# SAFETY DATA SHEET

**SPECIALTY ELECTRONIC MATERIALS UK LIMITED**

Safety Data Sheet according to Reg. (EU) No 2015/830

**Product name: MOLYKOTE® D-708 Anti-Friction Coating**

**Revision Date:** 18.05.2021
**Version:** 6.0
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SPECIALTY ELECTRONIC MATERIALS UK LIMITED encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

**1.1 Product identifier**
**Product name:** MOLYKOTE® D-708 Anti-Friction Coating

**1.2 Relevant identified uses of the substance or mixture and uses advised against**
**Identified uses:** Lubricants and lubricant additives

**1.3 Details of the supplier of the safety data sheet**
**COMPANY IDENTIFICATION**
SPECIALTY ELECTRONIC MATERIALS UK
LIMITED
KINGS COURT, LONDON ROAD
STEVENAGE
England
SG1 2NG
UNITED KINGDOM

**Customer Information Number:** 800-3876-6838
SDSQuestion-EU@dupont.com

**1.4 EMERGENCY TELEPHONE NUMBER**
**24-Hour Emergency Contact:** +(44)-870-8200418
**Local Emergency Contact:** +(44)-870-8200418

## SECTION 2: HAZARDS IDENTIFICATION

**2.1 Classification of the substance or mixture**

**Classification according to Regulation (EC) No 1272/2008:**
Flammable liquids - Category 2 - H225
Skin irritation - Category 2 - H315
Serious eye damage - Category 1 - H318
Skin sensitisation - Category 1 - H317
Germ cell mutagenicity - Category 2 - H341

Specific target organ toxicity - single exposure - Category 3 - H336
For the full text of the H-Statements mentioned in this Section, see Section 16.

**2.2 Label elements**

**Labelling according to Regulation (EC) No 1272/2008:**

**Hazard pictograms**

**Signal word: DANGER**

**Hazard statements**

| | |
|---|---|
| H225 | Highly flammable liquid and vapour. |
| H315 | Causes skin irritation. |
| H317 | May cause an allergic skin reaction. |
| H318 | Causes serious eye damage. |
| H336 | May cause drowsiness or dizziness. |
| H341 | Suspected of causing genetic defects. |

**Precautionary statements**

| | |
|---|---|
| P210 | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| P261 | Avoid breathing spray. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/ protective clothing/ eye protection/ face protection. |
| P305 + P351 + P338 + P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor. |
| P370 + P261 | In case of fire: Avoid breathing fume. |
| P370 + P378 | In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. |

**Contains** Methyl ethyl ketone; cyclohexanone; Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100); phenol; formaldehyde

**2.3 Other hazards**
Static-accumulating flammable liquid.
This product contains no substances assessed to be PBT or vPvB at levels of 0.1% or higher.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

**Chemical nature:** Organic compound in solvent
**3.2 Mixtures**

This product is a mixture.

| CASRN / EC-No. / Index-No. | REACH Registration Number | Concentration | Component | Classification: REGULATION (EC) No 1272/2008 |
|---|---|---|---|---|
| **CASRN** 78-93-3 **EC-No.** 201-159-0 **Index-No.** 606-002-00-3 | 01-2119457290-43 | >= 40.0 - < 50.0 % | Methyl ethyl ketone | Flam. Liq. - 2 - H225<br>Eye Irrit. - 2 - H319<br>STOT SE - 3 - H336 |
| **CASRN** 108-10-1 **EC-No.** 203-550-1 **Index-No.** 606-004-00-4 | 01-2119473980-30 | >= 10.0 - < 20.0 % | 4-methylpentan-2-one | Flam. Liq. - 2 - H225<br>Acute Tox. - 4 - H332<br>Eye Irrit. - 2 - H319<br>STOT SE - 3 - H335 |
| **CASRN** 108-94-1 **EC-No.** 203-631-1 **Index-No.** 606-010-00-7 | 01-2119453616-35 | >= 10.0 - < 20.0 % | cyclohexanone | Flam. Liq. - 3 - H226<br>Acute Tox. - 4 - H302<br>Acute Tox. - 4 - H332<br>Acute Tox. - 3 - H311<br>Skin Irrit. - 2 - H315<br>Eye Dam. - 1 - H318 |
| **CASRN** 25068-38-6 **EC-No.** polymer **Index-No.** – | – | >= 3.0 - <= 7.0 % | Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100) | Skin Irrit. - 2 - H315<br>Eye Irrit. - 2 - H319<br>Skin Sens. - 1 - H317 |
| **CASRN** 108-95-2 **EC-No.** 203-632-7 **Index-No.** 604-001-00-2 | – | >= 1.0 - <= 2.0 % | phenol | Acute Tox. - 3 - H301<br>Acute Tox. - 3 - H331<br>Acute Tox. - 3 - H311<br>Skin Corr. - 1B - H314<br>Eye Dam. - 1 - H318<br>Muta. - 2 - H341<br>STOT RE - 2 - H373<br>Aquatic Chronic - 2 - H411 |
| **CASRN** 1319-77-3 **EC-No.** 215-293-2 **Index-No.** 604-004-00-9 | – | >= 0.3 - <= 0.4 % | mix-cresol | Acute Tox. - 3 - H301<br>Acute Tox. - 3 - H311<br>Skin Corr. - 1B - H314<br>Eye Dam. - 1 - H318 |

| | | | | |
|---|---|---|---|---|
| **CASRN**<br>108-88-3<br>**EC-No.**<br>203-625-9<br>**Index-No.**<br>601-021-00-3 | 01-2119471310-51 | >= 0.2 - <= 0.3 % | toluene | Flam. Liq. - 2 - H225<br>Skin Irrit. - 2 - H315<br>Repr. - 2 - H361d<br>STOT SE - 3 - H336<br>STOT RE - 2 - H373<br>Asp. Tox. - 1 - H304<br>Aquatic Chronic - 3 - H412 |
| **CASRN**<br>50-00-0<br>**EC-No.**<br>200-001-8<br>**Index-No.**<br>605-001-00-5 | _ | < 0.1 % | formaldehyde | Flam. Liq. - 3 - H226<br>Acute Tox. - 3 - H301<br>Acute Tox. - 2 - H330<br>Acute Tox. - 3 - H311<br>Skin Corr. - 1B - H314<br>Eye Dam. - 1 - H318<br>Skin Sens. - 1 - H317<br>Muta. - 2 - H341<br>Carc. - 1B - H350 |

For the full text of the H-Statements mentioned in this Section, see Section 16.

## SECTION 4: FIRST AID MEASURES

**4.1 Description of first aid measures**
**General advice:**
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

**Skin contact:** Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be immediately available.

**Eye contact:** Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be available in work area.

**Ingestion:** If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

**4.2 Most important symptoms and effects, both acute and delayed:**
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

**4.3 Indication of any immediate medical attention and special treatment needed**
**Notes to physician:** Maintain adequate ventilation and oxygenation of the patient. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

## SECTION 5: FIREFIGHTING MEASURES

**5.1 Extinguishing media**
**Suitable extinguishing media:** Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical

**Unsuitable extinguishing media:** High volume water jet Do not use direct water stream.

**5.2 Special hazards arising from the substance or mixture**
**Hazardous combustion products:** Carbon oxides Fluorine compounds Chlorine compounds

**Unusual Fire and Explosion Hazards:** Flash back possible over considerable distance. Exposure to combustion products may be a hazard to health. Toxic vapours are evolved. Vapours may form explosive mixtures with air.

**5.3 Advice for firefighters**
**Fire Fighting Procedures:** Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Do not use a solid water stream as it may scatter and spread fire.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

**Special protective equipment for firefighters:** In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves to prevent contact with hydrofluoric acid.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures:** Remove all sources of ignition. Ventilate the area. Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

**6.2 Environmental precautions:** Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

**6.3 Methods and materials for containment and cleaning up:** Non-sparking tools should be used. Soak up with inert absorbent material. Suppress (knock down) gases/vapours/mists with a water spray jet. Clean up remaining materials from spill with suitable absorbant. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items

employed in the cleanup of releases. You will need to determine which regulations are applicable. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

**6.4 Reference to other sections:**
See sections: 7, 8, 11, 12 and 13.

## SECTION 7: HANDLING AND STORAGE

**7.1 Precautions for safe handling:** Do not get on skin or clothing. Do not breathe vapours or spray mist. Do not swallow. Do not get in eyes. Keep container tightly closed. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment. Non-sparking tools should be used. Handle in accordance with good industrial hygiene and safety practice.
Use with local exhaust ventilation. Use only in an area equipped with explosion proof exhaust ventilation. Ensure all equipment is electrically grounded before beginning transfer operations. This material can accumulate static charge due to its inherent physical properties and can therefore cause an electrical ignition source to vapors. In order to prevent a fire hazard, as bonding and grounding may be insufficient to remove static electricity, it is necessary to provide an inert gas purge before beginning transfer operations. Restrict flow velocity in order to reduce the accumulation of static electricity. Ground and bond container and receiving equipment.

**7.2 Conditions for safe storage, including any incompatibilities:** Keep in properly labelled containers. Store locked up. Keep tightly closed. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations. Keep away from heat and sources of ignition.

Do not store with the following product types: Strong oxidizing agents. Organic peroxides. Flammable solids. Pyrophoric liquids. Pyrophoric solids. Self-heating substances and mixtures. Substances and mixtures, which in contact with water, emit flammable gases. Explosives. Gases.
Unsuitable materials for containers**:** None known.

**7.3 Specific end use(s):** See the technical data sheet on this product for further information.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters**
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

| Component | Regulation | Type of listing | Value |
|---|---|---|---|
| Methyl ethyl ketone | ACGIH | TWA | 200 ppm |
| | Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section) | | |
| | ACGIH | STEL | 300 ppm |
| | Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section) | | |
| | 2000/39/EC | TWA | 600 mg/m3 200 ppm |
| | Further information: Indicative | | |

| | | | |
|---|---|---|---|
| | 2000/39/EC | STEL | 900 mg/m3 300 ppm |
| | Further information: Indicative | | |
| | GB EH40 | TWA | 600 mg/m3 200 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| | GB EH40 | STEL | 899 mg/m3 300 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| 4-methylpentan-2-one | ACGIH | TWA | 20 ppm |
| | Further information: URT irr: Upper Respiratory Tract irritation; headache: Headache; dizziness: Dizziness; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section); A3: Confirmed animal carcinogen with unknown relevance to humans | | |
| | ACGIH | STEL | 75 ppm |
| | Further information: URT irr: Upper Respiratory Tract irritation; headache: Headache; dizziness: Dizziness; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section); A3: Confirmed animal carcinogen with unknown relevance to humans | | |
| | 2000/39/EC | TWA | 83 mg/m3 20 ppm |
| | Further information: Indicative | | |
| | 2000/39/EC | STEL | 208 mg/m3 50 ppm |
| | Further information: Indicative | | |
| | GB EH40 | TWA | 208 mg/m3 50 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| | GB EH40 | STEL | 416 mg/m3 100 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| cyclohexanone | ACGIH | TWA | 20 ppm |
| | Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation; A3: Confirmed animal carcinogen with unknown relevance to humans; Skin: Danger of cutaneous absorption | | |
| | ACGIH | STEL | 50 ppm |
| | Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation; A3: Confirmed animal carcinogen with unknown relevance to humans; Skin: Danger of cutaneous absorption | | |
| | 2000/39/EC | TWA | 40.8 mg/m3 10 ppm |
| | Further information: skin: Identifies the possibility of significant uptake through the skin; Indicative | | |
| | 2000/39/EC | STEL | 81.6 mg/m3 20 ppm |
| | Further information: skin: Identifies the possibility of significant uptake through the skin; Indicative | | |
| | GB EH40 | TWA | 10 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| | GB EH40 | STEL | 20 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| phenol | ACGIH | TWA | 5 ppm |
| | Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; lung dam: Lung damage; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section); A4: Not classifiable as a human carcinogen; Skin: Danger of cutaneous absorption | | |
| | 2009/161/EU | TWA | 8 mg/m3 2 ppm |
| | Further information: skin: Identifies the possibility of significant uptake through the skin; Indicative | | |
| | 2009/161/EU | STEL | 16 mg/m3 4 ppm |
| | Further information: skin: Identifies the possibility of significant uptake through the skin; | | |

| | | | |
|---|---|---|---|
| | Indicative | | |
| | GB EH40 | TWA | 7.8 mg/m3 2 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| | GB EH40 | STEL | 16 mg/m3 4 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| mix-cresol | ACGIH | TWA Inhalable fraction and vapor | 20 mg/m3 |
| | Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen; Skin: Danger of cutaneous absorption | | |
| | 91/322/EEC | TWA | 22 mg/m3 5 ppm |
| | Further information: Indicative; (6): Existing scientific data on health effects appear to be particularly limited | | |
| toluene | ACGIH | TWA | 20 ppm |
| | Further information: visual impair: Visual impairment; female repro: Female reproductive; pregnancy loss: Pregnancy loss; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section); A4: Not classifiable as a human carcinogen | | |
| | 2006/15/EC | TWA | 192 mg/m3 50 ppm |
| | Further information: Indicative; skin: Identifies the possibility of significant uptake through the skin | | |
| | 2006/15/EC | STEL | 384 mg/m3 100 ppm |
| | Further information: Indicative; skin: Identifies the possibility of significant uptake through the skin | | |
| | GB EH40 | TWA | 191 mg/m3 50 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| | GB EH40 | STEL | 384 mg/m3 100 ppm |
| | Further information: Sk: Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. | | |
| formaldehyde | ACGIH | TWA | 0.1 ppm |
| | Further information: DSEN: Dermal Sensitization; RSEN: Respiratory sensitization; URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation; URT cancer: Upper Respiratory Tract cancer; A1: Confirmed human carcinogen | | |
| | ACGIH | STEL | 0.3 ppm |
| | Further information: DSEN: Dermal Sensitization; RSEN: Respiratory sensitization; URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation; URT cancer: Upper Respiratory Tract cancer; A1: Confirmed human carcinogen | | |
| | GB EH40 | TWA | 2.5 mg/m3 2 ppm |
| | GB EH40 | STEL | 2.5 mg/m3 2 ppm |

**Biological occupational exposure limits**

| Components | CAS-No. | Control parameters | Biological specimen | Sampling time | Permissible concentration | Basis |
|---|---|---|---|---|---|---|
| Methyl ethyl ketone | 78-93-3 | butan-2-one | Urine | After shift | 70 micromol per litre | GB EH40 BAT |
| | | methyl ethyl ketone | Urine | End of shift (As soon as possible after exposure ceases) | 2 mg/l | ACGIH BEI |
| 4-methylpentan-2-one | 108-10-1 | 4-methylpenta | Urine | After shift | 20 micromol per litre | GB EH40 BAT |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | n-2-one methyl isobutyl ketone | Urine | End of shift (As soon as possible after exposure ceases) | 1 mg/l | ACGIH BEI |
| cyclohexanone | 108-94-1 | cyclohexanol | Urine | After shift | 2 Millimoles per mole Creatinine | GB EH40 BAT |
| | | 1,2-Cyclohexanediol | Urine | End of shift at end of workweek | 80 mg/l | ACGIH BEI |
| | | Cyclohexanol | Urine | End of shift (As soon as possible after exposure ceases) | 8 mg/l | ACGIH BEI |
| phenol | 108-95-2 | Phenol | Urine | End of shift (As soon as possible after exposure ceases) | 250 mg/g Creatinine | ACGIH BEI |
| toluene | 108-88-3 | Toluene | In blood | Prior to last shift of workweek | 0.02 mg/l | ACGIH BEI |
| | | Toluene | Urine | End of shift (As soon as possible after exposure ceases) | 0.03 mg/l | ACGIH BEI |
| | | o-Cresol | Urine | End of shift (As soon as possible after exposure ceases) | 0.3 mg/g Creatinine | ACGIH BEI |

**Derived No Effect Level**
Methyl ethyl ketone

**Workers**

| *Acute systemic effects* | | *Acute local effects* | | *Long-term systemic effects* | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation |
| n.a. | n.a. | n.a. | n.a. | 1161 mg/kg bw/day41 2 mg/kg bw/day | 600 mg/m3 | n.a. | n.a. |

**Consumers**

| *Acute systemic effects* | | | *Acute local effects* | | *Long-term systemic effects* | | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Oral | Dermal | Inhalation | Dermal | Inhalation | Oral | Dermal | Inhalation |
| n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | 106 mg/m3 | 31 mg/kg bw/day | n.a. | n.a. |

4-methylpentan-2-one

**Workers**

| *Acute systemic effects* | | *Acute local effects* | | *Long-term systemic effects* | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation |
| n.a. | 208 mg/m3 | n.a. | 208 mg/m3 | 11.8 mg/kg bw/day | 83 mg/m3 | n.a. | 83 mg/m3 |

**Consumers**

| *Acute systemic effects* | | | *Acute local effects* | | *Long-term systemic effects* | | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Oral | Dermal | Inhalation | Dermal | Inhalation | Oral | Dermal | Inhalation |
| n.a. | 155.2 mg/m3 | n.a. | n.a. | 155.2 mg/m3 | 4.2 mg/kg bw/day | 14.7 mg/m3 | 4.2 mg/kg bw/day | n.a. | 14.7 mg/m3 |

cyclohexanone

**Workers**

| *Acute systemic effects* | | *Acute local effects* | | *Long-term systemic effects* | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation |
| 4 mg/kg bw/day | 80 mg/m3 | n.a. | 80 mg/m3 | 4 mg/kg bw/day | 40 mg/m3 | n.a. | 40 mg/m3 |

**Consumers**

| *Acute systemic effects* | | | *Acute local effects* | | *Long-term systemic effects* | | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Oral | Dermal | Inhalation | Dermal | Inhalation | Oral | Dermal | Inhalation |
| 1 mg/kg bw/day | 20 mg/m3 | 1.5 mg/kg bw/day | n.a. | 40 mg/m3 | 1 mg/kg bw/day | 10 mg/m3 | 1.5 mg/kg bw/day | n.a. | 20 mg/m3 |

phenol

**Workers**

| *Acute systemic effects* | | *Acute local effects* | | *Long-term systemic effects* | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation |
| n.a. | n.a. | n.a. | 16 mg/m3 | 1.23 mg/kg bw/day | 8 mg/m3 | n.a. | n.a. |

**Consumers**

| *Acute systemic effects* | | | *Acute local effects* | | *Long-term systemic effects* | | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Oral | Dermal | Inhalation | Dermal | Inhalation | Oral | Dermal | Inhalation |
| n.a. | n.a. | n.a. | n.a. | n.a. | 0.4 mg/kg bw/day | 1.32 mg/m3 | 0.4 mg/kg bw/day | n.a. | n.a. |

mix-cresol

**Workers**

| *Acute systemic effects* | | *Acute local effects* | | *Long-term systemic effects* | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation |
| n.a. | n.a. | n.a. | n.a. | n.a. | 3.5 mg/m3 | n.a. | 0.9 mg/m3 |

**Consumers**

| *Acute systemic effects* | | | *Acute local effects* | | *Long-term systemic effects* | | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Oral | Dermal | Inhalation | Dermal | Inhalation | Oral | Dermal | Inhalation |
| n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |

toluene

**Workers**

| *Acute systemic effects* | | *Acute local effects* | | *Long-term systemic effects* | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation |
| n.a. | 384 mg/m3 | n.a. | 384 mg/m3 | 384 mg/kg bw/day | 192 mg/m3 | n.a. | 192 mg/m3 |

**Consumers**

| *Acute systemic effects* | | | *Acute local effects* | | *Long-term systemic effects* | | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Oral | Dermal | Inhalation | Dermal | Inhalation | Oral | Dermal | Inhalation |
| n.a. | 226 mg/m3 | n.a. | n.a. | 226 mg/m3 | 226 mg/kg bw/day | 56.5 mg/m3 | 8.13 mg/kg bw/day | n.a. | 56.5 mg/m3 |

formaldehyde

**Workers**

| *Acute systemic effects* | | *Acute local effects* | | *Long-term systemic effects* | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation | Dermal | Inhalation |
| n.a. | n.a. | n.a. | 0.75 mg/m3 | 240 mg/kg bw/day | 9 mg/m3 | 0.037 mg/cm2 | 0.375 mg/m3 |

**Consumers**

| *Acute systemic effects* | | | *Acute local effects* | | *Long-term systemic effects* | | | *Long-term local effects* | |
|---|---|---|---|---|---|---|---|---|---|
| Dermal | Inhalation | Oral | Dermal | Inhalation | Dermal | Inhalation | Oral | Dermal | Inhalation |
| n.a. | n.a. | n.a. | n.a. | n.a. | 102 mg/kg bw/day | 3.2 mg/m3 | 4.1 mg/kg bw/day | 0.012 mg/cm2 | 0.1 mg/m3 |

**Predicted No Effect Concentration**

Methyl ethyl ketone

| **Compartment** | **PNEC** |
|---|---|
| Fresh water | 55.8 mg/l |
| Marine water | 55.8 mg/l |
| Intermittent use/release | 55.8 mg/l |
| Sewage treatment plant | 709 mg/l |
| Fresh water sediment | 284.74 mg/kg |
| Marine sediment | 284.7 mg/kg |
| Soil | 22.5 mg/kg |
| Oral (Secondary Poisoning) | 1000 mg/kg food |

4-methylpentan-2-one

| **Compartment** | **PNEC** |
|---|---|
| Fresh water | 0.6 mg/l |
| Marine water | 0.06 mg/l |
| Intermittent use/release | 1.5 mg/l |
| Fresh water sediment | 8.27 mg/kg dry weight (d.w.) |
| Marine sediment | 0.83 mg/kg dry weight (d.w.) |
| Soil | 1.3 mg/kg dry weight (d.w.) |
| Sewage treatment plant | 27.5 mg/l |

cyclohexanone

| **Compartment** | **PNEC** |
|---|---|
| Fresh water | 0.0329 mg/l |
| Marine water | 0.00329 mg/l |
| Intermittent use/release | 0.329 mg/l |
| Sewage treatment plant | 10 mg/l |
| Fresh water sediment | 0.168 mg/kg |
| Marine sediment | 0.0168 mg/kg |
| Soil | 0.0143 mg/kg |

phenol

| **Compartment** | **PNEC** |
|---|---|
| Fresh water | 0.0077 mg/l |
| Marine water | 0.00077 mg/l |
| Intermittent use/release | 0.031 mg/l |
| Sewage treatment plant | 2.1 mg/l |

| | |
|---|---|
| Fresh water sediment | 0.0915 mg/kg dry weight (d.w.) |
| Marine sediment | 0.00915 mg/kg dry weight (d.w.) |
| Soil | 0.136 mg/kg dry weight (d.w.) |

mix-cresol

| **Compartment** | **PNEC** |
|---|---|
| Fresh water | 0.1 mg/l |
| Marine water | 3 µg/l |
| Intermittent use/release | 0.044 mg/l |
| Sewage treatment plant | 1.14 mg/l |
| Fresh water sediment | 0.32783 mg/kg |
| Marine sediment | 0.00983 mg/kg |
| Soil | 0.05732 mg/kg |

toluene

| **Compartment** | **PNEC** |
|---|---|
| Fresh water | 0.68 mg/l |
| Marine water | 0.68 mg/l |
| Intermittent use/release | 0.68 mg/l |
| Sewage treatment plant | 13.61 mg/l |
| Fresh water sediment | 16.39 mg/kg |
| Marine sediment | 16.39 mg/kg |
| Soil | 2.89 mg/kg |

formaldehyde

| **Compartment** | **PNEC** |
|---|---|
| Fresh water | 0.44 mg/l |
| Marine water | 0.44 mg/l |
| Intermittent use/release | 4.44 mg/l |
| Sewage treatment plant | 0.19 mg/l |
| Fresh water sediment | 2.3 mg/kg |
| Marine sediment | 2.3 mg/kg |
| Soil | 0.2 mg/kg |

**8.2 Exposure controls**
**Engineering controls:** Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

**Hygiene measures:** Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating. Ensure that eye flushing systems and safety showers are located close to the working place.

**Individual protection measures**
**Eye/face protection:** Use chemical goggles.

**Skin protection**
**Hand protection:** Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
**Other protection:** Use chemical protective clothing resistant to this material, when there is any possibility of skin contact.
**Respiratory protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

**Environmental exposure controls**
See SECTION 7: Handling and storage and SECTION 13: Disposal considerations for measures to prevent excessive environmental exposure during use and waste disposal.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**9.1 Information on basic physical and chemical properties**

| | |
|---|---|
| **Appearance** | |
| **Physical state** | liquid |
| **Color** | black |
| **Odor** | solvent-like |
| **Odor Threshold** | No data available |
| **pH** | No data available |
| **Melting point/range** | No data available |
| **Freezing point** | No data available |
| **Boiling point (760 mmHg)** | > 35 °C |
| **Flash point** | **closed cup** 0.01 °C |
| **Evaporation Rate (Butyl Acetate = 1)** | No data available |
| **Flammability (solid, gas)** | Not applicable |
| **Lower explosion limit** | No data available |
| **Upper explosion limit** | No data available |
| **Vapor Pressure** | No data available |
| **Relative Vapor Density (air = 1)** | No data available |
| **Relative Density (water = 1)** | 0.95 |
| **Water solubility** | No data available |
| **Partition coefficient: n-octanol/water** | No data available |
| **Auto-ignition temperature** | 514 °C |
| **Decomposition temperature** | 200 °C |

| | |
|---|---|
| **Kinematic Viscosity** | 28 mm2/s at 25 °C |
| **Explosive properties** | Not explosive |
| **Oxidizing properties** | The substance or mixture is not classified as oxidizing. |

**9.2 Other information**

| | |
|---|---|
| **Molecular weight** | No data available |
| **Particle size** | Not applicable |

NOTE: The physical data presented above are typical values and should not be construed as a specification.

## SECTION 10: STABILITY AND REACTIVITY

**10.1 Reactivity:** Not classified as a reactivity hazard.

**10.2 Chemical stability:** Stable under normal conditions.

**10.3 Possibility of hazardous reactions:** Can react with strong oxidizing agents. Vapours may form explosive mixture with air. Highly flammable liquid and vapour.

**10.4 Conditions to avoid:** Heat, flames and sparks.

**10.5 Incompatible materials:** Oxidizing agents

**10.6 Hazardous decomposition products:** Phenol. Hexafluoroethane. Hydrogen Fluoride. 1,1,1,3,3,3-Hexafluoro-2-propanone. Carbonic difluoride. Carbon monoxide. Fluorinated hydrocarbons. Bisphenol A.

## SECTION 11: TOXICOLOGICAL INFORMATION

*Toxicological information appears in this section when such data is available.*

**11.1 Information on toxicological effects**

**Acute toxicity**

**Acute oral toxicity**
Product test data not available. Refer to component data.

**Acute dermal toxicity**
Product test data not available. Refer to component data.

**Acute inhalation toxicity**
Product test data not available. Refer to component data.

**Skin corrosion/irritation**
Product test data not available. Refer to component data.

**Serious eye damage/eye irritation**
Product test data not available. Refer to component data.

**Sensitization**
Product test data not available. Refer to component data.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
Product test data not available. Refer to component data.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
Product test data not available. Refer to component data.

**Carcinogenicity**
Product test data not available. Refer to component data.

**Teratogenicity**
Product test data not available. Refer to component data.

**Reproductive toxicity**
Product test data not available. Refer to component data.

**Mutagenicity**
Product test data not available. Refer to component data.

**Aspiration Hazard**
Product test data not available. Refer to component data.

**COMPONENTS INFLUENCING TOXICOLOGY:**

**Methyl ethyl ketone**

**Acute oral toxicity**
LD50, Rat, 2,193 mg/kg

**Acute dermal toxicity**
LD50, Rabbit, > 8,049 mg/kg

**Acute inhalation toxicity**
LC50, Mouse, 4 Hour, vapour, 32 mg/l

**Skin corrosion/irritation**
Brief contact is essentially nonirritating to skin.
Prolonged contact may cause moderate skin irritation with local redness.
Repeated contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.

**Serious eye damage/eye irritation**
May cause pain disproportionate to the level of irritation to eye tissues.
May cause moderate eye irritation which may be slow to heal.

May cause moderate corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.

**Sensitization**
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
May cause drowsiness or dizziness.
Route of Exposure: Inhalation
Target Organs: Nervous system

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
Methyl ethyl ketone has caused liver effects in laboratory animals exposed by inhalation to high concentrations.
Methyl ethyl ketone is probably not neurotoxic in itself but it potentiates the neurotoxicity of methyl-n-butyl ketone and n-hexane.

**Carcinogenicity**
Available data are inadequate to evaluate carcinogenicity.

**Teratogenicity**
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

**Reproductive toxicity**
For similar material(s): In animal studies, did not interfere with reproduction.

**Mutagenicity**
In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were negative.

**Aspiration Hazard**
May be harmful if swallowed and enters airways.

**4-methylpentan-2-one**

**Acute oral toxicity**
LD50, Rat, 2,080 mg/kg OECD Test Guideline 401

**Acute dermal toxicity**
LD50, Rabbit, > 2,000 mg/kg No deaths occurred at this concentration.

**Acute inhalation toxicity**
LC50, Rat, male, 4 Hour, vapour, 8.2 - 16.4 mg/l

**Skin corrosion/irritation**
Prolonged contact may cause slight skin irritation with local redness.
May cause drying and flaking of the skin.

**Serious eye damage/eye irritation**
May cause moderate eye irritation.

May cause slight corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.

**Sensitization**
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory Tract

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
Excessive exposure to methyl isobutyl ketone may cause respiratory irritation, gastrointestinal distress, anesthesia, kidney and liver effects.

**Carcinogenicity**
Has caused cancer in some laboratory animals. However, the relevance of this to humans is unknown. Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans.

**Teratogenicity**
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

**Reproductive toxicity**
In animal studies, did not interfere with reproduction.

**Mutagenicity**
In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were negative.

**Aspiration Hazard**
May be harmful if swallowed and enters airways.

**cyclohexanone**

**Acute oral toxicity**
LD50, Rat, 1,890 mg/kg

**Acute dermal toxicity**
LD50, Rabbit, 950 mg/kg

**Acute inhalation toxicity**
Vapor concentrations are attainable which could be hazardous on single exposure. May cause central nervous system effects. Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs.

LC50, Rat, 4 Hour, vapour, > 6.2 mg/l No deaths occurred at this concentration.

**Skin corrosion/irritation**
Brief contact may cause severe skin irritation with pain and local redness.

Prolonged contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage.

**Serious eye damage/eye irritation**
May cause severe eye irritation.
May cause severe corneal injury.
Vapor may cause severe eye irritation and corneal injury.
Vapor may cause lacrimation (tears).
In humans, eye irritation resulted from brief (minutes) exposure to cyclohexanone vapor concentration of 50 ppm and above.

**Sensitization**
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
In animals, effects have been reported on the following organs:
Central nervous system.
Kidney.
Liver.
Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

**Carcinogenicity**
Available data are inadequate to evaluate carcinogenicity.

**Teratogenicity**
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

**Reproductive toxicity**
Cyclohexanone caused reduced growth and survival of offspring in an animal reproduction study. Dose levels producing this effect also caused central nervous system effects in parental animals. In animal studies, has been shown to interfere with reproduction in males. Effects have been seen only at doses that produced significant toxicity to the parent animals.

**Mutagenicity**
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

**Aspiration Hazard**
Based on physical properties, not likely to be an aspiration hazard.

**Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100)**

**Acute oral toxicity**
Single dose oral LD50 has not been determined. Typical for this family of materials. LD50, Rat, > 2,000 mg/kg Estimated.

**Acute dermal toxicity**
The dermal LD50 has not been determined.

Typical for this family of materials. LD50, Rabbit, > 2,000 mg/kg

**Acute inhalation toxicity**
The LC50 has not been determined.

**Skin corrosion/irritation**
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause skin irritation with local redness.
Repeated contact may cause skin irritation with local redness.

**Serious eye damage/eye irritation**
May cause slight eye irritation.
Corneal injury is unlikely.
Solid or dust may cause irritation or corneal injury due to mechanical action.

**Sensitization**
Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

**Carcinogenicity**
Similar epoxy resin did not cause cancer in long-term animal studies.

**Teratogenicity**
No relevant data found.

**Reproductive toxicity**
No relevant data found.

**Mutagenicity**
Some similar resins have shown genetic toxicity in in vitro tests, while others have not.

**Aspiration Hazard**
Based on physical properties, not likely to be an aspiration hazard.

**phenol**

**Acute oral toxicity**
Lethal Dose, human, 140 mg/kg

LD50, Rat, male and female, 340 mg/kg

**Acute dermal toxicity**
LD50, Rat, female, 660 mg/kg OECD Test Guideline 402

**Acute inhalation toxicity**

Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs. Prolonged excessive exposure may cause adverse effects. May cause pulmonary edema (fluid in the lungs.) May cause central nervous system effects. Effects may be delayed.

The LC50 has not been determined.

**Skin corrosion/irritation**
Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage.

**Serious eye damage/eye irritation**
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Material may be handled at elevated temperatures; contact with heated material may cause thermal burns.

**Sensitization**
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
Repeated excessive exposure to phenol may cause central nervous system effects (including respiratory, motor difficulties, and paralysis), digestive disturbances, liver and kidney effects.

**Carcinogenicity**
Did not cause cancer in laboratory animals.

**Teratogenicity**
Phenol has been toxic to the fetus in laboratory animals at doses toxic to the mother. Birth defects (cleft palate) were seen in mice at maternally lethal doses. This is a common developmental abnormality in mice and is associated with stress to the maternal animals.

**Reproductive toxicity**
In animal studies, phenol did not interfere with reproduction. Toxicity to the newborn animals was observed at doses that were toxic to the maternal animals.

**Mutagenicity**
In vitro genetic toxicity studies were negative in some cases and positive in other cases.

**Aspiration Hazard**
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

**mix-cresol**

**Acute oral toxicity**
Typical for this family of materials. LD50, Rat, 100 - 300 mg/kg

**Acute dermal toxicity**
Typical for this family of materials. LD50, Rabbit, 300 - 1,000 mg/kg

**Acute inhalation toxicity**
Typical for this family of materials. LC50, Rat, 8 Hour, vapour, 35.38 mg/l

**Skin corrosion/irritation**
Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

**Serious eye damage/eye irritation**
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

**Sensitization**
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
Material is corrosive. Material is not classified as a respiratory irritant; however, upper respiratory tract irritation or corrosivity may be expected.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

**Teratogenicity**
Did not cause birth defects in laboratory animals. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

**Reproductive toxicity**
In animal studies, did not interfere with reproduction.

**Mutagenicity**
In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

**Aspiration Hazard**
Aspiration into the lungs may occur during ingestion or vomiting, resulting in rapid absorption and injury to other body systems.

**toluene**

**Acute oral toxicity**
LD50, Rat, 5,580 mg/kg

**Acute dermal toxicity**
LD50, Rabbit, 12,267 mg/kg

**Acute inhalation toxicity**

Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Alcohol consumption and exertion may increase the adverse effects of toluene. LC50, Rat, male, 4 Hour, vapour, 25.7 mg/l

LC50, Rat, female, 4 Hour, vapour, 30 mg/l

**Skin corrosion/irritation**
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.

**Serious eye damage/eye irritation**
May cause slight eye irritation.
May cause slight temporary corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Vapor may cause lacrimation (tears).

**Sensitization**
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
May cause drowsiness or dizziness.
Route of Exposure: Inhalation
Target Organs: Central nervous system

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
In animals, effects have been reported on the following organs:
central nervous system (CNS) effects
Excessive exposure may cause neurologic signs and symptoms.
Toluene has caused hearing loss in laboratory animals upon exposure to high concentrations.
Intentional misuse by deliberately inhaling toluene may cause nervous system damage, hearing loss, liver and kidney effects and death.

**Carcinogenicity**
Did not cause cancer in laboratory animals.

**Teratogenicity**
In laboratory animals, toluene has been toxic to the fetus at doses toxic to the mother; it has caused birth defects in mice when administered orally, but not by inhalation.

**Reproductive toxicity**
In animal studies, did not interfere with reproduction.

**Mutagenicity**
The majority and most reliable of the many genetic toxicity studies on toluene, both in vitro and in animals, indicate that it is not genetically toxic.

**Aspiration Hazard**
May be fatal if swallowed and enters airways.

**formaldehyde**

**Acute oral toxicity**
LD50, Rat, 100 mg/kg

**Acute dermal toxicity**
LD50, Rabbit, 270 mg/kg

**Acute inhalation toxicity**
LC50, Rat, 4 Hour, vapour, 0.578 mg/l

**Skin corrosion/irritation**
Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

**Serious eye damage/eye irritation**
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Vapor may cause lacrimation (tears).
Effects may be delayed.

**Sensitization**
Has caused allergic skin reactions in humans.
Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**
Material is corrosive. Material is not classified as a respiratory irritant; however, upper respiratory tract irritation or corrosivity may be expected.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**
In animals, effects have been reported on the following organs:
Kidney.
Liver.
Respiratory tract.
Skin.

**Carcinogenicity**
Has caused cancer in humans. Has caused cancer in laboratory animals.

**Teratogenicity**
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

**Reproductive toxicity**
No data available.

**Mutagenicity**
In vitro genetic toxicity studies were negative in some cases and positive in other cases.
Animal genetic toxicity studies were negative in some cases and positive in other cases.

**Aspiration Hazard**
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

## SECTION 12: ECOLOGICAL INFORMATION

*Ecotoxicological information appears in this section when such data is available.*

**12.1 Toxicity**

**Methyl ethyl ketone**

**Acute toxicity to fish**
Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 2,993 mg/l, OECD Test Guideline 203

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), static test, 48 Hour, 308 mg/l, OECD Test Guideline 202

**Acute toxicity to algae/aquatic plants**
ErC50, Pseudokirchneriella subcapitata (microalgae), static test, 96 Hour, Growth rate inhibition, 2,029 mg/l, OECD Test Guideline 201
NOEC, Pseudokirchneriella subcapitata (green algae), 96 Hour, 1,240 mg/l, OECD Test Guideline 201

**4-methylpentan-2-one**

**Acute toxicity to fish**
Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 179 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), 48 Hour, > 200 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**
EC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Growth rate inhibition, 400 mg/l, OECD Test Guideline 201 or Equivalent
EC50, Lemna minor (duckweed), semi-static test, 7 d, Growth rate inhibition, > 146 mg/l, OECD 221.

**Toxicity to bacteria**
EC10, Pseudomonas putida, 16 Hour, 275 mg/l

**Chronic toxicity to fish**
NOEC, Pimephales promelas (fathead minnow), 31 d, weight, 57 mg/l
LOEC, Pimephales promelas (fathead minnow), 31 d, weight, 105 mg/l
MATC (Maximum Acceptable Toxicant Level), Pimephales promelas (fathead minnow), 31 d, weight, 77.4 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Daphnia magna (Water flea), 21 d, 30 mg/l

**cyclohexanone**

**Acute toxicity to fish**
Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).
LC50, Leuciscus idus (Golden orfe), static test, 48 Hour, 630 mg/l
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 527 - 732 mg/l

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), 24 Hour, 820 mg/l

**Acute toxicity to algae/aquatic plants**
LOEC, Scenedesmus quadricauda (Green algae), 192 Hour, 370 mg/l, Method Not Specified.
EC50, Desmodesmus subspicatus (green algae), Static, 72 Hour, > 100 mg/l, OECD Test Guideline 201

**Toxicity to bacteria**
EC50, activated sludge, > 1,000 mg/l, OECD 209 Test

**Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100)**

**Acute toxicity to fish**
Based on information for a similar material:
Not expected to be acutely toxic, but may cause adverse effects by physical/mechanical means.

**phenol**

**Acute toxicity to fish**
Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).
LC50, Oncorhynchus mykiss (rainbow trout), flow-through test, 96 Hour, 8.9 mg/l

**Acute toxicity to aquatic invertebrates**
LC50, Ceriodaphnia dubia (water flea), 48 Hour, 4.3 - 20 mg/l

**Acute toxicity to algae/aquatic plants**
EC50, Pseudokirchneriella subcapitata (microalgae), static test, 96 Hour, Growth inhibition (cell density reduction), 61.1 mg/l, Other guidelines

**Chronic toxicity to fish**
NOEC, Fish, semi-static test, 60 d, 0.077 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Daphnia magna (Water flea), 16 d, 10 mg/l

**mix-cresol**

**Acute toxicity to fish**
Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).
LC50, Oncorhynchus mykiss (rainbow trout), flow-through test, 96 Hour, 7.5 mg/l

**Acute toxicity to aquatic invertebrates**
LC50, Daphnia magna (Water flea), 48 Hour, 4.9 mg/l

**Acute toxicity to algae/aquatic plants**
Based on data from similar materials
EC50, Desmodesmus subspicatus (green algae), 48 Hour, 21 mg/l
Based on data from similar materials
EC10, Desmodesmus subspicatus (green algae), 48 Hour, 21 mg/l

**Toxicity to bacteria**
EC50, activated sludge, 458 mg/l

**Chronic toxicity to fish**
For similar material(s):
NOEC, Pimephales promelas (fathead minnow), 32 d, 1.35 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Daphnia magna (Water flea), 21 d, number of offspring, > 1 mg/l

**toluene**

**Acute toxicity to fish**
Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 5.8 mg/l

**Acute toxicity to aquatic invertebrates**
LC50, water flea Ceriodaphnia dubia, semi-static test, 48 Hour, 3.78 mg/l

**Acute toxicity to algae/aquatic plants**
EbC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Biomass, 12.5 mg/l, OECD Test Guideline 201

**Chronic toxicity to fish**
NOEC, Fish, flow-through test, 40 d, growth, 1.4 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Ceriodaphnia dubia (water flea), 7 d, number of offspring, 0.74 mg/l

**Toxicity to soil-dwelling organisms**
LC50, Eisenia fetida (earthworms), 150 - 280 mg/kg

**formaldehyde**

**Acute toxicity to fish**
Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).
LC50, Bluegill sunfish (Lepomis macrochirus), flow-through test, 96 Hour, 50 mg/l
LC50, striped bass (Morone saxatilis), static test, 96 Hour, 6.7 mg/l
LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 44 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia pulex (Water flea), static test, 48 Hour, 5.8 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**
EC50, Desmodesmus subspicatus (green algae), Static, 72 Hour, Growth rate, 4.89 mg/l, OECD Test Guideline 201 or Equivalent

**Chronic toxicity to fish**
NOEC, Oryzias latipes (Orange-red killifish), flow-through, 28 d, mortality, >= 48 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Daphnia magna (Water flea), 21 d, >= 6.4 mg/l

**12.2 Persistence and degradability**

**Methyl ethyl ketone**
**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
**Biodegradation:** 98 %
**Exposure time:** 28 d
**Method:** OECD Test Guideline 301D or Equivalent

**4-methylpentan-2-one**
**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
**Biodegradation:** 83 %
**Exposure time:** 28 d
**Method:** OECD Test Guideline 301F or Equivalent

**cyclohexanone**
**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
**Biodegradation:** 87 %
**Exposure time:** 14 d
**Method:** OECD Test Guideline 301C or Equivalent
10-day Window: Pass
**Biodegradation:** 90 - 100 %
**Exposure time:** 28 d
**Method:** OECD Test Guideline 301F

**Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100)**
**Biodegradability:** This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

**phenol**
**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable

**Biodegradation:** 62 %
**Exposure time:** 100 Hour
**Method:** OECD Test Guideline 301C or Equivalent
10-day Window: Not applicable
**Biodegradation:** 85 %
**Exposure time:** 14 d
**Method:** OECD Test Guideline 301C or Equivalent

**mix-cresol**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

**toluene**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
**Biodegradation:** 100 %
**Exposure time:** 14 d
**Method:** OECD Test Guideline 301C or Equivalent

**formaldehyde**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
**Biodegradation:** 90 %
**Exposure time:** 28 d
**Method:** OECD Test Guideline 301D or Equivalent

**Theoretical Oxygen Demand:** 1.07 mg/mg

**12.3 Bioaccumulative potential**

**Methyl ethyl ketone**

**Bioaccumulation:** Bioaccumulation is unlikely. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
**Partition coefficient: n-octanol/water(log Pow):** 0.3 at 40 °C Measured

**4-methylpentan-2-one**

**Partition coefficient: n-octanol/water(log Pow):** 1.9 at 20 °C

**cyclohexanone**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
**Partition coefficient: n-octanol/water(log Pow):** 0.81 Measured
**Bioconcentration factor (BCF):** 3.16 Fish

**Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100)**

**Bioaccumulation:** No relevant data found.

**phenol**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
**Partition coefficient: n-octanol/water(log Pow):** 1.47 at 30 °C Measured
**Bioconcentration factor (BCF):** 10 - 39 Carassius auratus (goldfish) Measured

**mix-cresol**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
**Partition coefficient: n-octanol/water(log Pow):** 1.95 Calculated.
**Bioconcentration factor (BCF):** < 100 Fish Measured

**toluene**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
**Partition coefficient: n-octanol/water(log Pow):** 2.73 Measured
**Bioconcentration factor (BCF):** 13.2 - 90 Fish Measured

**formaldehyde**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
**Partition coefficient: n-octanol/water(log Pow):** 0.35 Measured
**Bioconcentration factor (BCF):** 3 Fish Estimated.

**12.4 Mobility in soil**

**Methyl ethyl ketone**

Potential for mobility in soil is very high (Koc between 0 and 50).
**Partition coefficient (Koc):** 3.8 Estimated.

**4-methylpentan-2-one**

Potential for mobility in soil is high (Koc between 50 and 150).
**Partition coefficient (Koc):** 101 Estimated.

**cyclohexanone**

Potential for mobility in soil is very high (Koc between 0 and 50).
**Partition coefficient (Koc):** 15 Estimated.

**Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100)**

In the terrestrial environment, material is expected to remain in the soil.
In the aquatic environment, material will sink and remain in the sediment.

**phenol**

Potential for mobility in soil is high (Koc between 50 and 150).
**Partition coefficient (Koc):** 27 - 91 Estimated.

**mix-cresol**

No relevant data found.

**toluene**

Potential for mobility in soil is very high (Koc between 0 and 50).
**Partition coefficient (Koc):** 37 - 178 Estimated.

**formaldehyde**

Potential for mobility in soil is very high (Koc between 0 and 50).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Partition coefficient (Koc):** 1 Estimated.

**12.5 Results of PBT and vPvB assessment**

**Methyl ethyl ketone**
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).

**4-methylpentan-2-one**
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).

**cyclohexanone**
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

**Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100)**
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

**phenol**
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).

**mix-cresol**
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

**toluene**
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).

**formaldehyde**
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

**12.6 Other adverse effects**

**Methyl ethyl ketone**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**4-methylpentan-2-one**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**cyclohexanone**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**Reaction product: Bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight 700-1100)**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**phenol**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**mix-cresol**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**toluene**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**formaldehyde**
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

## SECTION 13: DISPOSAL CONSIDERATIONS

**13.1 Waste treatment methods**
Do not dump into any sewers, on the ground, or into any body of water. This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 2008/98/EC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required.

The definitive assignment of this material to the appropriate EWC group and thus its proper EWC code will depend on the use that is made of this material. Contact the authorized waste disposal services.

## SECTION 14: TRANSPORT INFORMATION

**Classification for ROAD and Rail transport (ADR/RID):**

| | | |
|---|---|---|
| **14.1** | **UN number** | UN 1224 |
| **14.2** | **UN proper shipping name** | KETONES, LIQUID, N.O.S.(Butanone, Isobutyl methyl ketone) |
| **14.3** | **Transport hazard class(es)** | 3 |
| **14.4** | **Packing group** | II |
| **14.5** | **Environmental hazards** | Not considered environmentally hazardous based on available data. |
| **14.6** | **Special precautions for user** | Special Provision 640D<br>Hazard Identification Number: 33 |

**Classification for SEA transport (IMO-IMDG):**

| | | |
|---|---|---|
| **14.1** | **UN number** | UN 1224 |
| **14.2** | **UN proper shipping name** | KETONES, LIQUID, N.O.S.(Butanone, Isobutyl methyl ketone) |
| **14.3** | **Transport hazard class(es)** | 3 |
| **14.4** | **Packing group** | II |
| **14.5** | **Environmental hazards** | Not considered as marine pollutant based on available data. |
| **14.6** | **Special precautions for user** | EmS: F-E, S-D |
| **14.7** | **Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code** | Consult IMO regulations before transporting ocean bulk |

**Classification for AIR transport (IATA/ICAO):**

| | | |
|---|---|---|
| **14.1** | **UN number** | UN 1224 |
| **14.2** | **UN proper shipping name** | Ketones, liquid, n.o.s.(Butanone, Isobutyl methyl ketone) |
| **14.3** | **Transport hazard class(es)** | 3 |
| **14.4** | **Packing group** | II |
| **14.5** | **Environmental hazards** | Not applicable |
| **14.6** | **Special precautions for user** | No data available. |

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

## SECTION 15: REGULATORY INFORMATION

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

**REACh Regulation (EC) No 1907/2006**
This product contains only components that have been either registered, are exempt from registration, are regarded as registered or are not subject to registration according to Regulation (EC) No. 1907/2006 (REACH)., Polymers are exempted from registration under REACH. All relevant starting materials and additives have been either registered, or are exempt from registration according to Regulation (EC) No. 1907/2006 (REACH)., The aforementioned indications of the REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. It is the buyer´s/user´s responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

**Restrictions on the manufacture, placing on the market and use:**
The following substance/s contained in this product is/are subject through Annex XVII of REACH regulation to restrictions on the manufacture, placing on the market and use when present in certain dangerous substances, mixtures and articles. Users of this product have to comply with the restrictions placed upon it by the aforementioned provision.

| | |
|---|---|
| CAS-No.: 108-88-3 | Name: toluene |

Restriction status: listed in REACH Annex XVII
Restricted uses: See Annex XVII to Regulation (EC) no 1907/2006 for Conditions of restriction
Number on the list: 48

| | |
|---|---|
| CAS-No.: 50-00-0 | Name: formaldehyde |

Restriction status: listed in REACH Annex XVII
Restricted uses: See Annex XVII to Regulation (EC) no 1907/2006 for Conditions of restriction
Number on the list: 28

**Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.**
Listed in Regulation: FLAMMABLE LIQUIDS
Number in Regulation: P5c
5,000 t
50,000 t

**Further information**
Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

**15.2 Chemical safety assessment**

No Chemical Safety Assessment has been carried out for this substance/mixture.

## SECTION 16: OTHER INFORMATION

**Full text of H-Statements referred to under sections 2 and 3.**

| | |
|---|---|
| H225 | Highly flammable liquid and vapour. |
| H226 | Flammable liquid and vapour. |
| H301 | Toxic if swallowed. |
| H302 | Harmful if swallowed. |
| H304 | May be fatal if swallowed and enters airways. |
| H311 | Toxic in contact with skin. |
| H314 | Causes severe skin burns and eye damage. |
| H315 | Causes skin irritation. |
| H317 | May cause an allergic skin reaction. |
| H318 | Causes serious eye damage. |
| H319 | Causes serious eye irritation. |
| H330 | Fatal if inhaled. |
| H331 | Toxic if inhaled. |
| H332 | Harmful if inhaled. |
| H335 | May cause respiratory irritation. |
| H336 | May cause drowsiness or dizziness. |
| H341 | Suspected of causing genetic defects. |
| H350 | May cause cancer. |
| H361d | Suspected of damaging the unborn child. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| H411 | Toxic to aquatic life with long lasting effects. |
| H412 | Harmful to aquatic life with long lasting effects. |

**Classification and procedure used to derive the classification for mixtures according to Regulation (EC) No 1272/2008**
Flam. Liq. - 2 - H225 - Based on product data or assessment
Skin Irrit. - 2 - H315 - Calculation method
Eye Dam. - 1 - H318 - Calculation method
Skin Sens. - 1 - H317 - Calculation method
Muta. - 2 - H341 - Calculation method

STOT SE - 3 - H336 - Calculation method

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Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

**Legend**

| | |
|---|---|
| 2000/39/EC | Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values |
| 2006/15/EC | Europe. Indicative occupational exposure limit values |
| 2009/161/EU | Europe. COMMISSION DIRECTIVE 2009/161/EU establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC |
| 91/322/EEC | Europe. Commission Directive 91/322/EEC on establishing indicative limit values |
| ACGIH | USA. ACGIH Threshold Limit Values (TLV) |
| ACGIH BEI | ACGIH - Biological Exposure Indices (BEI) |
| GB EH40 | UK. EH40 WEL - Workplace Exposure Limits |
| GB EH40 BAT | UK. Biological monitoring guidance values |
| STEL | Short term exposure limit |
| TWA | Limit Value - eight hours |
| Acute Tox. | Acute toxicity |
| Aquatic Chronic | Long-term (chronic) aquatic hazard |
| Asp. Tox. | Aspiration hazard |
| Carc. | Carcinogenicity |
| Eye Dam. | Serious eye damage |
| Eye Irrit. | Eye irritation |
| Flam. Liq. | Flammable liquids |
| Muta. | Germ cell mutagenicity |
| Repr. | Reproductive toxicity |
| Skin Corr. | Skin corrosion |
| Skin Irrit. | Skin irritation |
| Skin Sens. | Skin sensitisation |
| STOT RE | Specific target organ toxicity - repeated exposure |
| STOT SE | Specific target organ toxicity - single exposure |

**Full text of other abbreviations**
ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO -

International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

**Information Source and References**
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

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