

HEALTH & SAFETY PLAN

**Douglas Road Landfill Superfund Site
16845 Douglas Road
Mishawaka, St. Joseph County, Indiana**

Patriot Project Number: 16-1731-04E

June 14, 2021

Written by:



Kendra Gutowski, Project Manager

Reviewed by:



Kyle Bauer, Health and Safety Manager

HEALTH AND SAFETY PLAN

A. General Information

Project Name: Douglas Road Landfill Superfund Site O&M

Project Number: 16-1731-04E

Location: Intersection of Douglas and Grape Road, Mishawaka, Indiana

Client: Indiana Department of Environmental Management (IDEM)

Plan Updated By: Kendra Gutowski Date: June 14, 2021

B. Site Description

The Douglas Road Landfill Superfund Site (Site) encompasses approximately 40 acres of land and includes one small building, an unlined landfill, a constructed wetlands treatment system, a landfill gas extraction system, a landfill gas monitoring system, a groundwater extraction system, and a landfill cover system. The Site is located northeast of the intersection of Grape Road and Douglas Road in Section 28, Township at 38 North, Range 3 East, north of South Bend in Mishawaka, Saint Joseph County, Indiana. The Site is bordered to the north by the Indiana Toll Road (Interstate Highways 80 and 90), to the south by Douglas Road, and residential and commercial properties to the west and east. The Site is fenced and is approximately 1,800 feet north from Juday Creek.

The Site was originally a sand and gravel pit excavated to provide materials for highway construction in the early 1950's. The Uniroyal Plastics Company, Inc. (UPC) leased the gravel pit between 1954 until it closed in December 1979. UPC used the landfill from 1954 to 1970 to dispose of (by burning) solvents, fly ash, paper, wood stock, rubber and plastic wrap, waste oil mixtures and trash. The practice consisted of the transportation of drummed materials to the landfill, emptying the drums into the excavation, and burning the wastes deposited that day. UPC estimates that 302,400 gallons of Resource Conservation and Recovery Act (RCRA) hazardous waste were disposed of at the landfill. These wastes included methyl ethyl ketone, acetone, tetrahydrofuran, toluene, hexane, and xylenes.

In 1970, the Indiana Stream Pollution Control Board requested that UPC cease disposing of solvents at the landfill in response to the suspected contamination of a nearby residential well. From 1971 to 1979, only fly ash and scrap rubber were landfilled at the Site. Intermittent sampling was conducted at six monitoring wells at the perimeter of the site from 1971 until 1980. No groundwater contamination was detected at the locations.

The landfill was subsequently capped with sand, topsoil, and vegetation and officially closed in 1980.

Soil sampling conducted during the Remedial Investigation (RI) in 1994 indicated that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, dioxins, and metals were present at the Site. The results of the investigation also indicated that contaminants had been carried in the groundwater offsite at potentially dangerous levels for human health and the environment.

The United States Environmental Protection Agency (USEPA) began remedial action at the Site in February of 1999 by removing vegetation from the landfill and wetland construction areas. The USEPA initiated operation and maintenance (O&M) of the remedial systems at the Site after construction activities were completed in September 2000. In October 2001, the Indiana Department of Environmental Management (IDEM) assumed O&M responsibility for the landfill portion of the Site only. The IDEM and Ecology & Environment, Inc. personnel conducted these activities through September 2009. In July 2011, the IDEM also assumed O&M responsibility from the USEPA for the groundwater extraction and wetlands portions of the Site. The IDEM contracted with KERAMIDA to conduct the day to day O&M activities at the Site from 2009 through mid-2013. KERAMIDA resumed responsibility for the Site O&M responsibilities in late April 2014 until December 2016. IDEM has contracted Patriot Engineering and Environmental, Inc. (Patriot) for the day to day O&M activities starting in the 2017 Calendar Year. Patriot has prepared this Health and Safety Plan (HASP) for the O&M activities at the Site.

C. Project Objectives

This HASP has been prepared for the O&M activities planned for the Douglas Road Landfill. A detailed list of work to be covered by the HASP is presented below:

- Inspect the fence once a month and make repairs when necessary.
- Inspect the landfill cap and drainage system two times a month.
- Inspect the landfill gas system two times per month. The inspections will include, but are not necessarily limited to: 1) checking the blower motor for operation, 2) checking pressure gages for functionality and operating specifications, 3) checking and replacing air filter elements, 4) checking the condensate tank and disposing of liquid contents, and 5) checking building integrity and general maintenance.
- Conduct a detailed landfill cap/cover inspection quarterly (4 times a year). Report deficiencies/issues.
- Mow the entire landfill, including drainage ditches and perimeter areas. Mowing activities will be completed using a bush hog or similar equipment. This task will be contracted out to US Lawns.

- Vegetation growth control along fence, both manually and using chemical treatment, once a year. This task will be contracted out to US Lawns.
- Vegetation growth control (chemical treatment) applied to drainage ditches and access road, once a year. This task will be contracted out to US Lawns.
- Nuisance animal control (muskrats/groundhogs), as needed, up to ten live trapping events.
- Remove debris and trash from fence line, drainage areas, and structures.
- Monitor the landfill gas monitoring wells on a quarterly basis for methane (CH₄), lower explosive limits (LEL), and oxygen (O₂) levels using a multi-gas meter, GEM 2000.
- Collect an eight-hour air sample from the exhaust of the landfill gas extraction system on a quarterly basis and submit for analysis of volatile organic compounds (VOCs) using USEPA Method TO-15. Sample analysis will be contracted out to Pace National.
- Perform repairs to the methane extraction system and building housing the equipment. Repairs will include but not limited to the blower motor, pressure gauges, condensate tank, air filter element replacement, installation of overhang intake/vent and resealing/painting the building.
- Collect samples from the groundwater monitoring well network during the fall (3rd) quarter for VOC, arsenic, lead, and iron analysis.
- Inspect and perform necessary repairs to well cover, locks, riser pipes, protective casings, guard posts or other components documented during the sampling event. Redeveloped and/or replace wells when warranted and approved by IDEM.

D. Project Organization

<u>Team Member</u>	<u>Responsibility</u>
<u>Jessica Fliss</u>	<u>IDEM Project Manager</u>
<u>Kendra Gutowski</u>	<u>Patriot Project Manager</u>
<u>James Douglas Lam</u>	<u>Patriot Assistant Project Manager</u>
<u>Patriot Staff</u>	<u>Field Personnel</u>
<u>Janna Stathyelich</u>	<u>Patriot QA/QC Manager</u>

Heather Wagner

Lab Manager- Pace National

E. Chemical Hazard Analysis

Principal contaminants suspected at the Site based upon IDEM file review include solvents, fly ash, paper, wood stock, rubber and plastic wrap, waste oil mixtures and trash. These wastes included methyl ethyl ketone, acetone, tetrahydrofuran, toluene, hexane, and xylenes. Safety Data Sheets (SDS) for the chemicals discussed below are attached.

Chemical	Exposure Route	Symptoms of Exposure	Exposure Limits
Acetone	Inhalation, ingestion, skin contact, and eye contact	Irritation of eyes, dry mouth, throat, nausea and dizziness	OSHA PEL: 1,000 PPM ACGIH TLV: 500 PPM
Dichloroethylene 1,2	Inhalation, ingestion, skin contact, and eye contact	Dizziness, drowsiness, and unconsciousness	OSHA PEL: 200 PPM ACGIH TLV: 200 PPM
Hexane	Inhalation, ingestion, skin contact, and eye contact	Headache, nausea, and giddiness	OSHA PEL: 500 PPM ACGIH TLV: 50 PPM
Methane	Inhalation, ingestion, skin contact, and eye contact	Headache, dizziness, and difficulty breathing	OSHA PEL: 100 PPM ACGIH TLV: N/A
Methyl Ethyl Ketone	Inhalation, ingestion, skin contact, and eye contact	Trembling and convulsions	OSHA PEL: 200 PPM ACGIH TLV: 200 PPM
Tetrahydrofuran	Inhalation, ingestion, skin contact, and eye contact	Irritation of eyes/nose, nausea, dizziness, and headache	OSHA PEL: 200 PPM ACGIH TLV: 200 PPM
Toluene	Inhalation, ingestion, skin contact, and eye contact	Irritation of eyes/URT/skin, fatigue, weakness, confusion and dizziness	OSHA PEL: 200 PPM ACGIH TLV: 200 PPM
Trichloroethylene	Inhalation, ingestion, skin contact, and eye contact	Flushed skin, confusion, headache, and dizziness	OSHA PEL: 100 PPM ACGIH TLV: 50 PPM
Xylene (all isomers)	Inhalation, ingestion, skin contact, and eye contact	Irritation of eyes/nose/throat, drowsiness and dizziness	OSHA PEL: 100 PPM ACGIH TLV: 100 PPM

TLV, threshold limit value; TWA, time weighted average; PEL, permissible exposure limit; STEL, short term exposure limit; IDLH, immediate danger to life and health, NE, Not Established; ppm, parts per million

F. Hazard Identification and Control

Precautions must be taken to prevent injuries and exposures to the following hazards.

Potential Hazard	Control
Chemical Exposures (See SDS for more specific information)	<ul style="list-style-type: none">• Stay upwind whenever possible• Minimize contact and contact time with the chemical• Avoid walking through suspected areas or anything likely to be contaminated• Do not eat, drink, smoke or apply cosmetics in exclusion zone• Wear gloves when in contact with contamination• Wear safety glasses• Wear splash goggles when working with liquids• Upgrade to Level C PPE if more than 25 ppm vapors in breathing zone is sustained for 5 minutes• Upgrade to Level D PPE if more than 250 ppm vapors in breathing zone is sustained for 5 minutes• Call Health & Safety Representative if unknown materials are encountered• All hazardous materials must be adequately labeled and have SDS available.• Use daily tool box safety meeting to record training attendance
Vehicular Traffic	<ul style="list-style-type: none">• Wear traffic safety vest• Use cones, flags, barricades, and caution tape to define work area• Use vehicle to block work area
Fall Protection	<ul style="list-style-type: none">• Assess the work area to determine potential for falling• Assess the distance of the potential fall• Use fall protection on heights greater than 6 feet• Consult safety personnel regarding fall protection and what system to use• Inspect fall protection equipment and anchoring points prior to use

Potential Hazard	Control
Confine Space Entry	<ul style="list-style-type: none"> • Ensure personnel assigned have met confined space training requirements • Complete confined space entry permit • Conduct pre-entry safety meeting • Use mechanical ventilation • Conduct remote air monitoring prior to entry • Attendant must be present at entry at all times when entrant is in confined space • Assess for fall hazards and ensure provisions for non-entry rescue have been met • Enter only when safe; conduct continuous air monitoring
Inclement Weather	<ul style="list-style-type: none"> • Cease all outdoor work during electrical storms, hail, and other extreme weather conditions • Take cover indoors • Listen to local forecasts for weather watches and warnings • Obey 30/30 lightning rule: If it takes less than 30 seconds to hear thunder after a lightning flash, the lightning is near enough to pose a threat
Electrical Shock	<ul style="list-style-type: none"> • Maintain appropriate distance from overhead utilities, 10 feet minimum clearance for power lines 50 kV or less and 10 feet minimum plus 4 inches for every 10 kV over 50 kV • Use ground fault protectors • Perform lockout/tag out procedures • Use three pronged plugs and extension cords • Contact local utility locating service • Follow code requirements for electrical installations in hazards locations
Noise	<ul style="list-style-type: none"> • Wear hearing protection when working near heavy equipment • Wear hearing protection when it is necessary to raise your voice above normal speech due to loud noise • Conduct noise monitoring to verify hearing protection requirements
Physical Injury	<ul style="list-style-type: none"> • Wear hard hats and safety glasses when on-Site • Maintain visual contact with equipment operator and wear safety colored vest when heavy equipment is used • Avoid loose fitting clothing • Prevent slips, trips, and falls by keeping work area uncluttered • Keep hands away from moving parts • Test emergency cutoff switch on equipment daily
Static Electricity	<ul style="list-style-type: none"> • Do not create discharge around flammable materials • Electrically bond and ground pumps, vessels, tanks, drums and probes when moving flammable liquids • Do not splash fill containers filled with flammable liquids

Potential Hazard	Control
Back Injury	<ul style="list-style-type: none"> • Use a mechanical lifting devices • Plan the lift • Check your route • Bend at the knees • Use buddy system • Do not twist your body
Heat Stress	<ul style="list-style-type: none"> • Increase water intake • Take frequent breaks or rotate workers, take shorter work shifts • Watch for signs and symptoms for heat exhaustion and fatigue • Avoid the hottest part of the day. Plan work for early morning or evening • Use ice vests when necessary • Rest in cool areas • In the event of heat stroke, cool the victim and initiate first aid. Seek medical attention
Cold Stress	<ul style="list-style-type: none"> • Take breaks in heated shelters • Drink warm liquids • Be aware of cold stress symptoms such as shivering, numbness, sluggishness
Bites, Stings from Spiders, Insects and Snakes	<ul style="list-style-type: none"> • Avoid suspected areas such as tall grass, brush, or undergrowth • Use caution moving or lifting objects which could be used as cover • Never reach under or behind objects which could be used as cover • Wear long pants and sleeves • Wear heavy gloves and sturdy leather boots • Use repellent • Check for signs of bites such as redness, swelling, and flu-like symptoms • Snake and spider bites can be medical emergencies – seek treatment immediately
Poisonous Plants	<ul style="list-style-type: none"> • Avoid suspected areas such as tall grass, brush, or undergrowth • Washed exposed skin that may come into contact with poison plants • Utilize protective clothing
Ladders	<ul style="list-style-type: none"> • Assess work areas for fall hazards • Inspect ladders for damage • Secure feet of ladders • Pitch ladder at a 4:1 ratio • Secure ladders at the top when possible • Extension ladders must extend 3 feet beyond landing platform • Use non-conductive ladders

Potential Hazard	Control
Fire Control	<ul style="list-style-type: none"> No smoking on-Site Keep flammable liquid in approved containers Keep approved containers closed Keep work areas free from combustible debris Isolate ignition sources
Drilling/ Boring Operations	<ul style="list-style-type: none"> Operations must be actively manned Know the locations of emergency shut off switch and test it daily for function Unauthorized personnel must be kept clear of drilling rig Area of drilling rig must be cordoned off and barricaded
Well Development, Well Gauging, Well Bailing, and Water Sampling	<ul style="list-style-type: none"> Wear appropriate PPE to avoid skin, eye, and inhalation contact with contaminated water and soil Stand upwind and minimize inhalation exposure Conduct air monitoring Utilize engineering controls to control chemical vapors
Welding, Cutting, Brazing	<ul style="list-style-type: none"> Conduct fire safety evaluations Ensure flammable materials are protected from hot work and sources of ignition Ensure fire watch/fire extinguisher is on standby
Cleaning Equipment	<ul style="list-style-type: none"> Wear appropriate PPE to avoid skin and eye contact with cleaning materials Stand upwind to minimize any potential inhalation hazard Properly dispose of spent cleaning solitons and rinses
Mowing Grass	<ul style="list-style-type: none"> Walk site down prior to mowing; remove possible obstructions or items that may be thrown by the mower Wear PPE including steel toe shoes, safety glasses, and hearing protection When mowing on a slope, mowing vertically with a riding mower Do not mow on slopes greater than 15% using a conventional mowing. Discuss with management on how to mow slopes greater than 15%
Rapid Response	<ul style="list-style-type: none"> Ensure emergency response activities have been completed prior to beginning rapid response activities Conduct hazard assessment of the Site and communicate findings through daily tool box safety meeting prior to beginning rapid response activities Communicate health and safety protocols to other contractor that may be impacted and coordinate field activities with them

First aid kits, fire extinguishers, and eye wash kits are located in the plastic tote (safety kit) located in the system shed and/or in vehicles.

G. Site Control

Work zones will be established in order to delineate traffic locations, identify hazardous locations, and contain contamination within the smallest area possible. Employees entering the work zone must wear proper PPE for that area. Work and support will be established based on ambient air data, necessary security measures, and site-specific conditions. General guidelines for developing site control and work zones are listed below:

When working in street or roadway:

- Wear traffic vest and hardhat when vehicle hazard exists;
- Use cones, flags, caution tape, or barricades;
- Use vehicle strobe light and block area with vehicle;
- Develop traffic patterns for high density areas;
- Use flagger;
- Use flashing arrows;
- Use “Men Working” signs; and
- Obtain lane closing permits, if warranted.

When working at excavation or trench sites:

- Competent person is required per OSHA.
- Safeguard open excavations by restricting unauthorized access.
- Maintain zone definitions along perimeter with continuous string of caution tape.
- Highlight work area using warning signs (cones, barricades) placed a minimum of 10 feet from excavation opening.

Excavations left unattended or overnight:

Use one of the following methods:

Surround entire perimeter with plastic or cloth construction fencing. Anchor fence to the ground using posts. Space post no greater than 8 feet apart. Fence height must be a minimum of 4 feet. Fence material must be a quality capable of withstanding a pressure of 200 pounds.

Place 8-foot-long barricade affixed with flashing lights end to end with 4 foot high construction net fence attached to barricades.

Utilize temporary curbing or concrete “jersey” barriers affixed with flashing signal lights or other warning signs.

H. Decontamination Procedures

Operations conducted on the Site have the potential to contaminate field equipment and PPE. To prevent transfer of contamination to vehicles, offices, and personnel, the procedures below must be followed:

Field Equipment, such as flow cells, water level indicator, meters, hand tools, and augers should be decontaminated with a solution of detergent and water, rinse prior to leaving the Site.

Disposable PPE, such as Tyvek suits, gloves, respirator cartridges, should be handled and disposed of according to the requirements of IDEM and USEPA. Most likely disposed of in a sealed trash bag and accepted as general solid waste.

Non-Disposable PPE, such as respirator masks and boots should be wiped or rinsed with water and detergent before leaving the Site.

I. Personal Protective Equipment

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work zones:

<u>Level of Protection</u>	<u>Required Protective Equipment</u>
<u>Level D</u>	Respirator: <u>N/A</u>
	Filters/Cartridges: <u>N/A</u>
	Boots: <u>Steel-toed shoes</u>
	Inner Gloves: <u>N/A</u>
	Outer Gloves: <u>Nitrile or similar</u>
	Suit: <u>N/A</u>
	Hard Hat: <u>Yes</u>
	Eye Protection: <u>Yes</u>

If site conditions change, it may be necessary to upgrade to Level C, B or A, based upon hazard evaluation:

Levels of PPE

Level A – The highest level of protection used when:

- Unknown chemicals are involved and there is a high risk for a chemical release.
- Chemical concentrations are known to be above safe levels [immediate danger to life of health (IDLH atmosphere)].
- Extremely hazardous substances are present or suspected.
- Chemicals and/or vapor mists are present or suspected.
- Oxygen deficient atmosphere or confined space conditions.

Level B – The second highest level of protection used when:

- Concentrations of chemicals in the air are IDLH or above the protection factors provided by an air-purifying respirator (APR) with full-face mask.
- Oxygen deficient atmosphere or confined space conditions.
- Vapor absorption or contact with skin not critical.

Level C – An intermediate level of chemical protection used when:

- Air concentrations of chemicals are potentially above or known to be above the American Conference of Government Industrial Hygienists (ACGIH) time weighted average (TWA) threshold limit values (TLVs) and APR will provide protection.
- Non-IDLH atmospheres.
- Chemicals are not destructive to skin.

Level D – An intermediate level of chemical protection used when:

- No concentrations of chemicals above the ACGIH TWA – TLVs.
- No hazardous effect from skin or inhalation.

Only PPE that meets the following American National Standard Institute (ANSI) standard are to be worn:

Eye Protection ANSI-Z87.1 – 2003

Head Protection ANSI-Z89.1 – 2003

Foot Protection ANSI-Z41 – 1999

Hearing Protection with an NRR of 25 dB at a minimum

Employees must maintain proficiency and, in the use, and care of PPE that is to be worn. Formal and informal refresher training sessions presented by Patriot typically satisfy this requirement. Specific PPE requirements are reviewed during the daily toolbox safety meeting.

J. Air Monitoring

Air monitoring will be performed on-Site, either during scheduled, quarterly monitoring events of the vent wells, or during periodic monitoring events when indication exists that exposures may have risen over permissible exposure limit (PEL), a flammable atmosphere has developed, or an immediate danger to life or health (IDLH) situation.

Site personnel assigned to conduct air monitoring must be trained in air monitoring equipment operation and calibration prior to its use.

Air monitoring will be performed at the Site using a GEM 2000 methane monitoring device. The device will monitor methane and percent lower explosive limit (%LEL) simultaneously. Should organic vapor concentrations be required to be monitored in the field, a photoionization detector (PID) may be used. Flammable vapors and or gas other than the anticipated methane, will be monitored with an oxygen/combustible meter (LEL/O₂) real time instrument.

All readings will be taken in the working breathing zone to determine whether an action level has been met and or exceeded. Readings must be sustained for 5 minutes for upgrade in PPE level.

Air monitoring action levels for the Site have been developed by previous consultants. These action levels will be used to indicate if an upgrade to PPE level is required. The action levels were derived from estimated concentrations, corrected to PID response factors (at which benzene could be present at 0.5ppm in air). Action will be taken if the action levels are consistently exceeded in a 5-minute period. The action levels apply to all task conducted at the Site. Engineering controls such as a blower or exhaust to remove vapors can be utilized as a means to downgrade PPE requirements.

Air monitoring action limits are outlined in the table below:

Function	Measurement	Action
Conduct air monitoring as necessary using PID	Background - 10 PPM	Level D
	> 10 PPM – 75 PPM	Upgrade to Level C. Half face respirator, Contact PM and H&S Manager for guidance and approval to continue work.
	> 75 PPM – 250 PPM	Upgrade to Level C. Full face respirator, Contact PM and H&S Manager for guidance and approval to continue work.
	> 250 PPM – 500 PPM	Upgrade to Level B. Contact PM and H&S Manager for guidance and approval to continue work.
	> 500 PPM	Stop Work. Contact PM and H&S Manager for guidance.

Function	Measurement	Action
<p>Conduct air monitoring as necessary using a LEL/Oxygen Meter</p> <p>A decrease in O₂ reading of 0.1% represents a change in total air of approximately 0.5% or 500 PPM. This change represents little hazards if displacement is by an inert gas but represents a real hazard if the displacing gas is toxic or flammable.</p>	O ₂ = 20.9%	Acceptable conditions.
	O ₂ = 19.5 - 20.8%	Verify O ₂ depletion. Utilize forced air ventilation to control atmosphere.
	O ₂ = 20.9 - 22%	Verify O ₂ enrichment. Utilize forced air ventilation to control atmosphere.
	O ₂ > 22%	Leave area immediately. Notify PM and H&S Manager for guidance.
	O ₂ < 19.5%	Leave area immediately. Notify PM and H&S Manager for guidance. Verify depletion and used forced air ventilation.
	LEL < 10%	Acceptable conditions.
	LEL > 10%	Leave area immediately. Notify PM and H&S Manager for guidance.

K. Contingency Plans and Field Communications

The table below presents contingency plans for potential emergency situations:

Situation	Action
Evacuation	<ul style="list-style-type: none"> • Immediately notify all on-Site personnel of an emergency requiring evacuation. • Leave dangerous area and report to a pre-designated rally point. • Notify emergency medical service (EMS) if appropriate. • Account for all personnel. • Contact PM and H&S Manager as soon as possible. • Maintain site security and control measures for community safety until emergency responders arrive. • Document the incident.
Fire Emergency	<ul style="list-style-type: none"> • Evacuate the area. • Notify EMS. • Extinguish small fires with an all-purpose dry chemical extinguisher. ONLY If you know what caused the fire and what the correct extinguisher is to use on the fire. • Contact PM and H&S Manager. • Document the incident.

Situation	Action
Medical Emergency	<ul style="list-style-type: none"> • Survey the situation. • Do not enter an area that may jeopardize your safety. • Establish the victims level of consciousness. • Call for help. • Notify EMS and inform them of victims condition • Primary Assessment (patient unconscious) Arousal, Airway, Breathing, Circulation. • Perform CPR IF properly trained and certified. • Secondary Assessment (patient conscious) Check for breathing, do not move the patient, monitor vital signs, provide first aid ONLY to the level of your training. • Contact PM and H&S Manager. • Document the incident.
Spill or Release	<p>Properly document the location of underground lines before starting work. If a line or tank is broken, document the spill or release in writing. Include dates, times, actions taken, agreements reached, and the names of people involved. In an event of a release:</p> <ul style="list-style-type: none"> • Wear appropriate PPE, stay upwind of the release. • Turn off equipment and other sources of ignition. • Turn off pumps and shut valves to stop flow. • Plug the leak or collect spill if possible. • Call Fire Department if fire emergency develops. • Inform PM and H&S Manager about the situation. • Determine if Client will want Patriot to repair damage or if Client will want to use an emergency repair contractor. • Advise Client of spill discharge notification requirements and determine who will complete and submit forms. Document interaction with the Client and regulators. Note in writing: name, title, authorizations, refusals, decisions, and commitments to actions. • Do not transport or approve to transport contaminated soils or product until proper manifests have been completed and approved. • Do not sign manifests as generator of waste. <p>A spill or release requires completion of the preliminary incident report. The project manager must contact the client or generator. The generator is under obligation to report to the proper governmental agencies. If spill extends into water ways, the Coast Guard and the National Response Center (800-424-8802) must be notified immediately by the client or with his permission.</p>

L. Emergency Telephone Numbers

Patriot Officer of Health and Safety (Patriot Office) -----(317) 576-8058

U.S. EPA Region 5 Emergency Response Center Chemtrec -----(800) 424-9300

Bureau of Explosives -----(202) 293-4048

Communicative Disease Center -----(404) 633-5313
(Biological Agents)

National Response Center -----(800) 424-3802
(Oil/Hazardous Substances)

DOT Office of Hazardous Operations -----(202) 426-0656

U.S. Coast Guard -----(800) 424-8802

National Agricultural Chemical Association -----(513) 961-4300

Nearby Hospital: St. Joseph Regional Medical Center
5215 Holy Cross Parkway
Mishawaka, IN 46530

Phone: (574) 335-5000

Travel Time: 1.4 Miles – 4 minutes

Directions: Turn right onto Douglas Road, go 1.3 miles to Holy Cross Parkway, turn right, hospital is on the left.

Paramedics: (Name): City of Mishawaka

(Phone): 911

Fire Department: (Name): City of Mishawaka

(Phone): 911, Non-emergency (574) 258-0620

Local Police: (Phone): 911, Non-emergency (574) 258-1678

Name

Signature

[illegible]

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SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: TRANS-1,2-DICHLOROETHYLENE

TRADE NAMES/SYNONYMS:

MTG MSDS 196; TRANS-ACETYLENE DICHLORIDE; TRANS-DICHLOROETHYLENE; TRANS-1,2-DICHLOROETHENE; 1,2-DICHLOROETHYLENE; RCRA U079; C2H2CL2; MAT23670; RTECS KV9400000

CHEMICAL FAMILY: halogenated, aliphatic

CREATION DATE: Jan 24 1989

REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TRANS-1,2-DICHLOROETHYLENE

CAS NUMBER: 156-60-5

PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=2



EMERGENCY OVERVIEW:

COLOR: colorless

PHYSICAL FORM: liquid

ODOR: pleasant odor

MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation, central nervous system depression

PHYSICAL HAZARDS: Flammable liquid and vapor. Vapor may cause flash fire. May react on contact with air, heat, light or water.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting, drowsiness, symptoms of drunkenness

LONG TERM EXPOSURE: no information on significant adverse effects

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: same as effects reported in short term exposure

EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: same as effects reported in short term exposure

INGESTION:

SHORT TERM EXPOSURE: symptoms of drunkenness

LONG TERM EXPOSURE: no information on significant adverse effects

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For ingestion, consider gastric lavage. Consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Vapor/air mixtures are explosive above flash point. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any

discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water may be ineffective.

FLASH POINT: 36 F (2 C) (CC)

LOWER FLAMMABLE LIMIT: 9.7%

UPPER FLAMMABLE LIMIT: 12.8%

AUTOIGNITION: 860 F (460 C)

FLAMMABILITY CLASS (OSHA): IB

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TRANS-1,2-DICHLOROETHYLENE:

1,2-DICHLOROETHYLENE (ALL ISOMERS):

200 ppm (790 mg/m³) OSHA TWA

200 ppm ACGIH TWA

200 ppm (790 mg/m³) NIOSH recommended TWA 10 hour(s)

VENTILATION: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye

wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

2000 ppm

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with organic vapor cartridge(s).

Any air-purifying respirator with a full facepiece and an organic vapor canister.

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions -

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Escape -

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

COLOR: colorless

ODOR: pleasant odor

MOLECULAR WEIGHT: 96.94

MOLECULAR FORMULA: C₂H₂CL₂

BOILING POINT: 118 F (48 C)

FREEZING POINT: -58 F (-50 C)

VAPOR PRESSURE: 400 mmHg @ 31 C

VAPOR DENSITY (air=1): 3.34

SPECIFIC GRAVITY (water=1): 1.2565

WATER SOLUBILITY: slightly soluble

PH: Not available

VOLATILITY: Not available

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not available

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: ethanol, ether

10. STABILITY AND REACTIVITY

REACTIVITY: May decompose on contact with air, light, moisture, heat or storage and use above room temperature. Releases toxic, corrosive, flammable or explosive gases.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

INCOMPATIBILITIES: bases, metals, combustible materials, oxidizing materials, acids

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: phosgene, halogenated compounds, oxides of carbon

POLYMERIZATION: May polymerize. Avoid contact with incompatible materials.

11. TOXICOLOGICAL INFORMATION

TRANS-1,2-DICHLOROETHYLENE:

IRRITATION DATA: 500 mg/24 hour(s) skin-rabbit moderate; 10 mg eyes-rabbit moderate

TOXICITY DATA: 24100 ppm inhalation-rat LC50; >5 gm/kg skin-rabbit LD50; 1235 mg/kg oral-rat LD50

LOCAL EFFECTS:

Irritant: inhalation, skin, eye

ACUTE TOXICITY LEVEL:

Moderately Toxic: ingestion

Slightly Toxic: inhalation

TARGET ORGANS: central nervous system

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders

MUTAGENIC DATA: Available.

REPRODUCTIVE EFFECTS DATA: Available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

INVERTEBRATE TOXICITY: <110000 ug/L 48 hour(s) (Mortality) Water flea (Daphnia magna)

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U079.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Trichlorobenzenes, liquid
ID NUMBER: UN2321
HAZARD CLASS OR DIVISION: 6.1
PACKING GROUP: III
LABELING REQUIREMENTS: 6.1



CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Trichlorobenzenes, liquid
UN NUMBER: UN2321
CLASS: 6.1
PACKING GROUP/CATEGORY: III

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):

ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):
1,2-DICHLOROETHYLENE (ALL ISOMERS)

OSHA PROCESS SAFETY (29 CFR 1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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SECTION 1: Identification

1.1. Identification

Product form	: Substance
Substance name	: Acetone
Chemical name	: 2-Propanone
CAS No	: 67-64-1
Product code	: LC10420, LC10425
Formula	: C ₃ H ₆ O
Synonyms	: 2-propanone / beta-ketopropane / dimethyl formaldehyde / dimethyl ketone / dimethylketal / DMK (=dimethyl ketone) / keto propane / methyl ketone / pyroacetic acid / pyroacetic ether / pyroacetic spirit

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

Use of the substance/mixture	: Solvent Cleaning product Chemical raw material
------------------------------	--

1.3. Details of the supplier of the safety data sheet

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zelienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number	: CHEMTREC: 1-800-424-9300 or 011-703-527-3887
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SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Flammable liquids Category 2	H225
Serious eye damage/eye irritation Category 2A	H319
Specific target organ toxicity (single exposure) Category 3	H336

Full text of H statements : see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US)	: Danger
Hazard statements (GHS-US)	: H225 - Highly flammable liquid and vapor H319 - Causes serious eye irritation H336 - May cause drowsiness or dizziness
Precautionary statements (GHS-US)	: P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking P233 - Keep container tightly closed P240 - Ground/bond container and receiving equipment P241 - Use explosion-proof electrical, lighting, ventilating equipment P242 - Use only non-sparking tools P243 - Take precautionary measures against static discharge P261 - Avoid breathing mist, spray, vapors P264 - Wash exposed skin thoroughly after handling P271 - Use only outdoors or in a well-ventilated area P280 - Wear eye protection, face protection, protective clothing, protective gloves P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position

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comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a POISON CENTER or doctor/physician if you feel unwell
P337 + P313 - If eye irritation persists: Get medical advice/attention
P370 + P378 - In case of fire: Use dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2) to extinguish
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to comply with local, state and federal regulations
P235 - Keep cool

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substance

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
Acetone (Main constituent)	(CAS No) 67-64-1	100	Flam. Liq. 2, H225 Eye Irrit. 2A, H319 STOT SE 3, H336

Full text of hazard classes and H-statements : see section 16

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

First-aid measures after inhalation : Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Wash immediately with lots of water. Soap may be used. Do not apply (chemical) neutralizing agents. Remove clothing before washing. Take victim to a doctor if irritation persists.

First-aid measures after eye contact : Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion : Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not give milk/oil to drink. Do not induce vomiting. Give activated charcoal. Call Poison Information Centre (www.big.be/antigif.htm). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital. Doctor: gastric lavage.

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

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Feeling of weakness. Irritation of the respiratory tract. Nausea. Vomiting. Headache. Central nervous system depression. Dizziness. Narcosis. Excited/restless. Drunkenness. Disturbed motor response. Respiratory difficulties. Disturbances of consciousness.

Symptoms/injuries after skin contact : ON CONTINUOUS EXPOSURE/CONTACT: Dry skin. Cracking of the skin.

Symptoms/injuries after eye contact : Irritation of the eye tissue.

Symptoms/injuries after ingestion : Dry/sore throat. Risk of aspiration pneumonia. Symptoms similar to those listed under inhalation. AFTER ABSORPTION OF LARGE QUANTITIES: Irritation of the gastric/intestinal mucosa. Change in the blood composition. Change in urine output. Renal disease. Enlargement/disease of the liver.

Symptoms/injuries upon intravenous administration : Not available.

Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Red skin. Skin rash/inflammation. Dry/sore throat. Headache. Nausea. Feeling of weakness. Loss of weight. Possible inflammation of the respiratory tract.

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

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Preferably: alcohol resistant foam. Water spray. Polyvalent foam. Alcohol-resistant foam. BC powder. Carbon dioxide.
- Unsuitable extinguishing media : Solid water jet ineffective as extinguishing medium.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : DIRECT FIRE HAZARD. Highly flammable. Gas/vapor flammable with air within explosion limits. INDIRECT FIRE HAZARD. May be ignited by sparks. Gas/vapor spreads at floor level: ignition hazard. Reactions involving a fire hazard: see "Reactivity Hazard".
- Explosion hazard : DIRECT EXPLOSION HAZARD. Gas/vapour explosive with air within explosion limits. INDIRECT EXPLOSION HAZARD. Heat may cause pressure rise in tanks/drums: explosion risk. may be ignited by sparks. Reactions with explosion hazards: see "Reactivity Hazard".
- Reactivity : Upon combustion: CO and CO₂ are formed. Violent to explosive reaction with many compounds. Prolonged storage: on exposure to light: release of harmful gases/vapours. Reacts violently with (strong) oxidizers: peroxidation resulting in increased fire or explosion risk.

5.3. Advice for firefighters

- Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. Physical explosion risk: extinguish/cool from behind cover. Do not move the load if exposed to heat. After cooling: persistent risk of physical explosion.
- Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Protective equipment : Gloves. Protective goggles. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus. See "Material-Handling" to select protective clothing.
- Emergency procedures : Keep upwind. Mark the danger area. Consider evacuation. Seal off low-lying areas. Close doors and windows of adjacent premises. Stop engines and no smoking. No naked flames or sparks. Spark- and explosion-proof appliances and lighting equipment. Keep containers closed. Wash contaminated clothes.

6.1.2. For emergency responders

- Protective equipment : Equip cleanup crew with proper protection.
- Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

- For containment : Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Measure the concentration of the explosive gas-air mixture. Dilute/disperse combustible gas/vapour with water curtain. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills.
- Methods for cleaning up : Take up liquid spill into inert absorbent material, e.g.: sand, earth, vermiculite. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Spill must not return in its original container. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Handle uncleaned empty containers as full ones. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Avoid prolonged and repeated contact with skin. Keep container tightly closed. Measure the concentration in the air regularly. Work under local exhaust/ventilation.
- Hygiene measures : Do not eat, drink or smoke when using this product. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Heat sources, Direct sunlight, incompatible materials. Keep container closed when not in use.
- Incompatible products : Strong bases. Strong acids.
- Incompatible materials : Sources of ignition. Direct sunlight.
- Storage temperature : 15 - 20 °C
- Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.
- Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: oxidizing agents. reducing agents. strong acids. (strong) bases. halogens. amines.
- Storage area : Store in a cool area. Keep out of direct sunlight. Store in a dry area. Store in a dark area. Ventilation at floor level. Fireproof storeroom. Provide for an automatic sprinkler system. Provide for a tub to collect spills. Provide the tank with earthing. Meet the legal requirements.
- Special rules on packaging : SPECIAL REQUIREMENTS: closing. with pressure relief valve. clean. opaque. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.
- Packaging materials : SUITABLE MATERIAL: steel. stainless steel. carbon steel. aluminium. iron. copper. nickel. bronze. glass. MATERIAL TO AVOID: synthetic material.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Acetone (67-64-1)		
ACGIH	ACGIH TWA (ppm)	500 ppm (Acetone; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
ACGIH	ACGIH STEL (ppm)	750 ppm (Acetone; USA; Short time value; TLV - Adopted Value)
OSHA	OSHA PEL (TWA) (mg/m³)	2400 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
IDLH	US IDLH (ppm)	2500 ppm
NIOSH	NIOSH REL (TWA) (mg/m³)	590 mg/m³
NIOSH	NIOSH REL (TWA) (ppm)	250 ppm

8.2. Exposure controls

- Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
- Personal protective equipment : Safety glasses. Gloves. Protective clothing. Face shield. High gas/vapor concentration: gas mask with filter type A.



- Materials for protective clothing : GIVE EXCELLENT RESISTANCE: No data available. GIVE GOOD RESISTANCE: butyl rubber. tetrafluoroethylene. GIVE LESS RESISTANCE: chlorosulfonated polyethylene. natural rubber. neoprene. polyurethane. PVA. styrene-butadiene rubber. GIVE POOR RESISTANCE: nitrile rubber. polyethylene. PVC. viton. nitrile rubber/PVC.
- Hand protection : Gloves.

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Eye protection	: Safety glasses.
Skin and body protection	: Head/neck protection. Protective clothing.
Respiratory protection	: Wear gas mask with filter type A if conc. in air > exposure limit.
Other information	: Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid.
Color	: Colourless
Odor	: Aromatic odour Sweet odour Fruity odour
Odor threshold	: 306 - 653 ppm 737 - 1574 mg/m ³
pH	: 7
Melting point	: -95 °C
Freezing point	: No data available
Boiling point	: 56 °C
Critical temperature	: 235 °C
Critical pressure	: 47010 hPa
Flash point	: -18 °C
Relative evaporation rate (butyl acetate=1)	: 6
Relative evaporation rate (ether=1)	: 2
Flammability (solid, gas)	: Non flammable.
Vapor pressure	: 247 hPa (20 °C)
Vapor pressure at 50 °C	: 828 hPa (50 °C)
Relative vapor density at 20 °C	: 2.0
Relative density	: 0.79
Relative density of saturated gas/air mixture	: 1.2
Specific gravity / density	: 786 kg/m ³
Molecular mass	: 58.08 g/mol
Solubility	: Soluble in water. Soluble in ethanol. Soluble in ether. Soluble in dimethyl ether. Soluble in petroleum spirit. Soluble in chloroform. Soluble in dimethylformamide. Soluble in oils/fats. Water: Complete Ethanol: Complete Ether: Complete
Log Pow	: -0.24 (Test data)
Auto-ignition temperature	: 465 °C
Decomposition temperature	: No data available
Viscosity, kinematic	: 0.417 mm ² /s
Viscosity, dynamic	: 32 mPa.s (20 °C; 0,27 mPa.s; 40 °C)
Explosion limits	: 2 - 12.8 vol % 60 - 310 g/m ³
Explosive properties	: No data available.
Oxidizing properties	: None.

9.2. Other information

Minimum ignition energy	: 1.15 mJ
Specific conductivity	: 500000 pS/m
Saturation concentration	: 589 g/m ³
VOC content	: 100 %
Other properties	: Gas/vapour heavier than air at 20°C. Clear. Highly volatile. Substance has neutral reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity

Upon combustion: CO and CO₂ are formed. Violent to explosive reaction with many compounds. Prolonged storage: on exposure to light: release of harmful gases/vapours. Reacts violently with (strong) oxidizers: peroxidation resulting in increased fire or explosion risk.

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10.2. Chemical stability

Unstable on exposure to light.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

fume. Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure : Inhalation; Skin and eye contact

Acute toxicity : Not classified

Acetone (67-64-1)	
LD50 oral rat	5800 mg/kg (Rat; Equivalent or similar to OECD 401; Experimental value)
LD50 dermal rabbit	20000 mg/kg (Rabbit; Experimental value; Equivalent or similar to OECD 402; >7426 mg/kg bodyweight; Rabbit; Weight of evidence)
LC50 inhalation rat (mg/l)	71 mg/l/4h (Rat; Experimental value; 76 mg/l/4h; Rat; Experimental value)
LC50 inhalation rat (ppm)	30000 ppm/4h (Rat; Experimental value)
ATE US (oral)	5800.000 mg/kg body weight
ATE US (dermal)	20000.000 mg/kg body weight
ATE US (gases)	30000.000 ppmV/4h
ATE US (vapors)	71.000 mg/l/4h
ATE US (dust, mist)	71.000 mg/l/4h

Skin corrosion/irritation : Not classified

pH: 7

Serious eye damage/irritation : Causes serious eye irritation.

pH: 7

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Based on available data, the classification criteria are not met

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Based on available data, the classification criteria are not met

Specific target organ toxicity (single exposure) : May cause drowsiness or dizziness.

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

Symptoms/injuries after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Feeling of weakness. Irritation of the respiratory tract. Nausea. Vomiting. Headache. Central nervous system depression. Dizziness. Narcosis. Excited/restless. Drunkenness. Disturbed motor response. Respiratory difficulties. Disturbances of consciousness.

Symptoms/injuries after skin contact : ON CONTINUOUS EXPOSURE/CONTACT: Dry skin. Cracking of the skin.

Symptoms/injuries after eye contact : Irritation of the eye tissue.

Symptoms/injuries after ingestion : Dry/sore throat. Risk of aspiration pneumonia. Symptoms similar to those listed under inhalation. AFTER ABSORPTION OF LARGE QUANTITIES: Irritation of the gastric/intestinal mucosa. Change in the blood composition. Change in urine output. Renal disease. Enlargement/disease of the liver.

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Symptoms/injuries upon intravenous administration	: Not available.
Chronic symptoms	: ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Red skin. Skin rash/inflammation. Dry/sore throat. Headache. Nausea. Feeling of weakness. Loss of weight. Possible inflammation of the respiratory tract.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Not classified as dangerous for the environment according to the criteria of Directive 67/548/EEC. Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.
Ecology - air	: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009). Not included in the list of substances which may contribute to the greenhouse effect (Regulation (EC) No 842/2006). TA-Luft Klasse 5.2.5.
Ecology - water	: Not harmful to fishes (LC50(96h) >1000 mg/l). Not harmful to invertebrates (Daphnia). Not harmful to algae (EC50 >1000 mg/l). Not harmful to plankton. Inhibition of activated sludge.

Acetone (67-64-1)

LC50 fish 2	5540 mg/l (LC50; EU Method C.1; 96 h; Salmo gairdneri; Static system; Fresh water; Experimental value)
EC50 Daphnia 2	12600 mg/l (LC50; Other; 48 h; Daphnia magna; Static system; Fresh water; Experimental value)

12.2. Persistence and degradability

Acetone (67-64-1)

Persistence and degradability	Readily biodegradable in water. Biodegradable in the soil. Biodegradable in the soil under anaerobic conditions. No test data on mobility of the substance available.
Biochemical oxygen demand (BOD)	1.43 g O ₂ /g substance
Chemical oxygen demand (COD)	1.92 g O ₂ /g substance
ThOD	2.20 g O ₂ /g substance
BOD (% of ThOD)	0.872 (20 days; Literature study)

12.3. Bioaccumulative potential

Acetone (67-64-1)

BCF fish 1	0.69 (BCF)
BCF other aquatic organisms 1	3 (BCF; BCFWIN)
Log Pow	-0.24 (Test data)
Bioaccumulative potential	Not bioaccumulative.

12.4. Mobility in soil

Acetone (67-64-1)

Surface tension	0.0237 N/m
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12.5. Other adverse effects

Other information	: Avoid release to the environment.
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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations	: Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle by distillation. Remove to an authorized waste incinerator for solvents with energy recovery. Do not discharge into drains or the environment.
Additional information	: LWCA (the Netherlands): KGA category 03. Hazardous waste according to Directive 2008/98/EC.
Ecology - waste materials	: Avoid release to the environment.

Acetone

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN1090 Acetone, 3, II

UN-No.(DOT) : UN1090

Proper Shipping Name (DOT) : Acetone

Transport hazard class(es) (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120

Packing group (DOT) : II - Medium Danger

Hazard labels (DOT) : 3 - Flammable liquid



DOT Packaging Non Bulk (49 CFR 173.xxx) : 202

DOT Packaging Bulk (49 CFR 173.xxx) : 242

DOT Special Provisions (49 CFR 172.102) : IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized
T4 - 2.65 178.274(d)(2) Normal..... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / 1 + a (tr - tf)$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling

DOT Packaging Exceptions (49 CFR 173.xxx) : 150

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L

DOT Vessel Stowage Location : B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded

Other information : No supplementary information available.

SECTION 15: Regulatory information

15.1. US Federal regulations

Acetone (67-64-1)

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

RQ (Reportable quantity, section 304 of EPA's List of Lists)	5000 lb
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Fire hazard

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency 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.

15.2. International regulations

CANADA

Acetone (67-64-1)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects
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Acetone

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

EU-Regulations

No additional information available

National regulations

Acetone (67-64-1)

Listed on the Canadian IDL (Ingredient Disclosure List)

15.3. US State regulations

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

SECTION 16: Other information

Revision date : 09/20/2016

Other information : None.

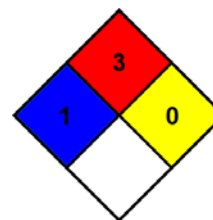
Full text of H-phrases: see section 16:

H225	Highly flammable liquid and vapor
H319	Causes serious eye irritation
H336	May cause drowsiness or dizziness

NFPA health hazard : 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard : 3 - Liquids and solids that can be ignited under almost all ambient conditions.

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



HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible

Flammability : 3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F. as well as liquids with flash points between 73 F and 100 F. (Classes IB & IC)

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Personal protection : C
C - Safety glasses, Gloves, Synthetic apron

SDS US LabChem

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.

IN CASE OF TRANSPORTATION EMERGENCY CONTACT:

CHEMTREC:(800) 424-9300

ALL OTHER INQUIRIES:
(770) 904-7042 // www.ciscochem.com
266 Rue Cezzan Lavonia, GA 30553



1. IDENTIFICATION

Product Name: Hexanes

Cas #: 110-54-3

TSA: TSCA 8(b) inventory: Hexane

2. HAZARDS IDENTIFICATION

FLAMMABLE LIQUIDS, CATEGORY 2: Highly flammable liquid and vapor.

SKIN IRRITATION, CATEGORY 2: Causes skin irritation

REPRODUCTIVELY TOXICITY: Suspected of damaging fertility or the unborn child.

Specific target organ systemic toxicity - single exposure, Category 3, Respiratory system: May cause respiratory irritation

Central Nervous system: May cause drowsiness or dizziness

Dangerous for the environment: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Potential Acute Health Effects:

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

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to peripheral nervous system, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

3. COMPOSITION

NAME:	CAS #	% BY WEIGHT
Hexanes	110-54-3	98.5-99.9

Molecular Formula: C₆H₁₄

Toxicological Data on Ingredients: Hexane: ORAL (LD50): Acute: 25000 mg/kg [Rat].

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. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

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.

5. FIRE FIGHTING MEASURES

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 225°C (437°F)

Flash Points: CLOSED CUP: -22.5°C (-8.5°F). (TAG)

Flammable Limits: LOWER: 1.15% UPPER: 7.5%

Products of Combustion: These products are carbon oxides (CO, CO₂).

Fire Hazards in Presence of Various Substances:

Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards:

Extremely flammable liquid and vapor. Vapor may cause flash fire.

Special Remarks on Explosion Hazards: Not available.

6. ACCIDENTAL RELEASE MEASURES

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

Large Spill:

Flammable liquid, insoluble in water. 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 get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

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. Avoid contact with skin. 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. Keep away from incompatibles such as oxidizing agents.

Storage:

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

8. EXPOSURE CONTROLS AND 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:

Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves (impervious).

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 (ppm) from OSHA (PEL) [United States] Inhalation TWA: 1800 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 176 (mg/m3) from ACGIH (TLV) [United States] SKIN TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 500 STEL: 1000 (ppm) from ACGIH (TLV) [United States] Inhalation TWA: 1760 STEL: 3500 (mg/m3) from ACGIH (TLV) [United States] Inhalation Consult local authorities for acceptable exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Liquid.

Odor: Gasoline-like or petroleum-like (Slight.)

Taste: Not available.

Molecular Weight: 86.18g/mole

Color: Clear Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 68°C (154.4°F)

Melting Point: -95°C (-139°F)

Critical Temperature: Not available.

Specific Gravity: 0.66 (Water = 1)

Vapor Pressure: 17.3 kPa (@ 20°C)

Vapor Density: 2.97 (Air = 1)

Volatility: Not available.

Odor Threshold: 130 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.9

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility: Soluble in diethyl ether, acetone. Insoluble in cold water, hot water.

10. STABILITY AND REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles.

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not available.

Special Remarks on Reactivity: Hexane can react vigorously with strong oxidizers (e.g. chlorine, bromine, fluorine)

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Absorbed through skin. Dermal contact. Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 25000 mg/kg [Rat]. Acute toxicity of the gas (LC50): 48000 ppm 4 hours [Rat].

Chronic Effects on Humans:

MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: peripheral nervous system, skin, central nervous system (CNS).

Other Toxic Effects on Humans:

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

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects based on animal data. May be tumorigenic based on animal data. May affect genetic material. Passes through the placental barrier in animal.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: May cause mild skin irritation. It can be absorbed through the skin in harmful amounts. Eyes: May cause mild eye irritation. Inhalation: May be harmful if inhaled. Inhalation of vapors may cause respiratory tract irritation.

Overexposure may affect, brain, spinal cord, behavior/central and peripheral nervous systems (lightheadness, dizziness, hallucinations, paralysis, blurred vision, memory loss, headache, euphoria, general anesthetic, muscle weakness, numbness of the extremities, asphyxia, unconsciousness and possible death), metabolism, respiration, blood, cardiovascular system, gastrointestinal system (nausea) Ingestion: May be harmful if swallowed. May cause gastrointestinal tract irritation with abdominal pain and nausea. May also affect the liver, blood, brain, peripheral and central nervous systems. Symptoms of over exposure by ingestion are similar to that of overexposure by inhalation.

12. ECOLOGICAL INFORMATION

Toxicity to fish

n-hexane : LL50: 12,51 mg/l Exposure time: 96 h

Species: *Oncorhynchus mykiss* (rainbow trout) Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates

n-hexane : EL50: 21,85 mg/l Exposure time: 48 h

Species: *Daphnia magna* (Water flea)

Method: QSAR modeled data

Toxicity to algae

n-Hexane

EL50: 9,29 mg/l

Exposure time: 72 h

Species: *Pseudokirchneriella subcapitata* (green algae) Method: QSAR modeled data

Bioaccumulation

n-hexane

Bioconcentration factor (BCF): 501

Does not significantly accumulate in organisms.

Biodegradability

n-hexane

This material is expected to be readily biodegradable.

Ecotoxicology Assessment

Acute aquatic toxicity n-hexane

Toxic to aquatic life

Chronic aquatic toxicity

n-hexane

Toxic to aquatic life with long lasting effects

Toxicity Data on Soil

n-hexane

No data available

Other organisms relevant to the environment

n-hexane

No data available

Impact on Sewage Treatment

n-hexane

No data available

Results of PBT assessment

n-hexane

Non-classified vPvB substance, Non-classified PBT substance

Additional information

ecological

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product: the product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging:

Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

14. TRANSPORT INFORMATION

DOT Classification: CLASS 3:

Flammable liquid.

Identification: : Hexane UNNA: 1208 PG: II

Special Provisions for Transport: Not available.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN1208, HEXANES, 3, II, RQ (HEXANE)

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1208, HEXANES, 3, II, (-23 °C)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1208, 3: NOT PERMITTED FOR TRANSPORT

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1208, HEXANES, 3, II, (D/E)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1208, HEXANES, 3, II

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1208, HEXANES, 3, II

15. REGULATORY INFORMATION

Federal and State Regulations:

Connecticut hazardous material survey.: Hexanes Illinois toxic substances disclosure to employee act: Hexanes Illinois chemical safety act: Hexanes New York release reporting list: Hexanes Rhode Island RTK hazardous substances: Hexanes Pennsylvania RTK: Hexanes Florida: Hexanes Minnesota: Hexanes Massachusetts RTK: Hexanes Massachusetts spill list: Hexanes New Jersey: Hexanes New Jersey spill list: Hexanes Louisiana spill reporting: Hexanes TSCA 8(b) inventory: Hexanes SARA 313 toxic chemical notification and release reporting: Hexanes CERCLA: Hazardous substances.: Hexanes: 5000 lbs. (2268 kg)

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. R20- Harmful by inhalation. R38- Irritating to skin. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R62- Possible risk of impaired fertility. R65- Harmful: may cause lung damage if swallowed. R67- Vapors may cause drowsiness or dizziness. S9- Keep container in a well-ventilated place. S16- Keep away from sources of ignition - No smoking. S29- Do not empty into drains. S33- Take precautionary measures against static discharges. S36/37- Wear suitable protective clothing and gloves. S61- Avoid release to the environment. Refer to special instructions/Safety

data sheets. S62- If swallowed, do not induce vomiting: seek medical advice immediately and show this

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: g

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

Health: 1 Flammability: 3 Reactivity: 0 Specific hazard:

Protective Equipment:

Gloves (impervious). Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

16. OTHER INFORMATION

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Date Created: 6/1/2015

Date Updated: 6/1/2015

Safety Data Sheet

Material Name: METHANE

SDS ID: 00233336

*** Section 1 - PRODUCT AND COMPANY IDENTIFICATION ***

Material Name: METHANE

Manufacturer Information

ADVANCED GAS TECHNOLOGIES

Phone: 1-800-416-2505

1401 Stauffer Road

Palm, PA 18070-0035

Emergency # 1-800-424-9300 (CHEMTREC)

Mfg Contact: Outside the US: 703-572-3887 (Collect Calls Accepted)

Chemical Family

hydrocarbons, gas

Synonyms

Mtg msds 58; Fire damp; Marsh gas; Methyl hydride; Natural gas; Methane; UN 1971; R50; CH₄; RTECS: PA1490000

*** Section 2 - HAZARDS IDENTIFICATION ***

EMERGENCY OVERVIEW

Color: colorless

Physical Form: gas

Odor: odorless

Health Hazards: difficulty breathing

Physical Hazards: Flammable gas. May cause flash fire. Electrostatic charges may be generated by flow, agitation, etc.

POTENTIAL HEALTH EFFECTS

Inhalation

Short Term: nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma

Long Term: no information is available

Skin

Short Term: no information on significant adverse effects

Long Term: no information is available

Eye

Short Term: no information on significant adverse effects

Long Term: no information is available

Ingestion

Short Term: ingestion of a gas is unlikely

Long Term: no information is available

*** Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS ***

CAS	Component	Percent
74-82-8	Methane	100.0

Safety Data Sheet

Material Name: METHANE

SDS ID: 00233336

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Aliphatic hydrocarbon gases (Alkane [C1-C4]).

*** Section 4 - FIRST AID MEASURES ***

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin

Wash exposed skin with soap and water.

Eyes

Flush eyes with plenty of water.

Ingestion

If a large amount is swallowed, get medical attention.

Note to Physicians

For inhalation, consider oxygen.

*** Section 5 - FIRE FIGHTING MEASURES ***

See Section 9 for Flammability Properties

NFPA Ratings: Health: 1 Fire: 4 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Flammable Properties

Severe fire hazard. Severe explosion hazard. Pressurized containers may rupture or explode if exposed to sufficient heat. Vapor/air mixtures are explosive above flash point. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

Extinguishing Media

carbon dioxide regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

Fire Fighting Measures

Move container from fire area if it can be done without risk. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Stop flow of gas.

*** Section 6 - ACCIDENTAL RELEASE MEASURES ***

Occupational spill/release

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.

Safety Data Sheet

Material Name: METHANE

SDS ID: 00233336

*** Section 7 - HANDLING AND STORAGE ***

Storage Procedures

Store and handle in accordance with all current regulations and standards. Grounding and bonding required.
Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

*** Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION ***

Component Analysis

Methane (74-82-8)

ACGIH: 1000 ppm TWA

Ventilation

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face

Eye protection not required, but recommended.

Protective Clothing

Protective clothing is not required.

Glove Recommendations

Wear appropriate chemical resistant gloves.

Respiratory Protection

Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Respiratory protection is ranked in order from minimum to maximum.

Consider warning properties before use.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

*** Section 9 - PHYSICAL AND CHEMICAL PROPERTIES ***

Physical State: Gas	Appearance: Not available
Color: colorless	Physical Form: gas
Odor: odorless	Odor Threshold: Not available
Taste: tasteless	Melting Point: -183 °C
Boiling Point: -162 °C	Flash Point: -223 °C
LEL: 5.0 %	UEL: 15 %
Vapor Pressure: 760 mmHg @ -161 °C	Henry's Law Constant: 0.00045830 atm-m3/mol
Vapor Density (air = 1): 0.555	Density: 0.717 g/L @ 0 °C
Water Solubility: 3.5 % @ 17 °C	KOW: 724.44 (estimated from water solubility)
KOC: 2192.80 (estimated from water solubility)	Auto Ignition: 537 °C
Viscosity: 0.01118 cP @ 27 °C	Molecular Weight: 16.04
Molecular Formula: C-H4	

Safety Data Sheet

Material Name: METHANE

SDS ID: 00233336

Solvent Solubility

Soluble: alcohol, ether, benzene, organic solvents

*** Section 10 - STABILITY AND REACTIVITY ***

Chemical Stability

Stable at normal temperatures and pressure.

Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

Materials to Avoid

halogens, oxidizing materials, combustible materials.

Decomposition Products

oxides of carbon

Possibility of Hazardous Reactions

Will not polymerize.

*** Section 11 - TOXICOLOGICAL INFORMATION ***

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Methane (74-82-8)

Inhalation LC50 Mouse: 326 g/m3/2H

Acute Toxicity Level

Methane (74-82-8)

Slightly Toxic: inhalation.

Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, OSHA or DFG.

*** Section 12 - ECOLOGICAL INFORMATION ***

Component Analysis - Aquatic Toxicity

No LOEL ecotoxicity data are available for this product's components.

*** Section 13 - DISPOSAL CONSIDERATIONS ***

Disposal Methods

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262.

Hazardous Waste Number(s): D001.

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

*** Section 14 - TRANSPORT INFORMATION ***

US DOT Information

Shipping Name: Methane, compressed

UN/NA #: UN1971 **Hazard Class:** 2.1

Required Label(s): 2.1

TDG Information

Shipping Name: Methane, compressed

Safety Data Sheet

Material Name: METHANE

SDS ID: 00233336

UN #: UN1971 Hazard Class: 2.1

Required Label(s): 2.1

* * * Section 15 - REGULATORY INFORMATION * * *

U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA 311/312

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

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Methane	74-82-8	No	Yes	Yes	Yes	Yes	Yes

Not regulated under California Proposition 65

Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
Methane	74-82-8	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes

* * * Section 16 - OTHER INFORMATION * * *

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

End of Sheet 00233336



SAFETY DATA SHEET

Methyl Ethyl Ketone

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

PRODUCT NAME	Methyl Ethyl Ketone
CAS-No.	78-93-3
EU INDEX NO.	606-002-00-3
EC No.	201-159-0
SUPPLIER	Univar Aquarius House 6 Midpoint Business Park Thornbury Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univareurope.com
SYNONYMS, TRADE NAMES	MEK, , Ethyl Methyl Ketone, , Butanone, , Butan-2-one, , MS-3, , BETACLEAN 3000
APPLICATION	Industrial Solvent In household and cosmetic chemical industry.
Emergency Contact Number (Office Hours)	+44 1274 267346
Emergency Contact Number (Outside Office Hours)	+441865 407333
SDS No.	20790

2 HAZARDS IDENTIFICATION

CLASSIFICATION (67/548) Xi;R36. F;R11. R66, R67.

CLASSIFICATION (EC 1272/2008)

Physical	Flam. Liq. 2 - H225
Health	EUH066;Eye Irrit. 2 - H319;STOT SE 3 - H336
Environmental	Not classified.

LABEL IN ACCORDANCE WITH (EC) NO. 1272/2008



SIGNAL WORD Danger

HAZARD STATEMENTS

EUH066	Repeated exposure may cause skin dryness or cracking.
H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

PRECAUTIONARY STATEMENTS

P243	Take precautionary measures against static discharge.
------	---

REVISION DATE: 02.07.2010

Methyl Ethyl Ketone

P305/351/338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P403/233	Store in a well-ventilated place. Keep container tightly closed. Dispose of contents/container to hazardous or special waste collection point.
P313	Get medical advice/attention.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

3 COMPOSITION/INFORMATION ON INGREDIENTS

EU INDEX NO.	606-002-00-3
EC No.	201-159-0
CAS-No.	78-93-3

4 FIRST-AID MEASURES

INHALATION

Move into fresh air and keep at rest. Get medical attention if any discomfort continues.

INGESTION

Provide rest, warmth and fresh air. Immediately rinse mouth and drink plenty of water (200-300 ml). DO NOT induce vomiting. Get medical attention immediately.

SKIN CONTACT

Remove contaminated clothing immediately and wash skin with soap and water.

EYE CONTACT

Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention immediately. Continue to rinse.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

SPECIAL FIRE FIGHTING PROCEDURES

Avoid water in straight hose stream; will scatter and spread fire.

SPECIFIC HAZARDS

Oxides of: Carbon.

PROTECTIVE MEASURES IN FIRE

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Follow precautions for safe handling described in this safety data sheet. Do not smoke, use open fire or other sources of ignition. Take precautionary measures against static discharges. Provide adequate ventilation. In case of spills, beware of slippery floors and surfaces.

ENVIRONMENTAL PRECAUTIONS

Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

SPILL CLEAN UP METHODS

Absorb with inert, damp, non-combustible material, then flush area with water. Collect spillage in containers, seal securely and deliver for disposal according to local regulations. Dike far ahead of larger spills for later disposal.

7 HANDLING AND STORAGE

REVISION DATE: 02.07.2010

Methyl Ethyl Ketone

USAGE PRECAUTIONS

Avoid spilling, skin and eye contact. Keep away from heat, sparks and open flame. Eliminate all sources of ignition. Static electricity and formation of sparks must be prevented. Provide good ventilation.

STORAGE PRECAUTIONS

Keep containers tightly closed. Keep in original container. Keep away from heat, sparks and open flame. Store in closed original container at temperatures between 5°C and 30°C.

STORAGE CLASS

Flammable liquid storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	Std	TWA - 8 hrs		STEL - 15 min		Notes
Methyl Ethyl Ketone	WEL	200 ppm	600 mg/m ³	300 ppm	866 mg/m ³	

WEL = Workplace Exposure Limit.

PROTECTIVE EQUIPMENT



ENGINEERING MEASURES

Well-ventilated area. Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of vapours.

RESPIRATORY EQUIPMENT

If ventilation is insufficient, suitable respiratory protection must be provided. Use respiratory equipment with gas filter, type AX.

HAND PROTECTION

Butyl rubber gloves are recommended.

EYE PROTECTION

Wear approved safety goggles.

OTHER PROTECTION

Wear rubber apron. Wear rubber footwear.

HYGIENE MEASURES

Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Clear liquid	BOILING POINT (°C)	79 - 81
COLOUR	Colourless	VAPOUR DENSITY (air=1)	>1 - 2.5
ODOUR	Characteristic	EVAPORATION RATE	6
SOLUBILITY	Soluble in water.	FLASH POINT (°C)	-4
MOL. WEIGHT	72	FLAMMABILITY LIMIT - LOWER(%)	1.8
RELATIVE DENSITY	0.805 20	SOLUBILITY VALUE (g/100g H ₂ O@20°C)	25 - 26.3
VAPOUR PRESSURE	9.3 kPa 20		
VISCOSITY	0.52 cSt 25		
AUTO IGNITION	>450 - 514		
TEMPERATURE (°C)			
FLAMMABILITY LIMIT - UPPER(%)	11.5		
VOLATILE ORGANIC COMPOUND (VOC)	YES		

10 STABILITY AND REACTIVITY

REVISION DATE: 02.07.2010

Methyl Ethyl Ketone

STABILITY

Stable under normal temperature conditions and recommended use.

CONDITIONS TO AVOID

Avoid heat, flames and other sources of ignition. Avoid excessive heat for prolonged periods of time.

HAZARDOUS POLYMERISATION

Will not polymerise.

MATERIALS TO AVOID

Strong oxidising substances.

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of: Carbon.

11 TOXICOLOGICAL INFORMATION

TOXIC DOSE 1 - LD 50 >2600 mg/kg (oral rat)

INHALATION

Vapours may irritate throat and respiratory system and cause headache, dizziness and dullness.

INGESTION

May cause stomach pain or vomiting. May cause nausea, headache, dizziness and intoxication.

SKIN CONTACT

Irritating to skin. Repeated exposure may cause skin dryness or cracking.

EYE CONTACT

Irritating to eyes.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

LC 50, 96 Hrs, FISH mg/l 1690

EC 50, 48 Hrs, DAPHNIA, mg/l 5091

IC 50, 72 Hrs, ALGAE, mg/l 4300

MOBILITY

The product is soluble in water.

DEGRADABILITY

The product is expected to be biodegradable.

13 DISPOSAL CONSIDERATIONS

GENERAL INFORMATION

Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority. Rags and the like, moistened with flammable liquids, must be discarded into designated fireproof bucket.

DISPOSAL METHODS

Dispose of waste and residues in accordance with local authority requirements.

14 TRANSPORT INFORMATION



UK ROAD CLASS

3

PROPER SHIPPING NAME

ETHYL METHYL KETONE (METHYL ETHYL KETONE)

UN NO. ROAD

1193

UK ROAD PACK GR.

II

REVISION DATE: 02.07.2010

Methyl Ethyl Ketone

ADR CLASS NO.	3	ADR CLASS	Class 3: Flammable liquids.
ADR PACK GROUP	II	TUNNEL RESTRICTION CODE	(D/E)
HAZARD No. (ADR)	33	ADR LABEL NO.	3
HAZCHEM CODE	•2YE	CEFIC TEC(R) NO.	30GF1-I+II
RID CLASS NO.	3	RID PACK GROUP	II
UN NO. SEA	1193	IMDG CLASS	3
IMDG PACK GR.	II	EMS	F-E, S-D
UN NO. AIR	1193	AIR CLASS	3
AIR PACK GR.	II		

15 REGULATORY INFORMATION**EU DIRECTIVES**

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

STATUTORY INSTRUMENTS

Chemicals (Hazard Information and Packaging) Regulations.

APPROVED CODE OF PRACTICE

Safety Data Sheets for Substances and Preparations. Classification and Labelling of Substances and Preparations Dangerous for Supply. DSEAR

GUIDANCE NOTES

Workplace Exposure Limits EH40. CHIP for everyone HSG(108).

16 OTHER INFORMATION

REVISION DATE 02.07.2010

REV. NO./REPL. SDS 08

GENERATED

SDS NO. 20790

SAFETY DATA SHEET STATUS

Approved.

DATE 11.09.2007

SIGNATURE Jitendra Panchal

Safety Data Sheet

Tetrahydrofuran

Revision date : 2016/11/10
Version: 7.1

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(30076724/SDS_GEN_US/EN)

1. Identification

Product identifier used on the label

Tetrahydrofuran

Recommended use of the chemical and restriction on use

Recommended use*: industrial chemicals

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Molecular formula: C(4)H(8)O
Chemical family: No data available.
Synonyms: Tetrahydrofuran

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Flam. Liq.	2	Flammable liquids
Acute Tox.	4 (oral)	Acute toxicity
Eye Dam./Irrit.	1	Serious eye damage/eye irritation
Carc.	2	Carcinogenicity
STOT SE	3 (Vapours may cause drowsiness and dizziness.)	Specific target organ toxicity — single exposure

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Tetrahydrofuran

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STOT SE

3 (irritating to
respiratory system)

Specific target organ toxicity — single exposure

Label elements

Pictogram:



Signal Word:
Danger

Hazard Statement:

H225	Highly flammable liquid and vapour.
H318	Causes serious eye damage.
H302	Harmful if swallowed.
H336	May cause drowsiness or dizziness.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

Precautionary Statements (Prevention):

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271	Use only outdoors or in a well-ventilated area.
P201	Obtain special instructions before use.
P243	Take precautionary measures against static discharge.
P202	Do not handle until all safety precautions have been read and understood.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P260	Do not breathe dust/gas/mist/vapours.
P270	Do not eat, drink or smoke when using this product.
P264	Wash with plenty of water and soap thoroughly after handling.
P240	Ground/bond container and receiving equipment.
P242	Use only non-sparking tools.

Precautionary Statements (Response):

P310	Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301 + P330	IF SWALLOWED: rinse mouth.
P370 + P378	In case of fire: Use water spray, dry powder, foam or carbon dioxide for extinction.

Precautionary Statements (Storage):

P233	Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Precautionary Statements (Disposal):

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P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

See section 12 - Results of PBT and vPvB assessment.

Labeling of special preparations (GHS):
May form explosive peroxides.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Weight %</u>	<u>Chemical name</u>
109-99-9	>= 99.95 - <= 100.0%	tetrahydrofuran

4. First-Aid Measures

Description of first aid measures

If inhaled:

Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

If on skin:

Wash affected areas thoroughly with soap and water. Immediate medical attention required.

If in eyes:

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

If swallowed:

Rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

Most important symptoms and effects, both acute and delayed

Symptoms: Overexposure may cause: nausea, headache, dizziness
The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further symptoms are possible

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

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Tetrahydrofuran

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5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, dry powder, foam, carbon dioxide

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
Substance/product is dangerous when exposed to heat or flames. If product is heated above decomposition temperature, toxic vapours will be released.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

In case of fire and/or explosion do not breathe fumes. Vapours are heavier than air and may accumulate in low areas and travel a considerable distance up to the source of ignition. Do not allow to enter drains or waterways.

Impact Sensitivity:

Remarks: Based on the chemical structure there is no shock-sensitivity.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Breathing protection required. Vapours are heavy and collect in low areas.

Use antistatic tools. Extinguish sources of ignition nearby and downwind. Breathing protection required. Vapours are heavy and collect in low areas.

Environmental precautions

This product is regulated by RCRA. This product is regulated by CERCLA ('Superfund'). Notify the responsible authorities of reportable releases to the air, into waterways, soil or sewers.

Methods and material for containment and cleaning up

Spills should be contained, solidified, and placed in suitable containers for disposal.

7. Handling and Storage

Precautions for safe handling

Keep away from sources of ignition - No smoking. Wear suitable protective clothing and eye/face protection. Handle and open container with care. Prevent contact with air/oxygen (formation of peroxide). Handle under dry inert gas. Use antistatic tools.

Protection against fire and explosion:

Use antistatic tools. Exhaust fans should be explosion proof. May form explosive peroxides.

Conditions for safe storage, including any incompatibilities

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Further information on storage conditions: Keep container tightly closed. Keep under inert gas. Avoid all sources of ignition: heat, sparks, open flame.

Storage stability:

Storage duration: 12 Months

The product is stabilized, the shelf life should be noted.

From the data on storage duration in this safety data sheet no agreed statement regarding the warrantee of application properties can be deduced.

additives:

BHT (CAS Number: 128-37-0)

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

tetrahydrofuran	OSHA PEL	PEL 200 ppm 590 mg/m3 ; STEL value 250 ppm 735 mg/m3 ; TWA value 200 ppm 590 mg/m3 ;
	ACGIH TLV	STEL value 100 ppm ; Skin Designation ; The substance can be absorbed through the skin. TWA value 50 ppm ;

Advice on system design:

Provide local exhaust ventilation to maintain recommended P.E.L.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator. Do not exceed the maximum use concentration for the respirator facepiece/cartridge combination. For emergency or non-routine, high exposure situations, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves, Polyethylene-Laminate (PE laminate) - ca. 0.1 mm coating thickness

Eye protection:

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:

Eye wash fountains and safety showers must be easily accessible. Wear protective clothing as necessary to prevent contact. Avoid inhalation of vapour. Airborne monitoring should be conducted to assure that the PEL/TLV is not exceeded. When using, do not eat, drink or smoke. Hands and/or face should be washed before breaks and at the end of the shift. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. Store work clothing separately.

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Tetrahydrofuran

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9. Physical and Chemical Properties

Form:	liquid	
Odour:	ether-like	
Odour threshold:	Not determined due to potential health hazard by inhalation.	
Colour:	colourless	
pH value:	7	
Melting point:	-108.50 °C	
Boiling point:	65.5 - 66.5 °C	
Flash point:	-22 °C	
Flammability:	Highly flammable.	
Lower explosion limit:	2.3 %(V) (-19.0 °C)	(air)
	Literature data.	
Upper explosion limit:	For liquids not relevant for classification and labelling.	
Autoignition:	230 °C	(DIN 51794)
Vapour pressure:	173 mbar (20 °C)	
	586 mbar (50 °C)	
Density:	0.887 g/cm3 (20.0 °C)	
	0.8511 g/cm3 (55 °C)	
Relative density:	0.883 (20 °C)	
Bulk density:	No data available.	
Partitioning coefficient n-octanol/water (log Pow):	0.45 (25 °C)	(OECD Guideline 107)
Self-ignition temperature:	Based on its structural properties the product is not classified as self-igniting.	
Thermal decomposition:	110 °C, 20 kJ/kg It is not a self-decompositionable substance. 400 °C No exothermic decomposition within the mentioned temperature range.	
Viscosity, dynamic:	0.456 mPa.s (25 °C)	
	Literature data. 0.359 mPa.s (50 °C)	
	Literature data.	
Particle size:	The substance / product is marketed or used in a non solid or granular form.	
Solubility in water:	(25 °C) miscible, Literature data.	
Solubility (qualitative):	miscible solvent(s): organic solvents,	
Molar mass:	72.11 g/mol	
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.	

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10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:

No corrosive effect on metal.

Oxidizing properties:

not fire-propagating

Formation of
flammable gases:

Remarks:

Forms no flammable gases in the
presence of water.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

The product is chemically stable.

Reacts with oxidizing agents.

Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame. Avoid electro-static charge.

Incompatible materials

Aluminium lithium hydride, alkaline-earth metal hydroxides

Hazardous decomposition products

Decomposition products:

No hazardous decomposition products if stored and handled as prescribed/indicated.

Thermal decomposition:

110 °C

It is not a self-decompositionable substance.

400 °C

No exothermic decomposition within the mentioned temperature range.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Of moderate toxicity after single ingestion. Virtually nontoxic by inhalation. Virtually nontoxic after a single skin contact. High concentrations in the air may cause narcosis. The substance can be absorbed through the skin.

Oral

Type of value: LD50

Species: rat (male/female)

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Value: 1,650 mg/kg

Inhalation

Type of value: LC50

Species: rat (male/female)

Value: > 14.7 mg/l

Exposure time: 6 h

The vapour was tested.

Dermal

Type of value: LD50

Species: rat (male/female)

Value: > 2,000 mg/kg (OECD Guideline 402)

Assessment other acute effects

Assessment of STOT single:

Causes temporary irritation of the respiratory tract. Possible narcotic effects (drowsiness or dizziness).

Irritation / corrosion

Assessment of irritating effects: Skin contact causes irritation. May cause severe damage to the eyes. Causes temporary irritation of the respiratory tract.

Skin

Species: rabbit

Result: non-irritant

Method: Draize test

Eye

Species: rabbit

Result: Risk of serious damage to eyes.

Method: Draize test

Sensitization

Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

Mouse Local Lymph Node Assay (LLNA)

Species: mouse

Result: Non-sensitizing.

Method: OECD Guideline 429

Aspiration Hazard

not applicable

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: No substance-specific organotoxicity was observed after repeated administration to animals.

Genetic toxicity

Assessment of mutagenicity: Results from a number of mutagenicity studies with microorganisms, mammalian cell culture and mammals are available. Taking into account all of the information, there is no indication that the substance is mutagenic.

Carcinogenicity

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Assessment of carcinogenicity: In long-term studies in rodents exposed to high doses, a tumorigenic effect was found; however, these results are thought to be due to a rodent-specific liver effect that is not relevant to humans. The observed kidney tumors in rats are regarded as a consequence of a species-specific mechanism and thus not relevant for man. No carcinogenic potential can be deduced from other studies with rats and mice.

In long-term animal studies in which the substance was given by inhalation in high concentrations, a carcinogenic effect was observed.

Reproductive toxicity

Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity

Assessment of teratogenicity: Animal studies gave no indication of a developmental toxic effect at doses that were not toxic to the parental animals.

Symptoms of Exposure

Overexposure may cause: nausea, headache, dizziness

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further symptoms are possible

Medical conditions aggravated by overexposure

Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product. See MSDS section 11 - Toxicological information.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish

LC50 (96 h) 2,160 mg/l, Pimephales promelas (Fish test acute, Flow through.)

The statement of the toxic effect relates to the analytically determined concentration. Literature data.

Aquatic invertebrates

EC50 (48 h) 3,485 mg/l, Daphnia magna (Daphnia test acute)

Nominal concentration. Literature data.

Aquatic plants

Toxic limit concentration (8 d) 3,700 mg/l (growth rate), Scenedesmus sp. (DIN 38412 Part 9, static)

The details of the toxic effect relate to the nominal concentration. Literature data.

Chronic toxicity to fish

No observed effect concentration (33 d) 216 mg/l, Pimephales promelas (Flow through.)

The statement of the toxic effect relates to the analytically determined concentration. Literature data.

Chronic toxicity to aquatic invertebrates

Study scientifically not justified.

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Assessment of terrestrial toxicity
Study scientifically not justified.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms
OECD Guideline 209 aquatic
activated sludge, domestic/EC20 (0.5 h): approx. 800 mg/l
The details of the toxic effect relate to the nominal concentration.

OECD Guideline 209 aquatic
activated sludge, domestic/Toxic limit concentration (3 h): 460 mg/l

Persistence and degradability

Assessment biodegradation and elimination (H₂O)
Moderately/partially biodegradable. Easily eliminated from water.

Elimination information

90 - 100 % BOD of the ThOD (14 d) (OECD Guideline 302 C) (activated sludge)
Literature data.

39.5 % BOD of the ThOD (28 d) (OECD 301D; EEC 92/69, C.4-E) (activated sludge, domestic)

Assessment of stability in water
According to structural properties, hydrolysis is not expected/probable.

Bioaccumulative potential

Assessment bioaccumulation potential
Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Bioaccumulation potential
Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments
The substance will slowly evaporate into the atmosphere from the water surface.
Adsorption to solid soil phase is not expected.

Additional information

Other ecotoxicological advice:
Do not release untreated into natural waters.

13. Disposal considerations

Waste disposal of substance:
Dispose of in a RCRA-licensed facility. Do not discharge into waterways or sewer systems without proper authorization. Dispose of in accordance with national, state and local regulations.

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Container disposal:

Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers. If containers are not empty, they must be disposed of in a RCRA-licensed facility.

RCRA: U213

14. Transport Information

Land transport

USDOT

Hazard class: 3
Packing group: II
ID number: UN 2056
Hazard label: 3
Proper shipping name: TETRAHYDROFURAN

Sea transport

IMDG

Hazard class: 3
Packing group: II
ID number: UN 2056
Hazard label: 3
Marine pollutant: NO
Proper shipping name: TETRAHYDROFURAN

Air transport

IATA/ICAO

Hazard class: 3
Packing group: II
ID number: UN 2056
Hazard label: 3
Proper shipping name: TETRAHYDROFURAN

15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Chronic; Fire; Acute

CERCLA RQ

1000 LBS

CAS Number

109-99-9

Chemical name

tetrahydrofuran

Reportable Quantity for release:

1,000 lb

State regulations

State RTK

PA

CAS Number

109-99-9

Chemical name

tetrahydrofuran

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NJ 109-99-9 tetrahydrofuran

NFPA Hazard codes:

Health : 3 Fire: 3 Reactivity: 1 Special:

Assessment of the hazard classes according to UN GHS criteria (most recent version):

STOT SE	3 (Vapours may cause drowsiness and dizziness.)	Specific target organ toxicity — single exposure
Acute Tox.	4 (oral)	Acute toxicity
Flam. Liq.	2	Flammable liquids
STOT SE	3 (irritating to respiratory system)	Specific target organ toxicity — single exposure
Carc.	2	Carcinogenicity
Eye Dam./Irrit.	1	Serious eye damage/eye irritation

16. Other Information

SDS Prepared by:

BASF NA Product Regulations

SDS Prepared on: 2016/11/10

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END OF DATA SHEET

Safety Data Sheet

Toluene

Version 1.3

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SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Toluene
Product Use Description : Industrial chemical

Manufacturer or supplier's details

Company : Nexeo Solutions LLC
Address : 3 Waterway Square Place Suite 1000
 Woodlands, Tx. 77380
 United States of America

Emergency telephone number:

Health North America: 1-855-NEXEO4U (1-855-639-3648)
 Health International: 1-855-NEXEO4U (1-855-639-3648)
 Transport North America: CHEMTREC 800.424.9300

Additional Information: : Responsible Party: Product Safety Group
 E-Mail: msds@nexeosolutions.com
 SDS Requests: 1-855-429-2661
 SDS Requests Fax: 1-281-500-2370
 Website: www.nexeosolutions.com

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 2
 Skin irritation : Category 2
 Eye irritation : Category 2A
 Reproductive toxicity : Category 2
 Specific target organ toxicity - single exposure : Category 3 (Central nervous system)
 Specific target organ toxicity - repeated exposure (Inhalation) : Category 2 (Auditory system, Eyes)
 Aspiration hazard : Category 1

GHS Label element

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Hazard pictograms



Signal word

: Danger

Hazard statements

: H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H361 Suspected of damaging fertility or the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure if inhaled.

Precautionary statements

: **Prevention:**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P331 Do NOT induce vomiting.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Potential Health Effects

Carcinogenicity:

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IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Emergency Overview

Appearance	liquid
Colour	colourless, transparent
Odour	sweet, pungent, hydrocarbon-like, aromatic, pleasant
Hazard Summary	No information available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

CAS-No.	Chemical Name	Concentration (%)
108-88-3	Toluene	90 - 100

SECTION 4. FIRST AID MEASURES

General advice	: Move out of dangerous area. Show this safety data sheet to the doctor in attendance. Symptoms of poisoning may appear several hours later.
If inhaled	: Consult a physician after significant exposure. If unconscious place in recovery position and seek medical advice.

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In case of skin contact	: If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	: Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing.
If swallowed	: Clean mouth with water and drink afterwards plenty of water. Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. Take victim immediately to hospital.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	: High volume water jet
Specific hazards during firefighting	: Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	: No hazardous combustion products are known
Specific extinguishing methods	: Use a water spray to cool fully closed containers.
Further information	: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments.
Special protective equipment for firefighters	: Wear self-contained breathing apparatus for firefighting if necessary.

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NFPA Flammable and Combustible Liquids Classification:

Flammable Liquid Class IB

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	<ul style="list-style-type: none"> : Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Environmental precautions	<ul style="list-style-type: none"> : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	<ul style="list-style-type: none"> : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	<ul style="list-style-type: none"> : Avoid formation of aerosol. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	<ul style="list-style-type: none"> : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions.

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Electrical installations / working materials must comply with the technological safety standards.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

CAS-No.	Components	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
108-88-3	Toluene	TWA	20 ppm	ACGIH
		TWA	100 ppm 375 mg/m ³	NIOSH REL
		ST	150 ppm 560 mg/m ³	NIOSH REL
		TWA	200 ppm	OSHA Z-2
		CEIL	300 ppm	OSHA Z-2
		Peak	500 ppm	OSHA Z-2
		TWA	100 ppm 375 mg/m ³	OSHA P0
		STEL	150 ppm 560 mg/m ³	OSHA P0

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of work-week	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI
		o-Cresol	Urine	End of shift (As soon as possible after	0.3 mg/g Creatinine	ACGIH BEI

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				expo- sure ceases)		
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Personal protective equipment

Respiratory protection	: No personal respiratory protective equipment normally required. In the case of vapour formation use a respirator with an approved filter.
Hand protection Remarks	: The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection	: Eye wash bottle with pure water Tightly fitting safety goggles
Skin and body protection	: impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Colour	: colourless, transparent
Odour	: sweet, pungent, hydrocarbon-like, aromatic, pleasant
Odour Threshold	: 1.74 - 5 ppm
pH	: not applicable
Freezing Point (Melting point/freezing point)	: -95 °C (-139 °F)
Boiling Point (Boiling point/boiling range)	: 109 - 111 °C (228 - 232 °F)
Flash point	: 4 - 7 °C (39 - 45 °F)
Evaporation rate	: 2 - 2.4

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Flammability (solid, gas)	butyl acetate=1 : No data available
Burning rate	: No data available
Upper explosion limit	: 6.7 - 8 %(V)
Lower explosion limit	: 1.2 - 1.4 %(V)
Vapour pressure	: 22.5 - 24 mmHg @ 20 °C (68 °F)
Relative vapour density	: 3.14
Relative density	: 0.87
Density	: 7.218 lb/gal @ 25 °C (77 °F)
Bulk density	: No data available
Solubility(ies)	
Water solubility	: soluble
Solubility in other sol- vents	: No data available
Partition coefficient: n- octanol/water	: No data available
Auto-ignition temperature	: 536 °C
Thermal decomposition	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Vapours may form explosive mixture with air.
Conditions to avoid	: Extremes of temperature and direct sunlight. Heat, flames and sparks.
Incompatible materials	: Strong oxidizing agents

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SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate : 5,000 mg/kg
Method: Calculation method

Components:

108-88-3:

Acute oral toxicity : LD50 (rat, male): > 5,580 mg/kg

Acute inhalation toxicity : LC50 (rat, male and female): 28.1 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (rabbit): > 5,000 mg/kg

Skin corrosion/irritation

Product:

Result: Irritating to skin.

Components:

108-88-3:

Species: rabbit
Exposure time: 4 h
Result: Irritating to skin.

Serious eye damage/eye irritation

Product:

Result: Irritating to eyes.

Components:

108-88-3:

Species: rabbit

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Result: Irritating to eyes.
Method: OECD Test Guideline 405

Respiratory or skin sensitisation

Components:

108-88-3:

Test Type: Maximisation Test (GPMT)
Species: guinea pig
Result: Did not cause sensitisation on laboratory animals.
GLP: yes

Germ cell mutagenicity

Components:

108-88-3:

Genotoxicity in vitro	: Test Type: Mammalian cell gene mutation assay Test species: Mouse lymphoma cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative
Genotoxicity in vivo	: Test Type: Dominant lethal assay Test species: mouse (male) Application Route: inhalation (vapour) Exposure time: 6 h/d, 5 d/wk for 8 wks Dose: 0, 100, 400 ppm Method: OECD Test Guideline 478 Result: negative
Germ cell mutagenicity-Assessment	: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity

Components:

108-88-3:

Species: rat, (male and female)
Application Route: inhalation (vapour)
Exposure time: 103 wks
Dose: 0, 600, 1200 ppm
Frequency of Treatment: 6.5 h/d, 5 d/wk
NOAEL: No observed adverse effect level: 1,200 ppm

Method: OECD Test Guideline 453
Result: did not display carcinogenic properties
Symptoms: Erosion of nasal epithelium
GLP: yes

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Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

Reproductive toxicity

Components:

108-88-3:

Effects on fertility : Test Type: Two-generation study
Species: rat, male and female
Application Route: Inhalation
Dose: 0, 100, 500, 2000 ppm
Frequency of Treatment: 7 days/week
General Toxicity - Parent: NOAEC: 500 ppm
General Toxicity F1: NOAEC: 500 ppm
Fertility: NOAEC: 2,000 ppm
Symptoms: Reduced maternal body weight gain. Reduced offspring weight gain.
Method: OECD Test Guideline 416
Result: Animal testing did not show any effects on fertility.
GLP: yes

Test Type: Fertility
Species: rat, male and female
Application Route: inhalation (vapour)
Dose: 0, 600, 1200 ppm
Frequency of Treatment: 7 days/week
General Toxicity - Parent: NOAEC: 600 ppm
Symptoms: Decreased sperm count
Result: Animal testing did not show any effects on fertility.

Effects on foetal development : Species: rat
Application Route: inhalation (vapour)
Dose: 0, 250, 750, 1500, 3000 ppm
Duration of Single Treatment: 10 d
Frequency of Treatment: 6 hr/day
General Toxicity Maternal: NOAEC: 750 ppm
Developmental Toxicity: NOAEC: 750 ppm
Symptoms: Maternal toxicity, Reduced body weight, Skeletal malformations.
GLP: yes

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

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STOT - single exposure

Product: No data available

Components:

108-88-3:

Exposure routes:	Target Organs:	Assessment:	Remarks:
Inhalation	Central nervous system	May cause drowsiness or dizziness., The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.	

STOT - repeated exposure

Product: No data available

Components:

108-88-3:

Exposure routes:	Target Organs:	Assessment:	Remarks:
Inhalation	Auditory system, Eyes	May cause damage to organs through prolonged or repeated exposure., The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.	

Repeated dose toxicity

Components:

108-88-3:

Species: rat, male and female

NOAEL: 300

Application Route: inhalation (vapour)

Exposure time: 6, 12, or 18 mths

Number of exposures: 6 h/d, 5 d/wk

Dose: 0, 30, 100, 300 ppm

Method: OECD Test Guideline 453

Repeated dose toxicity - : Causes skin irritation.

Assessment

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Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

Components:

108-88-3:

Aspiration Toxicity - Category 1

Further information

Product:

Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting., Concentrations substantially above the TLV value may cause narcotic effects., Solvents may degrease the skin.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

108-88-3:

Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): 5.5 mg/l Exposure time: 96 h Test Type: flow-through test
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Ceriodaphnia dubia): 3.78 mg/l Exposure time: 48 h Test Type: Renewal
Toxicity to algae	: EC50 (Chlorella vulgaris (Fresh water algae)): 134 mg/l Exposure time: 3 h Test Type: static test
Toxicity to bacteria	: IC50 (Bacteria): 84 mg/l Exposure time: 24 h Test Type: Static
Ecotoxicology Assessment	
Acute aquatic toxicity	: Toxic to aquatic life.
Chronic aquatic toxicity	: Toxic to aquatic life with long lasting effects.

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Persistence and degradability

Components:

108-88-3:

Biodegradability : Inoculum: Sewage
Biodegradation: 100 %
Remarks: Readily biodegradable

Bioaccumulative potential

Components:

108-88-3:

Partition coefficient: n-octanol/water : log Pow: 2.73

Mobility in soil

No data available

Other adverse effects

No data available

Product:

Regulation	40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information	: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	: Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact NEXO's Environmental Services Group at 800-637-7922.
Contaminated packaging	: Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty

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drum.

SECTION 14. TRANSPORT INFORMATION

IATA (International Air Transport Association): UN1294, TOLUENE, 3, II, Flash Point: 4 - 7 °C (39 - 45 °F)

IMDG (International Maritime Dangerous Goods): UN1294, TOLUENE, 3, II

DOT (Department of Transportation): UN1294, TOLUENE, 3, II

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : Flammable liquid, Moderate skin irritant, Teratogen, Reproductive hazard

WHMIS Classification : B2: Flammable liquid
D2A: Very Toxic Material Causing Other Toxic Effects
D2B: Toxic Material Causing Other Toxic Effects

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Toluene	108-88-3	1000	1000

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 302 : SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

108-88-3	Toluene	100 %
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Clean Air Act

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The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

108-88-3	Toluene	100 %
100-41-4	Ethylbenzene	0.0999 %
71-43-2	Benzene	0.0999 %
98-82-8	Cumene	0.0004 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

108-88-3	Toluene	100 %
100-41-4	Ethylbenzene	0.0999 %
71-43-2	Benzene	0.0999 %
98-82-8	Cumene	0.0004 %

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

108-88-3	Toluene	100 %
100-41-4	Ethylbenzene	0.0999 %
71-43-2	Benzene	0.0999 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

108-88-3	Toluene	100 %
100-41-4	Ethylbenzene	0.0999 %
71-43-2	Benzene	0.0999 %

This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

108-88-3	Toluene	100 %
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US State Regulations

Massachusetts Right To Know

108-88-3	Toluene	90 - 100 %
71-43-2	Benzene	0 - 0.1 %

Pennsylvania Right To Know

108-88-3	Toluene	90 - 100 %
100-41-4	Ethylbenzene	0 - 0.1 %
71-43-2	Benzene	0 - 0.1 %

New Jersey Right To Know

108-88-3	Toluene	90 - 100 %
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California Prop 65

	WARNING! This product contains a chemical known to the State of California to cause cancer.
100-41-4	Ethylbenzene
71-43-2	Benzene
98-82-8	Cumene

WARNING: This product contains a chemical known to the State of California to cause birth defects or other

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108-88-3 reproductive harm.
Toluene
71-43-2 Benzene

The components of this product are reported in the following inventories:

Switzerland. New notified substances and declared preparations	:	y (positive listing) (The formulation contains substances listed on the Swiss Inventory)
United States TSCA Inventory	:	y (positive listing) (On TSCA Inventory)
Canadian Domestic Substances List (DSL)	:	y (positive listing) (All components of this product are on the Canadian DSL.)
Australia Inventory of Chemical Substances (AICS)	:	y (positive listing) (On the inventory, or in compliance with the inventory)
New Zealand. Inventory of Chemical Substances	:	y (positive listing) (On the inventory, or in compliance with the inventory)
Japan. ENCS - Existing and New Chemical Substances Inventory	:	y (positive listing) (On the inventory, or in compliance with the inventory)
Japan. ISHL - Inventory of Chemical Substances (METI)	:	y (positive listing) (On the inventory, or in compliance with the inventory)
Korea. Korean Existing Chemicals Inventory (KECI)	:	y (positive listing) (On the inventory, or in compliance with the inventory)
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	:	y (positive listing) (On the inventory, or in compliance with the inventory)

Safety Data Sheet

Toluene

Version 1.3

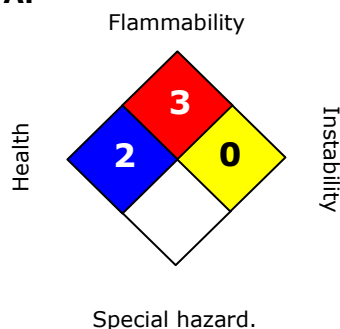
Revision Date: 03/06/2015

China. Inventory of Existing Chemical Substances in China (IECSC)	:	y (positive listing) (On the inventory, or in compliance with the inventory)
--	---	---

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	2*
FLAMMABILITY	3
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 =Extreme, * = Chronic

The information accumulated is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made become available subsequently to the date hereof, we do not assume any responsibility for the results of its use. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by NEXEO™ Solutions EHS Product Safety Department (1-855-429-2661) MSDS@nexeosolutions.com.

Legacy MSDS: R0000565

Material number:

16076583, 20054, 16052078, 16044492, 16042922, 16020146, 758386, 744411, 744290, 710730, 710841, 659495, 638920, 605418, 599094, 591594, 583688, 577548, 74292, 554035, 554297, 554199, 554034, 550273, 547202, 508613, 508487, 102358, 87255, 86312, 53763, 87252, 102690, 70140, 85974, 53211, 54494, 53551, 86521, 53216, 69928, 102899, 69593, 103631, 54061, 70083, 86461, 102680, 53543, 69918, 85966, 53699, 127683, 508226, 508225, 503157, 502489, 500113, 500040, 20058, 20055, 20052, 20051, 20050, 20049, 508283

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Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

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SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product identifier used on the label

: **Trichloroethylene**

Product Code(s) : Not available.

Recommended use of the chemical and restrictions on use

: Reagent; Chemical intermediate.
Use pattern: Professional Use Only
Restriction on use: None known

Chemical family : Pure substance

Name, address, and telephone number
of the supplier:

Comet Chemical Company Ltd.

3463 Thomas Street

Innisfill, ON, Canada
L9S 3W4

Supplier's Telephone # : 705-436-5580

24 Hr. Emergency Tel # : TERRRAPURE ENVIRONMENTAL : 800-567-7455

Name, address, and telephone number of
the manufacturer:

Refer to supplier

SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

Clear colourless liquid. Ether like odour.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification

Skin Irritation - Category 2

Eye Damage/Irritation - Category 2B

Carcinogenicity - Category 1

Germ Cell Mutagenicity - Category 2

Specific Target Organ Toxicity, Single Exposure -Category 3 (respiratory)

Specific Target Organ Toxicity, Single Exposure - Category 3 narcotic effects

Label elements

Hazard pictogram(s)



Signal Word

DANGER!

Hazard statement(s)

Causes skin irritation.

Causes serious eye irritation.

May cause cancer.

Suspected of causing genetic defects.

May cause respiratory irritation.

May cause drowsiness or dizziness.

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SAFETY DATA SHEET*Precautionary statement(s)*

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wash thoroughly after handling.
Avoid breathing mist or vapours.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/clothing and eye/face protection.

If exposed or concerned: Get medical advice/attention.
If on skin: Wash with plenty of soap and water.
If skin irritation occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
If eye irritation persists: get medical advice/attention.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.

Store locked up.
Store in a well-ventilated place. Keep container tightly closed.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards

Other hazards which do not result in classification: Burning produces obnoxious and toxic fumes. May be harmful if swallowed. Ingestion can cause gastrointestinal irritation, nausea, and diarrhea. May be an aspiration hazard. Aspiration into the lungs during swallowing or subsequent vomiting may cause chemical pneumonitis, which can be fatal.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance

<u>Chemical name</u>	<u>Common name and synonyms</u>	<u>CAS #</u>	<u>Concentration</u>
Trichloroethene	1,1,2-Trichloroethylene; Ethylene trichloride	79-01-6	100.00

SECTION 4. FIRST-AID MEASURES**Description of first aid measures**

- Ingestion* : Seek immediate medical attention/advice. Do not induce vomiting. Have victim rinse mouth with water, then give one to two glasses of water to drink. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep victim's head lowered (forward) to reduce the risk of aspiration.
- Inhalation* : Immediately remove person to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen by qualified medical personnel only. Seek immediate medical attention/advice.
- Skin contact* : Remove/Take off immediately all contaminated clothing. Flush affected skin with gently flowing lukewarm water for at least 20 minutes. Seek immediate medical attention/advice. Wash contaminated clothing before re-use. Leather and shoes that have been contaminated with the solution may need to be destroyed.
- Eye contact* : Immediately flush eyes thoroughly with running water for at least 20 to 30 minutes. Seek immediate medical attention/advice.

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SAFETY DATA SHEET

Most important symptoms and effects, both acute and delayed

- : Causes skin irritation. Symptoms may include redness, itching and swelling. Causes serious eye irritation. Symptoms may include redness, pain, tearing and conjunctivitis. May cause respiratory irritation. Symptoms may include upper respiratory irritation, coughing and breathing difficulties. May cause central nervous system effects. Inhalation could result in pulmonary edema (fluid accumulation). Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects. May be harmful if swallowed. May be an aspiration hazard. Aspiration into the lungs during swallowing or subsequent vomiting may cause chemical pneumonitis, which can be fatal. May cause cancer. Suspected of causing genetic defects.

Indication of any immediate medical attention and special treatment needed

- : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

- : Use water fog or fine spray, foams, carbon dioxide or dry chemical.

Unsuitable extinguishing media

- : Do not use a solid water stream as it may scatter and spread fire.

Special hazards arising from the substance or mixture / Conditions of flammability

- : Burning produces obnoxious and toxic fumes. Combustible liquid Vapors are heavier than air and may spread along floors. Vapors may travel considerable distance to a source of ignition and flash back.

Flammability classification (OSHA 29 CFR 1910.106)

- : Not flammable.

Hazardous combustion products

- : Carbon oxides; Hydrogen chloride. ; Phosgene .

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

- : Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

Special fire-fighting procedures

- : Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

- : All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Refer to protective measures listed in sections 7 and 8. Keep all other personnel upwind and away from the spill/release. Restrict access to area until completion of clean-up.

Environmental precautions

- : Do not allow material to contaminate ground water system. For large spills, dike the area to prevent spreading.

Methods and material for containment and cleaning up

- : Ventilate the contaminated area. Stop the flow of material, if this is without risk. Dike for water control. Use only non-sparking tools and equipment in the clean-up process. Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand), then place absorbent material into a container for later disposal (see Section 13).

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Special spill response procedures

- : If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8802).
- EPA/CERCLA Reportable quantity (RQ): Trichloroethylene (100 lbs / 45.4 kg)

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

- : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Wear protective gloves/clothing and eye/face protection. Avoid breathing vapour or mist. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Keep away from metals and incompatibles. Label containers appropriately. Keep containers tightly closed when not in use. Wash thoroughly after handling.

Conditions for safe storage

- : Store in a cool, dry, well-ventilated area. Store away from incompatibles and out of direct sunlight. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area.

Incompatible materials

- : Strong oxidizers (e.g. Chlorine, Peroxides, etc.). Reducing agents ;Reactive metals ;Alkalies ;Epoxides Copper alloys.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

<u>Chemical Name</u>	<u>ACGIH TLV</u>		<u>OSHA PEL</u>	
	<u>TWA</u>	<u>STEL</u>	<u>PEL</u>	<u>STEL</u>
Trichloroethene	10 ppm	25 ppm	100 ppm	N/Av

Exposure controls

Ventilation and engineering measures

- : Provide exhaust ventilation or other engineering controls to keep the airborne concentration of vapours below their respective threshold limit value.

Respiratory protection

- : Respiratory protection is required if the concentrations exceed the TLV. A NIOSH/MSHA approved air-purifying respirator with the appropriate chemical cartridges or a positive-pressure, air-supplied respirator may be used to reduce exposure. Advice should be sought from respiratory protection specialists.

Skin protection

- : Impervious gloves must be worn when using this product. Advice should be sought from glove suppliers.

Eye / face protection

- : Chemical splash goggles are recommended. A full face shield may also be necessary.

Other protective equipment

- : Wear resistant clothing and boots. An eyewash station and safety shower should be made available in the immediate working area. Other equipment may be required depending on workplace standards.

General hygiene considerations

- : Avoid breathing mist or vapours. Avoid contact with skin, eyes and clothing. Do not eat, drink, smoke or use cosmetics while working with this product. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Clear colourless liquid.

Odour : Sweet ethereal odour.

Odour threshold : 80-100 ppm

pH : Not applicable.

Melting/Freezing point : -73°C (-99°F)

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Initial boiling point and boiling range

: 82.2°C (188.96°F)

Flash point : Does not Flash

Flashpoint (Method) : Not applicable.

Evaporation rate (BuAe = 1) : 4.5-4.9

Flammability (solid, gas) : Not applicable.

Lower flammable limit (% by vol.) : 8%

Upper flammable limit (% by vol.) : 50%

Oxidizing properties : None known.

Explosive properties : Not explosive

Vapour pressure : 60 mm Hg @ 20°C

Vapour density : 4.5

Relative density / Specific gravity : 1.46

Solubility in water : Soluble (1.1 g/L)

Other solubility(ies) : Soluble in most organic solvents.

Partition coefficient: n-octanol/water or Coefficient of water/oil distribution

: 2.42-2.53

Auto-ignition temperature : 420°C (788°F)

Decomposition temperature : Not available.

Viscosity : 0.57 centipoise @ 20°C

Volatiles (% by weight) : Not available.

Volatile organic Compounds (VOC's) : N/Av

Absolute pressure of container : N/Av

Flame projection length : N/Av

Other physical/chemical comments : Molecular Weight: 131

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not normally reactive.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : No dangerous reaction known under conditions of normal use.

Conditions to avoid : Avoid heat and open flame. Ensure adequate ventilation, especially in confined areas.
Avoid contact with incompatible materials.

Incompatible materials : Strong oxidizers (e.g. Chlorine, Peroxides, etc.). Reducing agents ;Reactive metals
;Alkalies ;Epoxides Copper alloys.

Hazardous decomposition products : None known, refer to hazardous combustion products in Section 5.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Routes of entry inhalation : YES

Routes of entry skin & eye : YES

Routes of entry Ingestion : YES

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Routes of exposure skin absorption

: NO

Potential Health Effects:

Signs and symptoms of short-term (acute) exposure

Sign and symptoms Inhalation

: May cause severe irritation to the nose, throat and respiratory tract. Symptoms may include upper respiratory irritation, coughing and breathing difficulties. Inhalation of extremely high concentrations could cause pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. May cause central nervous system effects. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.

Sign and symptoms ingestion

: May be harmful if swallowed. Ingestion can cause gastrointestinal irritation, nausea, and diarrhea. May be an aspiration hazard. Aspiration into the lungs may cause chemical pneumonitis.

Sign and symptoms skin

: Causes skin irritation. Symptoms may include redness, itching and swelling.

Sign and symptoms eyes

: Causes serious eye irritation. Symptoms may include stinging sensation, tearing, conjunctivitis and possibly corneal damage.

Potential Chronic Health Effects

: Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Prolonged exposure can cause central nervous system effects.

Mutagenicity

: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification : Germ Cell Mutagenicity - Category 2 Suspected of causing genetic defects.

Carcinogenicity

: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification Carcinogenic Category 1 May cause cancer.

Reproductive effects & Teratogenicity

: Not expected to have other reproductive effects.

Sensitization to material

: Not expected to be a skin or respiratory sensitizer.

Specific target organ effects

: Eyes, skin, respiratory system and digestive system.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification: Specific Target Organ Toxicity, Single Exposure -Category 3 (respiratory) May cause respiratory irritation. Specific Target Organ Toxicity, Single Exposure - Category 3 narcotic effects May cause drowsiness or dizziness.

Not classified as a specific target organ toxicity-repeated exposure.

Medical conditions aggravated by overexposure

: Pre-existing skin, eye and respiratory disorders.

Synergistic materials

: Not available.

Toxicological data

: See below for toxicological data on the substance.

<u>Chemical name</u>	LC₅₀(4hr)	LD₅₀	
	<u>inh, rat</u>	<u>(Oral, rat)</u>	<u>(Rabbit, dermal)</u>
Trichloroethene	38.96 mg/L	5602 mg/kg	>29000mg/kg

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Other important toxicological hazards

: None known or reported by the manufacturer.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity : The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters. See the following tables for individual ingredient ecotoxicity data.

Ecotoxicity data:

<u>Ingredients</u>	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Trichloroethene	79-01-6	21.9 mg/L (Fathead minnow)	n/av	none

<u>Ingredients</u>	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Trichloroethene	79-01-6	18 mg/L (Daphnia magna)	n/av	none

<u>Ingredients</u>	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Trichloroethene	79-01-6	450 mg/L (Green algae)	n/av	none

Persistence and degradability

: Not readily biodegradable.

Bioaccumulation potential

: No data is available on the product itself.

<u>Components</u>	<u>Partition coefficient n-octanol/ater (log Kow)</u>	<u>Bioconcentration factor (BCF)</u>
Trichloroethene (CAS 79-01-6)	2.29	4-39

Mobility in soil : No data is available on the product itself.

Other Adverse Environmental effects

: No data is available on the product itself.

SECTION 13. DISPOSAL CONSIDERATIONS
Handling for Disposal

: Handle waste according to recommendations in Section 7. Empty containers retain residue (liquid and/or vapour) and can be dangerous.

Methods of Disposal

: Dispose of in accordance with federal, provincial and local hazardous waste laws.

RCRA

:

The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.





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SECTION 14. TRANSPORTATION INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
TDG	UN1710	TRICHLOROETHYLENE	6.1	III	
TDG Additional information	May be shipped as Limited Quantity when transported in containers no larger than 5.0 Litres; in packages not exceeding 30 kg gross mass.				
49CFR/DOT	UN1710	TRICHLOROETHYLENE	6.1	III	
49CFR/DOT Additional information	US CERCLA Reportable quantity (RQ): (100 lbs / 45.4 kg) . May be shipped as Limited Quantity when shipped in containers no greater than 1.0 Litre; per Section 173.154 of 49 CFR.				
ICAO/IATA	UN1710	Trichloroethylene	6.1	III	
ICAO/IATA Additional information	Refer to ICAO/IATA Packing Instruction				
IMDG	UN1710	TRICHLOROETHYLENE	6.1	III	
IMDG Additional information	May be shipped as limited quantity. Check the IMDG regulations for details.				

Special precautions for user : None known or reported by the manufacturer.

Environmental hazards : See ECOLOGICAL INFORMATION, Section 12.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: Not available.

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

<u>Ingredients</u>	CAS #	TSCA Inventory	CERCLA Reportable Quantity(RQ) (40 CFR 117.302):	SARA TITLE III: Sec. 302, Extremely Hazardous Substance, 40 CFR 355:	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical	de minimus Concentration
Trichloroethene	79-01-6	Yes	100 lb/ 45.4 kg	N/Av	Toxic Chemical Yes	Yes

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Acute Health Hazard ; Chronic Health Hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

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US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

<u>Ingredients</u>	CAS #	California Proposition 65		State "Right to Know" Lists					
		Listed	Type of Toxicity	CA	MA	MN	NJ	PA	RI
Trichloroethene	79-01-6	Yes	Carcinogen	Yes	Yes	Yes	Yes	Yes	Yes

Canadian Information:

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on the Domestic Substances List (DSL).

Canadian WHMIS Classification: Refer to Section 2 for a WHMIS Classification for this product.

International Information:

Components listed below are present on the following International Inventory list:

<u>Ingredients</u>	CAS #	European EINECs	Australia AICS	Philippines PICCS	Japan ENCS	Korea KECI/KECL	China IECSC	NewZealand IOC
Trichloroethene	79-01-6	201-167-4	Present	Present	(2)-105	KE-13680	Present	HSR001555

SECTION 16. OTHER INFORMATION

Legend

: ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstract Services
ERAP: Emergency Response Assistance Plan
HSDB: Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
Inh: Inhalation
LC: Lethal Concentration
LD: Lethal Dose
MSHA: Mine Safety and Health Administration
N/Av: Not Applicable
N/Av: Not Available
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
RTECS: Registry of Toxic Effects of Chemical Substances
STEL: Short Term Exposure Limit
TDG: Canadian Transportation of Dangerous Goods Act & Regulations
TLV: Threshold Limit Values
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

References

: Canadian Centre for Occupational Health and Safety, CCInfoWeb Databases, 2015 (Chempendium, RTECs, HSDB, INCHEM).
European Chemicals Agency, Classification Legislation, 2015
6. OECD- The Global Portal to Information on Chemical Substances - eChemPortal, 2015
Material Safety Data Sheet from manufacturer

Preparation Date (mm/dd/yyyy)

: 09/23/2015



Comet Chemical Company Ltd.
3463 Thomas Street
Innisfill, ON, Canada, L9S 3W4
Telephone: (705) 436 5580

Trichloroethylene

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Other special considerations for handling

: Provide adequate information, instruction and training for operators.

Prepared for: Comet Chemical Company Ltd. 3463 Thomas Street Innisfill, ON L9S 3W4 Information (M-F 8:00-5:00): 705-436-5580 www.cometchemical.com	 COMET COMET CHEMICAL COMPANY LTD.
Prepared by: ICC The Compliance Center Inc. Telephone: (888) 442-9628 (U.S.): (888) 977-4834 (Canada) http://www.thecompliancecenter.com	 icc ComplianceCenter

DISCLAIMER

This Safety Data Sheet was prepared by ICC The Compliance Center Inc. using information provided by Comet Chemical Company Ltd. and CCOHS' Web Information Service. The information in the Safety Data Sheet is offered for your consideration and guidance when exposed to this product. ICC The Compliance Center Inc. and Comet Chemical Company Ltd. expressly disclaim all expressed or implied warranties and assume no responsibilities for the accuracy or completeness of the data contained herein. The data in this SDS does not apply to use with any other product or in any other process.

This Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of ICC The Compliance Center Inc. and Comet Chemical Company Ltd.

END OF DOCUMENT

SAFETY DATA SHEET

Xylene



Section 1. Identification

GHS product identifier	: Xylene
Chemical name	: Xylene
Synonyms	: Xylol; Mixed Xylenes; Xylene Isomers and Ethylbenzene; Dimethylbenzenes and Ethylbenzene; Industrial-grade Xylene (meets ASTM D-364 Specifications); Nitration-grade Xylene (meets ASTM D-843 Specifications); CITGO® Material Code: 07306
Code	: 07306
Supplier's details	: CITGO Petroleum Corporation P.O. Box 4689 Houston, TX 77210 sdsvend@citgo.com
Emergency telephone number	: Technical Contact: (832) 486-4000 Medical Emergency: (832) 486-4700 CHEMTREC Emergency: (800) 424-9300 (United States Only)

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY: INHALATION - Category 4 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A CARCINOGENICITY: INHALATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [ears] - Category 2 ASPIRATION HAZARD - Category 1

GHS label elements

Hazard pictograms



Signal word

Hazard statements

- : Danger
- : Flammable liquid and vapor.
Harmful if inhaled.
Causes serious eye irritation.
Causes skin irritation.
Suspected of causing cancer if inhaled.
May be fatal if swallowed and enters airways.
May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure. (ears)

Precautionary statements

Prevention

- : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Wash hands thoroughly after handling.

Section 2. Hazards identification

Response	: Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
Storage	: Store locked up. Store in a well-ventilated place. Keep cool.
Disposal	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Supplemental label elements	: Avoid contact with skin and clothing. Wash thoroughly after handling.
Hazards not otherwise classified	: Prolonged or repeated contact may dry skin and cause irritation.

Section 3. Composition/information on ingredients

Substance/mixture	: Substance
Chemical name	: Xylene
Other means of identification	: Xylol; Mixed Xylenes; Xylene Isomers and Ethylbenzene; Dimethylbenzenes and Ethylbenzene; Industrial-grade Xylene (meets ASTM D-364 Specifications); Nitration-grade Xylene (meets ASTM D-843 Specifications); CITGO® Material Code: 07306

CAS number/other identifiers

CAS number	: 1330-20-7
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Ingredient name	%	CAS number
Xylenes, mixed isomers	60 - 100	1330-20-7
Ethylbenzene	10 - 30	100-41-4
Cumene	0.1 - 1	98-82-8

* = Various ** = Mixture *** = Proprietary

Any concentration shown as a range is to protect confidentiality or is due to process variation.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
Inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that gas or vapor is still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin contact	: Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Section 4. First aid measures

- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute

Potential acute health effects

- Eye contact** : Causes eye irritation. Causes serious eye irritation.
- Inhalation** : Harmful if inhaled. May cause respiratory irritation.
- Skin contact** : Causes skin irritation. Defatting to the skin.
- Ingestion** : May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
- Ingestion** : Adverse symptoms may include the following:
nausea or vomiting

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.
- Specific treatments** : Treat symptomatically and supportively.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that gas or vapor is still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

- Specific hazards arising from the chemical** : Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Extinguishing media

Section 5. Fire-fighting measures

- Suitable extinguishing media** : Use caution when applying carbon dioxide in confined spaces.
SMALL FIRE: Steam, CO₂, dry chemical or inert gas (e.g., nitrogen). LARGE FIRE: Use foam, water fog or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, ignition or explosion.
- Unsuitable extinguishing media** : Do not use water jet.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Section 7. Handling and storage

Protective measures

- Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not swallow. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container. Non equilibrium conditions may increase the fire hazard associated with this product. Always bond receiving containers to the fill pipe before and during loading. Always confirm that receiving container is properly grounded. Bonding and grounding alone may be inadequate to eliminate fire and explosion hazards. Carefully review operations that may increase the risks such as tank and container filling, tank cleaning, sampling, gauging, loading, filtering, mixing, agitation, etc. In addition to bonding and grounding, efforts to mitigate the hazards may include, but are not limited to, ventilation, inerting and/or reduction of transfer velocities. Always keep nozzle in contact with the container throughout the loading process. Do NOT fill any portable container in or on a vehicle.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Bulk Storage Conditions: Maintain all storage tanks in accordance with applicable regulations. Use necessary controls to monitor tank inventories. Inspect all storage tanks on a periodic basis. Test tanks and associated piping for tightness. Maintain the automatic leak detection devices to assure proper working condition.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Xylenes, mixed isomers	ACGIH TLV (United States, 4/2014). TWA: 100 ppm 8 hours. TWA: 434 mg/m ³ 8 hours. STEL: 150 ppm 15 minutes. STEL: 651 mg/m ³ 15 minutes. OSHA PEL (United States, 2/2013). TWA: 100 ppm 8 hours. TWA: 435 mg/m ³ 8 hours.
Ethylbenzene	ACGIH TLV (United States, 4/2014). TWA: 20 ppm 8 hours. OSHA PEL (United States, 2/2013). TWA: 100 ppm 8 hours. TWA: 435 mg/m ³ 8 hours.
Cumene	ACGIH TLV (United States, 4/2014). TWA: 50 ppm 8 hours. OSHA PEL (United States, 2/2013). Absorbed through

Section 8. Exposure controls/personal protection

skin.

TWA: 50 ppm 8 hours.

TWA: 245 mg/m³ 8 hours.

Xylenes, mixed (parent)

ACGIH TLV (United States)

6 ppm (25 mg/m³) 8 hour(s)

Notes: The TLV for the hydrocarbon solvent is based on the procedure described in Appendix H ("Reciprocal Calculations Method for Certain Refined Hydrocarbon Solvent Vapors") of the ACGIH TLVs® and BEIs® guidelines. The GGVMixture (ACGIH TLV) is based on Column B (McKee et al., 2005) of Table 1 ("Group Guidance Values") of Appendix H.

Appropriate engineering controls

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

Environmental exposure controls

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, vapor controls, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

- : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

- : Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection

- : Avoid skin contact with liquid. Chemical-resistant gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Recommended: Heavy duty, industrial grade chemically resistant gloves constructed of nitrile, neoprene, polyethylene, fluoroelastomer rubber or polyvinyl chloride as approved by glove manufacturer. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. Leather gloves are not protective for liquid contact.

Body protection

- : Avoid skin contact with liquid. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

- : Avoid skin contact with liquid. Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Leather boots are not protective for liquid contact.

Respiratory protection

- : Avoid inhalation of gases, vapors, mists or dusts. Use a properly fitted, air-purifying or supplied-air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If an air purifying respirator is appropriate, use one equipped with cartridges rated for organic vapors.

Section 9. Physical and chemical properties

Physical state	: Liquid.
Color	: Transparent, colorless.
Odor	: Sweet, pungent aromatic hydrocarbon.
pH	: Not available.
Melting point	: -48°C (-54.4°F)
Boiling point/boiling range	: 138°C (280.4°F)
Flash point	: Closed cup: 27°C (81°F)(Typical)
Evaporation rate	: 0.8 (n-butyl acetate. = 1)
Lower and upper explosive (flammable) limits	: Lower: 1% Upper: 7%
Vapor pressure	: 0.93 kPa (7 mm Hg) [room temperature]
Vapor density	: 3.7 [Air = 1]
Relative density	: 0.87
Density lbs/gal	: 7.25 lbs/gal
Gravity, °API	: Estimated 31 @ 60 F
Solubility	: Very slightly soluble in the following materials: cold water.
Auto-ignition temperature	: 432°C (809.6°F)

Section 10. Stability and reactivity

Reactivity	: Not expected to be Explosive, Self-Reactive, Self-Heating, or an Organic Peroxide under US GHS Definition(s).
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas. Do not store with strong oxidizing agents.
Incompatible materials	: Reactive or incompatible with the following materials: oxidizing materials
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Xylenes, mixed isomers	LC50 Inhalation Vapor	Rat	5000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	6700 ppm	4 hours
	LD50 Oral	Mouse	2119 mg/kg	-
	LD50 Oral	Rat	4300 mg/kg	-
Ethylbenzene	LD50 Oral	Rat	4300 mg/kg	-
	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-
Cumene	LC50 Inhalation Vapor	Mouse	10 g/m ³	7 hours
	LD50 Dermal	Rabbit	12300 uL/kg	-
	LD50 Oral	Rat	2.9 g/kg	-
	LD50 Oral	Rat	4000 mg/kg	-

Section 11. Toxicological information

Conclusion/Summary : **Xylenes, mixed isomers**: Overexposure to xylene may cause upper respiratory tract irritation, headache, cyanosis, blood serum changes, CNS damage and narcosis. Effects may be increased by the use of alcoholic beverages. Evidence of liver and kidney impairment were reported in workers recovering from a gross over-exposure.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Xylenes, mixed isomers	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Moderate irritant	Rabbit	-	100 Percent	-
Ethylbenzene	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-
Cumene	Eyes - Mild irritant	Rabbit	-	86 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 10 milligrams	-

Skin : **Xylenes, mixed isomers**: May cause skin irritation.

Eyes : **Xylenes, mixed isomers**: May cause eye irritation.

Respiratory : **Xylenes, mixed isomers**: May cause respiratory irritation.

Sensitization

Skin : No additional information.

Respiratory : No additional information.

Mutagenicity

Conclusion/Summary : No additional information.

Carcinogenicity

Conclusion/Summary : **Ethylbenzene**: Findings from a 2-year inhalation study in rodents conducted by NTP were as follows: Effects were observed only at the highest exposure level (750 ppm). At this level the incidence of renal tumors was elevated in male rats (tubular carcinomas) and female rats (tubular adenomas). Also, the incidence of tumors was elevated in male mice (alveolar and bronchiolar carcinomas) and female mice (hepatocellular carcinomas). IARC has classified ethyl benzene as "possibly carcinogenic to humans" (Group 2B).

Classification

Product/ingredient name	OSHA	IARC	NTP
Xylenes, mixed isomers	-	3	-
Ethylbenzene	-	2B	-
Cumene	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

Conclusion/Summary : **Ethylbenzene**: Studies in laboratory animals indicate limited evidence of renal malformations, resorptions, and developmental delays following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time.

Teratogenicity

Conclusion/Summary : No additional information.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Ethylbenzene	Category 3	Not applicable.	Respiratory tract irritation
Cumene	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
Ethylbenzene	Category 2	Inhalation	ears

Aspiration hazard

Name	Result
Ethylbenzene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

- Eye contact** : Causes eye irritation. Causes serious eye irritation.
- Inhalation** : Harmful if inhaled. May cause respiratory irritation.
- Skin contact** : Causes skin irritation. Defatting to the skin.
- Ingestion** : May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
- Ingestion** : Adverse symptoms may include the following:
nausea or vomiting

Potential chronic health effects

- General** : May cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.
- Carcinogenicity** : Suspected of causing cancer if inhaled. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Section 12. Ecological information

Toxicity

Section 12. Ecological information

Product/ingredient name	Result	Species	Exposure
Xylenes, mixed isomers	Acute EC50 90 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute LC50 8.5 ppm Marine water	Crustaceans - Palaemonetes pugio - Adult	48 hours
	Acute LC50 8500 µg/l Marine water	Crustaceans - Palaemonetes pugio	48 hours
	Acute LC50 15700 µg/l Fresh water	Fish - Lepomis macrochirus - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	Acute LC50 19000 µg/l Fresh water	Fish - Lepomis macrochirus	96 hours
	Acute LC50 13400 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute LC50 16940 µg/l Fresh water	Fish - Carassius auratus	96 hours
	Acute EC50 4600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 3600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 2930 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
Ethylbenzene	Acute LC50 5200 µg/l Marine water	Crustaceans - Americamysis bahia	48 hours
	Acute LC50 4200 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Chronic NOEC 1000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 2600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
Cumene	Acute EC50 7400 µg/l Fresh water	Crustaceans - Artemia sp. - Nauplii	48 hours
	Acute EC50 10600 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 2700 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary : Not available.

Persistence and degradability

Conclusion/Summary : Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Xylenes, mixed isomers	3.12	8.1 to 25.9	low
Ethylbenzene	3.6	-	low
Cumene	3.55	94.69	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive

Section 13. Disposal considerations




atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

RCRA classification : D001, D018

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Xylene	1330-20-7	Listed	U239

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	UN1307	UN1307	UN1307
UN proper shipping name	RQ, Xylenes, 3, UN 1307, PG III	RQ, Xylenes, 3, UN 1307, PG III	RQ, Xylenes, 3, UN 1307, PG III
Transport hazard class(es)	3 	3 	3 
Packing group	III	III	III
Environmental hazards	No.	No.	No.
Additional information	<p>Reportable quantity 125 lbs / 56.749 kg [17.232 gal / 65.229 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.</p> <p>Packaging instruction Passenger aircraft Quantity limitation: 60 L</p> <p>Cargo aircraft Quantity limitation: 220 L</p>	-	<p>Passenger and Cargo Aircraft Quantity limitation: 60 L Cargo Aircraft OnlyQuantity limitation: 220 L</p>

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

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

Clean Water Act (CWA) 307: Ethylbenzene; Toluene; Benzene; Naphthalene

Clean Water Act (CWA) 311: Xylene

This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

SARA 302/304

Composition/information on ingredients

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/information on ingredients

Name	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Xylenes, mixed isomers	Yes.	No.	No.	Yes.	Yes.
Ethylbenzene	Yes.	No.	No.	Yes.	Yes.
Cumene	Yes.	No.	No.	Yes.	Yes.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Xylenes, mixed isomers	1330-20-7	<90
	Ethylbenzene	100-41-4	<30
Supplier notification	Xylenes, mixed isomers	1330-20-7	<90
	Ethylbenzene	100-41-4	<30

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: XYLENE

New York : The following components are listed: Xylene (mixed)

New Jersey : The following components are listed: XYLENES; BENZENE, DIMETHYL-

Pennsylvania : The following components are listed: BENZENE, DIMETHYL-

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	%	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Ethylbenzene	<30	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
Cumene	<1	Yes.	No.	No.	No.
Toluene	<0.1	No.	Yes.	No.	7000 µg/day (ingestion)
Benzene	<0.01	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day	24 µg/day (ingestion) 49 µg/day (inhalation)

Section 15. Regulatory information

Naphthalene	<0.0001	Yes.	No.	(inhalation) Yes.	No.
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International regulations

International lists

- : **Australia inventory (AICS)**: All components are listed or exempted.
- : **China inventory (IECSC)**: All components are listed or exempted.
- : **Japan inventory**: All components are listed or exempted.
- : **Korea inventory**: All components are listed or exempted.
- : **Malaysia Inventory (EHS Register)**: All components are listed or exempted.
- : **New Zealand Inventory of Chemicals (NZIoC)**: All components are listed or exempted.
- : **Philippines inventory (PICCS)**: All components are listed or exempted.
- : **Taiwan inventory (CSNN)**: All components are listed or exempted.

Canada inventory

- : All components are listed or exempted.

EU Inventory

- : All components are listed or exempted.

WHMIS (Canada)

- : Class B-2: Flammable liquid
- : Class D-2A: Material causing other toxic effects (Very toxic).
- : Class D-2B: Material causing other toxic effects (Toxic).

Section 16. Other information

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



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History

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Key to abbreviations

- : ATE = Acute Toxicity Estimate
- : BCF = Bioconcentration Factor
- : GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- : IATA = International Air Transport Association
- : IBC = Intermediate Bulk Container
- : IMDG = International Maritime Dangerous Goods
- : LogPow = logarithm of the octanol/water partition coefficient
- : MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- : UN = United Nations

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