


 <p>National Petrochemical Company(NPC)</p>	Material Safety Data Sheet (MSDS) According to the Directives 91/155/CEE-2001/58/CE-ISO 11014-1	Page: 1 of 15 Revision Number: 1
	Product Name: Orthoxylene	 Reactivity Flammability Health

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

Identification of the substance or preparation: Country of origin: CAS Number: Synonyms:	Orthoxylene ,C ₆ H ₆ (CH ₃) ₃ Iran (Islamic Republic of Iran) 202 -422-2 Benzene, 1,2 – Dimethyl-;O-imethylbenzene; 1,2 – Dimethylbenzene;O-Methyl toluene; Ortho-Xylene; 1,2 Xylene; Xylene;O-Xylol; RCRA U 239; STCC 4909349; 2-Methyltolune; UN 1307;C₈H₁₀; OHS17180; RTECS ZE 2450000
Company/undertaking identification	National Petrochemical Company Iran Petrochemical Commercial Company (IPCC)
Manufacturer subcontractor: Emergency phone number: Contact email: Fax: Association/Organization: Use of the substance/Preparation:	None 00982188881735 msds@petrochem-ir.net 00982188839511 None Xylene and the individual isomers are primarily man-made chemicals. The leading application for o-xylene is an intermediate in the production of phthalic anhydride. Small amounts are used as solvents in bactericides, herbicides, and lube oil additives. Some low purity o-xylene may be returned to the gasoline pool but the largest use not identified is likely further isomerisation to maximize p-xylene production. Also it's a raw material for the manufacture of polyethylene naphthalate (PEN).

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous substances:	Ethyl benzene Risk phrase : R20 Ortho-xylene Risk phrase : R20/21 Harmful by inhalation and in contact with Skin R 38 Irritating to skin
Hazardous label(s):	XN F FLAMMABLE LIQUID AND VAPOR. May cause liver and kidney damage .Aspiration hazard if swallowed. Can enter

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Toxicological characteristics:

Substances present at a concentration below the minimum danger:

Other component:

lungs and cause damage .cause respiratory tract irritation . **WARNING!** Cause eye irritation and skin irritation. May be harmful if absorbed through the skin or inhaled.

See section 11

Not available

100% O-xylene

3. IDENTIFICATION OF HAZARDS

Risk phrases:

R 38 ; R20/21 ; R38 ; R 11

Respiratory tract irritation, skin irritation, eye irritation, and central nervous system depression.

Flammable liquid and vapour. Vapour may cause flash fire. Electrostatic charges may be generated by flow, agitation, etc.

Skin contact:

Causes skin irritation.

May be harmful if absorbed through the skin.

SHORT TERM EXPOSURE: irritation blisters

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

Inhalation :

Short term exposure: irritation low body temperature, ringing in the ears, nausea, vomiting, stomach pain, headache, drowsiness, symptoms of drunkenness, visual disturbances, lung congestion, kidney damage, liver damage, coma

LONG TERM EXPOSURE: same as effects reported in short term exposure, tingling sensation, infertility, menstrual disorders, blood disorders, reproductive effects

Eye contact:

Causes eye irritation.

SHORT TERM EXPOSURE: irritation (possibly severe), tearing.

LONG TERMS EXPOSURE: same as effects reported in short term exposure, blurred vision.

If swallowed:

Harmful if liquid is aspirated into lungs.



See toxicological information –section 11.

SHORT TERM EXPOSURE: same as effects reported in short term inhalation, digestive disorders, aspiration hazard

LONG TERM EXPOSURE: reproductive effects.

Other information:

Inhalation of high concentration may cause central nervous system effects characterized by

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nausea, headache, dizziness, unconsciousness and coma.

CARCINOGEN STATUS:

OSHA: NO

NTP: NO

IARC: NO

4. FIRST AID MEASURES

As a general rule, in case of doubt or if symptoms persist, always call a doctor
NEVER induce swallowing in an unconscious person.

In case of exposure by 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 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.

In case of splashes or contact with eyes:

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

In case of swallowing:

If swallowed, do NOT induce vomiting. Get immediate medical attention.



Note of physician:

For ingestion consider gastric lavage and activated charcoal slurry.

5. FIRE FIGHTING MEASURES

Flammable class:

Severe fire hazard. Vapour /air mixtures are explosive. The vapour is heavier than air. Vapours or gases may ignite at distant ignition sources and flash back. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.
FLASH POINT: 63 °F (17 °C)
LOWER FLAMEABLE LIMIT: 0.9%
UPPER FLAMEABLE LIMIT: 6.7 %

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Suitable extinguishing media:

AUTOIGNITION: 865 F (463 C)
FLAMEABILITY CLASS(SHA) :IB
 Use water spray to cool fire-exposed containers.
 Water may be ineffective.
 O-xylene is lighter than water and insoluble in water. The fire could easily spread by the use of water in an area where the water can not be contained. Use water spray, dry chemical, carbon dioxide, or appropriate foam. regular dry chemical carbon dioxide, water, and regular foam
 Large fires: Use regular foam or flood with fine water spray.
 Carbon monoxide and carbon dioxide

Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases:

Special protective equipment for fire fighting :



Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus. Wear chemical goggles and gloves.
 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) water may be ineffective.

Other information:

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:

Use proper protective equipment as indicated in section 5.
AIR RELEASE: Reduced vapours with water spray. Stay upwind and keep out of low areas.
SOIL RELEASE: Trap spilled material at bottom in deep-water pockets, excavated holding areas or within sand bag barriers. Dick for later disposal. Absorb with sand or other non-combustible material. Collect with absorbent

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Environmental precautions: into suitable container. **WATER RELEASE:** Cover with absorbent sheets, spill-control pads or pillows. Neutralize. Collect with absorbent into suitable container. Absorb with activated carbon. Remove trapped material with suction hoses. Collect spilled material using mechanical equipment. Remove or shut off all sources of ignition. Remove mechanically or contain on an absorbent material such as dry sand or earth .keep out of sewers and waterways.

Methods for cleaning up and disposal: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

Other information: Not available



7. HANDLING AND STORAGE

The regulations relating to storage premises apply to workshop where the product is handled:

Handling: Wash thoroughly after handling .remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue (liquid or vapor) and can be dangerous .Do not pressurize , cut , weld , braze , solder , drill , grind , or expose empty containers to heat , sparks or open flames . Use only with adequate ventilation. Avoid breathing vapor or mist.

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. Protect from physical damage. Store outside or in a detached building. Store with flammable liquids. Keep separated from incompatible substances.

Other information: Store in flammable liquids storage, and open flame in accordance with applicable regulations. Keep container closed when

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not in use. Keep away from ignition sources such as heat, sparks, or open flames. Keep container closed. Use with adequate ventilation

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:

EXPOSURE LIMITS:

O-XYLENE:

XYLENE:

100 ppm (435 mg/m³) OSHA TWA

150 ppm (651 mg/m³) OSHA STEL

(vacated by FR 35338 , June 30 , 1993)

100 ppm ACGIH TWA

150 ppm ACGH STEL

100 ppm (435 mg/m³) NIOSH recommended TWA 10 hour(s)

150 ppm (655 mg/m³) NIOSH recommended STEL

440 mg/m³ (100 ml/m³) DFG MAK (peak limitation category-II , I) (skin)

100 ppm (441 mg/m³) UK OES TWA (skin)

150 ppm (662 mg/m³) UK OES STEL (skin)

MEASUREMENT METHOD: Charcoal tube; Carbon disulfide; Gas chromatography with flame ionization detection; NIOSH IV # 1501, Aromatic Hydrocarbons.

Exposure controls:

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.

Personal protective equipment:

As below



Eye protection:

Wear splash resistant safety goggles with a face shield. Provide and emergency eye wash fountain and quick drench shower in the immediate work area

Respiratory protection:

The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.900 ppm
 Any chemical cartridge respirator with organic vapor cartridge(s).
 Any powered, air-purifying respirator with organic vapor cartridge(s).
 Any self-contained breathing apparatus with a full-face piece.



Escape –

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Hand protection:
 Any air-purifying respirator with a full face piece and an 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 full face pieces and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Skin and body protection:
 Any self-contained breathing apparatus with a full-face piece.
 Wear appropriate chemical resistant gloves.
Health measures:
 Wear appropriate chemical resistant clothing.
Environmental exposure controls:
 Not available
 Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

General information:	Liquid
Appearance (at 20°C):	clear
Colour:	colorless
Odour:	sweet odor
Odour threshold :	< 1 ppm
PH (at 20°C):	Not available
Boiling point/range (°C):	114°C (291°F)
Freezing point/range (°C):	-25°C (-13°F)
Flash point (°C):	17°C
Flammability:	Highly flammable
Auto-ignition temperature:	463°C
Explosive properties:	LOWER FLAMEABLE LIMIT: 0.9% UPPER FLAMEABLE LIMIT: 6.7%
Oxidising properties:	Not available
Vapour pressure (at 25°C):	5.2 mmHg
Vapour density (air=1):	3.7
Specific gravity (water=1) (at 20°C):	0.8802
Solubility (at 20°C):	water solubility: 0.0175% @ 20°C
Viscosity (40°C):	Solvent solubility: alcohol, ether, benzene, acetone, and organic solvents
Evaporation rate(butyl acetate=1):	Not available
Volatility :	0.7
Other information:	100% COEFFICIENT OF WATER / OIL DISTRIBUTION: Not available

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MOLECULAR WEIGHT: 106.17
 MOLECULAR FORMULA: C8-H10

10. STABILITY AND REACTIVITY

Stability:	Stable at normal temperatures and pressure.
Conditions to avoid:	POLYMERIZATION: Will not polymerize. 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.
Material to avoid:	Incompatibilities: oxidizing materials oxidizing materials O-xylene: oxidizers (strong): possible fire and explosion.
Hazardous decomposition products:	Thermal decomposition products: oxides of carbon

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	<ul style="list-style-type: none"> - LD₅₀, oral, rat (mg.kg⁻¹): - LD₅₀, oral, mouse (mg.kg⁻¹): - LD₅₀, dermal (mg.kg⁻¹): O-XYLENE: TOXICITY DATA: 3617-mg/kg oral-rat ld50 (Phillips); 6125 ppm/12 hour(s) inhalation-human LCLO; 5gm/kg oral-rat LDLO; 6125 ppm/12 hour(s) inhalation –rat LCLO; 30 gm/m ³ inhalation – mouse LCLO; 1550 ul/kg intrapationeal –mouse LD50; 1500 mg/kg intraperitoneal-mammal LDLO; 2500 mg/kg subcutaneous-mammal LDLO LOCAL EFFECTS: Irritant: inhalation, skin, eye ACUTE TOXICITY LEVEL: Moderately toxic: Ingestion TARGET ORGANS: Central nervous system Mentioned at human experience LOCAL EFFECTS: Irritant: inhalation, skin, eye
Sub chronic – chronic toxicity:	
Sensibilization:	
Carcinogenicity:	IARC: Human inadequate evidence, Animal Inadequate Evidence, Group 3,ACGIH: A40Not Classifiable as Human Carcinogen

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Reproductive effects:

REPRODUCTIVE EFFECTS DATA:
150-mg/m³ inhalation-rat TCLO/24 hour(s) 7-14 day(s) pregnant female continuous; 1500 mg/m³ inhalation-rat TCLO/24 hour(s) 7-14 day (s) pregnant female continuous; 3000 mg/m³ inhalation-rat TCLO/24hour(s) 7-14 day(s) pregnant female continuous; 500 mg/kg intraperitoneal-rat TDLO 2 day(s) male; 500 mg/m³ inhalation-mouse TCLO/12 hour(s) 6-15 day(s) pregnant female continuous. **ADDITIONAL DATA:**

Alcohol may enhance the toxic effects/Stimulants such as pinephrine may induce ventricular fibrillation.

Human experience:

HEALTH EFFECTS:
INHALATION:
ACUTE EXPOSURE:
XYLENE: Irritation of the upper respiratory tract may occur at 200ppm.Exposure to higher concentrations may cause more severe irritation and initial central nervous system excitation followed by depression. Signs and symptoms may include respiratory difficulty and substantial pain, transient euphoria and emotional liability, headache, nausea, vomiting, anorexia, abdominal pain, dizziness, drowsiness, ataxia, and staggering. There may be salivation, slurred speech, blurred vision, nystagmus; trinities, tremors, confusion, and flushing of the face and a feeling of increased body heat. In severe exposure, there may be stupor, amnesia, unconsciousness, and coma which may be punctuated by episodes of neuroirritability, but rarely frank convulsions, except in terminal asphyxia. Liver and kidney damage may occur, but are usually mild and transient. A group of subjects who inhaled 12.3 umol/L of xylene while exercising became significantly impaired on 3 neuropsychological tests. Exposure of 3 painters to approximately 10,000 ppm for 18.5 hours resulted in 1 death from pulmonary edema and pathological brain hemorrhage. Both survivors were unconscious for 19-24 hours and experienced retrograde ammonia, hypothermia, and lung congestion. Renal and hepatic impairment also developed.

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Complete recovery took 15 days. High concentrations may cause death from sudden ventricular fibrillation, but more frequently death occurs from respiratory arrest.

CHRONIC EXPOSURE:



XYLENE: Repeated or prolonged inhalation of vapors above 200 ppm may cause nausea, vomiting abdominal pain, and anorexia. Other common complaints include headache, fatigue, lassitude, irritability, breathing, difficulties, and flatulence. Effects on the nervous system may result in excitation, followed by depression, parenthesis, tremors, apprehension, impaired memory, insomnia, vertigo, and trinities. Effects on reaction time, manual coordination, body balance and EEG occurred with repeated exposure to 90 ppm of m-xylene. Sweetish taste in the mouth, dry nose and throat, strong thirst, mussel hemorrhage, and anemia has been reported. Effects on the liver, kidney, cardiovascular system, and the bone marrow have also been reported, although the latter has been questioned. Exposure of rabbits to 1150 ppm for 40-55 days resulted in a reversible decrease in the red and white cell counts and increases in the platelets. One case of an apparent epiletiform seizure following a relatively brief exposure has occurred. Women may develop menstrual disorders, such as menorrhagiaa or metrorrhagia, infertility, and pathological pregnancy conditions including toxicosis, danger of miscarriage, and specific developmental abnormalities. Included among these effects are fetal death, fetotoxicity, and musculoskeletal abnormalities, and extra embryonic structures.

SKIN CONTACT:

ACUTE EXPOSURE;

XYLENE: Liquid xylene is a defatting agent and may cause a burning sensation, drying, vasodilatation, erythematic, and possibly blistering . The liquid is readily absorbed through intact or broken skin at of approximately 4-10 mg/cm²/hour, but systemic effects have not been reported.

CHRONIC EXPOSURE:

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Xylene: Repeated or prolonged contact may cause defatting of the skin with drying, erythematic, and cracking, thickening and blistering. Repeated application of 95% xylene to rabbit skin caused moderate to marked irritation with erythematic and moderate necrosis. One case of allergic contact urinary has been reported.

EYE CONTACT:

ACUTE EXPOSURE:

XYLENE: 200 ppm has caused conjunctival irritation in humans, at higher concentrations, irritation may be severe. Vapor exposure has also caused tearing and photophobia. An accidental splash in the human eye caused transient superficial damage with rapid recovery, although reversible corneal burns have also been reported.

CHRONIC EXPOSURE:

XYLENE: Repeated or prolonged exposure to high vapor concentrations may cause a burning sensation, conjunctivitis and blurred vision; reversible vacuolar, epithelial keratopathy has been reported in some workers.



INGESTION;

ACUTE EXPOSURE:

XYLENE: Lung damage may occur if aspirated into the lungs and may be fatal. Symptoms may include coughing, difficulty breathing, cyanosis and pulmonary edema. May cause a burning sensation in the mouth and stomach, salivation, severe gastrointestinal distress with nausea and vomiting, possibly hematemesis, and toxic effects including signs of central nervous system depression and other symptoms as in acute inhalation, including ventricular fibrillation and liver and kidney injury. Ingestion of small quantities of 90% xylene plus toluene produced urinary dextrose and urobilinogen excretion with toxic hepatitis, which was reversible in 20 days. A does of 15-30 milliliters (about 1/2 –1 ounce) is the expected human lethal does.

CHRONIC EXPOSURE:

XYLENE: No data available on the ortho-isomer. Repeated ingestion of the mixed, meta-or Para-isomers by pregnant mice

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Other information:

resulted in effects on fertility, on the embryo or fetus, or specific developmental abnormalities. Including among these effects were fetotoxicity, litter size craniofacial and musculoskeletal system abnormalities, and post-implementation mortality.
Not available

12. ECOLOGICAL INFORMATION

Ecotoxicity:

FISH TOXICITY; 16400ug/L 96 hour(s) LC50 (Mortality) Fathead minnow (Pimephales promelas)
INVERTEBRATE TOXICITY: 200 mg / L 24 hour(s) EC 100 (Immobilization) water flea(Daphnia magna)
ALGAL TOXICITY: 4200 ug/L 8 hours(s) EC 50 (Growth) Green algae.
Other toxicity: 73000 ug/l 48 hour(s) LC50 clawed toad

Bio accumulative potential:

Kow: 138356.64(log=5.141)(estimated from water solubility)

Mobility:

Koc: 40550.85(log =4.608))(estimated from water solubility)

Persistence and degradability:

Bio concentration: 33.96 (estimated from water solubility)

Aquatic pressures: 2.6723816 hour(s)
Environmental summary: Relatively non-persistent in the environment. Not expected to leach through the soil or the sediment. Accumulates very little in the bodies of living organisms. Highly volatile from water.

Other adverse effects:



Not available

13. DISPOSAL CONSIDERATIONS

Disposal of product:

Subject to disposal regulations: U.S EPA 40 CFR 262. Hazardous waste number (s): U239. Dispose in accordance with all applicable regulations.

Disposal of packaging:

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14. TRANSPORT INFORMATION

Land transport:
ADR/RID:
Packaging group:

Maritime transport:

Air transport:

U.S. DOT 49 CFR 172.101:
Proper shipping name: XylenesID
Number: UN 1307
Hazards Class or division: 3
Packing group :II
Labeling Requirements: flammable liquid
Packaging Authorizations: Exceptions: 49
CFR 173.150NON-Bulk Packaging: 49
CFR 173 .202
Bulk packaging: 49 CFR 173.242
Quantity Limitation:
Passenger aircraft or railcar: 5 L
Cargo aircraft only 60 L
CANADIAN
RANSPORTATION OF DANGEROUS
GOODS: No Classification Assigned.
Land Transport ADR/RID;
Substance name: Xylenes
UN Number: UN 1307
ADR/RID Class: 3
Item Number: 3 (b)
Warning sign /Label: 3
HAZARD ID NUMBER: 33
AIR TRANSPORT
IATA/ICAO:PROPER SHIPPING
NAME: xylenes
UN/ID NUMBER: UN1307
IATA / ICAO CLASS: 3
PACKAGING GROUP:II
LABEL: Flammable Liquid
MARITIME TRANSPORT IMDG:
CORRECT TECHNICAL NAME:
DimethylbenzeneS
UN/ID NUMBER: UN1307
IMDG CLASS: 3.2
PAKAGING GROUP: II
Ems NO: 3-07
MFAG Table No: 310
IMDG CODE PAGE: see 3292

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15. REGULATORY INFORMATION

Hazardous label(s):

EC CLASSIFICATION

(ASSIGNED): Flammable

Xn harmful

Xi Irritant

Ec classification may inconsistent with
independly researched data. **.DANGER**

HAZARD SYMBOL: Xn

Harmful CONCENTRATION LIMITS:

C >= 20 % Xn R 20/21-38

12.55 <= C < 20% Xn R 20/21

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATIONS: VVWWS

**CLASSIFICATION UNDER HAZARD TO
WATER: 2**

NATIONAL INVENTORY STATUS:

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

TSCA 12 (b) EXPORT NOTIFICATION:

Not listed.

U.S. REGULATIONS: CERCLA

**SECTIONS 102a /103 HAZARDOUS
SUBSTANCES (40 CFR 302.4)**

O-Xylene: 1000LBS RQ

SARA TITLE III SECTION 302

EXTREMELY HAZARDOUS

**SUBSTANCES (40 CFR 355.30): not
regulated.**

SARA TITLE III SECTIN 304

EXTEREMELY HAZARDOUS

**SUBSTANCES (40 CFR 355.40): Not
regulated.**

SARA TITLE III SARA SECTIONS 311/312

HAZARDOUS CATEGORIES (40 CFR

370.21): ACUTE: Yes

CHRONIC: NO

FIRE: YES

REACTIVITY: NO

SUDDEN RELEASE: NO

**SARA TITLE III SECTION 313 (40 CFR
372.65):**

O-xylene



OSHA PROCESS SAFETY (29 CFR

1910.119): Not regulated

STATE REGULATIONS:

CALIFORNIA PROPOSITIONS:

California proposition 65: Not Regulated.

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Safety phrases:

Risk phrases:

CANADIAN REGULATIONS: WHIMS

CLASSIFICATION: Not determined.

S2 Keep out of reach of children.

S 25 Avoid contact with eyes.

R 10 Flammable

**R20 /21 harmful by inhalation and in
Contact with skin.**

R38 Irritating to skin.

16. OTHER INFORMATION

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The contents and format of this MSDS are in accordance with EEC Commission Directive 2001/58/EC

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