SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information
Product Name : Jet RF (AMS 2629B Type 1)
Material : 1102078, 1024360, 1024363, 1024362, 1024361, 1105002

Use : Reference Fluid

Company : Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:
Health: 866.442.9628 (North America)
1.832.813.4984 (International)
Transport: CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612.9186.1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14.583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification
- Flammable liquids, Category 2
- Skin irritation, Category 2
- Reproductive toxicity, Category 2
- Specific target organ systemic toxicity - single exposure, Category 3, Central nervous system
- Specific target organ systemic toxicity - repeated exposure, Category 2, Auditory organs

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Aspiration hazard, Category 1

Labeling

Symbol(s): 

Signal Word: Danger

Hazard Statements: 
H225: Highly flammable liquid and vapor.
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 (Auditory organs) through prolonged or repeated exposure.

Precautionary Statements: 

Prevention:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/fume/gas/mist/vapor/spray.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P331 Do NOT induce vomiting.
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:
Jet RF (AMS 2629B Type 1)

SECTION 3: Composition/information on ingredients

Synonyms: Jet RF (AMS 2629B Type 1)

Molecular formula: Mixture

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexane</td>
<td>110-82-7</td>
<td>30 - 60</td>
</tr>
<tr>
<td>2,2,4-Trimethylpentane (Isooctane)</td>
<td>540-84-1</td>
<td>30 - 60</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>25 - 60</td>
</tr>
<tr>
<td>tert-Butyl Disulfide</td>
<td>110-06-5</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

General advice: Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled: Consult a physician after significant exposure. If unconscious, place in recovery position and seek medical advice.

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: Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed: Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital. Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by
mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : -17 °C (1 °F)

Autoignition temperature : No data available

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.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

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. Use a water spray to cool fully closed containers.

Fire and explosion protection : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Hazardous decomposition products : Hydrocarbons. Carbon oxides.

SECTION 6: Accidental release measures

Personal precautions : Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions : 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 for cleaning up : 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

Handling

Advice on safe handling: Avoid formation of aerosol. Do not breathe vapors/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.

Advice on protection against fire and explosion: Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers: 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. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexane</td>
<td>ACGIH</td>
<td>TWA</td>
<td>100 ppm, 1,050 mg/m³</td>
<td>CNS impair, (b).</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>300 ppm, 1,050 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>300 ppm, 1,050 mg/m³</td>
<td></td>
</tr>
<tr>
<td>2,2,4-Trimethylpentane (Isooctane)</td>
<td>ACGIH</td>
<td>TWA</td>
<td>300 ppm,</td>
<td>URT irr,</td>
</tr>
<tr>
<td>Toluene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 ppm,</td>
<td>visual impair, female repro, pregnancy loss, BEI® A4.</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>TWA</td>
<td>200 ppm,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>CEIL</td>
<td>300 ppm,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>Peak</td>
<td>500 ppm,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>100 ppm, 375 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>STEL</td>
<td>150 ppm, 560 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

(b) The value in mg/m³ is approximate.

A4 Not classifiable as a human carcinogen

BEI® Substances for which there is a Biological Exposure Index or Indices (see BEI® section)

CNS impair Central Nervous System impairment

female repro Female reproductive

pregnancy loss Pregnancy loss

URT irr Upper Respiratory Tract irritation

visual impair Visual impairment

Hazardous components without workplace control parameters

Immediately Dangerous to Life or Health Concentrations (IDLH)

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Sampling time</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexane</td>
<td>110-82-7</td>
<td>Immediately Dangerous to Life or Health Concentration Value 1300 parts per million</td>
<td>1995-03-01</td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Immediately Dangerous to Life or Health Concentration Value 500 parts per million</td>
<td>1995-03-01</td>
<td></td>
</tr>
</tbody>
</table>

### Biological exposure indices

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Sampling time</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Toluene: 0.02 mg/l (In blood)</td>
<td>Prior to last shift of workweek</td>
<td>2010-03-01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toluene: 0.03 mg/l (Urine)</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>2010-03-01</td>
</tr>
<tr>
<td>o-Cresol</td>
<td></td>
<td>o-Cresol: 0.3 mg/g Creatinine (Urine)</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>2010-03-01</td>
</tr>
</tbody>
</table>

### Engineering measures

**Engineering measures**

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

### Personal protective equipment

**Respiratory protection**

Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection. Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection: Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the workplace. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear. Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific workplace. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

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

Information on basic physical and chemical properties

Appearance
Form: Liquid
Physical state: Liquid
Color: Colorless
Odor: gasoline-like

Safety data
Flash point: -17 °C (1 °F)
Lower explosion limit: No data available
Upper explosion limit: No data available
Oxidizing properties: no
Autoignition temperature: No data available
Molecular formula: Mixture
Molecular weight: Not applicable
Jet RF (AMS 2629B Type 1)

pH : No data available
Freezing point : No data available
Pour point : No data available
Boiling point/boiling range : 82 - 138 °C (180 - 280 °F)
Vapor pressure : 2.00 PSI at 38 °C (100 °F)
Relative density : 0.77 at 15.6 °C (60.1 °F)
Water solubility : Negligible
Partition coefficient: n-octanol/water : No data available
Viscosity, kinematic : No data available
Relative vapor density : 1 (Air = 1.0)
Evaporation rate : No data available
Percent volatile : > 99 %

SECTION 10: Stability and reactivity

Reactivity : No decomposition if stored and applied as directed.
Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. No decomposition if stored and applied as directed.

Possibility of hazardous reactions

Conditions to avoid : Heat, flames and sparks.
Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous decomposition products : Hydrocarbons Carbon oxides
Other data : No decomposition if stored and applied as directed.
Jet RF (AMS 2629B Type 1)

**SECTION 11: Toxicological information**

**Jet RF (AMS 2629B Type 1)**

**Acute oral toxicity**
- LD50 Oral: > 5,000 mg/kg
- Species: Rat
- Method: Acute toxicity estimate

**Acute inhalation toxicity**
- LC50: > 20 mg/l
- Exposure time: 4 h
- Species: Rat
- Test atmosphere: vapor
- Method: Acute toxicity estimate
  - Acute toxicity estimate: 80.13 mg/l
  - Exposure time: 4 h
  - Test atmosphere: vapor
  - Method: Calculation method

**Acute dermal toxicity**
- LD50 Dermal: > 5,000 mg/kg
- Species: Rabbit
- Method: Acute toxicity estimate

**Skin irritation**
- May cause skin irritation in susceptible persons.

**Eye irritation**
- May cause irreversible eye damage.

**Sensitization**
- Did not cause sensitization on laboratory animals. Information refers to the main ingredient.

**Repeated dose toxicity**

**Cyclohexane**
- Species: Rat
- Application Route: Inhalation
- Dose: 0, 500, 2000, 7000 ppm
- Exposure time: 90 day
- Number of exposures: 6 h/d, 5 d/wk
- NOEL: 2000 ppm
Species: Rat, Male and female  
Sex: Male and female  
Application Route: Inhalation  
Dose: 0, 500, 2000, 7000 ppm  
Exposure time: 13-14 wk  
Number of exposures: 6 hr/d, 5 d/wk  
NOEL: 7000 ppm

Species: Mouse, Male and female  
Sex: Male and female  
Application Route: Inhalation  
Dose: 0, 500, 2000, 7000 ppm  
Exposure time: 13-14 wk  
Number of exposures: 6 hr/d, 5 d/wk  
NOEL: 2000 ppm  
Target Organs: Blood

2,2,4-Trimethylpentane (Isooctane)  
Species: Rat, Male and female  
Sex: Male and female  
Application Route: Inhalation  
Dose: 0, 668, 2220, 6646 ppm  
Exposure time: 13 weeks  
Number of exposures: 6 hr/day 5 d/wk  
NOEL: 8.117 mg/l 2220 ppm  
Method: OECD Guideline 413  
Information given is based on data obtained from similar substances.

Toluene  
Species: Rat  
Application Route: Inhalation  
Dose: 0, 100, 625, 1250, 3000 ppm  
Exposure time: 15 wk  
Number of exposures: 6.5 h/d, 5 d/wk  
NOEL: 625 ppm  
Species: Mouse  
Application Route: Inhalation  
Dose: 0, 100, 625, 1250, 3000 ppm  
Exposure time: 14 wk  
Number of exposures: 6.5 h/d, 5 d/wk  
NOEL: 100 ppm

Carcinogenicity  
Toluene  
Species: Rat  
Dose: 0, 600, 1200 ppm  
Exposure time: 2 yrs  
Number of exposures: 6.5 h/d, 5 d/wk  
Remarks: No evidence of carcinogenicity  
Species: Mouse  
Dose: 0, 600, 1200 ppm  
Exposure time: 2 yrs  
Number of exposures: 6.5 h/d, 5 d/wk  
Remarks: No evidence of carcinogenicity

Reproductive toxicity  
Cyclohexane  
Species: Rat
**SAFETY DATA SHEET**

**Jet RF (AMS 2629B Type 1)**

**Version 1.5**

<table>
<thead>
<tr>
<th>Application Route</th>
<th>Dose</th>
<th>Number of exposures</th>
<th>Method</th>
<th>NOAEL Parent</th>
<th>NOAEL F1</th>
<th>NOAEL F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>0, 500, 2000, 7000 ppm</td>
<td>6 hr/d, 5 d/wk</td>
<td>OECD Test Guideline 416</td>
<td>500 ppm</td>
<td>7000 ppm</td>
<td>7000 ppm</td>
</tr>
</tbody>
</table>

**2,2,4-Trimethylpentane (Isocyanate)**

- Species: Rat
- Sex: male and female
- Application Route: Inhalation
- Dose: 0, 900, 3000, 9000 ppm
- Number of exposures: 6 h/d 5 d/wk
- Method: OECD Test Guideline 416
- NOAEL Parent: 3000 ppm
- NOAEL F1: 3000 ppm
- NOAEL F2: 3000 ppm
- Information given is based on data obtained from similar substances.

**Developmental Toxicity**

- **Cyclohexane**: Species: Rat
  - Application Route: Inhalation
  - Dose: 0, 500, 2000, 7000 ppm
  - Number of exposures: 6 hr/d
  - Test period: GD 6-15
  - Method: OECD Guideline 414
  - NOAEL Teratogenicity: 7,000 ppm
  - NOAEL Maternal: 500 ppm

  - Species: Rabbit
    - Application Route: Inhalation
    - Dose: 0, 500, 2000, 7000 PPM
    - Number of exposures: 6 hr/d
    - Test period: GD 6-18
    - Method: OECD Guideline 414
    - NOAEL Teratogenicity: 7,000 ppm
    - NOAEL Maternal: 500 ppm

- **2,2,4-Trimethylpentane (Isocyanate)**: Species: Rat
  - Application Route: Inhalation
  - Dose: 0, 400, 1200 ppm
  - Number of exposures: 6h/d
  - Test period: GD6-15
  - NOAEL Teratogenicity: 1200 ppm
  - NOAEL Maternal: 1200 ppm
- Information given is based on data obtained from similar substances.

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Jet RF (AMS 2629B Type 1)

Species: Rat
Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Number of exposures: 6h/d
Test period: GD6-15
Method: OECD Guideline 414
NOAEL Teratogenicity: 9000 ppm
NOAEL Maternal: 3000 ppm
Information given is based on data obtained from similar substances.

Toluene
Species: Rat
Application Route: Inhalation
Dose: 0, 100, 500, 2000 ppm
Test period: 95 d
NOAEL Teratogenicity: 400-750 ppm

Jet RF (AMS 2629B Type 1)
Aspiration toxicity: May be fatal if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

CMR effects
Cyclohexane: Carcinogenicity: Not classifiable as a human carcinogen. Mutagenicity: Did not show mutagenic effects in animal experiments. Teratogenicity: Did not show teratogenic effects in animal experiments. Reproductive toxicity: No toxicity to reproduction.

2,2,4-Trimethylpentane (Isooctane) Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.

Toluene Carcinogenicity: Not classifiable as a human carcinogen. Mutagenicity: Animal testing did not show any mutagenic effects. Teratogenicity: Some evidence of adverse effects on development, based on animal experiments. Reproductive toxicity: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Jet RF (AMS 2629B Type 1)
Further information: 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

Toxicity to fish
SDS Number: 100000014265  12/19
SAFETY DATA SHEET
Jet RF (AMS 2629B Type 1)
Version 1.5
Revision Date 2018-05-31

Cyclohexane: LC50: 4.53 mg/l
Exposure time: 96 h
Species: Pimephales promelas (fathead minnow)
Method: OECD Test Guideline 203

2,2,4-Trimethylpentane (Isooctane): LC50: 0.11 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
semi-static test Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

Toluene: LC50: 18 - 36 mg/l
Exposure time: 96 h
Species: Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates

Cyclohexane: EC50: 0.9 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

2,2,4-Trimethylpentane (Isooctane): EC50: 0.4 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
static test Information given is based on data obtained from similar substances.

Toluene: EC50: 3.78 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)

Toxicity to algae

Cyclohexane: EbC50: 3.4 mg/l
Exposure time: 72 h
Species: Selenastrum capricornutum (algae)
NOEC: 0.925 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (microalgae)
Method: OECD Test Guideline 201

2,2,4-Trimethylpentane (Isooctane): EL50: 2.943 mg/l
Exposure time: 72 h
Method: QSAR modeled data

Toluene: EC50: 134 mg/l
Exposure time: 72 h
Species: Chlamydomonas angulosa (Green algae)

M-Factor
cyclohexane: M-Factor (Acute Aquat. Tox.) 1
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

2,2,4-Trimethylpentane (Isooctane) : NOEL: 0.17 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211
Information given is based on data obtained from similar substances.

Elimination information (persistence and degradability)

Bioaccumulation

Cyclohexane : Bioconcentration factor (BCF): 167
This material is not expected to bioaccumulate.

Biodegradability : This material is not expected to be readily biodegradable.

Ecotoxicology Assessment

Acute aquatic toxicity
Cyclohexane : Very toxic to aquatic life.
2,2,4-Trimethylpentane (Isooctane) : Very toxic to aquatic life.
Toluene : Toxic to aquatic life.
tert-Butyl Disulfide : Toxic to aquatic life.

Chronic aquatic toxicity
Cyclohexane : Very toxic to aquatic life with long lasting effects.
2,2,4-Trimethylpentane (Isooctane) : Very toxic to aquatic life with long lasting effects.
Toluene : Harmful to aquatic life with long lasting effects.
tert-Butyl Disulfide : Toxic to aquatic life with long lasting effects.

Results of PBT assessment
Cyclohexane : Non-classified PBT substance, Non-classified vPvB substance
2,2,4-Trimethylpentane (Isooctane) : Non-classified PBT substance, Non-classified vPvB substance
Toluene : Non-classified vPvB substance, Non-classified PBT substance

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

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

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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.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, II, MARINE POLLUTANT, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, II, (-17 °C), MARINE POLLUTANT, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

<table>
<thead>
<tr>
<th>National legislation</th>
<th></th>
</tr>
</thead>
</table>
| **SARA 311/312 Hazards** | Flammable (gases, aerosols, liquids, or solids)  
Skin corrosion or irritation  
Reproductive toxicity  
Specific target organ toxicity (single or repeated exposure)  
Aspiration hazard |
| **CERCLA Reportable Quantity** | 2950 lbs  
Cyclohexane |
| **SARA 302 Reportable Quantity** | This material does not contain any components with a SARA 302 RQ. |
| **SARA 302 Threshold Planning Quantity** | No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302. |
| **SARA 304 Reportable Quantity** | This material does not contain any components with a section 304 EHS RQ. |

| SARA 313 Ingredients | The following components are subject to reporting levels established by SARA Title III, Section 313:  
Cyclohexane - 110-82-7  
Toluene - 108-88-3 |

**Clean Air Act**

| Ozone-Depletion Potential | 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).  
The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):  
2,2,4-Trimethylpentane (Isooctane) - 540-84-1  
Toluene - 108-88-3  
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). |

**SDS Number:** 100000014265
The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):
- Cyclohexane - 110-82-7
- Toluene - 108-88-3

US State Regulations

Pennsylvania Right To Know
- Cyclohexane - 110-82-7
- 2,2,4-Trimethylpentane (Isooctane) - 540-84-1
- Toluene - 108-88-3

New Jersey Right To Know
- Cyclohexane - 110-82-7
- 2,2,4-Trimethylpentane (Isooctane) - 540-84-1
- Toluene - 108-88-3
- tert-Butyl Disulfide - 110-06-5

California Prop. 65
Ingredients: WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

Notification status
Europe REACH: A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.
Switzerland CH INV: On the inventory, or in compliance with the inventory
United States of America (USA) TSCA: On TSCA Inventory
Canada NDSL: This product contains one or several components listed in the Canadian NDSL.
Australia AICS: On the inventory, or in compliance with the inventory
New Zealand NZIoC: On the inventory, or in compliance with the inventory
Japan ENCS: On the inventory, or in compliance with the inventory
Korea KECI: On the inventory, or in compliance with the inventory
Philippines PICCS: On the inventory, or in compliance with the inventory
China IECSC: Not in compliance with the inventory
NFPA Classification: Health Hazard: 2  
Fire Hazard: 3  
Reactivity Hazard: 0

Further information
Legacy SDS Number: 432570

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

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

The information provided in this 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.

Key or legend to abbreviations and acronyms used in the safety data sheet

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Lethal Dose 50%</td>
<td></td>
</tr>
<tr>
<td>AICS</td>
<td>Australia, Inventory of Chemical Substances</td>
<td></td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
<td></td>
</tr>
<tr>
<td>DSL</td>
<td>Canada, Domestic Substances List</td>
<td></td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Agency</td>
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</tr>
<tr>
<td>NDSL</td>
<td>Canada, Non-Domestic Substances List</td>
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</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
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</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
<td></td>
</tr>
<tr>
<td>NTTP</td>
<td>National Toxicology Program</td>
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<tr>
<td>CAS</td>
<td>Chemical Abstract Service</td>
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<tr>
<td>NZIoC</td>
<td>New Zealand Inventory of Chemicals</td>
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<tr>
<td>EC50</td>
<td>Effective Concentration</td>
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<tr>
<td>NOAEL</td>
<td>No Observable Adverse Effect Level</td>
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<tr>
<td>EC50</td>
<td>Effective Concentration 50%</td>
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<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
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<tr>
<td>EGEST</td>
<td>EOSCA Generic Exposure Scenario Tool</td>
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<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
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<tr>
<td>EOSCA</td>
<td>European Oilfield Specialty Chemicals Association</td>
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<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
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</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Chemical Substances</td>
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</tr>
<tr>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
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<tr>
<td>MAK</td>
<td>Germany Maximum Concentration Values</td>
<td></td>
</tr>
<tr>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
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</tr>
<tr>
<td>GHS</td>
<td>Globally Harmonized System</td>
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<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
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</tr>
<tr>
<td>&gt;=</td>
<td>Greater Than or Equal To</td>
<td></td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
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<tr>
<td>IC50</td>
<td>Inhibition Concentration 50%</td>
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<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act</td>
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<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
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<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
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<tr>
<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
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<td>TWA</td>
<td>Time Weighted Average</td>
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<tr>
<td>ENCS</td>
<td>Japan, Inventory of Existing and</td>
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<tr>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
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</table>

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<table>
<thead>
<tr>
<th>KECI</th>
<th>Korea, Existing Chemical Inventory</th>
<th>UVCB</th>
<th>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal Concentration 50%</td>
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