# Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)

Version 1.0 Revision Date 2024-04-04

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

**Product information**

Product Name : Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)

**Company** : Ras Laffan Olefins Company Ltd.
Amwal Tower, Omar Al Mukhtar St,
Al-Dafna (Zone 61)
PO Box 24646
Doha, Qatar

SDS Requests: (+974) 4484-7110
Technical Information : (+974) 4476-7145
Responsible Party: Product Safety Group
Email: MSDSInquiry@qchem.com.qa

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Al-Dafna (Zone 61)
PO Box 24646
Doha, Qatar

SDS Requests: (+974) 4484-7110
Technical Information : (+974) 4476-7145
Responsible Party: Product Safety Group
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**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
Mexico CHEMTREC 01-800-681-9531 (24 hours)
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Belgium: 070 245 245 (24 hours/day, 7 days/week)
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Croatia: +3851 2348 342 (24 hours/day, 7 days/week)
Cyprus: 1401
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Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)
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Norway: 22 59 13 00 (24 hours/day, 7 days/week)
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Portugal: CIAV phone number: +351 800 250 250
Romania: +40213183606
Slovakia: +421 2 5477 4166
Slovenia: Phone number: 112
Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)
Sweden: 112 – ask for Poisons Information

| | | |
|---|---|---|
| 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**
**Globally Harmonized System of Classification and Labeling of Chemicals (GHS)**

**GHS-Classification**

: Flammable liquids, Category 1
Acute toxicity, Category 4, Oral
Acute toxicity, Category 4, Inhalation
Skin corrosion/irritation, Category 2
Serious eye damage/eye irritation, Category 2A
Germ cell mutagenicity, Category 1B

Carcinogenicity, Category 1A
Reproductive toxicity, Category 2
Specific target organ toxicity - single exposure, Category 3, Respiratory system, Central nervous system
Specific target organ toxicity - repeated exposure, Category 1, Blood, Auditory organs
Specific target organ toxicity - repeated exposure, Category 2, Inhalation, Auditory organs, color vision, Nervous system
Aspiration hazard, Category 1
Short-term (acute) aquatic hazard, Category 1
Long-term (chronic) aquatic hazard, Category 1

**GHS-Labeling**

Symbol(s) :

Signal Word : Danger

Hazard Statements :
H224: Extremely 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.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361d: Suspected of damaging the unborn child.
H372: Causes damage to organs (Blood, Auditory organs) through prolonged or repeated exposure.
H373: May cause damage to organs (Auditory organs, color vision, Nervous system) through prolonged or repeated exposure if inhaled.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements :
**Prevention:**
P203 Obtain, read and follow all safety instructions before use.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ 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.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
**Response:**
P301 + P316 IF SWALLOWED: Get emergency medical help immediately.
P303 + P361 + P353 IF ON SKIN (or hair): Take off

immediately all contaminated clothing. Rinse affected areas with water.
P304 + P340 + P317 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical help.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P318 IF exposed or concerned, get medical advice.
P331 Do NOT induce vomiting.
P332 + P317 If skin irritation occurs: Get medical help.
P337 + P317 If eye irritation persists: Get medical help.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391 Collect spillage.
**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.

## SECTION 3: Composition/information on ingredients

Synonyms : DISTILLATION, RESIDUES C5-C11
Debutanized Aromatic Concentrate
Aromatic Concentrate
Aromatic Distillate
Debutanizer Bottoms
DAC
Raw Pyrolysis Gasoline
RPG
Slop Oil
Dripolene
Pygas

Molecular formula : UVCB

| Chemical name | CAS-No. / EINECS-No. | Concentration [wt%] |
|---|---|---|
| Hydrocarbons, ethylene-manuf.-by-product distn. residues | 68921-67-5 | 100 |
| Benzene | 71-43-2 | 0 - 80 |
| Dicyclopentadiene | 77-73-6 | 0 - 30 |
| Toluene | 108-88-3 | 0 - 30 |
| Xylenes | 1330-20-7 | 0 - 10 |
| Ethylbenzene | 100-41-4 | 0 - 10 |
| Cyclopentadiene | 542-92-7 | 0 - 10 |
| Styrene | 100-42-5 | 0 - 10 |
| n-Heptane | 142-82-5 | 0 - 5 |
| n-hexane | 110-54-3 | 0 - 5 |
| 1,3-Butadiene | 106-99-0 | 0 - 5 |

| | | |
|---|---|---|
| Isoprene | 78-79-5 | 0 - 5 |
| Methylcyclopentane | 96-37-7 | 0 - 5 |
| Isopentane | 78-78-4 | 0 - 5 |
| Phenanthrene | 85-01-8 | 0 - 1 |
| 1,2,4-Trimethylbenzene | 95-63-6 | 0 - 1 |
| Biphenyl | 92-52-4 | 0 - 1 |
| Indene | 95-13-6 | 0 - 1 |
| Cumene | 98-82-8 | 0 - 1 |
| Cyclopentane | 287-92-3 | 0 - 1 |
| n-Butane | 106-97-8 | 0 - 1 |
| Naphthalene | 91-20-3 | 0 - 1 |
| 2-methyl-2-butene | 513-35-9 | 0 - 1 |

## 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.

## SECTION 5: Firefighting measures

Flash point : >-11°C (>12°F)
Method: Tag closed cup

Autoignition temperature : 348°C (658°F)

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : 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 a naked flame or any 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 | : | Carbon Dioxide. Carbon monoxide. |

## 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 a naked flame or any 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

**DE**

| Components | Basis | Value | Control parameters | Note |
|---|---|---|---|---|
| Benzene | DE TRGS 910 | Acceptable concentration | 0.06 ppm, 0.2 mg/m3 | H, |
| | DE TRGS 910 | Tolerable concentration | 0.6 ppm, 1.9 mg/m3 | H, |
| Dicyclopentadiene | DE TRGS 900 | AGW | 0.5 ppm, 2.7 mg/m3 | |
| Toluene | DE TRGS 900 | AGW | 50 ppm, 190 mg/m3 | H, Y, |
| Xylenes | DE TRGS 900 | AGW | 100 ppm, 440 mg/m3 | H, |
| Ethylbenzene | DE TRGS 900 | AGW | 20 ppm, 88 mg/m3 | H, Y, |
| | DE TRGS 900 | AGW | 200 mg/m3 | Group-AGW, AGS, |
| Styrene | DE TRGS 900 | AGW | 20 ppm, 86 mg/m3 | Y, |
| Methylcyclopentane | DE TRGS 900 | AGW | 500 ppm, 1,800 mg/m3 | |
| n-Heptane | DE TRGS 900 | AGW | 500 ppm, 2,100 mg/m3 | |
| n-hexane | DE TRGS 900 | AGW | 50 ppm, 180 mg/m3 | Y, |
| Isopentane | DE TRGS 900 | AGW | 1,000 ppm, 3,000 mg/m3 | |
| Isoprene | DE TRGS 900 | AGW | 3 ppm, 8.4 mg/m3 | X, |
| 1,3-Butadiene | DE TRGS 910 | Acceptable concentration | 0.2 ppm, 0.5 mg/m3 | |
| | DE TRGS 910 | Tolerable concentration | 2 ppm, 5 mg/m3 | |
| Naphthalene | DE TRGS 900 | AGW | 0.4 ppm, 2 mg/m3 | H, Y, Vapour and aerosols, inhalable fraction |
| n-Butane | DE TRGS 900 | AGW | 1,000 ppm, 2,400 mg/m3 | |
| Cumene | DE TRGS 900 | AGW | 10 ppm, 50 mg/m3 | H, Y, |
| 1,2,4-Trimethylbenzene | DE TRGS 900 | AGW | 20 ppm, 100 mg/m3 | Y, |

AGS Commission for dangerous substances
Group-AGW Group exposure limit for hydrocarbon solvent mixtures
H Skin absorption
X Carcinogenic substance Cat. 1A or 1B or carcinogenic activity or procedure according to § 2 (3) No. 4 of the Hazardous Substances Ordinance - in addition, § 10 GefStoffV must be observed
Y When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child

**ID**

| Komponen | Dasar | Nilai | Parameter pengendalian | Catatan |
|---|---|---|---|---|
| Benzena | ID OEL | NAB | 0.5 ppm, | A1, Kulit, |
| | ID OEL | PSD | 2.5 ppm, | A1, Kulit, |
| Disiklopentadiena | ID OEL | NAB | 5 ppm, 27 mg/m3 | |
| Toluena | ID OEL | NAB | 20 ppm, | A4, |
| Benzene, dimethyl- | ID OEL | NAB | 100 ppm, 434 mg/m3 | A4, |
| | ID OEL | PSD | 150 ppm, 651 mg/m3 | A4, |
| Etilbenzena | ID OEL | NAB | 20 ppm, | A3, |
| Siklopentadiena | ID OEL | NAB | 75 ppm, 203 mg/m3 | |
| Stirena | ID OEL | NAB | 20 ppm, | A4, |
| | ID OEL | PSD | 40 ppm, | A4, |
| 1,3-Butadiena | ID OEL | NAB | 2 ppm, 4.4 mg/m3 | A2, |
| Isopentana | ID OEL | NAB | 1,000 ppm, | |
| n-heksana | ID OEL | NAB | 500 ppm, | Kulit, |
| | ID OEL | PSD | 1,000 ppm, | Kulit, |
| n-Heptana | ID OEL | NAB | 400 ppm, 1,640 mg/m3 | |
| | ID OEL | PSD | 500 ppm, 2,050 mg/m3 | |
| Metilsiklopentana | ID OEL | NAB | 500 ppm, | ▲, |
| | ID OEL | PSD | 1,000 ppm, | ▲, |
| Naftalena | ID OEL | NAB | 10 ppm, | A3, Kulit, |
| n-Butana | ID OEL | PSD | 1,000 ppm, | |
| Asenaftena | ID OEL | NAB | 0.2 mg/m3 | A1, Partikulat |
| Bifenil | ID OEL | NAB | 0.2 ppm, 1.3 mg/m3 | |
| Fluorena | ID OEL | NAB | 0.2 mg/m3 | A1, Partikulat |
| Fenantrena | ID OEL | NAB | 0.2 mg/m3 | A1, |
| | ID OEL | NAB | 0.2 mg/m3 | A1, Partikulat |
| | ID OEL | NAB | 0.2 mg/m3 | A1, |
| Siklopentana | ID OEL | NAB | 600 ppm, 1,720 mg/m3 | |
| Kumena | ID OEL | NAB | 50 ppm, 246 mg/m3 | |
| 1,2,4-Trimetilbenzena | ID OEL | NAB | 25 ppm, 123 mg/m3 | |

| | | | | |
|---|---|---|---|---|
| Indena | ID OEL | NAB | 5 ppm, | |

▲ Identitas bahan-bahan kimia dimana diperlukan indikator Pemaparan Biologik (BEI = Biological Exposure Indices)
A1 Terbukti karsinogen untuk manusia (Confirmed Human Carcinogen)
A2 Diperkirakan karsinogen untuk manusia (Suspected Human Carcinogen).
A3 Karsinogen terhadap binatang.
A4 Tidak diklasifikasikan karsinogen terhadap manusia. Tidak cukup data untuk mengklasifikasikan bahan-bahan ini bersifat karsinogen terhadap manusia ataupun binatang
Kulit Kulit

**IN**

| Components | Basis | Value | Control parameters | Note |
|---|---|---|---|---|
| Benzene | IN OEL | TWA | 0.5 ppm, 1.5 mg/m3 | HC, |
| | IN OEL | STEL | 2.5 ppm, 7.5 mg/m3 | HC, |
| Toluene | IN OEL | TWA | 100 ppm, 375 mg/m3 | |
| | IN OEL | STEL | 150 ppm, 560 mg/m3 | |
| Xylenes | IN OEL | TWA | 100 ppm, 435 mg/m3 | |
| | IN OEL | STEL | 150 ppm, 655 mg/m3 | |
| Styrene | IN OEL | TWA | 50 ppm, 215 mg/m3 | |
| | IN OEL | STEL | 100 ppm, 425 mg/m3 | |
| Naphthalene | IN OEL | TWA | 10 ppm, 50 mg/m3 | |
| | IN OEL | STEL | 15 ppm, 75 mg/m3 | |
| n-Butane | IN OEL | TWA | 800 ppm, 1,900 mg/m3 | |
| Biphenyl | IN OEL | TWA | 0.2 ppm, 1.5 mg/m3 | |

HC Confirmed human carcinogens

**MY**

| Komponen | Dasar | Nilai | Parameter Kawalan | Nota |
|---|---|---|---|---|
| Benzena | MY PEL | TWA | 0.5 ppm, 1.6 mg/m3 | |
| Disiklopentadiena | MY PEL | TWA | 5 ppm, 27 mg/m3 | |
| Toluena | MY PEL | TWA | 50 ppm, 188 mg/m3 | |
| Benzene, dimethyl- | MY PEL | TWA | 100 ppm, 434 mg/m3 | |
| Etilbenzena | MY PEL | TWA | 100 ppm, 434 mg/m3 | |
| Siklopentadiena | MY PEL | TWA | 75 ppm, 203 mg/m3 | |
| Stirena | MY PEL | TWA | 20 ppm, 85.2 mg/m3 | |
| 1,3-Butadiena | MY PEL | TWA | 2 ppm, 4.4 mg/m3 | |
| Isopentana | MY PEL | TWA | 600 ppm, 1,770 mg/m3 | |
| n-heksana | MY PEL | TWA | 50 ppm, 176 mg/m3 | |
| n-Heptana | MY PEL | TWA | 400 ppm, 1,640 mg/m3 | |
| Metilsiklopentana | MY PEL | TWA | 500 ppm, 1,760 mg/m3 | |
| Naftalena | MY PEL | TWA | 10 ppm, 52 mg/m3 | |
| n-Butana | MY PEL | TWA | 800 ppm, 1,900 mg/m3 | |
| Asenaftena | MY PEL | TWA | 0.2 mg/m3 | zarahan |
| Bifenil | MY PEL | TWA | 0.2 ppm, 1.3 mg/m3 | |
| Fluorena | MY PEL | TWA | 0.2 mg/m3 | zarahan |
| Fenantrena | MY PEL | TWA | 0.2 mg/m3 | zarahan |
| Siklopentana | MY PEL | TWA | 600 ppm, 1,720 mg/m3 | |
| Kumena | MY PEL | TWA | 50 ppm, 246 mg/m3 | |
| Indena | MY PEL | TWA | 10 ppm, 48 mg/m3 | |

**PH**

| Components | Basis | Value | Control parameters | Note |
|---|---|---|---|---|
| Benzene | PH OEL | C | 25 ppm, 80 mg/m3 | |
| Toluene | PH OEL | TWA | 100 ppm, 375 mg/m3 | |
| Xylenes | PH OEL | TWA | 100 ppm, 435 mg/m3 | |
| Ethylbenzene | PH OEL | C | 100 ppm, 435 mg/m3 | |
| Cyclopentadiene | PH OEL | TWA | 75 ppm, 200 mg/m3 | |
| Styrene | PH OEL | TWA | 100 ppm, 420 mg/m3 | |
| n-hexane | PH OEL | TWA | 500 ppm, 1,800 mg/m3 | |
| n-Heptane | PH OEL | TWA | 500 ppm, 2,000 mg/m3 | |
| Naphthalene | PH OEL | TWA | 10 ppm, 50 mg/m3 | |
| Biphenyl | PH OEL | TWA | 0.2 ppm, 1 mg/m3 | |
| Phenanthrene | PH OEL | TWA | 0.2 mg/m3 | |
| Cumene | PH OEL | TWA | 50 ppm, 245 mg/m3 | |

**US**

| Components | Basis | Value | Control parameters | Note |
|---|---|---|---|---|
| Benzene | ACGIH | TWA | 0.5 ppm, | A1, Skin, |
| | ACGIH | STEL | 2.5 ppm, | A1, Skin, |
| | OSHA Z-1-A | TWA | 1 ppm, | |
| | OSHA Z-1-A | CEIL | 5 ppm, | |
| | OSHA Z-2 | Peak | 50 ppm, | |
| | OSHA 29 CFR 1910.1028(c) | TWA | 1 ppm, | |
| | OSHA 29 CFR 1910.1028(c) | STEL | 5 ppm, | |
| | OSHA CARC | PEL | 1 ppm, | |

| | | | | |
|---|---|---|---|---|
| | OSHA CARC | STEL | 5 ppm, | |
| Dicyclopentadiene | ACGIH | TWA | 0.5 ppm, | |
| | OSHA Z-1-A | TWA | 5 ppm, 30 mg/m3 | |
| | ACGIH | STEL | 1 ppm, | |
| | ACGIH | TWA | 0.5 ppm, | URT irr, LRT irr, eye irr, |
| | ACGIH | STEL | 1 ppm, | |
| Toluene | ACGIH | TWA | 20 ppm, | A4, |
| | OSHA Z-2 | TWA | 200 ppm, | |
| | OSHA Z-2 | CEIL | 300 ppm, | |
| | OSHA Z-2 | Peak | 500 ppm, | |
| | OSHA Z-1-A | TWA | 100 ppm, 375 mg/m3 | |
| | OSHA Z-1-A | STEL | 150 ppm, 560 mg/m3 | |
| Xylenes | OSHA Z-1 | TWA | 100 ppm, 435 mg/m3 | |
| | OSHA Z-1-A | STEL | 150 ppm, 655 mg/m3 | |
| | OSHA Z-1-A | TWA | 100 ppm, 435 mg/m3 | |
| | ACGIH | TWA | 100 ppm, | A4, |
| | ACGIH | STEL | 150 ppm, | A4, |
| Ethylbenzene | OSHA Z-1 | TWA | 100 ppm, 435 mg/m3 | |
| | OSHA Z-1-A | TWA | 100 ppm, 435 mg/m3 | |
| | OSHA Z-1-A | STEL | 125 ppm, 545 mg/m3 | |
| | ACGIH | TWA | 20 ppm, | A3, |
| Cyclopentadiene | ACGIH | TWA | 0.5 ppm, | |
| | OSHA Z-1 | TWA | 75 ppm, 200 mg/m3 | |
| | OSHA Z-1-A | TWA | 75 ppm, 200 mg/m3 | |
| | ACGIH | STEL | 1 ppm, | |
| | ACGIH | TWA | 0.5 ppm, | URT irr, LRT irr, eye irr, |
| Styrene | OSHA Z-2 | TWA | 100 ppm, | |
| | OSHA Z-2 | CEIL | 200 ppm, | |
| | OSHA Z-2 | Peak | 600 ppm, | |
| | OSHA Z-1-A | TWA | 50 ppm, 215 mg/m3 | |
| | OSHA Z-1-A | STEL | 100 ppm, 425 mg/m3 | |
| | ACGIH | TWA | 10 ppm, | OTO, A3, |
| | ACGIH | STEL | 40 ppm, | OTO, A3, |
| 1,3-Butadiene | ACGIH | TWA | 2 ppm, | A2, |
| | OSHA Z-1 | TWA | 1 ppm, | |
| | OSHA Z-1 | STEL | 5 ppm, | |
| | OSHA CARC | PEL | 1 ppm, | |
| | OSHA 29 CFR 1910.1051(c) | TWA | 1 ppm, | |
| | OSHA CARC | STEL | 5 ppm, | |
| | OSHA 29 CFR 1910.1051(c) | STEL | 5 ppm, | |
| Isoprene | US WEEL | TWA | 2 ppm, | |
| Isopentane | ACGIH | TWA | 1,000 ppm, | |
| n-hexane | ACGIH | TWA | 50 ppm, | Skin, |
| | OSHA Z-1 | TWA | 500 ppm, 1,800 mg/m3 | |
| | OSHA Z-1-A | TWA | 50 ppm, 180 mg/m3 | |
| n-Heptane | OSHA Z-1 | TWA | 500 ppm, 2,000 mg/m3 | |
| | OSHA Z-1-A | TWA | 400 ppm, 1,600 mg/m3 | |
| | OSHA Z-1-A | STEL | 500 ppm, 2,000 mg/m3 | |
| | ACGIH | TWA | 400 ppm, | |
| | ACGIH | STEL | 500 ppm, | |
| Methylcyclopentane | ACGIH | TWA | 500 ppm, | CNS impair, URT irr, eye irr, |
| | ACGIH | STEL | 1,000 ppm, | CNS impair, URT irr, eye irr, |
| | OSHA Z-1-A | TWA | 500 ppm, 1,800 mg/m3 | |
| | OSHA Z-1-A | STEL | 1,000 ppm, 3,600 mg/m3 | |
| Naphthalene | ACGIH | TWA | 10 ppm, | A3, Skin, |
| | ACGIH | STEL | 15 ppm, | hematologic eff, URT irr, eye irr, eye dam, (), A4, Skin, |
| | OSHA Z-1 | TWA | 10 ppm, 50 mg/m3 | |
| | OSHA Z-1-A | TWA | 10 ppm, 50 mg/m3 | |
| | OSHA Z-1-A | STEL | 15 ppm, 75 mg/m3 | |
| n-Butane | OSHA Z-1-A | TWA | 800 ppm, 1,900 mg/m3 | |
| | ACGIH | STEL | 1,000 ppm, | CNS impair, EX, |
| Biphenyl | ACGIH | TWA | 0.2 ppm, | |
| | OSHA Z-1 | TWA | 0.2 ppm, 1 mg/m3 | |
| | OSHA Z-1-A | TWA | 0.2 ppm, 1 mg/m3 | |
| Phenanthrene | OSHA Z-1-A | TWA | 0.2 mg/m3 | |
| | OSHA Z-1 | TWA | 0.2 mg/m3 | |
| Cyclopentane | ACGIH | TWA | 600 ppm, | |
| | OSHA Z-1-A | TWA | 600 ppm, 1,720 mg/m3 | |
| Cumene | ACGIH | TWA | 50 ppm, | |
| | OSHA Z-1 | TWA | 50 ppm, 245 mg/m3 | X, |
| | OSHA Z-1-A | TWA | 50 ppm, 245 mg/m3 | X, |
| 1-Methylnaphthalene | ACGIH | TWA | 0.5 ppm, | A4, Skin, |

| | | | | |
|---|---|---|---|---|
| 2-Methylnaphthalene | ACGIH | TWA | 0.5 ppm, | A4, Skin, |
| 1,2,4-Trimethylbenzene | ACGIH | TWA | 25 ppm, | |
| | OSHA Z-1-A | TWA | 25 ppm, 125 mg/m3 | |
| Indene | ACGIH | TWA | 5 ppm, | |
| | OSHA Z-1-A | TWA | 10 ppm, 45 mg/m3 | |

() Adopted values or notations enclosed are those for which changes are proposed in the NIC
A1 Confirmed human carcinogen
A2 Suspected human carcinogen
A3 Confirmed animal carcinogen with unknown relevance to humans
A4 Not classifiable as a human carcinogen
CNS impair Central Nervous System impairment
EX Explosion hazard: the substance is a flammable asphyxiant or excursions above the TLV ® could approach 10% of the lower explosive limit.
eye dam Eye damage
eye irr Eye irritation
hematologic eff Hematologic effects
LRT irr Lower Respiratory Tract irritation
OTO Ototoxicant
Skin Danger of cutaneous absorption
URT irr Upper Respiratory Tract irritation
X Skin notation

### Biological exposure indices

**DE**

| Substance name | CAS-No. | Control parameters | Sampling time | Update |
|---|---|---|---|---|
| Benzene | 71-43-2 | Benzene: 5 µg/l (Urine) | Equivalence Value for Tolerable concentration: end of exposure or end of shift | 2019-03-29 |
| | | Benzene: 0.8 µg/l derived for non-smokers (Urine) | Equivalence Value for Acceptance concentration: end of exposure or end of shift | 2019-03-29 |
| | | S-phenylmercapturic acid: 25 µg/g creatinine (Urine) | Equivalence Value for Tolerable concentration: end of exposure or end of shift | 2019-03-29 |
| | | S-phenylmercapturic acid: 3 µg/g creatinine derived for non-smokers (Urine) | Equivalence Value for Tolerable concentration: end of exposure or end of shift | 2019-03-29 |
| | | trans,trans-muconic acid: 500 µg/g creatinine (Urine) | Equivalence Value for Tolerable concentration: end of exposure or end of shift | 2019-03-29 |
| Toluene | 108-88-3 | toluene: 600 µg/l (Blood) | End of shift | 2019-03-29 |
| | | o-cresol: 1.5 mg/l After hydrolysis (Urine) | In case of long-term exposure: after more than one shiftImmediately after exposure or after working hours | 2019-03-29 |
| | | toluene: 75 µg/l (Urine) | Immediately after exposure or after working hours | 2019-03-29 |
| Xylenes | 1330-20-7 | xylene: 1.5 mg/l (Blood) | Immediately after exposure or after working hours | 2013-09-19 |

| | | | | |
|---|---|---|---|---|
| | | methylhippuric acid (all isomers): 2 g/l (Urine) | Immediately after exposure or after working hours | 2013-09-19 |
| Ethylbenzene | 100-41-4 | mandelic acid + phenylglyoxylic acid: 250 mg/g Creatinine (Urine) | Immediately after exposure or after working hours | 2017-06-08 |
| Styrene | 100-42-5 | mandelic acid + phenylglyoxylic acid: 600 mg/g Creatinine (Urine) | In case of long-term exposure: after more than one shiftImmediately after exposure or after working hours | 2018-06-07 |
| n-hexane | 110-54-3 | 2,5-hexanedione plus 4,5-dihydroxy-2-hexanone: 5 mg/l After hydrolysis (Urine) | Immediately after exposure or after working hours | 2013-09-19 |
| 1,3-Butadiene | 106-99-0 | 3,4-dihydroxybutylmercapturic acid (DHBMA): 2900 µg/g creatinine (Urine) | Equivalence Value for Tolerable concentration: end of exposure or end of shiftEquivalence Value for Tolerable concentration: with long-term exposure: at the end of the shift after several previous shifts | 2019-03-29 |
| | | 3,4-dihydroxybutylmercapturic acid (DHBMA): 600 µg/g creatinine (Urine) | Equivalence Value for Acceptance concentration: end of exposure or end of shiftEquivalence Value for Acceptance concentration: with long-term exposure: at the end of the shift after several previous shifts | 2019-03-29 |
| | | 2-hydroxy-3-butenyl-mercapturic acid (MHBMA): 80 µg/g creatinine (Urine) | Equivalence Value for Tolerable concentration: end of exposure or end of shiftEquivalence Value for Tolerable concentration: with long-term exposure: at the end of the shift after several previous shifts | 2019-03-29 |

| | | | | |
|---|---|---|---|---|
| | | 2-hydroxy-3-butenyl-mercapturic acid (MHBMA): 10 µg/g creatinine (Urine) | Equivalence Value for Acceptance concentration: end of exposure or end of shiftEquivalence Value for Acceptance concentration: with long-term exposure: at the end of the shift after several previous shifts | 2019-03-29 |
| Cumene | 98-82-8 | 2-phenyl-2-propanol: 10 mg/g Creatinine After hydrolysis (Urine) | Immediately after exposure or after working hours | 2015-11-06 |
| 1,2,4-Trimethylbenzene | 95-63-6 | Dimethylbenzoic acids (Sum of all Isomers): 400 mg/g Creatinine After hydrolysis (Urine) | In case of long-term exposure: after more than one shiftImmediately after exposure or after working hours | 2018-06-07 |

**ID**

| Nama bahan | No-CAS | Parameter pengendalian | Waktu pengambilan sampel | Terkini |
|---|---|---|---|---|

**IN**

| Substance name | CAS-No. | Control parameters | Sampling time | Update |
|---|---|---|---|---|

**MY**

| Nama bahan | No.-CAS | Parameter Kawalan | Waktu persampelan | Kemaskini |
|---|---|---|---|---|

**PH**

| Substance name | CAS-No. | Control parameters | Sampling time | Update |
|---|---|---|---|---|

**US**

| Substance name | CAS-No. | Control parameters | Sampling time | Update |
|---|---|---|---|---|
| Benzene | 71-43-2 | S-Phenylmercapturic acid: 25 µg/g creatinine Background (Urine) | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| | | t,t-Muconic acid: 500 µg/g creatinine Background (Urine) | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| Toluene | 108-88-3 | Toluene: 0.02 mg/l (In blood) | Prior to last shift of workweek | 2010-03-01 |
| | | Toluene: 0.03 mg/l (Urine) | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| | | o-Cresol: 0.3 mg/g Creatinine Background (Urine) With hydrolyses () | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| Xylenes | 1330-20-7 | Methylhippuric acids: 1.5 g/g creatinine (Urine) | End of shift (As soon as possible after exposure ceases) | 2013-03-01 |
| Ethylbenzene | 100-41-4 | Sum of mandelic acid and phenyl glyoxylic acid: 0.15 g/g creatinine Nonspecific (Urine) | End of shift (As soon as possible after exposure ceases) | 2016-03-01 |

| | | | | |
|---|---|---|---|---|
| Styrene | 100-42-5 | Mandelic acid plus phenylglyoxylic acid: 400 mg/g Creatinine Nonspecific (Urine) | End of shift (As soon as possible after exposure ceases) | 2016-03-01 |
| | | Styrene: 40 µg/l (Urine) | End of shift (As soon as possible after exposure ceases) | 2016-03-01 |
| n-hexane | 110-54-3 | 2,5-Hexanedione: 0.5 mg/l Without hydrolysis (Urine) | End of shift | 2020-02-01 |
| 1,3-Butadiene | 106-99-0 | 1,2 Dihydroxy-4-(N-acetylcysteinyl)-butane: 2.5 mg/l Background (Urine) Semi-quantitative () | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| | | Mixture of N-1 and N-2(hydroxybutenyl)valine: 2.5 picomoles per gram Hemoglobin Semi-quantitative (Hemoglobin (Hb) adducts in blood) | Not critical | 2010-03-01 |
| Acenaphthene | 83-32-9 | 1-Hydroxypyrene: 2.5 µg/l Adjusted for the Pyrene to Benzo(a)pyrene ratio of the PAH mixture to which workers are exposed (Urine) Background () With hydrolyses () | End of shift at end of workweek | 2018-03-20 |
| | | 3-hydroxybenzo(a)pyrene: Nonquantitative (Urine) With hydrolyses () | End of shift at end of workweek | 2018-03-20 |
| Fluorene | 86-73-7 | 1-Hydroxypyrene: 2.5 µg/l Adjusted for the Pyrene to Benzo(a)pyrene ratio of the PAH mixture to which workers are exposed (Urine) Background () With hydrolyses () | End of shift at end of workweek | 2018-03-20 |
| | | 3-hydroxybenzo(a)pyrene: Nonquantitative (Urine) With hydrolyses () | End of shift at end of workweek | 2018-03-20 |
| Phenanthrene | 85-01-8 | 1-Hydroxypyrene: 2.5 µg/l Adjusted for the Pyrene to Benzo(a)pyrene ratio of the PAH mixture to which workers are exposed (Urine) Background () With hydrolyses () | End of shift at end of workweek | 2018-03-20 |
| | | 3-hydroxybenzo(a)pyrene: Nonquantitative (Urine) With hydrolyses () | End of shift at end of workweek | 2018-03-20 |

**Engineering measures**

Adequate ventilation to control airborned 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 work place 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 : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as:. Air-Purifying Respirator for Organic Vapors. Full-Face Air-Purifying Respirator for Organic Vapors, Dusts and Mists. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, 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 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 | : | Amber |
| Odor | : | Olefinic odor |
| Odor Threshold | : | No data available |

**Safety data**

| | | |
|---|---|---|
| Flash point | : | >-11°C (>12°F)<br>Method: Tag closed cup |
| Lower explosion limit | : | 1.3 %(V) |
| Upper explosion limit | : | 7.5 %(V) |
| Oxidizing properties | : | No |
| Autoignition temperature | : | 348°C (658°F) |
| Molecular formula | : | UVCB |
| Molecular weight | : | Not applicable |
| pH | : | Not applicable |
| Pour point | : | No data available |
| Freezing point | | -62°C (-80°F) |

| | | |
|---|---|---|
| Boiling point/boiling range | : | 32-204°C (90-399°F)<br>Overpoint-Endpoint |
| Vapor pressure | : | 11.00 PSI<br>at 38°C (100°F) |
| Relative density | : | 0.825 - 0.88 |
| Density | : | No data available |
| Water solubility | : | Soluble in hydrocarbon solvents; insoluble in water. |
| Partition coefficient: n-octanol/water | : | No data available |
| Viscosity, kinematic | : | 0.9 cSt<br>at 40°C (104°F) |
| Relative vapor density | : | 2.8<br>(Air = 1.0) |
| Evaporation rate | : | 3.9 |
| Percent volatile | : | 99 %<br><br>91 % |

## SECTION 10: Stability and reactivity

| | | |
|---|---|---|
| **Reactivity** | : | Stable under recommended storage conditions. |
| **Chemical stability** | : | This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. |

**Possibility of hazardous reactions**

| | | |
|---|---|---|
| **Hazardous reactions** | : | Hazardous reactions: Vapors may form explosive mixture with air. |
| **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** | : | Carbon Dioxide<br>Carbon monoxide |
| **Other data** | : | No decomposition if stored and applied as directed. |

## SECTION 11: Toxicological information

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Acute oral toxicity** : LD50 Oral: 500.77 mg/kg
Species: Rat
Method: Acute toxicity estimate

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Acute inhalation toxicity** : LC50: 1.49 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: dust/mist
Method: Acute toxicity estimate

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Acute dermal toxicity** : LD50 Dermal: > 2,000 mg/kg
Species: Rabbit
Method: Acute toxicity estimate

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Skin irritation** : May cause skin irritation in susceptible persons.

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Eye irritation** : May irritate eyes.

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Sensitization** : No data available.

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Repeated dose toxicity** : This information is not available.

**Genotoxicity in vitro**

| | |
|---|---|
| Benzene | : Test Type: Ames test<br>Result: negative<br><br>Test Type: Cytogenetic assay<br>Result: positive<br><br>Test Type: Mouse lymphoma assay<br>Result: positive<br><br>Test Type: Sister Chromatid Exchange Assay<br>Result: negative |
| Dicyclopentadiene | Test Type: Ames test<br>Result: negative<br><br>Test Type: Chromosome aberration test in vitro<br>Result: negative |
| Toluene | Test Type: Ames test<br>Result: negative |

| | |
|---|---|
| | Test Type: Sister Chromatid Exchange Assay<br>Result: negative<br><br>Test Type: Mouse lymphoma assay<br>Result: negative<br><br>Test Type: Cytogenetic assay<br>Result: negative |
| Xylenes | Test Type: Ames test<br>Result: negative<br><br>Test Type: Mouse lymphoma assay<br>Result: negative |
| Ethylbenzene | Test Type: Ames test<br>Result: negative<br><br>Test Type: Unscheduled DNA synthesis assay<br>Result: negative |
| Styrene | Test Type: Ames test<br>Result: negative<br><br>Test Type: Cytogenetic assay<br>Result: positive<br><br>Test Type: Reverse mutation assay<br>Result: negative<br><br>Test Type: Mouse lymphoma assay<br>Result: negative<br><br>Test Type: Sister Chromatid Exchange Assay<br>Result: positive<br><br>Test Type: Mammalian cell gene mutation assay<br>Result: negative |
| n-Heptane | Test Type: Ames test<br>Method: Mutagenicity (Escherichia coli - reverse mutation assay)<br>Result: negative<br><br>Test Type: Mammalian cell gene mutation assay<br>Method: OECD Guideline 476<br>Result: negative<br><br>Test Type: Chromosome aberration test in vitro<br>Method: OECD Guideline 473<br>Result: negative<br><br>Test Type: Mitotic recombination<br>Result: negative |
| n-hexane | Test Type: Ames test<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 471<br>Result: negative |

| | |
|---|---|
| | Test Type: Mouse lymphoma assay<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 476<br>Result: negative<br><br>Test Type: Mouse lymphoma assay<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 476<br>Result: Positive results were obtained in some in vitro tests. |
| 1,3-Butadiene | Test Type: Ames test<br>Metabolic activation: with and without metabolic activation<br>Result: Positive results were obtained in some in vitro tests.<br><br>Test Type: Chromosome aberration test in vitro<br>Test system: Chinese hamster cells<br>Method: OECD Guideline 473<br>Result: positive |
| Isoprene | Test Type: Ames test<br>Result: negative<br><br>Test Type: Sister Chromatid Exchange Assay<br>Result: positive |
| Isopentane | Test Type: Ames test<br>Concentration: 1, 2, 5, 8, 10%<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 471<br>Result: negative<br><br>Test Type: Ames test<br>Concentration: 1, 2, 5, 8, 10, 25, 50%<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 471<br>Result: negative<br>Remarks: Information given is based on data obtained from similar substances.<br><br>Test Type: Chromosome aberration test in vitro<br>Metabolic activation: with and without metabolic activation<br>Method: Mutagenicity (in vitro mammalian cytogenetic test)<br>Result: negative<br>Remarks: Information given is based on data obtained from similar substances.<br><br>Test Type: In vitro mammalian cell gene mutation test<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 476<br>Result: negative<br>Remarks: Information given is based on data obtained from similar substances. |
| Cumene | Test Type: Ames test<br>Result: negative |

| | |
|---|---|
| | Test Type: Cytogenetic assay<br>Result: negative |
| | Test Type: HGPRT assay<br>Result: negative |
| | Test Type: Unscheduled DNA synthesis assay<br>Result: negative |
| Cyclopentane | Test Type: Modified Ames test<br>Concentration: 1250 microgram/plate<br>Metabolic activation: with and without metabolic activation<br>Result: negative |
| | Test Type: Mouse lymphoma assay<br>Concentration: 200 microgram/mililiter<br>Metabolic activation: with and without metabolic activation<br>Result: negative |
| n-Butane | Test Type: Ames test<br>Result: negative |
| Naphthalene | Test Type: Ames test<br>Result: negative |
| | Test Type: Sister Chromatid Exchange Assay<br>Result: negative |
| | Test Type: Unscheduled DNA synthesis assay<br>Result: negative |
| 2-methyl-2-butene | Test Type: Ames test<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 471<br>Result: negative |
| | Method: OECD Test Guideline 480<br>Result: negative |

**Genotoxicity in vivo**

| | | |
|---|---|---|
| Benzene | : | Test Type: Mouse micronucleus assay<br>Result: positive |
| Toluene | | Test Type: Cytogenetic assay<br>Result: negative |
| | | Test Type: Mouse micronucleus assay<br>Result: negative |
| Xylenes | | Test Type: Mouse micronucleus assay<br>Result: negative |
| Ethylbenzene | | Test Type: Mouse micronucleus assay<br>Species: Mouse<br>Result: negative |
| Styrene | | Remarks: No significant adverse effects were reported |

| | |
|---|---|
| n-hexane | Test Type: Dominant lethal assay<br>Species: Mouse<br>Dose: 100 and 400 ppm<br>Result: negative<br><br>Test Type: Cytogenetic assay<br>Species: Rat<br>Dose: 900, 3000, 9000 ppm<br>Result: negative |
| 1,3-Butadiene | Test Type: Mouse micronucleus assay<br>Species: mice<br>Route of Application: inhalation (gas)<br>Exposure time: 6 h per day for 5 days<br>Dose: 50, 200, 500, 1300 ppm<br>Method: OECD Test Guideline 474<br>Result: positive<br><br>Test Type: Dominant lethal assay<br>Species: mice<br>Method: OECD Test Guideline 478<br>Result: Positive results were obtained in some in vivo tests. |
| Isoprene | Result: negative<br><br>Test Type: Micronucleus test<br>Result: positive |
| Isopentane | Test Type: In vivo micronucleus test<br>Species: Rat<br>Cell type: Bone marrow<br>Route of Application: inhalation (vapor)<br>Exposure time: 13 wk<br>Dose: 5000, 10,000, 20,000 mg/m3<br>Method: Directive 67/548/EEC, Annex V, B.12.<br>Remarks: Information given is based on data obtained from similar substances. |
| Cumene | Test Type: Mouse micronucleus assay<br>Result: negative |
| Cyclopentane | Test Type: Micronucleus test<br>Species: Mouse<br>Route of Application: inhalation (vapor)<br>Dose: 10,000 ppm<br>Result: negative |
| Naphthalene | Test Type: Mouse micronucleus assay<br>Result: negative |
| 2-methyl-2-butene | Test Type: Mouse micronucleus assay<br>Species: Rat<br>Cell type: Bone marrow<br>Route of Application: Inhalation<br>Exposure time: 6 h/d 2d<br>Method: OECD Test Guideline 474<br>Result: positive |

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**

**Carcinogenicity** : Method: Estimated based on individual component values.
Remarks: Suspect cancer hazard

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Reproductive toxicity** : This information is not available.

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Developmental Toxicity** : This information is not available.

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**Aspiration toxicity** : Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

**Toxicology Assessment**

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**CMR effects** : Carcinogenicity:
May cause cancer.
Mutagenicity:
May cause genetic defects.
Teratogenicity:
Suspected of damaging the unborn child.
Reproductive toxicity:
Not available

**Raw Pyrolysis Gas (RPG/DAC/Raw C5-C8)**
**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

**Ecotoxicity effects**

**Toxicity to fish** : No data available

**Toxicity to daphnia and other aquatic invertebrates** : No data available

**Toxicity to algae** : No data available

**Toxicity to bacteria**

Styrene : EC10: 0.28 mg/l
Exposure time: 96 h
Growth rate
Species: Skeletonema costatum (Marine Algae)
Test substance: yes

**Toxicity to fish (Chronic toxicity)**

| | | |
|---|---|---|
| n-Heptane | : | NOELR: 1.284 mg/l<br>Exposure time: 28 d<br>Species: Oncorhynchus mykiss (rainbow trout)<br>Method: QSAR modeled data |

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

| | | |
|---|---|---|
| Ethylbenzene | : | NOEC: 1 mg/l<br>Exposure time: 7 d<br>Species: Daphnia pulex (Water flea)<br>semi-static test<br>Analytical monitoring: yes |
| Styrene | : | NOEC: 1.01 mg/l<br>Exposure time: 21 d<br>Species: Daphnia magna (Water flea)<br>semi-static test<br>Test substance: yes<br>Method: OECD Test Guideline 211 |

| | | |
|---|---|---|
| Biodegradability | : | No data available |

Elimination information (persistence and degradability)

| | | |
|---|---|---|
| Bioaccumulation | : | This material is not expected to bioaccumulate. |
| Mobility | : | No data available |
| Results of PBT assessment | : | This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.<br><br>This substance/mixture contains components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB). |
| 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. |

**Ecotoxicology Assessment**

| | | |
|---|---|---|
| Short-term (acute) aquatic hazard | : | Very toxic to aquatic life. |
| Long-term (chronic) aquatic hazard | : | 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.

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, I, MARINE POLLUTANT, (N-HEPTANE, N-HEXANE)

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, I, (> -11 °C c.c.), MARINE POLLUTANT, (HYDROCARBONS, ETHYLENE-MANUF.-BY-PRODUCT DISTN. RESIDUES)

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

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, I, (D/E), ENVIRONMENTALLY HAZARDOUS, (HYDROCARBONS, ETHYLENE-MANUF.-BY-PRODUCT DISTN. RESIDUES)

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**
33,UN1268,PETROLEUM DISTILLATES, N.O.S., 3, I, ENVIRONMENTALLY HAZARDOUS, (HYDROCARBONS, ETHYLENE-MANUF.-BY-PRODUCT DISTN. RESIDUES)

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, I, ENVIRONMENTALLY HAZARDOUS, (HYDROCARBONS, ETHYLENE-MANUF.-BY-PRODUCT DISTN. RESIDUES)

| | | |
|---|---|---|
| **Other information** | **:** | **Pyrolysis gasoline (containing benzene) (n), Environmental Cat.Y, Ship Type2** |

**Maritime transport in bulk according to IMO instruments**

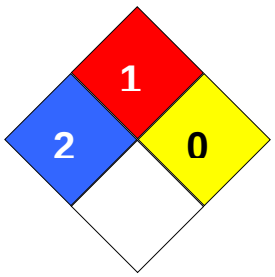
## SECTION 15: Regulatory information

**Notification status**

| | | |
|---|---|---|
| Europe REACH | : | Not in compliance with the inventory |
| Switzerland CH INV | : | Not in compliance with the inventory |
| United States of America (USA) TSCA | : | On or in compliance with the active portion of the TSCA inventory |
| Canada DSL | : | On the inventory, or in compliance with the inventory |
| Australia AIIC | : | 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 | : | Not in compliance with the inventory |
| Philippines PICCS | : | Not in compliance with the inventory |
| Taiwan TCSI | : | Not in compliance with the inventory |
| China IECSC | : | Not in compliance with the inventory |

## SECTION 16: Other information

**NFPA Classification** : Health Hazard: 2
Fire Hazard: 1
Reactivity Hazard: 0




**Further information**

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 | | | |
|---|---|---|---|
| ACGIH | American Conference of Government Industrial Hygienists | LD50 | Lethal Dose 50% |
| AIIC | Australian Inventory of Industrial Chemicals | LOAEL | Lowest Observed Adverse Effect Level |

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