

**HEALTH AND SAFETY PLAN  
FOR**

**U.S. EPA REGION V  
FULL SCALE EXERCISE  
ANGOLA, INDIANA**

**MARCH 13-14, 2018**

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## GLOSSARY OF ACRONYMS

ATV	All-Terrain Vehicle
BBP	Bloodborne Pathogen
bpm	Beats per minute
BT	Body Temperature
CDTS	Command and Decontamination Tent System
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
CP	Command Post
CPR	Cardio Pulmonary Resuscitation
CRC	Contamination Reduction Corridor
CRZ	Contamination Reduction Zone
CSE	Confined Space Entry
CZ	Clean Zone
EMP	Emergency Meeting Point
EMT	Emergency Medical Technician
EZ	Exclusion Zone
F	Fahrenheit
H&S	Health and Safety
HASP	Health and Safety Plan
HBV	Hepatitis B Virus
HIV	Human Immunodeficiency Virus
HR	Heart Rate
IAP	Incident Action Plan
IC	Incident Commander
IDEM	Indiana Department of Environmental Management
IDLH	Immediately Dangerous to Life or Health
LEL	Lower Explosive Limit
MCP	Mobile Command Post
mm Hg	millimeters Mercury
mR/hr	milli-Roentgen Per Hour
MSDS	Material Safety Data Sheet
NOAA	National Oceanic and Atmospheric Administration
NIOSH	National Institute for Occupational Safety and Health
NVWS	National Weather Service
OERR	Office of Emergency and Remedial Response
OSC	On Scene Coordinator
OSHA	Occupational Safety and Health Administration
PAPR	Powered Air Purifying Respirator
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PPE	Personal Protective Equipment
SCBA	Self-Contained Breathing Apparatus
SPF	Sun Protection Factor
SO	Safety Officer

GLOSSARY OF ACRONYMS (Continued)

START	Superfund Technical Assessment and Response Team
U.S. EPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

## **1.0 INTRODUCTION AND REGULATORY REQUIREMENTS**

### **1.1 Introduction**

This Health and Safety Plan (HASP) describes the general health and safety (H&S) guidelines developed for the United States Environmental Protection Agency (U.S. EPA) Full Scale Exercise (FSE) training and exercise to take place at the Pokagon State Park, in Angola, Indiana on March 14 and 15, 2017. Any amendments to this HASP will be incorporated into the safety procedures and documented in Appendix A. Where applicable, specific Occupational Safety and Health Administration (OSHA) standards or other guidance will be cited and employed.

### **1.2 Applicability**

This HASP addresses the general H&S procedures that will be followed by personnel from the U.S. EPA, U.S. Coast Guard, the Indiana Department of Environmental Management (IDEM), Tetra Tech NUS Inc. (TTNUS), and other agencies that may be involved in the FSE.

The training and exercise will take place at the National Guard Armory, Angola, Indiana (See Appendix B). An orientation / training session will be conducted on Tuesday, March 13 and the FSE will be conducted on Wednesday, March 14. Weather contingencies may move the entire full scale exercise into the Potawatomi Inn on the 14th.

This HASP does not supersede any Federal, OSHA, State, or Local regulations. The HASP is in accordance with, and refers to, the terminology used in the Office of Emergency and Remedial Response (OERR) *Standard Operating Safety Guides* (June 1992), the USEPA Emergency Responder Health and Safety Manual, and the Safety, Health, and Environmental Management Program (SHEMP).

### **1.3 Site History**

The National Guard Armory, is located in northeastern Indiana at 904 Williams St, Angola, IN. The facility is immediately across the street from the Carlin Park Elementary School and the Angola Headstart Preschool. The armory primarily consists of office space, classrooms, and a gymnasium. There is a large fenced in storage area north of the building used to store various military equipment vehicles. Access to the main entrance to the building is located off of Mechanic Street which leads to the primary parking lot. A secondary entrance to the back of the armory is located off Williams Street which leads to the rear entrance of the armory and to the storage area.

### **1.4 Key Personnel**

#### **EXERCISE HEALTH AND SAFETY OFFICERS**

The Safety Officer (SO) for this training and exercise is Keith Fusinski. The SO has full responsibility and authority to manage all health and safety related activities for the exercise and all related supporting activities. The SO, in consultation with the SHEMP, develops and recommends measures for assuring personnel safety, and assesses and/or anticipates hazardous and unsafe conditions. The SO will implement this HASP in coordination with the Exercise Planning Team. The SO will verify compliance with the HASP for all on-going operations. The SO will be on site or readily accessible to the site during all work operations. The SO will have an

Assistant Safety Officer (ASO) who will assist the SO with health and safety related activities for the exercise and training. The ASO for this exercise is Shanna Horvatin. The specific responsibilities of the SO include:

- \* Managing the health and safety functions during the exercise;
- \* Serving as the exercise point of contact for health and safety matters;
- \* Ensuring monitoring, worker training, and effective selection and use of personal protective equipment PPE;
- \* Assessing conditions for unsafe conditions and providing corrective action;
- \* Assisting in the preparation and review of this HASP
- \* Maintaining effective health and safety records as described in the HASP

## **1.5 Participants**

See Mobilization Incident Action Plan (Mobe IAP), located in Appendix C for detail on team rosters and reporting times. ICS Form 204 identifies team rosters.

- *Players* participate in the refresher training and two simulated scenarios. Players will don and doff PPE, and work with field monitoring instruments.
- *Observers* will attend the refresher training and exercise but will not play in the exercise.
- *Facilitators* are responsible for developing and controlling the scenarios and refresher training.
- *Evaluators* will observe the exercise and fill out “punch cards” to evaluate player performance.
- *Instructors* are responsible for conducting the training.

## **1.6 Health and Safety Plan Acceptance Acknowledgment**

The SO or designated representative will be responsible for ensuring that all individuals participating in the FSE and covered under this HASP as specified in Section 1.4 have read the HASP and have signed the Signature Page in Section 9.2. By signing the Signature Page, individuals are assuring that they recognize the hazards present and the policies and procedures required to minimize exposure or adverse effects of these hazards. This signature page will be kept on file.

## **1.7 Daily Safety Meetings**

Daily safety meetings will be held on the first day of the training and prior to the start of each exercise to ensure that all personnel understand exercise conditions and operating procedures, to update information, and to address any worker health and safety concerns. Attendance at these meetings will be required for all personnel. These meetings will also be used to communicate and acknowledge changes/amendments to the HASP. If conditions should change during the course of the exercise, work will be stopped and all personnel will be informed of the change in conditions.

## **1.8 Training Requirements**

All personnel covered under this HASP must have completed training requirements for hazardous waste site work in accordance with 29 CFR 1910.120(e)(6), as well as be trained and/or experienced in Level A/C personal protective equipment (PPE). Compliance and documentation of training requirements are the responsibility of each employer.

## **1.9 Medical Monitoring Requirements**

All personnel covered under this HASP who would be expected to conduct emergency response operations including entering a designated exclusion zone (EZ) or contamination reduction zone (CRZ) must have completed appropriate medical monitoring requirements required under 29 CFR 1910.120(f). Compliance and documentation of medical monitoring is the responsibility of each employer. If there are additional medical monitoring requirements resulting from the nature of operations, evidence of compliance must also be included.

## **1.10 Fit Testing Requirements**

All personnel covered under this HASP who would be expected to conduct emergency response operations including entering a designated EZ or CRZ using a negative pressure, positive pressure, or pressure-demand respirators should have successfully passed a qualitative fit test (or quantitative fit test as needed per substance-specific regulations) within the last 12 months, in accordance with OSHA 29 CFR 1910.134. Compliance and documentation of fit testing requirements are the responsibility of each employer.

## **1.11 Hazard Communication Program Requirements**

Each agency, department or contractor that have employees reporting to the training shall inform Jeff Borseth (734-740-9012) of all hazardous substances brought to the training and provide safety data sheets (SDSs) for the hazardous substances to the SO or designated representative. The SO or designated representative shall be responsible for informing all personnel of potential hazards. Each employer shall be responsible for providing other employers with information about labeling systems and precautionary measures. SDSs from all employers shall be stored in one conspicuous location accessible to all site personnel and visitors. SDSs known at the time of the preparation of this HASP are located in Appendix D. Each employer bringing hazardous substances onto the site will have a hazard communication plan in compliance with 29 CFR 1910.1200.

## **1.12 General Health and Safety and Incident/Injury Reporting**

All employees at the site, regardless of employer, are responsible for their own and each other's safety. This responsibility includes reading, understanding, and adhering to all facets of the HASP, ensuring that the HASP includes all tasks and/or hazards, and any new information relevant to exercise activities, and stopping work to report unsafe or potentially dangerous conditions to the SO, or designated representative. Each employee is also responsible for reporting any incident, injury, or "near miss" to the SO, or designated representative and their respective employer's health and safety representative according to their respective employer's

policies, but always within 24 hours.

## **2.0 GENERAL OPERATIONS**

### **2.1 Incident/Site Background**

The Full Scale Exercise will include a Level A and Level C Exercise.

### **2.2 Scope of Work**

An initial orientation, facility overview, safety briefing, and FSE procedures will be conducted on Tuesday morning. Participants will receive a Health and Safety Briefing by the SO at this time and will be required to sign the HASP. The Level A exercise is scheduled to take place at the toboggan run warming shelter and parking lot. The level C exercise is scheduled to be conducted in the Lake James Room at the Potawatomi Inn

*Level C:* Players will suit-up in Level C PPE, staff a full decontamination line and execute decontamination procedures of Level A entrants. The players will participate in pre-and post-medical monitoring by Emergency Medical Technicians (EMTs).

*Level A:* Players will suit-up in Level A PPE and make entries into the hotzone to assess a laboratory with unknown chemicals. Entrants will need to assess the lab, collect air and wipes samples, perform air monitoring and fully document the items in the lab. Entrants will then be fully decontaminated. Cooling vests and safety liquids will be available for use by participants. Players will participate in pre- and post-medical monitoring by EMTs.

In the event of a severe weather, both exercises may be relocated to the Potawatomi Inn at the Pokagon State Park.

## **3.0 HAZARD ANALYSIS**

This Hazard Analysis identifies the general documented or potential physical, chemical, biological, and radiological hazards associated with the FSE. Every effort will be made to reduce or eliminate these hazards. Those which cannot be eliminated will be guarded against by use of engineering controls and/or PPE. PPE descriptions and general usage guidelines can be found in Section 4.0. U.S. EPA Region 5 field safety procedures, as outlined in the Regional Safety Manual, will be followed.

### **3.1 General Physical Hazards**

3.1.1 Buddy System - All personnel should operate under the Buddy System, and maintain awareness of their surroundings. The buddy system means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of an emergency. The responsibilities of workers using the buddy system include:

- remaining in close visual contact with partner,
- providing partner with assistance as needed or requested,

- observing partner for signs of heat and/or cold stress or other difficulties,
  - periodically checking the integrity of partner's PPE, and
  - notifying the safety officer or other site personnel if emergency assistance is needed.
- 3.1.2 Electrical Power - All electrical power must have a ground fault circuit interrupter as part of the circuit. All equipment must be suitable and approved for the class of hazard. The provisions outlined in 29 CFR 1926, Subpart K, shall apply. All generators and extension cords used at the exercise venues will have a ground fault circuit interrupter as part of the circuit.
- 3.1.3 Eye Protection - All operations involving the potential for eye injury, splash, etc., shall have approved eye wash units locally available as per 29 CFR 1910.151 (c).
- 3.1.4 Fire Protection/Fire Prevention - Operations involving the potential for fire hazards shall be conducted in a manner as to minimize the risk. Fire extinguishers shall be used or available as appropriate. A fire extinguisher and first aid kit will be at each of the exercise venues. Sources of ignition shall be removed. The provisions outlined in 29 CFR 1910 Subpart L shall apply. Diesel or gasoline fuel will be used for generators. Proper storage and handling practices will be practiced.
- 3.1.5 Heavy Equipment - Hazards associated with heavy equipment include equipment backing-up, being struck by or against the equipment, contact with above and/or underground utility lines, and high noise levels. To minimize accidents involving heavy equipment, all equipment must have operational back up alarms; personnel must make eye-to-eye contact with the operator before approaching, must utilize proper hand signals when communicating, and are to avoid equipment swing areas. All personnel getting on or off heavy equipment will maintain three points of contact. Heavy equipment must be operated by qualified operators.
- 3.1.6 Heavy Manual Lifting/Moving — All participants should be cautious when lifting or moving equipment. Remember to bend at the knees and lift with your legs to avoid back injuries. Be cautious of rolling, pinching or sharp objects and slip, trip and falls. Individuals involved with the set-up and break down of the exercise venues need to be extremely careful when loading and unloading equipment from vehicles.
- 3.1.7 Inclement Weather- The National Oceanic and Atmospheric Administration (NOAA) website will be monitored by the safety personal at the exercise venue. If weather poses a health and safety concern, the exercise will stop and everyone at the Level A venue will report to the warming shelter. Tornado warnings will trigger teams to report to concrete buildings. *Precipitation* — Personnel should be aware of the increased risk of slips and falls on wet surfaces as well as exposure effects caused by wet clothing. Personnel should dress appropriately. Vehicles become stuck in mud, and tools and personnel can slip on wet surfaces. Rain and wet conditions may decrease visibility (especially for personnel wearing respiratory protection). *Lightning* represents a hazard of electrical shock that is increased when working in flat open spaces, elevated work places, or near tall structures or equipment. *High Winds* can also cause health and safety concerns. All participants should be aware of the weather conditions and should dress appropriately. The NOAA is one website you can

use for weather information (<http://www.noaa.gov/wx.html>). If the weather poses a health and safety concern, the exercise will stop and contingency plans will be implemented.

- 3.1.8 Lighting - Adequate lighting provisions are outlined in 29 CFR 1910.120 (m).
- 3.1.9 Slip/Trip/Fall Hazards - Any response situation may involve slip/trip fall hazards from unfamiliar and/or uneven terrain, debris, vegetation, wet surfaces, structural integrity, and/or poor illumination. Use of PPE may increase these hazards because of reduced mobility, vision, agility, and dexterity. All personnel will exercise due caution when walking through areas of uneven terrain and undergrowth to ensure proper footing.
- 3.1.10 Traffic - Traffic hazards may exist during mobilization to and from the training facility. There may be road closures for construction or security reasons, possibly requiring detours/travel on secondary and/or unfamiliar roads in heavy traffic conditions. All personnel should confirm routes prior to departures, maintain a high level of awareness for vehicular, pedestrian, and road hazards while driving, and communicate relevant traffic information to the SO and other personnel. Inspect vehicles prior to traveling. Ensure that lights, signals are working and that the vehicle is current on maintenance (oil level, tire pressure, etc.). *Drive Defensively* - Remain alert and aware when operating a motor vehicle. Avoid distractions while driving (cell phone, eating, etc.). Monitor the road and traffic for changing conditions. Follow standard Region 5 field safety procedures as outlined in Regional Safety Manual.

Drivers shall maintain a safe speed at all times and shall not be allowed to operate vehicles in a reckless manner. Seat belts will be worn. In backing situations where the rear of the vehicle cannot be clearly seen, one person shall act as a ground guide to assist the driver. In situations where ground clearance and soil conditions are not known, one person shall dismount and act as a guide. It is also important to drive safely and obey the speed limits.

### **3.2 General Chemical Hazards**

- 3.2.1 Industrial Chemicals - Chemicals used in the exercise may include acetone, starch, laundry detergent and florescence powder.

MSDSs for the chemicals and calibration gas are located in Appendix D. In addition, generator equipment operators shall ensure that personnel do not linger or work near exhaust pipes, which may be emitting carbon monoxide.

### 3.3 General Biological Hazards

3.3.1 Bloodborne Pathogens - Bloodborne pathogens (BBPs) are pathogenic microorganisms which may be present in human blood and can cause disease in humans. These pathogens include, but are not limited to hepatitis B virus (HBV) and human immunodeficiency virus (HIV). A source of occupational exposure may occur when an employee gives First Aid and Cardio Pulmonary Resuscitation (CPR) to an individual who has infectious blood, or who handles or comes in contact with materials containing blood. The occupational exposure occurs when potentially infectious materials come in contact with the employees' eyes, mucous membranes, or non-intact skin through cuts and abrasions. Precautions to take against BBPs include Universal Precautions, which are an approach to infection control that dictates that all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV and other BBPs. Body substances, including feces, urine, or vomit are not included, unless they contain visible blood. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials. Work practice controls reduce the likelihood of exposure by altering the manner in which a task is performed. These include wearing gloves, other PPE, and critical barriers to eliminate contact with potentially contaminated fluids; washing hands and other skin surfaces immediately and thoroughly if contaminated with blood, or other body fluids to which universal precautions apply, or their potentially contaminated articles; limiting access to potentially contaminated areas; and properly cleaning up, containerizing, labeling and disposal of contaminated items.

#### 3.3.2 Animals, Insects, Poisonous Plants, and Etiological Agents

*Animal Bites* — Personnel should use extreme caution when in contact with strange animals. If bitten, seek medical attention immediately.

*Snake Bites* — Personnel should use extreme caution when working in areas known to be inhabited by snakes. Snake leggings or chaps should be worn as a precaution. If bitten, seek medical attention immediately.

*Insect Stings* — Hornet, wasp or bee stings, mosquito. Personnel should avoid the nesting areas of these insects. Personnel who are allergic to these insects should carry bee sting kits. Personnel may find repellants containing DEET effective in keeping these insects away.

*Poisonous Spiders* — Black widow or brown recluse. Wear gloves when working in areas where these spiders may be present. If bitten, seek medical attention immediately.

*Ticks* — Personnel should cover the skin when working in wooded areas as a precaution. Barring this, personnel should wear light colored clothing and tuck pants into socks. Personnel should also wear a repellant containing DEET. Personnel should use the buddy system and perform a tick check after exiting wooded areas. Suspected bites should be reported immediately.

*Poisonous Plants* — Personnel should use caution when working in wooded areas. Personnel should cover the skin as a precaution. Personnel may choose to wear Ivy

Block.

### 3.3.3 UV Light Exposure

Personnel should dress so as to cover as much exposed skin as possible. Personnel should use a sunscreen with a sun protection factor (SPF) of 30 or greater and should wear tinted safety glasses.

## 3.5 Physiological Hazards

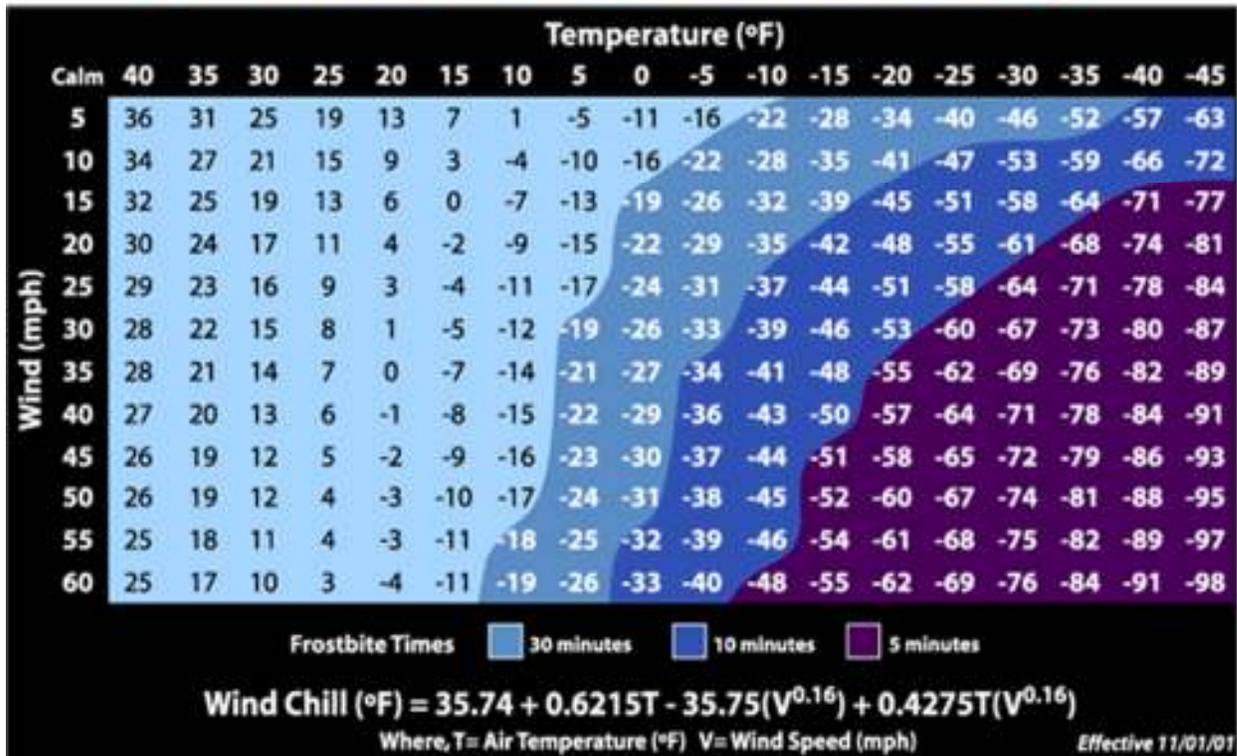
- 3.5.1 Cold Stress - All participants should monitor each other's speech, and appearance for signs and symptoms of cold-related injury including hypothermia and frostbite. The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold. Cool skin, muscle rigidity, low blood pressure, slowed or irregular pulse and apparent exhaustion and fatigue after rest manifest as hypothermia progresses and the core body temperature falls. Frostbite can occur without hypothermia when extremities do not receive sufficient heat from central body stores. Frostbite occurs when the fluids around the tissue cells freeze and usually affects the extremities, nose, and cheeks. Damage from frostbite can result in tissue death. Physical signs and symptoms of hypothermia and frost bite are discussed with workers daily and reviewed as necessary.

### **The NWS Windchill Chart**

NOAA's most recent NWS Windchill Chart is presented below. It was created in 2001 and is considered more accurate than earlier windchill charts because it uses the human face as a model, is based on modern heat transfer theory (which describes the physics of heat loss from the body to its surroundings on cold and breezy days), and it uses wind speed calculated at the average height of the human face (5 feet) instead of at 33 feet (the standard anemometer height). The chart describes the relationship between air temperature, wind speed, and the combined effect these factors have on the human body. It indicates exposure times within which frostbite is likely to occur to exposed skin. The likelihood of frostbite increases as temperatures decrease and wind speeds increase. At higher wind speeds the air removes heat faster than a person's metabolism and circulatory system replace it, resulting in conditions that can cause or promote frostbite. More information about wind chill, including an online windchill calculator is available at <http://www.nws.noaa.gov/om/windchill/>



# NWS Windchill Chart



## Cold Stress Disorders

Condition	Signs and Symptoms	First Aid
<p><b>Mild Hypothermia</b> Usually occurs when the core body temperature drops between 98 - 90°F</p>	<ul style="list-style-type: none"> <li>• Shivering;</li> <li>• Lack of coordination, stumbling, fumbling hands;</li> <li>• Slurred Speech;</li> <li>• Memory Loss; and/or</li> <li>• Pale, cold skin.</li> </ul>	<ul style="list-style-type: none"> <li>• Move to warm area;</li> <li>• Stay active;</li> <li>• Remove wet clothes and replace with dry clothes or blankets and cover head; and/or</li> <li>• Drink warm (not hot) sugary drink.</li> </ul>
<p><b>Moderate Hypothermia</b> Usually occurs when the core body temperature drops between 90 - 86°F</p>	<ul style="list-style-type: none"> <li>• Shivering stops;</li> <li>• Unable to walk to stand; and</li> <li>• Confused and irrational</li> </ul>	<ul style="list-style-type: none"> <li>• All of the above plus:</li> <li>• Call 911 for an ambulance</li> <li>• Cover all extremities; completely; and</li> <li>• Place very warm objects, such as hot packs or water bottles on the victim's head, neck, chest and groin.</li> </ul>
<p><b>Severe Hypothermia</b> Usually occurs when the core body temperature drops between 86 - 78°F</p>	<ul style="list-style-type: none"> <li>• Severe muscle stiffness;</li> <li>• Very sleepy or unconscious;</li> <li>• Ice cold skin; and</li> <li>• Death.</li> </ul>	<ul style="list-style-type: none"> <li>• Call 911 for an ambulance;</li> <li>• Treat the victim very gently; and</li> <li>• Do not attempt to re-warm. The victim should receive treatment in a hospital.</li> </ul>
<p><b>Frostbite</b> Usually occurs when the skin actually freezes and loses water. Frostbite usually occurs when temperatures are below 30°F. Wind chill factors can allow frostbite to occur in above freezing temperatures.</p>	<ul style="list-style-type: none"> <li>• Cold, tingling, stinging or aching feeling in the frostbitten area. This is followed by numbness;</li> <li>• Skin color turns red, then purple, then white or very pale. The skin is cold to the touch; and</li> <li>• Blistering in severe cases.</li> </ul>	<ul style="list-style-type: none"> <li>• Call 911 for an ambulance;</li> <li>• Do not rub the area;</li> <li>• Wrap frostbitten area with a soft cloth;</li> <li>• If help is delayed, immerse in warm, not hot, water. Do not pour water on affected area; and</li> <li>• Apply sterile dressings to blisters to prevent breaking.</li> </ul>
<p><b>Trench Foot</b> Usually occurs by having feet immersed in cold water for long periods of time. Similar to frostbite, but less severe</p>	<ul style="list-style-type: none"> <li>• Tingling, itching or burning sensation; and</li> <li>• Blisters may also be present.</li> </ul>	

3.5.2 Heat Stress - Physiological monitoring of workers in protective wear should commence when the adjusted ambient temperature reaches 65 degrees Fahrenheit (°F) or above, and always when wearing Level A/B/C PPE. Adjusted ambient temperature ( $t_{a\ adj}$ ) is the ambient temperature ( $t_a$ ) adjusted for solar radiation, and is calculated as:  $t_{a\ adj} \text{ } ^\circ\text{F} = t_a + (13 \times \% \text{sunshine})$ . Frequency of monitoring should increase as the ambient temperature increases or if slow recovery rates are indicated. Pre- and post- entry monitoring will be conducted for the Level A/C exercises. Medical monitoring will be conducted by trained medical personnel, and will include vital sign recording (heart rate, oral temperature, respiration rate, estimation of fluid loss and blood pressure) as well as questions on overall health and medical history. The SO, in coordination with the trained medical personnel and management staff, will make the final decision on physiological suitability for entry. Details such as rest period length and frequency and the consumption of fluids will be discussed during the heat stress monitoring program. Employees shall have access to break periods and drinking water as necessary. Any staff unavailability due to physiological factors will be communicated to the SO and other appropriate command and/or safety staff.

#### Heat Stress Prevention

Provide plenty of liquids. Drinking water is the single most important method of replacing body liquids lost through perspiration. Other drinks, such as 50% solution of fruit juice or the like in water, replace some fluids, but are not as effective as plain water. Be cautious about using other liquids, particularly alcoholic beverages or caffeine-containing liquids, such as coffee, tea, and most soft drinks, since these substances act as diuretics and cause a loss of fluids.

As a rule of thumb, water consumption should be approximately 80 ounces per day at a rate of 4 to 8 ounces every 15 minutes while in an exercising or physical labor mode, and 8 to 16 ounces after a period of physical activity is completed. If heat cramps symptoms are experienced, such as muscle cramps, ankle swelling or feeling faint, some electrolyte replacement such as sport drinks or a mixture of fruit juice and water may be needed. If heat exhaustion is experienced, a small amount of table salt with water and electrolyte drink can be used. A healthy diet and plenty of water are the essential ingredients for warding off heat related injuries.

Provide cooling devices. Cooling vests may be used to reduce body temperature and/or cool protective clothing. The amount and type of garments/clothing worn under PPE will be left to the preference of each individual. Cooling vests will be available at the Level A/C scenarios for participant use.

Adjustment of the work schedule. When practicable, the most labor-intensive tasks should be carried out during the coolest part of the day.

NOAA national weather service: heat index

		temperature (°F)															
		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
Relative Humidity (%)	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
100	87	95	103	112	121	132											

- Caution
- Extreme Caution
- Danger
- Extreme Danger

Effects of the heat index (shade values)

Celsius	Fahrenheit	Notes
27–32 °C	80–90 °F	Caution — fatigue is possible with prolonged exposure and activity. Continuing activity could result in <a href="#">heat cramps</a>
32–41 °C	90–105 °F	Extreme caution — <a href="#">heat cramps</a> and <a href="#">heat exhaustion</a> are possible. Continuing activity could result in <a href="#">heat stroke</a>
41–54 °C	105–130 °F	Danger — <a href="#">heat cramps</a> and <a href="#">heat exhaustion</a> are likely; <a href="#">heat stroke</a> is probable with continued activity
over 54 °C	over 130 °F	Extreme danger — <a href="#">heat stroke</a> is imminent

Exposure to full sunshine can increase heat index values by up to 8 °C (14 °F).

## Heat Stress Disorders

### HEAT RASH

CAUSE	SYMPTOMS	FIRST AID
Continuous exposure to heat and humidity; Aggravated by chafing clothing.	Appearance of red pimples around chaffed areas, accompanied by itching and tingling.	Remove sources of irritation. Rinse skin surface to remove sweat and dirt.

### HEAT CRAMPS

CAUSE	SYMPTOMS	FIRST AID
Insufficient replacement of electrolytes and body water lost through excessive sweating.	Stomach, leg, or arm cramps; muscle spasms in abdominal region; pale, wet skin; dizziness; extreme thirst.	Remove worker to contamination reduction zone. Remove protective clothing. Have worker drink cool water. Allow period of rest in cool location. If there is no improvement, transport worker to a medical facility.

### HEAT EXHAUSTION (SERIOUS)

CAUSE	SYMPTOMS	FIRST AID
Insufficient replacement of electrolytes and body water lost as a result of exertion in a hot environment and excessive sweating.	Same as heat cramps plus headache and weakness; worker may appear drunk, dizzy, or drowsy; skin is pale, cold, and moist.	Remove worker to the contamination reduction zone. Remove protective clothing. Elevate feet and loosen other clothing. If conscious, provide salt solution (1 tsp to 12 oz. H <sub>2</sub> O) to sip. Transport to nearest hospital.

### HEAT STROKE (VERY SERIOUS)

CAUSE	SYMPTOMS	FIRST AID
Prolonged exposure to high temperatures and failure of the body's cooling mechanism. More likely to strike a worker who is not acclimatized to heat or one who has suffered a previous heat injury.	Person may stop sweating; Skin is red and hot; victim may experience weakness, dizziness, confusion, headache, seizures, and nausea; respiration and pulse may be rapid and weak; unconsciousness and collapse may occur suddenly; body temperature sometimes reaches 106 to 110 degrees F,	Heat stroke is a medical emergency. Remove worker to contamination reduction zone. Immediately cool worker with ice packs to neck, groin, or underarms. If packs are not available spray or soak victim with cool water and fan body. Do not immerse in ice water. Do not try to give water to an unconscious victim. Rush worker to the nearest hospital.

#### 4.0 Medical Monitoring

Physiological monitoring of personnel wearing an impermeable protective ensemble will be conducted pre and post entry. The results must be recorded on a physiological monitoring data form. The Onsite Medical Monitoring form included in Appendix E will be fully completed for each participant of the Level A/C Scenarios. (See Appendix E, Onsite Medical Monitoring Form)

***Onsite EMT personnel will follow Onsite Medical Monitoring protocols in the U.S. EPA Emergency Responder Health and Safety Manual (Appendix E)***

- a. Heart Rate (HR) will be measured by a radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 70% of the worker's maximum heart rate (MHR). If the entry heart rate exceeds 70% MHR, the worker must not be allowed to conduct on-scene activities that contribute to physical stress. If the heart rate exceeds 110 beats per minute (bpm), shorten the next work period by one third and maintain the same rest period. Adjust work/ rest cycles as needed to achieve appropriate vital signs. See Appendix E for calculation of MHR. For convenience, Appendix E lists the average 70% MHR for several age ranges.
- b. Oral Temperature will be measured with a clinical or disposable thermometer, in accordance with manufacturer's instructions, pre and post entry (before drinking liquid). Oral temperature at the beginning of the rest period should not exceed 99.5°F. If the oral temperature exceeds 99.5°F at the beginning of the rest period, the worker must not be allowed to conduct on-scene activities that contribute to physical stress. If the exit oral temperature exceeds 99.7°F, shorten the next work cycle by one third and monitor carefully. If the exit oral temperature exceeds 101 °F, the worker must receive additional medical evaluation. Contact medical advisor for further guidance. Notify the Onsite Safety Officer of the status.
- c. Respiration Rate will be measured before donning PPE and after doffing PPE. EMT personnel will count breaths for one minute. If respirations exceed 24 breaths per minute, exclude worker from entry and check other vital signs (heart rate, blood pressure, temperature). EMT personnel will determine the exit respirations at the beginning of each rest period and then every 5 or 10 minutes until the entry rate is re-established. If an exit respiration rate does not return to within 10% of the pre-entry level within 10 minutes of stopping activities (and removing PPE), the worker must receive more medical evaluation (e.g., orthostatic vital signs). Contact the medical advisor for further guidance. Notify the Onsite Safety Officer of status.
- d. Blood Pressure will be measured with a clinical blood pressure digital monitor, in accordance with manufacturer's instructions. Blood pressure will be taken pre and post entry. If entry diastolic blood pressure (lower number) is above 105 mm-Hg, he or she must be prohibited from donning Level A or C PPE, informed that they are at increased risk of complications associated with hypertension (i.e., heart attack

or stroke), and encouraged to seek follow-up consultation with a doctor. If exit diastolic pressure (lower number) is not within 10 percent of the entry level within 10 minutes, continue taking vital signs every 5 to 10 minutes and consider obtaining orthostatic vital signs. Contact the medical advisor for further guidance. Notify the Onsite Safety Officer of status.

## 5.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following provides a general description of the PPE levels for each exercise venue.

Level A:                   Appropriate Work Clothes  
Surgical Inner Gloves  
Fully Encapsulating, Vapor-Tight Protective Suit with  
Integral Butyl/Rubber Gloves  
Chemical-Resistant Outer Boots  
SCBA  
Cooling Vest (participants option)  
Hard Hat

Level C:                   Appropriate Work Clothes  
Surgical Latex or Nitrile Gloves  
Steel-toed Work Boots  
Chemical Resistant Booties  
Tyvek  
APR / PAPR  
Hard Ha

Respiratory protective equipment shall be NIOSH-approved and use shall conform to 29 CFR Part 1910.134 (b) requirements. Each employer shall maintain a written respirator program detailing selection, use, cleaning, maintenance, and storage of respiratory protective equipment.

## 6.0 AIR MONITORING

*Air monitoring is not needed for H&S purposes for the training and exercise. This section is in the HASP as a training tool and for information purposes. Air monitoring will be utilized for practice and training purposes during the exercises.*

According to 29 CFR 1910.120 (h), air monitoring objectives may include any of the following:

- Identify and quantify airborne contaminants.
- Track changes in air contaminants that occur over time.
- Ensure proper selection of work practices and engineering controls.
- Determine the adequate level of worker protection.
- Assist in defining work zones.
- Identify additional medical monitoring needs in any given area.

### 6.1 General Requirements

Air monitoring using direct reading instruments shall be performed:

- Upon initial entry to rule out IDLH conditions.
- When the possibility of an IDLH condition or flammable atmosphere has developed.
- When work begins in a different area.
- When contaminants other than those previously identified are encountered.
- When a different type of operation is initiated.
- When employees are handling leaking drums or containers or working in areas with obvious contamination.
- During confined space entry (CSE) work.
- When prescribed by other applicable regulations.

Air monitoring will be conducted using the instrument listed in Section 5.2. All air monitoring data will be documented and submitted to the SO, and made available in the command post (CP) exercise files for review by all interested persons. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications. Additional air monitoring may be required if an incident arises which results in the release of hazardous substances.

## 6.2 Site Specific Requirements

Compounds Instrument	To Detect	Action Level
Combustible Gas Indicator (CGI)	Explosive/ Flammable Atmospheres	<10% LEL: Continue work and monitoring, apply engineering controls. >10% LEL: Exit area immediately.
Oxygen Meter	<ul style="list-style-type: none"> <li>• Oxygen %</li> <li>• Flammability risk.</li> <li>• Sufficient O<sub>2</sub> for accurate CGI readings.</li> </ul>	<p>&lt;19.5%: Exit (SCBA required; COI not valid).</p> <p>19.5-20%: Increase monitoring, apply engineering controls.</p> <p>20-21.5%: Continue operations</p> <p>21.5-23.5%: Identify source, increase monitoring, and apply engineering controls.</p> <p>&gt;23.5%: Cease operations, identify source.</p>
PID	Total unknown volatile gases and vapors.	<p>Background (BKGD) to 1 unit above BKGD: Level D.</p> <p>1 to 5 units above BKGD: Level C.</p> <p>&gt;5 to 500 units above BKGD: Level B.</p> <p>&gt;500 units above BKGD: Level A.</p>
PID	Known volatile gases and vapors.	To be determined based on half of the OSHA PEL for the specific compound.
Multi Gas Meter	To Be Determined	To be determined

Additional air monitoring may be required based on materials found on site or if an incident arises which results in the release of hazardous substances. This monitoring data will be utilized to assess site conditions and to design further removal action objectives.

## 7.0 SITE CONTROL MEASURES

The primary purpose for site control measures and work zone delineation is to establish the hazardous area perimeter, to reduce migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. In the event of a response, work zones will be delineated. The specific layout of these zones will be determined by the SO or designated representative prior to and during incident mobilization. Their location shall take into consideration site characteristics such as topography, site structures, wind direction, access points, and space constraints, and may change as site conditions change.

### 7.1 Designation of Work Zones at a Site

Specific areas of a site will be divided into three zones:

- The Exclusion Zone (EZ): the area which is known to be or has the potential for becoming, contaminated by the work performed.
- The Contamination Reduction zone (CRZ): the area between the EZ and the Clean Zone (CZ). The Contamination Reduction Corridor (CRC) will be located within the CRZ and serve as the area within which personnel and equipment will be decontaminated. This corridor will be the normal entry and exit path for the EZ. Their location shall take into consideration site characteristics such as wind direction, access points, and space constraints.
- The CZ: the area which is not contaminated.

### 7.2 Security Procedures

Security at the exercise will be maintained by designated personnel. All staff will follow the Buddy System in all activities, and remain in the Pokagon State Park unless the alternate location is selected due to inclement weather. Local public safety staff will be contacted as needed.

## 8.0 EMERGENCY RESPONSE PLAN

Personnel must be prepared for emergencies which include, but are not limited to: illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, structural collapses, releases of harmful contaminants, or sudden changes in the weather. The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate. An emergency should be defined as an unexpected occurrence which creates an unsafe work environment.

### 8.1 Emergency Contacts

There will be an emergency contact list to be filled out by all participants, facilitators, instructors, and observers. Please fill out this form by listing your emergency contact name and their phone number. Potawatomi Inn will be providing a hotel room list every evening to the SO for all individuals under the EPA reservation.

While at Pokagon State Park, emergency services can be contacted through 911.

Fire: 911

Police: 911

Poison Control Center telephone number: 1-800-222-1222 National/ 1-800-382-9097 Indiana

Emergency First Aid/CPR kits will be provided in compliance with OSHA Standard 29 CFR 1910.151 and will be kept at each of the exercise venue.

Hospital:

Address/Location

Cameron Memorial Community Hospital

416 E. Maumee Street

Angola, Indiana

260.665.2141

Chemical Trauma Capabilities? Yes or **No**

Hospital:

Address/Location:

DeKalb Memorial Hospital

1316 East Seventh Street

Auburn, Indiana 46706

260.925.4600

Chemical Trauma Capabilities? **Yes** or No

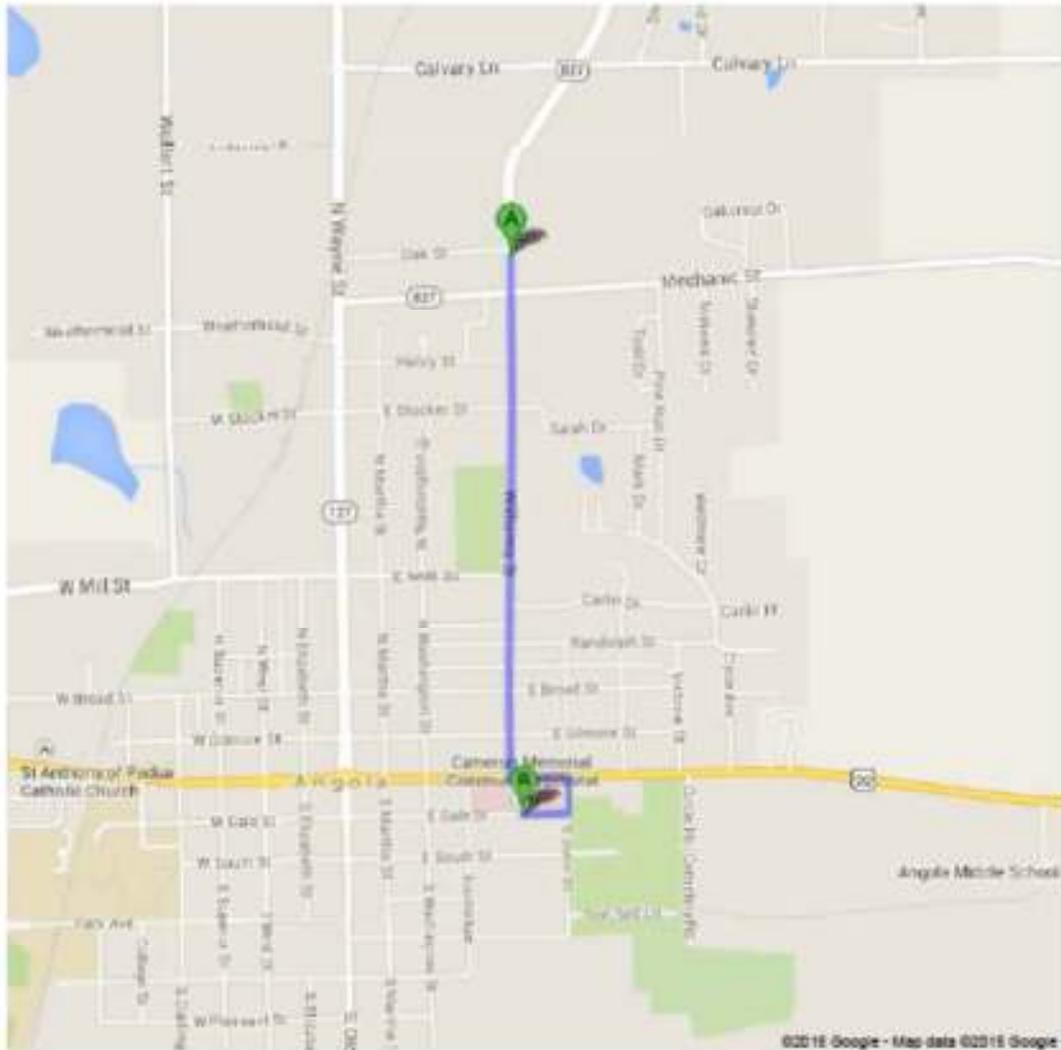
Directions from the National Guard Armory and the Pokagon State Park to the hospitals can be found on the following pages.

8.2 Route to Hospital Maps

National Guard Armory  
904 Williams St  
Angola, Indiana 46706

TO

Cameron Memorial Hospital  
416 E. Maumee Street  
Angola, Indiana 46703  
260.665.2141



**National Guard Army**

904 Williams Street, Angola, IN 46703 - (260) 665-3461

1. Head south on Williams St toward Mechanic St  
About 2 mins go 0.8 mi  
total 0.8 mi
2. Turn left onto E Maumee St go 440 ft  
total 0.9 mi
3. Turn right at the 1st cross street onto S John St go 308 ft  
total 0.9 mi
4. Turn right onto E Gale St  
Destination will be on the right go 348 ft  
total 1.0 mi



**Cameron Memorial Community Hospital, East Maumee Street, Angola, IN**

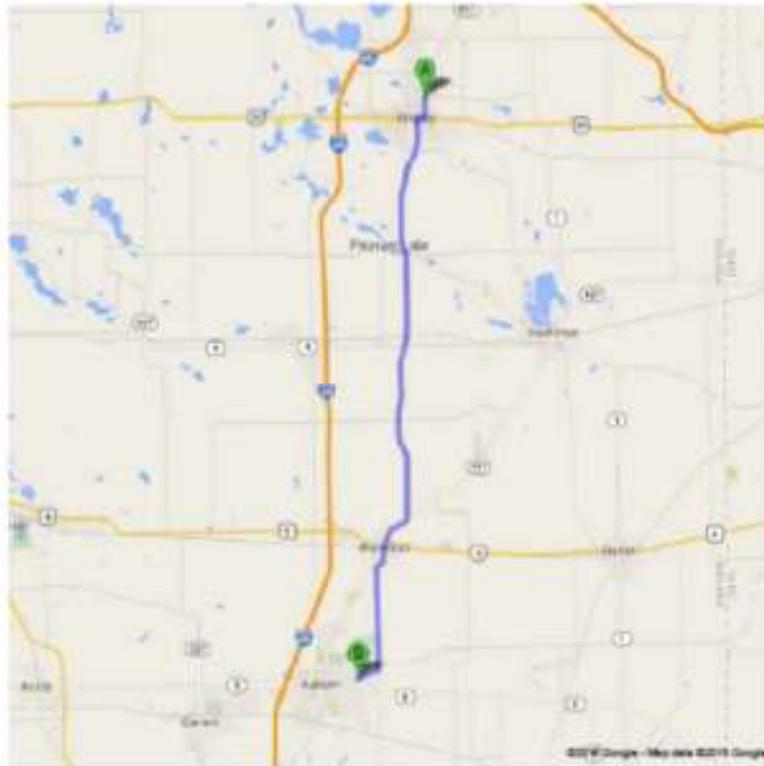
These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2015 Google

National Guard Armory  
904 Williams St  
Angola, Indiana 46706

TO

DeKalb Memorial Hospital  
1316 East Seventh Street  
Auburn, Indiana 46706  
260.925.4600



**A National Guard Armory**  
 904 Williams Street, Angola, IN 46703 - (260) 665-3461

- |   |                             |
|---|-----------------------------|
| 1. Head south on Williams St toward Mechanic St<br>About 2 mins                             | go 0.8 mi<br>total 0.8 mi   |
| ➤ 2. Turn right onto E Maumee St  | go 0.2 mi<br>total 1.0 mi   |
| ➤ 3. At the traffic circle, take the 3rd exit onto S Public Square                          | go 322 ft<br>total 1.1 mi   |
| 4. Continue straight onto S Wayne St<br>About 1 min   | go 0.7 mi<br>total 1.8 mi   |
| 5. Continue onto Old 27/Old US Hwy 27<br>Continue to follow Old US Hwy 27<br>About 15 mins  | go 12.5 mi<br>total 14.3 mi |
| ↗ 6. Slight right onto IN-427 S/N Wayne St<br>Continue to follow N Wayne St<br>About 4 mins | go 2.1 mi<br>total 16.3 mi  |
| ↶ 7. Turn left onto Co Rd 35/S Center St<br>Continue to follow Co Rd 35<br>About 5 mins     | go 3.4 mi<br>total 19.7 mi  |
| ➤ 8. Turn right onto Co Rd 40A<br>About 52 secs   | go 0.4 mi<br>total 20.2 mi  |
| 9. Continue onto Wesley Rd  | go 0.3 mi<br>total 20.5 mi  |

**B DeKalb Memorial Hospital Maumee Street, Angola, IN**

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Pokagon State Park, Angola, Indiana

TO

Cameron Memorial Hospital  
416 E. Maumee Street  
Angola, Indiana 46703  
260.665.2141



**Pokagon State Park 450 Lane 100 Lake James, Angola, IN 46703**



1. Start out going **southeast** on **W IN-727 / IN-727** toward **IN-127**. Continue to follow **W IN-727**. **0.3MI**



2. Turn **right** onto **N IN-127 / IN-127 S**. Continue to follow **N IN-127**. **5.0MI**



3. Enter next roundabout and take the 3rd exit onto **E Maumee St / US-20**. **0.3MI**

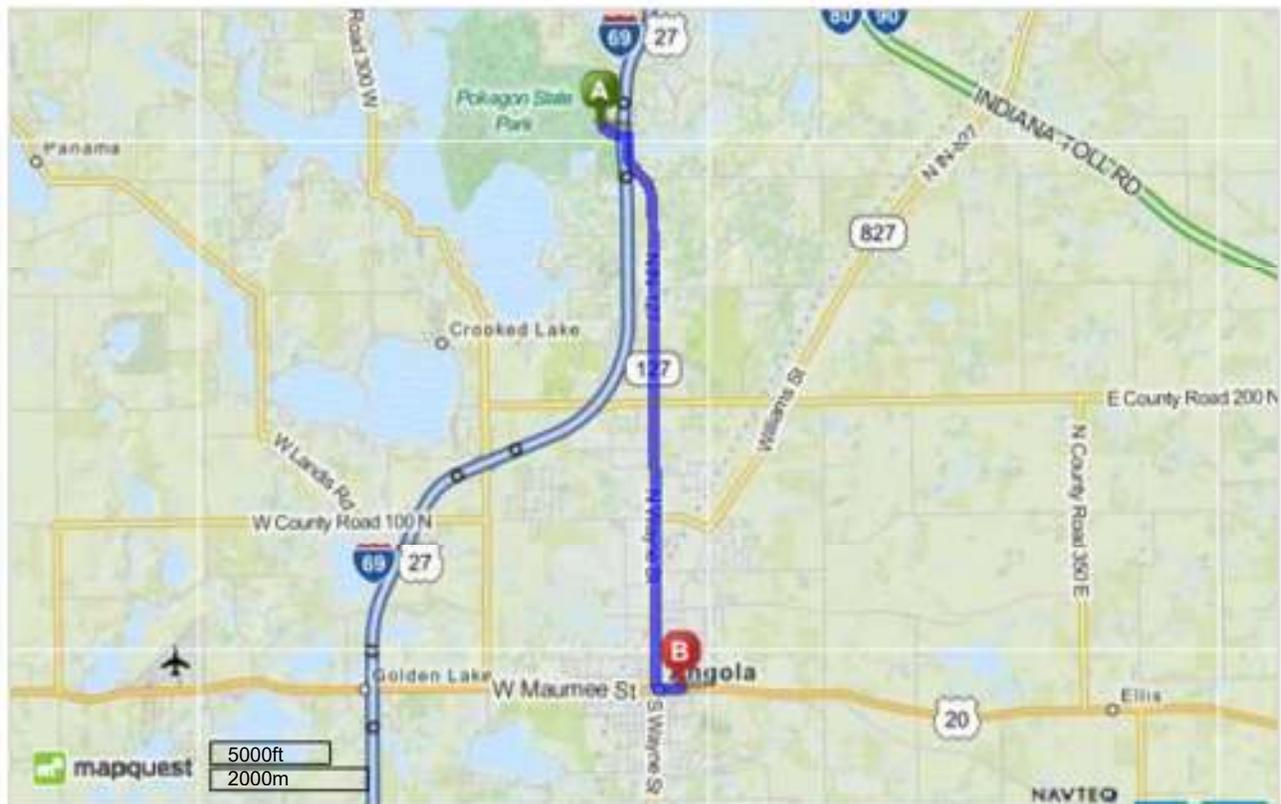


4. **416 E MAUMEE ST** is on the right.



**Cameron Memorial Hospital 416 E Maumee St, Angola, IN 46703-2015**

Total Travel Estimate: **5.54 miles - about 10 minutes**



Pokagon State Park, Angola, Indiana

TO

DeKalb Memorial Hospital  
1316 East Seventh Street  
Auburn, Indiana 46706  
260.925.4600



**Pokagon State Park 450 Lane 100 Lake James, Angola, IN 46703**



1. Start out going **southeast** on **W IN-727 / IN-727** toward **IN-127**. Continue to follow **W IN-727**. **0.2 MI**



2. Merge onto **I-69 S / US-27 S** toward **Fort Wayne**. **24.7 MI**



3. Take the **IN-8** exit, **EXIT 129**, toward **Auburn / Garrett**. **0.3 MI**



4. Turn **left** onto **IN-8**. **2.4 MI**



5. **1316 E 7TH ST.**



**DeKalb Memorial Hospital 1316 E 7th St, Auburn, IN 46706-2523**

Total Travel Estimate: **27.59 miles - about 29 minutes**



### 8.3 Emergency Equipment

Emergency Alarms/Horns: Three Horn/Whistle Blasts means "Stop Exercise"

#### Medical Equipment

First Aid Kits: Level A / C Venues

#### Fire-Fighting Equipment

Fire Extinguishers: Level A/C Venues

### 8.4 Emergency Contingency Plan

For severe weather (i.e. tornado, thunderstorms, lightning, etc.) seek shelter inside the armory.

In the event of an emergency during the FSE, the SO will coordinate and initiate the emergency contingency plan as applicable. The SO will initiate emergency procedures when activities are judged to involve an imminent danger condition. The activities conducted will vary, depending on the nature and severity of the emergency. The SO must assess possible hazards to, human health or the environment that may result from any emergency situation. The Emergency Contingency Plan will be implemented in any of the following situations:

- 1) A fire, hazardous materials release, or terrorist act, or the threat of one, occurs, which could create a threat of imminent danger or harm to the personnel in a given area.
- 2) Severe weather conditions including, but not limited to, tornadoes, hurricanes, severe wind/rain storms, or lightning storms.

The initial response to any emergency will be directed toward protecting human health and safety, and then the environment. Secondary considerations will be contaminant identification, containment, treatment, and disposal. If an emergency is beyond the capabilities of the operating crew, the SO will notify the Local Fire and Police Departments, and any other appropriate agencies.

### 8.5 Evacuation Plan

The first person recognizing an emergency situation that threatens human health or the environment shall notify the SO or designated representative, who will evaluate the situation and determine the need for an evacuation. The evacuation plan consists of either evacuation of the site or shelter-in-place at the site.

Emergency signal will be transmitted by siren, air horn, whistle or other mechanisms, along with further instructions concerning the nature of the emergency and emergency instructions.

The emergency meeting point (EMP) for the FSE will be at the southwest corner of the main parking lot of the armory. Personnel should proceed to the EMP in a rapid but calm manner, escorting any

visitors that they are responsible for. Personnel are to take note, before leaving, of where the emergency situation exists so they do not jeopardize their safety by walking into that area. Machinery and equipment will be shut off if appropriate and possible. Once at the EMP, personnel head counts will be taken by the various organizations' team leaders to ensure all staff are accounted for, and further instructions will be given. The SO will further direct actions as necessary and initiate proper notification procedures for the agencies involved, including the U.S. EPA Area Command. In the event that evacuation is not possible or desirable, shelter-in-place procedures shall be instituted. Shelter-in-place procedures consist of proceeding immediately to a place of refuge, which will be site-specific. These evacuation procedures may be modified during the deployment, and information on these procedures will be discussed during the daily safety meetings.

### **Inclement Weather**

The SO or designated representative will monitor weather reports issued by the local media and the National Weather Service (NWS) as needed, and be notified immediately in the event of impending storms. Weather monitoring will be increased when signs of impending storms, including darkening skies, increased wind, heavy rain, or thunder/lightning, are noticed. SO/ASO will notify exercise participants and observers of Tornado Watches and Tornado Warnings. During Tornado Warnings, they will inform seek shelter along the wall of the walls of the gymnasium in the armory.

The general rule for lightning is "If You See It, Flee It; If You Hear It, Clear It." The flash/bang (f/b) technique may be used to estimate distance to lightning, although using this method requires accurate matching of lightning to thunder, which may not always be possible. The f/b technique is defined as: for each five seconds from the time of observed lightning flash to hearing the associated thunder, the lightning is one mile away. All outside activities will be suspended when a lightning flash is observed in the immediate area, or an f/b of 30 seconds (6 miles) or less is noted. Safe areas include fully enclosed metal vehicles with windows up, and substantial and permanent buildings. Unsafe areas include small structures such as huts and rain shelters, nearby metallic objects like fences, gates, instrumentation, electrical equipment, wires, and power poles. Personnel may continue indoor work activities except for the use of electrical equipment, telephones, and computers. Upon suspension of site activities, all site personnel will gather in a safe location in the support zone for a head count and further instructions. Activities may resume when 30 minutes has passed since the last observable f/b of 30 seconds or less. If a sudden lightning storm catches personnel in an exposed area, they should seek the lowest possible area, away from large objects which may attract lightning or fall over, and assume a crouching position with head lowered. AREAS TO AVOID INCLUDE WATER, TREES, UTILITY POLES, HIGH GROUND, HEAVY EQUIPMENT, AND ALL TALL, ISOLATED OBJECTS. A person struck by lightning needs immediate, professional medical assistance (contact 911). The body will not carry an electrical charge, so personnel trained in first aid/CPR should assist with treatment for shock and/or burns until professional medical assistance is available.

9.0 HEALTH AND SAFETY PLAN ACKNOWLEDGMENT

91 Acceptance Log

I accept this Health and Safety Plan for the FSE Exercise. It adequately provides for the health and safety of site persons.

---

Jacob Hassan, Incident Commander  
U.S. EPA Region V

Date

---

Keith Fusinski, Health and Safety Officer  
U.S. EPA Region V

Date



APPENDIX A  
HEALTH AND SAFETY PLAN AMENDMENTS



HEALTH and SAFETY PLAN AMENDMENTS  
REGION V FSE EXERCISE

All amendments to the Safety Plan will be incorporated into the text (as applicable) and documented below.

HEALTH AND SAFETY PLAN AMENDMENT # : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DATE: \_\_\_\_\_

REASON FOR AMENDMENT: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ALTERNATE SAFEGUARD PROCEDURES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

REQUIRED CHANGES IN PPE: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
U.S. EPA OSC (Date)

\_\_\_\_\_  
U.S. EPA SO (Date)

\_\_\_\_\_  
Other Agency Lead (Date)

\_\_\_\_\_  
Other Agency Lead (Date)

APPENDIX B  
FIGURES



Figure 1. General Locations of Potawatomi Inn and Exercise Venue (Armory)



Figure 2. Layout of Exercise Venue (Armory)

2018 FSE Venue



Figure 3. Venue (Armory) Layout

APPENDIX C  
MOBE IAP

APPENDIX D  
MATERIAL SAFETY DATA SHEET (MSDS)  
(TO BE ADDED TO HARD COPY)

### SECTION: 1. Product and company identification

#### 1.1. Product identifier

Product form : Substance  
Name : Hydrogen, compressed  
CAS No : 1333-74-0  
Formula : H<sub>2</sub>  
Other means of identification : Dihydrogen, parahydrogen, refrigerant gas R702, water gas

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use. Use as directed.

#### 1.3. Details of the supplier of the safety data sheet

Praxair, Inc.  
10 Riverview Drive  
Danbury, CT 06810-6268 - USA  
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146  
[www.praxair.com](http://www.praxair.com)

#### 1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week  
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887  
(collect calls accepted, Contract 17729)

### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Flam. Gas 1    H220  
Compressed gas    H280

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02

GHS04

Signal word (GHS-US) :

DANGER

Hazard statements (GHS-US) :

H220 - **EXTREMELY FLAMMABLE GAS**  
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION  
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR  
CGA-HG08 - BURNS WITH INVISIBLE FLAME

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood  
P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking  
P271+P403 - Use and store only outdoors or in a well-ventilated place  
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely  
P381 - Eliminate all ignition sources if safe to do so  
CGA-PG05 - Use a back flow preventive device in the piping  
CGA-PG10 - Use only with equipment rated for cylinder pressure  
CGA-PG12 - Do not open valve until connected to equipment prepared for use  
CGA-PG06 - Close valve after each use and when empty  
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

### 2.3. Other hazards

Other hazards not contributing to the classification : None.

### 2.4. Unknown acute toxicity (GHS US)

No data available

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Name : Hydrogen, compressed  
 CAS No : 1333-74-0

Name	Product identifier	%
Hydrogen	(CAS No) 1333-74-0	99.5 - 100

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects, both acute and delayed

No additional information available

### 4.3. Indication of any immediate medical attention and special treatment needed

None.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, dry chemical powder, water spray, fog.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : **EXTREMELY FLAMMABLE GAS.** The hydrogen flame is nearly invisible. Hydrogen has a low ignition energy; escaping hydrogen gas may ignite spontaneously. A fireball forms if the gas cloud ignites immediately after release. Hydrogen forms explosive mixtures with air and oxidizing agents.

Explosion hazard : **EXTREMELY FLAMMABLE GAS.** Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described below.

### 5.3. Advice for firefighters

Firefighting instructions : If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

# Hydrogen, compressed

## Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980    Revision date: 10/17/2016    Supersedes: 06/03/2015

Protection during firefighting	: Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
Special protective equipment for fire fighters	: Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	: Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems
	Stop flow of product if safe to do so
	Use water spray or fog to knock down fire fumes if possible.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : **DANGER: EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.** See section 5. Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition. if safe to do so. Reduce gas with fog or fine water spray. Stop flow of product if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable gas may spread from leak. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

##### 6.1.1. For non-emergency personnel

No additional information available

##### 6.1.2. For emergency responders

No additional information available

#### 6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

#### 6.3. Methods and material for containment and cleaning up

No additional information available

#### 6.4. Reference to other sections

See also sections 8 and 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

# Hydrogen, compressed

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### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post "No Smoking/No Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Hydrogen, compressed (1333-74-0)

ACGIH	Not established
USA OSHA	Not established

#### Hydrogen (1333-74-0)

ACGIH	Remark (ACGIH)	Simple asphyxiant
USA OSHA	Not established	

### 8.2. Exposure controls

Appropriate engineering controls : Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. **MECHANICAL (GENERAL): Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting.

Eye protection : Wear safety glasses with side shields.

Respiratory protection : An air-supplied respirator must be used while working with this product in confined spaces. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.

Thermal hazard protection : None necessary.

Other information : Consider the use of flame resistant anti-static safety clothing. Wear safety shoes while handling containers.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 2 g/mol

Color : Colorless.

Odor : Odorless.

Odor threshold : No data available

pH : Not applicable.

Relative evaporation rate (butyl acetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable.

Melting point : -259.2 °C (-434.56°F)

# Hydrogen, compressed

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Freezing point	: No data available
Boiling point	: -252.9 °C (-422.97°F)
Flash point	: No data available
Critical temperature	: -239.9 °C (-399.82°F)
Auto-ignition temperature	: 566 °C (1051°F)
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: Not applicable.
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Density	: 0.089 g/l (0.0056 lb/ft3) (at STP = 0°C and 1atm)
Relative gas density	: 0.07
Solubility	: Water: 1.6 mg/l
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Explosion limits	: 4 - 77 vol %

### 9.2. Other information

Gas group	: Compressed gas
Additional information	: BURNS WITH INVISIBLE FLAME

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No reactivity hazard other than the effects described below.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Can form explosive mixture with air. May react violently with oxidants.

### 10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

### 10.5. Incompatible materials

Oxidizing agents. Lithium. Halogens.

### 10.6. Hazardous decomposition products

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

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

#### Hydrogen, compressed ( 1333-74-0

LC50 inhalation rat (ppm)	> 15000 ppm/1h
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#### Hydrogen (1333-74-0)

LC50 inhalation rat (ppm)	> 15000 ppm/1h
---------------------------	----------------

# Hydrogen, compressed

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Skin corrosion/irritation	: Not classified
	pH: Not applicable.
Serious eye damage/irritation	: Not classified
	pH: Not applicable.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

#### 12.2. Persistence and degradability

Hydrogen, compressed (1333-74-0)	
Persistence and degradability	No ecological damage caused by this product.

Hydrogen (1333-74-0)	
Persistence and degradability	No ecological damage caused by this product.

#### 12.3. Bioaccumulative potential

Hydrogen, compressed (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Hydrogen (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

#### 12.4. Mobility in soil

Hydrogen, compressed (1333-74-0)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

Hydrogen (1333-74-0)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

#### 12.5. Other adverse effects

Effect on ozone layer : None

Effect on the global warming : No known effects from this product

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

# Hydrogen, compressed

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### SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1049 Hydrogen, compressed, 2.1  
 UN-No.(DOT) : UN1049  
 Proper Shipping Name (DOT) : Hydrogen, compressed  
 Class (DOT) : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115  
 Hazard labels (DOT) : 2.1 - Flammable gas



DOT Special Provisions (49 CFR 172.102) : N89 - When steel UN pressure receptacles are used, only those bearing the "H" mark are authorized

#### Additional information

Emergency Response Guide (ERG) Number : 115 (UN1049)  
 Other information : No supplementary information available.  
 Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:  
 - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

#### Transport by sea

UN-No. (IMDG) : 1049  
 Proper Shipping Name (IMDG) : HYDROGEN, COMPRESSED  
 Class (IMDG) : 2 - Gases  
 MFAG-No : 115

#### Air transport

UN-No. (IATA) : 1049  
 Proper Shipping Name (IATA) : Hydrogen, compressed  
 Class (IATA) : 2  
 Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

##### Hydrogen, compressed (1333-74-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Fire hazard
-------------------------------------	--

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

# Hydrogen, compressed

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### 15.2. International regulations

#### CANADA

##### Hydrogen, compressed (1333-74-0)

Listed on the Canadian DSL (Domestic Substances List)

##### Hydrogen (1333-74-0)

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

##### Hydrogen, compressed (1333-74-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

#### 15.2.2. National regulations

##### Hydrogen, compressed (1333-74-0)

Listed on the AICS (Australian Inventory of Chemical Substances)  
 Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
 Listed on the Korean ECL (Existing Chemicals List)  
 Listed on NZIoC (New Zealand Inventory of Chemicals)  
 Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
 Listed on INSQ (Mexican National Inventory of Chemical Substances)

### 15.3. US State regulations

#### Hydrogen, compressed(1333-74-0)

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

#### Hydrogen (1333-74-0)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

#### Hydrogen (1333-74-0)

U.S. - Massachusetts - Right To Know List  
 U.S. - New Jersey - Right to Know Hazardous Substance List  
 U.S. - Pennsylvania - RTK (Right to Know) List

# Hydrogen, compressed

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### SECTION 16: Other information

**Other information**

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

Praxair SDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from [www.praxair.com](http://www.praxair.com). If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (Phone: 1-800-PRAXAIR/1-800-772-9247; Address: Praxair Call Center, Praxair, Inc, P.O. Box 44, Tonawanda, NY 14151-0044)

PRAXAIR and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.

**NFPA health hazard**

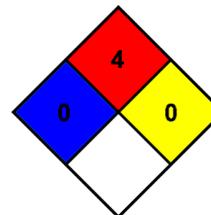
: 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

**NFPA fire hazard**

: 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

**NFPA reactivity**

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



**HMIS III Rating**

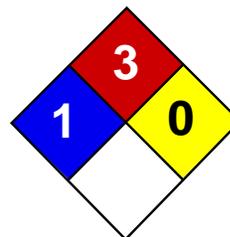
Health : 0 Minimal Hazard - No significant risk to health

Flammability : 4 Severe Hazard

Physical : 3 Serious Hazard

SDS US (GHS HazCom 2012) - Praxair

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*



Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet Acetone MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Acetone

**Catalog Codes:** SLA3502, SLA1645, SLA3151, SLA3808

**CAS#:** 67-64-1

**RTECS:** AL3150000

**TSCA:** TSCA 8(b) inventory: Acetone

**CI#:** Not applicable.

**Synonym:** 2-propanone; Dimethyl Ketone; Dimethylformaldehyde; Pyroacetic Acid

**Chemical Name:** Acetone

**Chemical Formula:** C3-H6-O

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Acetone	67-64-1	100

**Toxicological Data on Ingredients:** Acetone: ORAL (LD50): Acute: 5800 mg/kg [Rat]. 3000 mg/kg [Mouse]. 5340 mg/kg [Rabbit]. VAPOR (LC50): Acute: 50100 mg/m 8 hours [Rat]. 44000 mg/m 4 hours [Mouse].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. The substance is toxic to central nervous system (CNS). The substance may be toxic to kidneys, the reproductive system, liver, skin. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 465°C (869°F)

**Flash Points:** CLOSED CUP: -20°C (-4°F). OPEN CUP: -9°C (15.8°F) (Cleveland).

**Flammable Limits:** LOWER: 2.6% UPPER: 12.8%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of oxidizing materials, of acids.

**Fire Fighting Media and Instructions:**

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:** Vapor may travel considerable distance to source of ignition and flash back.

**Special Remarks on Explosion Hazards:**

Forms explosive mixtures with hydrogen peroxide, acetic acid, nitric acid, nitric acid + sulfuric acid, chromic anhydride, chromyl chloride, nitrosyl chloride, hexachloromelamine, nitrosyl perchlorate, nitryl perchlorate, permonosulfuric acid, thiodiglycol + hydrogen peroxide, potassium ter-butoxide, sulfur dichloride, 1-methyl-1,3-butadiene, bromoform, carbon, air, chloroform, thitriazylperchlorate.

## Section 6: Accidental Release Measures

**Small Spill:**

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

**Large Spill:**

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Section 7: Handling and Storage****Precautions:**

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, acids, alkalis.

**Storage:**

Store in a segregated and approved area (flammables area) . Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Keep away from direct sunlight and heat and avoid all possible sources of ignition (spark or flame).

**Section 8: Exposure Controls/Personal Protection****Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 500 STEL: 750 (ppm) from ACGIH (TLV) [United States] TWA: 750 STEL: 1000 (ppm) from OSHA (PEL) [United States] TWA: 500 STEL: 1000 [Australia] TWA: 1185 STEL: 2375 (mg/m3) [Australia] TWA: 750 STEL: 1500 (ppm) [United Kingdom (UK)] TWA: 1810 STEL: 3620 (mg/m3) [United Kingdom (UK)] TWA: 1800 STEL: 2400 from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

**Section 9: Physical and Chemical Properties**

**Physical state and appearance:** Liquid.

**Odor:** Fruity. Mint-like. Fragrant. Ethereal

**Taste:** Pungent, Sweetish

**Molecular Weight:** 58.08 g/mole

**Color:** Colorless. Clear

**pH (1% soln/water):** Not available.

**Boiling Point:** 56.2°C (133.2°F)

**Melting Point:** -95.35 (-139.6°F)

**Critical Temperature:** 235°C (455°F)

**Specific Gravity:** 0.79 (Water = 1)

**Vapor Pressure:** 24 kPa (@ 20°C)

**Vapor Density:** 2 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 62 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in water;  $\log(\text{oil/water}) = -0.2$

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water.

**Solubility:** Easily soluble in cold water, hot water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Excess heat, ignition sources, exposure to moisture, air, or water, incompatible materials.

**Incompatibility with various substances:** Reactive with oxidizing agents, reducing agents, acids, alkalis.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

### Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3000 mg/kg [Mouse]. Acute toxicity of the vapor (LC50): 44000 mg/m<sup>3</sup> 4 hours [Mouse].

### Chronic Effects on Humans:

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. Causes damage to the following organs: central nervous system (CNS). May cause damage to the following organs: kidneys, the reproductive system, liver, skin.

### Other Toxic Effects on Humans:

Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:** Not available.

### Special Remarks on Chronic Effects on Humans:

May affect genetic material (mutagenicity) based on studies with yeast (*S. cerevisiae*), bacteria, and hamster fibroblast cells. May cause reproductive effects (fertility) based upon animal studies. May contain trace amounts of benzene and formaldehyde which may cancer and birth defects. Human: passes the placental barrier.

### Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: May cause skin irritation. May be harmful if absorbed through the skin. Eyes: Causes eye irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. Inhalation: Inhalation at high concentrations affects the sense organs, brain and causes respiratory tract irritation. It also may affect the Central Nervous System (behavior) characterized by dizziness, drowsiness, confusion, headache, muscle weakness, and possibly motor incoordination, speech abnormalities, narcotic effects and coma. Inhalation may also affect the gastrointestinal tract (nausea, vomiting). Ingestion: May cause irritation of the digestive (gastrointestinal) tract (nausea, vomiting). It may also

affect the Central Nervous System (behavior), characterized by depression, fatigue, excitement, stupor, coma, headache, altered sleep time, ataxia, tremors as well as the blood, liver, and urinary system (kidney, bladder, ureter) and endocrine system. May also have musculoskeletal effects. Chronic Potential Health Effects: Skin: May cause dermatitis. Eyes: Eye irritation.

## Section 12: Ecological Information

### Ecotoxicity:

Ecotoxicity in water (LC50): 5540 mg/l 96 hours [Trout]. 8300 mg/l 96 hours [Bluegill]. 7500 mg/l 96 hours [Fathead Minnow]. 0.1 ppm any hours [Water flea].

**BOD5 and COD:** Not available.

### Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

### Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Acetone UNNA: 1090 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Benzene California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Benzene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Benzene, Formaldehyde Connecticut hazardous material survey.: Acetone Illinois toxic substances disclosure to employee act: Acetone Illinois chemical safety act: Acetone New York release reporting list: Acetone Rhode Island RTK hazardous substances: Acetone Pennsylvania RTK: Acetone Florida: Acetone Minnesota: Acetone Massachusetts RTK: Acetone Massachusetts spill list: Acetone New Jersey: Acetone New Jersey spill list: Acetone Louisiana spill reporting: Acetone California List of Hazardous Substances (8 CCR 339): Acetone TSCA 8(b) inventory: Acetone TSCA 4(a) final test rules: Acetone TSCA 8(a) IUR: Acetone

### Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

### Other Classifications:

### WHMIS (Canada):

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**

R11- Highly flammable. R36- Irritating to eyes. S9- Keep container in a well-ventilated place. S16- Keep away from sources of ignition - No smoking. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

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

**Health:** 1

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

**Section 16: Other Information****References:**

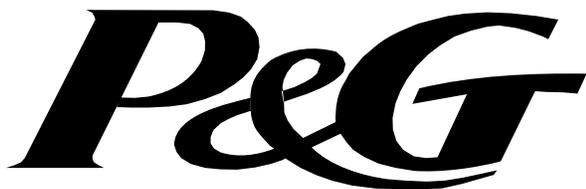
-Material safety data sheet issued by: la Commission de la Santé et de la Sécurité du Travail du Québec. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. LOLI, RTECS, HSDB databases. Other MSDSs

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:13 PM

**Last Updated:** 05/21/2013 12:00 PM

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## MATERIAL SAFETY DATA SHEET

MSDS: RQ0906459, RQ0904753  
RQ0701819, RQ0701482

Issue Date: 11/09/09

### SECTION I - PRODUCT IDENTIFICATION

Identity: **Liquid Laundry Detergent** (All 2X Concentrated Variations for Retail\*)

This MSDS applies to the following Liquid 2X Gain Detergent Brands:

Gain with A Touch of Softness Simply Fresh,  
Gain with A Touch of Softness Cotton Fresh

Emergency Telephone Number: 24hr P&G Operator – 1-800-888-4246

\* This MSDS applies to all uses/handling of these products in a retail package for consumer home use.

### SECTION II - HAZARDS IDENTIFICATION

#### Health Hazards (Acute and Chronic):

Ingestion: May cause transient gastrointestinal irritation.  
Eye Contact: May cause mild, transient irritation.  
Inhalation: Transient irritation with prolonged exposure to concentrated material.

#### Signs and Symptoms of Exposure:

Ingestion: May result in nausea, vomiting, and/or diarrhea.  
Eye Contact: May cause stinging, tearing, itching, swelling, and/or redness.  
Skin: Prolonged contact with concentrated material may be drying or transiently irritating to skin.

### SECTION III - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Biodegradable surfactants (anionic, nonionic, and cationic) and enzymes.

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

<u>Chemical Name</u>	<u>Common Name</u>	<u>CAS No.</u>	<u>Composition Range</u>	<u>LD50</u>
Ethyl alcohol	Ethanol	64-17-5	1 - 5%	7.06 g/kg (oral, rat)
Sodium borate	Borax	1330-43-4	1 - 5%	5.66 g/kg (oral, rat)
2-Aminoethanol	Ethanolamine	141-43-5	0.5 - 5%	1.7g/kg (oral, rat)
Alcohol Ethoxysulfate	AES	68585-34-2	7 - 13%	>2g/kg (oral, rat)
Linear Benzene Sulfonic Acid	HLAS	68584-22-5	5 - 10%	1.08-1.89g/kg (oral, rat)
Alkyl Sulfate	Sodium Sulfate/Alkyl Sulfate	68890-70-0	5 - 10%	2g/kg (oral, rat)
Alcohol Ethoxylate	Alcohol Ethoxylate	66455-14-9	1 - 5%	1.4-1.6g/kg (oral, rat)

**SECTION IV - FIRST AID INFORMATION****Emergency and First Aid Procedures:**

Ingestion: Drink a glassful of water.  
 Eye Contact: Flush with water for 10 to 15 minutes.  
 Skin: If prolonged contact occurs, rinse thoroughly with water. If spilled on clothing, change clothes.

If symptoms persist or reoccur, seek medical attention.

**Other:** Consumer product package has a caution statement: "CAUTION: Eye irritant. Harmful if swallowed. KEEP OUT OF REACH OF CHILDREN. If swallowed, give a glassful of water. Call a physician. In case of eye contact, flush with water."

**SECTION V - FIRE FIGHTING INFORMATION****Flammable Properties:**

These products have a Flash Point range of 135<sup>0</sup> – 139<sup>0</sup> F (57.2<sup>0</sup> – 59.4<sup>0</sup> C), but they do not sustain combustion per D.O.T. 49 CFR 173 Appendix H method.

**Explosive Limits:** LEL: N/A UEL: N/A

**Autoignition Temperature:** N/A

**Suitable Extinguishing Media:** CO<sub>2</sub>, water, foam, dry chemical.

**Unsuitable Extinguishing Media:** Not known.

**Protection of Fire Fighters:**

- **Specific Hazards arising from the chemical mixture:** Not known.
- **Protective Equipment and Precautions for Firefighters:** Standard self-contained breathing apparatus (SCBA) and full fire fighting turn-out gear (Bunker gear).

**SECTION VI - ACCIDENTAL RELEASE MEASURES**

**Personal Precautions:** None

**Environmental Precautions:** DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL REGULATIONS. Small or household quantities may be disposed of in refuse or in sewer. First check with your local water treatment plant. For larger quantities, incineration is preferred. Do not landfill.

**Steps To Be Taken in Case Material is Released or Spilled:** Flush small or household quantities down acceptable sewer (contains biodegradable surfactants). Prevent spills from reaching a waterway. Sorbents may be used.

**SECTION VII - HANDLING AND STORAGE**

**Precautions To Be Taken in Handling and Storing:** No unusual precautions necessary.

**Other Precautions:** None

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

**Respiratory Protection (Specify Type):** None required with normal use.

**Ventilation** Local Exhaust: None required with normal consumer use. Special: None

Mechanical (General): Normal/general dilution ventilation is acceptable. Other: None

**Eye Protection:** None required with normal consumer use.

*Industrial Setting:* If a splash is likely, chemical goggles may be needed.

**Protective Gloves:** None required with normal use.

*Industrial Setting:* Protective gloves (rubber, neoprene) should be used for prolonged direct contact.

**Other Protective Equipment:** None required with normal use.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES	
<b>Appearance:</b> Both 2X Gain with A Touch of Softness products are blue in color.	<b>Flash Point:</b> Range: 135 – 139 °F. (CC), but these products do not sustain combustion per DOT 49 CFR 173 Appendix H method)
<b>Odor:</b> All Gain products contain perfume/fragrance.	<b>Evaporation Rate (nBuOAc=1):</b> Not known
<b>Odor Threshold:</b> Not known.	<b>Explosive Limits:</b> LEL: N/A UEL: N/A
<b>Physical State:</b> Liquid.	<b>Percent Volatile by Volume (%):</b> 30 – 40
<b>Vapor Pressure Range (mm Hg):</b> 18 - 21 @ 68°F. (20° C) (mostly water)	<b>Specific Gravity (H<sub>2</sub>O=1):</b> 1.04 to 1.09
<b>Vapor Density (Air=1):</b> Not known	<b>Melting/Freezing Point:</b> N/A
<b>Boiling Point Range °F:</b> 210 - 216° F (98.9° – 102.2° C)	<b>pH (10% solution):</b> 8.1 to 8.6
<b>Coefficient of Water/Oil Distribution:</b> N/A	<b>Reserve Alkalinity:</b> N/A
<b>Solubility in Water:</b> Completely soluble.	

SECTION X - STABILITY AND REACTIVITY
<b>Chemical Stability:</b> Stable.
<b>Conditions to Avoid:</b> None known.
<b>Materials to Avoid:</b> None known.
<b>Hazardous Decomposition Products:</b> None known.
<b>Possibility of Hazardous Reactions:</b> None known.

SECTION XI - TOXICOLOGICAL INFORMATION
These Products have a low order of toxicity. If ingested, it may be mildly irritating. It is expected to be moderately emetic.
LD50 (oral, estimated): > 2g/kg ED50 (emesis, estimated): ~ 0.5 g/kg
Chronic Effects: No chronic health effects reported.
Target Organs: No target organs reported.
Carcinogenicity: NTP: No IARC: No OSHA: No

**SECTION XII - ECOLOGICAL INFORMATION**

Based on ecotoxicity and fate data for the individual ingredients in these mixtures, and for related consumer household cleaning product formulations, it is expected that these mixtures would exhibit a non-hazardous order of toxicity at relevant environmental concentrations.

**SECTION XIII - DISPOSAL CONSIDERATIONS**

**Waste Disposal Method:**  
 These Products in their original form when disposed as waste, are considered **hazardous waste, D-001**, according to Federal RCRA regulations (40 CFR 261). Disposal should be in accordance with all Federal, state/provincial and local regulations.

Household Use: Consumer produced household solutions may be disposed of down the drain with running water. Consumer may discard empty container in trash, or recycle where facilities exist.

**SECTION XIV - TRANSPORT INFORMATION**

U.S. D.O.T.: These products are not regulated when transported by ground.  
 IATA: These products are not regulated when transported by air.  
 IMDG: These products are not regulated when transported by vessel.

**SECTION XV - REGULATORY INFORMATION**

**United States**  
 All intentionally-added components of these products are listed on the US TSCA Inventory.  
 EPA Registration Number: NA

SARA 313/302/304/311/312 chemicals: None

*California:* These products have been evaluated and do not require warning labeling under California Proposition 65.  
 California Hazardous Waste: Yes

**State Right-to-Know and CERCLA:**  
 The following ingredients present in the finished product are listed on state right-to-know lists or state worker exposure lists:

Ingredient	CAS #	Level	CERCLA RQ	State					
				IL	MA	NJ	PA	RI	TX
Ethanol	64-17-5	1-5%	100 lbs	X	X	X	X	X	
Ethanolamine	141-43-5	1-5%	NA	X	X	X	X	X	
Sodium Borate	1330-43-4	1-5%	NA		X		X		
Alcohol Ethoxylate	68585-34-2	7-13%	NA						X
HLAS	68584-22-5	5-10%	NA						X

**Canada**  
 All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and this MSDS contains all information required by the Controlled Products Regulations.

SECTION XVI - OTHER INFORMATION		
Perfumes contained within these products covered by this MSDS comply with appropriate IFRA guidance.		
P&G Hazard Rating: 1	Health: 1 Flammability: 1 Reactivity: 0	4=EXTREME 3=HIGH 2= MODERATE 1=SLIGHT 0=NOT SIGINIFICANT
*N/A. - Not Applicable	*N/K. – Not Known	
Data supplied is for use only in connection with occupational safety and health.		
<b>DISCLAIMER:</b> This MSDS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company’s knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations.		
This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the product.		

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Goof Off Gunk & Adhesive Remover

**Company Name:** W. M. Barr  
2105 Channel Avenue  
Memphis, TN 38113

**Phone Number:** (901)775-0100

**Web site address:** www.wmbarr.com

**Emergency Contact:** 3E 24 Hour Emergency Contact (800)451-8346  
**Information:** W.M. Barr Customer Service (800)398-3892

**Intended Use:** Removes gum, adhesives, stickers, crayon, lipstick, wax, grease, etc. from most surfaces.

**Product Code:** FG791, FG792

**Additional Information** This product is regulated by the United States Consumer Product Safety Commission and is subject to certain labeling requirements under the Federal Hazardous Substances Act. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS). The product label also includes other important information, including directions for use, and should always be read in its entirety prior to using the product.

## 2. HAZARDS IDENTIFICATION

**Flammable Liquids, Category 3**  
**Acute Toxicity: Inhalation, Category 4**  
**Skin Corrosion/Irritation, Category 2**  
**Serious Eye Damage/Eye Irritation, Category 2A**  
**Skin Sensitization, Category 1**  
**Specific Target Organ Toxicity (single exposure), Category 3**



**GHS Signal Word:** **Warning**

**GHS Hazard Phrases:** H226: Flammable liquid and vapor.  
H332: Harmful if inhaled.  
H315: Causes skin irritation.  
H319: Causes serious eye irritation.  
H317: May cause an allergic skin reaction.  
H335: May cause respiratory irritation.

**GHS Precaution Phrases:** P233: Keep container tightly closed.  
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P280: Wear protective gloves/protective clothing/eye protection/face protection.  
P240: Ground/bond container and receiving equipment.  
P241: Use explosion-proof electrical/ventilating/lighting equipment.  
P243: Take precautionary measures against static discharge.  
P242: Use only non-sparking tools.  
P271: Use only outdoors or in a well-ventilated area.  
P261: Avoid breathing gas/mist/vapours/spray.  
P264: Wash hands thoroughly after handling.  
P362+364: Take off contaminated clothing and wash it before reuse.  
P272: Contaminated work clothing should not be allowed out of the workplace.

**GHS Response Phrases:** P370+378: In case of fire, use dry chemical powder to extinguish.  
P303+361+353: IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

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P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312: Call a POISON CENTER/doctor if you feel unwell.

P302+352: IF ON SKIN: Wash with plenty of soap and water.

P321: Specific treatment see instructions on label.

P332+313: If skin irritation occurs, get medical advice/attention.

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+313: If eye irritation persists, get medical advice/attention.

P333+313: If skin irritation or rash occurs, seek medical advice/attention.

**GHS Storage and Disposal Phrases:**

P403+235: Store in cool/well-ventilated place.

P501: Dispose of contents/container according to local, state and federal regulations.

P403+233: Store container tightly closed in well-ventilated place - if product is as volatile as to generate hazardous atmosphere.

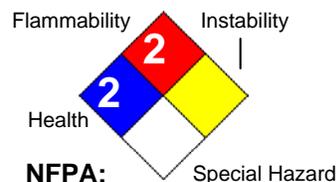
P405: Store locked up.

**Emergency Overview:**

Eye and skin irritant. May be harmful if swallowed.

**Hazard Rating System:**

HEALTH	*	2
FLAMMABILITY		2
PHYSICAL		0
PPE		X



**HMIS:**

**OSHA Regulatory Status:**

This material is classified as hazardous under OSHA regulations.

**Potential Health Effects (Acute and Chronic):**

This product has not been tested as a whole to determine health effects. The health effects listed below are associated with the individual ingredients listed in Section 3.

**EYES:** Can cause moderate to severe eye irritation and damage to the cornea. May cause discomfort, pain, redness, excess blood flow, and corneal clouding and swelling.

**SKIN:** Can cause inflammation of the skin and dermatitis. Repeated exposure may cause skin cracking, flaking or drying, redness, pain, blistering, and a rash. May enter the body through open lesions, cuts, abrasions, etc., and produce systemic injury.

**INHALATION:** Can cause respiratory irritation. May cause nose and throate irritation. May cause coughing and a headache.

**INGESTION:** Potassium ingestion can cause a slow, weak pulse, irregularities in heart rhythm, heart block and eventual fail in blood pressure. May produce diarrhea, bloated stomach, and occasional vomiting. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May be harmful if swallowed.

**CHRONIC OVEREXPOSURE EFFECTS:**

2-Butoxyethanol: In animals, effects have been reported on blood (hemolysis) and secondary effects on the kidney and liver. Human red blood cells have been shown to be significantly less sensitive to hemolysis than those of rodents and rabbits. In long term animal studies, small but statistically significant increases in tumors were observed in mice but not rats. The effects are not believed to be relevant to humans.

**TARGET ORGANS:** blood, kidney, liver, respiratory system, heart, stomach

**PRIMARY ROUTES OF ENTRY:** skin, ingestion, inhalation



Flammability Classification:

## 6. ACCIDENTAL RELEASE MEASURES

**Steps To Be Taken In Case Material Is Released Or Spilled:** Vapors may cause flash fire or ignite explosively.

Clean up: Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind, out of low areas, and ventilate closed spaces before entering. Shut off ignition sources; keep flares, smoking or flames out of hazard area. Use non-sparking tools. Use proper bonding and grounding methods for all equipment and processes. Keep out of waterways and bodies of water. Be cautious of vapors collecting in small enclosed spaces, sewers, low lying areas, confined spaces, etc.

Small spills: Take up with sand, earth or other noncombustible absorbent material and place in a plastic container where applicable.

Large spills: Dike far ahead of spill for later disposal.

Waste Disposal: Dispose in accordance with applicable local, state and federal regulations.

## 7. HANDLING AND STORAGE

**Precautions To Be Taken in Handling:** Read carefully all cautions and directions on product label before use. Since empty container retains residue, follow all label warnings even after container is empty. Dispose of empty container according to all regulations. Do not reuse this container.

Do not use this product near any source of heat or open flame, furnace areas, pilot lights, stoves, etc.

Do not use in small enclosed spaces, such as basements and bathrooms. Vapors can accumulate and explode if ignited.

Do not spread this product over large surface areas because fire and health safety risks will increase dramatically.

**Precautions To Be Taken in Storing:** Keep container tightly closed when not in use. Store in a cool, dry place. Do not store near flames or at elevated temperatures.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	Partial Chemical Name	OSHA TWA	ACGIH TWA	Other Limits
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	PEL: 50 ppm	TLV: 20 ppm	No data.
5989-27-5	d-Limonene	No data.	No data.	No data.
143-18-0	Oleic acid potassium salt	No data.	No data.	No data.
100-51-6	Benzenemethanol {Benzyl alcohol}	No data.	No data.	No data.

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### Respiratory Equipment (Specify Type):

For use in areas with inadequate ventilation or fresh air, wear a properly maintained and properly fitted NIOSH approved respirator for organic solvent vapors.

For OSHA controlled work places and other regular users - Use only with adequate ventilation under engineered air control systems designed to prevent exceeding the appropriate TLV.

A dust mask does not provide protection against vapors.

### Eye Protection:

Safety glasses should be worn during normal handling of this material.

Where contact with the eyes or face is likely, a faceshield or chemical splash goggles should be worn to prevent eye contact.

### Protective Gloves:

Wear gloves with as much resistance to the chemical ingredients as possible. Glove materials such as nitrile rubber may provide protection. Glove selection should be based on chemicals being used and conditions of use. Consult your glove supplier for additional information. Gloves contaminated with product should be discarded and not reused.

### Other Protective Clothing:

Various application methods can dictate use of additional protective safety equipment, such as impermeable aprons, etc., to minimize exposure.

### Engineering Controls (Ventilation etc.):

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Use only with adequate ventilation to prevent buildup of vapors. Do not use in areas where vapors can accumulate and concentrate, such as basements, bathrooms or small enclosed areas. Whenever possible, use outdoors in an open air area. If using indoors open all windows and doors and maintain a cross ventilation of moving fresh air across the work area. If strong odor is noticed or you experience slight dizziness, headache, nausea or eye-watering -- STOP -- ventilation is inadequate. Leave area immediately and move to fresh air.

### Work/Hygienic/Maintenance Practices:

Wash hands thoroughly after use and before eating, drinking, smoking, or using the restroom.

Do not eat, drink, or smoke in the work area.

Discard any clothing or other protective equipment that cannot be decontaminated.

Facilities storing or handling this material should be equipped with an emergency eyewash and safety shower.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical States:** [ ] Gas [ X ] Liquid [ ] Solid  
**Appearance and Odor:** Clear orange gel.  
**Melting Point:** No data.  
**Boiling Point:** No data.  
**Autoignition Pt:** No data.  
**Flash Pt:** 137.00 F Method Used: Setaf flash Closed Cup (Rapid Setaf flash)  
**Explosive Limits:** LEL: No data. UEL: No data.  
**Specific Gravity (Water = 1):** 0.9693  
**Density:** 8.12 LB/GL  
**Vapor Pressure (vs. Air or mm Hg):** No data.  
**Vapor Density (vs. Air = 1):** No data.  
**Evaporation Rate:** No data.  
**Solubility in Water:** soluble  
**pH:** 7 - 8  
**Percent Volatile:** No data.  
**VOC / Volume:** 191.0000 G/L

## 10. STABILITY AND REACTIVITY

**Stability:** Unstable [ ] Stable [ X ]  
**Conditions To Avoid - Instability:** No data available.  
**Incompatibility - Materials To Avoid:** Oxidizers, strong acids  
**Hazardous Decomposition or Byproducts:** Can include aldehydes, ketones, organic acids, oxides of citrus terpenes  
**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]  
**Conditions To Avoid - Hazardous Reactions:** No data available.

**11. TOXICOLOGICAL INFORMATION**

**Toxicological Information:** This product has not been tested as a whole. Refer to section 2 for acute and chronic effects.

**Carcinogenicity/Other Information:** CAS# 111-76-2:  
 Acute toxicity, LC50, Inhalation, Rat, 450.0 PPM, 4 H.  
 Result:  
 Behavioral: Ataxia.  
 Nutritional and Gross Metabolic: Weight loss or decreased weight gain.  
 - Toxicology and Applied Pharmacology, Academic Press, Inc., 1 E. First St., Duluth, MN 55802, Vol/p/yr: 68,405, 1983

Acute toxicity, LD50, Skin, Species: Rabbit, 220.0 MG/KG.  
 Result:  
 Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).  
 Effects on Embryo or Fetus: Other effects to embryo.  
 Specific Developmental Abnormalities: Musculoskeletal system.  
 - Dow Chemical Company Reports., Dow Chemical USA, Health and Environment Research, Toxicology Research Lab, Midland, MI 48640, Vol/p/yr: MSD-46,

Acute toxicity, LD50, Oral, Rat, 250.0 mg/kg.  
 Result:  
 Lungs, Thorax, or Respiration: Changes in pulmonary vascular resistance.

Standard Draize Test, Eyes, Species: Rabbit, 100.0 MG, Severe.  
 Result:  
 Effects on Newborn: Apgar score (human only).  
 Effects on Newborn: Other neonatal measures or effects.  
 Effects on Newborn: Drug dependency.  
 - American Journal of Ophthalmology., Ophthalmic Pub. Co., 435 N. Michigan Ave., Suite 1415, Chicago, IL 60611, Vol/p/yr: 29,1363, 1946

IARC 3: Not Classifiable as to Carcinogenicity in Humans.  
 ACGIH A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

CAS #	Hazardous Components (Chemical Name)	NTP	IARC	ACGIH	OSHA
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	n.a.	3	A3	n.a.
5989-27-5	d-Limonene	n.a.	3	n.a.	n.a.
143-18-0	Oleic acid potassium salt	n.a.	n.a.	n.a.	n.a.
100-51-6	Benzenemethanol {Benzyl alcohol}	n.a.	n.a.	n.a.	n.a.

**12. ECOLOGICAL INFORMATION**

**General Ecological Information:** This product has not been tested as a whole.

### 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Dispose of in accordance with local, state, and federal laws.

Do not place material in general trash.

Do not allow material to enter bodies of water or sewers.

### 14. TRANSPORT INFORMATION

**LAND TRANSPORT (US DOT):**

**DOT Proper Shipping Name:** DOT exempt per 49 CFR 173 Appendix H.  
**DOT Hazard Class:**  
**UN/NA Number:**

### 15. REGULATORY INFORMATION

**EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists**

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	No	No	Yes-Cat. N230
5989-27-5	d-Limonene	No	No	No
143-18-0	Oleic acid potassium salt	No	No	No
100-51-6	Benzenemethanol {Benzyl alcohol}	No	No	No

**This material meets the EPA**  Yes  No Acute (immediate) Health Hazard  
**'Hazard Categories' defined**  Yes  No Chronic (delayed) Health Hazard  
**for SARA Title III Sections**  Yes  No Fire Hazard  
**311/312 as indicated:**  Yes  No Sudden Release of Pressure Hazard  
 Yes  No Reactive Hazard

CAS #	Hazardous Components (Chemical Name)	Other US EPA or State Lists
111-76-2	Ethanol, 2-Butoxy- {Ethylene glycol n-butyl ether, (a glycol ether)}	CAA HAP,ODC: HAP; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No
5989-27-5	d-Limonene	CAA HAP,ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No
143-18-0	Oleic acid potassium salt	CAA HAP,ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No
100-51-6	Benzenemethanol {Benzyl alcohol}	CAA HAP,ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No

**Regulatory Information Statement:** All components of this material are listed on the TSCA Inventory or are exempt.

### 16. OTHER INFORMATION

**Revision Date:** 02/04/2016  
**Preparer Name:** EHS Department  
**Additional Information About This Product:** No data available.

**Company Policy or Disclaimer:** The information contained herein is presented in good faith and believed to be accurate as of the effective date shown above. This information is furnished without warranty of any kind. Employers should use this information only as a supplement to other

**SAFETY DATA SHEET**  
**Goof Off Gunk & Adhesive Remover**

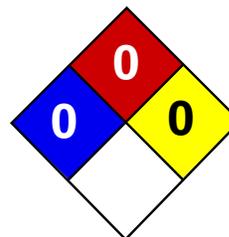
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Printed: 02/05/2016

Revision: 02/04/2016

Supersedes Revision: 04/15/2015

information gathered by them and must make independent determination of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. Any use of this data and information must be determined by the user to be in accordance with applicable federal, state and local laws and regulations.



Health	0
Fire	0
Reactivity	0
Personal Protection	A

## Material Safety Data Sheet Water MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Water

**Catalog Codes:** SLW1063

**CAS#:** 7732-18-5

**RTECS:** ZC0110000

**TSCA:** TSCA 8(b) inventory: Water

**CI#:** Not available.

**Synonym:** Dihydrogen oxide

**Chemical Name:** Water

**Chemical Formula:** H<sub>2</sub>O

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Water	7732-18-5	100

**Toxicological Data on Ingredients:** Not applicable.

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. Non-corrosive to the eyes. Non-corrosive for lungs.

**Potential Chronic Health Effects:**

Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

### Section 4: First Aid Measures

**Eye Contact:** Not applicable.

**Skin Contact:** Not applicable.

**Serious Skin Contact:** Not available.

**Inhalation:** Not applicable.

**Serious Inhalation:** Not available.

**Ingestion:** Not Applicable

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:** Not Applicable

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

**Large Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

## Section 7: Handling and Storage

**Precautions:** No specific safety phrase has been found applicable for this product.

**Storage:** Not applicable.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:** Not Applicable

**Personal Protection:** Safety glasses. Lab coat.

**Personal Protection in Case of a Large Spill:** Not Applicable

**Exposure Limits:** Not available.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Odorless.

**Taste:** Not available.

**Molecular Weight:** 18.02 g/mole

**Color:** Colorless.

**pH (1% soln/water):** 7 [Neutral.]

**Boiling Point:** 100°C (212°F)

**Melting Point:** Not available.

**Critical Temperature:** Not available.

**Specific Gravity:** 1 (Water = 1)

**Vapor Pressure:** 2.3 kPa (@ 20°C)

**Vapor Density:** 0.62 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not applicable

**Solubility:** Not Applicable

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Not available.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Eye contact.

**Toxicity to Animals:**

LD50: [Rat] - Route: oral; Dose: > 90 ml/kg LC50: Not available.

**Chronic Effects on Humans:** Not available.

**Other Toxic Effects on Humans:**

Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. Non-corrosive to the eyes. Non-corrosive for lungs.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

## Section 15: Other Regulatory Information

**Federal and State Regulations:** TSCA 8(b) inventory: Water

**Other Regulations:** EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** Not controlled under WHMIS (Canada).

**DSCL (EEC):**

This product is not classified according to the EU regulations. Not applicable.

**HMIS (U.S.A.):**

**Health Hazard:** 0

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** a

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

**Health:** 0

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Not applicable. Lab coat. Not applicable. Safety glasses.

**Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:33 PM

**Last Updated:** 05/21/2013 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*



## 1. IDENTIFICATION

Product Identifier Diesel Fuel

Synonyms: Diesel Fuel, Motor Vehicle Diesel Fuel, Dyed Diesel, \* DieselOne®, \* DieselOne® w/Platinum Plus DFX, Low Sulfur Diesel (LSD), Ultra Low Sulfur Diesel (ULSD)

Intended use of the product: Fuel

Contact: Global Companies LLC  
Water Mill Center  
800 South St.  
Waltham, MA 02454-9161  
[www.globalp.com](http://www.globalp.com)

Contact Information: EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300  
COMPANY CONTACT (business hours): 800-542-0778

## 2. HAZARD IDENTIFICATION

According to OSHA 29 CFR 1910.1200 HCS

### Classification of the Substance or Mixture

Classification (GHS-US):

Flam. Liquid	Category 3	H226
Skin Corrosion/Irritation	Category 2	H315
Aspiration Hazard	Category 1	H304
STOT SE	Category 3	H336
Carcinogenicity	Category 2	H350
Aquatic Chronic	Category 2	H411
Serious Eye Damage/ Irritation	Category 2B	H319

### Labeling Elements



Signal Word (GHS-US):

Hazard Statements (GHS-US):

### **Danger**

H226 – Flammable liquid and vapor.  
H315 – Causes Skin irritation.  
H304 – May be fatal if swallowed and enters airways.  
H336 – May cause drowsiness or dizziness.  
H350 – May cause cancer.  
H411 – Toxic to aquatic life with long lasting effects.  
H319 – May cause eye damage/irritation.

Precautionary Statements (GHS-US):

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P233 - Keep container tightly closed.  
P240 – Ground/bond container and receiving equipment.



# SAFETY DATA SHEET

## Diesel Fuel

P241 – Use explosion-proof electrical/ventilating/lighting equipment pursuant to applicable electrical code.  
P242 – Use only non-sparking tools.  
P243 – Take precautionary measures against static discharge.  
P261 – Avoid breathing dust/fume/gas/mist/vapors/spray.  
P264 – Wash skin thoroughly after handling.  
P271 – Use only outdoors or in a well-ventilated area.  
P273 – Avoid release to the environment.  
P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
P303+361+353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse with water/shower.  
P308+311 - If exposed or concerned: Get medical advice/attention.  
P301+310 - If swallowed: Immediately call a poison center/doctor/...  
P331 - Do NOT induce vomiting.  
P370+P378 – In case of fire use firefighting foam or other appropriate media for Class B fires to extinguish.  
P403+235 - Store in a well-ventilated place. Keep cool.  
P405 - Store locked up.  
P501 – Dispose of contents/container in accordance with local/regional/national/international regulation.

### Other information:

NFPA 704  
Health: 1  
Fire: 2  
Reactivity: 0



### 3. COMPOSITION / INFORMATION ON INGREDIENTS

#### Chemical Composition Information

Mixture

Name	Product Identifier (CAS#)	% (w/w)	Classification
Diesel Fuel	68476-34-6	100	Flam Liq. 3, H226; Skin Irrit. 2, H315; Aspiration 1, H304; STOT SE 3, H336; Carc.2. H350; Aquatic chronic 2, H411
Naphthalene	91-20-3	<0.1	Carc. 2, H351; Acute Tox. 4, H302; Aquatic Acute 1, H400; Aquatic Chronic 1, H410

#### Additional Formulation Information:

Diesel Fuel consists of C9+ hydrocarbons resulting from distillation of crude oil.

Low Sulfur Diesel Fuel typically contains less than 500 ppm of sulfur

Ultra Low Sulfur Diesel Fuel typically contains less than 15 ppm of sulfur



#### 4. FIRST AID MEASURES

Route	Measures
Inhalation	Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.
Ingestion	Aspiration Hazard: DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Ingestion may cause gastrointestinal disturbances including irritation, nausea, vomiting, and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory failure, and death.
Eye Contact	In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention. In case of contact lenses, remove immediately.
Skin Contact	Remove contaminated clothing and shoes. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and of the area of the body burned.

##### Most Important Symptoms

Contact with eyes and face may cause irritation. Long-term exposure may cause dermatitis (itching, irritation, pain and swelling).

Inhalation may cause irritation and significant or long term exposure could cause respiratory insufficiency and pulmonary edema.

Ingestion may cause aspiration, gastrointestinal disturbance, and CNS effects.

##### Immediate Medical Attention and Special Treatment

For contact with skin or eyes, immediately wash or flush contaminated eyes with gently flowing water. If possible, irrigate each eye continuously with 0.9% saline (NS). If ingested, rinse mouth. Do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

If inhaled, administer oxygen or establish a patent airway if breathing is labored. Suction if necessary. Monitor closely, anticipate seizures. Consider orotracheal or nostracheal intubation of airway control if patient is unconscious or is in severe respiratory distress.

Discard any clothing or shoes contaminated as they may be flammable.

#### 5. FIRE-FIGHTING MEASURES

##### Extinguishing Media

Foam, carbon dioxide, dry chemical are most suitable

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, firefighting foam, or Halon. Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other firefighting equipment.

LARGE FIRES: Foam, carbon dioxide, dry chemical. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

##### Specific Hazards / Products of Combustion

Moderate fire hazard when exposed to heat or flame with a very low flash point. Product is flammable and easily ignited when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Combustion may produce smoke, carbon monoxide and other products of incomplete combustion.

##### Special Precautions and Protective Equipment for Firefighters

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water.



For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied firefighting foam.

#### **Fighting Equipment/Instructions**

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH- approved pressure-demand self-contained breathing apparatus with full face piece and protective clothing.

**Refer to Section 9 for fire properties of this chemical including flash point, auto ignition temperature, and explosive limits.**

## 6. ACCIDENTAL RELEASE MEASURES

### **ACTIVATE FACILITY SPCC, SPILL CONTINGENCY or EMERGENCY PLAN.**

#### **Personal Precautions**

Due to high vapor density, flammable / toxic vapors may be present in low lying areas, dikes, pits, drains, or trenches. Vapors may accumulate in low lying areas and reach ignitable concentrations. Ventilate the area. Use of non-sparking tools and intrinsically safe equipment is recommended. Potential for flammable atmosphere should be monitored using a combustible gas indicator positioned downwind of the spill area. Refer to Sections 2 and 7 for further hazard warnings and handling instructions.

Use appropriate personal protective equipment to prevent eye/skin contact and absorption. Use NIOSH approved respiratory protection, if warranted, to prevent exposures above permissible limits. Refer to Section 8. Contaminated clothing should not be near sources of ignition.

#### **Emergency Measures**

As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. Consider wind direction. Secure all ignition sources (flame, spark, hot work, hot metal, etc.) from area. Evaluate the direction of product travel, diking sewers, etc. to confirm spill areas. Do not touch or walk-through spilled material. For large spills, isolate initial action distance downwind 1,000 ft. (300 m).

#### **Environmental Precautions**

Stop the spill to prevent environmental release if it can be done safely. Product is toxic to aquatic life. Take action to isolate environmental receptors including drains, storm sewers and natural water bodies. Keep on impervious surface if at all possible. Use water sparingly to prevent product from spreading. Foam and absorbents may be used to reduce / prevent airborne release.

Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Follow federal, state or local requirements for reporting environmental release where necessary. Refer to Section 15 for further information.

#### **Containment and Clean-Up Methods**

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of firefighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with dry earth, sand or other non-combustible, inert oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container with clean, non-sparking tools for reclamation or disposal. Response and cleanup crews must be properly trained and must utilize proper protective equipment. Refer to Section 8 for appropriate protective equipment.

## 7. HANDLING AND STORAGE

### **USE ONLY AS A FUEL. DO NOT SIPHON BY MOUTH.**

#### **Handling Precautions**

Handle as a flammable liquid. Keep away from heat, sparks, and open flame. No smoking. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer pursuant to NFPA 70 and API RP 2003 to



reduce the possibility of static-initiated fire or explosion. Follow precautions to prevent static initiated fire.

Use good personal hygiene practices. Use only with protective equipment specified in Section 8. Avoid repeated and/or prolonged skin exposure. Use only outdoors or in well ventilated areas. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves. Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API RP 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

**Storage**

Large quantities of diesel fuel are stored in tanks or portable containers at an ambient storage temperature. Separate from incompatible chemicals (Refer to Section 10) by distance or secondary containment. Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers that are clearly labeled. Label all secondary containers that this material is transferred into with the chemical name and associated hazard(s). Empty product containers or vessels may contain flammable vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Storage tanks should have a venting system. If stored in small containers, the area should be well ventilated, away from ignition sources and protected from potential damage or vehicular traffic. Post "No Smoking" signs in product storage areas. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code" or applicable building code. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks in Flammable and Combustible Liquid Service" and API RP 2015 "Safe Entry and Cleaning of Petroleum Storage Tanks".

**Incompatibles**

Keep away from strong oxidizers, ignition sources and heat.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Occupational Exposure Limits**

Component	CAS #	List	Value
Diesel Fuel	68476-34-6	ACGIH TLV-TWA	100 mg/m3*
Naphthalene	91-20-3	ACGIH TLV-TWA	10 ppm
		OSHA PEL	10 ppm
		ACGIH STEL	15 ppm

\*Critical effects; Skin; A3; CNS impairment.

**Engineering Controls**

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Intrinsically safe equipment and non-sparking tools shall be used in circumstances where concentrations may exceed lower flammable limits. Grounding and bonding shall be used to prevent accumulation and discharge of static electricity. Emergency shower and eyewash should be provided in proximity to handling areas in the event of exposure to decontaminate.

**Personal Protective Equipment**

Exposure	Equipment
Eye / Face	Wear appropriate chemical protective glasses or goggles or face shields to prevent skin and eye contact especially caused from splashing.
Skin	Wear appropriate personal protective clothing to prevent skin contact. Gloves constructed of nitrile, neoprene or PVC are recommended when handling this material. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure.



Exposure	Equipment
Respiratory	<p>A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.</p> <p>Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.</p>
Thermal	<p>Product is stored at ambient temperature. No thermal protection is required except for emergency operations involving actual or potential for fire. Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.</p>

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Value
Appearance	Clear or straw-colored liquid. May be dyed red for distribution.
Odor	Mild characteristic petroleum distillate odor.
Odor Threshold	<1 ppm
pH	Not available
Melting Point	-22 to -0.4 °F (-30 to -18 °C)
Boiling Point Range	320 to 690 °F (160 to 366 °C)
Flash Point	> 125.6 °F (52 °C) PMCC
Evaporation Rate	Slow, varies with conditions
Flammability	Flammable liquid
Flammable Limits	0.6 % - 6.5%
Vapor Pressure	0.009 psia @ 70 °F
Vapor Density	> 1 (air=1)
Specific Gravity	0.83-0.86 @ 60 °F (16 °C) (water=1)
Solubility	Insoluble in water; miscible with other petroleum solvents.
Partition Coefficient (N-octanol/water)	Log Kow range of 3.3 to >.6.0
Autoignition Temperature	494 °F (257 °C)
Decomposition Temperature	When heated it emits acrid smoke and irritating vapors.
Viscosity	>3 cSt
Percent Volatiles	100

## 10. STABILITY AND REACTIVITY

### Stability

This is a stable material that is flammable liquid (OSHA/GHS hazard category 3). Stable during transport.

### Reactivity

Material is not self-reacting. Flammable concentrations may be present in air. Compound can react with oxidizing materials.



**Possibility of Hazardous Reactions**

Hazardous polymerization will not occur.

**Incompatibility**

Keep away from strong oxidizers such as nitric and sulfuric acids.

**Conditions to Avoid**

Avoid high temperatures, open flames, sparks, static electricity, welding, smoking and other ignition sources.

**Hazardous Decomposition Products**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

**11. TOXICOLOGICAL INFORMATION**

**Acute Toxicity:**

Acute Toxicity (Inhalation LC50)

Diesel Fuel (68476-34-6)

LC50 Inhalation Rat >6 mg/l/4h

Acute Toxicity (Dermal LD50)

Diesel Fuel (68476-34-6)

LD50 Dermal Rabbit >5000 mg/kg

Acute Toxicity (Oral LD50)

Diesel Fuel (68476-34-6)

LD50 Oral Rabbit >5000 mg/kg

Skin Corrosion/Irritation: Prolonged and repeated contact may cause skin irritation leading to dermatitis. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not available

Carcinogenicity: OSHA: NO, IARC: Group 3, NTP: NO, ACGIH: NOIC:A3, NIOSH: NO

IARC: Group 3 – Not classifiable as to their carcinogenicity to humans

ACGIH: A3 – Confirmed animal carcinogen with unknown relevance to humans.

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

IARC classifies whole diesel fuel exhaust particulates (byproduct of combustion of this material) carcinogenic to humans (Group 1) and NIOSH regards diesel fuel exhaust particulate as a potential occupational carcinogen.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Specific Target Organ Toxicity (Single Exposure): Inhalation exposure may cause drowsiness or dizziness by inhalation exposure.

Aspiration Hazard: The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Potential Health Effects: Vapor irritating to skin, eyes, nose, and throat. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

WARNING: The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of



combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

## 12. ECOLOGICAL INFORMATION

### Toxicity:

This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

### Data for Component: Diesel Fuel (68476-34-6)

Material is toxic to aquatic organisms based on an acute basis (LC50/EC50 >1 but ≤ 10 mg/L in the most sensitive species tested).

Material is a long-term aquatic hazard based on a chronic basis (LC50/EC50 >1 but ≤ 10 mg/L in the most sensitive species tested).

Persistence and Degradation: This material is not expected to be readily biodegradable.

Bioaccumulative Potential: Not available

Mobility in Soil: Not available

Other Adverse Effects: None known

Other Information: Avoid release to the environment.

## 13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options. May be considered a hazardous waste if disposed. Direct solid waste (landfill) or incineration at a solid waste facility is not permissible. Do not discharge to sanitary or storm sewer. Personnel handling waste containers should follow precautions provided in this document.

Shipping containers must be DOT authorized packages. Follow licensure and regulations for transport of hazardous material and hazardous waste as applicable.

## 14. TRANSPORT INFORMATION

### US DOT

UN Identification Number	NA 1993 / UN 1202
Proper Shipping Name	Diesel Fuel
Hazard Class and Packing Group	3, PGIII
Shipping Label	Combustible liquid
Placard / Bulk Package	Combustible liquid, 1993
Emergency Response Guidebook Guide Number	128

### IATA Information

UN Identification Number	UN 1202
Proper Shipping Name	Combustible-Liquid, N.O.S. (Fuel, Diesel)
Hazard Class and Packing Group	3, PGIII
ICAO Label	3
Packing Instructions Cargo	310
Max Quantity Per Package Cargo	220L
Packing Instructions Passenger	309Y
Max Quantity per Package	60L

### ICAO

UN Identification Number	UN 1202
Shipping Name / Description	Combustible-Liquid, N.O.S. (Fuel, Diesel)
Hazard Class and Packing Group	3, PG III
IMDG Label	3



**IMDG**

UN Identification Number	UN 1202
Shipping Name / Description	Combustible-Liquid, N.O.S. (Fuel, Diesel)
Hazard Class and Packing Group	3, PGIII
IMDG Label	3
EmS Number	F-E-S-E
Marine Pollutant	Yes

**15. REGULATORY INFORMATION**

**U.S. Federal, State, and Local Regulatory Information**

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

**OSHA Hazard Communication Standard**

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning And Community Right-to-Know Act of 1986) Sections 311 and 312**

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	Yes
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

**Clean Water Act (Oil Spills)**

Any spill or release of this product to "navigable waters" (Essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

**CERCLA Section 103 and SARA Section 304 (Release to the Environment)**

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts this material. This product does not contain any chemicals subject to the reporting requirements of CERCLA Section 103 or SARA 304.

**SARA Section 313- Supplier Notification**

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

**EPA Notification (Oil Spills)**

If there is a discharge of more than 1,000-gallons of oil into or upon navigable waters of the United States, or if it is the second spill event of 42 gallons or more of oil into water within a twelve (12) month period, a written report must be submitted to the Regional Administrator of the EPA within sixty days of the event.

**Pennsylvania Right to Know Hazardous Substance list:**

The following product components are cited in the Pennsylvania Special Hazardous Substance List, and are present at levels which require reporting.

Component	CAS	Amount
Diesel Fuel	68476-34-6	100%

**New Jersey Right to Know Hazardous Substance list:**

The following product components are cited in the New Jersey Right to Know Hazardous Substance List, and are present at levels which require reporting.

Component	CAS	Amount
Diesel Fuel	68476-34-6	100%



**California Proposition 65 WARNING: This product contains chemicals known to the State of California to cause Cancer or Reproductive Toxicity.**

Component	CAS	Amount
Naphthalene	91-20-3	<0.1%

**U.S. Toxic Substances Control Act**

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30.

**CEPA - Domestic Substances List (DSL)**

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

**Canadian Regulatory Information (WHMIS)**

Class B3 – Combustible Liquid  
Class D2A – Materials causing other toxic effects. (Very Toxic)

**16. OTHER INFORMATION**

Version	4
Issue Date	May 20, 2016
Prior Issue Date	May 3, 2015

**Description of Revisions**

Revised to meet Globally Harmonized System for chemical hazard communication requirements pursuant to OSHA regulatory revisions 77 FR 17884, March 26, 2012.

**Abbreviations**

°F	Degrees Fahrenheit (temperature)	mL	Milliliter
<	Less than	mm <sup>2</sup>	Square millimeters
=	Equal to	mmHg	Millimeters of mercury (pressure)
>	Greater than	N/A	Not applicable
AP	Approximately	N/D	Not determined
C	Centigrade (temperature)	ppm	Parts per million
kg	Kilogram	sec	Second
L	Liter	ug	Micrograms
mg	Milligrams		

**Acronyms**

ACGIH	American Conference of Governmental Industrial Hygienists	GHS	Global Harmonized System
AIHA	American Industrial Hygiene Association	HMIS	Hazardous Materials Information System
AL	Action Level	IARC	International Agency for Research On Cancer
ANSI	American National Standards Institute	IATA	International Air Transport Association
API	American Petroleum Institute	IMDG	International Maritime Dangerous Goods
CAS	Chemical Abstract Service	Koc	Soil Organic Carbon
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	LC50	Lethal concentration 50%
DOT	U.S. Department of Transportation	LD50	Lethal dose 50%
EC50	Ecological concentration 50%	MSHA	Mine Safety and Health Administration
EPA	U.S. Environmental Protection Agency	NFPA	National Fire Protection Association
ERPG	Emergency Response Planning Guideline	NIOSH	National Institute of Occupational Safety and Health
		NOIC	Notice of Intended Change



# SAFETY DATA SHEET

## Diesel Fuel

NTP	National Toxicology Program	STEL	Short Term Exposure Limit (generally 15 minutes)
OPA	Oil Pollution Act of 1990	TLV	Threshold Limit Value (ACGIH)
OSHA	U.S. Occupational Safety & Health Administration	TSCA	Toxic Substances Control Act
PEL	Permissible Exposure Limit (OSHA)	TWA	Time Weighted Average (8 hr.)
RCRA	Resource Conservation and Recovery Act Reauthorization Act of 1986 Title III	UN	United Nations
REL	Recommended Exposure Limit (NIOSH)	UNECE	United Nations Economic Commission for Europe
RVP	Reid Vapor Pressure	WEEL	Workplace Environmental Exposure Level (AIHA)
SARA	Superfund Amendments and	WHMIS	Canadian Workplace Hazardous Materials Information System
SCBA	Self Contained Breathing Apparatus		
SPCC	Spill Prevention, Control, and Countermeasures		

### Disclaimer of Expressed and Implied Warranties

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

\*\* End of Safety Data Sheet \*\*

Glo Germ™ Company  
PO Box 537  
Moab, Utah 84532

## Safety Data Sheet (SDS)

### Section 1: Identification

#### GLO GERM™ POWDER All colors

Emergency & Information Telephone Numbers  
1-800-842-6622 Glo Germ™ M-F 9 am -5 pm MST  
1101 South Murphy Lane, Moab UT 84532

1-800-424-9300 ChemTrec®

Recommended use: Training aid used to determine hand washing, cross-contamination avoidance and surface cleaning effectiveness specifically to avoid transmission/spread of microbes. For external use only. See product label for specific use and instruction. Do not ingest. Avoid contact with eyes.

### Section 2: Hazard(s) Identification

No hazardous ingredients present.

**Health Rating:** 1

**Flammability Rating:** 1

**Reactivity Rating:** 0

HMIS Rating Scale: 0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe;  
N = No information provided by manufacturer; \* = Chronic Health Hazard

### Section 3: Composition/Information on Ingredients

100% Melamine Resin(plastic)

Component Exposure Limits: OSHA, PEL, ACGIG TLV Unites: No limit

### Section 4: First-Aid Measures

**Eye contact:** Flush eyes with large quantities of water immediately and continue to flush until discomfort is eased.

**Skin contact:** If discomfort or redness occurs wash off with warm water and soap.

**Ingestion:** Seek medical attention if any discomfort occurs.

**Inhalation:** Move to fresh air. If symptoms persist seek medical attention.

**Medical Conditions:** Generally Aggravated by Exposure- Allergic or slight skin irritation may occur.

## Section 5: Fire-Fighting Measures

**Flammable Properties:** During a fire, irritating and toxic gases may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

**Flammability Class** NA

**Flash Point:** None

**Explosive Range:** None

**Flammable Limits:** Unknown

**LEL:** Unknown **UEL:** Unknown

**Extinguishing Media:** Use dry chemical, alcohol foam, carbon dioxide or water spray when fighting fires involving this material.

### **Fire Fighting Instructions:**

Keep unnecessary people away. Isolate area. Stay upwind. Wear self-contained breathing apparatus.

**Special Fire Fighting Procedures:** No special firefighting procedures are indicated.

**Unusual Fire and Explosion Hazards:** None

## Section 6: Accidental Release Measures

This product is not defined as a hazardous waste under EPA 40 CFR 261. Sweep slowly to avoid stirring up dust and dispose of in sealed container along with regular waste. Do not flush to sewer to dispose.

## Section 7: Handling and Storage

**Handling:** When using large quantities use in a well ventilated area. Improper handling may lead to dust cloud formation which, as with any organic dust, may be an explosion hazard.

**Storage:** Store in a dry area.

## Section 8: Exposure Controls/Personal Protection

**Eye protection:** Not required for normal use.

**Skin protection:** Not required for single use of short duration. For prolonged or repeated exposure, use impervious clothing over parts of the body subject to exposure.

**Respiratory protection:** Not required for normal use.

**Ventilation:** Upon generation of large amounts of dust, adequate ventilation in accordance with good engineering practice is necessary.

## Section 9: Physical and Chemical Properties

**Form:** Powder

**Appearance/Color:** Typically White, Orange or Yellow under normal light. Under UV light, white will appear blue or green, Orange is fluorescent orange, and Yellow is fluorescent yellow.

**Odor:** None

<b>Solubility (in water):</b>	Insoluble
<b>Boiling Range:</b>	None
<b>Evaporation Rate:</b>	Non Volatile
<b>Vapor Density:</b>	Non Volatile
<b>% Volatile Weight:</b>	0. %
<b>% Volatile Volume:</b>	0. %
<b>Weight/Gallon:</b>	11.41
<b>VOC</b>	None

Items not applicable to product as material is stable, non-reactive and not a fire hazard the following have not been evaluated further: Auto-ignition temperature, Flammability (solid, gas), Upper/lower flammability or explosive limits, Decomposition temperature, and Viscosity, Upper/lower flammability or explosive limits, Vapor pressure.

### Section 10: Stability and Reactivity

**Stable or Unstable:** Stable

**Conditions to avoid:** Heat, sparks, and open flame

**Incompatibility (materials to avoid):** Strong Oxidizers

**Hazardous Polymerization:** Will Not Occur

**Hazardous Decomposition Products:** In the event of combustion, oxides of carbon, nitrogen and sulfur will be formed.

### Section 11: Toxicological Information

**Routes of Exposure:** Skin absorption not possible as particles are too large, accidental ingestion or intentional misuse, eye contact, inhalation.

We have not carried out any animal testing, therefore we have no Toxicological Data specifically for this product. The Toxicological Data, where provided by the raw material manufacturer, can be made available on request. Other Health Effects: ingestion may cause irritation of the gastro-intestinal tract.

### Section 12: Ecological Information\* (non-mandatory)

**Ecotoxicity:** Not regarded as dangerous for the environment.

### Section 13: Disposal Considerations\* (non-mandatory)

Dispose of in accordance with local, state, and federal regulations.

### Section 14: Transport Information\* (non-mandatory)

Not regulated.

### Section 15: Regulatory Information\* (non-mandatory)

#### **SARA Title III SECTION 313:**

This product contains no chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act.

## **California Proposition 65 (CARCINOGEN)**

This product is manufactured in a facility that uses a chemical known to the state of California to cause cancer\*

Ingredient Name	CAS Number
FORMALDEHYDE	00050-00-0

## **OSHA Hazard Communication Standard, 29 CFR 1910.1200**

This product is not considered hazardous as defined.

## **SARA Sections 311 thru~ 312**

Reporting of this product is not required.

## **Toxic Substances Control Act (TSCA)**

All components in this product are listed, or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) 8(b) Inventory.

## **Clean Water Act**

This product contains no ingredients regulated by the Clean Water Act.

## **Clean Air Act**

This product contains no ingredients regulated by the Clean Air Act.

## **Hazardous Air Pollutant (HAPS)**

This product contains no Hazardous Air Pollutants (HAP's).

## **Clean Air Act Ammendments(ODS)**

No Glo Germ Company product contains an ozone depleting substance (ODS), nor are any of our products manufactured with them.

## **Coalition of Northeast Governors (CONEG)**

This product is in compliance with CONEG (i.e., total cadmium, chromium, lead and mercury < 100 ppm) .

## **FDA 21 CFR**

Glo Germ Company products are not listed by the FDA for use under 21 CFR since potential applications are so numerous that specific applications must be submitted to the FDA for inclusion in the 21 CFR FDA listing.

## **Section 16: Other Information**

Most Recent Revision 11/14/2014

\*Glo Germ™ Powder is manufactured in a plant that uses Formaldehyde. In 10 years of random sample testing at independent labs, Formaldehyde has not been detected in Glo Germ™ particles. The original manufacturing method included using Formaldehyde for "curing" and the nature of the process ensures that any remaining formaldehyde is off-gassed.

**Disclaimer:** The information contained herein is accurate to the best of our knowledge. Glo Germ™ Company makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.

\*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15(29 CFR 1910.1200(g)(2)).



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

EMERGENCY OVERVIEW

DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT  
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF  
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs):

COMPANY CONTACT (business hours):

MSDS (Environment, Health, Safety) Internet Website

CHEMTREC (800)424-9300

Corporate Safety (732)750-6000

www.hess.com

**SYNONYMS:** Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS \*

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

### 3. HAZARDS IDENTIFICATION

#### **EYES**

Moderate irritant. Contact with liquid or vapor may cause irritation.

#### **SKIN**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

#### **INGESTION**

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

#### **INHALATION**

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

**WARNING:** the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

#### **CHRONIC EFFECTS and CARCINOGENICITY**

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

#### **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

### 4. FIRST AID MEASURES

#### **EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

#### **SKIN**

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

#### **INGESTION**



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### **INHALATION**

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## **5. FIRE FIGHTING MEASURES**

### **FLAMMABLE PROPERTIES:**

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

### **FIRE AND EXPLOSION HAZARDS**

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### **EXTINGUISHING MEDIA**

**SMALL FIRES:** Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, or Halon.

**LARGE FIRES:** Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

### **FIRE FIGHTING INSTRUCTIONS**

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

### **6. ACCIDENTAL RELEASE MEASURES**

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

### **7. HANDLING and STORAGE**

#### **HANDLING PRECAUTIONS**

\*\*\*\*\*USE ONLY AS A MOTOR FUEL\*\*\*\*\*

\*\*\*\*\*DO NOT SIPHON BY MOUTH\*\*\*\*\*

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

#### **STORAGE PRECAUTIONS**

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

#### **WORK/HYGIENIC PRACTICES**

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.



## MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

### 8. EXPOSURE CONTROLS and PERSONAL PROTECTION

#### EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	Skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50	--	A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200	--	Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	20	--	A4	
1,2,4-Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

#### ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

#### EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

#### SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

#### RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

### 9. PHYSICAL and CHEMICAL PROPERTIES

#### APPEARANCE

A translucent, straw-colored or light yellow liquid



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

### **ODOR**

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

### **ODOR THRESHOLD**

	<u>Odor Detection</u>	<u>Odor Recognition</u>
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

### **BASIC PHYSICAL PROPERTIES**

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	0.70 - 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H <sub>2</sub> O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

## **10. STABILITY and REACTIVITY )**

**STABILITY:** Stable. Hazardous polymerization will not occur.

### **CONDITIONS TO AVOID**

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

### **INCOMPATIBLE MATERIALS**

Keep away from strong oxidizers.

### **HAZARDOUS DECOMPOSITION PRODUCTS**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitroresols that can decompose violently.

## **11. TOXICOLOGICAL PROPERTIES**

### **ACUTE TOXICITY**

Acute Dermal LD50 (rabbits): > 5 ml/kg	Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating	Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative	

### **CHRONIC EFFECTS AND CARCINOGENICITY**

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

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This product may contain methyl tertiary butyl ether (MTBE ): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Gasoline
DOT HAZARD CLASS and PACKING GROUP: 3, PG II
DOT IDENTIFICATION NUMBER: UN 1203
DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:



15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

Table with 5 columns: ACUTE HEALTH, CHRONIC HEALTH, FIRE, SUDDEN RELEASE OF PRESSURE, REACTIVE. Values: X, X, X, --, --

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

Table with 2 columns: INGREDIENT NAME (CAS NUMBER), CONCENTRATION WT. PERCENT. Rows: Benzene (71-43-2) 0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline), Ethyl benzene (100-41-4) < 3



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

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n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents ([www.epa.gov/tri](http://www.epa.gov/tri)) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION - Parts per million (ppm) by weight</u>
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

**CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS**

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>Date Listed</u>
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Toluene	1/1/1991

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Class B, Division 2 (Flammable Liquid)  
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

**16. OTHER INFORMATION**

<b><u>NFPA® HAZARD RATING</u></b>	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
<b><u>HMIS® HAZARD RATING</u></b>	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal

**SUPERSEDES MSDS DATED:** 07/01/06

**ABBREVIATIONS:**

AP = Approximately    < = Less than    > = Greater than  
N/A = Not Applicable    N/D = Not Determined    ppm = parts per million

**ACRONYMS:**

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation
ANSI	American National Standards Institute (212)642-4900		[General Info: (800)467-4922]
API	American Petroleum Institute (202)682-8000	EPA	U.S. Environmental Protection Agency
		HMIS	Hazardous Materials Information System



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

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IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
NFPA	National Fire Protection Association (617)770-3000	SCBA	Self-Contained Breathing Apparatus
NIOSH	National Institute of Occupational Safety and Health	SPCC	Spill Prevention, Control, and Countermeasures
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	STEL	Short-Term Exposure Limit (generally 15 minutes)
NTP	National Toxicology Program	TLV	Threshold Limit Value (ACGIH)
OPA	Oil Pollution Act of 1990	TSCA	Toxic Substances Control Act
OSHA	U.S. Occupational Safety & Health Administration	TWA	Time Weighted Average (8 hr.)
PEL	Permissible Exposure Limit (OSHA)	WEEL	Workplace Environmental Exposure Level (AIHA)
RCRA	Resource Conservation and Recovery Act	WHMIS	Workplace Hazardous Materials Information System (Canada)

### DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

MATERIAL SAFETY DATA SHEET  
Starch

## Section 1 - Chemical Product and Company Identification

<b>MSDS Name:</b>	Starch
<b>Catalog Numbers:</b>	21512-0000, 21512-1000, 21512-5000, 24073-0000, 24073-0025, 41969-0000, 41969-5000
<b>Synonyms:</b>	
<b>Company Identification:</b>	Acros Organics BVBA Janssen Pharmaceuticaaan 3a 2440 Geel, Belgium
<b>Company Identification: (USA)</b>	Acros Organics One Reagent Lane Fair Lawn, NJ 07410
<b>For information in the US, call:</b>	800-ACROS-01
<b>For information in Europe, call:</b>	+32 14 57 52 11
<b>Emergency Number, Europe:</b>	+32 14 57 52 99
<b>Emergency Number US:</b>	201-796-7100
<b>CHEMTREC Phone Number, US:</b>	800-424-9300
<b>CHEMTREC Phone Number, Europe:</b>	703-527-3887

## Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name:	%	EINECS#
9005-25-8	Starch		232-679-6

**Hazard Symbols:** None listed

**Risk Phrases:** None listed

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

*Not available*

## Potential Health Effects

**Eye:** May cause eye irritation.

**Skin:** May cause skin irritation. Low hazard for usual industrial handling.

**Ingestion:** May cause irritation of the digestive tract. Low hazard for usual industrial handling.

**Inhalation:** May cause respiratory tract irritation. Low hazard for usual industrial handling.

**Chronic:**

## Section 4 - First Aid Measures

**Eyes:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

**Ingestion:** Get medical aid. Wash mouth out with water.  
**Inhalation:** Remove from exposure and move to fresh air immediately.  
**Notes to Physician:** Treat symptomatically and supportively.

### Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.  
**Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or chemical foam.

### Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.  
**Spills/Leaks:** Vacuum or sweep up material and place into a suitable disposal container.

### Section 7 - Handling and Storage

**Handling:** Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes.  
**Storage:** Store in a cool, dry place. Store in a tightly closed container.

### Section 8 - Exposure Controls, Personal Protection

#### Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

#### Exposure Limits

CAS# 9005-25-8:

United Kingdom, WEL - TWA: 10 mg/m<sup>3</sup> TWA (total inhalable); 4 mg/m<sup>3</sup> TWA (respirable) United Kingdom, WEL - STEL: 30 mg/m<sup>3</sup> STEL (total inhalable); 4 mg/m<sup>3</sup> STEL (respirable)

United States OSHA: 15 mg/m<sup>3</sup> TWA (total dust); 5 mg/m<sup>3</sup> TWA (respirable fraction)

Belgium - TWA: 10 mg/m<sup>3</sup> VLE

Malaysia: 10 mg/m<sup>3</sup> TWA

Spain: 10 mg/m<sup>3</sup> VLA-ED

#### Personal Protective Equipment

**Eyes:** Wear chemical splash goggles.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

### Section 9 - Physical and Chemical Properties

**Physical State:** Powder

**Color:** white to light yellow

**Odor:** odorless

**pH:** Not available

**Vapor Pressure:** Not available

**Viscosity:** Not available

**Boiling Point:** Not available

**Freezing/Melting Point:** Not available  
**Autoignition Temperature:** 400 deg C ( 752.00 deg F)  
**Flash Point:** Not available  
**Explosion Limits: Lower:** Not available  
**Explosion Limits: Upper:** Not available  
**Decomposition Temperature:**  
**Solubility in water:** Not available.  
**Specific Gravity/Density:**  
**Molecular Formula:** (C6H10O5)n  
**Molecular Weight:**

### Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures.  
**Conditions to Avoid:** Incompatible materials.  
**Incompatibilities with Other Materials** Incompatible materials.  
**Hazardous Decomposition Products** Carbon monoxide, carbon dioxide.  
**Hazardous Polymerization** Will not occur.

### Section 11 - Toxicological Information

**RTECS#:** CAS# 9005-25-8: GM5090000  
**LD50/LC50:** RTECS: Not available.  
**Carcinogenicity:** Starch - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.  
**Other:** The toxicological properties have not been fully investigated.

### Section 12 - Ecological Information

Not available

### Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

### Section 14 - Transport Information

	IATA	IMO	RID/ADR
<b>Shipping Name:</b>	Not regulated as a hazardous material	Not regulated as a hazardous material	Not regulated as a hazardous material
<b>Hazard Class:</b>			
<b>UN Number:</b>			
<b>Packing Group:</b>			

### Section 15 - Regulatory Information

#### European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: Not available

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9005-25-8: 0

Canada

CAS# 9005-25-8 is listed on Canada's DSL List

**US Federal**

TSCA

CAS# 9005-25-8 is listed on the TSCA Inventory.

**Section 16 - Other Information**

**MSDS Creation Date:** 7/16/1996

**Revision #1 Date** 12/15/2004

**Revisions were made in Sections:** General revision.

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.*

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APPENDIX E

EMERGENCY RESPONDER HEALTH AND SAFETY MANUAL,  
CHAPTER II-1: PHYSICAL STRESS MANAGEMENT PROGRAM

<http://www.epaosc.org/HealthSafetyManual/index.htm>