Maritime Construction and Engineering, LLC

Health and Safety Plan

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MARITIME CONSTRUCTION AND ENGINEERING, LLC

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Statement of Health & Safety Policy

It is the policy of the management of *Maritime Construction and Engineering, LLC* that all feasible and practical efforts be made to provide a safe and healthy place of employment for our employees and to do everything reasonable to protect our equipment and our other assets from accidental losses. The personal safety and health of each employee of our company is of primary importance. We believe that our employees are our most important asset and that their safety at the worksite is our greatest responsibility. The prevention of occupationally induced injuries and illnesses is of such consequence that it will be given precedence over operating productivity whenever necessary. Management will provide all mechanical and physical facilities required for the personal safety and health of each employee.

To be successful, such a program must embody the proper attitude toward injury and illness prevention on the part of corporate management, supervisors, and employees. It also requires cooperation in all safety and health matters, not only between corporate management, supervisors and employees, but also between each employee and their fellow workers.

Our concern for safety and health of all human beings is daily, even hourly. We expect every person who conducts the affairs of our company, no matter in what capacity they function, to accept this concern and its responsibility. Employees are expected to use the safety equipment provided. Rules of conduct and rules of safety and health must be observed. Safety equipment cannot be abused or destroyed.

Cooperation between our employees and management in the observance of this policy will ensure safe working conditions, will help result in accident-free performance and will work to our mutual advantage. It will also assist in reducing workers' compensation costs (direct costs) and reduce jobsite down time, material loss and regulatory agency fines (indirect costs).

Management has the authority to procure the necessary resources to execute the objectives of our company's safety and health program. We will hold managers, supervisors and employees accountable for meeting their responsibilities so that essential tasks will be performed.

Administrative Responsibilities

Corporate Management Safety Responsibilities

1. Eliminate potential hazards by providing appropriate safeguards, personal protective equipment and safe work tasks.

2. Provide necessary personal protective equipment and enforce its use and care.

3. Provide effective training, which is required by the "standards" as a minimum for the employees.

4. Become familiar and comply with applicable OSHA standards (29 CFR 1910, General Industry, and 1926 Construction); NFPA 241; ANSI A10.14 1996 Construction & Demolition Operations; local requirements.

5. Review, consider for approval, and execute appropriate action on safety policies developed to safety committees or safety director.

6. Ensure a high level of productivity and safety performance and hold project management staff accountable.

7. Assign an individual(s) {competent person} the authority for the implementation of the safety program at each worksite.

Safety Director Responsibilities

1. Monitor supervisory management and employee activity to ensure that the corporate programs are carried out in a timely manner.

2. Shall coordinate safety information between projects/shops to assure that all projects will benefit from each other's efforts.

3. Coordinate all safety activities, including jobsite inspections, and distribution of safety materials. Perform jobsite inspections periodically and follow up corrective actions.

4. Maintain all accident records and complete all required OSHA forms.

5. Analyze accident records and show trends

6. Promote safety education on all levels.

7. Periodically review safety rules and standards with employees to confirm that the company is meeting its goals and objectives.

8. Review with supervisors how to handle emergency procedures at each jobsite location.

9. Confirm that all required signs are posted, and bulletin boards are maintained in clear and legible condition.

10. Confirm employer is enforcing compliance with all applicable federal, state and local regulations.

11. Provide a regular report to upper management on the results of the safety program.

Instructions to Supervisors/ Foremen

You are expected to read and sign the following sheets which lists activities and behavior for which you are responsible, and then sign the signature sheet. Our company has a legal obligation to comply with our safety program, and we may be held legally liable for injuries or fatalities that occur to our employees and/or members of the general public. It is in your best interest and ours to carefully follow the safety rules and procedures that have been adopted as our safety policy.

Not only does accident prevention reduce human suffering and loss, it is also good management. Safety goes hand in hand with efficient job site operations and cost control which are an important part of your responsibilities. It is your primary responsibility to our organization and to your fellow workers.

Your annual Performance Evaluation will reflect your involvement in safety and health activities, especially accident prevention and training.

It is our intent to comply with all local, state and federal safety standards, codes and regulations. We expect everyone in the firm to perform their job in a safe manner and in accordance with the procedures outlined in our safety program.

Superintendent/ Foreman Responsibilities

1. Know safety rules and work practices that apply to the work you supervise. Take action to confirm that all employees in your charge understand the safety rules that apply to them. Always take immediate action to correct safety rule violations. Unsafe acts or procedures cannot be tolerated.

2. Prevent bad work habits from developing. You are responsible to make daily observations of employees to ensure that they perform their work safely, and continue this observation regularly once safe working habits are established.

3. Take action to correct or control hazardous conditions within your work areas. If it is beyond your control, remove the employee until the condition is safe. Eliminate unsafe conditions and prevent an accident.

4. Encourage workers to report unsafe conditions or procedures. Listen to your workers and don't take their safety complaints lightly. No job should proceed when a question of safety remains unanswered. Seek advice from your project manager when necessary.

5. Set a good example. Demonstrate safety in your own work habits and personal conduct. Always wear personal protective equipment in areas where personal protective equipment is required.

6. Train your employees on the proper safety procedures to follow, including the use of additional safeguards such as machine guards and personal protective equipment.

7. Investigate and analyze every accident, however slight, that occurs to any of your employees. Control the cause of minor accidents to help avoid future crippling accidents.

8. Complete and file a report on each and every incident and accident that occurs at your jobsite. If you have any questions or require reporting forms, contact your project manager.

9. Conduct weekly safety tool box meetings.

10. Make safety suggestions.

11. Serve on safety committee, if requested.

12. Take an active part and participate in safety meetings.

13. Non-compliance of these rules as well as other federal and/or state laws or regulations may be legal violations subject to civil and/or criminal penalties.

Employee Responsibilities

1. Whenever you are involved in accident that results in personal injury or property damage, no matter how slight, the accident must be reported to your supervisor or other management personnel prior to the end of the work shift. Get first-aid promptly.

2. Report any condition or practice you think might cause injury and/or damage to equipment immediately to your supervisor.

3. Do not operate any equipment which, in your opinion, is not in a safe condition. Report immediately the condition that you believe is unsafe to your foreman.

4. All prescribed safety equipment and personal protective equipment must be used when required and must be maintained in good working condition. It is your personal responsibility to use such equipment. The use of required personal protective equipment is a non-negotiable item.

5. Obey all safety rules, government regulations, signs, markings, and instructions. Be particularly familiar with the rules and regulations that apply directly to you in the area in which you work. If you don't know, ask your foreman.

6. When lifting, use the approved lifting technique, i.e. bend your knees, grasp load firmly, keep load close to you, then raise the load keeping your back as straight as possible. Always get help with heavy or awkward loads.

7. Do not engage in horse play; avoid distracting others; be courteous to fellow workers.

8. Always use the right tools and equipment for the job. Use them safety and only when authorized. If you are not familiar with the safe way to use a particular tool or piece of equipment, ask your supervisor. When using your own tools on the job site, make sure all guards, ground pins, etc. are in place.

9. Good housekeeping must always be practiced. Return all tools, equipment materials, etc. to their proper places when you are finished with them. Keep floors clean and passageways clear. Poor housekeeping wastes time, energy and material, and often results in injury.

10. The use of drugs and/or intoxicating beverages on the jobsite is forbidden. Being under the influence of alcohol or drugs when on the jobsite is inexcusable. Immediate discharge for being under the influence and/or using

drugs or alcohol may be instituted. Additional appropriate disciplinary action will be taken for the following offenses:

a. Fighting - no matter what the cause.

b. Insubordinate conduct or refusal to follow directions

c. False statements, such as injury claims

d. Other inappropriate behavior including, but not limited to, failure to obey safety rules.

11. Loose clothing and jewelry cannot be worn when operating machinery and equipment. Proper work shoes shall be worn at all jobsites. Open toed shoes and sneakers will not be permitted to be worn at any jobsite. If you are observed wearing open toed shoes or sneakers, you will not be permitted to work until you return with proper footwear.

12. Do not handle chemicals unless you have been trained in the safe handling procedure.

13. Hard hats and eye protection shall be worn at all times.

14. Read, understand and follow the guidelines set forth in the material safety data sheets (MSDS) pertaining to your work.

15. Compliance with safety and health rules and regulations is a condition of employment.

Accident Investigation/Reporting Procedures

Management is responsible for planning accident prevention methods, providing safe equipment and working conditions, training of work force and maintaining records related to accidents and injuries. (See attached Injury Report Sheet). All accidents or injuries will be immediately reported to the immediate supervisor. All pertinent information will be secured, including date, time and exact location of occurrence. A detailed description of the accident will be obtained. The information will be documented via the appropriate forms as soon as allowable, while the details are still fresh in the minds of the parties involved. Incident report forms and supervisor's report of injury forms are available to all supervisors.

Management will monitor project site safety activities and take corrective action to correct any deficiencies or non-compliance to this and other referenced procedures and guidelines.

Each superintendent and foreman will make a documented report of every incident, even those without injury, within twenty-four (24) hours of the occurrence. Reports are to be completed as soon as possible to avoid changes in physical conditions and witness reports.

Note: Any accident that causes a fatality or three or more employees to be hospitalized must be reported to OSHA within eight hours of the incident.

Accident reports highlight problem areas. Through the use of good reports, accident patterns can be detected and resources directed toward prevention. Accident reports make excellent training tools. The cause and effect of accidents can be reviewed at safety meetings.

Superintendent and foremen will be trained in accident investigation techniques.

Accident investigation is a management function that must be executed at the superintendent/foreman level.

All accidents/incidents must be investigated regardless of the extent of the injury or damage.

Employees will never be allowed to fill out their own accident investigation report.

Focus must be fact finding not fault finding.

Superintendent and foremen must identify the unsafe act or unsafe condition.

Superintendents and foremen should provide recommendations for corrective action, bring it to top management's attention and assure that it is acted upon.

Accident Investigation Techniques

A. The Investigative Process

1. Analysis for cause.
2. A plan of action to eliminate causes.
3. Fix responsibility for the elimination of hazards that caused the accident.
4. See that the plan is carried out.

B. Determining Unsafe Conditions and Acts

1. Observation
2. Inquiry
3. Review of past records
4. Surveys

C. Five-Step Interviewing Method

1. Remind employee of the investigation's purpose (Fact finding not fault finding).
2. Ask employee to give their complete version.
3. Ask questions to fill the gaps.
4. Check your understanding of the accident.
5. Discuss how to prevent a re-occurrence.

D. Key Points for Witness Interviewing

1. Interview witnesses promptly and separately.
2. Reassure witness of investigation's purpose (Fact finding not fault finding).
3. Get witnesses' version with minimal interruption.
4. Direct specific questions to clarify and fill in.
5. Summarize your understanding of what the witness related.

E. Other Points for Witness Interviewing

1. 1.Don't say anything to blame or threaten the employee
2. Don't badger the witness or give him/her a bad time
3. Don't resort to sarcasm, skepticism or accusations
4. Handle all discrepancies with tact
5. Let the witness feel that he/she is a partner in the investigation
6. Don't try to write down what a witness says when he/she is trying to explain.

DISCIPLINARY POLICY/PROCEDURES

All employees are expected to comply with jobsite rules and regulations, and to follow established operating procedures set forth by Maritime Construction and Engineering, LLC. Violations will not be tolerated and superintendent/foreman will be held accountable for the conduct of their employees.

Superintendent/foremen are required to take action when a violation is observed. Immediate action to control or eliminate a hazard is required.

In the event a violation is observed, the following procedures have been established to place an employee on notice.

Notice *	Action
First Offense	A written warning addressed to the employee and a copy placed in the employee's filereferencing the violation and warning, including date and time.
Second Offense	A written warning addressed to the employee with reference to the violation including date and time of the occurrence. A copy of this warning will be given to the employee and another copy will be placed in the employee's file.
Third Offense	A written warning similar to the second notice will be prepared and distributed in the same manner. This warning will be followed by a meeting with the employee, foreman and/or project manager and senior management to determine whether theemployee will be suspended without pay orterminated depending upon the nature of the violation.
Fourth Offense	Termination.

* Within any consecutive 12-month period.

The above procedure has been prepared so that there is no question about how violations of rules, regulations and procedures will be handled by management and so that employees will know what to expect if they do not comply with the established rules, regulations and procedures. Management knowledge of unsafe behavior and lack of appropriate documented discipline may be a violation of federal, state laws and regulations.

SAFETY MEETINGS

Safety meetings or tool box talks of 5 to 10 minutes must be held by superintendents and/or foreman each week. Employees never receive too much training, and therefore our company relies upon jobsite management to provide ongoing and continuous employee training.

The subject to each training discussion should be chose to relate to the type of work that is being performed.

Some examples include:

- The use of safety glasses when using circular saws, grinders, table saws, radial arm saws, jack hammers, power actuated tools, etc.
- The proper set up and use of ladders.
- Hard hats and why they are necessary.
- A discussion of a recent accident and its cause(s).
- A discussion of an old accident.
- A discussion of disciplinary procedures for failure to comply with safety policies.

A log of Safety Meetings must be kept in accordance with the form that follows. One copy should be kept by jobsite management and the other kept on the file in the home office by jobsite location.

SAFETY INSPECTIONS

1. Work sites shall have frequent safety inspections by the Site Health and Safety Officer to ensure compliance with this manual and all applicable laws.
2. Inspection reports will be completed at the time of safety inspections.
3. Any and all safety and health deficiencies will be identified and corrected within 24 hours by the Site Health and Safety Officer, or properly delegated authority.
4. All subsequent safety inspections will include any such corrected deficiencies.

PUBLIC SAFETY

The general public will be warned and cautioned of the hazards of the construction activity by properly posted signs, tags, and labels.

EMERGENCY RESPONSE

1. In the event of an accident, all work will immediately cease. The Project Manager will deem when work shall resume.

2. Emergency planning procedures will be coordinated with local authorities and implemented at the site. Additionally, communication with the local hospital will occur so as to advise the emergency room of the nature of contamination victims may have been exposed to while on site, if they are transported to the hospital. Directions to the hospital will be posted on site and a copy will be placed in all site vehicles. These procedures will be discussed during the weekly site briefings.

EMERGENCY PLANNING

1. Emergency plans to ensure employee safety in case of fire or other emergency shall be prepared, in writing, and reviewed with all affected employees. Emergency plans shall be tested to ensure their effectiveness.

2. Plans shall include escape procedures and routes; critical plant operations; employee accounting following an emergency evacuation; rescue and medical duties; means of reporting emergencies; persons to be contacted for information or clarification.

3. On-site emergency planning shall be integrated with off-site emergency support.

4. Evacuation procedures will be outlined and discussed to address possible emergencies requiring such; such as severe weather warnings, fires, etc. If the emergency evacuation requires the act of jumping overboard, proper guidelines shall be followed, such as the use of required life-saving flotation devices and the notification of the proper emergency authorities thru the use of on-board radio devices or phones.

CONTINGENCY PLANS

1. In the event of thunderstorms, lightning, blizzards, and high winds all work will be suspended.

2. In the event of severe storm warning, equipment will be secured on high ground and personnel evacuated.

3. All contingency actions will be coordinated with the Customers Project Manager.

HAZARD COMMUNICATION PROGRAM

It is a matter of company policy to provide our employees with information about Hazardous chemicals on the worksite through our hazard communication program, which includes container labeling. Material Safety Data Sheets (MSDSs) and employee information/training.

The Project Manager will have the overall responsibility for coordinating the hazard communication program for Maritime Construction and Engineering, LLC The Project Manager will make our written hazard communication program available, upon request, to employees, their designated representatives, the Assistant Secretary of Labor for Occupational Safety and Health, and the Director of the National Institute for Occupational Safety and Health.

List of Hazardous Chemicals

The Project Manager will compile a list of all hazardous chemicals that will be used on the worksite by reviewing container labels and Material Safety Data Sheets. The list will be updated as necessary. It will be kept at the jobsite. (See attached list of hazardous chemicals.)

Labeling

It is the policy of this company to ensure that each containerof hazardous chemicals on a jobsite is properly labeled. The labels will list:

- the contents of the container
- appropriate hazard warnings; and
- the name and address of the manufacturer, importer or other responsible party.

To further ensure that employees are aware of the chemical hazards of materials used in their work areas, it is our policy to label all secondary containers. Secondary containers will be labeled with either an extra copy of the manufacturer's label or with a sign or general label that lists the container's contents and appropriate hazard warnings.

Material Safety Data Sheets

Copies of Material Safety Data Sheets for all hazardous chemicals to which employees may be exposed are kept at jobsite w/ master file at the office and are readily accessible to employees in the work area during each work shift. The Project Manager is responsible for obtaining, maintaining and updating the file of Material Safety Data Sheet.

Employee Training

Employees are to attend a training session on hazardous chemicals in their work area at the time of their initial work assignment. The training session will cover the following:

- An overview of the hazard communication requirements.
- A review of the chemicals present in their workplace.
- The location and availability of our written hazard communication program, a list of hazardous chemicals and Material Safety Data Sheets.
- Methods and observation techniques that may be used to detect the presence or release of hazardous chemicals in the work area.
- The physical hazards of the chemicals in the work area.
- The health hazards of the chemicals in the work area, including signs and symptoms of exposure and any medical condition known to be aggravated by exposure to the chemical.
- How to lessen or prevent exposure to hazardous workplace chemicals by using good work practices, personal protective equipment, etc.
- Emergency procedures to follow if employees are exposed to hazardous chemicals.
- An explanation of our hazard communication program, including how to read labels and Material Safety Data Sheets to obtain appropriate hazard information.

When a new type of product is introduced into a work area or the chemical composition of a product changes, the Project Manager will review the above items as they are related to the new chemicals.

Non-Routine Tasks

Periodically employees are required to perform non-routine tasks. Prior to starting work on such projects, each affected employee will be informed by the Project Manager about hazards to which they may be exposed and appropriate protective and safety measures.

Informing Other Employees

To ensure that the employees of other contractors have access to information on the hazardous chemicals at a jobsite, it is the responsibility of the Project Manager to provide the other contractors the following information:

- Where the MSDS's are available
- The name and location of the hazardous chemicals to which their employees may be exposed and any appropriate protective measures required to minimize their exposure.
- An explanation of the labeling system used at the jobsite.

Each contactor bringing chemicals onto a jobsite must provide us with the appropriate hazard information on those substances to which our own employees may be exposed to on a jobsite. (See attached Outside Contractor Information Acknowledgement Form.)

MEDICAL NEEDS

1. An adequately contained First-Aid Kit shall be made readily available at each work site location.

2. Names of certified personnel in CPR/First-aid shall be made known.

3. Communication and Transportation to effectively care for injured workers is provided.

EMPLOYEES PHYSICAL QUALIFICATIONS

1. All persons employed throughout the course of the work shall be physically qualified for performing the duties to which they are assigned.

2. No persons shall be permitted or required to work while his ability or alertness is impaired by fatigue, illness or other causes to an extent that might unnecessarily expose himself or others to injury or property damage.

3. Operators of any equipment or vehicle shall be able to read and understand any and all signs, signals and operating instructions in use at the place of operation.

4. All employees are required to undergo periodic drug/alcohol testing.

PERSONAL PROTECTIVE EQUIPMENT

1. All personal protective equipment shall be provided as necessary. Equipment shall meet OSHA requirements and instructions on proper use and maintenance shall be provided.

2. Head protection will be mandatory for all workers with an exposure to falling and moving equipment and machinery. Hard hats provide head protection and will be made of aluminum, high-density polyethylene, phenolic resins with wire mesh, glass fiber reinforced with polyester resins or other types of dielectric plastics.

3. Approved work shoes will be required for field workers. Sneakers, sandals or shoes that have slits or holes cut in them will not be permitted.

4. Eye and face protection will be provided for all sawing, burning, welding and grinding operations. Goggles, spectacles, face shields and welding helmets will be provided where necessary. All equipment will fit snugly with no

undue interference with the wearer's movements and will be reasonably comfortable when worn under the designated conditions.

5. Gloves, hearing protection and respiratory protection will be provided if hazardous conditions warranting their use are encountered.

6. Any work performed on or over water will require the use of life jackets by all employees. Lifelines will be used. Life rings or similar approved life saving devices will be on site as well as emergency rafts. Emergency procedures will be discussed to ensure all employees are aware of the location of the equipment required during this type of work operation and the proper procedures to follow. Cell phones and radios will be onsite to use to notify proper authorities and emergency personnel.

LADDER USE

1. Care will be used in the selection of the proper size and design of the ladder for the use intended. Care will also be utilized in the maintenance and proper use of all ladders.

2. All ladders will be placed to that the distance from its base to the vertical surface against which it rests in one fourth of the ladder's working length.

3. Ladders will extend at least 36" above the level it is being used to gain access to.

4. Ladder feet will be placed on firm level surfaces.

5. Metal ladders will be frequently inspected for wear, corrosion and structural failure. Metal ladders will not be used any place where there could be contact with electrical circuits.

6. In ascending or descending ladders, workers will face the ladder and grasp the side rails with both hands.

CUTTING, WELDING AND CYLINDER STORAGE

1. Cutting and welding will not be performed in areas where easily combustible materials, such as wood shavings and scraps, sawdust, paper, oil soaked rags, etc. are located. All highly volatile materials will be removed from the area.

2. Suitable fire extinguishers will be provided. A thirty-minute watch will be adhered to after cutting or welding operations.

3. All equipment will be properly maintained and periodically inspected.

4. All compressed gas cylinders will be stored in an upright position, capped when not in use, and chained securely to prevent them from accidentally tipping over or being knocked over.

5. Cylinders will be stored away from heat sources. They are to be protected from accumulating ice and snow and the direct rays of the sun in high temperatures.

6. Cylinders of oxygen will be stored separately from cylinders of acetylene or other fuel gas.

7. Never drag cylinders. If possible use a hand truck. If they are being moved by hand, roll them on the bottom edge. Do not hoist cylinders by attaching lines to valves or to collars at the top.

8. Prior to use, check the hose for cuts, cracks or worn places. Check the pressure regulator and adjust accordingly.

9. When tanks are not in use, turn off the fuel supply at the tank. When in doubt, always consider cylinders full and handle accordingly.

10. Check local fire regulations.

MATERIALS HANDLING, STORAGE AND DISPOSAL

1. Maximum safe load limits shall not be exceeded on any scaffold, runway or deck.

2. Materials shall not be stored within 6 feet of a roof's edge unless guardrails are installed. Warning lines should be used to mark off material storage areas.

3. All stairways, passageways, gangways, and access ways shall be kept free of materials, supplies and obstructions at all times.

4. Materials, tools, equipment, and debris shall not be strewn about in a manner that could cause a t ripping or other hazard. Items should be properly secured from falling or displacement.

5. Protruding nails in boards, planks, and timbers shall be removed, hammered in or bent over flush with the wood.

6. Waste materials shall not be thrown from upper levels to lower levels

or to the ground.

7. Hazardous materials are not to be disposed of in the same containers as regular debris.

PROPER LIFTING TECHNIQUES

1. Lift with your legs, not with your back. Keep your head up and your back straight. Keep the load as close as possible to your body. Be sure your load is secure before moving. When you need to turn, use your feet as a pivot point. Do not twist when lifting.

2. Do warm up exercises before all phases of work. Good posture is always recommended.

FIRE PREVENTION

1. Fire extinguishers shall be situated at strategic points at the job site. They
2. should be in areas no less than 50 feet apart with easy access and on the same floor level.

3. All storage, handling and/or use of flammable or combustible material shall be under the supervision of a job superintendent or foreman.

4. Unopened containers of solvents/adhesives or other flammable material shall be kept in a well-ventilated location, free of excessive heat, smoke, sparks, flame or direct rays of the sun.

5. NO SMOKING shall be allowed in the vicinity of any flammable material.

FIRE PROTECTION

1. Fire extinguishers shall be provided and maintained in accordance with recommendations of the National Fire Protection Association, OSHA Regulations and any other applicable codes.

2. Extinguishers shall be suitable placed and distinctly marked as such.

3. Accessibility to the extinguishers shall not be obstructed.

4. Be aware of all emergency/fire evacuation procedures. Know what fire alert system to use. Know how to properly operate a fire extinguisher.

These proper procedures should be discussed with all personnel prior to start of project and reviewed periodically to ensure proper procedure in any emergency situation.

GENERATORS

The use of a portable generator will be available for this project according to the following terms and conditions:

The frame of the portable generator needs to be grounded and shall be permitted to serve as the grounding electrode for a system supplied by the generator if:

The generator supplies only equipment mounted on the generator and/or cord-and-plug-connected equipment connected through receptacles mounted on the generator, and

The non-current carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

HOISTING OPERATIONS

1. The hoist operator must make sure protection is used and the area around the hoist is protected. Check for overhead wires, debris in the hoisting area, slippery or unstable ground, frayed cables, broken welds, bent struts, proper slings and safety hooks, the counterbalance, outriggers, faulty mechanical parts. Never assume that the equipment is in the same condition as when you last left it.

2. Make frequent daily inspections.

3. Do not exceed the rated capacity of your hoist. Only properly trained personnel are authorized to operate hoisting equipment.

4. Know the standard hoisting signals and use them. Do not take directions from more than one person.

5. Never hoist a load over anyone's head. Workers on the ground must stand clear and see that others do not walk under the suspended load. Hard hats must be worn by any workers in the hoisting area, whether on the ground or overhead.

6. Erect guardrails (minimum of 42 inches high, 200 pounds of force, minimum of 4 feet on each side of hoisting area). Erect warning lines to isolate the hoisting area. Use tag lines to help control the loads being

hoisted. Protect yourself by using a safety line/lifeline, when in an unprotected area or when installing, using, and dismantling a hoist.

RAMPS, RUNWAYS, PLATFORMS AND SCAFFOLDS

1. All scaffolds/staging shall be erected in accordance with the requirements of 29 CFR 1926.451.

2. Every open-sided floor or platform 6 feet or more above adjacent floor or ground level shall be guarded by a standard railing, or equivalent, on all open sides, except where there is entrance to a ramp, stairway or fixed ladder.

3. A standard railing, or equivalent, on all open sides shall guard all runways, 4 feet or more above floor or ground level.

4. All guardrails and toe boards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor. Guardrails shall be 2" x 4" or equivalent, approximately 42 inches high, with a mid-rail. Supports shall be at intervals not to exceed 8 feet and toe boards shall be a minimum of 4 inches in height.

5. Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load. Any damaged parts or accessories shall be immediately repaired or replaced.

6. All planking of platforms shall be overlapped a minimum of 12 inches or secured from movement. They shall extend over their end supports not less than 6 inches and no more than 12 inches. All planking shall be scaffold grade or equivalent.

SAFETY BELT/HARNESSES, LIFELINES & LANYARDS

A safety belt system is designed to keep you from approaching the edge of a roof or an opening. It is a "Fall Restraint" Device and should not be used as a "Fall Arrest" system. When there is the possibility of actually falling, a "Fall Arrest" system, such as a safety harness, should be used. It is designed to stop you once you have fallen. It literally attaches you to the structure. A safety belt is a device usually worn around the waist, which by reason of its attachment to a lanyard and a lifeline or a structure, will prevent a worker from falling. A harness has the same purpose, however it's straps usually encircle the upper thighs and over the shoulders, spreading trunk rather than concentrating the force in the person's midsection where the soft tissue and organs are located.

A "Lifeline" is a rope, suitable for supporting one person, to which a lanyard or safety belt (or harness) is attached. Lifelines shall be secured above the point of

operation to an anchorage or structural member capable of supporting a minimum dead weight of 5,400 pounds. A minimum of 3/4." manilla or equivalent with a minimum breaking strength of 5,400 pounds shall be used.

A "Lanyard" is a rope (or nylon) suitable for supporting one person. One end is fastened to a safety belt (or harness) and the other end is secured to a substantial object or safety line. It shall be a minimum of 1/2 inch nylon or equivalent with a maximum length to provide for a fall no greater than 6 feet. It shall have a nominal breaking strength of 5,400 pounds.

All safety belt and lanyard hardware, except rivets, shall be capable of withstanding tensile loading of 4,000 pounds without cracking, breaking or taking permanent deformation.

LIFELINES, SAFETY BEL TS/HARNESSES AND LANYARDS SHALL BE USED ONLY FOR EMPLOYEE SAFEGUARDING. ANY PART ACTUALL Y SUBJECT TO IN-SER VICE LOADING, SHALL BE IMMEDIA TEL Y REMOVED FROM SERVICE AND SHALL NOT BE USED AGAIN FOR EMPLOYEE SAFEGUARDING.

MARINE WORK

1. Employees working over or near water, where the danger of drowning exists, shall be provided with U.S. Coast Guard-approved life jacket or buoyant work vests.

2. Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

3. Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between the ring buoys shall not exceed 200 feet.

4. At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water.

MARINE OPERATIONS & EQUIPMENT

(A) Access to Barges

1. Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, an properly secured.

2. Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp, meeting the requirements above, or a safe walkway shall be provided.

3. Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

4. A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

5. When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps properly secured and equipped with at least one substantial hand rail approximately 33 inches in height, shall be provided between the top of the bulwark and the deck.

6. Obstructions shall not be laid on or across the gangway.

7. The means of access shall be adequately illuminated for its full length.

8. Unless the structure makes it impossible, the means of access shall be so located that the load will not pass over employees.

(B) Working Surfaces of Barges

1. Employees shall not be permitted to walk along the sides of covered lighters or barges with coamings more than 6 feet high, unless there is a 3-foot clear walkway or a grab rail or a taut hand line is provided.

2. Decks and other working surfaces shall be maintained in a safe condition.

3. Employees shall not be permitted to pass fore and aft, over, or around deckloads, unless there is a safe passage.

4. Employees shall not be permitted to walk over deckloads from rail to coaming unless there is a safe passage. If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 inches of bulwark, rail, coaming or other protection exists, all employees shall be provided with a suitable means of protection against falling from the deckload.

(C) Lifesaving Equipment

1. Maritime Construction and Engineering, LLC will ensure that there is in the vicinity of each barge in use at least one U.S. Coast guard-approved 30-inch life ring with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, Maritime Construction and Engineering, LLC will furnish it during the time work is being performed on the barge.

2. Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved work vests or buoyant vests.

CRANES & DERRICKS

1. Every crane shall have the following documents with them at all times they are to be operated:

2. A copy of the operating manual developed by the manufacturer for the specific make and model of the crane; a copy of the operating manual for any crane operator aids with which the crane is equipped.

3. The load rating chart for the crane, which shall include:
   a. The crane make and model, serial number, year of manufacture;
   b. Load ratings for all crane operating configurations
   c. Recommended reeving for the hoist line; and
   d. Operating limits in windy or cold weather conditions.

4. The crane's log book which shall be used to record operating hours and all crane inspections, tests, maintenance and repair. The log shall be updated daily as the crane is used and shall be signed by the operator and supervisor; service mechanics shall sign the log after conducting maintenance or repairs on the crane.

5. Inspection of cranes and derricks shall be in accordance with the manufacturer's recommendations. Inspections shall be conducted by a qualified person. Before initial use all new and altered cranes shall be inspected by a qualified person to ensure compliance with the applicable standards. A copy of the checklist used for the inspection shall be maintained at the project site. Start-up (pre-operational) inspections shall be conducted by the operator before every operation of the crane. If checklists are used for pre-operational inspections, a copy of the checklist shall be maintained at the project site; if checklists are not used, the operator shall indicate the successful completion of the inspection, in accordance with the manufacturer's recommendations, in the operator's log.

Operator Responsibilities

1. The operator shall not engage in any activity which will divert his/her attention while operating the crane.

2. The operator shall respond to signals from the person who is directing the lift or an appointed signal person: when a signal person is not used in the crane operation, the operator shall ensure he/she has full view of the load and the load travel paths at all times the load is rigged to the crane.

3. In situations where the operator cannot see the load, audio (radio) communications shall be used (note that this does not preclude the use of hand signals in addition to audio).

4. Each operator is responsible for those operations under his direct control, whenever any doubt as to safety, the operator shall consult his supervisor before commencing the operation.

5. Before a lift, except before critical lifts when these shall be done by the lift supervisor, the rigger shall ensure that:

    a. The crane is level and where necessary blocked,
    b. The load is well secured and balanced in the sling or lifting device.

6. Each operator shall be instructed in and qualified for each type of crane or derrick he/she is to operate. Qualifications can be by written or oral and practical operating examination unless the operator is licensed by a state or city licensing agency for the particular type of crane or derrick.

EQUIPMENT & TOOLS

1. Tools are only as good as the users. Know the proper use and hazards of each piece of equipment and only use them for that designed purpose.

2. Inspect tools and equipment to make sure that they are in proper working order. They must be kept clean and checked for defects. Tag defective tools and equipment for repair.

3. Ask how to use a piece of equipment or a tool if you are unfamiliar with it. Don't force the tool. Use extra caution when using a sharp tool. Always be sure that proper guards are in place.

4. Always wear shatter resistant eye protection with side shields when working with a tool or equipment which can possibly make materials airborne.

5. Be sure all electrical tools are grounded before using them. Use double insulated (internal ground) cords, or ground-fault circuit interrupters (GFCI) especially if any moisture or water is near.

6. Always turn off a machine when there's a problem, adjustment, cleaning or repair required. Utilize the lock/out tag/out program to prevent accidental turnon of equipment. Be sure to shut off gasoline-powered equipment before refueling.

PILEDRIVERS

1. Guys, outriggers, thrust-outs, counter-balances, or rail clamps shall be provided to maintain stability of pile-driver rigs.

2. Pile driver leads

    a. Swinging (hanging) leads shall have fixed ladders, and Employees shall be prohibited from remaining on leads ladders while pile is being driven.

3. Hoisting and moving piles/hammers.

    a. All employees shall be kept clear when piling is being hoisted into the leads.

    b. Hoisting of steel piling shall be done by use of a closed shackle or other positive attachment that will prevent accidental disengagement.

    c. Taglines shall be used for controlling unguided piles and free-hanging (flying) hammers.

    d. Hammers shall be lowered to the bottom of the leads while the pile driver is being moved.

4. Pile extraction

    a. If piling cannot be pulled without exceeding the load rating of equipment, a pile extractor shall be used.

RESPIRATORY PROTECTION

1. Approved respiratory protective devices, suitable for their intended use will be provided by Maritime Construction and Engineering, LLC and used to protect employees against exposure to respiratory hazards.

2. A respirator equipped with a face piece shall not be worn if facial hair comes between the sealing surface of the face piece and the face, or if facial hair interferes with valve function.

3. The use or prohibition of wearing contact lenses with selected respirator types shall be determined.

4. If a spectacle, goggle, face shield, or welding helmet must be worn with a face piece, it shall be worn so as not to adversely affect the seal of the face piece to the face.

JOB SITE SET-UPS

1. Pre-job planning is essential for proper safety set-up on a job site. Contracts

should be reviewed, with special attention on details that focus on safety issues.

2. Safety equipment should be the first thing on a job and the last thing to be removed from a project. This is especially important with fall protection and fire protection equipment. Emphasis should also be made on electrical and chemical safety.

3. All job sites should, at minimum, have adequate fire extinguishers, first-aid kits, emergency/medical facility directions, ground-fault circuit interrupters and personal protective equipment.

4. Be sure the hoisting area is clear of wires and overhead obstructions.

The above Health and Safety Plan has been reviewed and approved as policy for Maritime Construction and Engineering, LLC

Shawn M. Toohey,
Owner

10 January 2014

OUTSIDE CONTRACTOR INFORMATION ACKNOWLEDGEMENT FORM

I _____(Name), of

_____(Company) acknowledge that

Maritime Construction and Engineering, LLC provided information on chemical

safety as required by the Hazard Communication Standard on _____(date).

This information included:

- Review of the requirement of the Hazard Communication Law
- Review of MSDSs for inventoried, regulated substances
- Information regarding the proper handling and potential exposure to inventoried and regulated substances.

Signed:

_____(Name)

_____(Title)

_____(Date)

Maritime
Construction and Engineering, LLC

Emergency Contact List

Primary Contact:

Shawn Toohey
Cell: (207) 252-4925
Office: (207) 439-9831
Home: (207) 363-3412

Alternate Contact:

Dan Reisbach
Cell: (207) 252-2013
Home: (207) 442-0967

Employee Disciplinary Action Form

Project Name: _____ Shop _____

Employee Name: _____ Date: _____

Superintendent: _____ Day: _____

Foreman: _____ Time: _____

1st Violation

Description: _____

_____

_____

_____

Employee Signature: _____

2nd Violation

Description: _____

_____

_____

_____

Employee Signature: _____

3rd Violation

Description: _____

_____

_____

_____

Employee Signature: _____

4th Violation: TERMINATION!

Within a 12-Month Period

FOREMAN'S REPORT OF INJURY

DIVISION _____

FOREMAN NAME _____

EMPLOYEE NAME _____

DATE OF BIRTH _____ SS # _____

DATE OF INJURY _____ DAY OF THE WEEK _____

TIME OF DAY _____

ADDRESS WHERE ACCIDENT OCCURRED _____

_____

JOB NAME _____ JOB # _____

WHEN DID FOREMAN FIRST KNOW OF INJURY _____

NAME & ADDRESS OF WITNESS _____

_____

DESCRIBE WHERE ACCIDENT OCCURRED (ex. street, on a truck, etc.) _____

_____

STATE NATURE OF INJURY & PARTS OF THE BODY AFFECTED _____

_____

_____

WHAT SPECIFIC TOOL WAS HE USING, IF ANY (ex. shovel, rake, etc.) _____

_____

WHAT SPECIFICALLY WAS THE EMPLOYEE DOING WHEN INJURED (ex. shoveling dirt, raking asphalt, getting into or out of truck, etc.)

_____

WERE ANY SAFEGUARDS USED AT THE TIME (ex. goggles, gloves, etc.) _____

_____

IF USING A MACHINE OR TOOL AT THE TIME, WHAT WAS IT AND WAS IT DEFECTIVE? _____

_____

WAS MEDICAL CARE PROVIDED: _____ IF YES, WHEN? _____

NAME & ADDRESS OF DOCTOR/HOSPITAL _____

_____

DID EMPLOYEE FINISH WORK DAY? _____ DID HE RETURN THE NEXT DAY? _____

_____ _____

DATE SIGNATURE OF FOREMAN

DESCRIBE IN DETAIL ON REVERSE SIDE OF THIS FORM YOUR DESCRIPTION AS TO WHAT HAPPENED ALONG WITH ANY INFORMATION YOU FEEL IS RELEVANT THAT IS NOT REQUESTED ABOVE

COMMON MATERIAL SAFETY DATA SHEETS

1. Acetylene, Dissolved Cutting Gas
2. Argon/CO2 Welding Gas
3. CCA Treated Lumber
4. Chain Saw Lubricant, Stihl
5. Diesel Fuel
6. Gear Lubricant, Mobil SHC 629
7. Grease, Mobil XHP 220
8. HILTI RE-500 Epoxy
9. Hydraulic Oil, Greenplus ES
10. Oxygen, Compressed Cutting Gas
11. Welding Electrode, 6010
12. Welding Electrode, 7018
13. Osmose End-Cut
14. Antifreeze
15. Kill Frost
16. Fluid Film
17. Cold Galvanizing
18. Brake Kleen
19. Ether-Starting Fluid.

Material Safety Data Sheet

Acetylene

Section 1. Chemical product and company identification

Product Name : Acetylene

Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Product use : Synthetic/Analytical chemistry.

MSDS# : 001001

Date of Preparation/Revision : **4/11/2005.**

In case of emergency : 1-800-949-7937

Section 2. Composition, Information on Ingredients

Name	CAS number	% Volume	Exposure limits
Acetylene	74-86-2	100	**NIOSH REL (United States, 6/2001).** CEIL: 2662 mg/m^3 Form: All forms CEIL: 2500 ppm Form: All forms

Section 3. Hazards identification

Physical state : Gas.

Emergency overview : Warning!

FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: RESPIRATORY TRACT, CENTRAL NERVOUS SYSTEM.
VAPOR MAY CAUSE FLASH FIRE.

Keep away from heat, sparks and flame. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation.

Contact with rapidly expanding gases can cause frostbite.

Routes of entry : Inhalation

Potential acute health effects

Eyes : No known significant effects or critical hazards.

Skin : No known significant effects or critical hazards.

Inhalation : Acts as a simple asphyxiant.

Ingestion : Ingestion is not a normal route of exposure for gases

Potential chronic health effects : **CARCINOGENIC EFFECTS** Not available.
MUTAGENIC EFFECTS Not available.
TERATOGENIC EFFECTS: Not available.

Medical conditions aggravated by overexposure : Acute or chronic respiratory conditions may be aggravated by overexposure to this gas.

See toxicological Information (section 11)

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training.If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus.It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Inhalation : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

Section 5. Fire fighting measures

Flammability of the product : Flammable.

Auto-ignition temperature : 304.85°C (580.7°F)

Flash point : Closed cup: -18.15°C (-0.7°F).

Flammable limits : Lower: 2.5% Upper: 82%

Products of combustion : These products are carbon oxides (CO, CO_2).

Fire hazards in presence of various substances : Extremely flammable in presence of open flames, sparks and static discharge, of heat, of oxidizing materials.

Explosion hazards in presence of various substances : Explosive in presence of heat.

Fire fighting media and instructions : In case of fire, use water spray (fog), foam, dry chemicals, or CO_2.

If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.

Extremely flammable. Gas may accumulate in confined areas, travel considerable distance to source of ignition and flash back causing fire or explosion.

Special protective equipment for fire-fighters : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 7. Handling and storage

Handling : Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire, minimize ignition sources. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not puncture or incinerate container. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure Controls, Personal Protection

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor or dust concentrations below any explosive limits. Use explosion-proof ventilation equipment.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93

Hands : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protection in case of a large spill : A self-contained breathing apparatus should be used to avoid inhalation of the product.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Molecular weight : 26.04 g/mole

Molecular formula : C2-H2

Boiling/condensation point : Not available.

Melting/freezing point : Sublimation temperature: -81.8°C (-115.2°F)

Critical temperature : 35.3°C (95.5°F)

Vapor pressure : 635 psig

Vapor density : 0.9 (Air = 1)

Specific Volume (ft^3/lb) : 14.7059

Gas Density (lb/ft^3) : 0.068

Physical chemical comments : Not available.

Section 10. Stability and reactivity

Stability and reactivity : The product may undergo hazardous decomposition, condensation or polymerization, it may react violently with water to emit toxic gases or it may become self-reactive under conditions of shock or increase in temperature or pressure.

Incompatibility with various substances : Extremely reactive or incompatible with oxidizing agents

Section 11. Toxicological information

Chronic effects on humans : Causes damage to the following organs: upper respiratory tract, central nervous system (CNS).

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material for humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Products of degradation : These products are carbon oxides (CO, CO_2) and water.

Toxicity of the products of biodegradation : The product itself and its products of degradation are not toxic.

Environmental fate : Not available.

Environmental hazards : No known significant effects or critical hazards.

Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1001	ACETYLENE, DISSOLVED	2.1	Not applicable (gas).		**Limited quantity** Yes. **Packaging instruction** **Passenger Aircraft** Quantity limitation: Forbidden. **Cargo Aircraft** Quantity limitation: 15 kg
TDG Classification	UN1001	ACETYLENE, DISSOLVED	2.1	Not applicable (gas).		**Explosive Limit and Limited Quantity Index** 0 **Passenger Carrying Ship Index** 75 **Passenger Carrying Road or Rail Index** Forbidden **Special provisions** 38, 42

Acetylene						
Mexico Classification	UN1001	ACETYLENE, DISSOLVED	2.1	Not applicable (gas).		-

Section 15. Regulatory information

United States

U.S. Federal regulations : TSCA 8(b) inventory: Acetylene

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Acetylene
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Acetylene: Fire hazard, reactive, Sudden Release of Pressure, Immediate (Acute) Health Hazard

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean air act (CAA) 112 accidental release prevention: Acetylene

Clean air act (CAA) 112 regulated flammable substances: Acetylene

Clean air act (CAA) 112 regulated toxic substances: No products were found.

State regulations : Pennsylvania RTK: Acetylene: (generic environmental hazard)
Massachusetts RTK: Acetylene
New Jersey: Acetylene

Canada

WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.
Class F: Dangerously reactive material.

CEPA DSL: Acetylene

Section 16. Other information

United States

Label Requirements : FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: RESPIRATORY TRACT, CENTRAL NERVOUS SYSTEM.
VAPOR MAY CAUSE FLASH FIRE.

Canada

Label Requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
Class F: Dangerously reactive material.

Hazardous Material Information System (U.S.A.) :

Health	*	1
Fire hazard		4
Reactivity		3
Personal protection		C

National Fire Protection Association (U.S.A.) :

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.

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: ARGON/CARBON DIOXIDE GAS MIXTURE

TRADE NAMES: WM 6, WM 6.5, WM 6.7, WM 7, WM 8

CHEMICAL FAMILY: Inert Gas/Carbon Dioxide Mixture **PRODUCT USE**: Welding Gas, Specialty Gas

MANUFACTURER

MATHESON TRI-GAS, INC.

959 ROUTE 46 EAST
PARSIPPANY, NJ 07054-0624
USA

Phone: 973/257-1100

EMERGENCY PHONE: **CHEMTREC DOMESTIC U.S.: 1-800-424-9300**
CHEMTREC INTERNATIONAL: 1-703-527-3887
CANUTEC (CANADA): 1-613-996-6666

2. COMPOSITION and INFORMATION ON INGREDIENTS

(10,000 ppm = 1%)

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-STEL		NIOSH	OTHER
			TWA ppm	STEL ppm	TWA ppm	STEL ppm	IDLH ppm	ppm
Carbon Dioxide	124-38-9	0.1-75%	5000	30,000	5000 10,000 (Vacated 1989 PEL)	30,000 (Vacated 1989 PEL)	40,000	NIOSH RELs TWA = 5000 STEL = 30000 DFG MAKs: TWA = 5000 PEAK = 2•MAK 60 min., momentary value
Argon	7440-37-1	Balance	There are no specific exposure limits for Argon. Argon is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

See Section 16 for Definitions of Terms Used.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This gas mixture is a colorless, non-flammable gas which is odorless or which has a sharp odor (due to the presence of Carbon Dioxide). A significant hazard associated with this gas mixture is the potential for Carbon Dioxide overexposures. Inhalation of this gas mixture can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Severe inhalation exposures may be fatal, due to Carbon dioxide overexposure or asphyxiation. Moisture in the air could lead to the formation of carbonic acid which can be irritating to the eyes. A cylinder rupture hazard exists when this gas mixture, which is under pressure, is subject to heat or flames.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: One of the most significant health hazards associated with this gas mixture is the potential for overexposure to Carbon Dioxide. Carbon Dioxide is an asphyxiant and a powerful cerebral vasodilator. If the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur rapidly. Inhalation of concentrations between 2 and 10% can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Carbon Dioxide initially stimulates respiration and then causes respiratory depression. Inhalation of low concentrations (3-5%) have no known permanent harmful effects. Symptoms in humans at various levels of concentration are as follows:

CONCENTRATION	SYMPTOMS OF EXPOSURE
1%:	Slight increase in breathing rate.
2%:	Breathing rate increases to 50% above normal; headache; tiredness.
3%:	Breathing increases to twice normal rate, becoming labored; weak narcotic effect; impaired hearing; headache; increase in blood pressure and pulse rate.
4-5%:	Breathing increases to four times normal rate; symptoms of intoxication become evident and slight choking may be felt.
5-10%:	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment and ringing in the ears. Judgment may be impaired, followed by loss of consciousness.
>10%:	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.

Releases of this gas mixture may also cause an oxygen-deficient environment. The effects associated with various levels of oxygen include disturbed muscular coordination, abnormal fatigue, disturbed respiration, nausea, vomiting, collapse, or loss of consciousness. Death may occur due to asphyxiation. It is important to note that the asphyxiating properties of Carbon Dioxide will be reached before oxygen-deficiency is a significant factor.

CONTACT WITH SKIN or EYES: Moisture in the air could lead to the formation of carbonic acid, which can be irritating to the eyes. Contact with the eyes can cause damage to the retinal ganglion cells.

SKIN ABSORPTION: No component of this gas mixture presents a hazard of skin absorption.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Inhalation of this gas mixture cause nausea, dizziness, visual disturbances, shaking, headache, mental confusion, sweating, increased heartbeat, and elevated blood pressure and respiratory rate. Severe inhalation overexposures may be fatal, due the effects of Carbon Dioxide or asphyxiation. High concentrations of the gas mixture may cause eye irritation.

CHRONIC: Reversible effects on the acid-base balance in the blood, blood pressure, and circulatory system may occur after prolonged exposure to elevated Carbon Dioxide levels. Refer to Section 11 (Toxicological Information) of this MSDS for further information.

3. HAZARD IDENTIFICATION (Continued)

TARGET ORGANS: ACUTE: Respiratory system, cardiovascular system, eyes. CHRONIC: Cardiovascular system.

HMIS RATING: HEALTH = 1 FLAMMABILITY = 0 REACTIVITY = 0 PPE LEVEL = B

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe PPE LEVEL B = Goggles, gloves (leather for handling cylinders)

4. FIRST-AID MEASURES

GENERAL INFORMATION: Remove to fresh air, as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. **Seek medical attention immediately**.

SKIN EXPOSURE: If release of this gas mixture has resulted in frostbite, warm affected area slowly. Seek immediate medical attention.

EYE EXPOSURE: If release of this gas mixture has affected the eyes, seek immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions, cardio-vascular conditions and disorders involving the "Target Organs" (see Section 3, Hazard Identification) may be aggravated by overexposure to this product.

5. FIRE-FIGHTING MEASURES

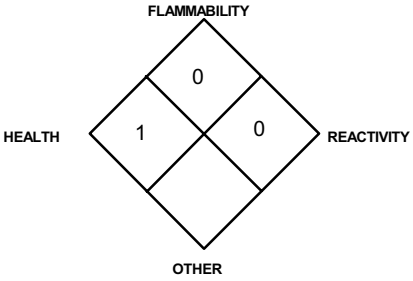
FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

NFPA RATING



See Section 16 for Definition of Ratings

FIRE EXTINGUISHING MATERIALS: Use extinguishing materials appropriate for surrounding materials involved in the fire. Water spray should be used to cool fire-exposed containers.

UNUSUAL FIRE AND EXPLOSION HAZARD: This gas mixture does not burn; however, cylinders, when involved in a fire, may rupture or burst in the heat of the fire.

EXPLOSION SENSITIVITY TO MECHANICAL IMPACT: Not sensitive.

EXPLOSION SENSITIVITY TO STATIC DISCHARGE: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Immediately cool the cylinders with water spray from a maximum distance. When cool, move cylinders from fire area if this can be done without risk to firefighters.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used in the event of a significant release from a single cylinder. Call CHEMTREC (1-800-424-9300) for emergency assistance. Or if in Canada, call CANUTEC (613-996-6666).

Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there. Monitor the surrounding area for the level of Oxygen. The atmosphere must have at least 19.5 percent Oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES

Do not eat or drink while handling chemicals.

Be aware of all potential exposure symptoms; exposures to a fatal oxygen-deficient atmosphere could occur without any significant warning symptoms.

All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release.

Workers who handle this gas mixture should wear protective clothing, as listed in Section 8 (Exposure Controls and Personal Protection).

If ventilation controls are not adequate to provide sufficient oxygen content, proper respiratory protection equipment should be provided and workers using such equipment should be carefully trained in its operation and limitations.

Precautions must always be taken to prevent suck-back of foreign materials into the cylinder by using a check-valve, or vacuum break, since suck-back may cause dangerous pressure changes within the cylinder.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored upright and be firmly secured to prevent falling or being knocked-over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Cylinders should be stored in dry, well-ventilated areas away from sources of heat or ignition. Do not allow the area where cylinders are stored to exceed 52°C (125°F).

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Compressed gases can present significant safety hazards. The following rules are applicable to work situations in which cylinders are being used.

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap (where provided) in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not use oils or grease on gas-handling fittings or equipment. Immediately contact the supplier if there are any difficulties associated with operating the cylinder valve. Never insert an object (e.g wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage the valve, causing a leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc, on a compressed gas cylinder or make a cylinder part of and electric circuit.

After Use: Close main cylinder valve. Replace valve protection cap. Close valve after each use and when empty. Mark empty cylinders “EMPTY”.

7. HANDLING and USE (Continued)

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Refer to current CGA Guidelines for information on protective practices during maintenance of contaminated equipment.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure compliance with exposure limits described in Section 2 (Composition and Information on Ingredients). Local exhaust ventilation is preferred, because it prevents dispersion of this gas mixture into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of Oxygen.

RESPIRATORY PROTECTION: Maintain the Oxygen level above 19.5% in the workplace. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards and Canadian CSA Standard Z94.4-93. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). The following NIOSH respiratory protection recommendations for Carbon Dioxide concentrations in air are provided for additional guidance in respirator selection:

CONCENTRATION	RESPIRATORY EQUIPMENT
Up to 40,000 ppm:	Supplied Air Respirator (SAR); or full-facepiece Self-Contained Breathing Apparatus (SCBA).
Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions:	Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
Escape:	Escape-type SCBA.

EYE PROTECTION: Splash goggles or safety glasses.

HAND PROTECTION: Wear mechanically-resistant gloves when handling cylinders containing this gas mixture.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to the task.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for the Argon component of this gas mixture:

GAS DENSITY: 0.103 lb/cu ft (1.650 kg/m^3)

EVAPORATION RATE (nBuAc = 1): Not applicable.

SPECIFIC GRAVITY (air = 1): 1.38

FREEZING POINT: -189.2°C (-308.9°F)

SOLUBILITY IN WATER: 0.056

BOILING POINT(@ 1 atmos.): -185.9°C (-302.6°F)

EXPANSION RATIO: Not applicable.

SPECIFIC VOLUME (ft^3/lb): 9.71

ODOR THRESHOLD: Not applicable.

MOLECULAR WEIGHT: 39.95

VAPOR PRESSURE (psia): Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

The following information is for the Carbon Dioxide component of this gas mixture:

GAS DENSITY: 0.1144 lb/ft^3 (1.833 kg/m^3)

EVAPORATION RATE (nBuAc = 1): Not applicable.

SPECIFIC GRAVITY (air = 1): 0.90

FREEZING POINT: -78.5°C (-109.3°F) [sublimation]

SOLUBILITY IN WATER: 0.0491

BOILING POINT(@ 1 atmos.): Sublimes.

EXPANSION RATIO: Not applicable.

SPECIFIC VOLUME (ft^3/lb): 8.741

ODOR THRESHOLD: Not applicable.

MOLECULAR WEIGHT: 44.01

VAPOR PRESSURE (psia): Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is pertinent to this product:

APPEARANCE, ODOR AND COLOR: This gas mixture is colorless and odorless, or may have a sharp odor (depending on the level of Carbon Dioxide).

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no distinct warning properties of this gas mixture, unless the Carbon Dioxide is at a high concentration, when the odor may be a warning property. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Stable at standard temperatures and pressures.

DECOMPOSITION PRODUCTS: The Carbon Dioxide component will produce Carbon Monoxide and Oxygen when heated to temperatures above 3000°F (1648°C). The Argon component of this product does not decompose, per se, but may react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Due to the presence of Carbon Dioxide, this gas mixture may be incompatible with a variety of metals, alloys, and metal acetylides (e.g., aluminum, chromium, and zirconium). Carbon Dioxide will react with alkaline materials to form carbonates and bicarbonates. The Argon component of this gas mixture is a relatively inert gas.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Argon is a simple asphyxiant (SA), which acts to displace oxygen in the environment. The following data are available for the Carbon Dioxide component of this gas mixture.

CARBON DIOXIDE:
LCLo (inhalation, human) = 9 pph/5 minutes.
LCLo (inhalation, mammal) = 90000 ppm/5 minutes.
TCLo (inhalation, rat) = 6 pph/24 hours; reproductive and teratogenic effects.

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, IARC, NTP, CAL/OSHA, and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

11. TOXICOLOGICAL INFORMATION (Continued)

IRRITANCY OF PRODUCT: Due to the formation of carbonic acid, this gas mixture can be slightly irritating to contaminated eyes.

SENSITIZATION TO THE PRODUCT: The components of this product are not known to be skin or respiratory sensitizers.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of the components of this gas mixture on the human reproductive system.

Mutagenicity: This gas mixture is not expected to cause mutagenic effects in humans.

Embryotoxicity: This gas mixture has not been reported to cause embryotoxic effects in humans.

Teratogenicity: This gas mixture has not been reported to cause teratogenic effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate teratogenic effects (e.g., cardiac and skeletal malformations, stillbirths).

Reproductive Toxicity: This gas mixture is not expected to cause adverse reproductive effects in humans. Studies involving test animals exposed to high concentrations of Carbon Dioxide show effects (e.g. changes in testes).

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, there are no Biological Exposure Indices (BEIs) determined for the components of this gas mixture.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: This gas mixture will be dissipated rapidly in well-ventilated areas.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to oxygen deficient environments.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No an adverse effect from this gas mixture on aquatic life is expected.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to Matheson Tri-Gas. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (Argon, Carbon Dioxide)

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not applicable.

D.O.T HAZARD LABEL: Non-Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as a Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

(continued on following page)

14. TRANSPORTATION INFORMATION (Continued)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles present serious safety hazards and should be discouraged.

NOTE: Shipment of compressed gas cylinders which have not been filled with the owner's consent is a violation of Federal law [49 CFR, Part 173.301 (b)].

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas mixture is considered as dangerous goods, per regulations of Transport Canada. Use the above U.S. DOT information for the preparation of Canadian Shipments of this mixture.

NOTE: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: No component of this product is subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY： There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21): ACUTE: No; CHRONIC: No; FIRE: No; REACTIVE: No; SUDDEN RELEASE: Yes

U.S. TSCA INVENTORY STATUS: Components of this product are listed on the TSCA Inventory.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under some specific State regulations, as denoted below (other State regulatory lists may exist; individual States should be contacted regarding full compliance).

California - Permissible Exposure Limits for Chemical Contaminants: Argon, Carbon Dioxide.

New Jersey - Right to Know Hazardous Substance List: Argon, Carbon Dioxide.

Pennsylvania - Hazardous Substance List: Argon, Carbon Dioxide.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 lists.

LABELING: Cylinders of this gas mixture should be labeled for precautionary information per the guidelines of the CGA. Refer to the CGA for further information.

15. REGULATORY INFORMATION (Continued)

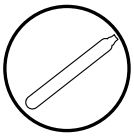
ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this product are not on the CEPA Priorities Substances Lists.

CANADIAN WHMIS SYMBOLS: This gas mixture would be categorized as a Controlled Product, Hazard Classes: **A** (compressed gas). The following symbol is required for WHMIS compliance for this gas mixture.



16. OTHER INFORMATION

CREATION DATE: April 5, 2000 **REVISION DATE:** April 11, 2002

REVISION HISTORY: Up-date of manufacturer address and phone.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you use the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

"Safe Handling of Compressed Gases in Containers" (P-1, 1999)
"Safe Handling and Storage of Compressed Gases" (AV-1, 1999)
"Handbook of Compressed Gases" (1992)

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
800/441-3365

16. OTHER INFORMATION (Continued)

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #:
This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health **-** This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards. Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures). PPE Rating B: Hand and eye protection is required for routine chemical use.

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury).

Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:
Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards as derived from select human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances. **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information: BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. **Ecological Information:** EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. **TL_m** = median threshold limit; Coefficient of Oil/Water Distribution is represented by **log K_{ow}** or **log K_{oc}** and is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:

U.S. and CANADA: This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label.

MATERIAL SAFETY DATA SHEET
WOLMANIZED HEAVY DUTY WOOD
Revised November 21, 2006

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: Chromated Copper Arsenate (CCA) Pressure Treated Wood
Wolmanized Heavy Duty Wood
General Use: Treated Wood Products
Synonyms: CCA Treated Wood with Water Repellant, CCA Treated wood with Mold Inhibitor, CCA Treated Wood with Wax, CCA Treated Wood with Oil, CCA Treated Wood with Polymer, CCA treated formaldehyde bonded wood products, CCA Treated Poles, Piles and Posts.

MANUFACTURER:
Wood Treaters, LLC
PO Box 41604
Jacksonville, FL 32203

EMERGENCY TELEPHONE NUMBERS:
904-358-2507 800-330-7283

FOR MORE INFORMATION PLEASE SEE:
www.woodtreaters.com
www.wolmanizedwood.com/hd/wolmanizedwood.shtml

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS	PERCENT[1]	CAS #	EXPOSURE LIMITS (mg/m3 except where noted)		
			OSHA-PEL	ACGIH-TLV	OSHA-STEL
Chrome III (as Cr)	<3	7440-47-3	0.5	0.5	None
Chrome VI[2]	Trace	18540-29-9	5µg/m^3 2. 5µg/m^3 (action level)	0.01 (as Cr)	0.1 (as CrO_3) Ceiling
Arsenic V (as As)[3]	<3	7440-38-2	0.01	0.01	None
Copper Oxide (as Cu) (dusts/mists)	<3	7440-50-8	1.0	1.0	None
Wood Dust[4] Western Red Cedar All other Species	>91	N/A	 15(total) 5.0 (respirable) 15(total) 5.0 (respirable)	 0.5 (inhalable) 1.0 (inhalable)	None
Formaldehyde[5]	<0.1	50-00-0	0.75ppm	0.37 (Ceiling)	2ppm

Notes: Chromic Acid, Arsenic Acid, and Copper oxide are present in the preservative used to treat this wood
[1]Actual retention may vary due to differences in wood stock and treatment retention levels.
[2]Although the Chrome VI present in the Chromic Acid used to treat this wood is reduced to Chrome III during the treating and fixation processes, some Chrome VI may be present. Due to this, OSHA's Hexavalent Chromium Rule (29 CFR 1910.1026) may apply. The manufacturer of this treated wood has monitoring data indicating the levels will be below the established limits and action levels when used under usual conditions. If unusual circumstances exist, monitoring may be required.
[3]The arsenic pentoxide present in this product is not subject to the OSHA Arsenic standard 29CFR 1910.1801
[4]A state-run OSHA program may have more stringent limits for wood dust and/or PNOR.
[5]Only applies to Plywood Products

3. HAZARDS IDENTIFICATION

Inhalation: Airborne treated or untreated wood dust may cause nose, throat or lung irritation. Various species of untreated wood dust can elicit allergic respiratory response in sensitized persons.
Eye Contact: Treated or untreated wood dust may cause mechanical irritation.
Skin Contact: Handling wood may result in skin exposure to splinters. Prolonged and/or repeated contact with treated or untreated wood dust may result in mild irritation. Various species of untreated wood dust can elicit allergic type skin irritation in sensitized persons.
Ingestion: Not anticipated to occur. A single ingestion of a very large dose of treated wood dust may require immediate medical attention.
Chronic Wood Dust (treated or untreated) Effects: Wood dust, depending on species, may cause dermatitis on prolonged, repetitive contact; may cause respiratory sensitization and/or irritation.

4. FIRST AID MEASURES

Inhalation: Remove from wood dust exposure. If breathing has stopped, administer artificial respiration. Seek medical aid if symptoms persist.
Eye Contact: Gently flush any particles from the eyes with large amounts of water for at least 15 minutes. DO NOT RUB THE EYES. Seek medical aid if irritation persists.

4. FIRST AID MEASURES (Con't)

Skin Contact: Rinse wood dust off with water. DO NOT RUB. Once the skin is free of the wood dust, wash thoroughly with soap and water. Seek medical aid if severe irritation develops.

Ingestion: Rinse the victim's mouth out with water. Do not induce vomiting. If symptoms develop, call a physician. One ounce of treated wood dust per 10 pounds of body weight ingested may cause acute arsenic intoxication.

5. FIRE FIGHTING MEASURES

Flash Point	NA	**Lower Explosive Limit**	NA
Auto-ignition	NA	**Upper Explosive Limit**	NA

Extinguishing Agents: Not applicable

Fire-Fighting Procedures: Fire from a separate fuel source may be intense enough to cause thermal decomposition releasing toxic fumes and/or gases. Wear complete fire service protective equipment, including full-face NIOSH/NFPA – approved self-containing breathing apparatus.

Fire and Explosion Hazard: High airborne levels of wood dust may burn rapidly in the air when exposed to an ignition source.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Not applicable.

Waste Disposal: See Section 13.

7. HANDLING AND STORAGE

Storage Conditions: Protect from physical damage. Maintain good housekeeping.

Caution: DO NOT BURN TREATED WOOD. Do not use pressure treated chips or sawdust as mulch. Whenever possible, sawing or machining treated or untreated wood should be performed outdoors to avoid accumulations of airborne wood dust. Wash hands thoroughly before eating, drinking, using tobacco products, and/or using restrooms.

NOTE: For plywood products only, provide adequate ventilation to reduce the possible buildup of formaldehyde vapors.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory Protection: None normally required. When sawing or cutting treated or untreated wood, wear a NIOSH approved N95 or better dust mask.

Eye Protection: Wear safety glasses with side shields or safety goggles when sawing or cutting.

Skin/Foot Protection: Wear leather or comparable gloves to prevent splinters. Wear long sleeve shirt, pants and steel toed shoes when handling treated or untreated wood

Ventilation: Saw, cut or machine wood outdoors or in well ventilated areas. Ventilation should be sufficient to maintain inhalation exposures below OSHA PEL for particulates.

Other Protective Equipment: Wear ear plugs or muffs when using power tools.

NOTE: For plywood products only, if Formaldehyde vapor level exceeds OSHA PEL or STEL, then a NIOSH approved respirator is required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Light to dark green	**Specific Gravity (Water =1)**	NA
Odor	None	**Boiling Point**	NA
Solubility in Water	NA	**Vapor Density (Air=1)**	NA
Physical State	Solid	**Vapor Pressure**	NA
pH	NA	**Freezing Point**	NA

10. STABILITY AND REACTIVITY

Conditions Contributing to Instability: None known.

Incompatibilities: Strong acids, open flame and oxidizers.

Hazardous Reactions/Decomposition/Combustion Products: Contact with strong acid may release metals. Combustion products may include smoke, oxides of carbon, nitrogen and copper. If the fire is intense enough, some arsenic trioxide may be released into the smoke. The metals will remain in the ash if the wood is burned.

Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Study Abstracts: In Hawaii, where over 45,000 homes have been built almost entirely of CCA-treated wood, a study was conducted by the Pacific Biomedical Center of the University of Hawaii (the Budy-Rashad study) in 1977 to determine any possible effect on the health of carpenters. The study concluded that exposure to CCA-treated sawdust is not associated with increased risk of total cancer, lung cancer or lymphatic cancer and shows that excess respiratory cancer mortality was not observed in the carpenters. A study was conducted by the University of Alabama to evaluate the teratogenicity of CCA-impregnated sawdust when exposed to rabbits and mice. Sawdust from CCA-treated wood has been shown not to cause chromosome damage or teratogenic effects in mice fed sawdust nor to cause birth defects in rabbits receiving sawdust applied to their skin.

According to a Human Health Risk Assessment conducted by Gradient Corporation in August 2004, potential health risks to workers and residents do not exceed U.S. Environmental Protection Agency acceptable risk limits. Although the arsenic complex (the predominate chemical form of arsenic in CCA-treated wood is chromium III arsenate) is present on the surface of CCA-treated utility poles and in surrounding soils, the arsenic in these poles is chemically bonded to the wood and is not readily absorbed in the body. This risk assessment evaluated exposures to arsenic complex on the surface of CCA treated utility poles and in soil adjacent to the poles. Exposure was evaluated for both hand to mouth contact and skin contact for a child resident age 2-6 and an adult utility pole worker. The assessment results also indicate that the amount of arsenic complex potentially taken into the body from exposures to CCA-treated utility poles and adjacent soils for a child resident is approximately 8 fold less than the intake of naturally occurring inorganic arsenic in food and drinking water at the new federal drinking water standard for arsenic. An adult worker is exposed to over 24 fold less arsenic complex associated with CCA-treated utility poles, compared to intake of inorganic arsenic form food and drinking water.

Carcinogenic status: IARC, the NTP, OSHA and California Proposition 65 do not consistently distinguish among arsenic or chrome species but list inorganic arsenic and chromium and certain chromium compounds as human carcinogens. Cancers in humans have followed from long term consumption of Fowler's Solution, a medicinal trivalent arsenical; inhalations and skin contact with inorganic trivalent arsenical sheep-dust; the combined inhalation of arsenic trioxide (trivalent arsenical), sulfur dioxide, and other particulates from ore smelting in arsenic trioxide production; and occupational exposure to nonwater-soluble hexavalent chromium.

Carcinogenicity Data: IARC has classified untreated hardwood and hardwood/softwood mix wood dust as a Group I human carcinogen. The wood dust classification is based primarily on IARC's evaluation of increased risk in the occurrence of adenocarcinomas of the nasal cavities and paranasal sinuses associated with occupational exposures to untreated wood dust. NTP has classified all untreated wood dust as a carcinogen.

12. ECOLOGICAL INFORMATION

Study Abstracts: A technical paper published in the Forest Products Journal (September, 1974) by Levi, Huisingh and Nesbitt described a study conducted to determine if CCA wood preservative in grapevine support posts might be absorbed by the vines, leaves and/or grapes. This study concluded that "... CCA preservatives are bound in wood, are not readily leached and are not concentrated in plants growing close to the treated wood."

The Springborn Laboratories Environmental Sciences Division in 1993 conducted a sediment exposure study using leachate from CCA treated and untreated marine pilings and exposing Ampelisca abdita for a period of 10 days. Survival of the organisms during the 10-day exposure period was the biological endpoint used to establish the effects of exposure. Results indicated that leachate from treated pilings had no adverse effect on organism survival. It was concluded that the primary constituents of the CCA-treated wood piling were not present in the leachate at concentrations which would adversely affect the survival of the organisms.

Testing has been conducted to evaluate the use of treated wood in raised vegetable gardens. Vegetables harvested from gardens in raised bed structures built of CCA-treated wood were compared with vegetables grown in untreated raised bed structures and with vegetables purchased at a local grocery store. Testing revealed that all vegetables contained minuscule amounts of each element in CCA. In some cases, the levels of metals were actually higher in the vegetables grown in untreated bins, and in one case the store-purchased vegetable had the highest level of arsenic. The report concluded that there was "no uptake of the metal constituents into the vegetables."

The Food and Drug Administration's (FDA) "Market Basket Survey" has consistently shown that arsenic in tomatoes is below the analytical level of detection despite the increased usage of arsenically-treated wood for tomato stakes. Moreover, even though CCA-treated wood has been increasingly used in applications such as cattle bunks and stalls and poultry brooders for the last ten years, the FDA survey has shown a decrease in the arsenic content of dairy, meat and poultry products.

A study funded in part by the National Oceanic and Atmospheric Administration (NOAA) and prepared by the Marine Resources Division of the South Carolina Department of Natural Resources in 1995 measured the impact of wood preservative leachate from docks in an estuarine environment. Copper, chromium, arsenic, and polynuclear aromatic hydrocarbons (PAHs) were measured in composite samples of sediments and naturally occurring oyster populations from creeks with high densities of docks, and from nearby reference creeks with no docks. Sediments from all but one site had metal and total PAH concentrations which were below levels reported to cause biological effects, and the oysters showed no significant difference in their physiological condition. Bioassays were also conducted on four common estuarine species and hatchery-reared oysters. The results suggest that wood preservative leachates from dock pilings have no acutely toxic effects on these common species, nor do they affect the survival or growth of juvenile oysters over a six-week period. In some cases, metal leachates may accumulate in sediments and oysters immediately adjacent to pilings, but do not appear to become concentrated in sediments or oysters elsewhere in the same creeks.

13. DISPOSAL CONSIDERATIONS

Disposal Guidance: DO NOT BURN TREATED WOOD. Do not use pressure treated chips or sawdust as mulch. Dispose of in accordance with local, state and federal regulations. This product is exempted as a hazardous waste under any sections of the RCRA regulations as long as the product is being utilized for its intended end use as stated in 40 CFR 261.4 (b) (9). State run hazardous waste programs may be more stringent.

14. TRANSPORT INFORMATION

DOT Hazardous Material Classification: This material is not regulated as a hazardous material by the DOT.

15. REGULATORY INFORMATION

RCRA (40 CFR 261): DO NOT BURN TREATED WOOD. Do not use pressure treated chips or sawdust as mulch. Dispose of in accordance with local, state and federal regulations. This product is exempted as a hazardous waste under any sections of the RCRA regulations as long as the product is being utilized for its intended end use as stated in 40 CFR 261.4 (b) (9). 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. Check local and state regulations, as they may be more stringent.

OSHA (29 CFR 1910.1200): This product is regulated under the Hazard Communication Standard.

SARA 313 (40 CFR 372): Unless exempted, this product may require a Toxic Release Inventory reporting for individual material uses of 25,000 pounds or more. Reporting is under Copper Compounds, Chromium Compounds and Arsenic Compounds. It is the user's responsibility to determine applicability of reporting requirements and exemptions.

California Proposition 65: This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. (This statement issued in accordance with California Proposition 65).

ABBREVIATIONS

OSHA	Occupational Safety and Health Administration	**TLV**	Threshold Limit Value
NFPA	National Fire Protection Association	**STEL**	Short-Term Exposure Limit
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act	**RCRA**	Resource Conservation and Recovery Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	**ACGIH**	American Conference of Governmental Industrial Hygienists
SARA	Superfund Authorization and Reauthorization Act	**NIOSH**	National Institute of Occupational Safety and Health
PEL	Permissible Exposure Limit	**TSCA**	Toxic Substances Control Act
DOT	Department of Transportation	**IARC**	International Agency for Research on Cancer
NTP	National Toxicology Program	**IBC**	International Building Code
CFR	Code of Federal Regulations	**mg/m3**	Milligrams per cubic meter
CWA	Clean Water Act	**CAA**	Clean Air Act
CAS	Chemical Abstracts Service		

MATERIAL SAFETY DATA SHEET

O M N I S P E C I A L T Y P A C K A G I N G

10399 HWY 1 ○ SHREVEPORT, LA 71115 ○ (318) 524-1100

Contact Name: Curtis Young Emergency Phone Number: (318) 347-5023

Packaged for Stihl Incorporated, 536 Viking Drive, Virginia Beach, VA 23452

MATERIAL SAFETY DATA SHEET	**U.S. DEPARTMENT OF LABOR**
May be used to comply OSHA's Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements.	Occupational Safety and Health Administration. (Non-Mandatory Form) Form Approved OMB No.1218-0072.

SECTION I GENERAL INFORMATION

PRODUCT NAME Stihl Bar & Chain Lubricant

Product will be packaged in the containers with no less than 25% of post consumer resin.

SECTION II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

COMPONENT	WT.%	C.A.S. No	TLV(ACGIH; OSHA)
Severely Hydrotreated Heavy Naphthenic Petroleum Oil	99.0	64742-52-5	5 mg/m^3
Petroleum Product Additive	1.00	Mixture	5 mg/m^3

This product does not contain any substances known to the state of California to cause cancer, birth defects or other reproductive harm.

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Specific Gravity (H_2O=1)	0.92	Appearance and Odor	Straw viscous liquid
Solubility in Water	Negligible	pH	N/A
Flash Point (PM), °F (°C)	435 (224)	Solubility in Solvent	N/A
Pour Point, °F (°C)	0 – (-18)	%Volatiles By Wt.	Negligible
Vapor Pressure (mmHg)	N/A	Boiling Point, F°	N/A
Evaporation Rate (Butyl Acetate=1)	N/A	Kinematic Viscosity, cSt	150.00 @ 40°C; 11.50 @ 100°C

SECTION IV FIRE AND EXPLOSION HAZARD DATA

EXTINGUSHING MEDIA:

Water xx Foam xx CO_2 xx Dry Chemicals xx Fog

SPECIAL FIRE FIGHTING PROCEDURES Forced stream may cause fire to spread.

Use water to cool containers exposed to flames.

UNUSUAL FIRE AND EXPLOSION HAZARDS Non Known.

SECTION V REACTIVITY DATA

Stable xx Unstable Corrosive No Hazardous Polymerization? Yes No xx

Incompatibilities: Strong oxidizing agents.

Hazardous Decomposition or Byproducts: Carbon dioxide and carbon monoxide.

SECTION VI HEALTH HAZARD INFORMATION

OSHA Exposure Limit 5 mg/m^3 (Mist); 10 mg/m^3 (Mist, Short Term).

EYE CONTACT	Eye contact may result in irritation and redness.	SKIN CONTACT	Prolonged or repeated contact can defat the skin, which may result in dryness, dermatitis, and cracking of the skin.
INHALATION	Inhalation of vapors or mist may be irritating to respiratory passages. Prolonged exposure to oil mists may result in dizziness and nausea.	INGESTION	May result in nausea or stomach discomfort.

SECTION VII EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT	Flush with water for 15 minutes thoroughly. Get medical attention if irritation develops or persists.
SKIN CONTACT	Remove contaminated clothing. Wash with soap and water. Get medical attention if skin disorder develops. Launder contaminated clothing before reuse.
INHALATION	Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. Get medical attention if symptoms persist.
INGESTION	If swallowed, observe for signs of stomach discomfort or nausea. If symptoms persist, seek medical help.

SECTION VIII SPECIAL PROTECTION INFORMATION

	CONSUMER	BULK HANDLING (Prolonged Exposure)
RESPIRATORY PROTECTION	N/A	Not normally needed. Respirator should be used in areas where vapor concentrations are excessive due to high temperatures or where oil misting occurs.
VENTILATION	Use with adequate ventilation.	General.
EYE PROTECTION	N/A	Goggles or full-face shield.
PROTECTIVE CLOTHING	Use impervious gloves for prolonged contact.	Oil-impervious gloves and apron.

SECTION IX PRECAUTIONS FOR SAFE HANDLING AND USE

SPILL OR LEAK PROCEDURE	Remove all sources of ignition. Contain spill. Recover all possible material for reclamation. Use non-flammable absorbent material to pick up remainder of spill.
WASTE DISPOSAL METHOD	Dispose in accordance with all applicable local, state and federal regulations.
STORAGE AND HANDLING PRECAUTIONS	Store away from heat, sparks, and hot surfaces “Empty” containers retain product residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose used containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode. Wash thoroughly after handling.
OTHER PRECAUTIONS	Keep away from children and animals.

SECTION X OTHER INFORMATION

NFPA Hazard Rating	- Health	1 Slight
	- Fire	1 Slight
	- Reactivity	0 Least

Supersedes_____ OSHA Revised_____

Title_____

While Omni Specialty Packaging believes this data is accurate as of revision date, we make no warranty with respect to the data and we expressly disclaim all liability for reliance thereon. The data is offered solely for your information, investigation, and verification.

MSDS SUMMARY SHEET

Manufacturer:
Name: PHILLIPS PETROLEUM COMPANY
Address 1:
Address 2:
Address 3:
CSZ: BARTLESVILLE **State:** OK **Zipcode:** 74004
Emergency phone: (800) 424-9300
Business phone: 800-762-0942

Product:

Ferndale MSDS#: 1354 **Version # :** 6
Manufacturer MSDS#: 0041
Current? : 2002
Name:

NO. 2 DIESEL FUEL

Synonyms:

CARB **Diesel** TF3
CARB **Diesel**
CARB **Diesel** 10%
Diesel Fuel Oil
EPA Low Sulfur **Diesel** Fuel
EPA Low Sulfur **Diesel** Fuel – Dyed
EPA Off Road High Sulfur **Diesel –** Dyed
Fuel Oil No. 2 – CAS # 68476-30-2
No. 2 **Diesel** Fuel Oil
No. 2 Fuel Oil – Non Hiway – Dyed
No. 2 High Sulfur **Diesel** – Dyed
No. 2 Low Sulfur **Diesel** - Dyed
No. 2 Low Sulfur **Diesel** - Undyed
Crude column 3rd IR
Crude column 3rd side cut
Atmospheric tower 3rd side cut
Ultra Low Sulfur **Diesel** No. 2
Finished **Diesel**
DHT Reactor Feed
Straight Run **Diesel**
Diesel
Middle Distillate

Product/Catalog Numbers:
MSDS Date: 01/01/2002 **(received:** 01/14/2002**)**

NFPA codes:
Health: 0 **Flammability:** 2 **Reactivity:** 0

MATERIAL SAFETY DATA SHEET
No. 2 Diesel Fuel

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: No. 2 Diesel Fuel
Product Code: Multiple
SAP Code:
Synonyms: 1354
CARB Diesel TF3
CARB Diesel
CARB Diesel 10%
Diesel Fuel Oil
EPA Low Sulfur Diesel Fuel
EPA Low Sulfur Diesel Fuel – Dyed
EPA Off Road High Sulfur Diesel – Dyed
Fuel Oil No. 2 – CAS # 68476-30-2
No. 2 Diesel Fuel Oil
No. 2 Fuel Oil – Non Hiway – Dyed
No. 2 High Sulfur Diesel – Dyed
No. 2 Low Sulfur Diesel - Dyed
No. 2 Low Sulfur Diesel – Undyed
No. 2 Ultra Low Sulfur Diesel – Dyed
No. 2 Ultra Low Sulfur Diesel - Undyed
Intended Use: Fuel
Chemical Family:
Responsible Party: Phillip's Petroleum Company
Bartlesville, Oklahoma 74004
For Additional MSDSs: 800-762-0942
Technical Information:

The intended use of this product is indicated above. If any additional use is known, please contact us at the Technical Information number listed.

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Numbers:
Spill, Leak, Fire or Accident
Call CHEMTREC
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

California Poison Control System: 800-356-3120

Health Hazards/Precautionary Measures: Causes severe skin irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Do not taste or swallow. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Flammable liquid and vapor. Keep away from heat, sparks, flames, static electricity or other sources of ignition.

Appearance: Straw-colored to dyed red
Physical Form: Liquid
Odor: Characteristic petroleum

HFPA Hazard Class:
Health: 0 (Least)
Flammability: 2 (Moderate)
Reactivity: 0 (Least)

HMIS Hazard Class
Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% VOLUME		EXPOSURE GUIDELINE	
		Limits	Agency	Type
Diesel Fuel No. 2 CAS# 68476-34-6	100	100* mg/m3	ACGIH	TWA-SKIN
Naphthalene CAS# 91-20-3	<1	10ppm	ACGIH	TWA
		15ppm	ACGIH	STEL
		10ppm	OSHA	TWA
		250ppm	NIOSH	IDLH

All components are listed on the TSCA inventory

Tosco Low Sulfur No. 2 Diesel meets the specifications of 40 CFR 60.41 for low sulfur diesel fuel.

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

*Proposed ACGIH (1999)

3. HAZARDS IDENTIFICATION

Potential Health Effects:

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Severe skin irritant. Contact may cause redness, itching, burning, and severe skin damage. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin, leading to dermatitis (inflammation). Not actually toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): Low degree of toxicity by ingestion. ASPIRATION HAZARD – This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea, diarrhea and transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Cancer: Possible skin cancer hazard (see Sections 11 and 14).

Target Organs: There is limited evidence from animal studies that overexposure may cause injury to the kidney (see Section 11).

Developmental: Inadequate data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders and kidney disorders.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: Immediately remove contaminated shoes, clothing, and constrictive jewelry and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops, seek immediate medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard; Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

5. FIRE FIGHTING MEASURES

Flammable Properties:

Flash Point: >125°F/>52°
OSHA Flammability Class: Combustible liquid
LEL %: 0.3 / UEL %; 10.0
Autoignition Temperature: 500°F/260°C

Unusual Fire & Explosion Hazards: This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended.

Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors (see Section 5). Spilled material may be absorbed into an appropriate material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharged. The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Use good personal hygiene practices.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing or high pressure hydraulic oil equipment.

“Empty” containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. “Empty” drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSIZ49.1 and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area “No Smoking or Open Flame.” Store only in approved containers. Keep away from incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentration below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with an organic vapor cartridge maybe used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2).

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrants a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact, possible irritation and skin damage (see glove manufacturer literature for information on permeability). Depending on conditions of use, apron and/or arm covers may be necessary.

Eyes/Face: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse. It is recommended that impervious clothing be worn when skin contact is possible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1atm).

Appearance: Straw-colored to dyed red
Physical State: Liquid
Odor: Characteristic petroleum
pH: unavailable
Vapor Pressure (mm Hg): 0.40
Vapor Densisty (air=1):>3
Boiling Point/Range: 320-700°F /160-371°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.81-0.88 @ 60°F
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 32.6-40.0 SUS @ 100°F
Bulk Density: 7.08 lbs/gal
Flash Point: >125°F / >52°C
Flammable/Expolsive Limits (%): LEL: 0.3 / UEL: 10.0

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions To Avoid: Avoid all possible sources of ignition (see Sections 5 and 7).

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc.

Hazardous Decomposition Products: The use of hydrocarbon fuels in an area without adequate ventilation may result in hazardous levels of combustion products (e.g., oxides of carbon, sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels. ACGIH has included a TLV of 0.05 mg/m3 TWA for diesel exhaust particulate on its 1999 Notice of Intended Changes. See Section 11 for additional information on hazards of engine exhaust.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Diesel Fuel No. 2 (CAS# 68476-34-6)

Carcinogenicity: Chronic dermal application of certain middle distillate streams contained in diesel fuel No. 2 resulted in an increased incidence of skin tumors in mice. This material has not been identified as carcinogen by NTP, IARC, or OSHA. Diesel exhaust is a probable cancer hazard based on tests with laboratory animals.

Target Organ(s): Limited evidence of renal impairment has been noted from a few case reports involving excessive exposure to diesel fuel No. 2.

Naphthalene (CAS# 91-20-3)

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has not been identified as a carcinogen by IARC or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, would be a RCRA “characteristic” hazardous waste due to the characteristic(s) of ignitability (D001) and benzene (D018). If the material is spilled to soil or water, characteristic testing of the contaminated materials is recommended. Further, this material, once it becomes a waste, is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent then the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container ?insate? could be considered a RCRA hazardous waste and must be disposed of with care and in compliance with federal, state and local regulations. Large empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT Shipping Description: Diesel Fuel, NA1983
Non-Bulk Package Marking: Diesel Fuel, 3, NA 1993, III

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health:	Yes
Chronic Health:	Yes
Fire Hazard:	Yes
Pressure Hazard:	No
Reactive Hazard:	No

SARA 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Component	CAS Number	Weight %
-- None known --		

California Proposition 65:

Warning: This material contains the following chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Effect
Benzene	Cancer, Developmental and Reproductive Toxicant
Toluene	Developmental Toxicant

Diesel engine exhaust, while not a component of this material, is on the Proposition 65 list of chemicals known to the State of California to cause cancer.

Carcinogen Identification:

This material has not been identified as a carcinogen by NTP, IARC, or OSHA. See Section 11 for carcinogenicity information of individual components, if any. Diesel exhaust is a probable cancer hazard based on tests in laboratory animals. It has been identified as carcinogen by IARC.

EPA (CERCLA Reportable Quantity: None

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 05/15/01
Product Code: Multiple
Revised Sections: None
Previous Product Code: Multiple
MSDS Number: 0041

Disclaimer of Expressed and Implied Warranties:

The information presented in this Material Data Safety Sheet is based on data believed to be accurate as of the date this Material Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THE PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

Tosco Refining Company ***Ferndale Refinery***

UltraLow Sulfur Diesel Product Specification

Ferndale Product Code:34380xx (5) Product Code: ULSD2

(COMETS)

Specification	Unit	Limit	Test Procedure	Typical
Appearance				
Water & Sediment	Vol %	0.05 Max	D 2709	
Color	Number	3.0 Max	D 1500	
Haze Rating	Rating	2 Max	D 4176	
Composition				
Carbon Residue (Ramsbottom)	Wt %	0.35 Max	D 524, D 189	
Volatility				
90% Recovered	Deg; F	540 Min	D 86	
	Deg; F	640 Min	D 86	
Flash Point	Deg; F	125 Min (1)	D 93	130 F
Gravity	API	30 Min	D 287, D4052	
Fluidity				
Pour Point	Deg; F	See Season Table (6)	D 97	
Cloud Point	Deg; F	See Season Table (6)	D 2500	10 F
Viscosity @ 104F	cSt	1.9 Min	D 445	
	cSt	4.1 Max	D 445	
Lubricity, SLBOCLE	grams	3100 Min	D 6078	3300gm
Lubricity, HFRR	mm	.45	D 6079	
Combustion				
Cetane Index or Cetane Number (3,4)	Number	40.0 Min	D 976, D613	47.0
Corrosion				
Copper Strip, 3hr @ 50 deg C	Number	3 Max (2)	D 130	
Aromatics (4)	Vol %	35 Max	D 1319	25 %
Contaminants				
Total Sulfur	PPM	30 Max	D 2622, D4294	15-20ppm
Water & Sediment	Vol %	0.05 Max	D 1796	
Ash	Wt %	0.01 Max	D 482	
Additives				
Cetane Improver	Lb/MBbl	675 Max		
Dye		Undyed		

1. Minimum release specification is 125 deg. F. The refinery should target 135 deg. F.
2. Test result reported as a number and letter (e.g. 1a). Any letter is allowable as long as the number meets the spec shown.
3. Either specification must be met.
4. Either cetane index minimum or aromatics maximum must be met.
5. Winter cloud and pour specifications may be relaxed to the summer specifications by agreement with the customer.
6. Season Table

Month	Product Code	Pour Point	Cloud Point
Jan, Feb, Nov, Dec	WI	0 max (5)	14 max (5)
Mar - Oct	SU	15 max	24 max

PRODUCT NAME : MOBIL SHC 629, GEAR BOX LUBRICANT

1. Product and Company Identification

Product Name: Mobil SHC 629 Gearbox Lubricant

Synonyms: None

Item Numbers : H110-23-010, H110-23-011

European Contact Details

BOC Edwards, Manor Royal, Crawley,
West Sussex, RH10 2LW, England
General enquiries
UK : +44 (0)1293 528844
France : +(33) 1 47 98 24 01
Germany : +(49) 89-991918-0
Italy : +(39) 0248-4471

US Contact Details

BOC Edwards, 301 Ballardvale Street,
Wilmington, MA 01887
General enquiries
+(1) 978-658-5410
Toll Free: 1-800-848-9800

24 h Emergency telephone number:
Chemtrec : 1-800-424-9300

2. Composition/Information on Ingredients

Ingredient	% Weight	CAS No	Hazard class*	Risk phrase*
Synthetic hydrocarbons and additives	100	Not assigned	Not applicable	Not applicable

*Hazard class & Risk phrase. These columns are only completed for ingredients which are classified as hazardous under EU Directive (67/548/EEC, as amended) and are present in sufficient concentration to make the overall substance hazardous. In all other situations, the column will be completed as “Not applicable”.

3. Hazards Identification

EMERGENCY OVERVIEW

The product, when properly handled according to good working and hygienic practices. is not dangerous for human health and the environment.

For short and long term exposure effects see Section 11 Toxicological data

Eye Effects:	Material is practically non irritating (based on testing of similar products and/or components).
Skin Effects:	Material is practically non toxic.
	Material is practically non irritating (based on testing of similar products and/or components).
Ingestion/ Oral Effects:	Material is practically non toxic.
Inhalation Effects:	Not applicable. Harmful concentrations of mists and/or vapours are unlikely to be encountered through any customary or reasonably foreseeable handling, use or misuses of this product.

PRODUCT NAME : MOBIL SHC 629, GEAR BOX LUBRICANT

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known.

NFPA Hazard codes		HMIS Hazard codes		Rating System
Health	0	Health	0	0 = No Hazard
Flammability	1	Flammability	1	1 = Slight hazard
Reactivity	0	Reactivity	0	2 = Moderate Hazard
				3 = Serious Hazard
				4 = Severe hazard

4. First Aid Measures

Eyes: Flush thoroughly with water. If irritation occurs, call a doctor.

Skin: Wash contact areas with soap and water.

Ingestion/Oral: Not expected to be a problem. However, if greater than ½ litre(1 pint) is ingested or if feeling uncomfortable, give 1 - 2 glasses of water and obtain medical attention or call an ambulance for assistance. DO NOT INDUCE VOMITING or give anything by mouth to an unconscious person.

Inhalation: Not expected to be a problem. If high concentrations of mists or fumes are inhaled, remove to fresh air. If breathing problems occur, a qualified individual should administer oxygen or artificial respiration as indicated. Seek immediate medical attention.

Other Information: None.

5. Fire Fighting Measures

Extinguishing Media: Carbon dioxide, foam, dry chemicals and water fog.

Fire and Explosion Hazard: There are no unusual fire or explosion hazards. Hazardous decomposition products : carbon monoxide, elemental oxides and metal oxides.

Special Protective Equipment for Fire Fighters: For fires in enclosed areas, fire fighters should wear a self-contained breathing apparatus (SCBA) which meets appropriate standards operated in positive pressure mode and full turn out gear.

Other information: Water or foam may cause frothing. Use water to keep cool containers exposed to fire.

For Flammability Properties - see Section 9

PRODUCT NAME : MOBIL SHC 629, GEAR BOX LUBRICANT

6. Accidental Release Measures

In the event of a spillage :

- Prevent contact with soil.
- Prevent spill from entering storm sewers, drains, waterways and ground water.
- Contain and absorb with fire retardant treated sawdust, diatomaceous earth, etc.
- Shovel up and dispose of at an appropriate licensed site in accordance with current applicable laws and regulations.
- In case of an accident or road spill contact the local police or fire brigade.
- In case of spills which are liable to enter storm sewers, drains, contact the police or local area water authority.

7. Handling and Storage

Handling : no special handling precautions are necessary beyond normal good hygiene practices. See Section 8 for additional protection advice when handling product.

Storage : do not store in open or unlabelled containers. Store away from strong oxidising agents or combustible materials.

8. Exposure Controls/Personal Protection

Exposure Limits

Ingredient	ACGIH - TLV -	OSHA - PEL	Occupational Exposure Limits EH40 (UK)
See Note below.	See Note below	See Note below	See Note below

NOTE : This product does not contain any components which have recognised exposure limits. However, a threshold limit value of 5.00 mg/m^3 is suggested for oil mist.

Personal Protection:

Engineering Measures:	No special requirements under ordinary conditions of use. There should be adequate ventilation.
Respiratory Protection:	No special requirements under ordinary conditions of use. There should be adequate ventilation.
Hand/Skin Protection:	No special equipment required.
Eye/Face Protection:	Normal industrial eye protection practices should be employed.
Hygiene Measures:	Employ good personal hygiene. Do not eat, drink or smoke when handling the product. Wash hands before eating.
Other/General Protection:	None.

PRODUCT NAME : MOBIL SHC 629, GEAR BOX LUBRICANT

9. Physical and Chemical Properties

Appearance and Odour	Light amber liquid with slight odour	Boiling Point	>260/500	^{0}C/ ^{0}F
pH (as supplied)	Not applicable	Freezing Point	No data available	^{0}C/ ^{0}F
Solubility in Water	Negligible	Auto Ignition	No data available	^{0}C/ ^{0}F
Volatile Content by Volume	No data available	Flash Point	245/473	^{0}C/ ^{0}F
Specific Gravity	0.864			
Vapour Pressure (mbar)	<0.13 @ 20^{o}C	Vapour Pressure (Torr)	< 0.1 @ 68^{o}F	

10. Stability and Reactivity

Stability: Stable with regard to light, thermal, etc.

Material/Conditions to Avoid: Strong oxidisers, extreme heat.

Hazardous Decomposition: Carbon monoxide, elemental oxides and metal oxides.

11. Toxicological Information

For a comprehensive description for the various toxicological (health) effects which may arise if the user comes into contact with the substance or preparation refer to Section 3 Hazards Identification.

Animal Data:

LD50 value: Based on testing similar products:

Oral : LD 50 > 2000 mg/kg

Skin : LD 50 > 2000 mg/kg

LC50 value: No data available

Carcinogenicity:

The product is formulated from synthesised, wax-free, hydrocarbon base fluids. These base stocks are not classified as carcinogenic.

12. Ecological Information

Acute LC/EC50 Fish (juvenile rainbow trout): practically non-toxic (based on testing of similar products).

13. Disposal Considerations

The product is suitable for burning in an enclosed, controlled burner for fuel value or disposal by supervised incineration. Such burning may be limited by the controlling authority. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at any waste disposal site. Use of these methods is subject to user compliance with applicable laws and regulations.

PRODUCT NAME : MOBIL SHC 629, GEAR BOX LUBRICANT

14. Transport Information

This product is not regulated as dangerous under transport regulations.

PARAMETER	EUROPEAN	CANADIAN TDG	UNITED STATES DOT
Proper Shipping Name	Not applicable	Not applicable	Not applicable
Hazard Class	Not applicable	Not applicable	Not applicable
Identification Number	Not applicable	Not applicable	Not applicable
Shipping Label	Not applicable	Not applicable	Not applicable

15. Regulatory Information

European Regulatory Information

This product has been classified in accordance with the Dangerous Substances Directive (67/548/EEC, as amended) and the Preparations Directive (88/379/EEC, as amended), implemented in the UK as the Chemical (Hazard Information and Packing) Regulations 1994 (CHIP, as amended).

Classified as dangerous to supply : No

Risk Phrases : Not applicable

Safety Phrases : Not applicable

Symbols : None

United States Regulatory Information

All ingredients contained in this product are included on the EPA TSCA Chemical Substance Inventory.

SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:

This product does not contain toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and 40 CFR Part 372.

California Proposition 65: This product does not contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Canadian Regulatory Information

All ingredients contained in this product are included on the Canadian DSL.

WHMIS Classification: Not Applicable

PRODUCT NAME : MOBIL SHC 629, GEAR BOX LUBRICANT

16. Other Information

This MSDS is compiled in accordance with ANSI Z400.1 and the EU Safety Data Sheet Directive 91/155/EEC.

Sources of information for this data sheet :

- Mobil 'Information on Product Safety for Mobil SHC 629'. Reference : 602946-61. Revision date : 9 December, 1996

Glossary : CAS, Chemical Abstracts Service; **NFPA**, National Fire Protection Association; **HMIS**, Hazardous Material Information Service; **LD**, Lethal Dose; **LC**, Lethal Concentration; **ACGIH**, American Conference of Governmental Industrial Hygienists; **TLV,** threshold limit value; **OSHA**, Occupational Safety and Health Administration, US department of Labour; **PEL,** Permissible exposure limit; **EH40 (UK),** HSE Guidance Note EH40 Occupational exposure limits; **PPM,** parts per million; **TWA**, Time-Weighted Average; **STEL**, Short Term Exposure Limit; **Canadian TDG,** Canadian Transportation of Dangerous Goods; **US DOT,** US Department of Transportation. **HSDB**, Hazardous Substances Data Bank; **RTECS**, Registry of Toxic Effects of Chemical Substances; **CHEMID**, Chemical Identification; **DSL**, Domestic Substances List ; **TSCA,** Toxic Substances Control Act Public Law 94-469: **CERCLA,** Comprehensive Environmental Response, Compensation and Liability Act; **EPCRA**. Emergency Planning and Community Right-to-Know Act; **CAA,** Clean Air Act; US, **SARA (Title III),** Superfund Amendments and Reauthorization Act.; **SARA 313,** Superfund Amendments and Reauthorization Act, Section 313; **EHS,** Extremely Hazardous Substance; **WHMIS,** Workplace Hazardous Materials Information System.

Revisions

For Lube #314
530436-00

530436-00 MOBILGREASE XHP 222
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **MOBILGREASE XHP 222**
SUPPLIER: EXXONMOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037
24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency (Primary) CHEMTREC: 800-424-9300
(Secondary) 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/

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES
GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
ZINC DIALKYL DITHIOPHOSPHATE (68649-42-3)	1-5

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).
EMERGENCY OVERVIEW: Dark Blue Grease. DOT ERG No. : NA
POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.
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: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.
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.
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: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

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5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. 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: None.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC)).
Flammable Limits (approx.% vol.in air) - LEL: NE, UEL: NE
NFPA HAZARD ID: Health: 0, Flammability: 1, 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: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. 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: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

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:
This product does not contain any components which have recognized exposure limits.

VENTILATION: Use adequate ventilation.

RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.

EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should 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: Grease
COLOR: Dark Blue
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
DROP POINT C(F): > 260(500)
FLASH POINT C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC))

FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.912
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 220.0
VISCOSITY AT 100 C, cSt: > 16.0
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOC: < 1.00 (Wt. %); 0.083 lbs/gal
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
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): Strong 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.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present

formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: The major components in the formulation show no aquatic toxicity at 1000 mg/L loading, therefore long-term adverse effects in the aquatic environment are not expected.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

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14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.
RID/ADR: NOT REGULATED BY RID/ADR.
IMO: NOT REGULATED BY IMO.
IATA: NOT REGULATED BY IATA.

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.
EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.
Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS and AICS.
U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".
SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.
This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP)	68649-42-3	1.3%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
LITHIUM HYDROXIDE MONOHYDRATE (0.05%)	1310-66-3	22
XYLENES (0.07%)	1330-20-7	22
TRICRESYL PHOSPHATE (>0.01%)	1330-78-5	22
ZINC (ELEMENTAL ANALYSIS) (0.18%)	7440-66-6	22
LITHIUM-SOAP THICKENER (6.14%)	7620-77-1	22
ZINC DINONYLNAPHTHALENE SULFONATE (0.40%)	28016-00-4	22
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (1.29%)	68649-42-3	18, 20, 21, 22, 24, 25
FATTY ACIDS, C16-22, LITHIUM SALTS (0.76%)	68783-36-8	22

--- 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
Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

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16. OTHER INFORMATION

USE: AUTOMOTIVE GREASE
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:
INDUSTRIAL LABEL
Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.
****
For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 530436-00, CMCS97: 97E898, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 21AUG2001
****

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MATERIAL SAFETY DATA SHEET

Product name: **HIT–RE 500**

Description: High strength adhesive for anchoring in concrete. (Part A is the larger tube)

Supplier: Hilti, Inc. P.O. Box 21148, Tulsa, OK 74121

Emergency # (Chem-Trec.): 1 800 424 9300 (USA, PR, Virgin Islands, Canada); 001 703 527 3887 (other countries)

INGREDIENTS AND EXPOSURE LIMITS

Ingredients:		CAS Number:	TLV: (mg/m^3)	PEL: (mg/m^3)	STEL:
Part A:	Bisphenol A epoxy resin	25068-38-6	NE	NE	NE
	Bisphenol F epoxy resin	28064-14-4	NE	NE	NE
	Quartz sand	14808-60-7	NA (0.05 / R)	NA (0.1 / T)	NE
	Alkylglycidyl ether	19136100-5012 *	NE	NE	NE
	Diglycidyl ether	19136100-5013 *	NE	NE	NE
	Synthetic amorphous silica	07631-86-9	NA (10 / R)	NA (20 mppcf)	NE
Part B:	m-xylene diamine	01477-55-0	C: 0.1 / S	C: 0.1 / S	NE
	Aliphatic polyamine	19136100-5014 *	NE	NE	NE
	Quartz sand	14808-60-7	NA (0.05 / R)	NA (0.1 / T)	NE
	Aluminum oxide	01344-28-1	NA (10)	NA (15 / T)	NE
	Cement	65997-16-2	NA (10)	NA (15 / T)	NE
	Amorphous silica	07631-86-9	NA (10 / R)	NA (20 mppcf)	NE

Abbreviations: **NJ TSRN** indicates New Jersey Trade Secret Registry Number. **C** = Ceiling. **NE** = None Established. **NA** = Not Applicable. **R** = "respirable" fraction. **S** = Skin; i.e. exposure should be controlled for the cutaneous routes including the mucous membranes, eyes, and skin. **T** = "total" dust. **mppcf** = million particles per cubic foot.

PHYSICAL DATA

Appearance and Odor:	A: Gray; B: red / paste. Amine-like odor.	**VOC Content:**	0.0 g/l
Boiling Point:	Approx. 212° F	**Vapor Pressure:**	Not determined.
Vapor Density: (air = 1)	Not determined.	**Odor Threshold:**	Not determined
Evaporation Rate:	Not applicable.	**Solubility in Water:**	Insoluble .
Specific Gravity:	1.5	**pH:**	11 (Part B with 1:1 water)

FIRE AND EXPLOSION HAZARD DATA

Flash Point:	> 200° F	**Flammable Limits:**	Not applicable.
Extinguishing Media:	CO_2, Dry Chemical, Foam, Water Spray.		
Special Fire Fighting Procedures:	A self-contained breathing apparatus should be worn when fighting fires involving chemicals.		
Unusual Fire and Explosion Hazards:	None known. Thermal decomposition products can be formed including CO_X, NO_X, water and carbon.		

REACTIVITY DATA

Stability:	Stable.	**Hazardous Polymerization:**	Will not occur.
Incompatibility:	Strong acids and oxidizing agents.		
Decomposition Products:	Thermal decomposition can yield CO_X, NO_X, water and carbon.		
Conditions to Avoid:	Avoid temperature extremes that could shorten the shelf-life of this product. (See handling and storage requirements for recommended storage temperatures).		

HEALTH HAZARD DATA

Known Hazards:	**Part A:** Eye and skin irritation. Possible skin sensitizer. **Part B:** Corrosive
Signs and Symptoms of Exposure:	**Part A:** Can be irritating to the eyes and skin, Can cause skin sensitization with some individuals (itching, redness, swelling). **Part B:** Can cause eye and skin burns. Vapors can be irritating. If swallowed, can cause burns.
Routes of Exposure:	Contact. Inhalation.

Carcinogenicity:	IARC classifies crystalline silica (quartz sand) as a Group I carcinogen based upon evidence among workers in industries where there has been long-term and chronic exposure (via inhalation) to silica dust; e.g. mining, quarry, stone crushing, refractory brick and pottery workers. This product does not pose a dust hazard; therefore, this classification is not relevant.
Medical Conditions Aggravated by Exposure:	Eye, skin, and respiratory conditions.

EMERGENCY AND FIRST AID PROCEDURES

Eyes:	Flush **immediately** with low pressure water for at least 15 minutes. Seek medical advice.
Skin:	Wash **immediately** with soap and water. Launder contaminated clothing before reuse.
Inhalation:	If symptoms occur, move to fresh air. Call a physician if symptoms persist.
Ingestion:	Rinse mouth and then drink large quantities of water. Never give anything by mouth to an unconscious person. Seek medical attention. Do not induce vomiting unless directed by a physician.
Other:	Referral to a physician is recommended if there is any question about the seriousness of the injury/exposure

CONTROL MEASURES AND PERSONAL PROTECTIVE EQUIPMENT

Ventilation:	General (natural or mechanically induced fresh air movements).
Eye Protection:	Safety glasses with side shields recommended.
Skin Protection:	Impermeable (neoprene or rubber) gloves recommended.
Respiratory Protection:	None normally required. Where ventilation is inadequate to control vapors, use a NIOSH-approved respirator with organic vapor cartridges. Never enter a confined space without an appropriate air supplied respirator. If dusts are generated during demolition or removal, wear an appropriate dust mask or respirator.

PRECAUTIONS FOR SAFE HANDLING AND USE

Handling and Storing Precautions:	For industrial use only. Keep away from children. Use with adequate ventilation. Avoid contact with the eyes or skin. Practice good hygiene; i.e. wash after using and before eating or smoking. Store in a cool dry area between 41° and 77° F (5 - 25° C). Keep from freezing.
Spill Procedures:	Take up with an absorbent material and place in a container for proper disposal.

REGULATORY INFORMATION

Hazard Communication:	This MSDS has been prepared in accordance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
HMIS Codes:	Health 3, Flammability 1, Reactivity 0, PPE B
DOT Shipping Name:	Consumer commodity, ORM-D
IATA / ICAO Shipping Name:	Amines, corrosive sold, n.o.s. (contains m-xylenediamine), Class 8, UN3259, PG II
TSCA Inventory Status:	Chemical components listed on TSCA inventory.
SARA Title III, Section 313:	This product does not contain any toxic chemicals which are subject to reporting under Section 313 of SARA Title III (40 CFR Part 372).
EPA Waste Code(s):	Not regulated by EPA as a hazardous waste
Waste Disposal Methods:	Consult with regulatory agencies or your corporate personnel for disposal methods that comply with local, state, and federal safety, health and environmental regulations.

CONTACTS

Customer Service:	1 800 879 8000	**Technical Service:**	1 800 879 8000
Health / Safety:	1 800 879 6000 Jerry Metcalf (x6704)		
Emergency # (Chem-Trec):	1 800 424 9300 (USA, PR, Virgin Islands, Canada); 001 703 527 3887 (other countries)		

The information and recommendations contained herein are based upon data believed to be correct; however, no guarantee or warranty of any kind expressed or implied is made with respect to the information provided.

Material Safety Data Sheet

Greenplus Hydraulic Fluid ES

Material Identification and Use

MANUFACTURER'S NAME.....	**Greenland Corporation**
MANUFACTURER'S ADDRESS.....	**7016 – 30 St SE** **Calgary, AB., CANADA** **T2C 1N9**
EMERGENCY PHONE NUMBER.....	**1-800-598-7636**
SUPPLIER IDENTIFIER.....	
SUPPLIER'S ADDRESS.....	
SUPPLIER'S EMERGENCY PHONE NUMBER.....	
PRODUCT IDENTIFIER.....	GREENPLUS HYDRAULIC FLUID ES
PRODUCT USE.....	Lubricant

Hazardous Ingredients of Materials

Chemical Identify	Concentration	CAS# / NA# / UN#	LD (50)	LC (50)
This is not a WHMIS controlled product.				>40,000 PPM Fingerling Rainbow Trout

Physical Data For Product

PHYSICAL STATE.....	Liquid
ODOUR AND APPEARANCE.....	Dark Brown, Distinctive
ODOUR THRESHOLD.....	N / A
SPECIFIC GRAVITY.....	.910
VAPOUR PRESSURE.....	N / A
VAPOUR DENSITY (air = 1).....	N / A
EVAPOURATION RATE.....	N / A
BOILING POINT.....	>300°C
POUR POINT.....	-36°C
pH.....	7.0 - 7.2
DENSITY (g/ml).....	N / A
COEFFICIENT OF WATER / OIL DISTRIBUTION.....	N / A

Fire and Explosion Hazard of Product

CONDITIONS OF FLAMMABILITY.....	Open flame, above flashpoint
MEANS OF EXTINCTION.....	Foam, CO_2, Dry Chemical, Water spray
FLASHPOINT AND METHOD OF DETERMINATION.....	279°C C.O.C.
UPPER EXPLOSION LIMIT (% by volume).....	N / A
LOWER EXPLOSION LIMIT (% by volume).....	N / A
AUTO-IGNITION TEMPERATURE.....	N / A

FLAMMABILITY CLASSIFICATION..... N / A

Material Safety Data Sheet

Greenplus Hydraulic Fluid ES

HAZARDOUS COMBUSTION PRODUCTS..... Toxic fumes may evolve on burning
EXPLOSION DATA..... N / A
SENSITIVITY TO STATIC DISCHARGE..... None

Reactivity Data

CHEMICAL STABILITY..... Stable
INCOMPATIBLE MATERIALS..... None
CONDITIONS OF REACTIVITY..... None
HAZARDOUS DECOMPOSITION PRODUCTS..... Oxides of sulphur, Carbon

Toxicological Properties of Product

ROUTES OF ENTRY
- SKIN CONTACT..... None
- SKIN ABSORPTION..... None
- EYE..... None
- INHALATION..... None
- INGESTION..... None

ACUTE OVER EXPOSURE EFFECTS..... None
CHRONIC OVER EXPOSURE EFFECTS..... None
EXPOSURE LIMITS..... LD 50 >5000 ml / kg
IRRITANCY OF PRODUCT..... None
SENSITIZATION TO MATERIAL..... None
CARCINOGENICITY, REPRODUCTIVE EFFECTS..... None
TERATOGENICITY, MUTAGENICITY..... None
TOXICOLOGICALLY SYNERGISTIC PRODUCTS..... None

Preventive Measures

PERSONAL PROTECTIVE EQUIPMENT..... None
SPECIFIC ENGINEERING CONTROLS..... None
LEAK AND SPILL PROCEDURES..... Although product is environmentally safe,

spills should be

contained and picked up
WASTE DISPOSAL..... Disposal shall be in compliance with Federal,

Provincial and Local

regulations
HANDLING PROCEDURES AND EQUIPMENT..... None
STORAGE REQUIREMENTS..... None
SPECIAL SHIPPING INFORMATION..... None

Material Safety Data Sheet

Greenplus Hydraulic Fluid ES

First Aid Measures

SPECIFIC FIRST AID PROCEDURES..... AS A PROCAUTION
FLUSH EYES WITH

ABUNDANT WATER.

WASH SKIN

WITH SOAP AND

WATER. IN CASE OF

INGESTION, DO NOT

INDUCE

VOMITING. CALL A

PHYSICIAN.

PRODUCT IS NOT

TOXIC.

Preparation of Material Safety Data Sheet

PREPARED BY..... Engineering Group
PHONE NUMBER OF PREPARER..... 1-800-598-7636
DATE PREPARED..... January 20, 2005

Material Safety Data Sheet

1. Product and Company Identification

Product name : **Oxygen, Compressed Gas**

Chemical formula : O2

Synonyms : Oxygen; Dioxygen; Molecular Oxygen; Oxygen Molecule; Pure Oxygen; LOX; Hyperoxia

Company : Specialty Gases of America, Inc
6055 Brent Dr.
Toledo, OH 43611

Telephone : 419-729-7732

Emergency : 800-424-9300

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Oxygen, Compressed Gas	7782-44-7	100%

3. Hazards Identification

Emergency Overview

Containers may rupture or explode if exposed to heat. May ignite combustibles.

Potential Health Effects

Inhalation : Irritation, changes in body temperature, nausea, difficulty breathing, irregular heartbeat, dizziness, disorientation, hallucinations, mood swings, pain in extremities, tremors, lung congestion, convulsions. May cause irritation, cough, chest pain, lung damage in long term exposure.

Eye contact : Irritation, frostbite, blurred vision.

Skin contact : Blisters, frostbite.

Ingestion : Ingestion of a gas is unlikely.

Chronic Health Hazard : None known.

4. First Aid Measures

General advice : None.

Eye contact : Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Skin contact : If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105 – 115 F; 41 – 46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

Ingestion : If a large amount is swallowed, get medical attention.

Inhalation : If adverse effects occur, remove to uncontaminated area. Get immediate medical attention.

5. Fire-Fighting Measures

Suitable extinguishing media	:	Carbon dioxide, regular dry chemical. Large fires: Use regular foam or flood with fine water spray.
Specific hazards	:	Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials. Containers may rupture or explode if exposed to heat.
Fire fighting	:	Move container from fire area if it can be done without risk. Cool containers with water spray until well after fire is out. Stay away from ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible, then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Cool containers with water. Apply water from a protected location or from a safe distance.

6. Accidental Release Measures

Personal precautions	:	Avoid contact with combustible materials. Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.
Environmental precautions	:	None.
Methods for cleaning up	:	None.
Additional advice	:	None.

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

Storage

Store in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Protect from physical damage. Keep separated from incompatible materials. Store in a cool, dry place. store outside or in a detached building. Store below 125 F.

8. Exposure Controls / Personal Protection

Engineering measures

Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

Personal protective equipment

Respiratory protection	:	Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. For unknown concentrations or immediately dangerous to life or health – Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
Hand protection	:	Wear insulated gloves.
Eye protection	:	For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and body	:	For the gas: Protective clothing is not required. For the liquid: Wear appropriate,

protection		protective, cold insulating clothing.

9. Physical and Chemical Properties

Form	:	Gas.
Color	:	Colorless.
Odor	:	Odorless.
Molecular weight	:	31.9988
Vapor pressure	:	760 mmHg @ -183 C
Vapor density	:	1.43 (air = 1)
Specific gravity	:	1.14 @ -183 C (water = 1)
Boiling point	:	-297.33 F (-182.96 C)
Freezing point	:	-361.1 F (-218.4 C)
Water solubility	:	3.2% @ 25 C
Evaporation rate	:	Not applicable.

10. Stability and Reactivity

Stability	:	Stable at normal temperatures and pressure.
Conditions to avoid	:	Avoid contact with combustible materials. Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.
Materials to avoid	:	Combustible materials, halo carbons, metals, bases, reducing agents, amines, metal salts, oxidizing materials.
Hazardous decomposition products	:	Thermal decomposition products: miscellaneous decomposition products.

11. Toxicological Information

Acute Health Hazard

Ingestion	:	None known.
Inhalation	:	None known.
Skin	:	None known.

12. Ecological Information

Not available.

13. Disposal Considerations

Waste from residues / unused products	:	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Contaminated packaging	:	Return cylinder to supplier.

14. Transport Information

DOT (US only)

Proper shipping name	:	Oxygen, Compressed
Class	:	2.2
UN/ID No.	:	UN1072
Labeling	:	Non-Flammable Gas, Oxidizer

Further information

Cylinders should be transported in a secure upright position in a well ventilated truck.

15. Regulatory Information

OSHA Process Safety (29 CFR 1910.119) Hazard Class(es)

Not regulated.

TCSA

Material is listed in TSCA inventory.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR 355.30)

Not regulated.

SARA Title III Section 304 Extremely Hazardous Substances (40 CFR 355.40)

Not regulated.

SARA Title III SARA Sections 311/312 Hazardous Categories (40 CFR 370.21)

Acute: Yes
Chronic: No
Fire: Yes
Reactive: No
Sudden Release: Yes

SARA Title III Section 313 (40 CFR 372.65)

Not regulated.

16. Other Information

Prepared by : Specialty Gases of America, Inc.

For additional information, please visit our website at www.americangasgroup.com.

MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) complies with the requirements of OSHA's Hazard Communication Standard.

6010 WELDING ELECTRODE

RADNOR WELDING PRODUCTS

Emergency Phone Number: 866-734-3438

Date: April 30, 2006

Product Information Number: 888-838-0615

SECTION 1 – PRODUCT IDENTIFICATION

Product Name/Class	AWS E6010 Welding Electrode
Product Number	004007
Manufacturer	Radnor Welding Products 259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283

SECTION 2 – HAZARDOUS INGREDIENTS

IMPORTANT! This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Sections 5 through 8. See these sections for industrial hygiene information.

CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.

The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Weight %	TLV mg/m^3	PEL mg/m^3	Supplemental Information:
Cellulose and other carbohydrates	65996-61-4	5	10*	10*	* Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 mg/m^3. TLV value for iron oxide is 5 milligrams per cubic meter. ** As respirable dust. *** Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 370 and 372. (c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter
Silicates and other binders	1344-09-8	<5	10*	10*	
Titanium dioxides (as Ti)***	13463-67-7	<5	10	10	
Iron	7439-89-6	<5	10*	10*	
Manganese and/or manganese alloys and compounds (as Mn)***	7439-96-5	1	0.2	1.0(c)	
Magnesite	1309-48-4	1	10	15	
Mineral silicates	1332-58-7	0.5	5**	5**	
Iron oxides (as Fe)	65996-74-9	<0.5	5	10	
Limestone and/or calcium carbonate	1317-65-3	<0.5	10	15	
Graphite	7782-42-5	<0.5	2.5	2.5	
Carbon steel core wire	7439-89-6	85	10*	10*	

SECTION 3 – PHYSICAL CHARACTERISTICS

Boiling Point: N/A	Specific Gravity (H_2O = 1): N/A	Solubility in Water : N/A
Vapor Pressure (mm Hg.) N/A	Melting Point N/A	%Volatile: N/A
Vapor Density (Air = 1) N/A	Evaporation Rate (Butyl Acetate =1) N/A	Appearance and Odor: N/A

SECTION 4 – FIRE and EXPLOSION HAZARD DATA

Non Flammable. Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 – REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc. as noted above.

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of manganese, potassium, silicon, sodium, and zinc.

Maximum fume exposure guideline for this product (based on manganese content) is 4.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

SECTION 5 – REACTIVITY DATA (continued)

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION 6 – HEALTH HAZARD DATA

Carcinogenicity: The composition of welding or brazing fumes may contain carcinogens, depending on several factors that are unknown and unknowable to the product manufacturer (see Section 5). Always assume that welding or brazing fumes may contain toxic and/or carcinogenic materials, and follow sound Work/Hygiene practices as recommended by ANSI Z49.1.

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC – (Not otherwise Classified) is 5 mg/m^3. ACGIH-1987-88 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section 5 for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air. Effects of Overexposure: Electric arc welding may create one or more of the following health hazards: Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion. Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash. Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.* Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control. Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques. IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases, call a physician.

HMIS Rating	HMIS Scale	NFPA Rating	NFPA Scale
Health = 2 Flammability = 0 Reactivity = 0	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard	Health = 1 Flammability = 0 Reactivity = 0 Other = N/A	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard

SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE

Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, "Safety in Welding and Cutting", published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more details on many of the following:

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

SECTION 8 – CONTROL MEASURES

Respiratory Protection *(Specify Type)* Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Other Protective Clothing or Equipment: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate from work and ground.

OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW

California Proposition 65 Information: Warning: This product contains a chemical known to the State of California to cause cancer.

New Jersey Right-To-Know Information: 5 most predominant ingredients/hazardous and non-hazardous)

1. Carbon steel; 2. Cellulose and other carbohydrates; 3. Manganese and/or other manganese alloys (as Mn); 4. Magnesite 5. Mineral silicates..

SARA Title III Notification Information: All chemical compounds marked with an asterisk (*) are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Disclaimer of Expressed and Implied Warranties: The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use.

MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) complies with the requirements of OSHA's Hazard Communication Standard.

7018 – WELDING ELECTRODE

WeldingDepot

1115 E. Ridge Rd. PMB248 Griffith, IN 46319 Tel: 219-884-0980

Date: May 24, 2004

SECTION 1 – PRODUCT IDENTIFICATION

Product Name/Class	AWS E7018 Welding Electrode
Product Number	
Manufacturer	Refer to supplier

SECTION 2 – HAZARDOUS INGREDIENTS

IMPORTANT! This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Sections 5 through 8. See these sections for industrial hygiene information.

CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.

The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Ingredients:	CAS No.	Weight %	TLV mg/m³	PEL mg/m³	Supplemental Information:
Iron	7439-89-6	15	10*	10*	* Not listed. Nuisance value maximum is 10 mg/m³. PEL value for iron oxide is 10 mg/m³. TLV value for iron oxide is 5 mg/m³. ** As respirable dust. *** Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 370 and 372. (c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.
Titanium dioxides (as Ti)***	13463-67-7	10	10	10	
Limestone and/or calcium carbonate	1317-65-3	5	10	15	
Silicates and other binders	1344-09-8	<5	10*	10*	
Manganese and/or manganese alloys and compounds (as Mn)***	7439-96-5	<5	1.0(c)	1.0(c)	
Mineral silicates	1332-58-7	<5	5**	5**	
Aluminum oxide and/or Bauxite***	1344-28-1	<5	10	10	
Fluorides (as F)	7789-75-5	1	2.5	2.5	
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	1	10*	10*	
Titanium and/or titanium alloys (as Ti)	12719-90-3	0.5	10*	10*	
Aluminum and/or aluminum alloys (as Al)***	7429-90-5	<0.5	10	15	
Lithium compounds (as Li)	554-13-2	<0.5	10*	10*	
Carbon steel core wire	7439-89-6	55	10*	10*	

SECTION 3 – PHYSICAL CHARACTERISTICS

Boiling Point: N/A	Specific Gravity (H_2O = 1): N/A	Solubility in Water : N/A
Vapor Pressure (mm Hg.): N/A	Melting Point: N/A	%Volatile: N/A
Vapor Density (Air = 1): N/A	Evaporation Rate (Butyl Acetate =1): N/A	Appearance and Odor: N/A

SECTION 4 – FIRE and EXPLOSION HAZARD DATA

Non Flammable. Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 – REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used.

Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base and coating, etc. as noted above.

Reasonably expected fume constituents of the product would include: Primarily iron; secondarily complex oxides of manganese, potassium, silicon, sodium, and titanium.

Maximum fume exposure guideline and PEL for this product is 5.0 milligrams per cubic meter.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

SECTION 5 – REACTIVITY DATA (continued)

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.4, and F1.5, available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

SECTION 6 – HEALTH HAZARD DATA

Carcinogenicity: The composition of welding or brazing fumes may contain carcinogens, depending on several factors that are unknown and unknowable to the product manufacturer (see Section 5). Always assume that welding or brazing fumes may contain toxic and/or carcinogenic materials, and follow sound Work/Hygiene practices as recommended by ANSI Z49.1.

Threshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC – (Not otherwise Classified) is 5 mg/m³. ACGIH-1987-88 preface states that the TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. See Section 5 for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air. Effects of Overexposure: Electric arc welding may create one or more of the following health hazards: Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion. Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported. Arc Rays can injure eyes and burn skin. *Skin cancer has been reported.* Electric Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with workpiece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control. Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques. IN CASE OF ELECTRICAL SHOCK, turn off power and follow recommended treatment. In all cases, call a physician.

HMIS Rating	HMIS Scale	NFPA Rating	NFPA Scale
Health = 2 Flammability = 0 Reactivity = 0	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard	Health = 1 Flammability = 0 Reactivity = 0 Other = N/A	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard

SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, "Safety in Welding and Cutting", published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more details on many of the following:

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

SECTION 8 – CONTROL MEASURES

Respiratory Protection *(Specify Type)* Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Keep exposure as low as possible.*

Eye Protection: Wear helmet or use face shield with filter lens shade number 12 or darker. Shield others by providing screens and flash goggles.

Other Protective Clothing or Equipment: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate from work and ground.

OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW

California Proposition 65 Information: Warning: This product contains a chemical known to the State of California to cause cancer.

New Jersey Right-To-Know Information: 5 most predominant ingredients/hazardous and non-hazardous)
1. Carbon steel; 2. Iron; 3. Titanium dioxides (as Ti); 4. Limestone and/or calcium carbonate; 5. Flourides (as F).

SARA Title III Notification Information: All chemical compounds marked with an asterisk (*) are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

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1 (Possesion of this document does not constitute use of said product by holder./
Possession de ce document ne constitu pas l'utilisation de ce produit mentionée par le teneur.)
Trade Name/ Nom: Osmose® End Cut/Entaille Product

Manufacturer: Osmose Pentox Inc.
1080 Pratt Avenue, Montreal, Quebec Canada H2V 2V2

2 PHYSICAL DATA/ PROPRIETES PHYSIQUES

Boiling Point/ Point d'ébullition: 155 - 200 C
Melting Point/ Point de Fusion: N/A
Vapor Pressure/ Tension de Vapeur(760mmHg): 3.0mm Hg @ 38 C
Solubility in H2O/ Solubilité dans l'eau: Negligable
Specific Gravity/ Poids Spécifique: .87kg
Vapor Density/ Densité de vapeur: 5
Evaporation Rate/ Evaporation (nBuAc=1): 0.15
Appearance & Odor/ Apparence et Odeur: Clear amber liquid; Hydrocarbon odor.

3 HAZARDOUS INGREDIENTS/ COMPOSES DANGEREUX

	%	TLV, LD 50
Copper metal/de duivre	2.35	
T.B.T.O.	.075	
Petroleum Distilates	72-76	100 ppm

4 FIRE & EXPLOSION DATA/ FEU ET EXPLOSION

Flash Point/Point Eclair: 60 C
Method: Tag C.C.
Combustible: UN1306 Class NR
Auto Ignition Temp: No
Flammable Limit (STP-%vol); Lower: 1.1 Upper: 6.0 @ 25C
Extinguishing Media: Dry chemical, CO2, foam, water fog/ Poudre, CO2, mousse, brouillard d'eau.
Fire fighting Procedures/Tech. spec. de Combattre le Feu: Treat like burning oil, wear protective clothing and avoid breathing fumes/ Traiter comme un l'huile en feu, porter de protection et éviter d'inhaler le vapeur.
Fire Explosion Hazard/ Risques d'explosion: Closed containers exposed to heat will build up pressure. Cool containers with water/ Le risque d'explosion sa monte avec pression quand le conteneur et exposée a chaleur.

5 REACTIVITY DATA/ REACTIONS

Stability/ Stabilité: Stable
Incompatability/ Incompatabilité: Water/L'eau,Acid/Acide & Base
Decompositions: When burned may produce toxic fumes, avoid breathing/ ça se peut produit le vapeur toxique quand brulé, éviter de respirer.

Osmose® End Cut/Entaille Product
(Possesion of this document does not constitute use of said product by holder./
Possession de ce document ne constitu pas l'utilisation de ce produit mentionée par le teneur.)

5 REACTIVITY DATA/ REACTIONS

Dangerous Polymerization/ Polymerisation Dangereuse: N/A
Conditions to Avoid/ Etats à éviter: Sparks, open flame, high heat/ étincelle, flammèche, chaleur éléver.

6 PRECAUTIONS

Stockage/ Entreposage: Cool dry place/ Tenir au frais.
Handling/ Manutention: Keep containers closed when not in use/ Fermer les conteneur hors d'usage.
Clothing/ Vetements: Use impervious gloves, goggles, apron and boots/ Utiliser des gants, lunettes & tablier
Respiration Devices/ Systeme de respiration: In confined areas use MOSH respirator
Ventilation: Local exhaust or mechanical ventilation recommended/ Ventilation méchanique est recommandé
Spill, Leak/ Procedure/ en cas de fuite ou renvesement: Soak up liquid with absorbent, remove to disposal container. Do not contaminate streams, lakes, or underground water table/ Utilliser l'absorbant
Waste Disposal/ Elimination des déchets: Follow Federal, State and local regulations/ Suivre les régulations Federal, Etat et local.

7 HEALTH HAZARD INFORMATION/RISQUE A LA SANTE

EXPOSURE/ VOIES D'ENTREE
Inhalation: Vapor may cause headache and nausea/Peut causer des maux de tête.
Skin Contact: May cause irritation, Dermatitis/ Irritation premiere, Dermatite.
Eye Contact: Irritation, burning sensation/ Irritation premiere comme brulé.
Ingestion: Harmful or fatal if swallowed/ Malfaisant ou fatal si avaler.
Over Exposure Effect: N/A

FIRST AID/ PREMIER SOINS
Eyes/Yeux: Flush with clean water and see physician/ Rincer les yeux à l'eau pendant au moins 15 min, consulter un médécin.
Skin/Peau: Wash with soap and water for 15 minutes. If skin irritation developes see physician/ Laver la partie avec de l'eau et du savon. Si l'irritation à develope consulter un médécin.
Inhalation: Remove to fresh air. If necessary give oxygen & see physician/ Déplacer dans un endroit bien aéré. Si necessaire donner lui l'oxygen et consulter un médécin.
Ingestion: Call physician. Do not induce vomiting; contains petroleum distilate/ Ne pas provoquer le vomissement. Consulter un médécin. Contenait du distilat de petrol.

8 NOTICE

While the company believes the data set forth herein are accurate as of the date hereof, the company makes no warrenty with respect thereto and expressly disclaims all liability for reliance thereon. Such data are offered solely for your consideration, investigation and verification. Possesion of this document does not constitute use of said product by holder./ Biens que nous croyons exactes les données soumises à la dateci-haut mentionnée, la compagnie ne garantit aucun des détails ci-joints et de ce fait se décharge de toute responsabilité en ce qui concerne l'utilisation de ces données. Ces donées sont offertes uniquement pour votre considération, recherche et vérifacation. Possession de ce document d'information ne constituer utilisation de la produit mentionée.

Conforms to ANSI Z400.5-2004 Standard (United States, Canada).

Material Safety Data Sheet

Propylene Glycol Antifreeze & Engine Coolant

Section 1. Product and company identification

Product name
Propylene Glycol Antifreeze & Engine Coolant

Material uses
Anti-Freeze and Engine Coolant.

Supplier/Manufacturer
AMSOIL INC.
925 Tower Avenue
Superior, WI 54880

Code
ANT

MSDS authored by
AMSOIL INC.

In case of emergency
CHEMTREC: (800) 424-9300

Section 2. Hazards identification

Emergency overview

Color	:	Yellow.
Physical state	:	Liquid. [Fluid.]
Odor	:	Mild to Odorless.
Signal word	:	WARNING!
Hazard statements	:	CAUSES EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED.
Precautions	:	Do not ingest. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.
OSHA/HCS status	:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential acute health effects

Inhalation	:	Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Ingestion	:	May be harmful if swallowed.
Skin	:	No known significant effects or critical hazards.
Eyes	:	Irritating to eyes.

Potential chronic health effects

Chronic effects	:	No known significant effects or critical hazards.
Carcinogenicity	:	No known significant effects or critical hazards.
Mutagenicity	:	No known significant effects or critical hazards.
Teratogenicity	:	No known significant effects or critical hazards.
Developmental effects	:	No known significant effects or critical hazards.
Fertility effects	:	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation	:	No specific data.
Ingestion	:	No specific data.
Skin	:	No specific data.
Eyes	:	Adverse symptoms may include the following: pain or irritation watering redness

Date of issue : 08/15/2010

Medical conditions aggravated by over-exposure : None known.

See toxicological information (section 11)

Section 3. Composition/information on ingredients

United States

Name	CAS number	%
Tolyltriazole	29385-43-1	1 - 5

Canada

Name	CAS number	%
Tolyltriazole	29385-43-1	1 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Section 4. First aid measures

Eye contact : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.

Skin contact : After contact with skin, wash immediately with plenty of soap and water.

Inhalation : Move exposed person to fresh air.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call medical doctor or poison control center immediately.

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Section 5. Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Hazardous decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : Provide adequate ventilation. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Avoid contact with used product. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
Tolyltriazole	**OSHA PEL (United States).** TWA: 15 mg/m³ **ACGIH TLV (United States).** TWA: 10 mg/m³

Under conditions which may generate mists, the following exposure limits are recommended:
ACGIH TLV TWA: 5 mg/m³ ; STEL: 10 mg/m³.

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
Tolyltriazole	US ACGIH	-	10	-	-	-	-	-	-	-	

Under conditions which may generate mists, the following additional exposure limits are recommended: ACGIH TLV TWA: 5 mg/m³ ; STEL: 10 mg/m³.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : No special ventilation requirements. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Ensure that eyewash stations and safety showers are close to the workstation location. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Respiratory : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Not required under normal conditions of use. Recommended: Wear an appropriate NIOSH approved respirator if concentration levels exceed the safe exposure limits.

Hands : Use gloves appropriate for work or task being performed. Not required under normal conditions of use. Recommended: Natural rubber (latex).

Eyes : Safety eyewear should be used when there is a likelihood of exposure. Not required under normal conditions of use. Recommended: Safety glasses with side shields.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. No special protective clothing is required. Recommended: Coveralls.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 9. Physical and chemical properties

Physical state : Liquid. [Fluid.]

Color : Yellow.

Flash point : Not available.

Flammable limits : Not available.

Boiling point : Not available.

Relative density : 1.136

Volatility : Not available.

Viscosity : Not available.

Odor : Mild to Odorless.

pH : 8 to 9

Auto-ignition temperature : Not available.

Melting point/ Pour point : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Evaporation rate : Not available.

Solubility : Not available.

Section 10. Stability and reactivity

Chemical stability : The product is stable.

Conditions to avoid : No specific data.

Materials to avoid : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Tolyltriazole	LC50 Inhalation Vapor LD50 Dermal LD50 Oral	Rat Rabbit Rat	>1730 mg/m3 >2000 mg/kg 675 mg/kg	1 hours - -

Chronic toxicity : No specific data.

Section 12. Ecological information

Environmental effects : Not established

Aquatic ecotoxicity

Product/ingredient name	Result	Species	
Tolyltriazole	LC50 73.7 mg/l LC50 21.4 mg/l	Daphnia Fish	48 hours 96 hours

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. This material and its container must be disposed of in a safe way. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT/TDG/IMDG/IATA : Not regulated.

Section 15. Regulatory information

United States

HCS Classification : Irritating material

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: Potassium hydroxide

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

California Prop. 65

No products were found.

Canada

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists : **CEPA Toxic substances**: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: None of the components are listed.
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

Canada inventory : All components are listed or exempted.

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.

International regulations

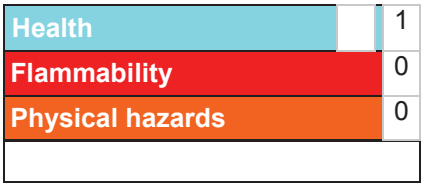
International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

Section 16. Other information

United States

Label requirements : CAUSES EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED.

Hazardous Material Information System (U.S.A.) :



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :

Date of issue : 08/15/2010

Version : 1

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.

MATERIAL SAFETY DATA SHEET
FOR KILFROST

Keystone Lubricants Division
Total Fina Elf Lubricants USA, Inc.
5 N. Stiles Street, Linden NJ 07036

REVISION DATE
05-FEB-01

DATE ISSUED
19-DEC-02

IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME:
KILFROST

PRODUCT #:
200269

CHEMICAL NAME:
N/A - Mixture

CAS #'S:
Mixture

PRODUCT APPEARANCE AND ODOR:
Amber liquid, slight chemical odor

CHEMICAL FAMILY:
Semi-Synthetic Fluid

SYNONYMS:
Semi-Synthetic air tool lubricant

EMERGENCY TELEPHONE:
1-908-862-9300

COMPONENTS AND HAZARD INFORMATION

COMPONENTS:	W/W	HAZARD DATA (TLV, LD50, LC50, ETC.):
Water CAS No. 7732-18-5	15-20	n/e
Ethylene Glycol CAS No. 107-21-1	55-60	100 mg/m3 ACGIH CEILING LIMIT (as an aerosol)
Synthetic sulfonated hydrocarbon CAS Nos. 78330-12-8 68855-24-3	10-15	n/e
Triethanolamine Napthenate CAS No. 68410-61-7	3-5	n/e
Oleyl Alcohol CAS No. 143-28-2	1-2	n/e

For further information see the Toxicity section.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health	Flammability	Reactivity
1	0	0

TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION:

DOT: Not regulated.

EMERGENCY FIRST AID

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

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EMERGENCY FIRST AID

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 effects 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 ethanol per hour. A desired therapeutic level of ethanol in blood is 100 mg/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 noncardiogenic 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):
not applicable

AUTOIGNITION TEMPERATURE:
not established

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: not applicable

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

UNUSUAL FIRE AND EXPLOSION HAZARDS:
not applicable

"EMPTY" CONTAINER WARNING:
Empty containers retain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, 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. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other

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FIRE AND EXPLOSION HAZARD INFORMATION

contemplated operations.

HEALTH AND HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT:
50 PPM Ceiling for vapor and mist combined.

BASIS:
ACGIH: 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.

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:
Approximately 20

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

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

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PHYSICAL DATA

> 1.0

Soluble

POUR POINT:
- 20 F

FREEZING POINT:
n/e

n/e= not established.

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

This product does NOT contain any ingredients identified as carcinognic 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	59.5

CANADA's Workplace Hazardous Materials Information System (WHMIS):
This product does not meet the definition of a controlled product under the Canadian WHMIS regulations.

CANADA's Domestic Substance List (DSL):
All components in this product are listed in Canada's Domestic Substance List, except one. The one chemical that is not on the DSL list appears on the NDSL list, and is present in the product at <5% (wt.).

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.

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TOXICITY

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.

PROTECTION 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/ENGINEERING 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 before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by

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PROTECTION AND PRECAUTIONS

washing thoroughly with soap and water.

PREPARED BY: Luke McHale REGULATORY MANAGER

PRODUCT SAFETY DATA SHEET

Date:2011
Revision: 3

FLUID FILM® AEROSOL (AS)

1.Identification of the Substance/Preparation & Supplier

Name of Manufacturer/Supplier: Eureka Chemical Company

Address & Phone No.
234 Lawrence Avenue
South San Francisco, CA 94080
USA Tel: (650)761-3536 Fax: (650)589-1943

24 Hour Telephone
Chemtrec (800) 424-9300

Product Name: FLUID FILM® AEROSOL (AS)
Product Type: Liquid, Lubricant, Corrosion Inhibitor

	HAZARD RATING	
N	4 – EXTREME	HEALTH 0
F	3 – HIGH	FIRE 4
P	2 – MODERATE	REACTIVITY 0
A	1 – SLIGHT	SPECIAL
	0 – INSIGNIFICANT	

2. Composition/Information on Ingredients

Hazardous components:	CAS No.	Exposure Limit ACGIH / OSHA
Liquefied Petroleum Gas	68476-86-8	1000 ppm TLV / PEL
Petroleum Oil	64742-54-7	5 mg/m³ TWA (Mist)

Product less propellant contains no solvents or known carcinogens.

3. Hazards Information

Aerosol - Contents under pressure, 70 ± 5 PSIG

Eye Contact: May cause mild irritation.
Skin Contact: Prolonged contact could cause irritation.
Inhalation: Exposure in confined areas, without benefit of protective gear, may result in light-headedness and irritation to respiratory tract.
Ingestion: No information available.

4. First Aid Measures

Eye Contact: Flush with plenty of clean water for at least 15 minutes. If irritation persists, obtain medical attention.
Skin Contact: Wipe excess material from the skin with a cloth, followed by washing with soap and water. A waterless skin cleanser is beneficial in removing the material from the skin.
Inhalation: If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.
Ingestion: If symptoms develop, seek medical attention.

5. Fire Fighting Measures

Flammability:	Flammable.
Extinguishing Media:	Extinguish with dry chemical, CO_2 or foam.
Special Considerations:	Aerosol - Contents under pressure, 70 $\pm$ 5 PSIG. Fire fighters should enter area wearing positive pressure respiratory protection.

6. Accidental Release Measures

Do not allow product to enter drains or water courses. Transfer bulk of material into another container. Absorb remaining residue with proper absorbents such as earth or vermiculite. Sweep up and dispose of as solid waste in accordance with applicable regulations.

7. Handling and Storage

Storage Temperature:	0 - 49^{0}C
Storage Precautions:	No special requirements. Keep in closed containers.
Handling:	Avoid contact with skin and eyes. Observe good standards of industrial hygiene.

8. Exposure Controls/Personal Protection

Engineering Measures:	Provide forced air ventilation in tanks and confined spaces.
Respiratory Protection:	Use approved respirator with organic vapor cartridges in tanks and confined spaces.
Eyes:	Use chemical eye goggles in tanks and confined spaces.
Hand:	Non-natural, non-butyl rubber gloves are recommended.
Skin:	Use protective clothing. Remove contaminated clothing and wash the affected area with soap and water.
Exposure Limits:	Not determined.

9. Typical Physical and Chemical Properties

Appearance: Straw colored liquid. **Odor:** Mild piney odor (less propellant). **Water Solubility:** Not soluble. **pH Neat:** 7.8 **Specific Gravity (25^{0}C):** 0.880 (less propellant). **Freezing Point:** Not determined. **Vapor Pressure:** Not determined. **Boiling Point:** Not determined. **Flash Point:** Propellant -91^{0}C (Closed cup). AS (less propellant) 207^{0}C (COC). **VOC:** 27% **VOC:** 237 grams / liter

10. Stability and Reactivity

Stability: Stable under normal conditions. Hazardous polymerization will not occur.
Hazardous Decomposition Products: Combustion can produce a variety of compounds including oxides of sulfur, oxides of carbon, water vapor and unidentified organic and inorganic compounds, some of which may be toxic.
Conditions to Avoid: Exposed flames, high temperature sources and strong oxidizers.

11. Toxicological Information

LD50 (Animal/Oral): Product less propellant - Greater than 14 Grams/Kilogram
Health Effects:
Eyes: Minimally irritating.
Skin: Prolonged contact could cause skin irritation.
Inhalation: Excessive exposure due to lack of protective gear or proper ventilation could result in pulmonary abnormalities.
Ingestion: Ingestion of this product is not regarded as a significant health hazard likely to arise in normal use.

12. Ecological Information

No data available.

13. Disposal Recommendations

Product should be disposed of via authorized waste disposal contractors in accordance with all local and national regulations.

14. Transportation Information

Mode	Shipping Name	Hazard Class	Number
D.O.T. Ground	Consumer Commodity	ORM-D	UN1950
IMDG	Aerosol Dangerous Goods in Limited Quantities	2	UN1950

15. Regulatory Information

Safety Phrases: Keep out of reach of children.

16. Other Information

Do not mix with other chemicals.

This data sheet does not constitute an assessment of the workplace risks as required under the provisions of the Health & Safety at Work act and the Control of Substances Hazardous to Health (COSHH).

Legal Disclaimer: The information supplied above is based upon the present state of our knowledge of the product at the time of publication. It is given in good faith and no warranty is implied with respect to the specification or quality of the product. The user must satisfy himself that the product is entirely suitable for his purpose.

ZRC GALVANIZING COMPOUND (AEROSOL) NFPA HAZARD RATING

MATERIAL SAFETY DATA SHEET

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SECTION 1 - PRODUCT IDENTIFICATION

Product Identifier: ZRC Cold Galvanizing Compound
Product Class: Esterified Epoxy Based Zinc-Rich Metal Primer
Product Identification Number (PIN): 10000

Manufacturer's Name: ZRC Worldwide
Address: 145 Enterprise Drive, Marshfield, MA 02050

Emergency Telephone No.: 781-319-0400 Business Hours
Chemtrec 24 hrs. 1-800-424-9300

Date of Preparation: January 1, 2008

SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	% (wt)	LEL	ACGIH TLV ppm (mg/M³)	OSHA PEL ppm (mg/M³)	V.P. MMHG @ 20°C
*Zinc (CAS # 7440-66-6)	44	na	Not Established	TWA (RF) 15 mppcf (5) TWA (TD) 50 mppcf (15)	na
*Acetone (CAS # 67-64-1)	20	2.6	TWA 500 STEL 750	TWA 1000 (2400)	185.00
Propane (CAS # 74-98-6)	10	2.2	TWA 1000	TWA 1000 (1800)	5585.20
Petroleum Distillates (CAS # 8052-41-3)	7	0.7	TWA 100	TWA 500 (2900)	2.00
*Methyl Ethyl Ketone (CAS #78-93-3)	6	1.8	TWA 200 STEL 300	TWA 200 (590)	85.00
N-Butane (CAS # 106-97-8)	5	1.8	TWA 1000	Not Established	879.10
Zinc Oxide CAS # 1314-13-2)	1	na	TWA (RF) (2) STEL (RF) (10)	TWA (RF) (5) TWA (TD) (15)	na

RF = Respirable Fraction TD = Total Dust

Aerosol Contents under pressure of 55+/-5 psi

*This CAS No. is subject to the reporting requirements of Section 313 of SARA Title III and of 40 CFR 372.

SECTION 3 – PHYSICAL DATA - FIRE AND EXPLOSION DATA

Physical State: Liquid **Water Solubility:** Insignificant **Odor and Appearance:** Grey with Odor of aliphatic and aromatic hydrocarbons
Vapor Pressure: 50 @ 21°C **Vapor Density:** Heavier than Air **Evaporation Rate:** Faster than Ether
Boiling Range: 01-396 °F **Flash Point:** <20 °F TOC **Specific Gravity:** 1.20 @ 25 °C
Percent Volatile: 48 (wt) **Autoignition Temp.:** not determined **Weight per Gallon:** 10.01 Lbs. @ 25 °C.
Reactivity in Water: See Sec.4 **Flammability Limits in Air:** UEL 12.8% (vol) LEL 1.1% (vol)
Flammability Classification:
DOT – UN #1950 - Consumer Commodity – Hazard Class ORM-D / OSHA- Flammable Class IA, OSHA Class 29(1910-106a)
Label: Extremely Flammable RSP. CFR 16-1500.3(6)(V)
VOC: Less than 30% by weight (516 gm/L (4.3 lbs/gal)).
Extinguishing Media: Approved Class B Fire Extinguisher, foam or dry chemical. DO NOT USE WATER! Combustion in a limited amount of air can generate toxic Carbon Monoxide. Use full protective equipment and self-contained breathing apparatus for respiratory protection in fighting fires in enclosures. In a fire situation, or when the material is heated, it becomes a highly flammable liquid with a moderate explosion hazard. Once ignited, this product will burn readily in air.
Unusual Fire and Explosion Hazards: Keep containers closed tightly. Isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat. Zinc present in a finely divided form is hazardous when atomized in air and, if sparked, explosion is possible. Application to hot surfaces requires special precautions. During emergency conditions, overexposure to decomposition products (gaseous oxides of Carbon and Nitrogen) may cause health hazard. Symptoms may not be immediately apparent. Obtain medical attention. Heavier than air vapors may flow along surfaces to distant ignition sources and flash back. Moisture and acid contamination can result in Hydrogen gas evolution, causing cans to bulge with increased pressure. Cans so deformed should not be moved, opened or punctured. Call (781) 319-0400. See also Sections 4 and 5.
Special Fire Fighting Procedures: DO NOT USE WATER IN ANY FORM.
Water may be used to cool containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat, but care should be taken to prevent water access to wet paint and spray residues. See also Section 7.

SECTION 4 - PHYSICAL HAZARDS

Stability: Stable **Hazardous Polymerization:** Will not occur
Materials and Conditions to Avoid: This material is considered to be stable under its normal handling and storage conditions. It can react violently with strong oxidizing agents such as chlorine and oxygen, as well as water, weak acids and concentrated acids. Store in dry areas away from oxidizing agents (chlorine, oxygen), all acids, alkalies and water. Avoid dusting and accumulations of spray residues.
Hazardous Combustion Products: Thermal degradation, water and alkali contact may produce hydrogen gas accompanied with additional risks of explosion and fire. May produce fumes of zinc oxide and the oxides of carbon and nitrogen when heated to decomposition. Acid contact will produce hydrogen.
Sensitivity to Impact: Impact w/sparking may produce discharge of contents with fire or explosion hazard.

SECTION 5 – HEALTH HAZARD DATA

Threshold Limit Value: 100 ppm **OSHA PEL:** Mixture (See Section 2)
Routes of Entry: Skin Contact, Skin Absorption, Eye Contact, Inhalation and Ingestion.
Medical Conditions Generally Aggravated by Exposure: Respiratory conditions, dermatitis and other skin afflictions, conditions of the central nervous system.
Effects of Acute Exposure to Product: Propane is an asphyxiant. Solvents contained in this mixture are central nervous system depressants. Symptoms of overexposure include drowsiness, dizziness, headache, slurred speech, intoxication with euphoria and/or depression leading to stupor and unconsciousness. Nose, throat and lung irritation may occur from inhalation. Skin contact may cause defatting and dermatitis. Eye contact with the liquid causes tears, burning, irritation, conjunctivitis. Ingestion will cause

poisoning and may be fatal; avoid aspiration if ingested. Do not induce vomiting. Lung contact may cause chemical pneumonitis. During welding and burning operations, hazardous decomposition products may be evolved from the dried film, these may include but not be limited to Zinc Oxides, as well as gaseous oxides of Carbon and Nitrogen. Excessive inhalation of these fumes may produce symptoms known as "Fume Fever" and "Zinc Shakes" among other effects. Consult Physician.
Effects of Chronic Overexposure to Product: Reports have associated repeated and prolonged overexposure to solvents with permanent damage to the brain and central nervous system.
Irritancy of Product: Eye, Skin, Nose, Throat and Lung irritant. **Sensitization to Product:** May cause allergic skin reaction.
Carcinogenicity: None **Teratogenicity:** None **Mutagenicity:** None **Reproductive Toxicity:** None
Synergistic Products: None known
EMERGENCY AND FIRST AID PROCEDURES:
Inhalation: Remove to fresh air. Keep warm and quiet. Give artificial respiration if required. Get medical assistance.
Eyes: Wash eyes immediately with large amounts of water for at least 15 minutes. Take to physician for medical attention.
Skin: Wash contact area promptly with soap and water. Promptly remove paint-wet clothing. Consult physician if irritation persists.
Ingestion: Do not induce vomiting without medical advice. Contact a physician, emergency room or Poison Center immediately. Observe all rules of good hygiene during and after use. Wash thoroughly before smoking or eating.

SECTION 6 – SPECIAL PROTECTION INFORMATION

Personal Protective Equipment:
Gloves: Neoprene gloves and aprons should be used to prevent prolonged or repeated skin contact. Use protective creams when skin contact is likely.
Respirator: In outdoor or open areas, wear only properly fitted, NIOSH/MSHA approved respirators capable of filtering dust particulates during and after application unless air monitoring demonstrates vapor/mist levels are below acceptable limits. In areas of restricted ventilation, wear only properly fitted, NIOSH/MSHA approved respirators designed to remove a combination of organic vapors and dust particulates during and after application unless air monitoring demonstrates vapor/mist levels are below acceptable limits. In confined areas, use approved air line type respirators or hoods. Follow respirator manufacturer's directions for respirator use.
Eye: Safety goggles with unperforated side shields or face shield should be used where splashing into eyes is possible. An eye wash fountain should also be available in areas where splashing is possible. When large amounts of material are used, a safety shower should be available.
Footwear: Wear chemical resistant boots with steel toes.
Clothing: Wear neoprene apron over well fitting clothes. Loose fitting clothes should not be worn. Remove and wash or discard contaminated clothing.
Ventilation Engineering Controls: Work place areas require exhaust ventilation in accordance with OSHA regulation 29 CFR Part 1910.107d to maintain vapor levels below the TLV (especially during spraying, misting or heating). Use an approved high efficiency respirator of the full face canister type (for limited time and concentrations), air supplied type of self-contained respirators (for extended exposures involving high or unknown vapor concentrations or for non-routine or emergency conditions). Exhaust levels should be maintained at least at 100 lfm. All ventilation equipment should be explosion-proof, and any tools used in the area should be of the non-sparking type.

SECTION 7 – SPECIAL PRECAUTIONS – SPILL OR LEAK PROCEDURES

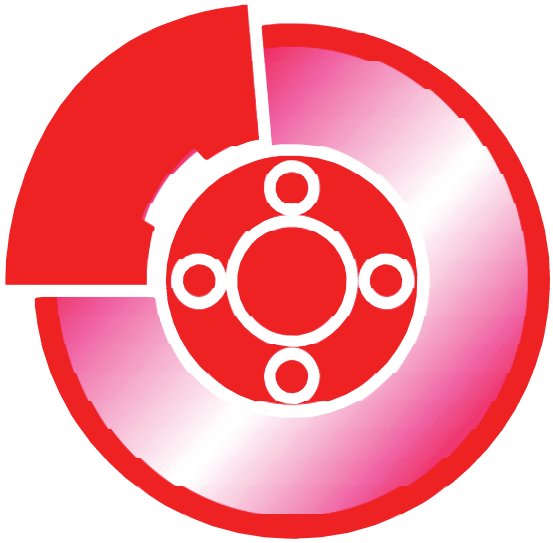
Leak and Spill Procedure: For massive spills, evacuate the area. For all spills, eliminate ignition sources. Dike and contain spills with dry, inert materials (sand, earth, etc.). Eliminate all sources of moisture and do not use water in clean-up operations. Recover as much of the free liquid as possible for disposal and use an absorbent to pick up the residue. Avoid discharging paint directly into a sewer or surface waters. Do not flush spills with water. Use non-sparking tools only. Spilled material may be slippery on floors.
Waste Disposal: Dispose of the absorbed material or the free waste liquid in dry containers according to Local, State and Federal regulations for Hazardous Wastes. Dispose of all materials including empty cans according to Local, State and Federal regulations. Do not incinerate. Do not flush into sewers. Containers may explode if heated even when empty. It is recommended that solid waste be landfilled only at approved hazardous disposal sites using approved contractors.
Handling Procedures and Equipment: Use only non-sparking tools. Areas of use should have good ventilation and all sources of open flame and high heat should be excluded. Prohibit smoking in these areas. Ensure sufficient ventilation to prevent accumulation of heavy vapors in low lying areas of sumps. Material is electrically conductive.
Storage Requirements: This extremely flammable liquid should be stored in a cool, clean, dry, well-ventilated, fire resistant storage room or in a solvent storage cabinet that meets OSHA requirements. Do not store in direct sunlight. Store only in cans with identifying labels that indicate the flammability of the material. Store large quantities only in buildings in compliance with OSHA 1910.105. Areas of storage for this material should have good ventilation and all sources of open flame and high heat should be excluded. Prohibit smoking in these areas. Ensure sufficient ventilation to prevent accumulation of heavy vapors in low lying areas or sumps. Do not store above 49 degC. Do not puncture, drag or slide container.
Other Precautions: Any deformed cans should not be moved, opened or punctured. Call (781) 319-0400. Do not take internally. Keep away from children. Empty container may contain extremely flammable residues and explode if heated.

THIS PRODUCT IS A MIXTURE. MSDS FILES ON THE INDIVIDUAL
COMPONENTS WERE USED TO DERIVE THE INFORMATION CONTAINED HEREIN.

BRAKE-KLEEN

BRAKE PARTS CLEANER

CHEMBOND UNIVERSAL



- SAFE NON-FLAMMABLE SPRAY
- DEGREASES INSTANTLY AND LEAVES NO RESIDUE
- CLEANS BRAKE PARTS IN PLACE WITHOUT TOTAL DISASSEMBLY
- HELPS ELIMINATE SQUEAL AND CHATTER
- HELPS EXTEND THE LIFE OF BRAKE UNITS

SUPER POWERFUL DEGREASING ACTION

ADASEAL INTERNATIONAL, INC.
P.O. BOX 377 • NEW JOHNSONVILLE, TN 37134
TELEPHONE: 931-296-2291 • TOLL FREE: 800-521-2521 • FAX: 888-758-8828

07/02

MATERIAL SAFETY DATA SHEET

COMPLIES WITH OSHA'S HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

SECTION I · PRODUCT IDENTIFICATION

Product Name: Brake-Kleen • Brake Parts Cleaner
Product Number: 526
Product Type: AEROSOL
Supplier's Name: Adaseal International, Inc.
Supplier's Address: P.O. Box 377 • New Johnsonville, TN 37134
D.O.T. Hazard Class: CONSUMER COMMODITY · ORM-D

Formula: Proprietary
Date Prepared: 12/12/01
Emergency Phone: (800) 255-3924
Information Phone: (931) 296-2291

HMIS Rating (Based on Aerosol Conc.):
0-Minimal 1- Slight 2- Moderate
3- Serious 4- Extreme
HEALTH: 2 FIRE: 0 REACTIVITY: 0
Personal Protection : B

SECTION II · INGREDIENTS

CHEMICAL NAME	CAS #	%WT	313/Chem	Skin	Carcinogen	PEL	TWA/TLV
Tetrachloroethylene	127-18-4	70-85	YES	NO	YES	100 ppm	100 ppm
Carbon Dioxide Propellant	124-38-9	01-05	NO	NO	NO	10,000 ppm	5,000 ppm

SECTION III · PHYSICAL DATA

Data Below Based On Aerosol Concentrate Only:
Boiling Point: N/D
pH: N/A
Solubility In Water: Negligible
Appearance/Odor: Clear Colorless Liquid, Mild Sweet Odor
Vapor Density(Air=1): >1
Specific Gravity (H_2O=1)@75°F: 1.50
Data Below Based On Total Contents:
Vapor Pressure of can (psig @70°F): N/D
Total VOC %: N/A

SECTION IV · FIRE AND EXPLOSION DATA

Flash Point (of Concentrate Only): None to Boil.
Flammability (as per USA Flame Projection Test)**:** Non-Flammable Spray
Extinguishing Media: Foam, CO_2, Dry Media
Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Cool fire exposed containers to prevent rupturing.
Unusual Fire and Explosion Hazards: Exposure to temperature above 120° F may cause bursting.

SECTION V · REACTIVITY DATA

Stability: Material Stable.
Hazardous Polymerization: Will not Occur.
Incompatibility: Avoid contact with strong oxidizing agents or strong alkalies.
Hazardous Decomposition Products: Carbon Dioxide, Carbon Monoxide**,** Hydrogen Chloride, small amount of Phosgene.

SECTION VI · STORAGE AND HANDLING

KEEP OUT OF REACH OF CHILDREN.
For Industrial and Institutional use only.
Store in a cool, dry area away from heat or open flame.
Do not store at temperatures above 120° F.
NFPA Code 30B Rating: Level 1 Aerosol.

SECTION VII · HEALTH AND FIRST AID

PRIMARY ROUTES OF ENTRY & EFFECTS OF OVER EXPOSURE:
Eyes: May cause pain and severe irritation.
Skin: May cause burning sensation, mild irritation, slight irritation, slight dermatitis or defatting.
Inhalation: Inhalation of mist can cause irritation of nasal and respiratory passages. Abusive or excessive inhalation of vapors may cause irritation to the upper respiratory tract, dizziness, nausea and other central nervous system effects.
Ingestion: Can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration of material into the lungs can cause chemical pneumonitis.
FIRST AID PROCEDURES:
Eyes: Flush with large amounts of cool running water for at least 15 minutes while holding upper and lower lids open. If irritation persists get medical attention immediately.
Skin: Wash with plenty of soap and water. If irritation persists seek medical attention.
Inhalation: Remove to fresh air. Seek medical attention immediately. If breathing stops give artificial respiration.
Ingestion: Do not induce vomiting. Seek medical attention immediately.

SECTION VIII · SPECIAL PROTECTION DATA

Respiratory Protection: None needed for proper use in accordance with label directions. Wear a NIOSH/ MSHA approved respirator with organic vapor cartridges if recommended exposure level is exceeded.
Ventilation: Provide local exhaust to keep TLV of Section II ingredients below acceptable limits.
Protective Gloves: Use chemical resistant gloves if hand contact will be made.
Eye Protection: Wear safety glasses or chemical proof goggles.

SECTION IX · SPILL OR LEAK PROTECTION

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK: Allow propellant to evaporate. Maintain local exhaust and adequate ventilation. No smoking. Keep sparks, heat sources and open flame far away from spill or leak. Cover with absorbent material and sweep up. Wash area to prevent slipping. Dispose of soaked absorbent material in accordance with Federal, State and local laws.
WASTE DISPOSAL METHOD: Aerosol cans, when emptied and depressurized through normal use, pose no disposal hazard and should be recycled. Consult Federal, State and local authorities for approved procedures.

N/A= NOT APPLICABLE · N/E=NOT ESTABLISHED · N/D=NOT DETERMINED · <=LESS THAN · >=MORE THAN

BRAKE-KLEEN

BRAKE PARTS CLEANER

aerosol product data sheet

Description

Dirt and grease on brake linings can inhibit the ability of the brake system to do its job. This powerful aerosol is a non-flammable, high solvency spray that quickly cleans away contamination that can lead to decreased performance, cause premature brake wear and annoying squeal and chatter. For use on all types of brake assemblies. Quickly removes BRAKE FLUID, GREASE, OIL, ROAD GRIME and other foreign matter without the need to disassemble the unit. Application of this quick drying, residue free cleaner , will extend the life of brake components and improve performance. One can cleans a full set of four automotive brakes. Also useful as a general parts cleaner.

NOTE: May damage plastic, rubber or painted surfaces. Pre-testing is suggested.

For Use by

AUTOMOBILE MAINTENANCE
AIRCRAFT MAINTENANCE • MARINAS
SHIPPING OPERATIONS • GARAGES
BUS YARDS • POSTAL SERVICES
TRUCK FLEET MAINTENANCE
FORK LIFT REPAIR • MACHINE SHOPS
CONSTRUCTION COMPANIES

For Use On

BRAKE LININGS • DRUMS
CYLINDERS • SPRINGS
SHOES AND DISC PADS
TOOLS • ENGINE PARTS • MOTORS
BEARINGS • GEARS • GENERATORS
STARTERS • RELAYS • CALIPERS
BRAKE PADS • CV JOINTS
OTHER METAL SURFACES

Features

STRONG FLUSHING SPRAY ACTION
DRIES VIRTUALLY RESIDUE FREE IN SECONDS
REMOVES BRAKE FLUID ND OIL FOR QUICK INSPECTION AND LOCATION OF LEAKS
NON-FLAMMABLE • HIGH SOLVENCY

Specifications

Appearance and Odor	Clear Colorless Liquid, Mild Sweet Odor
Flash Point of Concentrate	None to Boil
Flammability	Non-Flammable Spray
Specific Gravity	1.50
Propellant	Carbon Dioxide Propellant
Spray Pattern	Circular Spray
NFPA Fire Rating	Level 1 Aerosol
Packaging	12 x 18oz. Net Wt. Cans per case (20oz. Cans)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: NAPA PREM STARTING FLUID
SAP Material No: PYSFP11
General or Generic ID: SOLVENT BLEND
Company Telephone Numbers
The Valvoline Company Emergency: 1-800-274-5263
P.O. Box 14000
Lexington, KY 40512 Information: 1-859-357-7206

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
HEPTANE	142-82-5	60.0- 70.0
ETHYL ETHER ACS REAGENT GRADE	60-29-7	23.0- 33.0
CARBON DIOXIDE	124-38-9	1.0- 11.0

3. HAZARDS IDENTIFICATION

Potential Health Effects
Eye
May cause mild eye irritation.
Skin
Can cause skin irritation. Prolonged or repeated contact may dry and crack the skin. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Swallowing
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. This material can get into the lungs during swallowing or vomiting. This results in lung inflammation and other lung injury.
Inhalation
Breathing aerosol and/or mist is possible when material is sprayed. Aerosol and mist may present a greater risk of injury because more material may be present in the air than from vapor alone. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See

Section 8).
Symptoms of Exposure
Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea) irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), loss of appetite, loss of coordination irregular heartbeat, narcosis (dazed or sluggish feeling).
Target Organ Effects
testis damage, lung damage, visual impairment, central nervous system effects.
Developmental Information
There are no data available for assessing risk to the fetus from maternal exposure to this material.
Cancer Information
This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

Other Health Effects
No data
Primary Route(s) of Entry
Inhalation, Skin absorption, Skin contact, Eye contact.

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4. FIRST AID MEASURES
Eyes
If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.
Skin
Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention. Launder clothing before reuse.
Swallowing
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.
Inhalation
If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.
Note to Physicians

Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias. Sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to this material. This material is an aspiration hazard. Potential danger from aspiration must be weighed against possible oral toxicity (See Section 3 - Swallowing) when deciding whether to induce vomiting. Preexisting

disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin, lung (for example, asthma-like conditions), Individuals with pre-existing heart disorders may be more susceptible to arrhythmias (irregular heartbeats) if exposed to high concentrations of this material.

5. FIRE FIGHTING MEASURES

Flash Point
Not applicable
Explosive Limit
(for component) Lower 1.0 %
Autoignition Temperature
No data
Hazardous Products of Combustion
May form:
Fire and Explosion Hazards
Material is highly volatile and readily gives off vapors which may travel along the ground or be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.
Extinguishing Media
No data
Fire Fighting Instructions
Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating
Health - 1, Flammability - 4, Reactivity - 0

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6. ACCIDENTAL RELEASE MEASURES
Small Spill
Eliminate all sources of ignition such as flares, flames (including pilot lights), and electrical sparks. Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.
Large Spill
Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occured. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Eliminate all ignition sources (flares, flames, including pilot lights,electrical sparks).

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7. HANDLING AND STORAGE
Handling
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five gallon pails and larger metal containers including tank cars and tank trucks should be grounded and/or bonded when material is transferred. Precautions during use: avoid prolonged or frequently repeated skin contact with this material. Skin contact can be mininized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Hydrocarbon solvents are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering or pumping at high flow rates.

If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids.
Storage
Do not store near extreme heat, open flame, or sources of ignition.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Eye Protection
Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection
Wear resistant gloves (consult your safety equipment supplier).
To prevent repeated or prolonged skin contact, wear impervious clothing and boots.
Respiratory Protections
If workplace exposure limit(s) of product or any component is exceeded (See Exposure Guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (consult your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.
Engineering Controls
Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).
Exposure Guidelines
Component

HEPTANE (142-82-5)
OSHA VPEL 1600.000 mg/m3 - TWA
OSHA VPEL 400.000 ppm - TWA
OSHA VPEL 500.000 ppm - STEL
OSHA VPEL 2000.000 mg/m3 - STEL

ACGIH TLV 400.000 ppm - TWA
ACGIH TLV 1640.000 mg/m3 - TWA
ACGIH TLV 2050.000 mg/m3 - STEL
ACGIH TLV 500.000 ppm - STEL
ETHYL ETHER ACS REAGENT GRADE (60-29-7)
No exposure limits established
CARBON DIOXIDE (124-38-9)
OSHA VPEL 10000.000 ppm - TWA
OSHA VPEL 18000.000 mg/m3 - TWA
OSHA VPEL 54000.000 mg/m3 - STEL
OSHA VPEL 30000.000 ppm - STEL
ACGIH TLV 9000.000 mg/m3 - TWA
ACGIH TLV 5000.000 ppm - TWA
ACGIH TLV 54000.000 mg/m3 - STEL
ACGIH TLV 30000.000 ppm - STEL

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9. PHYSICAL AND CHEMICAL PROPERTIES
Boiling Point
(for component) 94.0 F (34.4 C)
Vapor Pressure
(for component) 439.000 mmHg
Specific Vapor Density
> 1.000 @ AIR=1
Specific Gravity

.690 - .720 @ 77.00 F
Liquid Density
5.860 lbs/gal @ 77.00 F
.705 kg/l @ 25.00 C

Percent Volatiles (Including Water)
No data
Evaporation Rate
SLOWER THAN ETHYL ETHER
Appearance
No data
State
LIQUID
Physical Form
No data
Color
No data
Odor
No data
pH
Not applicable
Flame Propagation
> 18.000 in

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10. STABILITY AND REACTIVITY
Hazardous Polymerization
Product will not undergo hazardous polymerization.
Hazardous Decomposition
May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Chemical Stability
Stable.
Incompatibility
Avoid contact with: aldehydes, alkanol amines, amines, ammonia, chlorinated solvents, oxygen, strong bases, strong oxidizing agents.

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11. TOXICOLOGICAL INFORMATION
No data

12. ECOLOGICAL INFORMATION

No data

13. DISPOSAL CONSIDERATION

Waste Management Information

Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101

DOT Description:

CONSUMER COMMODITY,ORM-D

Container/Mode:

CASES/SURFACE - ORM-D EXCEPTION

NOS Component:

None

RQ (Reportable Quantity) - 49 CFR 172.101

Product Quantity (lbs)	Component
333	DIETHYL ETHER

15. REGULATORY INFORMATION

US Federal Regulations

CERCLA RQ - 40 CFR 302.4

None

SARA 302 Components - 40 CFR 355 Appendix A

None

Section 311/312 Hazard Class - 40 CFR 370.2

Immediate(X) Delayed(X) Fire(X) Reactive( ) Sudden Release of Pressure( )

SARA 313 Components - 40 CFR 372.65

None

International Regulations

Inventory Status

Not determined

State and Local Regulations

California Proposition 65

None

New Jersey RTK Label Information
N-HEPTANE 142-82-5
CARBON DIOXIDE 124-38-9
Pennsylvania RTK Label Information
HEPTANE (N-) 142-82-5
CARBON DIOXIDE 124-38-9

16. OTHER INFORMATION
The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.
Mac's Starting Fluid

MATERIAL SAFETY DATA SHEET
Effective Date: 5-21-04 Revision Date: none
Mac's Starting Fluid

Section 1 - Product and Company Identification

PRODUCT NAME: Mac's Starting Fluid

MANUFACTURER'S NAME: EMERGENCY TELEPHONE NUMBER
Technical Chemical Corp. (817)645-6088
P O BOX 139
CLEBURNE , TX 76033 MISCELLANEOUS INFORMATION

MATERIAL SAFETY DATA SHEET
Effective Date: 5-21-04 Revision Date: none
Mac's Starting Fluid

Section 1 - Product and Company Identification - Continued

MATERIAL SAFETY DATA SHEET
Trade Name: Johnsens Starting Fluid 25%
MSDS NO. 6762
Revision Date: 03/28/2002
Date Printed 05/21/2004
Page 1 of 1
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
Trade Name: Johnsens Starting Fluid 25%
Chemical Family: ETHER
Synonyms: None
Emergency Telephone (24 hr.): 24-Hour Emergency Information: CHEMTREC (800) 424-9300
Supplier: Technical Chemical Company, P.O. Box 139, Cleburne, Texas 76033
2. COMPOSITION/INFORMATION ON INGREDIENTS
Ingredient/CAS No.
wt. %
OSHA PEL
TWA

OSHA PEL
Ceiling Limits
ACGIH TLV
TWA
ACGIH TLW
STEL
Heptane
142-82-5 40-50 500 ppm: 2000
mg/m3
None Established 400 ppm: 1640 mg/m3 500 ppm
Ethyl Ether
60-29-7
23-30 400 ppm None Established 400 ppm 500 ppm
Propane
74-98-6 15-25 1000 ppm Not Known 2500 ppm Not Known
Carbon Dioxide
124-38-9
2-10 5000 ppm
(exposures <10,000
ppm to be cited de
minimus)
Not Known 5000 ppm 30,000 ppm
Iso-Butane
75-28-5
5-15 None Established None Established None Established None Established
Lubricating Oil
64742-52-5 0-5 Not known Mist 5 mg/m3 TLV Mist 5 mg/m3 8
HR.
Not Known
This product contains trace amounts of (<15 ppm) of Butylated hydroxytoluene (BHT) as an inhibitor to prevent or reduce
the formation of potentially explosive peroxides.
3. HAZARDS IDENTIFICATION
Emergency Overview: Danger: Extremely flammable. Breathing high concentrations of vapor or mist may cause nausea, vomiting, central nervous system (CNS) depression and asphyxiation. Symptoms may include headache, diziness, blurred vision, slurred

speech, memory loss, confusion, faigue, loss of consciousness, convulsions, paralysis, or coma. This material is irritating
to skin, eyes and respiratory tract. Keep away from heat, sparks and flame. Prolonged or repeated inhalation or ingestion
may result in kidney and liver changes.
HMIS Classification: Health: *2 Flammability: 4 Physical Hazard: 2
NFPA Rating: Health: 2 Flammability: 4 Reactivity: 1
4. FIRST AID MEASURES
Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get
medical attention immediately after flushing. Do not permit victim to rub

eyes.
Ingestion: If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person. Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.
Inhalation: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.
Skin Contact: Wash with soap and water for 15 minutes. If irritation persists or signs of toxicity occur, seek medical attention. Remove contaminated clothing and shoes, and launder before reuse.
5. FIRE FIGHTING MEASURES
Flammable Properties
Flash Point F(C): <-10 F
Flash Point Method: TAG Closed Cup
Flammable Limits in Air - Lower (%): 1.2% (Lowest Component)
Flammable Limits in Air - Upper (%): 6.7% (Lowest Component)
Autoignition Temperature F(C): 356 F (Lowest Component)
Extinguishing Media: Dry chemical. Carbon dioxide. Alcohol foam. Use water spray to keep containers cool that are

exposed to heat or flames.
Protection Of Fire-Fighters:
Special Fire-Fighting Procedures: Wear approved positive-pressure self-contained breathing apparatus and protective clothing. Vapor may cause flash fire. Fight from a maximum distance or use unmanned hose holders or monitor nozzles. Containers can build up pressure if exposed to heat; cool with flooding quantities of water until well after the fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of vessel.
Hazardous Combustion Products: Carbon Dioxide. Carbon Monoxide.
Aerosol Comments: NFPA Level 3 Aerosol
6. ACCIDENTAL RELEASE MEASURES
Personal Precautions: Wear appropriate protective clothing and equipment to prevent skin and eye contact.
Spill Procedures: Contain any liquid from leaking containers. Avoid all sources of ignition; heat, sparks and open flames.
Do not puncture or incinerate container. Contents under pressure. Wear proper protective equipment as specified in the protective equipment section. Remove sources of ignition. Leaking

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MATERIAL SAFETY DATA SHEET
Effective Date: 5-21-04 Revision Date: none
Mac's Starting Fluid
==========
Section 1 - Product and Company Identification - Continued

containers should be removed to an isolated, well-ventilated area and transferred to other suitable containers. Wipe, scrape, or soak up in an inert material and put in a container intended for flammable materials for disposal.

Environmental Precautions: Do not allow to enter sanitary drains, sewer or surface and subsurface waters. Keep out of lakes, ponds or streams.
7. HANDLING AND STORAGE
Handling and
Storage:
Caution: Contents under pressure. Keep away from heat and open flame. Use only in a well ventilated area. Avoid breathing vapors,
if exposed to high vapor concentration, leave area at once. Avoid contact with skin and eyes. Do not puncture, incenerate or store
above 120 F. Exposure to high temperatures may cuase bursting. DO NOT store in the passenger compartment of an automobile.
Store in a cool, dry place, out of direct sunlight.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Engineering Controls: Use in a well ventilated area. Local exhaust ventilation as necessary to maintain exposures to within applicable limits.
Eyes: Chemical goggles; also wear a face shield if splashing hazard exists.
Skin Protection: Avoid skin contact. Wear protective clothing and gloves.
Respiratory Protection: Do not breath mist or vapor. Use in a well ventilated area. Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure.
9. PHYSICAL AND CHEMICAL PROPERTIES
Appearance: Colorless to pale yellow liquid
Odor: PUNGENT SWEET pH Value: Not Determined
Vapor Pressure: Not Determined Vapor Density (Air=1): >1.5 Approximate Boiling Point (F): -44 F (Lowest Component) Melting/Freezing Point: Freezing -176F (Ether)
Solubility in Water: PARTLY SOLUBLE Bulk Density at 20C: Not Determined
Molecular Weight: Mixture Evaporation Rate: Not Determined
Viscosity: Not Determined. Specific Gravity (H20=1): Not Determined
VOC Content(%): Not determined. Decomposition Temperature: Not Determined
10. STABILITY AND REACTIVITY
Chemical Stability: Stable under normal conditions of handling, use and transportation.
Conditions to Avoid: Keep away from heat,sparks and flame. Avoid any source of ignition. Do not expose to heat or store at
temperatures above 120 F.
Materials to Avoid: Contact with oxidizing agents. Concentrated oxygen. Nitric acid. Avoid contact with chlorine in the presence
of light.
Hazardous Decomposition Products: Carbon monoxide. and other asphxiants. Explosive peroxides. Will react with nitric acid to form explosive nitrates.
Hazardous Polymerization: WILL NOT OCCUR
11. TOXICOLOGICAL INFORMATION
Toxicological Data:
Ingredient/CAS No.
wt. %
Route
Species

==========

Dose
Heptane
142-82-5
40-50 Inhalation Rats LC50 103 gm/m3/4H
Ethyl Ether
60-29-7 23-30 Inhalation Mice LC50 31000 ppm/30M
Propane
74-98-6 15-25 NA NA Not known.
Carbon Dioxide
124-38-9 2-10 NA NA Not known.
Iso-Butane
75-28-5 5-15 Inhalation Rats LC50 57 pph/15M
Lubricating Oil
64742-52-5 0-5 NA NA Not known.

Carcinogenicity:
Ingredient/CAS No.
wt. %
IARC
NTP
OSHA
Heptane
142-82-5 40-50 Not Listed Not Listed Not Listed
Ethyl Ether
60-29-7 23-30 Not Listed Not Listed Not Listed
Propane
74-98-6
15-25 Not Listed Not Listed Not Listed
Carbon Dioxide
124-38-9 2-10 Not Listed Not Listed Not Listed
Iso-Butane
75-28-5
5-15 Not Listed Not Listed Not Listed
Lubricating Oil
64742-52-5 0-5 Not Listed Not Listed Not Listed

12. ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product.

13. DISPOSAL CONSIDERATION

Waste Classification: Residues and spilled material are hazardous waste due to ignitability.
Waste Management: Not determined.
Disposal should be made in accordance with federal, state and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT:
Proper Shipping Name: Aerosols, flammable, n.o.s. (Engine Starting Fluid)
Hazard Class: 2.1 (limited quantity)
UN/NA Number: UN 1950
DOT Packing Group: Not Determined
IMDG:
Proper Shipping Name: Aeroslols (Limited Quantity)
Hazard Class: 2.1

Hazard Subclass: Not determined.
UN No.: UN 1950

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MATERIAL SAFETY DATA SHEET
Effective Date: 5-21-04 Revision Date: none
Mac's Starting Fluid
==========
Section 1 - Product and Company Identification - Continued

Packing Group: Not Determined
Marine Pollutant: No
15. REGULATORY INFORMATION
US Federal Regulations:
Ingredient/CAS No.
wt. %
SARA 313
SARA 302
RQ
TPQ
Heptane
142-82-5 40-50 Not Listed Not Listed NA NA
Ethyl Ether
60-29-7 23-30 Not Listed Not Listed 100 lbs. NA
Propane
74-98-6 15-25 Not Listed Not Listed NA NA
Carbon Dioxide
124-38-9 2-10 Not Listed Not Listed NA NA
Iso-Butane
75-28-5 5-15 Not Listed Not Listed NA NA
Lubricating Oil
64742-52-5
0-5 Not Listed Not Listed NA NA
Trade Name: Johnsens Starting Fluid 25% MSDS NO. 6762
Page 4 of 1
Hazardous per OSHA 29 CFR 1910.1200
SARA 311/312 Hazard Catagories: Immediate/Acute, Delayed/Chronic, Fire
State Regulations:
Ingredient/CAS No.
wt. %
California Prop. 65
Cancer list
California Prop. 65
Developmental
Toxicity
California Prop. 65
Reproductive Female
California Prop. 65
Reproductive Male
Heptane
142-82-5 40-50 Not Listed Not Listed Not Listed Not Listed
Ethyl Ether
60-29-7 23-30 Not Listed Not Listed Not Listed Not Listed
Propane
74-98-6 15-25 Not Listed Not Listed Not Listed Not Listed
Carbon Dioxide

124-38-9 2-10 Not Listed Not Listed Not Listed Not Listed
Iso-Butane
75-28-5
5-15 Not Listed Not Listed Not Listed Not Listed
Lubricating Oil
64742-52-5 0-5 Not Listed Not Listed Not Listed Not Listed
U.S. TSCA: The components of this product are listed on the TSCA Inventory.
16. OTHER INFORMATION
General Notes: Do not allow undiluted material or large quantities to reach

groundwater, bodies of water or sewer system.
Disclaimer:
The information and recommendations contained herein are based upon tests believed to be reliable. However, the manufacturer/distributor of this product does not guarantee their accuracy or completeness NOR SHALL ANY OF THIS INFORMATION CONSTITUTE A WARRA NTY, WHETHER
EXPRESSED OR IMPLIED, AS TO THE SAFETY OF THE GOODS, THE MERCHANTABILITY OF THE GOODS, OR THE FITNESS OF THE GOODS
FOR A PARTICULAR PURPOSE. Adjustment to conform to actual conditions of usage may be required. The manufacturer/distributor as sumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty
against infringement of any patent, copyright or trademark is made or implied.