SAFETY DATA SHEET

Crude Dicyclopentadiene
Version 2.4

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

Product information
Product Name: Crude Dicyclopentadiene
Material: 1104300

Use: Chemical intermediate
Company: Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:
Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 1.800.424.9300 (within USA and Canada) or 703.527.3887 (outside USA and Canada)
Asia: +800 CHEMCALL (+800 2436 2255) China:+86-21-22157316
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

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.

Emergency Overview

Danger
Physical state: Liquid
OSHA Hazards: Combustible Liquid, Toxic by ingestion, Aspiration hazard, Carcinogen, Moderate skin irritant, Moderate eye irritant, Reproductive hazard, Mutagen, Specific target organ systemic toxicity - repeated exposure, Specific target organ systemic toxicity - single exposure

Color: Colorless to pale yellow
Odor: Pungent

MSDS Number: 100000013685
Crude Dicyclopentadiene

Classification:
- Flammable liquids, Category 3
- Acute toxicity, Category 4, Oral
- Acute toxicity, Category 4, Inhalation
- Skin irritation, Category 2
- Eye irritation, Category 2A
- Germ cell mutagenicity, Category 1B
- Carcinogenicity, Category 1A
- Reproductive toxicity, Category 2
- Specific target organ systemic toxicity - single exposure, Category 3, Respiratory system
- Specific target organ systemic toxicity - repeated exposure, Category 1, Auditor organs
- Aspiration hazard, Category 1

Labeling:

Symbol(s):
- Flammable (1F)
- Human exposure (1G)
- Causes serious eye irritation (1A)
- May cause cancer (1A)
- May cause genetic defects (1A)
- Causes damage to organs (Auditory organs) through prolonged or repeated exposure (1A)

Signal Word: Danger

Hazard Statements:
- H226: Flammable liquid and vapor.
- H302 + H332: Harmful if swallowed or if inhaled.
- H304: May be fatal if swallowed and enters airways.
- H315: Causes skin irritation.
- H319: Causes serious eye irritation.
- H335: May cause respiratory irritation.
- H340: May cause genetic defects.
- H350: May cause cancer.
- H361: Suspected of damaging fertility or the unborn child.
- H372: Causes 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.
- P205 Use non-sparking tools.
- P204 Use explosion-proof electrical/ventilating/lighting/equipment.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe dust/fume/gas/mist/vapor/spray.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- 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 or doctor/physician.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off all clothing.
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 or doctor/physician 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:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
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.

Carcinogenicity:

**IARC**
Group 1: Carcinogenic to humans
Benzene 71-43-2

Group 2B: Possibly carcinogenic to humans
Styrene 100-42-5
Ethylbenzene 100-41-4

**NTP**
Known to be human carcinogen
Benzene 71-43-2

**ACGIH**
Confirmed human carcinogen
Benzene 71-43-2

Confirmed animal carcinogen with unknown relevance to humans
Ethylbenzene 100-41-4

**SECTION 3: Composition/information on ingredients**

**Synonyms**:
- Resin Oil Stream
- 24 Unit Hydro
- Rerun Bottoms 24 Unit
- Resin Oil Stream (Rerun Bottoms)
- DCPD

**Molecular formula**: UVCB
**SAFETY DATA SHEET**

**Crude Dicyclopentadiene**

**Version 2.4**

**Revision Date 2015-11-18**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillates (petroleum), steam-cracked, C8-12 fraction</td>
<td>68477-54-3</td>
<td>100</td>
</tr>
<tr>
<td>Dicyclopentadiene</td>
<td>77-73-6</td>
<td>0 - 75</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>100-41-4</td>
<td>0 - 2</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Styrene</td>
<td>100-42-5</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>0 - 0.2</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: If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

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. Do NOT induce vomiting. 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: 52 °C (125 °F)

Method: ASTM D 56

Autoignition temperature: 465 °C (869 °F)

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.
**Crude Dicyclopentadiene**

**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). Keep away from open flames, hot surfaces and sources of ignition.

**Hazardous decomposition products**: No data available.

### 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). 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>Dicyclopentadiene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>5 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>5 ppm, 30 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>100 ppm, 435 mg/m³</td>
<td>(b),</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>100 ppm, 435 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>STEL</td>
<td>125 ppm, 545 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 ppm.</td>
<td></td>
</tr>
<tr>
<td>Styrene</td>
<td>OSHA Z-2</td>
<td>TWA</td>
<td>100 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>CEIL</td>
<td>200 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>Peak</td>
<td>600 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>50 ppm, 215 mg/m³</td>
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</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>STEL</td>
<td>100 ppm, 425 mg/m³</td>
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</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA</td>
<td>0 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>STEL</td>
<td>40 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 ppm.</td>
<td>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>
<tr>
<td>Benzene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.5 ppm.</td>
<td>BEI, A1, Skin</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>STEL</td>
<td>2.5 ppm.</td>
<td>BEI, A1, Skin</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>1 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>CEIL</td>
<td>5 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>Peak</td>
<td>50 ppm.</td>
<td>(a)</td>
</tr>
<tr>
<td></td>
<td>OSHA 29 CFR 1910.1028(c)</td>
<td>TWA</td>
<td>1 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA 29 CFR 1910.1028(c)</td>
<td>STEL</td>
<td>5 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA CARC</td>
<td>PEL</td>
<td>1 ppm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA CARC</td>
<td>STEL</td>
<td>5 ppm.</td>
<td></td>
</tr>
</tbody>
</table>

(a) This standard applies to the industry segments exempt from the 1 ppm 8-hour TWA and 5 ppm STEL of the benzene standard at 1910.1028.
(b) The value in mg/m³ is approximate.

A1 Confirmed human carcinogen
A4 Not classifiable as a human carcinogen
BEI Substances for which there is a Biological Exposure Index or Indices (see BEI® section)
Skin Danger of cutaneous absorption

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.

Personal protective equipment

Respiratory 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.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.
Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear 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
Physical state : Liquid
Color : Colorless to pale yellow
Odor : Pungent
Odor Threshold : No data available

Safety data
Flash point : 52 °C (125 °F)
Method: ASTM D 56
Lower explosion limit : 0.8 %(V)
Upper explosion limit : 6.3 %(V)
Oxidizing properties : No
Autoignition temperature : 465 °C (869 °F)
Molecular formula : UVCB
Molecular weight : Not applicable
pH : Not applicable
Freezing point : < 27 °C (< 80 °F)
Pour point : No data available
Boiling point/boiling range : 38 °C (101 °F)
Vapor pressure : 0.06 PSI
at 38 °C (100 °F)
SAFETY DATA SHEET
Crude Dicyclopentadiene
Version 2.4
Revision Date 2015-11-18

Method: Reid
Relative density : No data available
Density : 0.9814 g/cm³
Water solubility : 0.0081 g/l
Partition coefficient: n-octanol/water : log Pow: 3.3
Viscosity, kinematic : 1.25 cSt
                                 at 100 °C (212 °F)
Relative vapor density : 4.66
                                 (Air = 1.0)
Evaporation rate : 0.13
                                 (N-Butyl Acetate = 1)

SECTION 10: Stability and reactivity

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions
Conditions to avoid : Heat, flames and sparks.
Materials to avoid : Corrosive to copper and copper bearing alloys.
Hazardous decomposition products : No data available
Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Crude Dicyclopentadiene
Acute oral toxicity : LD50 Oral: 460.58 mg/kg
                          Species: Rat
                          Method: Acute toxicity estimate

Acute inhalation toxicity : No data available

Acute dermal toxicity : LD50 Dermal: > 2,000 mg/kg
                          Species: Rabbit
                          Method: Acute toxicity estimate
### Crude Dicyclopentadiene

#### Skin irritation
- May irritate skin.

#### Eye irritation
- May irritate eyes.

#### Sensitization
- Did not cause sensitization on laboratory animals. Information given is based on data obtained from similar substances.

#### Repeated dose toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>Sex: Male</th>
<th>Male Application Route: Inhalation</th>
<th>Dose:</th>
<th>Exposure time:</th>
<th>Number of exposures:</th>
<th>NOEL:</th>
<th>Target Organ:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicyclopentadiene</td>
<td>Rat, female</td>
<td></td>
<td>oral gavage</td>
<td>200, 400, 600, 800 ppm</td>
<td>13 weeks</td>
<td>6 hours/day, 6 days/week</td>
<td>20 mg/kg</td>
<td>Ototoxicity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>Rat, male</td>
<td></td>
<td>Inhalation</td>
<td>0, 100, 625, 1250, 3000 ppm</td>
<td>15 wk</td>
<td>6.5 h/d, 5 d/wk</td>
<td>625 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>200 ppm</td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>Rat</td>
<td></td>
<td>Inhalation</td>
<td>0, 100, 625, 1250, 3000 ppm</td>
<td>14 wk</td>
<td>6.5 h/d, 5 d/wk</td>
<td>100 ppm</td>
<td>Ototoxicity</td>
</tr>
<tr>
<td>Styrene</td>
<td>Mouse, Male and female</td>
<td>Male and female</td>
<td>Oral</td>
<td>0, 150, 300 mg/kg</td>
<td>78 wk</td>
<td>5 d/wk</td>
<td>150 mg/kg</td>
<td>Ototoxicity</td>
</tr>
</tbody>
</table>
Crude Dicyclopentadiene

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 0.500, 650, 850, 1000 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 500 ppm
Target Organs: Ototoxicity

**Benzene**

Species: Rat, female
Sex: female
Application Route: oral gavage
Dose: 0, 25, 50, 100 mg/kg
Exposure time: 103 wk
Number of exposures: 5 d/wk
NOEL: < 25 mg/kg
Lowest observable effect level: 25 mg/kg

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 0, 50, 100, 200 mg/kg
Exposure time: 103 wk
Number of exposures: 5 d/wk
NOEL: < 50 mg/kg
Lowest observable effect level: 50 mg/kg

Species: Mouse
Application Route: oral gavage
Dose: 0, 25, 50, 100 mg/kg
Exposure time: 103 wk
NOEL: < 25 mg/kg

**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

**Benzene**

Species: Rat
Sex: female
Dose: 0, 25, 50, 250 mg/kg
Exposure time: 103 wks
Number of exposures: daily, 5 days/week
Test substance: yes
Remarks: zymbal gland carcinomas, squamous cell papillomas
SAFETY DATA SHEET

Crude Dicyclopentadiene

Version 2.4

Species: Rat
Sex: male
Dose: 0, 50, 100, 200 mg/kg
Exposure time: 103 wks
Number of exposures: daily, 5 days/week
Test substance: yes
Remarks: zymbal gland carcinomas, squamous cell papillomas

Species: Mouse
Sex: male and female
Dose: 25, 50, 100 mg/kg
Exposure time: 103 wks
Number of exposures: daily, 5 days/week
Test substance: yes
Remarks: Clear evidence of multiple organ carcinogenicity.

Reproductive toxicity

Dicyclopentadiene

Species: Rat
Sex: male
Application Route: oral gavage
NOAEL Parent: 100 mg/kg

Species: Rat
Sex: female
Application Route: oral gavage
NOAEL Parent: 20 mg/kg
NOAEL F1: 20 mg/kg

Toluene

Species: Rat
Application Route: Inhalation
Dose: 0, 100, 500, 2000 ppm
Test period: 95 d
NOAEL Parent: 2000 ppm

Developmental Toxicity

Toluene

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

Crude Dicyclopentadiene

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

Ethylbenzene

Mutagenicity: In vivo tests did not show mutagenic effects
Teratogenicity: Did not show teratogenic effects in animal experiments.
Reproductive toxicity: No toxicity to reproduction

Toluene

Carcinogenicity: Not classifiable as a human carcinogen.
**Crude Dicyclopentadiene**

**Version 2.4** Revision Date 2015-11-18

- **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.

**Styrene**

- **Carcinogenicity**: This substance has been reported to cause tumors in certain animal species.
- **Mutagenicity**: In vitro tests showed mutagenic effects which were not observed with in vivo test.
- **Teratogenicity**: Did not show teratogenic effects in animal experiments.
- **Reproductive Toxicity**: No toxicity to reproduction

**Benzene**

- **Carcinogenicity**: Human carcinogen.
- **Mutagenicity**: In vivo tests showed mutagenic effects
- **Teratogenicity**: Did not show teratogenic effects in animal experiments.
- **Reproductive Toxicity**: Animal testing did not show any effects on fertility.

**Further information**

Solvents may degrease the skin.

### SECTION 12: Ecological Information

#### Toxicity to fish

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC50</th>
<th>Exposure time</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicyclopentadiene</td>
<td>3.7 mg/l</td>
<td>48 h</td>
<td>Oryzias latipes (Orange-red killifish)</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>4.3 mg/l</td>
<td>96 h</td>
<td>Marone saxatilis (striped bass)</td>
</tr>
<tr>
<td>Toluene</td>
<td>18 - 36 mg/l</td>
<td>96 h</td>
<td>Pimephales promelas (fathead minnow)</td>
</tr>
<tr>
<td>Styrene</td>
<td>4.02 mg/l</td>
<td>96 h</td>
<td>Pimephales promelas (fathead minnow)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>flow-through test Test substance: yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Toxic to fish.</td>
</tr>
<tr>
<td>Benzene</td>
<td>5.3 mg/l</td>
<td>96 h</td>
<td>Oncorhynchus mykiss (rainbow trout)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>flow-through test Test substance: yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Method: OECD Test Guideline 203</td>
</tr>
</tbody>
</table>

#### Toxicity to daphnia and other aquatic invertebrates

<table>
<thead>
<tr>
<th>Substance</th>
<th>EC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicyclopentadiene</td>
<td>8.0 mg/l</td>
</tr>
</tbody>
</table>
## Toxicity to algae

<table>
<thead>
<tr>
<th>Substance</th>
<th>EC50</th>
<th>Exposure time</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicyclopentadiene</td>
<td>27.0 mg/l</td>
<td>72 h</td>
<td>Selenastrum capricornutum (algae)</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>5.0 mg/l</td>
<td>96 h</td>
<td>Selenastrum capricornutum (algae)</td>
</tr>
<tr>
<td></td>
<td>7.7 mg/l</td>
<td>72 h</td>
<td>Skeletonema costatum (Marine Algae)</td>
</tr>
<tr>
<td>Toluene</td>
<td>134 mg/l</td>
<td>72 h</td>
<td>Chlamydomonas angulosa (Green algae)</td>
</tr>
<tr>
<td>Styrene</td>
<td>4.9 mg/l</td>
<td>72 h</td>
<td>Selenastrum capricornutum (algae)</td>
</tr>
<tr>
<td>Benzene</td>
<td>100 mg/l</td>
<td>72 h</td>
<td>Pseudokirchneriella subcapitata (green algae)</td>
</tr>
</tbody>
</table>

## Toxicity to bacteria

<table>
<thead>
<tr>
<th>Substance</th>
<th>EC10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene</td>
<td>0.28 mg/l</td>
</tr>
</tbody>
</table>
**Crude Dicyclopentadiene**

**Exposure time:** 96 h  
**Growth rate**  
**Species:** Skeletonema costatum (Marine Algae)  
**Test substance:** yes

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

**Ethylbenzene**  
: NOEC: 1 mg/l  
**Exposure time:** 7 d  
**Species:** Daphnia pulex (Water flea)  
**semi-static test**  
**Analytical monitoring:** yes

**Styrene**  
: NOEC: 1.01 mg/l  
**Exposure time:** 21 d  
**Species:** Daphnia magna (Water flea)  
**semi-static test**  
**Test substance:** yes  
**Method:** OECD Test Guideline 211

**Elimination information (persistence and degradability)**

**Bioaccumulation**

**Styrene**  
: Does not significantly accumulate in organisms.

**Biodegradability**  
: Expected to be ultimately biodegradable

**Ecotoxicology Assessment**

**Acute aquatic toxicity**  
: Toxic to aquatic life.

**Chronic aquatic toxicity**  
: Toxic to aquatic life with long lasting effects.

**Results of PBT assessment**

**Ethylbenzene**  
: Non-classified vPvB substance, Non-classified PBT substance

**Toluene**  
: Non-classified vPvB substance, Non-classified PBT substance

**Styrene**  
: This substance is not considered to be very persistent and very bioaccumulating (vPvB), This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

**Benzene**  
: This substance is not considered to be persistent, bioaccumulating and toxic (PBT), This substance is not considered to be very persistent and very bioaccumulating (vPvB).

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

**SECTION 13: Disposal considerations**

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

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, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, III, (52 °C), MARINE POLLUTANT, (DICYCLOPENTADIENE)

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

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS, (DICYCLOPENTADIENE)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, III, ENVIRONMENTALLY HAZARDOUS, (DICYCLOPENTADIENE)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, III, ENVIRONMENTALLY HAZARDOUS, (DICYCLOPENTADIENE)
Crude Dicyclopentadiene

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

SECTION 15: Regulatory information

National legislation

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

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable  Quantity : 5000 lbs
                              Benzene

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 :
                     Benzene - 71-43-2
                     Styrene - 100-42-5
                     Toluene - 108-88-3
                     Dicyclopentadiene - 77-73-6
                     Ethylbenzene - 100-41-4

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

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):
                     Ethylbenzene - 100-41-4
                     Toluene - 108-88-3
                     Styrene - 100-42-5
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 SOCMI Intermediate or Final VOC’s (40 CFR 60.489):

- Ethylbenzene - 100-41-4
- Toluene - 108-88-3
- Styrene - 100-42-5

**US State Regulations**

**Pennsylvania Right To Know**

- Dicyclopentadiene - 77-73-6
- Ethylbenzene - 100-41-4
- Toluene - 108-88-3
- Styrene - 100-42-5
- Benzene - 71-43-2

**New Jersey Right To Know**

- Dicyclopentadiene - 77-73-6
- Ethylbenzene - 100-41-4
- Toluene - 108-88-3
- Styrene - 100-42-5
- Benzene - 71-43-2

**California Prop. 65 Ingredients**

- WARNING! This product contains a chemical known in the State of California to cause cancer.

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

**Notification status**

- **Europe REACH**: Not in compliance with the inventory
- **United States of America TSCA**: On the inventory, or in compliance with the inventory
- **Canada DSL**: On the inventory, or in compliance with the inventory
- **Australia AICS**: On the inventory, or in compliance with the inventory
- **New Zealand NZIoC**: Not in compliance with the inventory
- **Japan ENCS**: Not in compliance with the inventory
- **Korea KECI**: On the inventory, or in compliance with the inventory
- **Philippines PICCS**: Not in compliance with the inventory
- **China IECSC**: On the inventory, or in compliance with the inventory
Crude Dicyclopentadiene

SAFETY DATA SHEET

Version 2.4

Revision Date 2015-11-18

SECTION 16: Other information

NFPA Classification:

- Health Hazard: 2
- Fire Hazard: 2
- Reactivity Hazard: 1

Further information

Legacy SDS Number: CPC00525

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>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
</tr>
<tr>
<td>LD50</td>
<td>Lethal Dose 50%</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Agency</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>NZIoC</td>
<td>New Zealand Inventory of Chemicals</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No Observable Adverse Effect Level</td>
</tr>
<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
</tr>
<tr>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
</tr>
<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act.</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
</tr>
</tbody>
</table>

MSDS Number: 100000013685
<table>
<thead>
<tr>
<th>Substances in China</th>
<th>TSCA</th>
<th>Toxic Substance Control Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
<td>TSCA</td>
</tr>
<tr>
<td>KECI</td>
<td>Korea, Existing Chemical Inventory</td>
<td>UVCB Untaken or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
<td>WHMIS Workplace Hazardous Materials Information System</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal Concentration 50%</td>
<td></td>
</tr>
</tbody>
</table>