SAFETY DATA SHEET

Diisobutylene

Section 1. Identification

GHS product identifier : Diisobutylene
Chemical name : Diisobutylene
Other means of identification : Pentene, 2,4,4-trimethyl-; Diisobutylene

Product use : Chemical Intermediate for antioxidants, surfactants, lube additives, plasticizers, and rubber chemicals.

Supplier's details : TPC Group
One Allen Center, Suite 1000
Houston, TX, 77002, USA
T 713-627-7474

company web address : www.tpcgrp.com

Emergency telephone number (with hours of operation) : 800-424-9300 (Chemtrec - U.S.)
+1-793-527-3887 (Chemtrec - International)

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 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
ASPIRATION HAZARD - Category 1

GHS label elements Hazard pictograms :

Signal word : Danger

Hazard statements : Highly flammable liquid and vapor.
May be fatal if swallowed and enters airways.
May cause drowsiness and dizziness.

Precautionary statements Prevention : Wear protective gloves. Wear eye or face protection.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. 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.
Avoid breathing vapor.
Section 2. Hazards identification

Response

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.

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

Diisobutylene

Other means of identification

Pentene, 2,4,4-trimethyl-; Diisobutylene

CAS number/other identifiers

CAS number: 25167-70-8
Product code: Not available.

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<td>Diisobutylene</td>
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<td>25167-70-8</td>
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Any concentration shown as a range is to protect confidentiality or is due to batch variation.

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

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 fumes are 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. Get medical attention if symptoms occur. 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. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. 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 and delayed

Potential acute health effects

Eye contact: No known significant effects or critical hazards.
Inhalation: Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness.
Skin contact: Defatting to the skin. May cause skin dryness and irritation.
Ingestion: Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

Eye contact: No specific data.
Inhalation: Adverse symptoms may include the following: nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness.
Skin contact: Adverse symptoms may include the following: irritation, 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: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments: No specific treatment.
Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are 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

Extinguishing media

Suitable extinguishing media: Use dry chemical, CO₂, water spray (fog) or foam.
Unsuitable extinguishing media: Do not use water jet.
# Section 5. Fire-fighting measures

| Specific hazards arising from the chemical | Highly 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. |
| 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). |

## 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. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry 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

#### Protective measures

Put on appropriate personal protective equipment (see Section 8). Do not swallow. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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
Section 7. Handling and storage

and can be hazardous. Do not reuse container.

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.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diisobutylene</td>
<td>AIHA WEEL (United States, 10/2011). TWA: 75 ppm 8 hours.</td>
</tr>
</tbody>
</table>

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, fume scrubbers, 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 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 contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. 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. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection: 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. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
Section 8. Exposure controls/personal protection

Other skin protection: 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.

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

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid.
Color: Clear.
Odor: Turpentine like.

Odor threshold: Not available.
pH: Not available.
Melting point: -93.5°C (-136.3°F)
Boiling point: 101.4°C (214.5°F)
Flash point: -5°C (23°F)
Evaporation rate: Not available.
Flammability (solid, gas): Not available.
Lower and upper explosive (flammable) limits: Lower: Data Unavailable. Upper: 0.9%

Vapor pressure: 6 kPa (44.7 mm Hg) @ 25°C (77°F)
Vapor density: 4 [Air = 1]
Specific gravity: 0.72 @ 15.6°C (60°F)
Solubility: Not available.
Solubility in water: Insoluble.
Partition coefficient: n-octanol/water: 4.55

Auto-ignition temperature: 420°C (788°F)
Decomposition temperature: Not available.
Viscosity: Kinematic (room temperature): 0.00749 cm²/s (0.749 cSt)
Molecular weight: 112.1 g/mol
% Volatiles by volume: 100
Reactivity in water: Does not react with water.

Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

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.
Section 10. Stability and reactivity

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. Hazardous polymerization does not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

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<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
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<td>Diisobutylene</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat Rabbit Mammal - species unspecified</td>
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<td>LD50 Dermal</td>
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<td>&gt;3200 mg/kg</td>
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<td></td>
<td>LD50 Oral</td>
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<td>&gt;10000 mg/kg</td>
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Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

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<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
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Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

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<th>Name</th>
<th>Result</th>
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<tr>
<td>Diisobutylene</td>
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</table>

Information on the likely routes of exposure

Not available.

Potential acute health effects

Eye contact: No known significant effects or critical hazards.

Inhalation: Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness.

Skin contact: Defatting to the skin. May cause skin dryness and irritation.

Ingestion: Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.

: 25/03/2015.
Section 11. Toxicological information

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.
Inhalation : Adverse symptoms may include the following:
- nausea or vomiting
- headache
- drowsiness/fatigue
- dizziness/vertigo
- unconsciousness

Skin contact : Adverse symptoms may include the following:
- irritation
- dryness
- cracking

Ingestion : Adverse symptoms may include the following:
- nausea or vomiting

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects : Not available.
Potential delayed effects : Not available.

Long term exposure
Potential immediate effects : Not available.
Potential delayed effects : Not available.

Potential chronic health effects
Not available.

General : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates
Not available.

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
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<td>Acute LC50 0.58 mg/m³</td>
<td>Fish - Oncorhynhus mykiss</td>
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Persistence and degradability
Not available.

Bioaccumulative potential

Date of issue/Date of revision : 04/08/2015.
Date of previous issue : No previous validation.
Version : 1.0
Section 12. Ecological information

<table>
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<td>Diisobutylene</td>
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</table>

Mobility in soil

Soil/water partition coefficient (K\text{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. Incineration or landfill should only be considered when recycling is not feasible. 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 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.

Section 14. Transport information

<table>
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Date of issue/Date of revision : 04/08/2015. Date of previous issue : No previous validation. Version : 1.0
Section 14. Transport information

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<th>≤5 kg.</th>
<th>Emergency schedules (EmS) F-E, S-D</th>
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<td>Cargo aircraft</td>
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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.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

Section 15. Regulatory information

<table>
<thead>
<tr>
<th>U.S. Federal regulations</th>
<th>TSCA 8(a) CDR Exempt/Partial exemption</th>
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<td>Clean Air Act Section 112</td>
<td>United States inventory (TSCA 8b):</td>
<td>This material is listed or exempted.</td>
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<td>(b) Hazardous Air Pollutants (HAPs)</td>
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<td>Clean Air Act Section 602</td>
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</tr>
<tr>
<td>Clean Air Act Section 602</td>
<td>Not listed</td>
<td></td>
</tr>
<tr>
<td>Class II Substances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEA List I Chemicals (Precursor Chemicals)</td>
<td>Not listed</td>
<td></td>
</tr>
<tr>
<td>DEA List II Chemicals (Essential Chemicals)</td>
<td>Not listed</td>
<td></td>
</tr>
<tr>
<td>SARA 302/304</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composition/information on ingredients</td>
<td>No products were found.</td>
<td></td>
</tr>
<tr>
<td>SARA 304 RQ</td>
<td>Not applicable.</td>
<td></td>
</tr>
<tr>
<td>SARA 311/312</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 15. Regulatory information

**Classification**
- Fire hazard
- Immediate (acute) health hazard

**Composition/information on ingredients**

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>Fire hazard</th>
<th>Sudden release of pressure</th>
<th>Reactive</th>
<th>Immediate (acute) health hazard</th>
<th>Delayed (chronic) health hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diisobutylene</td>
<td>100</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**State regulations**
- Massachusetts : This material is listed.
- New York : This material is not listed.
- New Jersey : This material is listed.
- Pennsylvania : This material is listed.

**International regulations**
- Chemical Weapon Convention List Schedules I, II & III Chemicals
  - Not listed.
- Montreal Protocol (Annexes A, B, C, E)
  - Not listed.
- Stockholm Convention on Persistent Organic Pollutants
  - Not listed.
- Rotterdam Convention on Prior Inform Consent (PIC)
  - Not listed.
- UNECE Aarhus Protocol on POPs and Heavy Metals
  - Not listed.

**International lists**

**National inventory**
- Australia : This material is listed or exempted.
- Canada : This material is listed or exempted.
- China : This material is listed or exempted.
- Europe : This material is listed or exempted.
- Japan : This material is listed or exempted.
- Malaysia : Not determined.
- New Zealand : This material is listed or exempted.
- Philippines : This material is listed or exempted.
- Republic of Korea : This material is listed or exempted.
- Taiwan : This material is listed or exempted.

Section 16. Other information

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

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
Section 16. Other information

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

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

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

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flam. Liq. 2</td>
<td>On basis of test data</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>Asp. Tox. 1</td>
<td>On basis of test data</td>
</tr>
</tbody>
</table>

History

| Date of printing | : 04/08/2015. |
| Date of issue/Date of revision | : 04/08/2015. |
| Date of previous issue | : No previous validation. |
| Version | : 1.0 |

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 |
| UN = United Nations |

References

- Not available.

Indicates information that has changed from previously issued version.

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