increased amounts of sputum, and changes in lung function tests.

May be absorbed following inhalation and cause target organ effects.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May be absorbed following ingestion and cause target organ effects.

Target Organ Effects:
Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

Auditory Effects: Signs/symptoms may include hearing impairment, balance dysfunction and ringing in the ears.

Liver Effects: Signs/symptoms may include loss of appetite, weight loss, fatigue, weakness, abdominal tenderness and jaundice.

Prolonged or repeated exposure may cause:

Immunological Effects: Signs/symptoms may include alterations in the number of circulating immune cells, allergic skin and /or respiratory reaction, and changes in immune function.

Kidney/Bladder Effects: Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination.

Neurological Effects: Signs/symptoms may include personality changes, lack of coordination, sensory loss, tingling or numbness of the extremities, weakness, tremors, and/or changes in blood pressure and heart rate.

Ocular Effects: Signs/symptoms may include blurred or significantly impaired vision.

Carcinogenicity:
Contains a chemical or chemicals which can cause cancer.

Ingredient	C.A.S. No.	Class Description	Regulation
QUARTZ SILICA	14808-60-7	Grp. 1: Carcinogenic to humans	International Agency for Research on Cancer
SILICA, CRYSTALLINE (AIRBORNE PARTICLES OF RESPIRABLE SIZE)	SEQ677	Grp. 1: Carcinogenic to humans	International Agency for Research on Cancer
SILICA, CRYSTALLINE (AIRBORNE PARTICLES OF RESPIRABLE SIZE)	SEQ677	Known human carcinogen	National Toxicology Program Carcinogens
STYRENE MONOMER	100-42-5	Grp. 2B: Possible human carc.	International Agency for Research on Cancer

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

Skin Contact: Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. Get medical attention. Wash contaminated clothing and clean shoes before reuse.

Inhalation: Remove person to fresh air. If signs/symptoms develop, get medical attention.

If Swallowed: Do not induce vomiting unless instructed to do so by medical personnel. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature *No Data Available*

Flash Point	88 ºF [*Test Method:* Closed Cup]
Flammable Limits(LEL)	*No Data Available*
Flammable Limits(UEL)	*No Data Available*

5.2 EXTINGUISHING MEDIA
Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. Water may be used to blanket the fire. Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Flammable liquid and vapor. Closed containers exposed to heat from fire may build pressure and explode. Vapors may travel long distances along the ground or floor to an ignition source and flash back.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. Remove all ignition sources such as flames, smoking materials, and electrical spark sources. Use only non-sparking tools. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Remember, adding an absorbent material does not remove a toxic, corrosivity or flammability hazard.

6.2. Environmental precautions
For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Place in a metal container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.

Clean-up methods
Refer to other sections of this MSDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment. Call 3M-HELPS line (1-800-364-3577) for more information on handling and managing the spill. Contain spill. Cover spill area with a fire-extinguishing foam. An aqueous film forming foam (AFFF) is recommended. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible using non-sparking tools. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and MSDS. Seal the container.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Keep away from heat, sparks, open flame, pilot lights and other sources of ignition. Ground containers securely when transferring contents. Wear low static

or properly grounded shoes. Avoid skin contact. Avoid static discharge. Avoid eye contact with vapors, mists, or spray. Keep out of the reach of children. Do not breathe vapors. Do not breathe dust. Avoid contact with oxidizing agents. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

7.2 STORAGE

Store away from acids. Store away from heat. Store out of direct sunlight. Keep container in well-ventilated area. Keep container tightly closed. Store away from oxidizing agents. Store in a cool, dry place.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Use in an enclosed process area is recommended. Provide appropriate local exhaust for cutting, grinding, sanding or machining. Use in a well-ventilated area. If exhaust ventilation is not available, use appropriate respiratory protection. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control mist, vapor, or spray. If ventilation is not adequate, use respiratory protection equipment.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

Avoid eye contact with vapors, mists, or spray.
The following eye protection(s) are recommended: Indirect Vented Goggles
.

8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.
Gloves made from the following material(s) are recommended: Polyvinyl Alcohol (PVA)
.

8.2.3 Respiratory Protection

Do not breathe vapors. Do not breathe dust.
Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half facepiece or fullface air-purifying respirator with organic vapor cartridges and P95 particulate prefilters
. Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

8.3 EXPOSURE GUIDELINES

Ingredient	Authority	Type	Limit	Additional Information
LIMESTONE	OSHA	TWA, respirable fraction	5 mg/m3	
LIMESTONE	OSHA	TWA, as total dust	15 mg/m3	
QUARTZ SILICA	ACGIH	TWA, respirable fraction	0.025 mg/m3	
QUARTZ SILICA	OSHA	TWA concentration, respirable	0.1 mg/m3	
QUARTZ SILICA	OSHA	TWA concentration, as total dust	0.3 mg/m3	
STYRENE MONOMER	ACGIH	TWA	20 ppm	

STYRENE MONOMER	ACGIH	STEL	40 ppm	
STYRENE MONOMER	OSHA	TWA	100 ppm	
STYRENE MONOMER	OSHA	CEIL	200 ppm	
TALC	ACGIH	TWA, respirable fraction	2 mg/m3	
TALC	CMRG	TWA, as respirable dust	0.5 mg/m3	
TALC	OSHA	TWA concentration, respirable	0.1 mg/m3	
TALC	OSHA	TWA concentration, as total dust	0.3 mg/m3	
TALC	OSHA	TWA	20 millions of particles/cu. ft.	
TITANIUM DIOXIDE	ACGIH	TWA	10 mg/m3	
TITANIUM DIOXIDE	CMRG	TWA, as respirable dust	5 mg/m3	
TITANIUM DIOXIDE	OSHA	TWA, as total dust	15 mg/m3	
TRIMETHYLOLPROPANE TRIACRYLATE	AIHA	TWA	1 mg/m3	Skin Notation*****

* Substance(s) refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
ACGIH: American Conference of Governmental Industrial Hygienists
CMRG: Chemical Manufacturer Recommended Guideline
OSHA: Occupational Safety and Health Administration
AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Paste
Odor, Color, Grade:	Green/gold paste with pungent solvent odor
General Physical Form:	Liquid
Autoignition temperature	*No Data Available*
Flash Point	88 ºF [*Test Method:* Closed Cup]
Flammable Limits(LEL)	*No Data Available*
Flammable Limits(UEL)	*No Data Available*
Boiling Point	293 ºF
Density	1.1326 g/ml
Vapor Density	3.6 [*Ref Std:* AIR=1]
Vapor Pressure	4.5 mmHg
Specific Gravity	1.1326 [*Ref Std:* WATER=1]
pH	*No Data Available*
Melting point	*No Data Available*
Solubility in Water	Negligible
Evaporation rate	*No Data Available*
Hazardous Air Pollutants	15.6 % weight [*Test Method:* Calculated]
Volatile Organic Compounds	177 g/l [*Test Method:* calculated SCAQMD rule 443.1]
Volatile Organic Compounds	15.6 % weight [*Test Method:* calculated per CARB title 2]
Kow - Oct/Water partition coef	*No Data Available*
Percent volatile	15.578 % weight

Percent volatile	19.4613 % volume
VOC Less H2O & Exempt Solvents	178 g/l [*Test Method:* calculated SCAQMD rule 443.1]
Viscosity	136000 centipoise - 212000 centipoise
Materials to avoid	Strong acids
Materials to avoid	Strong oxidizing agents

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable. Stable under normal conditions. May become unstable at elevated temperatures and/or pressure.

Materials and Conditions to Avoid:
10.1 Conditions to avoid
Heat
Sparks and/or flames

10.2 Materials to avoid
Strong acids
Strong oxidizing agents

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition
Hydrocarbons	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not determined.

CHEMICAL FATE INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Incinerate in a permitted hazardous waste incinerator. As a disposal alternative, dispose of waste product in a permitted hazardous waste facility.

EPA Hazardous Waste Number (RCRA): D001 (Ignitable), D018 (Benzene)

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

LB-K100-0902-4

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
STYRENE MONOMER	100-42-5	10 - 30

STATE REGULATIONS

Contact 3M for more information.

CALIFORNIA PROPOSITION 65

Ingredient	C.A.S. No.	Classification
SILICA, CRYSTALLINE (AIRBORNE PARTICLES OF RESPIRABLE SIZE)	SEQ677	**Carcinogen

** WARNING: contains a chemical which can cause cancer.

CHEMICAL INVENTORIES

The components of this product are in compliance with the chemical notification requirements of TSCA.

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS. The components of this product are listed on the Canadian

Domestic Substances List.

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 2 **Flammability:** 3 **Reactivity:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: 2 **Flammability:** 3 **Reactivity:** 0 **Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS(r)) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS(r) ratings are to be used with a fully implemented HMIS(r) program. HMIS(r) is a registered mark of the National Paint and Coatings Association (NPCA).

Revision Changes:
Section 1: Initial issue message was modified.
Section 14: ID Number(s) Template 1 was added.

DISCLAIMER: The information in this Material Safety Data Sheet (MSDS) is believed to be correct as of the date issued. 3M MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

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3M MSDSs are available at www.3M.com

Material Safety Data Sheet

An RPM Company

24 Hour Emergency Phone Numbers:
Medical/Poison Control:
In U.S.: Call 1-800-222-1222
Outside U.S.: Call your local poison control center
Transportation/National Response Center:
1-800-535-5053
1-352-323-3500

NOTE: The National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

IMPORTANT: Provide this information to employees, customers, and users of this product. Read this MSDS before handling or disposing of this product. This product is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard. All abbreviated terms used in this MSDS are further described in Section 16.

Section 1 - Chemical Product / Company Information

This Material Safety Data Sheet is available in Canadian French and Hispanic American Spanish upon request.
On peut demader cette fiche signalétique (MSDS) a la langue francaise-canadienne.
Los Datos de Serguridad del Producto pueden obtenerse en Espanol si lo riquiere.

Product Name:	Dynaflex 230 - All Colors	**Revision Date:**	03/13/2009
Product UPC Number:	070798183032, 070798182806, 070798182851, 070798183018, 070798183063, 070798183001, 070798183025, 070798184121	**Supersedes:**	06/03/2008
Product Use/Class:	Latex Caulk	**MSDS Number:**	00010001001
Manufacturer:	**DAP Inc.** **2400 Boston Street Suite 200** **Baltimore, MD 21224-4723** **888-327-8477 (non-emergency matters)**		

Section 2 - Hazards Identification

Emergency Overview: A colored paste product with a very slight ammonia odor. WARNING! May cause eye, skin, nose, throat and respiratory tract irritation. Harmful if swallowed or absorbed through the skin. This product contains ethylene glycol.

Refer to other MSDS sections for other detailed information.

Effects Of Overexposure - Eye Contact: May cause eye irritation.

Effects Of Overexposure - Skin Contact: Harmful if absorbed through the skin. May cause skin irritation.

Effects Of Overexposure - Inhalation: Inhalation may cause irritation to the respiratory tract (nose, mouth, mucous membranes). Inhalation may cause mild irritation to the respiratory tract (nose, mouth, mucous membranes). Inhalation of high concentrations may cause headache, nausea, and dizziness. May be harmful if inhaled.

Effects Of Overexposure - Ingestion: Ingestion of ethylene glycol can cause gastrointestinal irritation, nausea, vomiting, diarrhea and if ingested in sufficient quantities, death. Harmful or fatal if swallowed. If ingested, may cause vomiting, diarrhea, and depressed respiration. Ingestion may result in obstruction when material hardens.

Effects Of Overexposure - Chronic Hazards: Repeated or prolonged exposure may cause skin, respiratory, kidney and liver damage. Prolonged and repeated skin contact may cause irritation and possibly dermatitis.

The International Agency for Research on Cancer (IARC) has determined that crystalline silica in the form of quartz or cristobalite that is inhaled from occupational sources is carcinogenic to humans (Group 1- carcinogenic to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (published in June 1997) in conjunction with the use of these materials. The National Toxicology Program (NTP) classifies respirable crystalline silica as "known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (Group A2).
Breathing dust containing respirable crystalline silica may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may have the following serious chronic health effects: Excessive inhalation of respirable dust can cause pneumoconiosis, a respiratory disease, which can result in delayed, progressive, disabling and sometimes fatal lung injury. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. Smoking exacerbates this disease. Individuals with pneumoconiosis are predisposed to develop tuberculosis. There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by fibrosis of the lungs, skin and other internal organs) and kidney disease. Prolonged, repeated, or high exposures may cause weakness and depression of the central nervous system.
A mixture of diisodecyl phthalate and diisononyl phthalate has been tested in a two-generation toxicity study in laboratory animals. No effects on reproductive parameters were seen. However, a small but statistically significant increase in early offspring mortality was seen at high oral doses. The significance of this to humans is uncertain.

The mixture of phthalate esters contained within this product has been shown to cause developmental effects at high doses in laboratory animals when administered orally by gavage in a developmental study and developmental and fertility effects when administered at high doses by feed in a two-generation reproduction study. The potential risk from occupational and consumer exposure is considered to be very low, based on limited relevance of the rodent findings to humans and the large safety margins between exposure and the effect levels.

Ethylene Glycol may cause kidney and liver damage upon prolonged and repeated overexposures. Studies have shown that repeated inhalation of ethylene glycol has produced adverse cardiovascular changes in laboratory animals. Ethylene glycol has been shown to cause birth defects in laboratory animals.

Primary Route(s) Of Entry: Skin Contact, Inhalation, Eye Contact

Medical Conditions which May be Aggravated by Exposure: None known.

Carcinogenicity:

CAS No.	Chemical Name	ACGIH	OSHA	IARC	NTP
13463-67-7	Titanium dioxide	Not Listed.	Not Listed.	Possible carcinogen.	Not Listed.
14808-60-7	Silica, crystalline	Suspected human carcinogen.	Not Listed.	Human carcinogen.	Known carcinogen.
50-00-0	Formaldehyde	Suspected human carcinogen.	Potential cancer hazard.	Human carcinogen.	Anticipated carcinogen.

Section 3 - Composition / Information On Ingredients

Chemical Name	CASRN	Wt%
Limestone	1317-65-3	30-60
Branched and linear phthalates	Proprietary	1-5
Titanium dioxide	13463-67-7	0.1-1.0
Ethylene glycol	107-21-1	0.1-1.0
Silica, crystalline	14808-60-7	0.1-1.0
Formaldehyde	50-00-0	<0.02

Section 4 - First Aid Measures

First Aid - Eye Contact: In case of contact, immediately flush eyes with large quantities of water for at least 15 minutes until irritation subsides. Get medical attention immediately.

First Aid - Skin Contact: Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical aid if symptoms persist. In case of contact, immediately flush skin with plenty of water while removing contaminated clothing and shoes. If skin irritation persists, call a physician. Remove and wash contaminated clothing.

First Aid - Inhalation: If inhaled, remove to fresh air. If breathing is difficult, leave the area to obtain fresh air. If continued breathing difficulty is experienced, get medical attention immediately. First Aid: If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical attention immediately.

First Aid - Ingestion: If swallowed, DO NOT INDUCE VOMITING. Get medical attention immediately. If ingested, drink 2 glasses of water. Immediately see a physician. Never give anything by mouth to an unconscious person.

Note to Physician: None.

COMMENTS: If over-exposure occurs, call your poison control center at 1-800-222-1222.

Section 5 - Fire Fighting Measures

Extinguishing Media: Carbon Dioxide, Dry Chemical, Foam, Water Fog

Unusual Fire And Explosion Hazards: No special protective measures against fire required.

Special Firefighting Procedures: Wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear. Use water spray to cool exposed surfaces.

Section 6 - Accidental Release Measures

Steps To Be Taken If Material Is Released Or Spilled: Wear proper protective equipment as specified in Section 8. Use absorbent material or scrape up dried material and place in container.

Section 7 - Handling And Storage

Handling: KEEP OUT OF REACH OF CHILDREN! DO NOT TAKE INTERNALLY. Open all windows and doors or use other means to ensure cross-ventilation and fresh air entry during application and drying. Odor is not an adequate warning for hazardous conditions. Use only with adequate ventilation. Avoid breathing vapor and contact with eyes, skin and clothing. Wash thoroughly after handling.

Storage: Do not store at temperatures above 120 degrees F. Store containers away from excessive heat and freezing. Close container after each use. Store away from caustics and oxidizers.

Section 8 - Exposure Controls / Personal Protection

Chemical Name	CASRN	ACGIH TWA	ACGIH STEL	ACGIH CEIL	OSHA TWA	OSHA STEL	OSHA CEIL	Skin
Limestone	1317-65-3	10 MGM3	N.E.	N.E.	5 MGM3 (respirable fraction)	N.E.	N.E.	No
Branched and linear phthalates	Proprietary	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	No
Titanium dioxide	13463-67-7	10 MGM3	N.E.	N.E.	15 MGM3	N.E.	N.E.	No
Ethylene glycol	107-21-1	N.E.	N.E.	100 MGM3	N.E.	N.E.	N.E.	No
Silica, crystalline	14808-60-7	0.025 MGM.	N.E.	N.E.	10/(%SiO2 + 2) MGM3	N.E.	N.E.	No
Formaldehyde	50-00-0	N.E.	N.E.	0.3 PPM	0.75 PPM	2 PPM	N.E.	No

Exposure Notes:

14808-60-7 The 2002 ACGIH Threshold Limit Values for Chemical Substances and Physical Agents lists the median Respirable Particulate Mass (RPM) point for crystalline silica at 4.0 microns in terms of the particle's aerodynamic diameter.

The TLVs for crystalline silica represent the respirable fraction.

OSHA PEL TWA for Quartz is calculated using the following formula: 10 mg/m3/(% SiO2 + 2). Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size selector with the following characteristics.

Aerodynamic diameter (unit density sphere)	Percent passing selector
2	90
2.5	75
3.5	50
5.0	25
10	0

Precautionary Measures: Contact lenses pose a special hazard; soft lenses may absorb and all lenses concentrate irritants.

Engineering Controls: Good general ventilation should be sufficient to control airborne levels. Ensure adequate ventilation, especially in confined areas. Local ventilation of emission sources may be necessary to maintain ambient concentrations below recommended exposure limits.

Respiratory Protection: In case of insufficient ventilation, wear suitable respiratory equipment. A NIOSH-approved air purifying respirator with an organic vapor cartridge or canister may be necessary under certain circumstances where airborne concentrations are expected to exceed exposure limits. A respiratory protection program that meets the OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/m3) as determined by a full shift sample up to 10-hour work shift.

Skin Protection: Rubber gloves. Natural rubber, butyl rubber and polyvinyl chloride gloves are not suitable protection against the phthalates contained within this product; neoprene is recommended.

Eye Protection: Goggles or safety glasses with side shields.

Other protective equipment: Not required under normal use.

Hygienic Practices: Wash hands before breaks and at the end of workday. Remove and wash contaminated clothing before re-use.

Important: Listed Permissible Exposure Levels (PEL) are from the U.S. Dept. of Labor OSHA Final Rule Limits (CFR 29 1910.1000); these limits may vary between states.

Note: An employee's skin exposure to substances having a "YES" in the "SKIN" column in the table above shall be prevented or reduced to the extent necessary under the circumstances through the use of gloves, coveralls, goggles or other appropriate personal protective equipment, engineering controls or work practices.

Section 9 - Physical And Chemical Properties

Boiling Range:	Not Established	**Vapor Density:**	Heavier Than Air
Odor:	Very Slight Ammonia	**Odor Threshold:**	Not Established
Color:	Colored	**Evaporation Rate:**	Slower Than n-Butyl Acetate
Solubility in H2O:	Not Established	**Specific Gravity:**	1.4
Freeze Point:	Not Established	**pH:**	Between 7.0 and 12.0
Vapor Pressure:	Not Established	**Viscosity:**	Not Established
Physical State:	Paste	**Flammability:**	Non-Flammable
Flash Point, F:	Greater than 200	**Method:**	(Seta Closed Cup)
Lower Explosive Limit, %:	Not Established	**Upper Explosive Limit, %:**	Not Established

When reported, vapor pressure of this product has been calculated theoretically based on its constituent makeup and has not been determined experimentally.

(See section 16 for abbreviation legend)

Section 10 - Stability And Reactivity

Conditions To Avoid: Excessive heat and freezing.

Incompatibility: Incompatible with strong bases and oxidizing agents.

Hazardous Decomposition Products: Normal decomposition products, i.e., COx, NOx.

Hazardous Polymerization: Hazardous polymerization will not occur under normal conditions.

Stability: Stable under recommended storage conditions.

Section 11 - Toxicological Information

Product LD50: Not Established **Product LC50:** Not Established

CASRN	Chemical Name	LD50	LC50
107-21-1	Ethylene glycol	Rat:4700 mg/kg	Rat:10876 mg/kg
50-00-0	Formaldehyde	----------	Rat:203 mg/m3

Significant Data with Possible Relevance to Humans: None.

Section 12 - Ecological Information

Ecological Information: Ecological injuries are not known or expected under normal use.

Section 13 - Disposal Information

Disposal Information: Dispose of material in accordance with all federal, state and local regulations. State and Local regulations/restrictions are complex and may differ from Federal regulations. Responsibility for proper waste disposal is with the owner of the waste.

EPA Waste Code if Discarded (40 CFR Section 261): This product does not meet the definition of a hazardous waste according to U.S. EPA Hazardous Waste Management Regulation, 40 CFR Section 261.

Section 14 - Transportation Information

DOT Proper Shipping Name:	Not Regulated.	**Packing Group:**	N.A.
DOT Technical Name:	N.A.	**Hazard Subclass:**	N.A.
DOT Hazard Class:	N.A.	**DOT UN/NA Number:**	None

Note: The shipping information provided is applicable for domestic ground transport only. Different categorization may apply if shipped via other modes of transportation and/or to non-domestic destinations.

Section 15 - Regulatory Information

CERCLA - SARA Hazard Category:

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Immediate Health Hazard, Chronic Health Hazard

SARA Section 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

None

Toxic Substances Control Act:

All ingredients in this product are either on TSCA inventory list, or otherwise exempt.

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

None

New Jersey Right-to-Know:

The following materials are non-hazardous, but are among the top five components in this product:

Chemical Name	CAS Number
Water	7732-18-5
Non-Hazardous Polymer	Proprietary
Acrylic polymer	Proprietary

Pennsylvania Right-to-Know:

The following non-hazardous ingredients are present in the product at greater than 3%:

Chemical Name	CAS Number
Water	7732-18-5
Non-Hazardous Polymer	Proprietary
Acrylic polymer	Proprietary

California Proposition 65:

WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Section 16 - Other Information

HMIS Ratings:

Health: 1 Flammability: 1 Reactivity: 0 Personal Protection: X

Volatile Organic Compounds (VOC), less water less exempts: g/L: 49.0 lb/gal: 0.41 wt:wt%: 2.8

Volatile Organic Compounds (VOC), less water less exempts, less LVP-VOCs: wt:wt%: 0.1

REASON FOR REVISION: Periodic Update

Legend:

N.A. – Not Applicable

N.E. – Not Established

N.D. – Not Determined

VOC – Volatile Organic Compound

ACGIH – American Conference of Governmental Industrial Hygienists

SARA – Superfund Amendments and Reauthorization Act of 1986

NJRTK – New Jersey Right-to-Know Law

OSHA – Occupational Safety and Health Administration

PEL – Permissible Exposure Limit	HMIS – Hazardous Materials Identification System
TLV – Threshold Limit Value	NTP – National Toxicology Program
CEIL – Ceiling Exposure Limit	STEL – Short Term Exposure Limit
LD50 – Lethal Dose 50	LC50 – Lethal Concentration 50
F – Degree Fahrenheit	MSDS – Material Safety Data Sheet
C – Degree Celsius	CASRN – The Chemical Abstracts Service Registry Number

DAP believes the data and statements contained herein are accurate as of the date hereof. They are offered in good faith as typical values and not as a product specification. **NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE WITH REGARD TO THE INFORMATION HEREIN PROVIDED OR THE PRODUCT TO WHICH THE INFORMATION REFERS.** Since this document is intended only as a guide to the appropriate use and precautionary handling of the referenced product by a properly trained person, it is therefore the responsibility of the user to (i) review the recommendations with due consideration for the specific context of the intended use and (ii) determine if they are appropriate.

<End of MSDS>

XIAMETER(R)
Material Safety Data Sheet

DAP(R) 100% SILICONE RUBBER SEALANT CLEAR, 8641

1. PRODUCT AND COMPANY IDENTIFICATION

Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900
Customer Service: (989) 496-6000
Product Disposal Information: (989) 496-6315
CHEMTREC: (800) 424-9300

MSDS No.: 04061395 Revision Date: 2005/06/01

Generic Description: Silicone elastomer
Physical Form: Paste
Color: Colorless
Odor: Acetic acid odor

NFPA Profile: Health 2 Flammability 1 Instability/Reactivity 0

Note: NFPA = National Fire Protection Association

2. OSHA HAZARDOUS COMPONENTS

CAS Number	Wt %	Component Name
17689-77-9	1.0 - 5.0	Ethyltriacetoxysilane
4253-34-3	1.0 - 5.0	Methyltriacetoxysilane

The above components are hazardous as defined in 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may cause moderate irritation.

Skin: May cause moderate irritation.

Inhalation: Material is not likely to present an inhalation hazard at ambient conditions. However, if material is heated or high vapor/aerosol concentrations are attained, central nervous system depression may occur, which is characterized by drowsiness, dizziness, confusion or loss of coordination.

Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin: No known applicable information.

Inhalation:	No known applicable information.
Oral:	No known applicable information.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

4. FIRST AID MEASURES

Eye:	Immediately flush with water for 15 minutes. Get medical attention.
Skin:	Remove from skin and wash thoroughly with soap and water or waterless cleanser. Get medical attention if irritation or other ill effects develop or persist.
Inhalation:	Material is not likely to present an inhalation hazard at ambient conditions. If material is heated or vapor/mist/dust/fumes are generated, care should be taken to prevent inhalation. In case of exposure to vapor/mist/dust/fumes, move to fresh air.
Oral:	No first aid should be needed.
Comments:	Treat according to person's condition and specifics of exposure.

5. FIRE FIGHTING MEASURES

Flash Point:	> 212 °F / > 100 °C (Closed Cup)
Autoignition Temperature:	Not determined.
Flammability Limits in Air:	Not determined.
Extinguishing Media:	On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide (CO2), dry chemical or water spray. Water can be used to cool fire exposed containers.
Fire Fighting Measures:	Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Unusual Fire Hazards:	None.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following hazardous

decomposition products: Carbon oxides and traces of incompletely burned carbon compounds. Silicon dioxide. Formaldehyde.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up: Observe all personal protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, state and federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which federal, state and local laws and regulations are applicable. Sections 13 and 15 of this MSDS provide information regarding certain federal and state requirements.

Note: See section 8 for Personal Protective Equipment for Spills. Call (989) 496-5900, if additional information is required.

7. HANDLING AND STORAGE

Use with adequate ventilation. Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection. Avoid eye contact. Avoid skin contact. Do not take internally. Avoid breathing vapor. Keep container closed.

Use reasonable care and store away from oxidizing materials. Keep container closed and store away from water or moisture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

CAS Number	Component Name	Exposure Limits
17689-77-9	Ethyltriacetoxysilane	See acetic acid comments.
4253-34-3	Methyltriacetoxysilane	See acetic acid comments.

Acetic acid is formed upon contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 10 ppm and ACGIH TLV: TWA 10 ppm, STEL 15 ppm.

Engineering Controls

Local Ventilation: Recommended.
General Ventilation: Recommended.

Personal Protective Equipment for Routine Handling

DAP(R) 100% SILICONE RUBBER SEALANT CLEAR, 8641

Eyes:	Use proper protection - safety glasses as a minimum.
Skin:	Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.
Suitable Gloves:	Nitrile Rubber. Butyl Rubber.
Inhalation:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. IH personnel can assist in judging the adequacy of existing engineering controls.
Suitable Respirator:	Respiratory protection is not needed under ambient conditions. If vapor/mist/dust/fumes are generated when material is heated or handled, the following is advised. General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators.

Personal Protective Equipment for Spills

Eyes:	Use full face respirator.
Skin:	Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.
Inhalation/Suitable Respirator:	Respiratory protection recommended. Follow OSHA Respirator Regulations (29 CFR 1910.134) and use NIOSH/MHSA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
Precautionary Measures:	Avoid eye contact. Avoid skin contact. Do not take internally. Avoid breathing vapor. Keep container closed. Use reasonable care.
Comments:	Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection. When heated to temperatures above 150 C (300 F) in the presence of air, product may form formaldehyde vapors. Physical and health hazard information is readily available from Dow Corning Corporation and the Material Safety Data Sheet.

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: Paste

Color:	Colorless
Odor:	Acetic acid odor
Specific Gravity @ 25°C:	1.007
Viscosity:	Not determined.
Freezing/Melting Point:	Not determined.
Boiling Point:	Not determined.
Vapor Pressure @ 25°C:	Not determined.
Vapor Density:	Not determined.
Solubility in Water:	Not determined.
pH:	Not determined.
Volatile Content:	Not determined.

Note: The above information is not intended for use in preparing product specifications.

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.
Materials to Avoid:	Oxidizing material can cause a reaction. Water, moisture, or humid air can cause hazardous vapors to form as described in Section 8.

11. TOXICOLOGICAL INFORMATION

Special Hazard Information on Components

No known applicable information.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Complete information is not yet available.

Environmental Effects

Complete information is not yet available.

Fate and Effects in Waste Water Treatment Plants

Complete information is not yet available.

Ecotoxicity Classification Criteria

Hazard Parameters (LC50 or EC50)	High	Medium	Low
Acute Aquatic Toxicity (mg/L)	<=1	>1 and <=100	>100
Acute Terrestrial Toxicity	<=100	>100 and <= 2000	>2000

DAP(R) 100% SILICONE RUBBER SEALANT CLEAR, 8641

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

13. DISPOSAL CONSIDERATIONS

RCRA Hazard Class (40 CFR 261)

When a decision is made to discard this material, as received, is it classified as a hazardous waste? No

State or local laws may impose additional regulatory requirements regarding disposal.

Call (989) 496-6315, if additional information is required.

14. TRANSPORT INFORMATION

DOT Road Shipment Information (49 CFR 172.101)

Not subject to DOT.

Ocean Shipment (IMDG)

Not subject to IMDG code.

Air Shipment (IATA)

Not subject to IATA regulations.

15. REGULATORY INFORMATION

Contents of this MSDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA Status: All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

EPA SARA Title III Chemical Listings

Section 302 Extremely Hazardous Substances (40 CFR 355):
None.

Section 304 CERCLA Hazardous Substances (40 CFR 302):
None.

Section 311/312 Hazard Class (40 CFR 370):
Acute: Yes
Chronic: No
Fire: No

Pressure: No
Reactive: No

Section 313 Toxic Chemicals (40 CFR 372):
None present or none present in regulated quantities.

Supplemental State Compliance Information

California

Warning: This product contains the following chemical(s) listed by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) as being known to cause cancer, birth defects or other reproductive harm.

None known.

Massachusetts

CAS Number	Wt %	Component Name
7631-86-9	7.0 - 13.0	Silica, amorphous

New Jersey

CAS Number	Wt %	Component Name
70131-67-8	> 60.0	Dimethyl siloxane, hydroxy-terminated
7631-86-9	7.0 - 13.0	Silica, amorphous
64742-46-7	<=7.0	Hydrotreated middle petroleum distillates
17689-77-9	1.0 - 5.0	Ethyltriacetoxysilane
4253-34-3	1.0 - 5.0	Methyltriacetoxysilane

Pennsylvania

CAS Number	Wt %	Component Name
70131-67-8	> 60.0	Dimethyl siloxane, hydroxy-terminated
7631-86-9	7.0 - 13.0	Silica, amorphous
64742-46-7	<=7.0	Hydrotreated middle petroleum distillates

DAP(R) 100% SILICONE RUBBER SEALANT CLEAR, 8641

16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

XIAMETER(R) is a trademark of Dow Corning Corporation

http://www.xiameter.com

MATERIALS SAFETY DATA SHEET

Date Prepared July 14, 2010 3rd Edition

FOR CHEMICAL EMERGENCY
During Business Hours: (800) 966-3458
Outside Business Hours: (800) 420-7186

1. IDENTIFICATION OF SUBSTANCE/PREPARATION/AND THE COMPANY

Product name: Gorilla Super Glue
Product description: Ethyl Cyanoacrylate adhesive
Distributor: The Gorilla Glue Company
4550 Red Bank Expressway
Cincinnati, OH 45227
Tel: (513) 271-3300
Fax: (513) 527-3742

2. COMPOSITION AND INFORMATION ON HARMFUL INGREDIENTS

Ingredients:	CAS No.	OSHA PEL	ACGIH TLV	Other limits	% Composition
Ethyl Cyanoacrylate	7085-85-0	N/A	0.2ppm TWA	0.3ppm STEL	86-100

3. HAZARDS IDENTIFICATION

HMIS Health 2 Flammability 2 Physical hazards 1

Emergency overview

Immediate concerns: Causes eye irritation. May cause sensitization. May cause respiratory tract irritation. Rapid polymerization occurs upon contact with water or alkaline substances. As a result, heat is generated. Skin inflammation or burns may occur upon contact during this polymerization.

Potential health effects

Eyes: Causes eye irritation.
Skin: Bonds skin instantly. May cause sensitization.
Ingestion: Note likely route of entry. Substance may be harmful if swallowed.
Inhalation: May cause irritation to the nose, throat and respiratory tract.

Signs and symptoms of overexposure

Acute toxicity: Symptoms of exposure include burning sensation, coughing, wheezing, laryngitis, stomach or intestinal upset, and/or respiratory tract irritation.
Target organ statement Eyes.
Sensitization: May cause allergic skin reaction.

4. FIRST AID MEASURES

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes. Do not attempt to pull apart bonded eyelid. Seek medical attention.
Skin: Immediately wash skin with soap and plenty of water. Removed contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.
Ingestion: Do not induce vomiting. Saliva will cause cyanoacrylate to polymerize in mouth. If lips are bonded together, use warm water to gently separate the lips apart. Contact a physician.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Notes to physician: Cured adhesive does not pose a health risk.

5. FIRE FIGHTING MEASURES

Flash Point:	>81ºC (150-200ºF)
Extinguishing Media:	Water spray, foam, dry chemical or CO2
Special Fire Fighting Procedures:	Wear self contained breathing apparatus
Unusual Fire/Explosion Hazards:	No applicable information found.
Hazardous Thermal Decomposition Products:	Irritating organic vapors may be formed.

6. ACCIDENTAL RELEASE MEASURES

Small spill:	Absorb with an inert material and place in an appropriate waste disposal container.
Large spill:	Extinguish all sources of ignition. Stop spill or leak at source. Dike if necessary. Absorb with an inert material and place in an appropriate waste disposal container.
Release notes:	Keep spilled material from entering storm drains, sewers or other environmental mediums.
Comments:	Disposal of clean-up materials may be governmentally regulated. Observe all applicable local, state and Federal waste management regulations.

7. HANDLING AND STORAGE

Handling:	To avoid fire, eliminate ignition sources. Avoid contact with eyes, skin and clothing. In case of insufficient ventilation, wear suitable respiratory equipment. May react in presence of moisture. May react or be incompatible with alkalies. Wash thoroughly after handling.
Storage:	Contains moisture sensitive material. Store in a dry, cool, well-ventilated area. Keep away from sources of heat ignition. Keep container tightly closed when not in use. Store between 5-25ºC.
Comments:	Rapid polymerization occurs upon contact with water or alkaline substances. As a result, heat is generated. Skin inflammation or burns may occur upon contact during this polymerization.

8. EXPOSURE CONTROL AND PERSONAL PROTECTION

Eye Protection:	Safety goggles / glasses suitable for use with chemicals.
Repiratory Protection:	Always use appropriate filter mask / respirator.
Skin Protection:	Nitrile / polyethylene gloves, coveralls, avoid cotton products.
Ventilation:	Good general or local exhaust ventilation is required for usage.

9. PHYSICA L AND CHEMICAL PROPERTIES

Form:	Liquid
Color:	Water white / straw colored
Odor:	Sharp, irritating
Solubility in Water:	Immiscible in water
Boiling Point:	>100ºC
Specific Gravity @ 25ºC:	1.1
Vapor Pressure @ 25ºC:	<0.5mm Hg
V.O.C. Content:	<20g/l estimated (California SCAQMD Method 316B)

10. REACTIVITY AND STABILITY

Stability: Stable
Hazardous Polymerization: No
Incompatibility: Reactive with alkalis, oxidizing agents, reducing agents, amines, alcohols and water.
Conditions to Avoid: No applicable information found
Hazardous Decomposition Products: No applicable information found.

11. TOXICOLOGICAL INFORMATION

Estimated Oral LD50: >5000 mg kg
Estimated Dermal LD50: >2000 mg kg
Estimated Inhalation LC50: >4000 mg kg

Causes Severe Irritation. High concentrations are destructive to tissues of the mucous membranes and the upper respiratory tract.

Exposure limits:
ACGIH TLV: 0.2ppm
TWA, OSHA: none

12. ECOLOGICAL INFORMATION

No applicable information found.

13. DISPOSAL CONSIDERATIONS

Cyanoacrylates must be disposed of in accordance with all national and local regulations.

14. TRANSPORTATION INFORMATION

Not considered hazardous for the purpose of transportation.

15. REGULATORY INFORMATION (NOT MEANT TO BE ALL INCLUSIVE)

TSCA
All ingredients of this product are listed, or are exempt from listing, on the TSCA inventory.

California Proposition 65
No California Proposition 65 listed chemicals are known to be present.

Canada DSL
All ingredients of this product are listed, or are exempt from listing, on the Canada DSL.

SARA
CERCLA/SARA Section 302EHS: None above reporting de minimus
CERCLA/SARA Section 311/312: Fire, Reactive, Delayed Health, Immediate Health
CERCLA/SARA Section 313: None above reporting de minimus

Risk Phrases
R36/37/38 Irritating to eyes, respiratory system and skin

Safety Phrases

S2 Keep out of reach of children.

S23 Do not breathe fumes.

S24 Avoid contact with skin

S25 Avoid contact with eyes

S26 In case of emergency rinse immediately with plenty of water and seek medical advice.

S46 If swallowed, seek medical advice immediately and show this container or label.

16. OTHER INFORMATION

The information herein is presented in good faith and believed to be accurate as of the effective date given. However no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or Provincial, and Local laws.

KRAYDEN, INC.
AUTHORIZED DISTRIBUTOR
HTTP://KRAYDEN.COM 1-800-448-0406

LOCTITE® Superflex® Clear RTV Silicone

December 2010

PRODUCT DESCRIPTION

LOCTITE® Superflex® Clear RTV Silicone provides the following product characteristics:

Technology	Silicone
Chemical Type	Acetoxy silicone
Appearance (uncured)	Clear[LMS]
Components	One component - requires no mixing
Viscosity	Thixotropic paste
Cure	Room temperature vulcanizing (RTV)
Odor	Acetic Acid
Application	Sealing
Specific Benefit	• Non-slumping • Superior adhesion and flexibility • Seals out moisture and contaminants • Fills large cracks and seams • Non-flammable • Non-toxic

LOCTITE® Superflex® Clear RTV Silicone is a single component, room temperature vulcanizing compound designed to provide an excellent adhesive sealant for mechanical assemblies. This material cures on exposure to moisture in the air to form a tough, flexible, silicone rubber seal. This product resists aging, weathering and thermal cycling without hardening, shrinking or cracking. Designed for superior bonding and sealing properties to most surfaces (not recommended for concrete). Formulated to withstand extreme temperature cycling, UV light and ozone. Typical applications include electrical insulation, protection of leads from mechanical shock, trim bonding, and sealing of ductwork, vents, flues, doors, and windows.

NSF International

Certified to ANSI/NSF Standard 51 for use with plastic materials and components used in food equipment not exceeding 204°C. **Note**: This is a regional approval. Please contact your local Technical Service Center for more information and clarification.

UL Classification

Classified by Underwriters Laboratories Inc.® E257711 - Plastics & Components. Please visit the UL website for additional information. **Note:** This is a regional approval. Please contact your local Technical Service Center for more information and clarification

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.01
Extrusion Rate, g/min	350 to 750[LMS]
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

LOCTITE® Superflex® Clear RTV Silicone cures on exposure to moisture in the air. The product dries tack free in 45 minutes and fully cures in 24 hours. Cure times will vary with temperature, humidity and gap.

Tack Free Time / Surface Cure

Tack Free Time, minutes	≤45[LMS]
Full cure time, hours	24

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 1 week @ RT

Physical Properties:

Tensile Strength, ISO 37	N/mm² (psi)	≥0.8[LMS] (≥120)
Elongation, ISO 37, %		≥275[LMS]
Shore Hardness, ISO 868, Durometer A		≥14[LMS]

TYPICAL ENVIRONMENTAL RESISTANCE

Silicones provide excellent environmental resistance due to their unique chemical structure and the inherent properties of the materials.

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

Loctite Material Specification[LMS]

LMS dated July 6, 2005. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

Directions for use:

1. Clean and dry surfaces. Remove all oil and grease.
2. Apply product to surface. For bonding applications, apply to one surface only and join surfaces immediately. When using pressurized cans and cartridges, apply silicone by pushing the product in the direction of use (Forward) into the surface.
3. Wipe away excess material immediately.

Clean-up

1. Allow excess material to extend beyond the extension nozzle or aerosol tip to cure, sealing and protecting the remaining product from moisture. For reuse, simply remove the cured product from the tip.
2. Remove uncured product from parts and hand-tools with a dry cloth. If skinned over, break film with a dry cloth to remove as much as possible.
3. Clean hands with a dry cloth or hand cleaner.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.
Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties. Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

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Reference 0.1

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HIGH TEMP RED 100% silicone sealant

Spec Sheet #S0117
September 2006

Industrial / Plumbers Grade RTV

HERCULES®

specifications

HIGH TEMP RED 100% silicone sealant

DESCRIPTION

HIGH PERFORMANCE one-step RED colored 100% silicone sealant for high temperature applications, provides a strong, durable, and flexible seal to wood, glass, metal, porcelain, ceramic, painted surfaces, and many plastics and rubber materials. Resistant to weathering, vibration, shrinking, peeling, or cracking. It allows for a permanently flexible waterproof seal. Ideal for pipes, ducts/vents, valves, tanks, gaskets, and flues. Performs at temperatures ranging from -80°F to +600°F. Joint movement +/- 25%; superior gunning and tooling; all season ease of application.

SIZES AND PACKING

STOCK NO.	SIZE	PACKING	WEIGHT/CASE
25666	10.1 fl. oz.	12	11.0 lbs.

HIGH TEMP RED
100% silicone sealant
Industrial / Plumbers Grade RTV

APPROVALS AND LISTINGS

Meets specification for Federal Meat and Poultry Inspection Program: FDA Regulation: No. 21 CFR 177.2600 for incidental food contact and ASTM C-920, Type S, Grade NS, Class 25, Use NT, G,A,O; TT-S-00230C, Type II, Class A; CAN-19.13M87. Recognized under UL QMFZ2, NSF Std 51, MIL-A-46106A, and CARB 2003 for VOC content.

SPECIFIC USES

High Temp Red is a general purpose, one component 100% RTV acetoxy silicone sealant designed for high temperature applications.

High performance silicone sealant ideal for high temperature applications where retention of flexibility, resistance to weathering, vibration, shrinking, peeling, or cracking is important.

SPECIFIC APPLICATIONS*

Construction

- Perimeter sealing, glazing
- Countertops, sanitary seals
- Kitchen/Bath; HVAC
- Roofing

Industrial

- Heating/Refrigeration units
- Foam in place gaskets
- Appliance trim
- RV, marine, truck sealing

PHYSICAL PROPERTIES

Color	Red
Odor	Vinegar like odor
Hardness, Shore A	25 +/- 5
Skin-over Time	10 minutes
Tack-free Time	15 minutes
Cure Rate	24 hours / 1/8” caulk thickness
Service Temp	-80°F to +600°F

WARNINGS OR CAUTIONS

UNCURED SEALANT CAN CAUSE IRRITATION. Avoid contact with sensitive areas. Contact lens wearers take appropriate precautions.

IN CASE OF CONTACT flush eyes or exposed area with water. Call physician. If skin contact should occur, wipe skin with dry cloth and then wash thoroughly with soap and water. Sealant releases vinegar-like odor during curing.

DIRECTIONS FOR USE

1. Clean and dry surfaces - remove any oil, dirt, grease, or soaps. If void is more than ½ inch deep fill with appropriate filler prior to application of silicone sealant.

2. Cut nozzle to gain appropriate bead size and apply with standard caulking gun.

3. Clean up excess caulk immediately with sharp edge tool or dry cloth.

4. Silicone forms dry skin within 10 minutes and cures in one hour. Comes to full strength and adhesive value within 24 hours per ⅛″ of caulk.

STORAGE

Store in a dry place at ambient temperature. Avoid storage in areas over 90°F.

MATERIAL SAFETY INFORMATION

FOR MORE INFORMATION ON THIS PRODUCT, REQUEST MATERIAL SAFETY DATA SHEET - (MSDS) #117

For Delivery by Fax	Call 1-800-942-4636
Internet	See MSDS section of **www.herchem.com**
Mail	Contact Hercules at address below or any Hercules representative

INGREDIENTS	CAS#
Dimethyl siloxane	70131-67-8
Hydro-treated middle petroleum distillates	64742-46-7
Silica, amorphous	7631-86-9
Ethyltriacetoxysilane	17689-77-9
Methyltriacetoxysilane	4253-34-3

HMIS Hazard Rating 2-1-0-A

*For special applications which may not be covered on this or other Hercules literature, please contact Hercules Technical Services Department by phone 1-800-221-9330, or fax 1-800-333-3456, or visit our technical database web-site at www.herchem.com.

ISO 9001: 2000 Certified

HERCULES®

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MATERIAL SAFETY DATA SHEET

Date Prepared: 1/15/2011

SECTION 1 – Product Identification

PRODUCT NAME:	**J-B Weld, J-B Professional (Resin)**
PRODUCT CODE:	**8265, 8265S, 8265SF, 8280, 7265S**
SYNONYM/CROSS REFERENCE:	**Epoxy Paste Resin**
COMPANY:	**J-B Weld Company**

P.O. Box 483
1130 Como Street
Sulphur Springs, TX 75482

Tel: (903) 885-7696
Fax: (903) 885-5911

SECTION 2 – Hazard Identification

Potential Health Effects

EYE: May cause moderate eye irritation.

SKIN: Has caused allergic skin reactions in humans. A single exposure not likely to cause skin irritation. Prolonged and repeated contact may cause skin irritation with local redness.

INGESTION: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

INHALATION: Vapors are unlikely due to physical properties.

CHRONIC (CANCER) INFORMATION: N/A

TERATOLOGY (BIRTH DEFECT) INFORMATION: N/A

REPRODUCTION INFORMATION: N/A

SECTION 3 – Composition, Information or Ingredients

Component/Exposure Limits	CAS#	% by Wt.
Diglycidyl Ether of Bisphenol A INGESTION LD(50): >5000 mg/kg (rat) SKIN ABSORPTION: 20000 mg/kg (rabbit)	**25068-38-6**	**15% to 40%**
Diglycidyl ether of bisphenol F Oral LD50 rats >2000 mg/kg	**28064-14-4**	**5% to 10%**

SECTION 4 – First Aid Measures

EYES:
Flush eyes thoroughly with water for several minutes. If effects occur, consult a physician, preferably an ophthalmologist.

SKIN: Wash skin with plenty of soap and water.

INGESTION: No emergency medical treatment necessary.

INHALATION: N/A

NOTE TO PHYSICIANS: Consider additional thorough skin wash with mild, nonabrasive soap and plenty of warm water for at least fifteen minutes.

SECTION 5 – Fire-Fighting Measures

FLAMMABLE PROPERTIES:

FLASH POINT: > 140F Method: N/A
FLAMMABLE LIMITS:
Lower flammable limit: N/A
Upper flammable limit: N/A
AUTOIGNITION TEMPERATURE: N/A

HAZARDOUS COMBUSTION PRODUCTS: Carbon dioxide, carbon monoxide, oxides of nitrogen and sulfur.

EXTINGUISHING MEDIA:
FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG, OTHER

FIREFIGHTING INSTRUCTIONS:

Respiratory equipment should be worn to avoid inhalation of concentrated vapors. Water should not be used except as fog to keep nearby containers cool. Fire Fighters and others who may be exposed to the products of combustion should be equipped with NIOSH approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.

SECTION 6 – Accidental Release Measures

SPILLS:
Dispose of in normal manner in accordance to all applicable state, federal, and local laws. Not a hazardous waste.

SECTION 7 – Handling and Storage

HANDLING:
No special precautions needed.
Personal hygiene- Wash thoroughly after handling, especially before eating, drinking, smoking, and using restroom facilities. Professionally launder contaminated clothing before use.
Empty container precautions- Do not reuse empty containers for food, clothing, or products for human or animal consumption, or where skin contact can occur.

STORAGE:
Temperature - Less than 90 F.
Conditions - Store in cool, dry, well-ventilated area.

SECTION 8 – Exposure Controls and Personal Protection

ENGINEERING CONTROLS:
Local exhaust: Use to keep exposures below recommendations.
Use if material is heated above 100 F.

RESPIRATORY PROTECTION:
None required in a well-ventilated area.

SKIN PROTECTION:
Appropriate impervious gloves. Because a variety of protective gloves exist, consult glove manufacturer to determine the proper type for the specific operation.

EYE PROTECTION:
Safety glasses or goggles.

SECTION 9 – Physical and Chemical Properties

BOILING POINT: 392F200C
MELTING POINT: N/A
VAPOR PRESSURE: N/A
VAPOR DENSITY: N/A
SOLUBILITY IN WATER: Insoluble in water
SPECIFIC GRAVITY: 1.9313
pH: N/A
VOLATILE ORGANIC COMPOUNDS: <0.1%
ODOR: Sweet, Acrid
APPEARANCE: THICK PASTE

SECTION 10 – Stability and Reactivity

CHEMICAL STABILITY (CONDITIONS TO AVOID): This product is stable.
INCOMPATIBILITY: None.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon dioxide, aldehydes, acids, oxides of sulfur and nitrogen
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 – Toxicological Information

EYE: N/A
SKIN: N/A
INGESTION: N/A
INHALATION: N/A
SUBCHRONIC: N/A
CHRONIC/CARCINOGENICITY: N/A
TERATOLOGY: N/A
REPRODUCTION: N/A
MUTAGENICITY: N/A

SECTION 12 – Ecological Information

ECOTOXICOLOGICAL INFORMATION: N/A
CHEMICAL FATE INFORMATION: N/A

SECTION 13 – Disposal Considerations

Incinerate in furnace or bury in landfill in accordance with all applicable regulations.
Not classified as a hazardous waste.

SECTION 14 – Transport Information

Not DOT regulated.

SECTION 15 – Regulatory Information

U.S. FEDERAL REGULATIONS: TSCA: All ingredients are TSCA listed.
OSHA: Not OSHA regulated.
CERCLA: SARA HAZARD CATEGORY: Not regulated.
SECTION 313: Not regulated.
INTERNATIONAL REGULATIONS:
CANADIAN WHMIS: DB2 skin sensitizer.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): N/A
EINECS: EINECS listed.
STATE REGULATIONS: CALIFORNIA PROPOSITION 65
This product contains the following chemicals known to the state of California to cause cancer or reproductive toxicity. None

The following ingredients are present in this material and are subject to reporting in accordance to the Pennsylvania, New Jersey, and/or Massachusetts Right-to-Know (RTK) laws:
Iron Powder (CAS 7439-89-6)
Calcium Carbonate (CAS 1317-65-3)

SECTION 16 – Other Information

Hazard Ratings
NFPA Ratings: Health: 1 Fire: 0 Physical Data: 0 PPE: B

MSDS Last Revised: 01/15/2011 Created by: I. David Crossan

USERS RESPONSIBILITY: A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects on an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information herein should be passed on to your customers or employees as the case may be.

DISCLAIMER OF LIABILITY: The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damage incurred by the use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representation of warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information refers. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

PREPARED BY:

J-B Weld Company

P.O. Box 483
1130 Como Street
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Tel: (903) 885-7696
Fax: (903) 885-5911

MATERIAL SAFETY DATA SHEET

WM731B

This MSDS complies with OSHA'S Hazard Communication standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-0; Flammability-1; Reactivity 0 ; Special-	**HMIS Rating:** Health-0; Flammability-1; Reactivity-0; Personal Protection--
Manufacturer's Name: **DYNAFLUX, INC.** 241 Brown Farm Rd. Cartersville, GA 30120	**DOT Hazard Classification:** Welding Compound 50390 **Identity** (trade name as used on label): **WELDMARK NOZZLE DIP WM731**
Manufactured for: I.W.D.C. Indianapolis, IN 46219	
Prepared By: GS	**MSDS Number: WM731B** Revision: 11/3/2008
Information Calls: (800)334-4420	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA
Emergency Response Number: CHEMTEL US: (800)-255-3924 / International: 813-248-0585	

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	CAS NUMBER	SARA III LIST	OSHA PEL (PPM)	ACGIH TLV (ppm)	Carcinogen Ref. source*
No hazardous materials					
% BY WT.					
Contents: Petrolatum **100%**	8009-03-8				
VOC: 0%					

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: NA	**Specific Gravity (H2O=1):** 0.831
Vapor Pressure:(PSIG @ 70° F (Aerosols):NA	**Vapor Pressure:**(Non-Aerosols)(mm Hg and Temperature): .0005
Vapor Density:(Air=1): NA	**Evaporation Rate** (BUAC=1): NA
Solubility in Water: Negligible	**Water Reactive:** No

Appearance and Odor: Blue paste hydrocarbon; no odor

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST (aerosols): NA	**Auto Ignition Temperature** Unknown	**Flammability Limits in Air by % in Volume:** %LEL: Unknown	%UEL: Unknown

FLASH POINT AND METHOD USED (non-aerosols): 425º F TCC **SPECIAL FIRE FIGHT PROCEDURES:** None	**EXTINGUISHER MEDIA:** Dry Foam, carbon dioxide

Unusual Fire & Explosion Hazards: None

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: [X] STABLE [ ] UNSTABLE	**HAZARDOUS POLYMERIZATION** [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to Avoid): Strong oxidizing agents.	**Conditions to Avoid**:None

Hazardous Decomposition Products: carbon monoxide and dioxide.

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [ ] INHALATION [ ] INGESTION [ ] SKIN ABSORPTION [ ] EYE [X] NOT HAZARDOUS

ACUTE EFFECTS:

Inhalation: None

Eye contact: Reddening of eyes

Skin contact: Reddening of skin

Ingestion: None

CHRONIC EFFECTS: Mild irritant

Medical conditions Generally Aggravated by Exposure: Existing dermatitis

EMERGENCY FIRST AID PROCEDURES

Eye Contact: Wash with water.

Skin Contact: Wash with water.

Inhalation: NA

Ingestion: Drink two glasses of water.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type): Normally not required.

Protective Gloves: Rubber if desired.

Eye Protection: Safety glasses or face shield.

Ventilation Requirements: NA

Other Protective Clothing & Equipment: Normally not required.

Hygienic Work Practices: NA

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken if Material Is Spilled Or Released: Sweep up onto paper and discard. Larger spill should be collected and reused.

Waste Disposal Methods: In accordance with local, state and federal regulations.

Precautions To Be Taken In Handling & Storage: Keep in cool place. Empty containers must be considered a fire hazard.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

*Chemical Listed as Carcinogen or Potential Carcinogen. [a] NPT [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

Material Safety Data Sheet

Revision Number: 001.0 **Issue date:**02/02/2011

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite Blue 242 Threadlocker Auto**
Product type: Anaerobic Sealant

IDH number: 1289273

Region: United States

Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

Contact information:
Telephone: 800.624.7767
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state: Liquid
Color: blue
Odor: Mild

HEALTH: *2
FLAMMABILITY: 1
PHYSICAL HAZARD: 1
Personal Protection: See MSDS Section 8

WARNING: CAUSES EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: May cause respiratory tract irritation.
Skin contact: May cause allergic skin reaction. May cause skin irritation.
Eye contact: Contact with eyes will cause irritation.
Ingestion: Not expected to be harmful by ingestion.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Polyglycol dimethacrylate	25852-47-5	60 - 100
Oleic acid 5.5EO	9004-96-0	10 - 30
Saccharin	81-07-2	1 - 5
Silica, amorphous, fumed, crystal-free	112945-52-5	1 - 5
Cumene hydroperoxide	80-15-9	1 - 5
Propanediol-1,2	57-55-6	1 - 5
Titanium dioxide	13463-67-7	0.1 - 1

4. FIRST AID MEASURES

Inhalation:	Move to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Keep warm and quiet. Get medical attention.
Skin contact:	Wash with soap and water. Remove contaminated clothing and footwear. Wash clothing before reuse. If symptoms develop and persist, get medical attention.
Eye contact:	Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Get medical attention.
Ingestion:	Do not induce vomiting. Keep individual calm. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point:	> 93.3 °C (> 199.94 °F) Tagliabue closed cup
Flame projection:	Not applicable
Autoignition temperature:	Not determined
Flammable/Explosive limits - lower:	2.6 % (propylene glycol)
Flammable/Explosive limits - upper:	12.5 % (propylene glycol)
Extinguishing media:	Foam, dry chemical or carbon dioxide.
Special firefighting procedures:	None
Unusual fire or explosion hazards:	None
Hazardous combustion products:	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Do not allow product to enter sewer or waterways.
Clean-up methods:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

Handling:	Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling.
Storage:	For safe storage, store at or below 38 °C (100.4 °F) Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol dimethacrylate	None	None	None	None
Oleic acid 5.5EO	None	None	None	None
Saccharin	None	None	None	None
Silica, amorphous, fumed, crystal-free	10 mg/m3 TWA Inhalable dust. 3 mg/m3 TWA Respirable fraction.	20 MPPCF TWA 0.8 mg/m3 TWA	None	None
Cumene hydroperoxide	None	None	1 ppm (6 mg/m3) TWA (SKIN)	None
Propanediol-1,2	None	None	10 mg/m3 TWA Aerosol.	None
Titanium dioxide	10 mg/m3 TWA	15 mg/m3 TWA Total dust.	None	None

Engineering controls: No specific ventilation requirements noted, but forced ventilation may still be required if concentrations exceed occupational exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Use impermeable gloves and protective clothing as necessary to prevent skin contact. Neoprene gloves. Butyl rubber gloves. Natural rubber gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid
Color: blue
Odor: Mild
Odor threshold: Not available
pH: Not applicable
Vapor pressure: < 5 mm hg (27 °C (80.6 °F))
Boiling point/range: > 149 °C (> 300.2 °F)
Melting point/ range: Not available
Specific gravity: 1.1 at 23.9 °C (75.02 °F)
Vapor density: Not available
Flash point: > 93.3 °C (> 199.94 °F) Tagliabue closed cup
Flame projection: Not applicable
Flammable/Explosive limits - lower: 2.6 % (propylene glycol)
Flammable/Explosive limits - upper: 12.5 % (propylene glycol)
Autoignition temperature: Not determined
Evaporation rate: Not available
Solubility in water: Slight
Partition coefficient (n-octanol/water): Not available
VOC content: 4.48 %; 49.3 g/l EPA Method 24

10. STABILITY AND REACTIVITY

Stability: Stable

Hazardous reactions: Will not occur.

Hazardous decomposition products: Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.

Incompatible materials: Strong oxidizing agents. Free radical initiators. Strong reducing agents. Alkalis. Oxygen scavengers. Other polymerization initiators. Copper. Iron. Zinc. Aluminum. Rust.

Conditions to avoid: See "Handling and Storage" (Section 7) and "Incompatibility" (Section 10).

11. TOXICOLOGICAL INFORMATION

Acute oral product toxicity: LD50 (rat) > 10,000 mg/kg

Acute dermal product toxicity: LD50 (rabbit) > 5,000 mg/kg

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol dimethacrylate	No	No	No
Oleic acid 5.5EO	No	No	No
Saccharin	No	No	No
Silica, amorphous, fumed, crystal-free	No	No	No
Cumene hydroperoxide	No	No	No
Propanediol-1,2	No	No	No
Titanium dioxide	No	Group 2B	No

Hazardous components	Health Effects/Target Organs
Polyglycol dimethacrylate	Irritant, Allergen
Oleic acid 5.5EO	Irritant
Saccharin	No Target Organs
Silica, amorphous, fumed, crystal-free	Nuisance dust
Cumene hydroperoxide	Allergen, Central nervous system, Corrosive, Irritant, Mutagen
Propanediol-1,2	Irritant
Titanium dioxide	Irritant, Respiratory, Some evidence of carcinogenicity

12. ECOLOGICAL INFORMATION

Ecological information: Not available

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The shipping classifications in this sections are for non-bulk packaging only (unless otherwise specified). Shipping classification may be different for bulk packaging.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12(b) Export Notification:	None above reporting de minimus
CERCLA/SARA Section 302 EHS:	None above reporting de minimus
CERCLA/SARA Section 311/312:	Immediate Health, Delayed Health
CERCLA/SARA 313:	This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Cumene hydroperoxide (CAS# 80-15-9).
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class:	D.2.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: New Material Safety Data Sheet format.

Prepared by: Karim Nasr, Regulatory Affairs

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation does not assume responsibility for any results obtained by persons over whose methods Henkel Corporation has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any of Henkel Corporation's products. In light of the foregoing, Henkel Corporation specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation further disclaims any liability for consequential or incidental damages of any kind, including lost profits.

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87101 / 85671

MATERIAL SAFETY DATA SHEET

******** SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION **********

PRODUCT NAME.....: 271 HIGH STRENGTH THREADLOCKER RED
PRODUCT NUMBER.....: 87101
PRODUCT DESCRIPTION..:
DATE PREPARED.....: 07/16/96
SUPPLIER NAME AND ADDRESS.....: Parts Associates, Inc.
12420 Plaza Drive Parma, Ohio 44130 216-433-7700
EMERGENCY PHONE - 24 HOURS.....: CALL CHEM-TEL, INC. (800) 255-3924

********** SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS **********

INGREDIENTS	CAS NO.	%			
POLY DIMETHACRYLATE	25852-47-5	65-70			
BISPHENOL A FUMARATE RESIN	39382-25-7	20-25	SACCHARIN	81-07-2	3-5
CUMENE HYDROPEROXIDE*	80-15-9	1-3			
N,N-DIALKYTOLUIDINES	613-48-9	0.2-1			

*THIS COMPONENT IS LISTED AS A SARA SECTION 313 TOXIC CHEMICAL.

********** SECTION 3 HAZARDS IDENTIFICATION**********

EMERGENCY OVERVIEW.....:N/A (color, clarity, odor, liquid/solid, irritant)
POTENTIAL HEALTH EFFECTS
INHALATION.....:N/A
EYE CONTACT.....:N/A
SKIN CONTACT.....:N/A
INGESTION.....:N/A
CHRONIC.....:
PRIMARY ROUTES OF ENTRY: NONE KNOWN
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE KNOWN
LITERATURE REFERENCED CARCINOGEN

INGREDIENTS	TARGET ORGAN AND OTHER HEALTH EFFECTS	NTP	IARC	OSHA
POLYGLYCOL DIMETH-ACRYLATE	ALG IRR	NO	NO	NO
BISPHENOL A FUMARATE RESIN	ALG IRR	NO	NO	NO
SACCHARIN	NO DATA	YES	2B	NO
CUMENE HYDROPEROXIDE	ALG CNS COR IRR MUT	NO	NO	NO
N,N-DIALKYLTOLUIDINES	NO DATA	NO	NO	NO

ABBREVIATIONS:
2B POSSIBLY CARCINOGENIC TO HUMANS MUT MUTAGEN
ALG ALLERGEN CNS CENTRAL NERVOUS SYSTEM
COR CORROSIVE IRR IRRITANT

********** SECTION 4 FIRST AID MEASURES **********

INHALATION.....:DOES NOT APPLY
EYE CONTACT.....:FLUSH AT LEAST 15 MINUTES WITH WATER. OBTAIN MEDICAL ATTENTION.
SKIN CONTACT.....:FLUSH WITH WATER.
INGESTION.....:DO NOT INDUCE VOMITING. KEEP INDIVIDUAL CALM. OBTAIN MEDICAL ATTENTION.

********** SECTION 5 FIRE FIGHTING MEASURES **********

FLASHPOINT AND METHOD.....:> 200 F (TCC)
FLAMMABLE LIMITS:
GENERAL HAZARD.....:NONE
FIRE FIGHTING INSTRUCTIONS.....:NONE
FIRE FIGHTING EQUIPMENT.....:CARBON DIOXIDE, FOAM, DRY CHEMICAL.
HAZARDOUS COMBUSTION PRODUCTS....: IRRITATING ORGANIC VAPORS.

********** SECTION 6 ACCIDENTAL RELEASE MEASURES **********

LAND SPILL.....:SOAK UP IN AN INERT ABSORBENT. STORE IN A PARTLY FILLED, CLOSED CONTAINER UNTIL DISPOSAL.
WATER SPILL.....:N/A

********** SECTION 7 HANDLING AND STORAGE **********

STORAGE TEMPERATURE.....:AMBIENT
STORAGE PRESSURE.....:ATMOSPHERIC
GENERAL.....:STORE BELOW 100 F. SERVICE 1-800-243-4874 FOR SHELF LIFE INFORMATION). AVOID PROLONGED

RECEI... 4/21/01

SKIN CONTACT. KEEP AWAY FROM EYES.

******** SECTION 8 EXPOSURE CONTROLS AND PERSONAL PROTECTION **********

ENGINEERING CONTROLS

VENTILATION.....:DOES NOT APPLY.

PERSONAL PROTECTION

RESPIRATOR.....:ND

PROTECTIVE CLOTHING....:NEOPRENE, RUBBER OR BUTYL GLOVES.

********** SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES **********

VAPOR PRESSURE.....:<5MM @ 80F VAPOR DENSITY.....:N/A SPECIFIC GRAVITY.....:1.10 @80F (air=1)
SOLUBILITY IN WATER...:SLIGHT EVAPORATION RATE.....:N/A pH.....:N/A (n-Butyl Acetate=1) BOILING
POINT.....:>300 F FREEZING POINT.....:ND
VISCOSITY.....:ND ODOR.....:MILD APPEARANCE.....:RED PHYSICAL STATE.....:LIQUID

********** SECTION 10 STABILITY AND REACTIVITY **********

GENERAL.....:NA
INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID.....:NONE
HAZARDOUS DECOMPOSITION.....:NONE
STABILITY.....: STABLE
HAZARDOUS POLYMERIZATION.....: WILL NOT OCCUR

********** SECTION 11 TOXICOLOGICAL INFORMATION **********

EYE IRRITANT. ESTIMATED ORAL LD50 MORE THAN 5000 MG/KG.
ESTIMATED DERMAL LD50 MORE THAN 2000MG/KG.

********** SECTION 12 ECOLOGICAL INFORMATION **********

NO DATA AVAILABLE

********** SECTION 13 DISPOSAL CONSIDERATIONS **********

INCINERATE FOLLOWING EPA AND LOCAL REGULATIONS.
EPA HAZARDOUS WASTE NUMBER - NH - NOT A RCRA HAZARDOUS WASTE MATERIAL.

********** SECTION 14 TRANSPORT INFORMATION **********

DOT (Department Of Transportation)

PROPER SHIPPING NAME...:UNRESTRICTED
UN NUMBER.....:ND
HAZARD CLASS.....:UNRESTRICTED
IDENTIFICATION NUMBER..:NONE
PACKING GROUP.....:ND

IATA

PROPER SHIPPING NAME....:UNRESTRICTED
CLASS OR DIVISION.....:UNRESTRICTED
UN OR ID NUMBER.....:NONE

********** SECTION 15 REGULATORY INFORMATION **********

CA PROPOSITION 65: THIS PRODUCT CONTAINS SACCHARIN. NO PROP 65 HAZARD WARNING IS NECESSARY IF THIS PRODUCT IS USED AS REASONABLY ANTICIPATED.

********** SECTION 16 OTHER INFORMATION **********

HMIS HEALTH: 1 FIRE: 1 REACTIVITY: 1 NFPA HEALTH: 1 FIRE: 1 REACTIVITY: 1

Common Name: SLIME SUPER DUTY TIRE SEALANT

Manufacturer: ACCESSORIES MARKETING

MSDS Revision Date: 3/10/2008

Grainger Item Number(s): 1MRD9, 1MRE1, 1MRE2, 1MRE3, 1MRE5, 1MRE6, 1MRF7, 3CZP8

Manufacturer Model Number(s):

MSDS Table of Contents

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MATERIAL SAFETY DATA SHEET

SLIME

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

top

PRODUCT NAME: SLIME SUPER DUTY TIRE SEALANT

GENERAL USE: SEALANT

PRODUCT DESCRIPTION:
GREEN PASTE WITH BLACK SPECKS, SLIGHT ODOR; MAY ALSO BE BLUE, WHITE, ORANGE

OR YELLOW IN COLOR

MANUFACTURER'S NAME: ACCESSORIES MARKETING, INC.

ADDRESS (NUMBER, STREET, P.O. BOX): 800 FARROLL ROAD
(CITY, STATE AND ZIP CODE): GROVER BEACH, CA 93433
COUNTRY: USA

DATE PREPARED: MARCH 10, 2008

SUPERSEDES: OCTOBER 5, 2005

TELEPHONE NUMBER FOR INFORMATION: (805) 489-0490

EMERGENCY TELEPHONE NUMBER:
CHEMTEL INC.: 1-(800) 255-3924
INTL.: + 01 (813) 248-0585

DISTRIBUTOR'S NAME: SAME
ADDRESS (NUMBER, STREET, P.O. BOX):
(CITY, STATE AND ZIP CODE):
COUNTRY:

TELEPHONE NUMBER FOR INFORMATION:

EMERGENCY TELEPHONE NUMBER:

SECTION 2 - HAZARDOUS INGREDIENTS

top

HAZARDOUS COMPONENTS	CAS #	% (BY WEIGHT)	OSHA PEL PPM	OSHA PEL MG/M3	ACGIH TWA PPM	ACGIH TWA MG/M3	SARA TITLE III	RQ LBS
NO HAZARDOUS MATERIALS PRESENT AS DEFINED BY OSHA - 29 CFR 1910.1000; EPA - 40 CFR 260 - 281, 302, 355, 370, 372; DOT - 49 CFR 172; WHMIS OR EC DIRECTIVE 91 / 155 / EEC.								

SECTION 3 - HAZARDS IDENTIFICATION

top

EMERGENCY OVERVIEW: MILD PASTE, INGESTION MAY CAUSE GASTRIC DISTRESS.

POTENTIAL HEALTH EFFECTS:

INHALATION:

NONE EXPECTED, HOWEVER, CERTAIN INDIVIDUALS MAY EXPERIENCE MINOR NAUSEA OR HEADACHES.

SKIN: NONE EXPECTED, HOWEVER, PROLONGED CONTACT MAY CAUSE IRRITATION.

EYES: CONTACT WITH EYES MAY CAUSE IRRITATION.

INGESTION: MAY CAUSE GASTRIC DISTRESS, VOMITING AND DIARRHEA.

CARCINOGENICITY:
NTP?: NO
IARC MONOGRAPHS?: NO
OSHA REGULATED?: NO

SECTION 4 - FIRST AID MEASURES

top

INHALATION:
REMOVE AFFECTED PERSON TO FRESH AIR; IF SYMPTOMS PERSIST SEEK MEDICAL ATTENTION.

SKIN:
REMOVE CONTAMINATED CLOTHING; WASH AFFECTED AREA WITH SOAP AND WATER; LAUNDER CONTAMINATED CLOTHING BEFORE REUSE; IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.

EYES:
REMOVE CONTACT LENSES. FLUSH EYES WITH WATER FOR 15 MINUTES; IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.

INGESTION:
GIVE TWO GLASSES OF WATER FOR DILUTION; DO NOT INDUCE VOMITING; NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON; SEEK MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

top

FLASH POINT (METHOD USED): NON-FLAMMABLE

FLAMMABLE LIMITS:
LEL: NOT APPLICABLE
UEL: NOT APPLICABLE

AUTOIGNITION TEMPERATURE: NOT DETERMINED

NFPA CLASS: NONE

GENERAL HAZARDS:
PRODUCT IS NOT CONSIDERED FLAMMABLE OR COMBUSTIBLE. PRODUCTS OF COMBUSTION INCLUDE COMPOUNDS OF CARBON, HYDROGEN AND OXYGEN, INCLUDING CARBON MONOXIDE.

EXTINGUISHING MEDIA:
CARBON DIOXIDE, WATER, WATER FOG, DRY CHEMICAL, CHEMICAL FOAM

FIRE FIGHTING PROCEDURES:
KEEP CONTAINERS COOL WITH WATER SPRAY TO PREVENT CONTAINER RUPTURE DUE TO STEAM BUILDUP; FLOOR WILL BECOME SLIPPERY IF MATERIAL IS RELEASED.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

HAZARDOUS COMBUSTION PRODUCTS: SMOKE, FUMES, OXIDES OF CARBON

SECTION 6 - ENVIRONMENTAL RELEASE MEASURES

top

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILLS: WASH TO SANITARY SEWER WITH PLENTY OF WATER.

LARGE SPILLS:
SOAK UP WITH APPROVED ABSORBENT, SHOVEL PRODUCT INTO APPROVED CONTAINER FOR DISPOSAL. WASH AREA WITH PLENTY OF WATER.

SECTION 7 - HANDLING AND STORAGE

top

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
KEEP CONTAINER CLOSED WHEN NOT IN USE; PROTECT CONTAINERS FROM ABUSE; PROTECT FROM EXTREME TEMPERATURES.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

top

ENGINEERING CONTROLS:
THE USE OF LOCAL EXHAUST VENTILATION IS RECOMMENDED. NO OTHER SPECIAL CONTROLS ARE INDICATED.

PERSONAL PROTECTION:
RESPIRATORY PROTECTION (SPECIFY TYPE): NONE REQUIRED

PROTECTIVE GLOVES: NONE REQUIRED

EYE PROTECTION:
RECOMMENDED FOR GENERAL PROTECTION REFER TO 29 CFR 1910.133 OR EUROPEAN STANDARD EN166.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: SAFETY EYEBATH NEARBY

WORK / HYGIENIC PRACTICES:
PRACTICE SAFE WORKPLACE HABITS. MINIMIZE BODY CONTACT WITH THIS, AS WELL AS

ALL CHEMICALS IN GENERAL.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

top

VAPOR PRESSURE (MMHg): NOT DETERMINED

VAPOR DENSITY (AIR = 1): >1

SPECIFIC GRAVITY (WATER = 1): 1.16 +/- 0.1

EVAPORATION RATE (WATER = 1): <1

SOLUBILITY IN WATER: APPRECIABLE

FREEZING POINT: NOT SPECIFIED

pH: 8.8 +/- 1.0

APPEARANCE AND ODOR: VARIOUS COLORED PASTE WITH BLACK SPECKS, SLIGHT ODOR

BOILING POINT: 220 DEG. F (104.4 DEG. C)

PHYSICAL STATE: VISCOUS LIQUID

VISCOSITY: PASTE

VOLATILE ORGANIC COMPOUNDS (TOTAL VOC'S): NONE

SECTION 10 - STABILITY AND REACTIVITY

top

STABILITY:
UNSTABLE ( )
STABLE (X)

CONDITIONS TO AVOID: EXTREME TEMPERATURES, KEEP FROM FREEZING

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS, STRONG ACIDS

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
DECOMPOSITION WILL NOT OCCUR IF HANDLED AND STORED PROPERLY. IN CASE OF A FIRE, OF CARBON, HYDROCARBONS, FUMES, AND SMOKE MAY BE PRODUCED.

HAZARDOUS POLYMERIZATION:
MAY OCCUR ( )
WILL NOT OCCUR (X)

CONDITIONS TO AVOID: NONE

SECTION 11 - TOXICOLOGICAL INFORMATION

top

HAZARDOUS INGREDIENTS	CAS #	EINECS #	LD50 OF INGREDIENT (SPECIFY SPECIES AND ROUTE)	LC50 OF INGREDIENT (SPECIFY SPECIES)

NO HAZARDOUS MATERIALS
PRESENT AS DEFINED BY
OSHA - 29 CFR 1910.1000;
EPA - 40 CFR 260 - 281,
302, 355, 370, 372;
DOT - 49 CFR 172;
WHMIS OR EC DIRECTIVE
91 / 155 / EEC.

SECTION 12 - ECOLOGICAL INFORMATION

top

NO DATA ARE AVAILABLE ON THE ADVERSE EFFECTS OF THIS MATERIAL ON THE ENVIRONMENT. NEITHER COD NOR BOD DATA ARE AVAILABLE. BASED ON THE CHEMICAL COMPOSITION OF THIS PRODUCT IT IS ASSUMED THAT THE MIXTURE CAN BE TREATED IN AN ACCLIMATIZED BIOLOGICAL WASTE TREATMENT PLANT SYSTEM IN LIMITED QUANTITIES. HOWEVER, SUCH TREATMENT SHOULD BE EVALUATED AND APPROVED FOR EACH SPECIFIC BIOLOGICAL SYSTEM. NONE OF THE IN THIS MIXTURE ARE CLASSIFIED AS A MARINE POLLUTANT.

SECTION 13 - DISPOSAL CONSIDERATIONS

top

WASTE DISPOSAL METHOD:
DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
PRODUCT IS CLASSIFIED AS NON - HAZARDOUS, HOWEVER, NON-HAZARDOUS MATERIALS MAY BECOME HAZARDOUS WASTE UPON CONTACT WITH OTHER PRODUCTS. REFER TO "40 CFR PROTECTION OF ENVIRONMENT PARTS 260 - 299" FOR COMPLETE WASTE DISPOSAL REGULATIONS. CONSULT YOUR LOCAL, STATE, OR FEDERAL ENVIRONMENTAL PROTECTION AGENCY BEFORE DISPOSING OF ANY CHEMICALS.

SECTION 14 - TRANSPORT INFORMATION

top

PROPER SHIPPING NAME: NOT REGULATED

DOT HAZARD CLASS / PACK GROUP: NOT REGULATED
REFERENCE: NOT APPLICABLE
UN / NA IDENTIFICATION NUMBER: NONE
LABEL: NONE REQUIRED
HAZARD SYMBOLS: NONE

IATA HAZARD CLASS / PACK GROUP: NOT REGULATED

IMDG HAZARD CLASS: NOT REGULATED

RID/ADR DANGEROUS GOODS CODE: NOT REGULATED

UN TDG CLASS / PACK GROUP: NOT REGULATED

HAZARD IDENTIFICATION NUMBER (HIN): NONE

NOTE:
TRANSPORTATION INFORMATION PROVIDED IS FOR REFERENCE ONLY. CLIENT IS URGED TO CONSULT CFR 49 PARTS 100 - 177, IMDG, IATA, EC, UNITED NATIONS TDG, AND WHMIS (CANADA) TDG INFORMATION MANUALS FOR DETAILED REGULATIONS AND EXCEPTIONS COVERING SPECIFIC CONTAINER SIZES, PACKAGING MATERIALS AND METHODS OF SHIPPING.

SECTION 15 - REGULATORY INFORMATION

top

TSCA (TOXIC SUBSTANCE CONTROL ACT):
ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE U.S. TOXIC SUBSTANCES CONTROL ACT CHEMICAL INVENTORY (TSCA INVENTORY) OR ARE EXEMPTED FROM LISTING BECAUSE A LOW VOLUME EXEMPTION HAS BEEN GRANTED IN ACCORDANCE WITH 40 CFR 723.50.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):
311/312 HAZARD CATEGORIES: NONE
313 REPORTABLE INGREDIENTS: NONE

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION AND LIABILITY ACT): NONE

CALIFORNIA PROP 65, SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986:
THERE ARE NO CHEMICALS PRESENT KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY.

CPR (CANADIAN CONTROLLED PRODUCTS REGULATIONS):
THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CONTROLLED PRODUCTS REGULATIONS AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CONTROLLED PRODUCTS REGULATIONS.

WHMIS CLASSIFICATION: NOT CONTROLLED

IDL (CANADIAN INGREDIENT DISCLOSURE LIST):
COMPONENTS OF THIS PRODUCT IDENTIFIED BY CAS NUMBER AND LISTED ON THE CANADIAN INGREDIENT DISCLOSURE LIST ARE SHOWN IN SECTION 2.

DSL / NDSL (CANADIAN DOMESTIC SUBSTANCES LIST / NON-DOMESTIC SUBSTANCES LIST):
COMPONENTS OF THIS PRODUCT IDENTIFIED BY CAS NUMBER ARE LISTED ON THE DSL OR NDSL, OR ARE OTHERWISE IN COMPLIANCE WITH THE NEW SUBSTANCES NOTIFICATION (NSN) REGULATIONS. ONLY INGREDIENTS CLASSIFIED AS "HAZARDOUS"

ARE LISTED IN SECTION 2 UNLESS OTHERWISE INDICATED.

EINECS (EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES):
COMPONENTS OF THIS PRODUCT IDENTIFIED BY CAS NUMBERS ARE ON THE EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES.

EC RISK PHRASES: NONE

SYMBOL(S) REQUIRED FOR LABEL: NONE

EC SAFETY PHRASES:
S2: KEEP OUT OF THE REACH OF CHILDREN.

SECTION 16 - OTHER INFORMATION

top

NO SPECIFIC NOTES.

HMIS HAZARD RATINGS:

HEALTH	0
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTIVE EQUIPMENT	A SAFETY GLASSES

* = CHRONIC HEALTH HAZARD
0 = INSIGNIFICANT
1 = SLIGHT
2 = MODERATE
3 = HIGH
4 = EXTREME

REVISION SUMMARY:

THIS MSDS HAS BEEN REVISED IN THE FOLLOWING SECTIONS:
SECTION 9, FREEZING POINT

CHEMTEL INC.

MSDS PREPARED BY:
CHEMTEL INC.
1305 N. FLORIDA AVE.
TAMPA, FLORIDA USA 33602
(888) 255-3924

INTL.: 01+ (813) 248-0573

WWW.CHEMTELINC.COM

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE SO. DATA AND CALCULATIONS ARE BASED ON INFORMATION FURNISHED BY THE MANUFACTURER OF THE PRODUCT AND MANUFACTURERS OF THE COMPONENTS OF THE PRODUCT. USERS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED

THAT INFORMATION IS CURRENT, APPLICABLE AND SUITED TO THE CIRCUMSTANCES OF USE. VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT ADHERED TO AS STIPULATED IN THE DATA SHEET. FURTHERMORE, VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY CAUSED BY ABNORMAL USE OF THIS MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED. ANY QUESTIONS REGARDING THIS PRODUCT SHOULD BE DIRECTED TO THE MANUFACTURER OF THE PRODUCT AS DESCRIBED IN SECTION 1.

MATERIAL SAFETY DATA SHEET (MSDS)
PRODUCT NAME: MEK

Team, Inc.
Team Industrial Services, Inc.
TECO Manufacturing, Inc.
200 Hermann Drive
Alvin, Texas 77511

Prepared By: James H. Varner
Revision Date: July 1, 2006
Team Main: 281-331-6154
8 - 5 CDT: 281-388-5618
Answering Service: 281-482-3530
CHEMTREC: 800-424-9300

1. General Notes

This formulation is a trade secret and considered confidential and proprietary information of Team, Inc.

UND = Undetermined
NA = Not Applicable

2. Product Information

Product Part Number / Name: 804-0004 / MEK
Chemical Family: Ketone
Product Use: Industrial Leak Sealant
Product Description: Solvent

3. Hazardous Ingredients

Compound	CAS Number	Percent	OSHA PEL (mg/m3)	ACGIH TLV (mg/m3)	OSHA PEL (ppm)	ACGIH TLV (ppm)	Possible Carcinogen
methyl ethyl ketone	78-93-3	50 +			200	200	

Notes

4. Physical Data

Boiling Point (F):	175 F.	Specific Gravity (H20 = 1):	.806 @ 68 F.
Vapor Pressure (mm Hg):	70 mmHg @ 68 F.	Melting Point (F):	UND.
Solubility in H20:	26.8 % at 20 C.	Evaporation Rate (Butyl Acetate = 1):	5.70 (N- Butyl Acetate)
Appearance and Odor:	Clear, colorless, mobile liquid, with a strong characteristic " Ketone " odor.		

5. Fire and Explosion Hazard Information

Flash Point (Closed Cup) (F): 23 F
Flammability Limits in Air (%): Low: 2.0 % High: 11.5 %
Extinguishing Media: Regular foam, carbon dioxide, dry chemical.
Special Fire Fighting Procedures: SCBA with full faceshield
Unusual Fire and Explosion: Product is highly volatile and gives off vapors which will ignite.

6. Reactivity Data

Team, Inc.
Team Industrial Services, Inc.
TECO Manufacturing, Inc.
200 Hermann Drive
Alvin, Texas 77511

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Stability:	Stable.
Conditions to Avoid:	None known.
Materials to Avoid:	Avoid contact with: strong oxidizing agents.
Hazardous Decomposition Products:	May form: carbon dioxide and carbon monoxide.
Hazardous Polymerization:	Will not occur.

7. Health Hazards

Routes of Entry:

Inhalation:	Yes
Skin:	Yes
Eyes:	Yes
Ingestion:	Yes

Acute Symtoms:

Inhalation:	May cause irritation to the mucous membrane of throat and respiratory tract.
Skin:	Repeated or prolonged exposure may cause irritation.
Eyes:	May cause irritation and in extreme cases, possibly blindness.
Ingestion:	May cause dizziness, unconsciousness, CNS disorder (headache, nausea, vomiting) and if ingested in large quantities, possibly death.

Carcinogenicity:

National Toxicology	None.
IARC Monographs:	None.
OSHA Regulated:	None.

Chronic Symptoms:	Repeated or prolonged exposures may result in shorting the time of onset or worsens the liver and kidney damage induced by other chemicals.
Medical Conditions Aggravated:	None Known.

Team, Inc.
Team Industrial Services, Inc.
TECO Manufacturing, Inc.
200 Hermann Drive
Alvin, Texas 77511

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CHEMTREC: 800-424-9300

1st Aid Procedures:

Inhalation:	Immediately remove from contaminated area to fresh air. Keep individual quiet. In case of respiratory distress, give oxygen or give artificial respiration. Obtain medical attention.
Skin:	Thoroughly wash affected area with soap and water. Flush area with water for 15 minutes. If irritation develops, obtain medical attention.
Eyes:	Flush with water for at least 15 minutes. If irritation develops, obtain medical attention.
Ingestion:	Do not induce vomiting. Obtain medical attention.

8. Safe Handling / Disposal / Use

Releases or Spills:	Soak up with absorbent material. Place in container for disposal. If needed, on small spills flush with large quantities of water and detergent.
Disposal:	Dispose of in accordance with all applicable local, state and federal regulations.
Ventilation:	Use adequate ventilation.
Other Storage Precautions:	Keep away from open flames. Avoid prolonged contact with skin.

9. Control Measures

Respiratory Protection:	If ventilation is poor, an organic vapor respirator is recommended.
Ventilation:	Local exhaust is usually adequate. If necessary use mechanical exhaust.
Hand Protection:	Hydrocarbon resistant gloves recommended.
Eye Protection:	Safety goggles or glasses.
Other:	Other equipment as necessary.
Hygienic Practices:	Wash hands with soap and water.

10. Hazard Ratings

Team, Inc.
Team Industrial Services, Inc.
TECO Manufacturing, Inc.
200 Hermann Drive
Alvin, Texas 77511

Prepared By: James H. Varner
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CHEMTREC: 800-424-9300

	NFPA
Health:	1
Flammability:	3
Reactivity:	0

11. Additional Information

This data is offered in good faith as typical values and not as a product specification. No warranty, is either expressed or implied. The recommended handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use.

End of Document

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Armor All

REGULAR TEL. #:
EMERGENCY TEL. #: 714-362-0600

ADDRESS: 6 Liberty, Aliso Viejo, CA 92656

TRADE NAME: Armor All Car Cleaner

SYNONYMS:

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	%	HAZARD DATA
N-Propoxypropanol	<10.00	
Tetrapotassium Pyprophosphate	< 5.00	
Nonyl Phenol Ethoxylate	<10.00	

III. PHYSICAL DATA

BOILING POINT: 205°F

MELTING POINT:

SPECIFIC GRAVITY: 1.030

VAPOR PRESSURE: 2.1

VAPOR DENSITY: 1

SOLUBILITY IN H20 % BY WEIGHT: About 97% Soluble

% VOLATILES BY VOLUME:

EVAPORATION RATE (BUTYL ACETATE): 0.3

APPEARANCE AND ODOR: Clear liquid with fragrance.

MATERIAL SAFETY DATA SHEET

IV. FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)	Not Available. Combustible.	AUTOIGNITION TEMPERATURE			
FLAMMABLE LIMITS IN AIR % BY VOLUME		LOWER		UPPER	
EXTINGUISHING MEDIA	Foam or C02. Use water to cool fire-exposed containers.				
SPECIAL FIRE FIGHTING PROCEDURES	Wear self contained breathing apparatus with facepiece operated in pressure demand or other positive pressure mode.				
UNUSUAL FIRE AND EXPLOSION HAZARD	None known.				

V. HEALTH HAZARD INFORMATION

HEALTH HAZARD DATA:

ROUTES OF EXPOSURE INHALATION: Avoid prolonged or repeated breathing of vapor.

SKIN CONTACT: Avoid prolonged or repeated contact with skin.

SKIN ABSORPTION:

EYE CONTACT: Avoid prolonged or repeated contact with eyes.

INGESTION:

EFFECTS OF OVEREXPOSURE/ACUTE OVEREXPOSURE:

CHRONIC OVEREXPOSURE:

MATERIAL SAFETY DATA SHEET

V. HEALTH HAZARD INFORMATION (CONTINUED)

EMERGENCY AND FIRST AID PROCEDURES:

EYES: Flush thoroughly with water for 15 minutes. If irritation persists, call a physician.

SKIN: Flush skin with water.

INHALATION: Remove to fresh air.

INGESTION: If swallowed, do not induce vomiting. Call a physician immediately.

NOTES TO PHYSICIAN:

VI. REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY:

INCOMPATIBILITY:

HAZARDOUS DECOMPOSITION PRODUCTS:

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Use absorbent material to collect and contain for salvage and/or disposal. Remove all sources of ignition and wear protective equipment.

NEUTRALIZING CHEMICALS:

WASTE DISPOSAL METHOD: In accordance with local, state and federal regulations.

MATERIAL SAFETY DATA SHEET

VIII. SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS:

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY (SPECIFIC DETAIL):

EYE:

GLOVES:

OTHER CLOTHING AND EQUIPMENT:

IX. SPECIAL PRECAUTIONS

PRECAUTIONARY STATEMENTS:

OTHER HANDLING AND STORAGE REQUIREMENTS:

PREPARED BY:

ADDRESS:

ATE:

Material Safety Data Sheet

Revision Number: 002.1

Issue date: 12/01/2010

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite(R) Extend(R) Rust Treatment**
Product type: Rust converter

Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

IDH number: 234928
Item number: 30539
Region: United States

Contact information:
Telephone: 860.571.5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state: Aerosol, Liquid
Color: Translucent
Odor: Acetone

HEALTH: *2
FLAMMABILITY: 3
PHYSICAL HAZARD: 1
Personal Protection: See MSDS Section 8

DANGER: CONTENTS UNDER PRESSURE.
EXTREMELY FLAMMABLE LIQUID AND VAPOR.
VAPOR HARMFUL.
MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
MAY CAUSE EYE, SKIN AND RESPIRATORY BURNS.

Relevant routes of exposure: Skin, Inhalation, Eyes, Ingestion

Potential Health Effects

Inhalation: Mists, vapors or liquid may cause severe irritation or burns. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Skin contact: Exposure to mists, vapors and liquid may cause severe skin irritation or burns.

Eye contact: High concentration of product vapors can cause severe irritation of eyes. Direct spray or vapors will irritate and may harm eyes.

Ingestion: Harmful if swallowed.

Existing conditions aggravated by exposure: Not available

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
2-Butoxyethanol	111-76-2	30 - 60
Acetone	67-64-1	30 - 60
Formic acid	64-18-6	5 - 10

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Seek medical advice.

Skin contact:	Remove contaminated clothing and footwear. Wash with soap and water. If symptoms develop and persist, get medical attention. Wash clothing before reuse.
Eye contact:	Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.
Ingestion:	Rinse mouth, drink 1-2 glasses of water, do not induce vomiting, consult a doctor.

5. FIRE FIGHTING MEASURES

Flash point:	< -17.7 °C (< 0.14 °F) ; This product exhibits flashback when tested for flame extension.
Autoignition temperature:	Not available
Flammable/Explosive limits - lower:	1.1 %
Flammable/Explosive limits - upper:	57 %
Extinguishing media:	Carbon dioxide. Dry chemical. Foam
Special firefighting procedures:	Use water spray to keep fire exposed containers cool and disperse vapors. Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.
Unusual fire or explosion hazards:	Closed containers may rupture (due to build up of pressure) when exposed to extreme heat. Vapours may accumulate in low or confined areas, travel considerable distance to source of ignition, and flash back.
Hazardous combustion products:	Oxides of carbon. Hydrocarbons

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Do not allow material to contaminate ground water system. Do not let product enter drains. Absorb spill with inert material. Shovel material into appropriate container for disposal.
Clean-up methods:	Absorb the spilled material with an inert absorbent (nonflammable) material.

7. HANDLING AND STORAGE

Handling:	Avoid breathing mists or aerosols of this product. Keep away from sources of ignition - no smoking. Avoid contact with eyes, skin and clothing.
Storage:	Store in a cool, dry area. Keep containers closed when not in use.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
2-Butoxyethanol	20 ppm TWA	50 ppm (240 mg/m3) TWA (SKIN)	None	None
Acetone	500 ppm TWA 750 ppm STEL	1,000 ppm (2,400 mg/m3) TWA	None	None
Formic acid	5 ppm TWA 10 ppm STEL	5 ppm (9 mg/m3) TWA	None	None

Engineering controls: Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety glasses with sideshields or chemical safety goggles should be worn if there is a risk of splashing.

Skin protection: Use impermeable gloves and protective clothing as necessary to prevent skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Aerosol, Liquid
Color: Translucent
Odor: Acetone
Odor threshold: Not available
pH: Not available
Vapor pressure: Not available
Boiling point/range: Not available
Melting point/ range: Not available
Specific gravity: 1.0000
Vapor density: Not available
Flash point: < -17.7 °C (< 0.14 °F) ; This product exhibits flashback when tested for flame extension.
Flammable/Explosive limits - lower: 1.1 %
Flammable/Explosive limits - upper: 57 %
Autoignition temperature: Not available
Evaporation rate: Not available
Solubility in water: Not available
Partition coefficient (n-octanol/water): Not available
VOC content: 50.4 %

10. STABILITY AND REACTIVITY

Stability: Stable

Hazardous reactions: Will not occur.

Hazardous decomposition products: Irritating organic vapours. Oxides of carbon.

Incompatible materials: Acids and bases. Oxidizing agents.

Conditions to avoid: Keep away from heat, spark and flame.

11. TOXICOLOGICAL INFORMATION

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
2-Butoxyethanol	No	No	No
Acetone	No	No	No
Formic acid	No	No	No

Hazardous components	Health Effects/Target Organs
2-Butoxyethanol	Blood, Central nervous system, Irritant, Kidney, Liver
Acetone	Blood, Central nervous system, Irritant, Reproductive
Formic acid	Central nervous system, Corrosive, Irritant, Kidney, Metabolic

12. ECOLOGICAL INFORMATION

Ecological information: No specific studies have been conducted by Henkel on the ecotoxicity or environmental fate of this material; however, commonly available data on the material indicate that uncontrolled releases to soil, ground water, or surface waters could entail acute and/or chronic ecological effects, depending on the quantity and concentration of such releases. Releases of volatile components to the atmosphere are not believed to entail significant ecological consequences provided such releases are within the exposure levels set forth in this document. Accordingly, all appropriate measures should be taken to avoid uncontrolled releases to the environment, and any spills or other uncontrolled releases which may occur should be contained and cleaned up immediately in accordance with Section 6.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Dispose of according to Federal, State and local governmental regulations.

Hazardous waste number: D001: Ignitable.

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Aerosols
Hazard class or division: 2.1
Identification number: UN 1950
Packing group: None
DOT Reportable quantity: Acetone

International Air Transportation (ICAO/IATA)

Proper shipping name: Aerosols, flammable
Hazard class or division: 2.1
Identification number: UN 1950
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: AEROSOLS
Hazard class or division: 2.1
Identification number: UN 1950
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12(b) Export Notification: None above reporting de minimus

CERCLA/SARA Section 302 EHS: None above reporting de minimus
CERCLA/SARA Section 311/312: Immediate Health, Delayed Health, Fire, Sudden Release
CERCLA/SARA 313: This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). 2-Butoxyethanol (CAS# 111-76-2). Formic acid (CAS# 64-18-6).

California Proposition 65: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. This product contains a chemical known in the State of California to cause cancer.

Canada Regulatory Information

CEPA DSL/NDSL Status: All components are listed on or are exempt from listing on the Canadian Domestic Substances List.

WHMIS hazard class: A, B.1, D.2.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: New Material Safety Data Sheet format.

Prepared by: Lou Fabrizio, Regulatory Affairs Specialist

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation does not assume responsibility for any results obtained by persons over whose methods Henkel Corporation has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any of Henkel Corporation's products. In light of the foregoing, Henkel Corporation specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation further disclaims any liability for consequential or incidental damages of any kind, including lost profits.

MATERIAL SAFETY DATA SHEET

E-404
01 00

MANUFACTURER' S NAME
THE NOCO COMPANY
23300 Mercantile Rd.
Cleveland, OH 44122-5921

EMERGENCY TELEPHONE NO.
(800) 424-9300

DATE OF PREPARATION
07-AUG-00

INFORMATION TELEPHONE NO.
(216) 464-8131

Section I — PRODUCT IDENTIFICATION

PRODUCT NUMBER

E-404

HMIS CODES

Health	2
Flammability	4
Reactivity	0

PRODUCT NAME
NOCO* H2SO4 Battery Cleaner and Acid Detector
PRODUCT CLASS
Aerosol Cleaner

Section II — HAZARDOUS INGREDIENTS

INGREDIENT / CAS No.	% by WT	ACGIH TLV	OSHA PEL	UNITS	V.P.
Propane 74-98-6	3	2500	1000	PPM	760.00
Butane 106-97-8	7	800	800	PPM	760.00
2-Propanol 67-63-0	6	400	400	PPM	33.00
	STEL	500	500	PPM	

pH - 7.0

Section III — PHYSICAL DATA

PRODUCT WEIGHT	7.69 lb/gal	921 g/l
SPECIFIC GRAVITY	0.93	
BOILING POINT	<0 - 213 F	<-18 - 100 C
MELTING POINT	Not Available	
VOLATILE VOLUME	98 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)
Volatile Weight 15.90 % Less Federally Exempt Solvents
HMIS — 2 4 0

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	LEL	UEL
Propellant < 0 F	1.9	12.7

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam

Continued on page 2

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

If SWALLOWED: Get medical attention.

CHRONIC Health Hazards

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY — Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Continued on page 3

Section VII – SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII – PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.

PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section IX – PRECAUTIONS

DOL STORAGE CATEGORY

1A

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section X – OTHER REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

Continued on page 4

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element

No ingredients in this product are subject to SARA 313 (40 CFR 372.65C) Supplier Notification.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

PACKAGING TAPE, INCORPORATED

4900 West Stewart Avenue
Wausau, WI. 54402

MATERIAL SAFETY DATA SHEET

Revision Date: 10/13/2005 **MSDS No.: PTI-795**

Emergency Phones: 800-826-4405 **800-424-9300 (CHEMTREC)**

PLEASE NOTE: This MSDS is being provided to your company for the purpose of providing current health and safety information to your management and for your employees who work with this material. Please read the information on these sheets, and then provide this information to those people at your company whose responsibility it is to comply with FEDERAL and STATE RIGHT-TO-KNOW regulations. Also make this information available to any employee who requests it. It is your obligation to comply with these regulations.

SECTION I - PRODUCT IDENTITY

PRODUCT NAME: 'POWER CLEAN' DEGREASER
Formula: Mixture, Sodium hydroxide, inorganic detergent builders, detergents, solvent, and additives in water.
Chemical Type: as above

HMIS RATINGS

Health = 3 (Serious)	Flammability = 0 (Minimal)
Reactivity = 0 (Minimal)	Protection = D (Face Shield, Gloves, Synthetic Apron)

SECTION II - HAZARDOUS INGREDIENTS

	PERCENT	TLV	CARCINOGEN (OSHA,TP,IARC)
Sodium Hydroxide CAS No. 1310-73-2	> 6%	2 mg/m3 ceiling	no
2-Butoxyethanol CAS No. 11176-2	< 15%	25 ppm	

SECTION III - CHEMICAL AND PHYSICAL

Appearance: green liquid
Odor: solvent
pH: >13.5
Water Solubility: Completely
Viscosity, Cp. @ 25°C.: A-5 (Ianger

Boiling Point: 212 ° F.
Melting Point: N/A
Spec. Gravity (H_2O = 1): 1.09
Vapor Pressure (mm Hg): n/a
VOC Content: >13%

SECTION IV - FIRE AND EXPLOSION HAZARDS

Flash Point (Method): none

Explosion Limits: Upper: N/A
Lower: N/A

Extinguishing Media: not flammable.
Special Firefighting Procedures and Hazards: Avoid skin and eye contact, and breathing of acid vapors. Wear head and body protection and alkali respirator if exposure to liquid is likely. Fire waters may become corrosive with product contact

SECTION V - REACTIVITY INFORMATION

Stable: ☒ Unstable: ☐

Precautions:
Incompatibility: strong acids, materials not resistant to alkalis, active metals (zinc, aluminum, magnesium, etc.).

Hazardous Decomposition Products: Contact with active metals can release flammable hydrogen gas.

Hazardous Polymerization: Occurs: Does Not Occur: x

SECTION VI - HEALTH HAZARDS - PROTECTIVE MEASURES - FIRST AID

Inhalation: Breathing of mists can cause respiratory irritation or burns. Wear approved alkali mist respirator if exposure is likely. Remove to fresh air. Give artificial respiration or oxygen if needed. Get prompt medical attention.

Skin: Corrosive! Extended contact may cause irritation. Prolonged contact with 2-butoxyethanol may result in the absorption of potentially harmful amounts leading to possible liver and kidney damage. Flush skin with water for 15 minutes. Wear protective gloves if needed. Get medical attention for any irritation.

Eyes: Corrosive. Causes eye damage. Wear splash proof goggles. Provide convenient eyewash stations. Flush immediately with water for 15 minutes. Get prompt medical attention.

Ingestion: Corrosive. Causes irritation and burning in mouth, esophagus, throat and stomach. Avoid swallowing. Drink lots of water or, preferably, milk. Get medical attention if effects persist. Do not induce vomiting.

Most likely routes of entry: Skin, Eyes, Inhalation

Other Important Medical or Precautionary Information: none

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Spills and Leaks: Small spills can be flushed into normal drainage or into ground with copious amounts of water, or taken up with absorbant material. Larger spills should be contained by dike or other methods and held for collection and/or reuse, or for neutralization with alkali before collection & disposal. People should use eye and skin protection & respirator.

Storage and Handling: Check daily for any leaks from containers, vessels, pumps, and piping. Have water hoses and acid (acetic, glycolic acids etc.) convenient. Only use containers and equipment designed for acid service.

Waste Disposal: If neutralized may be disposable in sewers if local regulations permit. Otherwise, send to licensed treatment and disposal facility. As supplied, this product is a RCRA hazardous waste.

Empty Containers: Rinse well before handling and disposal.

Other Precautions: none

SECTION VIII - REGULATORY INFORMATION

Reportable for SARA Title III, S.313 (Form R): 2-butoxyethanol

The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, PTI cannot give any guarantees regarding information from other sources, and expressly does not make any warranties, nor assumes any liability, for its use.

RECKITT BENCKISER

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name	**PROFESSIONAL RESOLVE® SPOT & STAIN CARPET CLEANER (TRIGGER)**
Product Description	Not available.
Manufacturer	Reckitt Benckiser North America, Inc. Morris Corporate Center IV 399 Interpace Parkway (P.O. Box 225) Parsippany, N.J. 07054-0225
Product Identifier	Not available.
Item Number	36241-97402-08
Formula Number	713-179 (F/F 378171); 732-191 (F/F 375602)
UPC Number	36241-97402 (32 oz.) Trigger.

MSDS#	Not available.
Validation Date	**5/3/2004**
Print Date	5/5/2004

In case of Emergency:	Telephone: 800-677-9218 (Professional Products)
Transportation Emergencies:	Chemtrec: 1-800-424-9300 (U.S. & Canada) Outside the U.S & Canada (North America), call: 703-527-3887

Section 2. Composition and Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits : TLV/PEL
1) ISOPROPYL ALCOHOL	67-63-0	1-2	TWA: 983 STEL: 1230 (mg/m^3) from ACGIH (TLV) [United States] TWA: 400 STEL: 500 (ppm) from ACGIH (TLV) [United States] TWA: 980 STEL: 1230 (mg/m^3) from OSHA (PEL) [United States] TWA: 400 (ppm) from OSHA (PEL) [United States]

Section 3. Hazards Identification

Emergency Overview	No adverse effects are expected from exposure to the recommended use of this product. KEEP OUT OF REACH OF CHILDREN.

Section 4. First Aid Measures

Eye Contact	In case of eye contact, immediately rinse eyes thoroughly with plenty of water. Remove any contact lenses and continue rinsing for at least 15 minutes. If irritation persists, consult a physician.
Skin Contact	In keeping with good hygienic practices, wash exposed areas thoroughly with soap and water.
Inhalation	None required. Remove to fresh air.
Ingestion	Rinse mouth with water. Contact a physician or poison control center if symptoms develop. NEVER give an unconscious person anything to ingest.

Continued on Next Page

Section 5. Fire and Explosion Data

Flammability	Not flammable. See Section 14 for any Shipping Classifications.
Flash Point	CLOSED CUP: Higher than 93.3°C (>200°F). (Tagliabue.).
Explosive Limits in Air	Not available.
Products of Combustion	Not available.
Fire and Explosion Hazards	None known.
Fire Fighting Media and Instructions	Use water spray, foam, dry chemical or carbon dioxide, as suitable for the surrounding fire.
Special Fire Fighting Instructions	Wear self-contained breathing apparatus and protective clothing appropriate for fighting a chemical fire.

Section 6. Accidental Release Measures

Accidental Spill	Small spills: Soak up with an inert absorbent material and dispose of in an appropriate waste container. Rinse surface reside and flush to sink or sanitary sewer. Large spills should be diked, contained and collected for later disposal according to local, state or federal regulations.

Section 7. Handling and Storage

Handling and Storage	Do not mix with bleach or use in conjunction with other household products. Keep from freezing. Store in original container in a secure area, inaccessible to children and pets. KEEP OUT OF REACH OF CHILDREN.

Section 8. Exposure Controls/Personal Protection

Ventilation Requirements	None required.
Eye Protection	Emergency responders should wear full eye and face protection.
Skin Protection	None required.
Respiratory Protection	None required.
Other Protection	None required.
Work/Hygienic Practices	Washing with soap and water after use is recommended as good hygienic practice to prevent possible eye irritation from hand contact.

Section 9. Physical and Chemical Properties

Description	Clear liquid. Thin
pH	6.7 [Neutral.]
Boiling/Condensation Point	Not available.
Specific Gravity	0.9985(Water = 1)
Vapor Pressure	Not determined.

Odor	Citrus / Herbaceous.
Color	Pale amber color.

Continued on Next Page

Vapor Density	Not determined.
Viscosity	Not available.
Solubility	Complete.
Physical Chemical Comments	Not available.

Section 10. Stability and Reactivity Data

Chemical Stability	The product is stable.
Conditions of Instability	None known.
Incompatibility with Various Substances	Do not mix with bleach or other household cleaners.
Hazardous Decomposition Products	None known.
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

Exposure effects

Eye Contact	None expected. May cause eye irritation upon direct contact with the eyes.
Skin Contact	None expected.
Inhalation	None expected.
Ingestion	None expected.
Carcinogenicity	Not listed as carcinogenic by OSHA, NTP or IARC.

Section 12. Ecological Information

Ecotoxicity	Not available.

Section 13. Disposal Considerations

Waste Disposal	Rinse empty container thoroughly and discard in trash or rinse and recycle container. Large quantity disposal: Dispose of in accordance with local, state and federal regulations.

Section 14. Transport Information

DOT Classification	Not a DOT regulated material (United States).
Proper Shipping Name	Not applicable.
DOT Identification Number	Not applicable
Packing Group	Not applicable
Maritime Transportation	Not applicable.

Continued on Next Page

Hazardous Substances Reportable Quantity	Not applicable.
Special Provisions for Transport	Not applicable.
TDG Classification	Not regulated under TDG.
ADR Classification	Not applicable.
IMDG Classification	Not regulated under IMDG.
IATA Classification	Not regulated under IATA.

Section 15. Regulatory Information

Federal and State Regulations

SARA Title III, Section 313 Toxic Chemical Notification & Release Reporting:

1) ISOPROPYL ALCOHOL	Not available.	1-2	Not avai

California Proposition 65: This product contains the following ingredients which require a warning under the Safe Drinking Water & Toxic Enforcement Act:
None

Other Classifications

WHMIS (Canada) Not controlled under WHMIS (Canada).

New Jersey Right-To-Know Regulation:

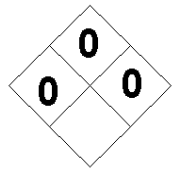
WATER CAS #: 7732-18-5
ISOPROPYL ALCOHOL CAS #: 67-63-0
SODIUM LAURYL SULFATE CAS #: 151-21-3
TETRASODIUM EDTA CAS #: 64-02-8
ETHYLENE GLYCOL HEXYL GLYCOL CAS #: 112-25-4

Section 16. Other Information

HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	0
Reactivity	0
Personal Protection	A

National Fire Protection Association (U.S.A.)



NFPA Aerosol Level Not applicable.

Validated by Product Safety on 5/3/2004.

Printed 5/5/2004.

Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

MSDS Safety Information

TOP

FSC: 7930 **NIIN:** 01−306−8369 **MSDS Date:** 03/01/1993 **MSDS Num:** BWKZD

Submitter: F BT **Tech Review:** 08/31/1994 **Status CD:** C

Product ID: 13005 SIMPLE GREEN **MFN:** 02

Article: N **Kit Part:** N

Responsible Party **Cage:** IO907

Name: SUNSHINE MAKERS INC

Address: 15922 PACIFIC COAST HWY **Box:** N/K

City: HUNTINGTON HARBOR **State:** CA **Zip:** 92649−5000

Country: US

Info Phone Number: 800−228−0709/213−592−3034

Emergency Phone Number: 213−592−3034/800−228−0709

Preparer's Name: N/P

Proprietary Ind: N Review Ind: Y

Published: Y Special Project CD: N

Preparer Co. when other than Responsible Party Co.

TOP

Cage: IO907 **Assigned Ind:** Y

Name: SUNSHINE MAKERS INC

Address: 15922 PACIFIC COAST HIGHWAY **Box:** N/K

City: HUNTINGTON HARBOUR **State:** CA **Zip:** 92649

Contractor Summary

TOP

Cage: IO907 **Name:** SUNSHINE MAKERS INC

Address: 15922 PACIFIC COAST HIGHWAY **Box:** N/K

City: HUNTINGTON HARBOUR **State:** CA **Zip:** 92649

Country: US **Phone:** 310−795−6000

Cage: 1Z575 **Name:** SUNSHINE MAKERS, INC.

Address: 15922 PACIFIC COAST HIGHWAY

City: HUNTINGTON HARBOUR **State:** CA **Zip:** 92649

Country: US **Phone:** 800−228−0709/562−795−6000

Item Description Information

TOP

Item Manager: GSA

Item Name: CLEANING COMPOUND,SOLVENT−DETERGENT

Specification Number: NK Type/Grade/Class: NK

Unit of Issue: BX Quantitative Expression: 00000000006EA

UI Container Qty: 0 Type of Container:

Ingredients

TOP

Cas: 111−76−2 Code: M RTECS #: KJ8575000 Code: M

Name: **2−BUTOXYETHANOL (ETHYLENEGLYCOL MONOBUTYL ETHER), BUTYL CELLOSOLVE, BUTYL GLYCOL, GLYCOL ETHER EB**

% Text: <6 Environmental Wt:

Other REC Limits: 25 PPM (SKIN)

OSHA PEL:	50 PPM (SKIN)	Code: M	OSHA STEL:		Code:
ACGIH TLV:	25 PPM (SKIN)	Code: M	ACGIH STEL:	N/P	Code:
EPA Rpt Qty:			DOT Rpt Qty:		

Ozone Depleting Chemical: N

Cas: Code: X RTECS #: 9999999VO Code: M

Name: **VOL ORGANIC CMPD: 7.96 G/L**

% Text: N/K Environmental Wt:

Other REC Limits: N/K

OSHA PEL:	N/K	Code: M	OSHA STEL:		Code:
ACGIH TLV:	N/K	Code: M	ACGIH STEL:	N/P	Code:
EPA Rpt Qty:			DOT Rpt Qty:		

Ozone Depleting Chemical:

Health Hazards Data

TOP

LD50 LC50 Mixture ORAL LD50(RAT): >5 G/KG

Route Of Entry Inds − Inhalation:YES Skin:NO Ingestion:NO

Carcinogenicity Inds − NTP:NO IARC:NO OSHA:NO

Health Hazards Acute And Chronic

EYES: REDDENING MAY DEVELOP, MILD IRRITANT. SKIN: REVERSIBLE REDDENING MAY OCCUR IN SOME DERMAL−SENSITIVE USERS. REPEATED DAILY APPLICATION W/O RINSING/CONTINUOUS CONTACT MAY LEAD TO TEMPORARY, BUT RE VERSIBLE, IRRITATION. INHALATION: MILD IRRITATION OF NASAL PASSAGES/THROAT.

Explanation Of Carcinogenicity

NONE

Signs And Symptions Of Overexposure

IRRITATION, REDDENING.

Medical Cond Aggravated By Exposure

DERMAL − SENSITIVE USERS MAY REACT TO DERMAL CONTACT.

First Aid

EYES: RINSE W/LARGE QUANTITIES OF COOL WATER FOR 10−15 MINS/UNTIL MATERIAL IS REMOVED, BE SURE TO REMOVE CONTACT LENSES. SKIN: RINSE W/WATER. INGESTION: GIVE SEVERAL GLASSES OF WATER TO DILUTE. DON'T INDUCE VOMITING. INHALATION: REMOVE TO FRESH AIR. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Spill Release Procedures

RECOVER USABLE MATERIAL BY CONVENIENT METHOD. RESIDUAL MAY BE REMOVED BY WIPE/WET MOP. IF NECESSARY, UNRECOVERABLE MATERIAL MAY BE WASHED TO DRAIN W/LARGE QUANTITIES OF WATER.

Neutralizing Agent

N/K

Waste Disposal Methods

PRODUCT IS WATER SOLUBLE & BIODEGRADABLE. IT WILL NOT HARM SEWAGE TREATMENT MICROORGANISMS IF DISPOSAL BY SEWER/DRAIN IS NECESSARY. DISPOSE OF IAW/LOCAL, STATE & FEDERAL REGULATIONS.

Handling And Storage Precautions

N/K

Other Precautions

N/K

========== Fire and Explosion Hazard Information ==========

TOP

Flash Point Method: N/P

Flash Point:

Flash Point Text: NONFLAMMABLE

Autoignition Temp:

Autoignition Temp Text: N/A

Lower Limits: N/K

Upper Limits: N/K

Extinguishing Media

NO SPECIAL PROCEDURES REQUIRED.

Fire Fighting Procedures

NONE REQUIRED.

Unusual Fire/Explosion Hazard

NONE REQUIRED.

========== Control Measures ==========

TOP

Respiratory Protection

NO SPECIAL PRECAUTIONS REQUIRED.

Ventilation

NO SPECIAL VENTILATION IS REQUIRED DURING USE.

Protective Gloves

NO SPECIAL PRECAUTIONS REQUIRED.

Eye Protection

REQUIRED

Other Protective Equipment

N/K

Work Hygienic Practices

REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. RINSE COMPLETELY FROM SKIN BEFORE TOUCHING EYES/CONTACT LENSES.

Supplemental Safety and Health

PRODUCT RESIDUES CAN BE COMPLETELY REMOVED BY RINSING W/WATER, THE CONTAINER MAY BE RECYCLED/APPLIED TO OTHER USES.

Physical/Chemical Properties

TOP

HCC:		NRC/State LIC No:	
Net Prop WT For Ammo:			
Boiling Point:		B.P. Text:	231F
Melt/Freeze Pt:		M.P/F.P Text:	16F
Decomp Temp:		Decomp Text:	N/K
Vapor Pres:	17	Vapor Density:	1.3
Volatile Org Content %:		Spec Gravity:	1.0257
VOC Pounds/Gallon:		PH:	9.5
VOC Grams/Liter:		Viscosity:	N/P

Evaporation Rate & Reference: N/K

Solubility in Water: COMPLETE

Appearance and Odor: TRANSLUCENT GREEN LIQUID W/CHARACTERISTIC SASSAFRAS ODOR.

Percent Volatiles by Volume: N/K

Corrosion Rate: N/K

Reactivity Data

TOP

Stability Indicator: YES

Stability Condition To Avoid: N/K

Materials To Avoid: N/K

Hazardous Decomposition Products: N/K

Hazardous Polymerization Indicator: NO

Conditions To Avoid Polymerization N/K

:

Toxicological Information

TOP

Toxicological Information: N/P

Ecological Information

TOP

Ecological: N/P

MSDS Transport Information

TOP

Transport Information: N/P

Regulatory Information

TOP

Sara Title III Information: N/P

Federal Regulatory Information: N/P

State Regulatory Information: N/P

Other Information

TOP

Other Information: N/P

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turtle wax, inc
625 Willowbrook Ctr Pkwy
Willowbrook, Illinois 60527

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME	**TURTLE WAX F-21 SUPER PROTECTANT**
PRODUCT CODE	**T-096R, 097R, 098R(C)**
CHEMICAL FAMILY	Vinyl and Rubber Protectant
CHEMICAL NAME	Mixture: water, silicone, emulsifiers, additives
FORMULA	Mixture

MANUFACTURER

Turtle Wax, Inc.
625 Willowbrook Centre Parkway
Willowbrook, IL 60527
Phone: 630-455-3700
Fax: 630-455-3868

EMERGENCY TELEPHONE NUMBERS

Transportation:
CHEMTREC: 800-424-9300
Medical:
Contact your local Poison Control Center

2. POSITION/INFORMATION ON INGREDIENTS

COMPONENT	**CAS NUMBER**	**CONCENTRATION (wt %)**
(None)		

EXPOSURE LIMITS 8 hrs. TWA(ppm)

	OSHA PEL	ACGIH TLV	CARCINOGEN (OSHA,NPT,IARC)

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

INHALATION: Repeated or excessive inhalation of vapor can cause irritation and nausea. No chronic effects known.

INGESTION: Can cause digestive system upsets and nausea. Avoid sucking into lungs. No chronic effects known.

SKIN CONTACT: Repeated or excessive contact can cause moderate irritation, de-fatting or dermatitis. No chronic effects known.

EYE CONTACT: Can cause irritation. No chronic effects known

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4. FIRST AID MEASURES

EYE: Flush with water for 15 minutes. Get prompt medical attention if effects persist.

SKIN: Remove contaminated clothing. Wash effected areas thoroughly with soap and water. Launder clothing before re-use.

INHALATION: Remove to fresh air. Use artificial respiration and oxygen if needed.

INGESTION: Rinse mouth. Never give anything orally to someone who is unconscious. Give several large classes of water to drink. If liquid is sucked into lungs, get prompt medical attention.

5. FIRE FIGHTING MEASURES

FLASH POINT: (Cl. Cup): >200°F (93°C) Explosive Limits: Lower: n/av Upper: n/av

EXTINGUISHING MEDIA: Water Spray, Alcohol Foam, Carbon Dioxide, Dry Chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Avoid flow of material to sewers. See Sec. 8 for personal protection.

6. ACCIDENTIAL RELEASE MEASURES

SPILL OR LEAK PROCEDURES: Take up large spills and put into closed container. Flush small spills (less than 1 gallon) to sewers. Floors may be slippery. See Section 8 for other protective measures.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE (MIN./MAX.): 32° F (0° C)/120° F (49° C)

SHELF LIFE: 7 years minimum when the original container is kept tightly closed and properly stored.

SPECIAL SENSITIVITY: None.

HANDLING AND STORAGE PRECAUTIONS: Store in cool and ventilated places, but avoid freezing. Keep containers closed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION REQUIREMENTS: Wear goggles. Have convenient eye wash stations.

SKIN PROTECTION REQUIREMENTS: Wear chemical resistant gloves and other clothing as needed to prevent exposure.

RESPIRATOR/VENTILATION PROTECTION REQUIREMENTS: Provide sufficient ventilation to avoid exposure levels above the established TLV.

INGESTION PROTECTION REQUIREMENTS: Avoid swallowing or sucking into lungs.

EXPOSURE LIMITS: Not established for product as whole.

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9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM: Opaque thin liquid

COLOR: white to light tan

ODOR: Leather

BOILING POINT: n/av

MELT/FREEZE POINT: n/av

PH: 9.0

SOLUBILITY IN WATER: Dispersable

SPECIFIC GRAVITY: 0.997

% NON-VOLATILE BY WEIGHT: 21.0%

VAPOR PRESSURE: n/av

VAPOR DENSITY: n/av

10. REACTIVITY

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Does not occur.

INCOMPATIBILITIES: Strong oxidizers such as peroxides.

DECOMPOSITION PRODUCTS: If burning: CO_2, CO, Hydrocarbons.

11. TOXICOLOGICAL INFORMATION

ACUTE INHALATION: Can cause irritation and nausea.

CHRONIC INHALATION: None known.

ACUTE SKIN CONTACT: Can cause irritation, de-fatting, or dermatitis.

CHRONIC SKIN CONTACT: None known.

ACUTE EYE CONTACT: Can cause irritation.

12. ECOLOGICAL INFORMATION

Product is readily biodegradable when diluted and used according to label directions.

13. DISPOSAL CONSIDERATIONS

RCRA HAZARDOUS WASTE: Is not a RCRA hazardous waste.

WASTE DISPOSAL METHOD: Dispose of product in accordance with all local, state and federal laws and regulations.

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14. TRANSPORT INFORMATION

DOT INFORMATION:	Not regulated as a hazardous material.	
PROPER SHIPPING NAME:	None	
TECHNICAL SHIPPING NAME:	None	
HAZARD CLASS:	None	
UN NUMBER:	None (Canada)	
PRODUCT RQ (lbs):	n/ap	
LABEL:	Non Bulk	None
	Bulk	None
PLACARD:	Non Bulk	None
	Bulk	None
FREIGHT CLASS BULK:	n/ap	
FREIGHT CLASS PACKAGE:	None	
PRODUCT LABEL:	None	

15. REGULATORY INFORMATION

TSCA STATUS: All ingredients are commercially available and listed by manufacturer. All ingredients are listed under TSCA.

CERCLA REPORTABLE QUANTITY: None

SARA TITLE III:

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES None

SECTION 311/312 HAZARD CATEGORIES

Acute Health	Yes
Chronic Health	No
Fire	No
Reactive	No
Sudden Release of Pressure	No

SECTION 313

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
None		

CANADIAN STATUS: All materials contained in this product are listed on the Canadian Domestic Substances List. Consult Turtle Wax, Inc. regarding status of ingredients.

EUROPEAN UNION: All materials contained in this product are listed on EINECS.

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STATE REGULATORY INFORMATION

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

COMPONENT/ **CAS NUMBER**	**CONCENTRATION**	**STATE CODE**

16. OTHER INFORMATION

HMIS CLASSIFICATION	Health	1
	Flammability	1
	Reactivity	0
	PPI	A
NFPA RATING	Health	1
	Fire	1
	Reactivity	0
	Special	None
REASON FOR ISSUE	Three Year Up-date	
PREPARED BY	James P. Heidel	
TITLE	Technical Director, R&D	
APPROVAL DATE	September 1, 2010	
SUPERCEDES DATE	September 11, 2007	
REVISION NUMBER	A-2	

This information is to the best of Turtle Wax, Inc.'s knowledge and belief, accurate and reliable. However, no representation, warranty, or guarantee is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitableness and completeness of such information for his own particular use.

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Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M™ Tire and Wheel Cleaner PN 39036
MANUFACTURER: 3M
DIVISION: Automotive Aftermarket

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 07/07/09
Supercedes Date: 06/30/09

Document Group: 26-9401-6

Product Use:
Intended Use: Automotive
Specific Use: AUTOMOTIVE TIRE AND WHEEL CLEANER

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
WATER	7732-18-5	80 - 100
ALCOHOLS, C10-16, ETHOXYLATED	68002-97-1	0.1 - 1.0
POLY(OXY-1,2-ETHANEDIYL),.ALPHA.-UNDECYL-.OMEGA.-HYDROXY-	34398-01-1	0.1 - 1.0
2-HYDROXY-1,2,3-PROPANETRICARBOXYLIC ACID, TRISODIUM SALT, DIHYDRATE	6132-04-3	0.1 - 1.0
D-LIMONENE	5989-27-5	< 0.01
CITRAL	5392-40-5	< 0.002

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Odor, Color, Grade: Clear/yellow liquid with lemon fragrance
General Physical Form: Liquid
Immediate health, physical, and environmental hazards:

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin Contact:
Moderate Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

Inhalation:
Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

Skin Contact: Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. Get medical attention. Wash contaminated clothing and clean shoes before reuse.

Inhalation: Remove person to fresh air. If signs/symptoms develop, get medical attention.

If Swallowed: Do not induce vomiting unless instructed to do so by medical personnel. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	*No Data Available*
Flash Point	*Not Applicable*

5.2 EXTINGUISHING MEDIA
Non-combustible. Choose material suitable for surrounding fire.

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Not applicable. None inherent in this product.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Ventilate the area with fresh air. Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible. Clean up residue with water. Collect the resulting residue containing solution. Place in a closed container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING
Avoid breathing of vapors, mists or spray. Avoid prolonged or repeated skin contact. Avoid eye contact with vapors, mists, or spray. Keep out of the reach of children.

7.2 STORAGE
Keep container tightly closed. Keep from freezing.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS
Use in a well-ventilated area. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control mist, vapor, or spray. If ventilation is not adequate, use respiratory protection equipment.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection
Avoid eye contact with vapors, mists, or spray.
The following eye protection(s) are recommended: Safety Glasses with side shields.

8.2.2 Skin Protection
Avoid prolonged or repeated skin contact. Select and use gloves and/or protective clothing to prevent skin contact based on the results

of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

8.2.3 Respiratory Protection
Avoid breathing of vapors, mists or spray.

8.2.4 Prevention of Swallowing
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Do not ingest.

8.3 EXPOSURE GUIDELINES

None Established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Odor, Color, Grade:	Clear/yellow liquid with lemon fragrance
General Physical Form:	Liquid
Autoignition temperature	*No Data Available*
Flash Point	*Not Applicable*
Boiling point	212 ºF
Density	8.3 - 8.4 lb/gal
Vapor Density	*No Data Available*
Vapor Pressure	*No Data Available*
Specific Gravity	1 [*Ref Std:* WATER=1]
pH	10
Melting point	*Not Applicable*
Solubility in Water	Complete
Hazardous Air Pollutants	0.064 % weight [*Test Method:* Calculated]
Volatile Organic Compounds	2.25 g/l [*Test Method:* calculated SCAQMD rule 443.1] [*Details:* excluding exempt compounds]
Volatile Organic Compounds	0.22 % [*Test Method:* calculated SCAQMD rule 443.1] [*Details:* excluding exempt compounds]
VOC Less H2O & Exempt Solvents	85.67 g/l [*Test Method:* calculated SCAQMD rule 443.1]

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: Strong oxidizing agents; Strong acids

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not determined.

CHEMICAL FATE INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose of waste product in a facility permitted to accept chemical waste.

EPA Hazardous Waste Number (RCRA): Not regulated

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

LB-K100-0702-9

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - No

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

The components of this product are in compliance with the chemical notification requirements of TSCA.

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS.

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 2 **Flammability:** 1 **Reactivity:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Revision Changes: Not Applicable

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MSDS Safety Information

TOP

FSC:	MSDS Date:	MSDS Num:
7930	07/02/1990	BVYXQ

Submitter:	LIIN:	Tech Review:	Status CD:
N EN	00N054914	10/31/1995	C

Product ID: MFN:

0132Z, WINDEX GLASS CLEANER POWERIZED (SUPDAT) 01

Article: Kit Part:

N N

Cage:

Responsible Party DRACK

Name:

DRACKETT PRODUCTS CO

Address:

1020 SPRING GROVE AVE

City:	State:	Zip:
CINCINNATI	OH	45232−1988

Country:

US

Info Phone Number:

513−632−1500

Emergency Phone Number:

513−632−1500

Radioactive Ind:

N

Preparer's Name:

N/P

Proprietary Ind:

N Review Ind: N

Published: Y Special Project CD: N

Contractor Summary

TOP

Cage:	Name:
85234	DRACKETT CO

Address:

5020 SPRING GROVE AVE

City:	State:	Zip:
CINCINNATI	OH	45232−1926

Country:	Phone:
US	513−632−7409

Cage:	Name:
DRACK	DRACKETT PRODUCTS CO

Address: 5020 SPRING GROVE AVE **Box:** N/K

City: CINCINNATI **State:** OH **Zip:** 45232−1988

Country: US **Phone:** 513−632−1500

Ingredients

TOP

Cas: 111−76−2 M KJ8575000 M

Code: RTECS #: Code:

Name: **ETHANOL, 2−BUTOXY−; (2−BUTOXYETHANOL) (SARA III)**

% Text: <5 Environmental Wt:

Other REC Limits: N/K

OSHA PEL:

S, 50 PPM Code: M OSHA STEL: Code:

ACGIH TLV: S, 25 PPM Code: M ACGIH STEL: N/P Code:

EPA Rpt Qty: DOT Rpt Qty:

Ozone Depleting Chemical:

N

Health Hazards Data

TOP

LD50 LC50 Mixture

NONE SPECIFIED BY MANUFACTURER.

Route Of Entry Inds − Inhalation:NO Skin:YES Ingestion:NO

Carcinogenicity Inds − NTP:NO IARC:NO OSHA:NO

Health Hazards Acute And Chronic

ANIMAL STUDIES HAVE CLEARLY DEMONSTRATED DOSE−RELATED ADVERSE EFTS ON THE CNS, HEMATOPOIETIC TISS, BLOOD, KIDNEYS & LIVER ASSOC W/ADMIN OF ETHYLENE GLYCOL MONOBUTYL ETHER (EGBE). (EXTRACTED FROM DHHS (NIOSH) PUB NO. 90−118) (FP N). ACUTE:EYE:SENSATION OF IRRITATION.

Explanation Of Carcinogenicity

NOT RELEVANT.

Signs And Symptions Of Overexposure

SEE HEALTH HAZARDS.

Medical Cond Aggravated By Exposure

NONE KNOWN.

First Aid

INHAL:REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O2/ARTIFICIAL RESPIRATION) (FP N). EYES:FLUSH WITH WATER FOR @ LEAST 15 MINUTES. SKIN:FLUSH WITH WATER. INGEST:DRINK MILK OR WATER FREELY.

Spill Release Procedures

FLUSH AREA WITH WATER. KEEP OUT OF WATERSHEDS AND WATER SYSTEMS.

Neutralizing Agent

NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Methods

DISPOSE ONLY IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

Handling And Storage Precautions

UNPLUG ELECTRICAL APPLIANCES BEFORE USING PRODUCT ON THEM.

Other Precautions

NONE SPECIFIED BY MANUFACTURER.

========== Fire and Explosion Hazard Information ==========

TOP

Flash Point Method:

SCC

Flash Point:		Flash Point Text:	>212F,>100C
Autoignition Temp:		Autoignition Temp Text:	N/A
Lower Limits:	N/A	Upper Limits:	N/A

Extinguishing Media

IF INVOLVED IN FIRE, USE WATER, DRY ALCOHOL−TYPE/ALL PURPOSE FOAM, DRY CHEM, CO2 OR OTHER CLASS B EXTING AGENTS.

Fire Fighting Procedures

FULL PROT EQUIP, INCLDG NIOSH/MSHA PRESS DEMAND SCBA & TURNOUT EQUIP SHOULD BE WORN BY FIREFIGHTERS & OTHERS EXPOSED TO COMBUSTION BY−PRODUCTS.

Unusual Fire/Explosion Hazard

NOT APPLICABLE

========== **Control Measures** ========== TOP

Respiratory Protection

NOT APPLICABLE. USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation

NOT APPLICABLE

Protective Gloves

NOT APPLICABLE

Eye Protection

ANSI APPROVED SAFETY GLASSES (FP N).

Other Protective Equipment

NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices

NOT APPLICABLE

Supplemental Safety and Health

MFR TRADE NAME/PART NO:FORMULA−INSTITUTIONAL.

========== **Physical/Chemical Properties** ========== TOP

HCC:

B3 NRC/State LIC No:

Net Prop WT For Ammo:			
Boiling Point:		B.P. Text:	212F,100C
Melt/Freeze Pt:		M.P/F.P Text:	N/A
Decomp Temp:		Decomp Text:	N/K
Vapor Pres:	17.4	Vapor Density:	1.2
Volatile Org Content %:		Spec Gravity:	0.99 (WATER=1)
VOC Pounds/Gallon:		PH:	11
VOC Grams/Liter:		Viscosity:	N/P
Evaporation Rate & Reference:	0.3 (BUAC =1)		
Solubility in Water:	100 (W/V%)		
Appearance and Odor:	CLEAR, BLUE LIQUID WITH SLIGHT AMMONIA ODOR		
Percent Volatiles by Volume:	N/K	Corrosion Rate:	N/K

========== **Reactivity Data** ========== TOP

Stability Indicator:

YES

Stability Condition To Avoid: NOT APPLICABLE

Materials To Avoid: NOT APPLICABLE

Hazardous Decomposition Products: NOT APPLICABLE

Hazardous Polymerization Indicator: NO

Conditions To Avoid Polymerization NOT RELEVANT.

:

========== **Toxicological Information** ========== TOP

Toxicological Information:

N/P

========== **Ecological Information** ========== TOP

Ecological:

N/P

========== **MSDS Transport Information** ========== TOP

Transport Information:

N/P

========== **Regulatory Information** ========== TOP

Sara Title III Information:

N/P

Federal Regulatory Information: N/P

State Regulatory Information: N/P

========== **Other Information** ========== TOP

Other Information:

N/P

========== **HMIS HAZCOM Label** ========== TOP

Print Labels

Product ID:

0132Z, WINDEX GLASS CLEANER POWERIZED (SUPDAT)

Cage: DRACK Assigned IND: N

Company Name:

DRACKETT PRODUCTS CO

Street: 5020 SPRING GROVE AVE PO Box: N/K

City:

CINCINNATI State: OH Zipcode: 45232−1988

Country: US

Health Emergency Phone:

513−632−1500

Label Required IND:

Y Date Of Label Review: 11/06/1994

Status Code: C MFG Label NO:

Label Date: 11/06/1994 Year Procured:

Origination Code:

G Chronic Hazard IND: Y

Eye Protection IND: N/P

Skin Protection IND: N/P

Signal Word: CAUTION

Respiratory Protection IND: N/P

Health Hazard:

None

Contact Hazard: Slight

Fire Hazard:

None

Reactivity Hazard: None

Hazard And Precautions

ACUTE:EYE:SENSATION OF IRRITATION. CHRONIC:ANIMAL STUDIES HAVE CLEARLY DEMONSTRATED DOSE−RELATED ADVERSE EFFECTS ON THE CENTRAL NERVOUS SYSTEM, BLOOD FORMING TISSUE, BLOOD, KIDNEYS & LIVER ASSOCIATED WITH ADMINISTRATION OF ETHYLENE GLYCOL MONOBUTYL ETHER (FP N).

==========

This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever expressly or implied warrants, states, or intends said information to have any application, use or viability by or to any person or persons outside the Department of Defense nor any person or persons contracting with any instrumentality of the United States of America and disclaims all liability for such use. Any person utilizing this instruction who is not a military or civilian employee of the United States of America should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation regardless of similarity to a corresponding Department of Defense or other government situation.

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTITY: -20F Super Tech Windshield Washer Fluid

SECTION 1 - MANUFACTURER'S INFORMATION

Manufacturer: Fox Packaging Company
51 East Maryland Avenue
St. Paul, MN 55117-4615

Telephone: (651) 489-8211

Facsimile: (651) 489-8247

Chemical Transportation Emergency Center (for immediate information about a chemical or to seek assistance from a manufacturer): 1-800-424-9300

National Response Center (to report spills of oil and hazardous material): 1-800-424-8802

Date Prepared: March 24, 2005

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Common Name: Windshield Washer Fluid

Product Use: Used for cleaning windshields

Product Identification: Windshield Washer Fluid

NFPA HAZARD RATINGS
HEALTH - 1
FLAMMABILITY - 3
REACTIVITY - 0
OTHER - NOT APPLICABLE

Hazardous Component*	Approximate Composition	OSHA Permissible Exposure Limit**	NIOSH REL	ACGIH Threshold Limit Value	IDLH (NIOSH)
Methanol (Methyl Alcohol) -CAS 67-56-1 -UN 1230 (DOT Guide 28)	30 percent by weight	200 ppm (260 mg/m^3) 8-Hour TWA (Skin)	200 ppm (260 mg/m^3) 8-Hour TWA 250 ppm (310 mg/m^3) Ceiling (Skin)	200 ppm (260 mg/m^3) 8-Hour TWA 250 ppm (310 mg/m^3) Short-term Exposure Limit (15-minute TWA) (Skin)	6,000 ppm (0.6 percent in air)

* The hazardous component listed is not a known or suspected human carcinogen as listed or determined by the National Agency for Research on Cancer, National Toxicological Program "NTP Seventh Annual Report on Carcinogens," or International Agency for Research on Cancer (IARC) monograph reviews. In addition, it is not considered a carcinogen by the Occupational Safety and Health Administration or the National Institute for Occupational Safety and Health.

** This MSDS contains the 1989 PEL's and from the June 1993 Air Contaminants Final Rule, specified in Tables Z-1, Z-2, and Z-3 [Federal Register; 58(124): 35338-35351; June 30, 1993].

MATERIAL SAFETY DATA SHEET

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: Approximately 180°F (for product)

Flash Point: 93°F

Solubility in Water: Soluble

Vapor Pressure: 100mm @ 21.2° (methanol)

Vapor Density: 1.11 (methanol)

Ionization Potential: 10.84 cV (methanol)

Freezing Point: -20°F

Appearance and Odor: The windshield washer is blue, and it has a mild characteristic pungent odor from the methanol. The odor threshold for methanol is 10 ppm.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Flammable Limits: UEL - 36 percent for methanol LEL - 6 percent for methanol

Autoignition Temperature: 878°F for methanol

Extinguishing Media for Methanol

Small Fires: Dry chemical, carbon dioxide, water spray or alcohol resistant foam.
Large Fires: Water spray, fog or alcohol-resistant foam.

Special Fire Fighting Procedures: Move container away from fire area if you can do so without risk. Dike fire control water for later disposal; do not scatter the material. Apply cooling water to the sides of containers exposed to flames until well after the fire is out.

Unusual Fire and Explosion Hazards for Methanol: Flammable/combustible material; may be ignited by heat, spark or flame. Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors, or in sewers. Runoff to sewer may create fire or explosion hazard.

SECTION 5 - REACTIVITY DATA

Stability/Polymerization: In a closed container, methyl alcohol is stable at room temperature and it is stable under routine handling and storage. Hazardous polymerization will not occur.

Incompatibility (Material to Avoid): Incompatible with beryllium dihydride; metals; oxidants; potassium tert-butoxide; carbon tetrachloride + metals; dichloromethane. Can react vigorously with oxidizing materials.

Explosive reaction with chloroform + sodium methoxide; diethyl zinc. Violent reaction with alkyl aluminum salts; acetyle bromide; chloroform + sodium hydroxide; CrO_3; cyanuric chloride; (I + ethanol + HgO); $Pb(ClO_4)_2$; $HClO_4$; P_2O_3; (KOH + $CHCl_2$); nitric acid[1]

Hazardous Decomposition or By-products: When methanol is heated to decomposition, carbon dioxide and carbon monoxide may be produced, as well as formaldehyde may be produced, and it emits acrid smoke and irritating fumes.

[1]Lewis, Richard J., Sr.: *Sax's Dangerous Properties of Industrial Materials, Eighth Edition.* New York, New York: Van Nostrand Reinhold, 1992.

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTITY: -20F Super Tech Windshield Washer Fluid

SECTION 6 - HEALTH HAZARD DATA

Routes of Entry (Methanol): The primary routes of entry are inhalation, ingestion, and absorption.

Health Hazards and Signs and Symptoms of Exposure (Methanol): Irritant to eyes, skin, and upper respiratory system. Headaches, drowsiness, dizziness, vertigo, light-headed, nausea, and vomiting. Visual disturbance, optic nerve damage, and blindness. Skin exposure hazard.

Target Organs: Central nervous system, digestive tract, eyes, and skin.

Acute Effects: Eye irritation. Inhalation can result nose irritation, headache, fatigue, nausea, visual impairment or complete and possible blindness, acidosis, convulsions, circulatory collapse, respiratory fatigue, and death. Ingestion can cause gastrointestinal (GI) irritation followed by the symptoms described for inhalation and possible kidney impairment. Skin contact results in a cold sensation, dryness, and cracking, possibly leading to dermatitis. Methyl alcohol may be absorbed through the skin and may cause headache, fatigue, and visual disturbances. Eye contact results in irritation with lacrimation, inflamed lids, and photophobia.

Chronic Effects: Chronic exposure may result in visual impairment or blindness.

Medical Conditions Generally Aggravated by Exposure: Ocular, respiratory, or dermal disorders may be aggravated by methanol exposure.

Emergency and First Aid Procedures:

Eyes:	Rinse with water 15 to 20 minutes, seek medical assistance.
Skin:	Flush with water for 15 minutes.
Inhalation:	Remove from source to fresh air, provide respiratory support as needed.
Ingestion:	Call Physician, hospital emergency room or Poison Control Center immediately.
	GET PROMPT MEDICAL ATTENTION

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is Released or Spilled:

- Keep unnecessary people away; isolate hazard area and deny entry.
- Stay upwind; keep out of low areas.
- Shut off ignition sources; no flares, smoking or flames in hazard area.
- Positive pressure self-contained breathing apparatus and chemical protective clothing is recommended for personnel involved in clean-up procedures with no fire.
- Do not walk through spilled material; stop leak if it can be done without risk.
- Water spray may reduce vapor; but it will not prevent ignition in closed spaces.

Waste Disposal Method: Dispose of in accordance with federal, state and local regulations.

EPA Designations:

RCRA Hazardous Waste (40 CFR 261.33): Hazardous Waste No. U154
CERCLA Hazardous Substance (40 CFR 302.4): Not Listed
SARA Extremely Hazardous Substance (40 CFR 355): Not Listed
SARA Toxic Chemical (40 CFR 372.65): Not Listed

DOT Designation: Based on flash point and alcohol content, this is a Class 3, combustible liquid.

SECTION 8 - SPECIAL PROTECTION INFORMATION

Respiratory Protection: Under normal use conditions (outdoor windshield cleaning), respiratory protection is not justified.

Protective Eye Wear: Splash goggles are recommended when handling the solution. Contact lens use is not recommended.

Protective Clothing: The selection of protective clothing and gloves is dependent upon anticipated exposure. As reported by the manufacturer, Best Glove style 725R (PVC) offers excellent protection for up to 240 minutes of complete immersion.

SECTION 9 - OTHER HAZARDOUS INFORMATION AND DEFINITIONS

OSHA PEL: The Occupational Safety and Health Administration's Permissible Exposure Limit, which is defined as the maximum concentration of contaminant to which a normal healthy individual may be exposed 8-hours per day, 40-hours per week, without experiencing adverse health effects over a working lifetime.

ACGIH TLV: American Conference of Governmental Industrial Hygienist's Threshold Limit Value, similar to the OSHA PEL but not considered a legal standard.

SECTION 10 – TRANSPORTATION INFORMATION

DOT HAZARD DESCRIPTION: combustible liquid., consumer commodity, ORM-D n.o.s (methanol) 3 UN1992 pgIII

MSDS Prepared by: Maxim Technologies, Inc.

Judgements as to the suitability herein for the user's purposes are necessarily the user's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Maxim Technologies, Inc., extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the intended purposes or for the consequences of its use.

MATERIAL SAFETY DATA SHEET

 MSDS # 111811002

OFF! INSECT REPELLENT II

Date Issued: 06Oct1998 **Supersedes: 18Aug1998**

US MANUFACTURER:
S.C. Johnson & Son, Inc.
Phone: (800) 725-6737
Racine, Wisconsin 53403-2236
Emergency Phone: (888) 779-7920
International Emergency Phone:
(262) 886-1480

CANADIAN MANUFACTURER:
S.C. Johnson and Son, Limited
Phone: (800) 725-6737
1 Webster Street
Brantford, Ontario N3T 5R1
Transportation Emergency:
CANUTEC (collect) (613) 996-6666
Poison Control: (888) 779-7920

HAZARD RATING	HMIS	HAZARD	NFPA
4-Very High	1	Health	1
3-High	4	Flammability	4
2-Moderate	0	Reactivity	0
1-Slight		Special	
0-Insignificant			

DISTRIBUTED IN CANADA BY:
S.C. Johnson and Son, Limited
Phone: (800) 725-6737
1 Webster Street
Brantford, Ontario N3T 5R1

SECTION 1 - PRODUCT IDENTIFICATION

PRODUCT NAME..... OFF! INSECT REPELLENT II
REASON FOR CHANGE..... Name change.
PRODUCT USE..... Insect repellent

UPC	SCJ CODE	QUANTITY	US SIZE	CANADIAN SIZE
62300 01910	1255	12		170 GM

SECTION 2 - INGREDIENT INFORMATION

INGREDIENT	WEIGHT%	EXPOSURE LIMIT/TOXICITY
Diethyl toluamide (CAS# 134-62-3).....	10-30	NOT ESTABLISHED
Ethanol (CAS# 64-17-5).....	60-100	1000 ppm ACGIH/OSHA TWA

SECTION 3 - HEALTH HAZARDS IDENTIFICATION (Also See Section 11)

ROUTE(S) OF ENTRY..... Skin contact. Eye contact. Inhalation.
EFFECTS OF ACUTE EXPOSURE:
EYE..... May cause: Moderate eye irritation.
SKIN..... May cause skin reactions in rare cases.
INHALATION..... None known.
INGESTION..... None known.
MEDICAL CONDITIONS..... None known.
GENERALLY RECOGNIZED
AS BEING AGGRAVATED
BY EXPOSURE

SECTION 4 - FIRST AID MEASURES

EYE CONTACT..... Rinse with plenty of water. If irritation persists, get medical attention.
SKIN CONTACT..... If reaction occurs, wash skin and seek medical attention.
INHALATION..... No special requirements.
INGESTION..... Contact nearest poison control center.

OFF! INSECT REPELLENT II

Date Issued: 06Oct1998 **Supersedes: 18Aug1998**

SECTION 5 - FIRE AND EXPLOSION INFORMATION

FLASH POINT.....	< 20°F (< -7°C) (TCC) (propellant)
FLAMMABLE LIMITS.....	Not available.
AUTOIGNITION..... TEMPERATURE	Not available.
EXTINGUISHING MEDIA....	Foam. CO2. Dry chemical. Water fog.
SPECIAL FIREFIGHTING... PROCEDURES	Fight fire from maximum distance or protected area. Cool and use caution when approaching or handling fire-exposed containers. Fire fighters should wear self-contained breathing apparatus and protective clothing.
UNUSUAL FIRE AND..... EXPLOSION HAZARDS	Aerosol product - Containers may rocket or explode in heat of fire.

SECTION 6 - PREVENTIVE RELEASE MEASURES

STEPS TO BE TAKEN IN... CASE MATERIAL IS RELEASED OR SPILLED	Eliminate all ignition sources. Dike large spills. Absorb with oil-dri or similar inert material. Sweep or scrape up and containerize.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONARY..... INFORMATION	WARNING: Harmful if swallowed. Avoid contact with eyes and lips. Do not allow children to rub eyes if hands have been treated . FLAMMABLE: CONTENTS UNDER PRESSURE. Do not use near open fire, flames or heat. Do not puncture or incinerate. Do not store at temperatures above 120 °F (50 °C).
OTHER HANDLING AND..... STORAGE CONDITIONS	Keep out of reach of children.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION.	No special requirements under normal use conditions.
VENTILATION.....	Not applicable.
PROTECTIVE GLOVES.....	No special requirements under normal use conditions.
EYE PROTECTION.....	No special requirements under normal use conditions.
OTHER PROTECTIVE..... MEASURES	No special requirements.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

COLOR.....	Clear
PRODUCT STATE.....	Dispensed as a spray mist.
ODOR.....	Fragrant
pH.....	Not applicable.
ODOR THRESHOLD.....	Not available.
SOLUBILITY IN WATER....	Appreciable
SPECIFIC GRAVITY..... (H2O=1)	0.78
VAPOR DENSITY (AIR=1)..	Not available.
EVAPORATION RATE (BUTYL ACETATE=1)	Not available.
VAPOR PRESSURE (mm HG).	Not available.
BOILING POINT.....	Not available.
FREEZING POINT.....	Not available.

OFF! INSECT REPELLENT II

Date Issued: 06Oct1998 **Supersedes: 18Aug1998**

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES (continued)

COEFFICIENT OF WATER/OIL	Not available.
PERCENT VOLATILE BY VOLUME (%)	Not available.
VOLATILE ORGANIC COMPOUND (VOC)	Not available.
THEORETICAL VOC (LB/GAL)	Not available.

SECTION 10 - STABILITY AND REACTIVITY

STABILITY	Stable
STABILITY - CONDITIONS TO AVOID	Excessive heat.
INCOMPATIBILITY	Avoid contact with: Rubber, Plastic.
HAZARDOUS DECOMPOSITION PRODUCTS	When exposed to fire: Produces normal products of combustion.
HAZARDOUS POLYMERIZATION	Will not occur.
HAZARDOUS POLYMERIZATION - CONDITIONS TO AVOID	Not applicable.

SECTION 11 - TOXICOLOGY INFORMATION (Also See Section 3)

LD50 (ACUTE ORAL TOX)	Not available.
LD50 (ACUTE DERMAL TOX)	Not available.
LC50 (ACUTE INHALATION TOX)	Not available.
EFFECTS OF CHRONIC EXPOSURE	None known.
SENSITIZATION	None known.
CARCINOGENICITY	None known.
REPRODUCTIVE TOXICITY	None known.
TERATOGENICITY	None known.
MUTAGENICITY	None known.

SECTION 12 - ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA	Not available.

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL INFORMATION	If possible, recycle empty aerosol can to nearest steel recycling center. Use up package or give to someone who can.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT INFORMATION	Not applicable.
CANADIAN SHIPPING NAME	OFF! INSECT REPELLENT II

OFF! INSECT REPELLENT II

Date Issued: 06Oct1998 **Supersedes: 18Aug1998**

SECTION 14 - TRANSPORTATION INFORMATION (continued)

TDG CLASSIFICATION.....	Not applicable.
PIN/NIP.....	Not applicable.
PACKING GROUP.....	Not applicable.
EXEMPTION NAME.....	Consumer commodity

SECTION 15 - REGULATORY INFORMATION

WHMIS CLASSIFICATION... Non-regulated.

All ingredients of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

All ingredients in this product comply with the New Substances Notification requirements under the Canadian Environmental Protection Act (CEPA).

This product is not subject to the reporting requirements under California's Proposition 65.

SECTION 16 - OTHER INFORMATION

ADDITIONAL INFORMATION.	NFPA 30B Level 2 Aerosol. PCP NO. 22708
EPA REGISTRATION #.....	4822-380

PREPARATION INFORMATION

PREPARED BY..... Manufacturer's Technical Support Department. Refer to page 1 (Manufacturer) for contact information.

This document has been prepared using data from sources considered technically reliable. It does not constitute a warranty, express or implied, as to the accuracy of the information contained herein. Actual conditions of use and handling are beyond seller's control. User is responsible to evaluate all available information when using product for any particular use and to comply with all Federal, State, Provincial and Local laws and regulations.

PRINT DATE: 07Jun2000

WPC Brands, Inc.
P. O. Box 4406
Bridgeton, MO 63044-0406

Material Safety Data Sheet

Complies with OSHA's Hazard Communication Standard, 29 CFR 1910.1200

Hazardous Material Identification System – (HMIS)	
HEALTH – 2	REACTIVITY – 0
FLAMMABILITY – 2	PERSONAL – None

I Trade Name: Repel Insect Repellent Sportsmen Formula 29% DEET

Product Type: Aerosol Insect repellent

Product Item Number: 32901.1

Formula Code Number: 21-0751

EPA Registration Number	Manufacturer	Emergency Telephone Numbers
305-49	Chemsico Division of United Industries Corporation 8494 Chapin Industrial Drive St. Louis, MO 63114	**For Chemical Emergency:** 1-800-633-2873 **For Information:** 1-800-8801181 **Prepared by:** C. A. Duckworth **Date Prepared:** October 16, 2003

II Hazards Ingredient/Identity Information

Chemical	%	OSHA PEL	ACGIH TLV
DEET (N,N-diethyl-m-toluamide) CAS# 134-62-3	29.0	NA	NA
Ethanol CAS #64-17-5/ 977021-81-0	48.1	1000 ppm	1000 ppm
Hydrocarbon Propellant CAS #75-28-5/74-98-6	15.0	NA	NA

III Physical and Chemical Characteristics

Appearance & Odor: Light mist spray with an alcohol odor
Boiling Point: NA
Vapor Pressure: NA
Specific Gravity: 0.88 at 72º F (H_2O = 1)
Vapor Density: 1.6
% Volatile (by vol.): >90%
Solubility in Water: NA
Evaporation Rate: Approximately 1 (Butyl Acetate = 1)

IV Fire and Explosive Hazards Data

Flash Point: NA
Flame Extension: 18"
Autoignition Temperature: N/A
Fire Extinguishing Media: Carbon dioxide, Foam, Dry chemical
Decomposition Temperature: NA
Special Fire-Fighting Procedures: *For Small Fires:* Use Carbon dioxide or dry chemical extinguisher. *For Large Fires:* Use copious amounts of water.
Unusual Fire and Explosion Hazards: Also see Section VII

V Reactivity Data

Stability: Stable
Polymerization: Will not occur
Conditions to Avoid: None
Incompatible Materials: May soften or damage some synthetics such as rayon. May damage leather.
Hazardous Decomposition or Byproducts: None

VI Health Hazard Data

Ingestion: Harmful if swallowed. **First Aid**: Contact a Poison Control Center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a Poison Control Center or doctor. Do not give anything by mouth to an unconscious person.
Special Notes: Use of this product may cause skin reactions in rare cases. If you suspect a reaction to this product discontinue use. Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Contact a Poison Control Center or doctor. Have the product container with you when calling or going for treatment.

Health conditions Aggravated by Exposure: None known
Ingredients listed by NTP, OSHA, or IARC as Carcinogens or Potential Carcinogens: None

VII Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled:
Flammable material. Remove all possible ignition sources. Soak up with absorbent material. Wash small quantities away with soapy water.

Waste Disposal:
Do not puncture or incinerate. If empty: Place in trash or offer for recycling. If partially filled: Call your local solid waster disposal agency or 1-800-CLEANUP for disposal instructions.

Handling & Storage Precautions:
Keep away from heat, sparks, or open flame. Exposure to temperatures higher than 130ºF may cause bursting.

VIII Control Measures

Read and follow label directions. They are your best guide to using this product effectively, and give necessary safety precautions to protect your health.

IX Transportation Data

DOT Shipping Name: Consumer Commodity
DOT Hazard Class: ORM-D

The information and statements herein are believed to be reliable but are not to be construed as warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.

MATERIAL SAFETY DATA SHEET

PS, PSH, PSG and PG
Valve Regulated (VRLA) Batteries
Absorbed Electrolyte (AGM)

Section 1 - Product Identification

Manufacturers Name	*Emergency Telephone Numbers:*
Power-Sonic Corporation, 7550 Panasonic Way San Diego, CA 92154	**CHEMTREC (Domestic): (800) 424-9300 CHEMTREC (International): (703) 527-3887**
	Telephone Number for Information **Power-Sonic Corporation: (619) 661-2020**
	Date Issued: **January 25, 2010**

The information contained within is provided as a service to our customers and is for their information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate at the date compiled. Power-Sonic Corporation makes no warranty expressed or implied.

Section 2 - Hazardous Ingredients/Identity Information

Components	CAS Number	Approx Wt. %	OSHA PEL (µg/m³)	ACGIH TLV (µg/m³)	NIOSH (µg/m³)
Inorganic Lead/Lead Compounds	7439-92-1	65%-75%	50	150	10
Tin	7440-31-5	<0.5%	2000	2000	N/A
Calcium	7440-70-2	<0.1%	N/A	N/A	N/A
Electrolyte: Dilute sulfuric Acid	7664-93-9	14-20%	1000	1000	1000
Fiberglass Separator	-	5%	N/A	N/A	N/A
Case Material: Acrylonitrile Butadine Styrene (ABS)	9003-56-9	5-10%	N/A	N/A	N/A

Inorganic lead and electrolyte (sulfuric acid) are the main components of every Valve Regulated Lead Acid battery supplied by Power-Sonic Corporation. Other ingredients may be present dependent upon the specific battery type. For additional information contact Power-Sonic Corporation Technical Department.

Section 3 - Physical/Chemical Characteristics

Components	Density	Melting Points	Solubility (H2O)	Odor	Appearance
Lead	11.34	621 °F	None	None	Silver-Gray
Lead Sulfate	6.20	1950 °F	40mg/l (60 °F)	None	White Powder
Lead Dioxide	9.40	554 °F	None	None	Brown Powder
Sulfuric Acid	About 1.30	203-240 °F	100%	Sharp penetrating pungent	Clear Colorless Liquid
Fiberglass Separator	N/A	N/A	Slight	None	White Fibrous
Case Material: Acrylonitrile Butadine Styrene (ABS)	N/A	N/A	None	None	Solid

Continued on next page

Section 4 – Flammability Data

Components	Flashpoint	Explosive Limit	Comments
Lead and Sulfuric Acid	None	None	None
Hydrogen		LEL = 4.1%	Sealed batteries can emit hydrogen if overcharged (float voltage> 2.40 VPC)
Fiberglass Separator	N/A	N/A	Toxic vapors may be released. In case of fire, wear self contained breathing apparatus
Acrylonitrile Butadine Styrene (ABS)	None	N/A	Temp over 527°F (300°C) may release combustible gases. In case of fire, wear self contained breathing apparatus

Section 5 - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	Prolonged overcharge on high current, ignition sources. Sulfuric acid remains stable at all temperatures

Incompatibility (Materials to Avoid)

Sulfuric acid: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may product toxic sulfur dioxide fumes and may release flammable hydrogen gas.
Lead Compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents.

Hazardous Decomposition or Byproducts

Sulfuric acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen sulfide.
Lead Compounds: High temperatures above the melting point are likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas. Hazardous Polymerization.

Polymerization: Sulfuric acid will not polymerize

Decomposition Products: Sulfuric Dioxide, Trioxide, Hydrogen Sulfide, Hydrogen.

Conditions to Avoid: Prohibit smoking, sparks, etc. from battery charging area. Avoid mixing acid with other chemicals.

Section 6 - Health Hazard Data

Routes of Entry

Sulfuric acid: Harmful by all routes of entry
Lead compounds: Hazardous Exposure can occur only when product is heated, oxidized, or otherwise processed or damaged to create dust, vapor or fume.

Inhalation

Sulfuric acid: Breathing sulfuric acid vapors and mists may cause severe respiratory problems.
Lead compounds: Dust or fumes may cause irritation of upper respiratory tract or lungs.
Fiberglass Separator: Fiberglass is an irritant to the upper respiratory tract, skin and eyes. For exposure up to 10°F/ use MSA Comfoll with type H filter. Above 10°F use Ultra Twin with type H filter. This product is not considered carcinogenic by NTP or OSHA.

Skin Contact

Sulfuric acid: Severe irritation, burns and ulceration.
Lead compounds: Not absorbed through the skin

Continued on next page

Ingestion

Sulfuric acid: May cause severe irritation of the mouth, throat, esophagus, and stomach.
Lead compounds: May cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping. Acute ingestion should be treated by a physician.

Eye Contact

Sulfuric acid: Severe irritation, burns, cornea damage and possible blindness.
Lead Compounds: May cause eye irritation.

Acute Health Hazards

Sulfuric acid: Severe skin irritation, burns, damage to cornea may cause blindness, upper respiratory irritation.
Lead compounds: May cause abdominal pain, nausea, headaches, vomiting, loss of appetite, severe cramping, muscular aches and weakness, and difficulty sleeping. The toxic effects of lead are cumulative and slow to appear. It affects the kidneys, reproductive and central nervous systems. The symptoms of lead overexposure are listed above. Exposure to lead from a battery most often occurs during lead reclamation operations through the breathing or ingestion of lead dust or fumes.

Chronic Health Hazards

Sulfuric acid: Possible scarring of the cornea, inflammation of the nose, throat and bronchial tubes, possible erosion of tooth enamel.
Lead compounds: May cause anemia, damage to kidneys and nervous system, and damage to reproductive system in both males and females.

Carcinogenicity

Sulfuric acid: The National Toxicological Program (NTP) and The International Agency for Research on Cancer (IARC) have classified strong inorganic acid mist containing sulfuric acid as a Category 1 carcinogen, a substance that is carcinogenic to humans. The ACGIH has classified strong inorganic acid mist containing sulfuric acid as an A2 carcinogen (suspected human carcinogen). These classifications do not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.
Lead compounds: Human studies are inconclusive regarding lead exposure and an increased cancer risk. The EPA and the International Agency for Research on Cancer (IARC) have categorized lead and inorganic lead compounds as a B2 classification (probable/possible human carcinogen) based on sufficient animal evidence and inadequate human evidence.

Medical Conditions Generally Aggravated by Exposure

Inorganic lead and its compounds can aggravate chronic forms of kidney, liver, and neurological diseases. Contact of battery electrolyte (acid) with the skin may aggravate skin diseases such as eczema and contact dermatitis. Overexposure to sulfuric acid mist may case lung damage and aggravate pulmonary conditions.

Emergency and First Aid Procedures

Inhalation
Sulfuric acid: Remove to fresh air immediately. If breathing is difficult, give oxygen
Lead compounds: Remove from exposure, gargle, wash nose and lips, consult physician

Ingestion
Sulfuric acid: Do not induce vomiting, consult a physician immediately.
Lead compounds: Consult a physician immediately

Eyes
Sulfuric acid: Flush immediately with water for 15 minutes, consult a physician.
Lead compounds: Flush immediately with water for 15 minutes, consult a physician

Skin
Sulfuric acid: Flush with large amounts of water for at least 15 minutes, remove any contaminated clothing. If irritation develops seek medical attention.
Lead compounds: Wash with soap and water.

Continued on next page

Section 7 - Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled

There is no release of material unless the case is damaged or battery is misused/overcharged. If release occurs stop flow of material, contain/absorb all spills with dry sand, earth, or vermiculite. Do not use combustible materials. Neutralize spilled material with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. Dispose of as hazardous waste. Do not discharge acid to sewer

Waste Disposal Method

Spent Batteries - send to secondary lead smelter for recycling. Follow applicable federal, state and local regulations Neutralize as in preceding step. Collect neutralized material in sealed container and handle as hazardous waste as applicable. A copy of this MSDS must be supplied to any scrap dealer or secondary lead smelter with the battery.

Precautions to be Taken in Handling and Storing

Store batteries in a cool, dry, well ventilated area that are separated from incompatible materials and any activities which may generate flames, sparks, or heat. Keep all metallic articles that could contact the negative and positive terminals on a battery and create a short circuit condition.

Electrical Safety

Due to the battery's low internal resistance and high power density, high levels of short circuit current can be developed across the battery terminals. Do not rest tools or cables on the battery. Use insulated tools only. Follow all installation instructions and diagrams when installing or maintaining battery systems.

Fiberglass Separator

Fiberglass is an irritant to the upper respiratory tract, skin and eyes. For exposure up to 10°F/ use MSA Comfoll with type H filter. Above 10°F use Ultra Twin with type H filter. This product is not considered carcinogenic by NTP or OSHA.

Section 8 - Control Measures

Respiratory Protection

None required under normal conditions. If battery is overcharged and concentrations of sulfuric acid are known to exceed PEL use NIOSH or MSH approved respiratory protection.

Engineering Controls

Store and handle batteries in a well ventilated area. If mechanical ventilation is used, components must be acid resistant

Protective Gloves	**Eye Protection**
None needed under normal conditions. If battery case is damaged use rubber or plastic elbow length gauntlets	None needed under normal conditions. If handling damaged or broken batteries use chemical splash goggles or face shield

Other Protective Clothing or Equipment

None needed under normal conditions. In case of damaged or broken battery use an acid resistant apron. Under severe exposure or emergency conditions wear acid resistant clothing.

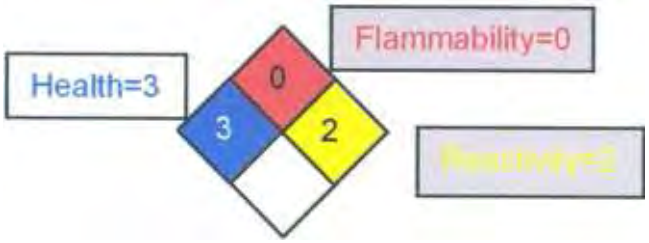
Work Hygienic Practices

Handle batteries carefully to avoid damaging the case. Do not allow metallic articles to contact the battery terminals during handling. Avoid contact with the internal components of the battery.

Continued on next page

Section 9 Regulatory Information

NFPA Hazard Rating for Sulfuric Acid



Transportation Batteries. Non-Restricted Status

Shipment of Power-Sonic Rechargeable Sealed Lead Acid Batteries
NORTH AMERICA – SURFACE AND AIR SHIPMENTS
Non-Restricted Status

Our non-spillable lead acid batteries are listed in the U.S. Department of Transportation (DOT) hazardous materials regulations, but are excepted from these regulations since they met all of the following requirements found under 49 CFR 173.159 and 49 CFR 173.159(a)

49 CFR 173.159:

(f) Batteries can be considered as non-spillable provided they are capable of withstanding the following two tests, without leakage of battery fluid from the battery:

(1) ***Vibration test.*** The battery must be rigidly clamped to the platform of a vibration machine, and a simple harmonic motion having an amplitude of 0.8 mm (0.03 inches) with a 1.6 mm (0.063 inches) maximum total excursion must be applied. The frequency must be varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return must be traversed in 95 ± 5 minutes for each mounting position (direction of vibrator) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

(2) ***Pressure differential test***. Following the vibration test, the battery must be stored for six hours at 24 °C ± 4 °C (75 °F ± 7 °F) while subjected to a pressure differential of at least 88 kPa (13 psig). The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

49 CFR 173.159 (a)

Non-spillable batteries are excepted from the packaging requirements of §173.159 under the following conditions:

(1) Non-spillable batteries must be securely packed in strong outer packaging and meet the requirements of §173.159(a). A non-spillable battery which is an integral part of and necessary for the operation of mechanical or electronic equipment must be securely fastened in the battery holder on the equipment**;**

(2) The battery and outer packaging must be plainly and durably marked "NON-SPILLABLE" or "NON-SPILLABLE BATTERY." The requirement to mark the outer package does not apply when the battery is installed in a piece of equipment that is transported unpackaged.

(d) Non-spillable batteries are excepted from all other requirements of this subchapter when offered for transportation and transported in accordance with paragraph (c) of this section and the following:

(1) At a temperature of 55 °C (131 °F), the battery must not contain any unabsorbed free-flowing liquid, and must be designed so that electrolyte will not flow from a ruptured or cracked case; and

(2) For transport by aircraft, when contained in a battery-powered device, equipment or vehicle must be prepared and packaged for transport in a manner to prevent unintentional activation in conformance with §173.159(b)(2) of this Subpart**.**

January 25, 2010

Continued on next page

Shipment of Power-Sonic Rechargeable Sealed Lead Acid Batteries
INTERNATIONAL
Non-Restricted Status

Our non-spillable lead acid batteries also are *excepted* from the international hazardous materials (also known as "dangerous goods") regulations since they comply with the following requirements:

• The vibration and pressure differential tests found in Packing Instruction 806 and Special Provision A67 of the International Air Transport Association (IATA) Dangerous Goods Regulations;

• The vibration and pressure differential tests found in Packing Instruction 806 and Special Provision A67 of the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air; and

• The vibration, pressure differential, and "crack" tests found in Special Provision 238.1 and 238.2 of the International Maritime Dangerous Goods (IMDG) Code.

• Under I.A.T.A. classification Power-Sonic batteries fall under UN number 2800: "Batteries, wet, non-spillable, electric storage".

January 25, 2010

Regulatory Information

RCRA: Spent lead acid batteries are not regulated as hazardous waste by the EPA when recycled, however state and international regulations may very.

CERCLA (superfund) and EPCRA:

(a) Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (superfund) and EPCRA (Emergency Planning Community Right to Know Act is 1,000lbs. State and local reportable quantities for spilled sulfuric acid may vary.
(b) Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA with a Threshold Planning Quantity (TPQ) of 1,000lbs.
(c) EPCRA Section 302 Notification is required if 1,000lbs. or more of sulfuric acid is present at one site. The quantity of sulfuric acid will vary by battery type. Contact Power-Sonic Corporation for additional information.
(d) EPCRA Section 312 Tier 2 reporting is required for batteries if sulfuric acid is present in quantities of 500lbs. or more and/or lead is present in quantities of 10,00lbs. or more.
(e) Supplier Notification: This product contains toxic chemicals which may be reportable under EPCRA Section 313 Toxic Chemical Release Inventory (Form R) requirements. If you are a manufacturing facility under SIC codes 20 through 39 the following information is provided to enable you to complete the required reports:

Regulatory Information continued:

(f)

Toxic Chemical	CAS Number	Approximate % by weight
Lead	7439-92-1	60
Sulfuric Acid	7664-93-9 10-	30
Arsenic	7440-38-2	0.2

If you distribute this product to other manufacturers in SIC codes 20 through 39, this information must be provided with the first shipment in a calendar year. The Section 313 supplier notification requirement does not apply to batteries which are "consumer products". Not present in all battery types. Contact Power-Sonic Corporation for further information.

TSCA
Ingredients in Power-Sonic Corporation's batteries are listed in the TSCA Registry as follows:

Components	CAS Number	TSCA Status
Electrolyte Sulfuric Acid (H2SO4)	7664-93-9	Listed
Inorganic Lead Compound: Lead (Pb)	7439-92-1	Listed
Lead Oxide (PbO)	1317-36-8	Listed
Lead Sulfate (PbSO4)	7446-14-2	Listed
Arsenic (As)	7440-38-2	Listed
Calcium (Ca)	7440-70-2	Listed
Tin (Sn)	7440-31-5	Listed

Power-Sonic Corporation
E-Mail: quality-assurance@power-sonic.com
Website:http://www.power-sonic.com

MATERIAL SAFETY DATA SHEET

1307
10 00

DATE OF PREPARATION
Nov 21, 2012

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER
1307
PRODUCT NAME
KRYLON® Battery Protector
MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
KRYLON Products Group
Cleveland, OH 44115

Telephone Numbers and Websites

Product Information	(800) 247-3266
Regulatory Information	(216) 566-2902 www.paintdocs.com
Medical Emergency	(216) 566-2917
Transportation Emergency*	(800) 424-9300
**for Chemical Emergency ONLY (spill, leak, fire, exposure, or accident)*	

SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

% by Weight	CAS Number	Ingredient	Units	Vapor Pressure
15	**74-98-6**	**Propane**		
		ACGIH TLV	2500 PPM	760 mm
		OSHA PEL	1000 PPM	
15	**106-97-8**	**Butane**		
		ACGIH TLV	800 PPM	760 mm
		OSHA PEL	800 PPM	
18	**64742-89-8**	**Lt. Aliphatic Hydrocarbon Solvent**		
		ACGIH TLV	100 PPM	53 mm
		OSHA PEL	100 PPM	
16	**108-88-3**	**Toluene**		
		ACGIH TLV	20 PPM	22 mm
		OSHA PEL	100 ppm (Skin)	
		OSHA PEL	150 ppm (Skin) STEL	
2	**100-41-4**	**Ethylbenzene**		
		ACGIH TLV	20 PPM	7.1 mm
		OSHA PEL	100 PPM	
		OSHA PEL	125 PPM STEL	
13	**1330-20-7**	**Xylene**		
		ACGIH TLV	100 PPM	5.9 mm
		ACGIH TLV	150 PPM STEL	
		OSHA PEL	100 PPM	
		OSHA PEL	150 PPM STEL	
2	**64742-94-5**	**Medium Aromatic Hydrocarbons**		
		ACGIH TLV	Not Available	0.12 mm
		OSHA PEL	Not Available	
0.3	**91-20-3**	**Naphthalene**		
		ACGIH TLV	10 PPM	1 mm
		ACGIH TLV	15 PPM STEL	
		OSHA PEL	10 PPM	
		OSHA PEL	15 PPM STEL	
11	**67-64-1**	**Acetone**		
		ACGIH TLV	500 PPM	180 mm
		ACGIH TLV	750 PPM STEL	
		OSHA PEL	1000 PPM	

SECTION 3 — HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.

HMIS Codes

Health	2*
Flammability	4
Reactivity	0

EFFECTS OF OVEREXPOSURE

EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.
Prolonged overexposure to hazardous ingredients in Section 2 may cause adverse chronic effects to the following organs or systems:

- the liver
- the urinary system
- the cardiovascular system
- the reproductive system

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

SECTION 4 — FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

SECTION 5 — FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL	EXTINGUISHING MEDIA
Propellant < 0 °F	0.8	12.8	Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

SECTION 7 — HANDLING AND STORAGE

STORAGE CATEGORY

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.
During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	5.92 lb/gal	709 g/l
SPECIFIC GRAVITY	0.71	
BOILING POINT	<0 - 415 °F	<-18 - 212 °C
MELTING POINT	Not Available	
VOLATILE VOLUME	95%	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	Not Available	
pH	7.0	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

Volatile Weight 81.18% Less Water and Federally Exempt Solvents

SECTION 10 — STABILITY AND REACTIVITY

STABILITY — Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

SECTION 11 — TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Naphthalene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals.

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

TOXICOLOGY DATA

CAS No.	Ingredient Name			
74-98-6	**Propane**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
106-97-8	**Butane**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
64742-89-8	**Lt. Aliphatic Hydrocarbon Solvent**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
108-88-3	**Toluene**			
		LC50 RAT	4HR	4000 ppm
		LD50 RAT		5000 mg/kg
100-41-4	**Ethylbenzene**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		3500 mg/kg
1330-20-7	**Xylene**			
		LC50 RAT	4HR	5000 ppm
		LD50 RAT		4300 mg/kg
64742-94-5	**Medium Aromatic Hydrocarbons**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
91-20-3	**Naphthalene**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		Not Available
67-64-1	**Acetone**			
		LC50 RAT	4HR	Not Available
		LD50 RAT		5800 mg/kg

SECTION 12 — ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

SECTION 13 — DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

SECTION 14 — TRANSPORT INFORMATION

Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (ocean, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport.

US Ground (DOT)

May be classed as LTD. QTY. OR ORM-D
UN1950, AEROSOLS, 2.1, LIMITED QUANTITY, (ERG#126)

Canada (TDG)

May be classed as LTD. QTY. OR ORM-D
UN1950, AEROSOLS, CLASS 2.1, LIMITED QUANTITY, (ERG#126)

IMO

May be shipped as Limited Quantity
UN1950, AEROSOLS, CLASS 2.1, LIMITED QUANTITY, EmS F-D, S-U, ADR (D)

IATA/ICAO

UN1950, AEROSOLS, FLAMMABLE, 2.1, LIMITED QUANTITY

SECTION 15 — REGULATORY INFORMATION

SARA 313 *(40 CFR 372.65C)* SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
108-88-3	Toluene	16	
100-41-4	Ethylbenzene	2	
1330-20-7	Xylene	13	
91-20-3	Naphthalene	0.2	

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

SECTION 16 — OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

SOUTHEASTERN CHEMICAL

MATERIAL SAFETY DATA SHEET

Service or Information Number: (800)428-2436 / In case of Emergency call Chem-Trec 800-424-9300

#10 LACQUER THINNER

SECTION1: PRODUCT IDENTIFICATION

SYNONYMS: Acrylic Lacquer Thinner
FORMULA: Paint related material
MOLECULAR WEIGHT: N/A
NFPA 704M/HMIS RATING: 2/2 Health 3/3 Flammability 0/0 Reactivity 0 Other
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

SECTION 2: HAZARDOUS INGREDIENTS

INGREDIENT(S)	CAS#	APPROX. %	OSHA
Toluene	108-88-3	25-40%	100
Methanol	67-56-1	12-18%	200
Acetone	67-64-1	16-24%	750
Aliphatic Petroleum Distillates	64742-89-8	10-30%	400
Ethylene Glycol Butyl Ether	111-76-2	1-5%	25

SECTION 3: FIRST AID INFORMATION

EYES: Flush promptly with copious amounts of water for 15 minutes. Call a physician.
SKIN: Wash thoroughly with soap and water. Remove contaminated cloth. Seek medical attention.
INHALATION: Remove to fresh air. Seek medical attention.
INGESTION: Induce vomiting if victim is conscious. This product contain Methyl Alcohol and cannot be made non-poisonous. Seek medical attention.

SECTION 4: HEALTH EFFECTS/HAZARD INFORMATION

PRIMARY ROUTES OF ENTRY: Dermal [X] Ingestion [X] Inhalation [X]
EYE CONTACT: May cause irritation and/or conjunctival inflammation.
SKIN CONTACT: May cause irritation
INHALATION: May cause irritation to respiratory tract. May cause depression of the central nervous system. Prolonged exposure may result in liver or kidney damage.
MEDICAL CONDITIONS AGGRAVATED BY LONG TERM EXPOSURE: Alcoholism and CNS, kidney, skin or liver disease.

SECTION 5: TOXICOLOGY/CARCINOGENITY INFORMATION

TOXICOLOGY: No specific toxicology information available for this product.
CARCINOGENITY: No specific carcinogenity information available for this product.

SECTION 6: PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Clear FORM: Liquid ODOR: Characteristic Solvent
SPECIFIC GRAVITY: .8017-.8200 @ 60 Degrees F
BOILING POINT: 133 Degrees F
VAPOR PRESSURE: 181.7 Hg @ 68 Degrees F Component
FLASH POINT: -18 Degrees F
VAPOR DENSITY: Heavier than air
EVAPORATION RATE: 2.47 (n-Butyl Acetate =1)

SOUTHEASTERN CHEMICAL

MATERIAL SAFETY DATA SHEET

Service or Information Number: In case of Emergency call Chem-Trec 800-424-9300

#10 LACQUER THINNER

SECTION 7: FIRE AND EXPLOSION INFORMATION

FLASH POINT: -18 Degrees F METHOD: (PMCC)
FLAMMABLE LIMITS: LEL: 1; UEL:36

SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
EXTINGUISHING MEDIA: Foam, CO2, dry chemical.
UNUSUAL FIRE AND EXPLOSION HAZARD: This material is extremely flammable and may be ignited by heat, sparks, flame or other sources of ignition. Vapors are heavier than air and may accumulate in low areas.

SECTION 8: REACTIVITY INFORMATION

STABILITY: Stable
INCOMPATIBILITY: Storage in open container, prolonged storage above 100F, exposure to excessive heat or open flame, strong acids or bases, oxidizing agents, amines, anhydrides.
HAZARDOUS DECOMPOSITION PRODUCTS: In the event of combustion CO, CO2 may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 9: PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Chemical respirator with self-contained air supply is required when concentration of vapor exceed the established exposure limits.

VENTILATION: Good general ventilation (typically 10 air changes per hour) should be sufficient to control airborne levels. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or poorly ventilated spaces, evaporation from large surfaces, spraying, heating, etc.

PROTECTIVE EQUIPMENT: Safety glasses with side shields (or goggles) are recommended for any type of industrial chemical handling. Good industrial hygiene practice should be followed which includes preventing eye contact and minimizing skin contact.

SECTION 10: SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL CHEM-TREC AT 800-424-9300.

SPILL CONTROL AND RECOVERY: Extinguish all sources of flame and ignition absorb with inert material such as vermiculite or sand. Sweep up and collect in containers to dispose as solid waste. Wash the area with tri-sodium phosphate and water.

DISPOSAL: Recycle through fuel blending, incineration and/or land disposal. Observe all federal, state, and local laws concerning health and environment.

SOUTHEASTERN CHEMICAL IND. INC. 660 OAK PLACE DAYTONA BEACH. FLORDIA 32127

SOUTHEASTERN CHEMICAL

MATERIAL SAFETY DATA SHEET

Service or Information Number: (800)428-2436 / In case of Emergency call Chem-Trec 800-424-9300

#10 LACQUER THINNER

SECTION 11: ENVIRONMENTAL INFORMATION

No environmental information available for this product.

SECTION 12: TRANSPORTATION INFORMATION

DOT Hazard Classification: Paint Related Material,3,UN-1263,PGII,Flammable Liquid

SECTION 13: ADDENDUM TO MATERIAL SAFETY DATA SHEET (Identifies SARA 313 Substances)

COMPOUND	SARA EHS Sec. 302 RQ(lb)	SARA EHS Sec. 302 TPQ(lb)	SARA Sec. 313	CERCLA Sec. 103 RQ (lbs)	RCRA Sec. 261.33 (if Pure)
Toluene	----	----	YES	1000	YES, U220
Methanol	5000	----	YES	5000	YES, U154
Acetone	5000	----	NO	5000	YES, U002
Aliphatic Petroleum Distillates	----	----	No	----	No
Ethylene Glycol Butyl Ether Monomethyl Ether Acetate	----	----	NO	----	NO

SARA Section 302 RQ: Reportable Quantity of Extremely Hazardous Substances, from 40 CFR 355
SARA Section 302 TPQ: Threshold Planning Quantity of Extremely Hazardous Substances
SARA Section 313 Chemicals: Toxic Substances subject to the annual reporting requirements listing at 40 CFR 302.4
CERCLA Section 103: Releases to air, land, or water of these hazardous substances which exceed the RQ must be reported to the National Response Center, (800-424-8802). Listed at 40 CFR 302.4
RCRA: Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33
REVISION DATE: 1/5/00

SOUTHEASTERN CHEMICAL IND.Inc provides the information contained in this MSDS in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving the information must exercise their independent judgement in determining its appropriateness for a particular purpose or use.

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M A T E R I A L S A F E T Y D A T A S H E E T

I. IDENTIFICATION

MANUFACTURED BY: Diamond Vogel Paint
1020 Albany Place South
Orange City, Ia 51041

24 Hour Emergency Telephone
CHEMTREC 1-800-424-9300

REVISED: 01/26/1999
PRINTED: 10/24/2001

General Information:
Mon-Fri 8 AM - 5 PM
712-737-4996

TRADE NAME: #10 Mineral Spirits

MFG. PRODUCT NUMBER: N-1110

PROPER SHIPPING NAME: Paint Related Material

II. HAZARDOUS INGREDIENTS

CAS #64741-41-9 Mineral Spirits WT %: 75-99 Footnote: (1)
ACGIH TLV: 100 PPM ACGIH STEL:
OSHA PEL: 500 PPM OSHA CEILING: OSHA PEAK:
VAPOR PRESSURE: 2.0 mm LEL%: .7

WARNING MESSAGES:
(1) Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Chronic exposure may cause damage to the central nervous system, respiratory system, lung, eye, skin, liver, gastrointestinal tract, spleen, kidneys, and blood.
(2) See Section IX for reportable Hazardous Air Pollutants.

III. PHYSICAL DATA

BOILING RANGE: 311-380° F

EVAPORATION RATE: * slower than ether *

PERCENT VOLATILE BY VOLUME: 100.00% WEIGHT PER GALLON: 6.50 LBS

VAPOR DENSITY: * heavier than air *

ACTUAL VOC (lb/gal): 6.50
EPA VOC (lb/gal): 6.50 EPA VOC (g/L): 779.19

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 39° C 102° F LEL: Refer to Section II

FLAMMABILITY CLASSIFICATION: CLASS II

DOT CLASSIFICATION (HAZARD CLASS): *Combustible Liquid*

EXTINGUISHING MEDIA: *carbon dioxide, dry chemical, or fire foam*

UNUSUAL FIRE AND EXPLOSION HAZARDS: keep away from heat, sparks, and flame.

SPECIAL FIRE FIGHTING PROCEDURES: Water is unsuitable, but may be used to cool closed containers.

V. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF OVEREXPOSURE:

ACUTE: High vapor concentrations are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.
Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

CHRONIC: None recognized.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: consult physician

PRIMARY ROUTE(S) OF ENTRY: Skin and Inhalation

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove to fresh air. Restore breathing. Treat symptomatically. Consult a physician.

EYES: Flush immediately with large amounts of water for at least 15 minutes. Talk to a physician for medical treatment.

SKIN: Wipe off with towel. Wash with soap and water. Remove contaminated clothing.

INGESTION: If swallowed, call a physician immediately. Remove stomach contents by gastric suction or induce vomiting only as directed by a medical personnel. Never give anything by mouth to an unconscious person.

VI. REACTIVITY DATA

STABILITY: *stable* HAZARDOUS POLYMERIZATION: *will not occur*

INCOMPATIBILITY: * unknown *

HAZARDOUS DECOMPOSITION PRODUCTS: Fire, burning and welding may generate carbon monoxide.

CONDITIONS TO AVOID: Fire, burning, and welding.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Remove all sources of ignition (flames, hot surfaces and electrical, static or frictional sparks). Avoid breathing vapors. Ventilate area. Use non-sparking tools. Remove with inert absorbant.

WASTE DISPOSAL METHOD: Dispose of in accordance with local, state, and federal regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: In confined areas of poor ventilation, use chemical cartridge respirator or self-contained breathing apparatus.

VENTILATION: Provide general dilution or local exhaust ventilation in volume and pattern to keep TLV and LEL of most hazardous ingredient in Section II, below acceptable limit.

PROTECTIVE GLOVES: None required except for prolonged contact.

EYE PROTECTION:
Splash proof eye goggles. In emergency situations, use eye goggles with a full face shield.

OTHER PROTECTIVE EQUIPMENT: *none*

HYGIENIC PRACTICES: See Section V

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Do not store near heat, sparks, or flame.

OTHER PRECAUTIONS: * none *

This product contains no known reportable Hazardous Air Pollutants.

NEW RAPID TAP®
MATERIAL SAFETY DATA SHEET

02/05/00

MSDS PROVIDED BY:
STOODY INDUSTRIAL AND WELDING SUPPLY, INC.
3316 National Ave., San Diego, CA 92113
Phone: (619) 234-6750
MILITARY EMERGENCY RESPONSE NUMBER 1 (800) 851-8061

RELTON corporation ®
CHEMICAL DIVISION

MATERIAL SAFETY DATA SHEET

Meets requirements of 29 CFR 1910.1200
Federal Hazard Communication Standard

HMIS	
Health	1
Fire	1
Reactivity	1

SECTION I

MANUFACTURER'S NAME: Relton Corporation 317 Rolyn Place Arcadia, CA 91007-2838 EMERGENCY RESPONSE for spill, leak, exposure, etc: Chemtrec – (800) 424-9300 For non-emergency product information: Relton Corp – (213) 681-2551 (800) 423-1505	PRODUCT NAME OR NUMBER **NEW Rapid Tap®** CHEMICAL NAME & SYNONYMS: Predominantly Chlorinated Paraffin CHEMICAL FAMILY: Chlorinated Paraffin FORMULA: Mixture (see Section II)

SECTION II - INGREDIENTS

	TLV	PEL	STEL	C.A.S. NO.	% wt.
Paraffin, chlorinated	NE	NE	NE	61788-76-9	< 40
Mineral Oil	5 mg/m^3	5 mg/m^3	NE	64742-58-1	< 50
Metal-Cutting-Fluid Additive	5 mg/m^3	10 mg/m^3	NE	Trade secret	< 8
Soybean Oil, epoxidized	NE	NE	NE	8013-07-8	> 1
Olefin Sulfide	5 mg/m^3	5 mg/m^3	NE	Trade secret	< 1
Cinnamon Oil Perfume	NE	NE	NE	--	trace

SECTION III – PHYSICAL DATA

BOILING POINT (F^o) (C^o) :	450^{o}F	SPECIFIC GRAVITY (H_20=1) @ 25^{o}C :	1.02	Freezing Point:	-20^{o}F
VAPOR PRESSURE (mm Hg) :	NF	PERCENT VOLATILE BY VOLUME (%) :	NA	VOC: Negligible	
VAPOR DENSITY (AIR=1) :	NF	EVAPORATION RATE (WATER=1) :	Slower than water		
SOLUBILITY IN WATER :	< .2%	pH: NA			
APPEARANCE AND ODOR: light amber color; slight, sweet odor			MATERIAL IS	LIQUID	

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Data isbased upon testing mixture as a whole.

FLASH POINT (method used) 350^{o}F COC	FLAMMABLE LIMITS	LFL	UFL
	Non-flammable	ND	ND

EXTINGUISHING MEDIA Carbon dioxide, Foam, Dry Chemical, Water, Fog

SPECIAL FIRE FIGHTING PROCEDURES
Self-contained breathing apparatus with full facepiece in a pressure-demand mode; full-body protective clothing. Treat as oil fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS combustion can produce acid gases (hydrogen chloride, hydrogen sulfide) Exposing containers to intense heat could cause drums to rupture. Cool fire-exposed containers with water spray to prevent rupture.

SECTION V – HEALTH HAZARD DATA

ROUTES OF ENTRY AND SYMPTOMS OF OVEREXPOSURE
Eyes and skin: may cause mild irritation. Inhalation: may cause mild upper respiratory irritation. Ingestion: possible nausea.

EMERGENCY AND FIRST AID PROCEDURES:
Eyes: Flush for 15 minutes with water. Skin: Wash with soap and water. Inhalation: remove to fresh air. Ingestion: do not induce vomiting; give lots of water to a conscious person. Call Doctor

NE = not established NF = not found NA = not applicable ND = not determined

SIWS PROVIDES MSDS AS A COURTESY TO ENSURE ACCURATE AND CURRENT DATA, OBTAIN AND USE ONLY MSDS FROM MANUFACTURER

NEW RAPID TAP®
MATERIAL SAFETY DATA SHEET

SECTION VI – REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID:
	STABLE	X	Elevated temperatures produce decomposition
INCOMPATIBILITY (materials to avoid): Strong oxidizing and reducing agents, strong alkalies,. Iron and zinc catalyze deterioration			
HAZARDOUS DECOMPOSITON PRODUCT: Combustion can produce carbon-dioxide and monoxide, hydrogen chloride, incompletely burned hydrocarbon products, oxides of sulfur & nitrogen, aldehydes, & traces of hydrogen sulfide.			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID:
	WILL NOT OCCUR	X	NA

SECTION VII– SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Clean up promptly by vacuum or absorbent material. Prevent discharge to streams or sewage systems; report if required.
WASTE DISPOSAL METHOD Transport in DOT-approved container to EPA-approved treatment, storage, and disposal facility. Follow local, State & Federal disposal regulations.

SECTION VIII– SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type) Normally not needed. For oil-type mist, use NIOSH listed respirator.		
VENTILATION Local-mechanical	LOCAL EXHAUST (Specify Rate) Adequate to avoid fumes and oil mists	SPECIAL Not required normally
	MECHANICAL (General) (Specify Rate):	OTHER
PROTECTIVE GLOVES Freshly washed cotton or rubber, nitrile	EYE PROTECTION Chemical goggles or full faceshield	
OTHER PROTECTIVE EQUIPMENT clean clothes Apron or chemical suit where splashing may occur		

SECTION IX– SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in a dry place. Vent vapors to open area if stored above 100ºF. Don't store near food or in zinc or iron containers.
OTHER PRECAUTIONS: Chlorinated Paraffin will darken at elevated temperatures. Avoid mist and vapor; use with adequate ventilation & exhaust of work area.

ADDITIONAL INFORMATION

DOT: No hazardous substance
No hazard class
It# 155250 class 65

UN or NA#: Not applicable
Freight classification: chlorinated paraffin

SARA: Not considered to be subject to Title III

TSCA: All components required to be listed on the inventory are listed

IARC-NTP-OSHA: Neither the mixture nor any component is listed as a carcinogen or suspected carcinogen.

Ozone-Depleting Substance: No 1,1,1-Trichloroethane (methane chloroform) or other ozone-depleting substance
No 5/15/93 labeling required

California Prop. 65 Material: None

Note: Although no exposure limits are established, observe ACGIH-OSHA TWA for oil mists: 5Mg/meter^3.
Use with adequate local ventilation and exhaust devices.

RELTON corporation ®

317 ROLYN PLACE ARCADIA CALIFORNIA 91007-2838
Phone: (213) 681-2551 (800) 423-1505
Emerg: Chemtrec –(800) 424-9300

Prepared: 2/24/93 Updated 11/07/94
Updated: 3/04/93 Updated 11/04/96
Updated: 7/15/93 Updated 07/25/97

By Dr. Robert E. Pratt,
consulting chemist

SIWS PROVIDES MSDS AS A COURTESY TO ENSURE ACCURATE AND CURRENT DATA, OBTAIN AND USE ONLY MSDS FROM MANUFACTURER

NORTON -- RESINOID BONDED GRINDING WHEELS - ANY GRADE
MATERIAL SAFETY DATA SHEET
NSN: 513000F009416
Manufacturer's CAGE: 44197
Part No. Indicator: A
Part Number/Trade Name: RESINOID BONDED GRINDING WHEELS

General Information

Item Name: ANY GRADE
Company's Name: NORTON CO
Company's Street: 1 NEW BOND ST
Company's City: WORCESTER
Company's State: MA
Company's Country: US
Company's Zip Code: 01615-0008
Company's Emerg Ph #: 508-795-2690/393-5847
Company's Info Ph #: 508-795-2690/795-5738
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 002
Status: SE
Date MSDS Prepared: 17APR90
Safety Data Review Date: 28JAN94
MSDS Preparer's Name: THOMAS Z. RICHARDS
Preparer's Company: NORTON CO
Preparer's St Or P. O. Box: 1 NEW BOND ST
Preparer's City: WORCESTER
Preparer's State: MA
Preparer's Zip Code: 01615-0008
MSDS Serial Number: BHGHY

Ingredients/Identity Information

Proprietary: NO
Ingredient: ALUMINUM OXIDE, BAUXITE, ALUMINA, DIALUMINUM TRIOXIDE
Ingredient Sequence Number: 01
Percent: 80
NIOSH (RTECS) Number: BD1200000
CAS Number: 1344-28-1
OSHA PEL: 10 MG/CUM TOTAL DUST
ACGIH TLV: 10 MG/CUM TOTAL DUST

Proprietary: NO
Ingredient: SILICON CARBIDE
Ingredient Sequence Number: 02
Percent: 80
NIOSH (RTECS) Number: VW0450000
CAS Number: 409-21-2
OSHA PEL: 10 MG/CUM TOTAL DUST
ACGIH TLV: 10 MG/CUM TOTAL DUST

Proprietary: NO
Ingredient: FERROVANADIUM DUST
Ingredient Sequence Number: 03
Percent: 20
NIOSH (RTECS) Number: LK2900000
CAS Number: 12604-58-9
OSHA PEL: 1 MG/CUM
ACGIH TLV: 1 MG/CUM

Proprietary: NO
Ingredient: ACRYLONITRILE (SUSPECTED HUMAN CARCINOGEN BY IARC, ACGIH, NTP, OSHA)
Ingredient Sequence Number: 04
Percent: 20

NIOSH (RTECS) Number: AT5250000
CAS Number: 107-13-1
OSHA PEL: 2 PPM
ACGIH TLV: 4.3 MG/CUM (A2)

Proprietary: NO
Ingredient: COPPER (DUST & MIST), BRONZE POWDER
Ingredient Sequence Number: 05
Percent: 20
NIOSH (RTECS) Number: GL5325000
CAS Number: 7440-50-8
OSHA PEL: 0.1 MG(CU)/M3 (FUME)
ACGIH TLV: 0.2 MG/M3 (FUME)
Other Recommended Limit: 1 MG(CU)/M3 (DUST)

Physical/Chemical Characteristics

Appearance And Odor: SOLID PRODUCT: MAY GIVE OFF ODOR IN USE
Specific Gravity: 2-4
Solubility In Water: SLIGHT

Fire and Explosion Hazard Data

Extinguishing Media: WATER

Reactivity Data

Stability: YES
Hazardous Decomp Products: DUST & DECOMPOSING ODORS. COOLANTS MAY PRODUCE OTHER DECOMPOSITION PRODUCTS.
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: CHRONIC INHALATION: MAY AFFECT BREATHING CAPACITY. SKIN/EYES: IRRITATION. GRINDING MAY CREATE ELEVATED SOUND LEVELS WHICH MAY AFFECT HEARING.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: YES
Explanation Carcinogenicity: SEE INGREDIENTS
Signs/Symptoms Of Overexp: INHALATION: COUGH.
Med Cond Aggravated By Exp: RESPIRATORY CONDITIONS
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. ARTIFICIAL RESPIRATION AS NEEDED. SKIN: WASH W/SOAP & WATER. EYES: FLUSH W/PLENTY OF WATER. INGESTION: OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: NORMAL CLEANUP PROCEDURES.
Waste Disposal Method: STANDARD LANDFILL METHODS CONSISTENT W/APPLICABLE FEDERAL, STATE & LOCAL LAWS.

Control Measures

Respiratory Protection: APPROVED DUST RESPIRATORS AS NEEDED
Ventilation: LOCAL EXHAUST OR MECHANICAL (GENERAL): RECOMMENDED.
Protective Gloves: RECOMMENDED
Eye Protection: RECOMMENDED
Other Protective Equipment: HEARING PROTECTION AS NEEDED

Transportation Data

==========
==========
Disposal Data
==========
==========
Label Data
==========
Label Required: NO
Technical Review Date: 31JAN94
Label Date: 31JAN94
Label Status: N
Common Name: RESINOID BONDED GRINDING WHEELS
Label Name: NORTON CO
Label Street: 1 NEW BOND ST
Label City: WORCESTER
Label State: MA
Label Zip Code: 01615-0008
Label Country: US
Label Emergency Number: 508-795-2690/393-5847

*******MATERIAL SAFETY DATA SHEET*******

For Coatings, Resins and Related Materials

SECTION I-PRODUCT AND PREPARATION INFORMATION

MANUFACTURER: RUST-OLEUM CORPORATION
ADDRESS: 11 Hawthorn Parkway
Vernon Hills, IL
60061

EMERGENCY AND INFORMATION
TELEPHONE: (708)367-7700

PRODUCT CLASS: Aerosol Spray Paint
MANUFACTURERS CODE: 2412
TRADE NAME: OVERALL Fast Drying Industrial Enamel Spray
DATE OF PREPARATION: March 23, 1993 (rwb)

SECTION II-HAZARDOUS INGREDIENTS

		EXPOSURE LIMITS			
INGREDIENT/CAS No	WT %	ACGIH-TLV	OSHA-PEL	LEL	mm Hg@20C
Xylene/1330-20-7	1%	100ppm	100ppm	1.2%	9.5
Toluene/108-88-3	55%*	100ppm	100ppm	1.2%	22.0
Mineral Spirits/8052-41-3	1%	100ppm	100ppm	1.0%	2.0
Propellant/68476-86-8 (propane, butane, isobutane)	35%*	1000ppm	1000ppm	1.8%	85psi

** TLV established for Butane only
* Nearest 5%
NE-not established NA-not applicable

SECTION III-PHYSICAL DATA

Boiling range: Below 0 F
Vapor density: Heavier than air
Evaporation Rate: Slower
(Ether=1)
% Volatile: NA
(by volume)
Wt/gal: NA
pH: NA

SECTION IV-FIRE AND EXPLOSION HAZARDS

Flammability Classification: Extremely Flammable
Flashpoint: <0 F (TCC)
DOT Classification: Consumer Commodity ORM-D
Extinguishing Media: NFPA Class B extinguishers (Carbon dioxide, dry chemical or foam)

Special Fire Fighting Procedures:
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion. If water is used, fog nozzles are preferred.

Unusual Fire and Explosion Hazards:
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat. DO NOT apply to hot surfaces.

SECTION V-HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

Acute(Inhalation): Harmful if inhaled. May affect the brain and nervous system causing dizziness, headache or nausea. Repeated overexposures may progressively lead to staggering gait, confusion, unconsciousness or coma. Causes nose and throat irritation.

Acute(Skin or Eye Contact): Causes eye and skin irritation which can lead to dermatitis with repeated overexposures.

Ingestion: May cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Overexposure to Xylene and Toluene in lab animals has been associated with liver abnormalities, kidney, lung, spleen and eye damage as well as anemia. Effects in humans have included liver and cardiac abnormalities.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove from exposure, restore breathing and notify a physician.

Eye Contact: Flush immediately with large amounts of water for at least 15 minutes. Notify a physician.

Skin Contact: Wash affected area with soap and water, remove contaminated clothing and wash before reuse.

Ingestion: DO NOT induce vomiting. Keep person warm, quiet and get medical attention. Aspiration of this material into the lungs can cause chemical pneumonitis which can be fatal.

SECTION VI-REACTIVITY DATA

Stability: Stable Incompatible: with strong oxidizing agents

Hazardous Decomposition Products: By open flame- Carbon monoxide & Carbon dioxide

Hazardous Polymerization: Will Not Occur

SECTION VII-SPILL OR LEAK PROCEDURES

Release or Spill Procedures: Remove all sources of ignition, ventilate area and remove with inert absorbent and non-sparking tools

Waste Disposal Method: Dispose of according to local, state and federal regulations. DO NOT incinerate closed containers.

SECTION VIII-SPECIAL PROTECTION INFORMATION

Respiratory Protection: Use NIOSH approved chemical cartridge respirator (TC23C) to remove solid airborne particles of overspray and organic vapors during spray application. In Confined Areas: Use NIOSH approved supplied-air respirators or hoods (TC19C).

Eye Protection: Use safety eyewear designed to protect against splash of liquids.

Other Protective Equipment:Use impervious gloves/clothing to prevent skin contact

Ventilation: Provide general dilution or local exhaust ventilation in volume and pattern to keep TLV of hazardous ingredients below acceptable limits.

SECTION IX-SPECIAL PRECAUTIONS AND REGULATORY ISSUES

Handling and Storage Precautions: Do not store above 120 F. DO NOT puncture or incinerate containers. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

CALIFORNIA PROPOSITION 65 STATEMENT: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

*Estimate
N/A-Not Applicable
N/R-Not Restricted
N/E-Not Established

MATERIAL SAFETY DATA SHEET

NOTE: BLANK SPACES ARE NOT PERMITTED. IF ANY ITEM IS NOT APPLICABLE, THE SPACE MUST BE MARKED TO INDICATE THAT.

IDENTITY **(As shown on Label or package)** **PLASTI DIP and PLASTI DIP UV** (F-698, 819, 820)	**PART NO. IF APPLICABLE**
SECTION I	
MANUFACTURER'S NAME Plasti Dip International Inc.	**EMERGENCY PHONE No.** **USA only:** 1-800-424-9300 **INT'L:** 703-527-3887
ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE) 3920 Pheasant Ridge Drive	**REVISION #**
Blaine, MN 55449	**MANUFACTURER'S PHONE No. FOR INFORMATION** 1-763-785-2156
	DATE MSDS WAS PREPARED October 17, 2008

SECTION II - HAZARDOUS INGREDIENTS INFORMATION. All Health Hazards which comprise 1% or greater of the composition and all carcinogens if 0.1% of the composition or greater.

HAZARDOUS COMPONENTS CHEMICAL and IDENTITY AND COMMON NAME (S)	% Wt. (OPTIONAL)	CAS NO.	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMEND
VM&P Naphtha	32 – 38	64742-89-8	300 ppm	300 ppm	None
Hexane	16-19	110-54-3	500 ppm	50 ppm	None
Toluene	13-16	108-88-3	200 ppm	50 ppm	None
Methyl Ethyl Ketone	3-7	78-93-3	200 ppm	200 ppm	None
Resins	25-27	N/A	N/A	N/A	None

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT 149-285°F	**SPECIFIC GRAVITY** (H_20 =1) 0.79 – 0.83	**APPROXIMATE WEIGHT PER GALLON (LBS)** 6.60 – 6.90
VAPOR PRESSURE 125 mmHg @ 20°C	**VAPOR DENSITY (AIR = 1)** Heavier than air	**EVAPORATION RATE (BUTYL ACETATE =1)** >1.0
SOLUBILITY IN WATER Insoluble	**% VOLATILE** 72 – 75 **VOC LBS./GAL** 4.8-5.2	**OTHER (IF ANY)** None

APPEARANCE AND ODOR Various colors, Honey Like Substance – Characteristic Odor

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

FLASH POINT -10.0°F **(METHOD USED)** TCC	**FLAMMABLE LIMITS**	**LEL** 0.9	**UEL** 11.5

EXTINGUISHING MEDIA Carbon Dioxide, Dry Chemical, or Foam

SPECIAL FIRE FIGHTING PROCEDURES Self contained breathing apparatus with a full face piece, operated in pressure demand or other positive pressure mode.

UNUSUAL FIRE AND EXPLOSION HAZARDS This material is flammable and may be ignited by heat, sparks, flame or static electricity.

HAZARDOUS PRODUCTS FORMED BY FIRE OR THERMAL DECOMPOSITION Carbon Dioxide and/or Carbon Monoxide

EXPLOSIVE LIMITS (% BY VOLUME IN AIR) 0.9 – 11.5

SECTION V - OPTIONAL HAZARD RATINGS IDENTIFICATION

HAZARD RATING **4-EXTREME** **3-HIGH** **2-MODERATE** **1-SLIGHT** **0-INSIGNIFICANT** ****SEE SECTION IV**	**National Fire Protection Association (NFPA)** **FIRE 3 REACTIVITY 0 .** **HEALTH 2 SPECIAL HAZARDS None .**

SECTION VI - REACTIVITY AND STABILITY DATA

STABILITY	**UNSTABLE** **STABLE X**	
INCOMPATIBILITY (Materials to Avoid) Strong acids, bases, oxidizing agents, selected amines with alkali metals and halogens.		
HAZARDOUS DECOMPOSITION OR BY PRODUCTS Carbon Monoxide, Carbon Dioxide		
HAZARDOUS POLYMERIZATION	**MAY OCCUR** **WILL NOT OCCUR X**	**CONDITIONS TO AVOID** May be ignited by heat, sparks, flame or static electricity.

SECTION VII - HEALTH HAZARD DATA

ROUTES OF ENTRY	**INHALATION?** YES	**SKIN?** YES **INGESTION?** YES **EYES?** YES
HEALTH HAZARDS	**ACUTE** X	
	CHRONIC X	

CARCINOGENICITY: No

SIGNS AND SYMPTOMS OF EXPOSURE

Headache, Dizziness, Drowsiness, Fatigue, Irregular Heartbeat, Skin and Eye Irritation.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

Ingestion: Contact Physician or Poison Control Immediatley.
Inhalation: Remove to fresh air. Administer Oxygen or Artificial Respiration if Necessary.
Eye Contact: Flush with large amounts of water. If irritation persists, contact Physician.
Skin: Wash with soap and water.

SECTION VIII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wipe up with floor absorbent. Transfer to hood. Prevent run-off to sewers.
Eliminate all sources of ignition. Ventilate to maintain exposure below PEL's. Use sand or other material to dam or contain spills. If large spill, notify appropriate state and local agencies.

WASTE DISPOSAL METHODS Dispose of product in accordance with local, county, state and federal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Avoid eye contact with eyes. Keep container closed. Use with adequate ventilation. Keep away from sparks, flame and heat sources and store in a cool area. Avoid inhalation of vapors and personal contact with liquid product.
Use good personal hygiene practices.

OTHER PRECAUTIONS

Keep Container Closed When Not In Use. Containers should be disposed of in an environmentally safe manner in accordance with Governmental Regulations.

SECTION IX - CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE) Depending on the Airborne concentration, use a Respirator with appropriate NIOSH approved cartridge or supplied air equipment.		**PROTECTIVE GLOVES** Impervious Gloves
VENTILATION	**LOCAL EXHAUST** Supplemental (if needed)	**SPECIAL** None
	MECHANICAL (GENERAL) To maintain exposure below PEL's	**OTHER** None
EYE PROTECTION Chemical splash goggles, or approved eye protection.		**OTHER PROTECTIVE CLOTHING OR EQUIPMENT** Chemcial Apron/Eye bath/Safety Shower
WORK HYGIENIC PRACTICES Wash thoroughly after handling.		

SECTION X - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME Coating Solution	**DOT HAZARD CLASS** 3
DOT UN NUMBER UN 1139	**DOT PACKING GROUP** II
IATA PROPER SHIPPING NAME Coating Solution	**IATA HAZARD CLASS** 3
IATA UN NUMBER UN 1139	**IATA PACKING GROUP** II

SECTION XI - 313 SUPPLIER NOTIFICATION

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT -TO-KNOW ACT OF 1986, 40 CFR 372, (see table on page 1 for CAS # and percent by weight).
Hexane, Toluene, and Methyl Ethyl Ketone

WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS, OR OTHER REPRODUCTIVE HARM.

Prepared By: Michael N Hindin

THE INFORMATION PROVIDED HEREIN IS BASED ON DATA CONSIDERED ACCURATE. NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THE DATA OR THE RESULTS OBTAINED FROM ITS USE. SINCE THE INFORMATION CONTAINED HEREIN MAY BE APPLIED UNDER CONDITIONS BEYOND THE VENDORS CONTROL AND SINCE SUBSEQUENT DATA MAY SUGGEST MODIFICATION OF THE INFORMATION, VENDOR ASSUMES NO RESPONSIBILITY FOR THE RESULTS OF ITS USE.

Procter & Gamble
CPG TN 6
2 Procter & Gamble Plaza
Cincinnati, OH 45202

MATERIAL SAFETY DATA SHEET

Issue Date: 2/1/00
Supersedes: N/A Issue Date: N/A

SECTION I - CHEMICAL PRODUCT

Identity: **Fabric Refresher**

Brands: **FEBREZE (Professional Line)**

Hazard Rating: 2

Health: 1
Flammability: 2
Reactivity: 0

4=EXTREME
3=HIGH
2= MODERATE
1=SLIGHT

Emergency Telephone Number: - 1-800-332-7787 or call Local Poison Control Center

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Water, alcohol, odor eliminator derived from corn, fragrance

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

Chemical Name	Common Name	CAS No.	Recommended Limits	Composition Range	LD50/LC50
Ethyl alcohol	Ethanol	64-17-5	ACGIH TLV: 1000 mg/m^3	3-7%	

SECTION III - HAZARDS IDENTIFICATION

Health Hazards (Acute and Chronic):

Inhalation: Inhalation of high concentrations of ethanol vapor may cause irritation of the eyes and respiratory tract, drowsiness and fatigue.

Ingestion: Possible mild gastrointestinal irritation with nausea, vomiting and/or diarrhea.

Eye Contact: Mild eye irritant. Do not spray directly toward face. If eye contact occurs, rinse well with water.

Skin: Prolonged skin contact may result in transient, superficial effects similar to those produced by mild toilet soaps.

SECTION IV - FIRST AID INFORMATION

Emergency and First Aid Procedures:

Inhalation:	Get fresh air.
Ingestion:	Dilute with fluids and treat symptomatically.
Eye contact:	Rinse well with water for at least 15 minutes.
Skin:	Rinse with water.

Other: Product package has a caution statement: CAUTION: KEEP OUT OF REACH OF CHILDREN. Do not spray directly toward face. If eye contact occurs, rinse well with water.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): >>150°F (cc) **Explosive Limits**: *LEL:* N/A *UEL*: N/A

Extinguishing Media: CO_2, water, or dry chemical

Special Fire Fighting Procedures: N/A

Unusual Fire Hazards:N/A.

Stability *Unstable*: *Conditions to Avoid*: None known

Stable: X

Incompatibility (Materials to Avoid): None known

Hazardous Decomposition/By Products: None known

Hazardous Polymerization: *May Occur*: *Conditions to Avoid*: None known

Will Not Occur: X

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: N/A

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Small quantities may be slowly flushed down sewer with excess water or dispose as liquid scrap. Discard empty container in trash.

Steps To Be Taken in Case Material is Released or Spilled: Use water spray or dilute and/or wash away spills to avoid exposure and to protect persons working to stop/repair leak. Any spills are to be prevented from entering waterways. Sorbents may be used.

SECTION VII - HANDLING AND STORAGE

Precautions To Be Taken in Handling and Storing:. Store at room temperature

Other Precautions: None.

SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Respiratory Protection (Specify Type): No special requirements with casual exposure
Ventilation *Local Exhaust*: Not necessary. *Special*: None

Mechanical (General): Acceptable. *Other*: None
Eye Protection: None required with normal use.
Manufacturing: If splash of solution is likely, chemical goggles may be needed.
Protective Gloves: None required with normal use.
Manufacturing: Minimize skin contact with protective gloves (rubber, neoprene).
Other Protective Equipment: None required with normal use.
Manufacturing: Use ventilation to minimize exposure to vapor or mist (ethanol).

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point ° F: ~212°F
Vapor Pressure (mm Hg): N/A
Vapor Density (Air=1): N/A
Odor Threshold: N/A
Coefficient of Water/Oil Distribution: N/A
Scooped Density: N/A
Appearance and Odor: Clear liquid
Product is perfumed.

Specific Gravity (H_2O=1): ca. 1
Percent Volatile by Volume (%): ca. 95
Evaporation Rate (nBuOAc=1): N/K
Freezing Point: N/A
pH (1% solution): ~7.0
Solubility in Water: Completely
Reserve Alkalinity: N/A

SECTION X - STABILITY AND REACTIVITY

Possible Hazardous Reactions/Conditions: None known

Conditions to Avoid: None

Materials to Avoid: None

Hazardous Decomposition Products: None known

Other Recommendations: None

SECTION XI - TOXICOLOGICAL INFORMATION

LD50 (rats oral): >5000 mg/kg

SECTION XII - ECOLOGICAL INFORMATION

No concerns at relevant environmental concentrations.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: Slowly flush down sewer with excess water or dispose as liquid scrap. . DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. Discard empty container in trash.

SECTION XIV - TRANSPORT INFORMATION

DOT Classification: Febreze is not DOT hazardous.

SECTION XV - ADDITIONAL REGULATORY INFORMATION

All components are listed on the US TSCA Inventory. No components are affected by Significant New Use Rules (SNURs) under TSCA §5.

No components of Febreze are subject to California Proposition 65.

TSCA §4 N-amyl acetate (CAS# 628-63-7) of Febreze (Professional Line) is subject to TSCA §12(b) export notification.

SECTION XVI - OTHER INFORMATION

*N/A. - Not Applicable *N/K. - Not Known

The submission of this MSDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

MATERIAL SAFETY DATA SHEET

PENNZOIL® ROADSIDE™ FIX-A-FLAT®

1. PRODUCT AND COMPANY IDENTIFICATION

MSDS Number: 13380
Version Date: 10/15/00

Product Name: PENNZOIL® ROADSIDE™ FIX-A-FLAT®
Product Use: Seal & inflate automotive tires
Synonyms: PENNZOIL® ROADSIDE™ SUPER FIX-A-FLAT®, S410, S420, S430

Manufacturer
Pennzoil-Quaker State Company
P.O. Box 2967
Houston, TX 772522967
USA

Phone Numbers
Medical Emergency: 1-800-546-6040
CHEMTREC(USA): 1-800-424-9300
CHEMTREC(International): 1-703-527-3887
MSDS Assistance: 1-800-546-6227
Fax On Demand: 1-800-546-6227
Technical Assistance: 1-800-416-1600
Customer Service: 1-800-468-8397
Fax Number: 713-217-3181
Internet Address: www.MSDS.PZLQS.com

2. COMPONENT INFORMATION

Component	CAS No.	Weight Percent Range	Hazardous in Blend
WATER	7732-18-5	30 - 60	No
TETRAFLUOROETHANE	811-97-2	10 - 55	Yes
HEAVY AROMATIC SOLVENT NAPHTHA	64742-94-5	10 - 50	Yes
AMORPHOUS POLYOLEFIN	MIXTURE	< 15	No
AROMATIC RESIN	MIXTURE	< 10	No
INERT FILLER	MIXTURE	< 7	No
EMULSIFIER	TRADESECRET	1 - 8	No

This product is **HAZARDOUS** according to OSHA 29 CFR 1910.1200.
Hazards:
Flammable/Combustible ___ **Acute Toxin** X **Chronic Toxin** ___ **Carcinogen** ___
Pressure X **Reactive** ___ **Exposure Limit** X **Target Organ** ___ **Other** ___

Other: No information available

3. HAZARDS IDENTIFICATION

Emergency and Hazards Overview
DANGER: HARMFUL OR FATAL IF SWALLOWED. CONTENTS UNDER PRESSURE. MAY CAUSE EYE IRRITATION.

NFPA Ratings: **Health** 1 **Flammability** 1 **Reactivity** 0

Primary Route of Exposure: **Skin** X **Inhalation** ___ **Eye** ___

Health Effect Information

Eye Contact: Avoid eye contact. Exposure to mists and vapors may be irritating to the eyes. May be irritating to the eyes upon direct contact.

Skin Contact: Avoid skin contact. This product may cause skin irritation upon direct contact. Prolonged or repeated skin contact may result in dryness, chapping, and reddening. Pre-existing skin conditions may make the skin more susceptible and facilitate uptake by this route. May be absorbed through skin.

Inhalation: This product is not expected to pose an inhalation hazard under conditions of forseeable use. Avoid prolonged inhalation of vapors. Acute and chronic overexposures may be irritating to the respiratory tract. Inhalation of high concentrations of this product can cause central nervous system depression and narcosis. Severe intoxication may lead to drowsiness, dullness, numbness, and headache followed by dizziness, weakness, and nausea. Exposure to extremely high concentrations may have anesthetic effects but are completely reversible upon cessation of exposure. Inhalation of high vapor concentrations may cause heart irregularities, including irregular pulse, palpitation and inadequate circulation. Vapors are heavier than air and can settle in low lying areas such as pits. Intentional misuse by deliberately concentrating and/or inhaling can be harmful or fatal.

Ingestion: Ingestion is unlikely for aerosol products. This product is regarded as having a low order of toxicity.

Medical Conditions Aggravated by Exposure: Drying and chapping may make the skin more susceptible to other irritants, sensitizers and disease. Individuals with preexisting diseases of the central nervous system or cardiovascular system may have increased susceptibility to this product.

Other: No information available

4. FIRST AID INFORMATION

Eye Contact: Immediately flush eyes with large amounts of water and continue flushing until irritation subsides. If irritation persists, seek medical attention.

Skin Contact: Wash contaminated area thoroughly with soap and water. If redness or irritation persists, seek medical attention.

Inhalation: If victim exhibits signs of vapor intoxication remove to fresh air. If discomfort persists seek medical attention.

Ingestion: Ingestion is unlikely for aerosol products. Accidental spraying into the mouth will not result in any harmful effects. Do not induce vomiting due to aspiration hazard.

Notes to Physician: Because of possible disturbances of cardiac rhythm, catecholamine drugs such as epinephrine, should be used with caution, and only in emergency situations.

Other: No information available

5. FIRE AND EXPLOSION INFORMATION

Flammable Properties

Flash Point (aerosol concentrate): None **Test Method:** Setaflash

Flame Extension: 0", no flashback **Test Method:** CPSC 1500.45

Flammable Limits in Air

Upper Percent: No data available

Lower Percent: No data available

Autoignition Temperature: No data available **Test Method:** No information available

NFPA Classification: No information available

Extinguishing Media: Use water spray (fog), dry chemical, foam, or carbon dioxide.

Fire Fighting Measures

Special Fire Fighting Procedures and Equipment: This material is nonflammable.

Unusual Fire and Explosion Conditions: Caution! Contents are under pressure and can explode when exposed to heat or flames. Pressurized container: Protect from sunlight and do not expose to temperatures exceeding 50 C. Do not pierce or burn even after container is empty.

Hazardous Combustion By-Products: Carbon monoxide, carbon dioxide, and other oxides may be generated as products of combustion.

Other: No information available

6. ACCIDENTAL RELEASE MEASURES

Personnel Safeguards: Consult Health Effect Information in Section 3, Personal Protection Information in Section 8, Fire and Explosion Information in Section 5, and Stability and Reactivity Information in Section 10. Provide adequate ventilation during clean-up.

Regulatory Notifications: No notification required

Containment and Clean up: No special cleanup procedures are necessary.

Other: No information available

7. HANDLING AND STORAGE INFORMATION

Handling: Contents under pressure and can explode when exposed to heat or open flame. Caution!--Do not puncture or incinerate. Do not weld on a rim without first removing the tire from the rim. Failure to do so could cause the tire to explode regardless of whether tire inflator is used. Welded and repaired rims are unsafe.

Storage: Do not store at temperatures greater than 120 F.

Empty Container Warnings
Drums: Not applicable
Plastic: Not applicable

Other: No information available

8. EXPOSURE CONTROLS / PERSONAL PROTECTION INFORMATION

Exposure Limits and Guidelines

Component	CAS No.	Exposure Limit
HEAVY AROMATIC SOLVENT NAPHTHA	64742-94-5	OSHA - PEL: TWA 500 ppm ACGIH - TLV: TWA 100 ppm

Personal Protective Equipment
Eye/Face Protection: Wear safety glasses with unperforated sideshields.

Skin Protection: Skin protection is not required under conditions of normal use. For prolonged or repeated exposures, use impervious clothing (boots, gloves, aprons, etc.) over parts of the body subject to exposure. Launder soiled clothes.

Respiratory Protection: Respiratory protection is not required under conditions of normal use. If excessive levels of mists or vapors are generated while using this product, use an organic vapor respirator. All respirators must be NIOSH certified.

Personal Hygiene: Always wash hands and face with soap and water before eating, drinking, or smoking. Consumption of food and beverage should be avoided in work areas where this product is present.

Engineering Controls / Work Practices

Ventilation: All use, including deflating of tires, must be done in a well-ventilated area. If product is used in enclosed or confined spaces, adequate ventilation must be provided to prevent buildup of vapors or mists.

Other: No information available

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Foamy , milky liquid	
Odor: Ammonia - mild	**Vapor Pressure:** 77 - 79 psig @ 68 F
Physical state: Liquid	**Vapor Density (air=1):** < 1
pH: 8.5 - 9.5	**Percent Volatile by Volume:** Apx 92 %
Boiling Point: 30 F, -1.1 C	**Volatile Organic Content:** No data available
Melting Point: No data available	**Molecular Weight:** No data available
Specific Gravity: Apx 0.98	**Average Carbon Number:** No data available
Pour Point: -15 F, -26.1 C	**Viscosity @ 100 F:** 20 SUS
	Viscosity @ 40 C: No data available
Solubility in Water: Soluble in water	
Octanol / Water Coefficient: Log K_{ow} = No data available	

10. STABILITY AND REACTIVITY INFORMATION

Chemical Stability: Stable

Conditions to Avoid: High heat and open flames.

Incompatible Materials to Avoid: Avoid contact with magnesium.

Other: No information available

11. TOXICOLOGICAL INFORMATION

Primary Eye Irritation: No information available

Primary Skin Irritation: No information available

Acute Dermal Toxicity: No information available

Subacute Dermal Toxicity: No information available

Dermal Sensitization: No information available

Inhalation Toxicity: No information available

Inhalation Sensitization: No information available

Oral Toxicity: No information available

Mutagenicity: No information available

Carcinogenicity: The IARC has concluded that petroleum solvents are Group 3 substances, "not classifiable as to their carcinogenicity to humans". This product is not considered to be carcinogenic.

Reproductive and Developmental Toxicity: No information available

Teratogenicity: No information available

Immunotoxicity: No information available

Neurotoxicity: No information available

Other: No information available

12. ECOLOGICAL INFORMATION

Aquatic Toxicity: No information available

Terrestrial Toxicity: No information available

Chemical Fate and Transport: No information available

Other: No information available

13. DISPOSAL INFORMATION

Regulatory Information: Dispose of residual products and empty containers responsibly.

Waste Disposal Methods: No special waste disposal methods are required. Waste material may be landfilled or incinerated at an approved facility.

Other: No information available

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)
Highway / Rail (Bulk): Not Regulated
Highway / Rail (Non-Bulk): CONSUMER COMMODITY - ORM-D

The DOT description is provided to assist in the proper shipping classification of this product and may not be suitable for all shipping descriptions.

International Information

Vessel:	**IMDG Regulated:**	**X**	**IMDG Not Regulated:**	
Air:	**ICAO Regulated:**	**X**	**ICAO Not Regulated:**	

Other: No information available

15. Regulatory Information

Regulatory Lists Searched The components listed in Section 2 of this MSDS were compared to substances which appear on the following regulatory lists. Each list is numerically identified. See Regulatory Search Results below.

Health & Safety: 10 - IARC carcinogen, 11 - NTP carcinogen, 12 - OSHA carcinogen, 15 - ACGIH TLV, 16 - OSHA PEL, 17 - NIOSH exposure limit, 20 - US DOT Appendix A, Hazardous substances, 21 - USDOT Appendix B, Marine pollutants, 22 - FDA 21 CFR Total food additives, 23 - NFPA 49 or 325

Environmental: 30 - CAA 1990 Hazardous air pollutants, 31 - CAA Ozone depletors, 33 - CAA HON rule, 34 - CAA Toxic substance for accidental release prevention, 35 - CAA Volatile organic compounds (VOC's) in SOCMI, 41 - CERCLA / SARA Section 302 extremely hazardous substances, 42 - CERCLA / SARA Section 313 emissions reporting, 43 - CWA Hazardous substances, 44 - CWA Priority pollutants, 45 - CWA Toxic pollutants, 46 - EPA Proposed test rule for hazardous air pollutants, 47 - RCRA Basis for listing - Appendix VII, 48 - RCRA waste, 49 - SDWA - (S)MCLs

International: 50 - Canada - WHMIS Classification of substance, 54 - Mexico - Drinking water - ecological criteria, 55 - Mexico - Wastewater discharges, 56 - US -TSCA Section (12)(b) - export notification

State Lists: 60 - CA - Proposition 65, 61 - FL - Substances, 62 - MI - Critical materials, 63 - MA - RTK, 64 - MA - Extraordinarily hazardous substances, 65 - MN - Hazardous substances, 66 - PA - RTK, 67 - NJ - RTK, 68 - NJ - Environmental hazardous substances, 69 - NJ - Special hazardous substances

Inventories: 80 - Canada - Domestic substances , 81 - European - EINECS, 82 - Japan - ENCS, 83 - Korea - Existing and evaluated chemical substances, 84 - US - TSCA

Regulatory Search Results:
HEAVY AROMATIC SOLVENT NAPHTHA: 80, 81, 83, 84
TETRAFLUOROETHANE: 65, 80, 81, 82, 83, 84
WATER: 80, 81, 83, 84

U.S. TSCA Inventory: All components of this material are on the US TSCA Inventory.

SARA Section 313: Consumer products are not regulated under SARA, Title III, Section 313.

IARC: No information available

SARA 311 / 312 Categories
Acute: X **Chronic:** ___ **Fire:** ___ **Pressure:** X **Reactive:** ___
Not Regulated: ___

Canadian WHMIS Classification
Class A Compressed gas
Class D Poisonous and infectious material, Division 2, Subdivision B Toxic material

European Union Classification
Hazard Symbols:
"3" / Aerosol
Harmful / Xn / X in square.
Risk Phrases:
R66: Repeated exposure may cause skin dryness or cracking.
R67: Vapours may cause drowsiness and dizziness.
Safety Phrases:
S2: Keep out of the reach of Children.
S23: Do not breathe gas/fumes/vapour/spray.
S24: Avoid contact with skin.
S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Other: No information available

16. OTHER INFORMATION

Health and Environmental Label Language

Front Label:
DANGER: HARMFUL OR FATAL IF SWALLOWED. CONTENTS UNDER PRESSURE. MAY CAUSE EYE IRRITATION.
Read all cautions and directions on back panel before using.

Back Label:
DANGER: PRECAUTIONARY MEASURES:
DO NOT ingest or inhale. Use in a well ventilated area. Avoid contact with eyes.
DO NOT puncture or incinerate container. DO NOT expose to heat, open flame, direct sunlight or store at temperatures above 120º F. Exposure to heat may cause can to rupture. DO NOT STORE IN INTERIOR OF CAR (INCLUDING GLOVE COMPARTMENT AND INSIDE HATCHBACKS). TEMPERATURES INSIDE CAR CAN EXCEED 120º F. STORE OUTSIDE PASSENGER AREA OF VEHICLE PREFERABLY SECURED IN SPARE TIRE WELL OR TRUNK.
DO NOT use with any other tire inflator products.
DO NOT use on motorcycle tires. Failure of one tire could cause loss of control. Also DO NOT use on high performance or "Z-rated" tires.
DO NOT use Fix-A-Flat with tires which utilize tire sensor technology. Fix-A-Flat may block tire sensors and cause them to be inoperable. Fix-A-Flat will not be liable for damage to tire sensors.
NEVER WELD ON A RIM. WELDING ON A RIM WITH THE TIRE MOUNTED COULD CAUSE THE TIRE TO EXPLODE REGARDLESS OF WHETHER TIRE INFLATOR IS USED. WELDED AND REPAIRED RIMS ARE UNSAFE.

FIRST AID: Contains fluorocarbons and aromatic solvents.
INHALATION: If inhaled, breathe fresh air. If breathing is affected, give artificial respiration and call a physician.
EYE CONTACT: Immediately flush with water for 15 minutes. If irritation persists, call physician.
INGESTION: If ingested, do not induce vomiting. Call physician immediately.

KEEP OUT OF REACH OF CHILDREN.

For health emergency call: 1-800-546-6040.

MSDS Revisions

Previous Version Date: 03/02/99

Previous Version Information: Product formulation changed.

Other: No information available

Prepared By:

Pennzoil-Quaker State Company
Environmental, Safety, Health, & DOT Compliance
P.O. Box 2967
Houston, TX 77252-2967 USA

Disclaimer of Warranty: The information contained herein is based upon data and information available to us, and reflects our best professional judgement. This product may be formulated in part with components purchased from other companies. In many instances, especially when proprietary or trade secret materials are used, Pennzoil-Quaker State Company must rely upon the hazard evaluation of such components submitted by that product's manufacturer or importer. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent. Since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use.

Olin MATERIAL SAFETY DATA

OCEAN® Network
EMERGENCY PHONE 1-800-OLIN-911

SECTION I - IDENTIFICATION

CHEMICAL NAME & SYNONYMS		
Industrial Ammunition 8 Gauge (Small Arms Ammunition)		
CHEMICAL FAMILY	FORMULA	TRADE NAME
Not applicable	Mixture	Not applicable
DESCRIPTION		CAS NO.
Container with powders and projectile		Not assigned

SECTION II - NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in a cool, well-ventilated place away from all sources of ignition. If damaged, do not get dust in eyes, on skin or on clothing. Do not take internally. Avoid breathing dust or fumes. Upon contact with skin or eyes wash off with water. Avoid breathing fumes during discharge.

PROTECTIVE EQUIPMENT		VENTILATION REQUIREMENTS
Eyes	Safety glasses or goggles	Local mechanical exhaust ventilation recommended during confined space discharge.
Gloves	None necessary	
Other	Hearing protection recommended during discharge	

SECTION III - HAZARDOUS INGREDIENTS

BASIC MATERIAL	OSHA PEL	LD 50	LC 50	SIGNIFICANT EFFECTS
Lead	50 ug/m^3	No Data	No Data	Eye irritation, fatigue disturbance of sleep

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT METHOD	OSHA CLASSIFICATION	FLAMMABLE EXPLOSIVE LIMITS	LOWER	UPPER
Not Applicable	Explosive		-	-

EXTINGUISHING MEDIA

Deluge with water, material is self-oxidizing. Flood with water to fight fire and to cool shells.

SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES

Evacuate area. Fight fire from an explosion resistant location.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

None established. (Inorganic recm. std.-air: TWA 0.15 mg (Pb)m^3 (ACGIH 1984-85)

SYMPTOMS OF OVER EXPOSURE

Eye irritation, fatigue, disturbance of sleep.

EMERGENCY FIRST-AID PROCEDURES

SKIN	Contact of skin with shells presents no health hazard.
EYES	Flush thoroughly with water. If an irritation occurs, call a physician.
INGESTION	Ingestion of shells not a possible route of exposure.
INHALATION	Remove victim to fresh air.

Chemical Industrial Ammunition 8 Gauge

CAS No. Not assigned

SECTION VI - TOXICOLOGY (Product) (Small Arms Ammunition)

ACUTE ORAL LD 50	Not applicable	CARCINOGENICITY	Not carcinogenic
		MUTAGENICITY	May be mutagenic
ACUTE DERMAL LD 50	> 2 g/kg	EYE IRRITATION	May be an irritant
		PRIMARY SKIN IRRITATION	Not an irritant
ACUTE INHALATION LC 50	Not known		

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, dermal

EFFECTS OF ACUTE EXPOSURE
Fatigue, disturbance of sleep, eye irritation.

EFFECTS OF CHRONIC EXPOSURE Anemia, central nervous system depression, toxicity to kidneys, reproductive system and fetus.

SECTION VII - SPILL AND LEAKAGE PROCEDURES (Control Procedures)

ACTION FOR MATERIAL RELEASE OR SPILL

Remove all sources of ignition. Wear goggles and gloves. Use non-sparking utensils during cleanup. If containers are damaged, wear NIOSH/MSHA approved dust respirator. Follow OSHA regulations for respirator use. (See 29 CFR 1910.134). Minimize powder contamination. Clean up and place in an approved DOT container. Isolate and do not seal. Label "Small Arms Ammunition". Wash all contaminated clothing before reuse.

In the event of a large spill use the emergency telephone number shown on the front of this sheet.

TRANSPORTATION EMERGENCY, CONTACT CHEMTREC 800-424-9300

WASTE DISPOSAL METHOD

Dispose of contaminated product, empty containers and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate federal, state and local regulatory agencies to ascertain proper disposal procedures.

SECTION VIII - SHIPPING DATA

D.O.T. CLASS	Class C Explosive ORM-D

SECTION IX - REACTIVITY DATA

STABLE X UNSTABLE AT ____ °C ____ °F	HAZARDOUS POLYMERIZATION	MAY OCCUR	
		WILL NOT OCCUR	X
CONDITIONS TO AVOID	Open flame, heat, sparks, shock or percussion, pressure		
INCOMPATIBILITY (Material to Avoid)	Acids, alkalis, oxidizing materials (contents)		
HAZARDOUS DECOMPOSITION PRODUCTS	Lead fume, carbon monoxide		

SECTION X - PHYSICAL DATA

MELTING POINT	N/A	VAPOR PRESSURE	N/A	VOLATILES	N/A
BOILING POINT	N/A	SOLUBILITY IN WATER	N/A	EVAPORATION RATE	N/A
SPECIFIC GRAVITY (H_2O = 1)	N/A	pH	N/A	VAPOR DENSITY (Air = 1)	N/A

INFORMATION FURNISHED BY: C. C. Noonan (203) 789-5436 **DATE** November 16, 1985

Department of Environmental Hygiene and Toxicology
(203) 789-5436

1475

Olin CORPORATION
120 Long Ridge Road, Stamford, Connecticut 06904
OCEAN® Network
EMERGENCY PHONE 1-800-OLIN-911

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)	Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.
All Shotshell Ammunition	

Section I "Small Arms Ammunition"

Manufacturer's Name	Emergency Telephone Number
Remington Arms Co., Inc.	(501) 676-3161
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
I-40 & Highway 15	(501) 374-2246
Lonoke, Arkansas 72086	Date Prepared 8-12-86
	Signature of Preparer (optional) W.G. Bell, Chem Lab - Technical Section

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Lead, Inorganic and lead compounds	50mg/M^3			
Arsenic and compounds	10mg/M^3			
Antimony and compounds	500 mg/M^3			
Barium and compounds	500 mg/M^3			
Nitroglyerin (0.05 ppm skin) 500 micrograms/M^3 of air				

DOT - "Small Arms Ammunition"
Class C Explosive

UPS ORM-D

Section III — Physical/Chemical Characteristics

Boiling Point		Specific Gravity (H_2O = 1)	
Not applicable		Not applicable	
Vapor Pressure (mm Hg.)		Melting Point	
Not applicable		Not applicable	
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	
Not applicable		NOT Applicable	

Solubility in Water
Lead & Lead Styphnate - Insoluble; Lead Nitrate - 127 gm/100cc Water - 100°C

Appearance and Odor
Grayish, Gray, Silvery Material - No odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
Not applicable	Not applicable	NA	NA

Extinguishing Media
Material is self oxidizing; flood with water to fight fire and cool shells.

Special Fire Fighting Procedures
Evacuate immediate area and deluge with water. Wear protective clothing for shrapnel.

Unusual Fire and Explosion Hazards
Shells will detonate when exposed to flame and high temperatures.

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid: Flames, sparks, percussion or shock and high temperatures (130°C)
	Stable	X	

Incompatibility (*Materials to Avoid*): Strong mineral acids and alkalis

Hazardous Decomposition or Byproducts: Oxides of carbon, nitrogen and lead fumes.

Hazardous Polymerization	May Occur		Conditions to Avoid: Heat, fire, static, friction and percussion.
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Fumes Skin? Cuts or abrasions - Ingestion? Particles

Health Hazards (*Acute and Chronic*)
Anemia, fatigue, noctoria, embryotoxin, malnutrition, weakness, mental confusion, pallor - treat per general lead exposure; headache and nausea

Carcinogenicity: Not known NTP? IARC Monographs? OSHA Regulated? Lead - Yes

Signs and Symptoms of Exposure: Refer to health hazard above.

Medical Conditions Generally Aggravated by Exposure: Gastrointestinal tract; kidneys, blood and central nervous system. (CNS)

Emergency and First Aid Procedures: Skin - flush with water; if swallowed seek medical attention immediately.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

Use non-sparking equipment to cleanup and store shells - avoid ignition sources.

Waste Disposal Method
Material may be burned per appropriate federal, state and local regulatory agency - contact

Precautions to Be Taken in Handling and Storing

Refer to released or spilled data above.

Other Precautions

Label containers - "Small Arms Ammunition" wear gloves and shrapnel protection.

Section VIII — Control Measures

Respiratory Protection (*Specify Type*): OSHA SA/HiE/SCBA

Ventilation	Local Exhaust	Not required	Special	Not applicable
	Mechanical (General)	Not required	Other	Not applicable

Protective Gloves: Not applicable

Eye Protection: Safety glasses when shooting

Other Protective Clothing or Equipment: Use hearing protection when discharging cartridges.

Work/Hygienic Practices: Wash hands after skin contact with cartridges.

• USGPO: 1988-491-529/45775

MATERIAL SAFETY DATA SHEET

SMALL ARMS AMMUNITION
CENTERFIRE RIFLE & PISTOL AMMUNITION

Federal Cartridge Company
900 Ehlen Drive
Anoka, Minnesota 55303

TELEPHONE: 612-323-2300
PRODUCT SERVICE: 612-323-3706
EMERGENCY PHONE NUMBER: 800-424-9300 (CHEMTREC)

Issue Date: January 4, 1999

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SECTION #1 - PRODUCT IDENTIFICATION:

CENTERFIRE PRODUCT FAMILY		
Centerfire Metallic Cartridge Including The Following:		
.222 Remington	.30-30 Winchester	.300 Savage
.22-250 Remington	.32 Automatic	.32 Winchester Special
.223 Remington	.32 S&W Long	.338 Winchester Magnum
6mm Remington	.32 H&R Magnum	.35 Remington
.243 Winchester	.380 Automatic	8mm Mauser
.257 Roberts +P	.38 Special	.45-70 Government
.25-06 Remington	.357 Magnum	.280 Remington
.270 Winchester	9mm Luger Auto	7-30 Waters
7mm Remington Magnum	9mm Ball (M-822)	7.62X39 Soviet
7mm Mauser	9mm Federal	.303 British
.300 Winchester Magnum	.41 Rem Magnum	.375 H&H Magnum
.308 Winchester	.44 S&W Special	.300 H&H Magnum
.30-06 Springfield	.44 Rem Magnum	.458 Winchester Magnum
.30 Caliber Carbine	.45 Automatic	.416 Rigby
.25 Automatic	.45 Colt	.470 Nitro Express
10mm Automatic	9mm Subsonic	.38 Special +P+
.40 S&W	6.5X55 Swedish	7X64 Brenneke
5.56 Limited Range	9mm Limited Range	.38 Special +P
356 TS&W	.270 Weatherby Magnum	.300 Weatherby Magnum
7mm Weatherby Magnum	.357 SIG	.38 Super

CENTERFIRE PRODUCT FAMILY		
Centerfire Metallic Cartridge Including The Following:		
9X18 Makarov	.257 Weatherby Magnum	.416 Remington Magnum
.220 Swift	.35 Whelen	.340 Weatherby Magnum
7mm STW	7mm-08 Remington	.260 Remington

SECTION #2 - CHEMICAL COMPOUNDS:

CHEMICAL COMPOUNDS			
		TWA UNLESS OTHERWISE NOTED	
	CAS NUMBER	OSHA PEL	ACGIH TLV
Bullet - Lead or Lead Core	7439-92-1	.05 mg/m^3	.05 mg/m^3
Copper Jacket	7440-50-8	1 mg/m^3 Fume: .1 mg/m^3	1 mg/m^3 Fume: .2 mg/m^3
Zinc (As Zinc Oxide)	7440-66-6 1314-13-2	10 mg/m^3 (5 mg/m^3 as respirable dust) Fume: 5 mg/m^3	10 mg/m^3 Fume: 5 mg/m^3
Tin	7440-315	.1 mg/m^3	2 mg/m^3
Nyclad Coating	Not Established	Not Established	Not Established
Cartridge Case - Brass, (As Zinc & Copper) (See Above)			
Nickel Plated Brass (As Nickel)	7440-02-0	1 mg/m^3	1 mg/m^3
Propellant - Nitrocellulose	9004-70-0	Not Established	Not Established
Nitroglycerine	55-63-0	2 mg/m^3 Ceiling	0.46 mg/m^3 (Skin)
Graphite	7782-42-5	15 mg/m^3 (5 mg/m^3 as respirable dust)	2 mg/m^3
Primer - Lead Styphnate (As Lead)	12403-82-6	.05 mg/m^3	.05 mg/m^3
Barium Nitrate (As Barium)	7440-39-3	.5 mg/m^3	.5 mg/m^3
Antimony Sulfide (As Antimony)	7440-36-0	.5 mg/m^3	.5 mg/m^3
Aluminum	7429-90-5	15 mg/m^3 (5 mg/m^3 as respirable dust)	10 mg/m^3

DEFINITIONS OF ACRONYMS

OSHA PEL:	Occupational Safety and Health Administration's Permissible Exposure Limit.
ACGIH TLV:	American Conference of Governmental Industrial Hygienists' Threshold Limit Values.
TWA:	Time Weighted Average.
STEL:	Short Term Exposure Limit, the 15 minute exposure which should not be exceeded at any time during a workday.
CEILING:	The concentration which is not to be exceeded at any time during a workday.
CAS:	Chemical Abstracts Service number.

SECTION #3 - PHYSICAL DATA

Boiling Point:	Not Applicable
Melting Point:	Not Applicable
Vapor Pressure:	Not Applicable
Density:	3.1 - 8.0 grams/cc
Solubility (Water):	None
Evaporation Rate:	Not Applicable
Percent Volatiles:	Not Applicable
Vapor Density (Air = 1):	Not Applicable
Appearance:	Brass or nickel plated brass case with plastic, lead, copper jacketed lead or nylon clad lead bullet.
Odor:	None
Odor Threshold:	None

SECTION #4 - FIRE FIGHTING & EXPLOSION DATA:

Flash Point (F):	Not Applicable
Auto Ignition Temperature (F):	Not Applicable
Upper Explosive Limits (Percent):	Not Applicable
Lower Explosive Limits (Percent):	Not Applicable
Fire & Explosion Hazards:	May ignite if heated to 250 degrees F, independent of air. Unconfined ignited cartridges can produce low velocity metallic fragments which may cause eye injury or superficial skin wounds if unprotected by standard fire-fighter turnout gear.
Extinguishing Media:	Water

Special Fire Fighting Instructions: Wear full fire-fighter protective gear including face shield or SCBA. Use wide fog pattern nozzle to stop any low velocity fragments. Use water to cool ordinary combustibles below ignition temperature.

SECTION #5A - EXPOSURE & EFFECTS -- INHALATION

ROUTE OF EXPOSURE & EFFECTS - INHALATION

Acute: Inhalation of gases and particulates produced while firing ammunition may result in mild throat, eye, upper respiratory and lung irritation. The irritant effects may lead to lung symptoms such as bronchitis. An over exposure to gases or particulates may also cause: anemia; nervous system symptoms which may include irritability, headache, restlessness, fatigue, muscle weakness, muscle tremor, convulsions, loss of memory, visual and hearing disturbances, loss of coordination; gastrointestinal effects such as vomiting, colic, diarrhea or constipation; circulatory symptoms such as a drop in blood pressure; reproductive effects including fertility problems, birth defects, miscarriages and possible kidney damage.

Chronic: Prolonged repeated over exposure to fired cartridge gases and particulates may result in elevated blood lead levels and elevated zinc protoporphyrin levels. Symptoms of chronic overexposure to lead may include: anemia; lead lines on the gums; nervous system symptoms which may include irritability, headache, restlessness, fatigue, muscle weakness (i.e. wrist drop), muscle tremor, convulsions, loss of memory, visual and hearing disturbances, loss of coordination; gastrointestinal effects such as weight loss, vomiting, colic, diarrhea, constipation; circulatory symptoms such as a drop in blood pressure; reproductive effects including fertility problems, birth defects, miscarriages and possible kidney damage.

If acute or chronic symptoms should appear, contact a physician. Blood lead and zinc protoporphryn levels are recommended and should be monitored as per OSHA 1910.1025.

First Aid: Remove person to fresh air. Seek medical attention.

SECTION #5B - EXPOSURE & EFFECTS -- SKIN

ROUTES OF EXPOSURE & EFFECTS - SKIN

Acute: Elemental and inorganic lead compounds are not absorbed through the skin. Certain organic lead compounds, however, can be absorbed through the skin.

Chronic: Elemental and inorganic lead compounds are not absorbed through the skin. Certain organic lead compounds, however, can be absorbed through the skin.

First Aid: Wash exposed areas thoroughly with soap and water.

SECTION #5C - EXPOSURE & EFFECTS – EYES

ROUTES OF EXPOSURE & EFFECTS - EYES

Acute: Contact with large volumes of smoke may cause minor eye irritation.

Chronic: None reported

First Aid: Remove person to fresh air. If foreign body is suspected, wash eyes in fresh water for 15 minutes, contact physician.

SECTION #5D - EXPOSURE & EFFECTS – INGESTION

ROUTE OF EXPOSURE & EFFECTS – INGESTION

Acute: Acute ingestion of lead may occur from poor personal hygiene associated with the handling of lead bearing materials. The effects of lead ingestion would be similar to those listed under acute inhalation in addition to gastrointestinal irritation.

Chronic: Chronic ingestion of lead may occur from poor personal hygiene associated with the handling of lead bearing materials. The effects of lead ingestion would be similar to those listed under chronic inhalation.

Note: Wash hands thoroughly with soap and water before eating or smoking.

First Aid: Ingestion is not a likely route of exposure. In case of ingestion, contact physician.

SECTION #5E - EXPOSURE & EFFECTS – CARCINOGENESIS DATA

N.T.P. No

I.A.R.C.: Group 2B, possibly carcinogenic in humans.

OSHA: No

SECTION #5F - EXPOSURE & EFFECTS – COMMENTS

Lead and barium are toxic metals, which may be released during the firing of modern ammunition. Care should be taken in the cleaning of range facilities to minimize the exposure potential to lead and barium. Persons engaged in these activities should wear protective clothing with an appropriate respirator. Range operators should consult OSHA 1910.1025 for details pertaining to the handling of lead in the work environment.

Severe lead intoxication has been associated in the past with sterility, abortion, and stillbirth. Modern information confirming that lead poisoning affects birth rates or causes injury to the fetus in man is not conclusive.

SECTION #5G - AGGRAVATION OF PRE-EXISTING HEALTH CONDITIONS

AGGRAVATION TO PRE-EXISTING HEALTH CONDITIONS

Exposure to lead can aggravate pre-existing anemia, cardiovascular and respiratory diseases and conditions related to the gastrointestinal, reproductive, renal (kidney), and central nervous systems.

Reference: Industrial Toxicology, Safety and Health Applications in the Workplace; Williams/B.

SECTION #6 - REACTIVITY & POLYMERIZATION

Stability:	Stable under normal use conditions
Conditions to Avoid:	Individual cartridges may ignite if the primer is struck or if the cartridge is exposed to excess heat
Incompatible Materials:	Oils, acids, Alkalies, Ammonia, and other corrosive materials
Hazardous Decomposition Materials:	Oxides of Barium, Lead, Antimony, Aluminum, Magnesium, Nitrogen, Carbon, and Sulfur. Lead and Antimony fume may also be produced.
Polymerization:	Will not occur

SECTION #7 - SPILLS, LEAKS & DISPOSAL PROCEDURES

STEPS TO BE TAKEN - SPILLS:

Avoid conditions detailed in Section #6. If container should rupture, place all loose cartridges from broken shipping cases into a sturdy container. Secure container carefully.

Waste Disposal Methods: Contact Manufacturer - Product Service (612) 323-3706

SECTION #8 - SPECIAL PROTECTIVE EQUIPMENT

Ventilation: Use in a well-ventilated area. Consult the current addition of ACGIH Industrial Ventilation Manual and/or NRA ventilation recommendations.

Protective Equipment:

Eyes: Recommend protective eyewear conforming to ANSI Z-87

Gloves: Not generally required

Respirators: Use an approved respirator while cleaning range facilities. Consult OSHA 1910.1025 for exact requirements.

Hearing Protection: Hearing protection recommended while discharging cartridges

SECTION #9 - SPECIAL PRECAUTIONS -- STORAGE & HANDLING

Store in a dry, cool area in the original container to assure performance. Keep out of the reach of children. Avoid striking the primer of unchambered cartridges. Remove ammunition from service if any of the following conditions have occurred:

1. Prolonged storage at or above 200 degrees F
2. Evidence of corrosion
3. Physical damage
4. Exposure to oil or spray type lubricants

Avoid prolonged storage in leather cartridge carriers. Cartridges can ignite if heated to 250 degrees F independent of air.

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Although reasonable care has been taken in the preparation of this document, Federal Cartridge Company extends no warranties and makes no representation as to the accuracy or completeness of the information contained herein and assumes no responsibility regarding the suitability of this information for the user's intended purpose or the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose.

Remington Arms *Material Safety Data Sheet*

This Material Safety Data Sheet has been prepared in compliance with Federal OSHA Hazard Communication Standard 29 CFR 1910.1200, ANSI Z400.1-1993 and the ISO Safety Data Sheet Standard. This product may be considered to be a hazardous chemical under 29 CFR 1910.1200. This information is required to be disclosed for safety in the workplace. ***This MSDS is applicable only to the product identified herein and only when used properly.***

NOTE: Refer to Section XVII for *List of Acronyms.*

I. PRODUCT IDENTIFICATION

Product: **CENTERFIRE RIFLE, PISTOL & REVOLVER LOADED ROUND (LEAD-LESS)**

HMIS Rating
Health: 2
Flammability: 0
Reactivity: 1

IN EVENT OF EMERGENCY
(Spill, Leak, Fire, Exposure, Accident)
CALL CHEMTREC DAY OR NIGHT
(800) 424-9300
In Arlington, VA 741-5000
Outside Continental U.S.A. (703) 741-5000

II. HAZARDOUS COMPONENT INFORMATION

Centerfire Rifle, Pistol & Revolver Ammunition is comprised of the following four (4) components. The hazardous chemicals contained in each are listed. The percent by weight of the hazardous ingredients in Centerfire Rifle, Pistol & Revolver Ammunition are listed in the table below.

1. **Projectile**.....Lead, Copper, Zinc, Antimony, Arsenic
2. **Brass Shellcase** .....Copper, Zinc, Nickel
3. **Propellant** .....Nitrocellulose, Nitroglycerin, Dibutyl Phthalate, Diphenylamine, Dinitrotoluene, Graphite
4. **Primer** .....Copper, Zinc, Diazodinitrophenol, Barium, Tetrazene, Nitrocellulose, Nitroglycerin

Hazardous Ingredients	Percent by Weight	CAS Number	Exposure Limits (PEL)
Copper	28-34%	7440-50-8	None established
Zinc	9-12%	7440-66-6	TWA (fume) 0.1 mg/m³ TWA (dust, mist) 1.0 mg/m³
Lead	47-61%	7439-92-1	TWA 0.05 mg/m³
Antimony	Less than 0.1-1.5%	7440-36-0	TWA 0.5 mg/m³
Arsenic	Less tan 0.4%	7440-38-2	TWA 0.5 mg/m³
Barium	Less than 0.5%	7440-39-3	TWA 0.5 mg/m³

Nitroglycerin	0-3.6%	55-63-0	TWA CL 0.2 ppm (skin) STEL 0.1 mg/m³ (skin)
Dibutyl Phthalate	0-0.5%	84-74-2	TWA 5mg/m³
Diphenylamine	0-0.5%	122-39-4	TWA 10 mg/m³
Nickel	Less than 1%	7440-02-0	TWA Soluble Compounds: 0.1 mg/m³ TWA Insoluble Compounds 1.0 mg/m³
Graphite	Less than 1%	7440-44-0	(Natural) TWA 2.5 mg/m³ (Synthetic) Respirable Fraction: 5 mg/m³
Nitrocellulose Cellulose Tetranitrate	Less than 1%	9004-70-0	None established
Tetrazene	Less than 0.1%	109-27-3	None established
2,4-Dinitrotoluene	0-1.1%	121-14-2	TWA 1.5 mg/m³
Diazodinitrophenol	Less than 1%	87-31-0	None established

III. HAZARDS IDENTIFICATION

Emergency Overview: Accidental fire may cause low-energy fragments to be emitted thus causing potential eye injury.

Potential Human Health Effects:

Skin Contact: May cause allergic reaction (sensitization) in susceptible individuals.

Eye Contact: Dust and fumes can irritate the eyes causing redness and discharge.

Inhalation: Inhalation of dust or fumes may cause irritation to nose, throat, upper respiratory tract and lungs. Irritation may lead to bronchitis, headache, lowering of blood pressure and weakness.

Ingestion/Absorption: Ingestion may cause severe headache, nausea, vomiting, abdominal pain, fatigue, diarrhea, trembling, ringing in ear and salivation.

Carcinogenicity Information: This product is not classified a carcinogen by IARC, OSHA, NTP or EPA. Lead and Arsenic are classified a carcinogen by IARC.

IV. FIRST AID MEASURES

Skin Contact: Wash affected area thoroughly with soap and water. Remove contaminated clothing. Wash clothing thoroughly prior to reuse. Discard any contaminated leather items (i.e. shoes, etc.).

Eye Contact: If wearing contacts, immediately remove contact lenses. Hold eyelids apart and flush eyes thoroughly with water for at least 15 minutes. Obtain medical attention immediately.

Inhalation: Immediately remove to fresh air. Administer artificial respiration, if necessary. If breathing is difficult, administer oxygen. Obtain medical attention immediately.

Ingestion/Absorption: If conscious, drink large amounts of water. Induce vomiting. Immediately contact a physician or Poison Control Center. ***Never*** induce vomiting or give anything by mouth to an unconscious person.

V. FIRE HAZARDS

Flammable Properties: May ignite if heated above 130°C. Will ignite when exposed to flame and high temperatures. Be cautious of low-energy fragments.

Extinguishing Media: Flood fire with water to fight fire and cool shells. If no water is available, use carbon dioxide, dry chemical or earth.

Fire-Fighting Instructions: Evacuate area immediately. Deluge area with water. Wear full fire-fighting protective gear including face shield or SCBA to protect from fragments.

VI. ACCIDENTAL RELEASE MEASURES

Safeguards: Remove from all sources of ignition.

Spill Cleanup: Use non-sparking equipment to clean up spill. If disposal is necessary, refer to *XIII. DISPOSAL CONSIDERATIONS* .

VII. HANDLING AND STORAGE

Personnel Handling: Handle with care. Do not strike or crush the rounds.

Storage: Store in original containers in a cool, dry, well-ventilated area away from all sources of ignition. Do not subject to mechanical shock. Keep out of reach of children. This product ***must not be stored*** with acids, strong oxidizers or caustics.

VIII. PERSONAL PROTECTION/EXPOSURE CONTROLS

Engineering Controls: Local exhaust ventilation is recommended if significant dusting occurs. Otherwise, use general exhaust ventilation.

Personal Protective Equipment: Safety glasses recommended when handling or firing rounds.
Hearing protection recommended when firing rounds.
Use of a NIOSH/MSHA-approved respirator is recommended when concentrations to fumes and/or dust exceed the PEL or TLV.

Exposure Guidelines:
- Keep product away from sources of accidental ignition.

Exposure Limits:
- Exposure limits listed with each hazardous chemical.

IX. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Form:	Solid	**Evaporation Rate:**	N/A
Color:	Variable	**Melting Point:**	N/A
Odor:	None	**Solubility in Water:**	N/A
Boiling Point:	N/A	**pH:**	N/A
Specific Gravity:	N/A		
Vapor Density:	N/A		

X. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal use conditions. Will not react with water.

Other Hazards:

Incompatibility: Incompatible with acids, strong oxidizers and caustics.
Polymerization: Will not occur.

Conditions to Avoid: Flames, sparks, percussion, shock, static, high temperatures (266°F or 130°C, or above)

XI. TOXICOLOGICAL INFORMATION

Oral LD 50: No available data.
Dermal LD 50: No available data.
Inhalation LC 50: No available data.
Irritation: Not a skin or eye irritant.

XII. ECOLOGICAL INFORMATION

Aquatic Toxicity:

Lead (LC 50) to Bluegill: 2-5 mg/l
Barium to Stickleback: 400 mg/l
Barium Nitrate to Stickleback: 760 mg/l

Environmental Impact:

When used and disposed of properly, there is no known environmental impact.

XIII. DISPOSAL CONSIDERATIONS

This product is considered a characteristic hazardous waste per 40 CFR 261.24 ***for disposal purposes only***. Dispose of as required by local, state and federal laws and regulations.

EPA Hazardous Waste Code: D008 (Lead)

XIV. TRANSPORTATION INFORMATION

SHIPPING INFORMATION

Proper Shipping Name: Cartridges, Small Arms
Hazard Class: ORM-D
UN/NA No: N/A
Packing Group: N/A
Shipping Label: None required.
Special Information: May be reclassified internationally as:
Hazard Class: 1.4S
UN/NA No.: UN0012
Packing Group: II
Shipping Label: 1.4S label (or marked 1.4S)

XV. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA Inventory Status: Included on list.

This product contains a toxic chemical or chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

XVI. OTHER INFORMATION

NFPA Rating: Not established.

HAZARD CLASSIFICATION

Chronic Health: Headache, nausea, weakness
Acute Health: Anemia, embryotoxin.
Fire Hazard: 0 (per *HMIS Rating*)
Pressure Hazard: Sudden release of pressure.
Reactivity Hazard: 1 (per *HMIS Rating*)

NPCA-HMIS Ratings:

Health: 2
Flammability: 0
Reactivity: 1

References:

Code of Federal Regulations, Monthly Summary, CFR 1910.1200(g) and Appendix E (B.), Regulations Management Corporation, Bloomington, Indiana, July 1, 1994.

Hazardous Chemical Desk Reference: Third Edition, Richard J. Lewis, Sr., Van Nostrand Reinhold, Copyright 1993.

American National Standards Institute, Z400.1-1993

International Standards Organization Safety Data Sheet Standard.

XVII. LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA WEEL	American Industrial Hygiene Association-Workplace Environmental Exposure Level
ANSI	American National Standard Institute
BEI	Biological Exposure Indexes
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
CL	Ceiling Limits (not to be exceeded)
DSL	Domestic Substances List
EPA	Environmental Protection Agency
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ISO	International Standards Organization
LC	Lethal Concentration
LD	Lethal Dose
MITI	Ministry of International Trade and Industry (Japan)
MSHA	Mine Safety and Health Appliance
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NTA	National Transportation Agency (Canada)
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
ORM	Other Regulated Materials
PEL	Permissible Exposure Limit (OSHA)
SCBA	Self-contained Breathing Apparatus
STEL	Short-Term Exposure Limit
TLV	Threshold Limit Values (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
UN/NA	United Nations/North American (Identification number)
SARA	Superfund Amendments and Reauthorization Act
RCRA	Resource Conservation and Recovery Act

For additional information, please contact:

Remington Arms Company, Inc.
P.O. Box 700, 870 Remington Road
Madison, NC 27025-0700
(800) 243-9700

The information contained in this *Material Safety Data Sheet* is provided to all individuals who are or will be exposed to this product through use, handling, storage or transport. Remington believes, yet makes no warranty, that all information contained in this document is current as of the date of publication.

seisPRIME/E® Emulsion Seismic Explosive

EXCELLENT FOR "MINI-HOLES" AND VERTICAL STACKING

These non-nitroglycerin emulsion products are packaged in convenien one-pound, one-half, one-third, and one-quarter pound cartridges an formulated to provide a seismic pulse equal to dynamite for clear, shar seismic records.

Although classified as high explosive, seisPRIME/E emulsions are non headache and have excellent resistance to accidental detonation by friction o impact.

Spiral-wound 1/4 to 1/2-pound paper cartridges are easily capped an waxed to sleep well.

PROPERTIES AND SPECIFICATIONS

PRODUCT	E-1	E-1/2	E-1/3	E-1/4
Weight	One Pound	1/2 Pound	1/3 Pound	1/4 Pound
Size	2 1/4 x 8 1/2	1 1/2 x 8	1 1/8 x 8	1 x 8
Style	49	SW	SW	SW
Density (gm/cc)	1.18	1.15	1.15	1.15
Velocity (fps) (unconfined)	16,500	16,000	15,000	14,500
Detonation pressure (kilobars)	100	100	100	100
Absolute Bulk Strength (cal/cc)	885	775	775	775
Relative Bulk Strength (ANFO=100)	120	105	105	105

PACKAGING

Available in four sizes to meet vertical stacking an "mini-hole" applications. seisPRIME/E in the one-poun size is packaged in thin-walled, easy couplin cartridges for vertical stacking or larger downhol shots.

In the 1/2 to 1/4-pound sizes, seisPRIME/E i packaged in spiral-wound paper cartridges.

All sizes have excellent water resistance and can b initiated with a #8 strength STATICMASTER detonator.

STATICMASTER® Electric Detonators for Seismic Exploration

DESIGNED FOR SEISMIC WORK - Exclusive Atlas electric match provides reliabl detonation with minimum lag time and scatter. Full #8 strength explosive output to hel insure initiation of the seismic charge, even under severe conditions.

UNEXCELLED PERFORMANCE - Rigid statistical quality control tests are performe on all components and on the completed detonator to assure reliable and consiste performance. A tough, hard enamel coating under the plastic outer insulation provide additional protection against shorting of legwires under extreme conditions.

WATER AND WEATHER-PROOF - Legwire insulation is designed to withstan extremes of heat and cold and the severe conditions encountered in deep-hole loading All detonators contain a double-crimped rubber plug to provide a water-tight sea Excellent firing characteristics permit use in single-hole or multiple-hole pattern shooting

PROPERTIES AND SPECIFICATIONS

- Detonator strength - #8
- Functioning time scatter - Less than 0.001 second; even lower as firing current is increased
- Recommended firing current - 3 to 10 amps DC, 4 to 10 amps AC
- Water immersion depth (max. tested) - 500 feet
- Bridgewire resistance - 0.9 Ohms
- Detonator shell - Gilding metal

REDUCED SENSITIVITY TO EXTRANEOUS ELECTRICITY

A special bridgewire and the SF feature in the electric match provide reduced sensitivity to static electricity.

OPERATING AIDS

With recommended firing currents, STATICMASTER electri detonators meet all requirements for series firing.

WARNING - Do not use STATICMASTER electric detonators i the same circuit with other types or brands of electric detonators.

PACKAGING

STATICMASTER electric detonators come with spooled duplex copper lead wires (yellow color) in lengths of 40', 60', 80', 100', 120', 150', 160', 200', 250', 300', and 400'; and in shorter legwire lengths (folded duplex wires, yellow) measuring 12', 20', and 24'.

HAZARDOUS CHEMICAL MATERIAL SAFETY DATA SHEET

(Conforms to the Requirements of 29 CFR 1910.1200)

PRODUCT CATEGORY: EMULSIONS AND EMULSION / ANFO BLENDS - BLASTING AGENTS, ALL GRADES

1. NAME AND ADDRESS OF MANUFACTURER:

ATLAS POWDER COMPANY
15301 DALLAS PARKWAY
SUITE 1200
DALLAS, TEXAS 75248
TWX 910-860-5237

2. PREPARED BY: P.E. Therriault DATE: 06-24-88 REVISION: One

3. MEDICAL EMERGENCY TELEPHONE NUMBERS:

EAST OF THE MISSISSIPPI: 717 - 386 - 4121
WEST OF THE MISSISSIPPI: 417 - 624 - 0212

4. THE MATERIALS DESCRIBED IN THIS DATA SHEET ARE:

HAZARDOUS CHEMICAL INGREDIENTS

5. CHEMICAL AND COMMON NAME(S) OF HAZARDOUS CHEMICAL MIXTURE/INGREDIENTS:

Apex-All Grades, RXL 614, RXL 615, PowerAN-All Grades, Bulk Emulsions-All Grades

Major Hazardous Ingredients Include:	TSCA LISTED	CAS NO.	RTECS NO.
Ammonium Nitrate	Y	6484-52-2	BR9050000
Diesel Oil (In Some Formulas)	Y	68334-30-5	No Listing

Note: See MSDS for Ammonium Nitrate Plus Fuel Oil

6. PHYSICAL AND CHEMICAL CHARACTERISTICS:

	Vapor Pressure	Flash Point	Melting Point°C	Boiling Point°C	Specific Gravity	Mol. Wt.	Odor	Appearance
Ammonium Nitrate	0	d	155	190	1.725	83	None	White Solid
Diesel Oil	nd	nd	nd	147.371	0.87	nd	Pungent	Brown Liqui
Mixture	Neg.	nd	nd	125	1.1 to 1.3	NA	None	White Greas

nd = No Data d = Dissociates na = Not Applicable

7. PHYSICAL HAZARDS:

Ammonium Nitrate - DOT: Oxidizer Diesel Oil: Flammable
Mixture DOT Explosive, Blasting Agent

8. HEALTH HAZARDS:

	A.N.	D.O.
Carcinogen	N	N
Corrosive	N	N
Highly Toxic	N	N
Irritant	N	N
Sensitizer	N	N
Toxic	N	N
Target Organ Effects	N	N

Ref: Registry of Toxic Effects of Chemical Substances (RTECS)
N = No Criteria Match
Y = Positive Criteria Match per RTECS
nd = No Data

9. PRIMARY ROUTE(S) OF ENTRY: No Data

10. PERMISSIBLE EXPOSURE LIMITS: No Data

11. LISTINGS:

MATERIAL	NTP ANNUAL REPORT ON CARCINOGENS	IARC MONOGRAPHS	OSHA CARCINOGEN
AN	No	No	No
SN	No	No	No
SP	No	No	No
EDDN	No	No	No
DO	No	No	No

12. GENERALLY APPLICABLE PRECAUTIONS FOR SAFE HANDLING AND USE:

HYGIENIC PRACTICES:

Avoid Skin and Eye Contact. Avoid Breathing Blasting Fumes.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT:

Use non sparking tools, avoid open flame, wear normal safety equipment, such as safety glasses and hard hat.

PROCEDURES FOR CLEANUP OF SPILLS AND LEAKS:

Bulk Product: Isolate and contain spilled material. Contact Distributor or Atlas Powder for Spill Response Assistance.
The disposal of damaged or deteriorated explosives must be carried out in accordance with all Federal and State Regulations.
In the event of a major spill, contact the National Response Center (800-424-8802) and the local Police.

13. CONTROL MEASURES:

ENGINEERING: Follow BATF standards for storage (27 CFR 151 Subpart 3)
Except for Bulk products, see "Do's and Don'ts - Instructions and Warnings" - found in every shipping case.
See Institute of Makers of Explosives Publications.

WORK PRACTICES: Follow OSHA Standards for Storage and Use (29 CFR 1910.109)
Except for Bulk products, see "Do's and Don'ts - Instructions and Warnings" - found in every shipping case.
See Institute of Makers of Explosives Publications.

PERSONAL PROTECTIVE EQUIPMENT:

Avoid toxic fumes from blasting, wear normal protective equipment, such as safety glasses, hard hats, etc.

14. EMERGENCY AND FIRST AID PROCEDURES:

Do not attempt to fight fires involving explosives.
Immediately evacuate the area. Avoid toxic fumes from fires.
In case of skin contact, wash affected area with water. Eye contact - flush eyes for at least 15 minutes and consult a Physician.

15. DISCLAIMER: The above information taken from various published and unpublished sources is believed to be accurate and represents the best information currently available to us. However, we make no warranty of the accuracy of such information, express or implied, and assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.