SAFETY DATA SHEET
Epichlorohydrin

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

1.1. Product identifier

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product name</strong></td>
<td>Epichlorohydrin</td>
</tr>
<tr>
<td><strong>Chemical name</strong></td>
<td>100% 1-chloro-2,3-epoxypropane</td>
</tr>
<tr>
<td><strong>REACH registration number</strong></td>
<td>01-2119457436-33-0021</td>
</tr>
<tr>
<td><strong>CAS number</strong></td>
<td>106-89-8</td>
</tr>
<tr>
<td><strong>EU index number</strong></td>
<td>603-026-00-6</td>
</tr>
<tr>
<td><strong>EC number</strong></td>
<td>203-439-8</td>
</tr>
</tbody>
</table>

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses
The manufacturing of polymeric Epoxy resin is the main monomer use for Epichlorohydrin (ECH). ECH is fully reacted into polymeric substances with a residual monomer content of much less than 0.01%.
Other monomer use of ECH are:
- Monomers in industrial manufacture of polymeric ion exchange resins.
- Monomer in manufacture of wet strength resins for polymeric paper coating products.
- Monomer for industrial manufacture of polymeric rubber products.

Sector of Use
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites

Product Category
PC19 Intermediate

Process category
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC15: Use as laboratory reagent.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.

Environmental release category
ERC1 Manufacture of the substance

Application of the substance / the mixture
Chemicals for synthesis

1.3. Details of the supplier of the safety data sheet

Manufacturer
Jubail Chemical Industries Company (JANA)
Tareeq 263, Jubail 1, Jubail Industrial City, 31961
Kingdom of Saudi Arabia, (PO Box 10661)
Tel. +966 13 3585002
Fax. +966 13 3583192
safety@nama.com.sa
Epichlorohydrin

Only Representative REACH
1907/2006/EC Article 8
NAMA Germany
Teichstrasse 38
D-79539 Lörrach
Tel. + 49 762 1940 5410
Fax. + 49 762 1940 5420

1.4. Emergency telephone number

Emergency telephone
Emergency CONTACT (24-Hour-Number): GBK GmbH +49 (0)6132-84463

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards
Flam. Liq. 3 - H226

Health hazards
Acute Tox. 3 - H301 Acute Tox. 3 - H311 Acute Tox. 3 - H331 Skin Corr. 1B - H314 Eye Dam.
1 - H318 Skin Sens. 1 - H317 Carc. 1B - H350

Environmental hazards
Aquatic Chronic 3 - H412

2.2. Label elements

EC number
203-439-8

Hazard pictograms

Signal word
Danger

Hazard-determining
components of labelling
1-chloro-2,3-epoxypropane

Hazard statements
H226 Flammable liquid and vapour.
H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H350 May cause cancer.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing gas, fume, vapours or spray.
P273 Avoid release to the environment.
P280 Wear protective clothing, gloves, eye and face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P501 Dispose of contents/ container in accordance with national regulations.

2.3. Other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name
Epichlorohydrin
Epichlorohydrin

**Chemical name** 100% 1-chloro-2,3-epoxypropane

**REACH registration number** 01-2119457436-33-0021

**EU index number** 603-026-00-6

**CAS number** 106-89-8

**EC number** 203-439-8

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

**General information** Promptly remove any clothing that becomes contaminated. For breathing difficulties, oxygen may be necessary.

**Inhalation** IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical attention immediately. For breathing difficulties, oxygen may be necessary. Place unconscious person on their side in the recovery position and ensure breathing can take place.

#### 4.2. Most important symptoms and effects, both acute and delayed

**Inhalation** IF INHALED: Remove person to fresh air and keep comfortable for breathing. If breathing stops, provide artificial respiration. For breathing difficulties, oxygen may be necessary. Get medical attention if symptoms are severe or persist.

**Ingestion** IF SWALLOWED: Do not induce vomiting. Get medical attention immediately.

**Skin contact** IF ON SKIN: Wash promptly with soap and water if skin becomes contaminated. Continue to rinse for at least 15 minutes and get medical attention. Wash clothing and clean shoes thoroughly before reuse.

**Eye contact** IF IN EYES: Remove any contact lenses and open eyelids wide apart. Rinse cautiously with water for several minutes. Get medical attention immediately.

#### 4.3. Indication of any immediate medical attention and special treatment needed

**Notes for the doctor** No information available.

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

**Suitable extinguishing media** Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Dry chemicals.

**Unsuitable extinguishing media** Do not use water jet as an extinguisher, as this will spread the fire.

#### 5.2. Special hazards arising from the substance or mixture

**Specific hazards** Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back.

**Hazardous combustion products** Thermal decomposition or combustion products may include the following substances: Carbon monoxide (CO). Carbon dioxide (CO2). Hydrogen chloride (HCl).

#### 5.3. Advice for firefighters

**Protective actions during firefighting** Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. If material is molten, do not apply direct water stream. Use fine water spray or foam. Cool surroundings with water to localize fire zone. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires.
Epichlorohydrin

Special protective equipment for firefighters

Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Wear suitable protective equipment, including gloves, goggles/face shield, respirator, boots, clothing or apron, as appropriate.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions

Wear suitable protective equipment, including gloves, goggles/face shield, respirator, boots, clothing or apron, as appropriate. Keep unnecessary and unprotected personnel away from the spillage. Eliminate all ignition sources if safe to do so. Ground/bond container and receiving equipment.

6.2. Environmental precautions

Environmental precautions

Avoid the spillage or runoff entering drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up

Contain and absorb spillage with sand, earth or other non-combustible material. Cleaning agent. Collect and dispose of spillage as indicated in Section 13. Provide adequate ventilation.

6.4. Reference to other sections

Reference to other sections

Follow precautions for safe handling described in this safety data sheet. For personal protection, see Section 8. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions

Provide adequate general and local exhaust ventilation. Keep away from heat, sparks and open flame. Handle and open container with care.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions

Keep container tightly closed. Do not store near heat sources or expose to high temperatures.

7.3. Specific end use(s)

Specific end use(s)

No information available.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

DNEL

Workers - Inhalation, Oral; Acute: 1.52 mg/m³
- Inhalation, Oral; Long term: 1.52 mg/m³

PNEC

General population - Fresh water; 0.0106 mg/l
- Sediment (Freshwater); 0.0572 mg/kg/dwt
- marine water; 0.00106 mg/l
- Sediment (Marinewater); 0.00572 mg/kg/dwt
- STP; 35 mg/l

Additional information:
The lists valid during the making were used as basis

8.2. Exposure controls

Protective equipment
Epichlorohydrin

Appropriate engineering controls
Provide adequate general and local exhaust ventilation.

Personal protection
Keep away from food, drink and animal feeding stuffs. Remove contaminated clothing and wash the skin thoroughly with soap and water after work. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Avoid contact with skin and eyes. Contaminated clothing should be placed in a closed container for disposal or decontamination.

Eye/face protection
Wear tight-fitting, chemical splash goggles or face shield.

Hand protection
Wear protective gloves. For users with sensitive skin, it is recommended that suitable protective gloves are worn. It is recommended that gloves are made of the following material: Butyl rubber. Thickness: ≥ 0.7 mm Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected.

Other skin and body protection
Wear protective clothing.

Hygiene measures
Keep away from food, drink and animal feeding stuffs. Wash hands thoroughly after handling. Avoid contact with skin, eyes and clothing. Use appropriate skin cream to prevent drying of skin.

Respiratory protection
Gas filter, type AX. Ensure suitable respiratory protection is worn during removal of spillages in confined areas.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid.</td>
</tr>
<tr>
<td>Colour</td>
<td>Colourless.</td>
</tr>
<tr>
<td>Odour</td>
<td>Pungent.</td>
</tr>
<tr>
<td>Melting point</td>
<td>-57.2°C</td>
</tr>
<tr>
<td>Initial boiling point and range</td>
<td>117°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>28°C Closed cup.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>16.4 mm Hg @ 25°C</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.18 g/cm³ @ 20°C</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>65.9 g/l water @ 20°C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>385°C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>1.02 cP @ 25°C</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not considered to be explosive.</td>
</tr>
<tr>
<td>Organic solvents</td>
<td>0.0%</td>
</tr>
<tr>
<td>VOC (EC)</td>
<td>100%</td>
</tr>
<tr>
<td>VOC (CH)</td>
<td>100%</td>
</tr>
</tbody>
</table>

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity
Epichlorohydrin

Reactivity  No information available.

10.2. Chemical stability
Stability  Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions  No potentially hazardous reactions known.

10.4. Conditions to avoid
Conditions to avoid  Exposure to elevated temperatures can cause product to decompose. Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials
Materials to avoid  Avoid contact with strong oxidising agents. Chlorine. The following materials may react strongly with the product: Strong acids. Strong alkalis. Amines. Aluminium.

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Toxicological effects  Very toxic if swallowed. Toxic in contact with skin. Toxic if inhaled.

Acute toxicity - oral
Notes (oral LD₅₀)  LD₅₀ 175 mg/kg, Oral, Rat
ATE oral (mg/kg)  100.0

Acute toxicity - dermal
Notes (dermal LD₅₀)  LD₅₀ 515 mg/kg, Oral, Rabbit
ATE dermal (mg/kg)  300.0

Acute toxicity - inhalation
Notes (inhalation LC₅₀)  LC₅₀ 4114 mg/l, Inhalation, Rat
ATE inhalation (vapours mg/l)  3.0

Skin corrosion/irritation  Test: Skin Corrosive Positive
Serious eye damage/irritation  Test: Eye Irritant Positive
Respiratory sensitisation  Toxic if inhaled.
Skin sensitisation  Test: Skin Sensitization Positive - Source: Repeated contact
Germ cell mutagenicity  Based on available data the classification criteria are not met.
Genotoxicity - in vitro
Carcinogenicity  May cause cancer if swallowed. May cause cancer by inhalation.
Epichlorohydrin

Target organ for carcinogenicity
Oral Digestive system Stomach Inhalation Respiratory system

Reproductive toxicity
Reproductive toxicity - fertility Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure
STOT - single exposure Based on available data the classification criteria are not met.

Specific target organ toxicity - repeated exposure
STOT - repeated exposure Based on available data the classification criteria are not met.

Aspiration hazard
Aspiration hazard Based on available data the classification criteria are not met.

SECTION 12: Ecological information

General Notes Water Hazard Class 3 (German Regulation): Highly hazardous to water.

12.1. Toxicity
Toxicity Adopt good working practices so that the product is not released into the environment.

Acute aquatic toxicity
Acute toxicity - fish LC₅₀, 4 days: 10.6 mg/l, Freshwater fish
Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 23.9 mg/l, Freshwater invertebrates
Acute toxicity - aquatic plants EC₅₀, 72 hours: 15 mg/l, Freshwater algae
NOEC, 72 hours: 1.7 mg/l, Freshwater algae
Acute toxicity - microorganisms NOEC, : 35 mg/l, Notes: micro-organism

12.2. Persistence and degradability
Persistence and degradability No information available.

12.3. Bioaccumulative potential
Bioaccumulative potential No information available.

12.4. Mobility in soil
Mobility No information available.

12.5. Results of PBT and vPvB assessment
Results of PBT and vPvB assessment Not applicable.

12.6. Other adverse effects
Other adverse effects No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
General information External recovery, treatment, recycling and disposal of waste should comply with all applicable local and/or national regulations.

Disposal methods Dispose of waste product or used containers in accordance with local regulations

European waste catalogue: 07 01 04*: other organic solvents, washing liquids and mother liquors
### Epichlorohydin

#### SECTION 14: Transport information

<table>
<thead>
<tr>
<th>14.1. UN number</th>
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<tbody>
<tr>
<td>UN No. (ADR/RID)</td>
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</tr>
<tr>
<td>UN No. (IMDG)</td>
<td>2023</td>
</tr>
<tr>
<td>UN No. (ICAO)</td>
<td>2023</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>14.2. UN proper shipping name</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Proper shipping name (ADR/RID)</td>
<td>EPICHLOROHYDRIN</td>
</tr>
<tr>
<td>Proper shipping name (IMDG)</td>
<td>EPICHLOROHYDRIN, MARINE POLLUTANT</td>
</tr>
<tr>
<td>Proper shipping name (ICAO)</td>
<td>EPICHLOROHYDRIN</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>14.3. Transport hazard class(es)</th>
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</thead>
<tbody>
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<td>ADR/RID class</td>
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<tr>
<td>IMDG class</td>
<td>6.1</td>
</tr>
<tr>
<td>IMDG subsidiary risk</td>
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</tr>
<tr>
<td>ICAO class/division</td>
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<td>ICAO subsidiary risk</td>
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**Transport labels**

- ![Transport Label](image)

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<th>14.4. Packing group</th>
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<tr>
<td>IMDG packing group</td>
<td>II</td>
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<tr>
<td>ICAO packing group</td>
<td>II</td>
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</table>

<table>
<thead>
<tr>
<th>14.5. Environmental hazards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmentally hazardous substance/marine pollutant</td>
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</tbody>
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<table>
<thead>
<tr>
<th>14.6. Special precautions for user</th>
<th></th>
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<tbody>
<tr>
<td>EmS</td>
<td>F-E, S-D</td>
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<td>ADR transport category</td>
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<td>Emergency Action Code</td>
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<td>Hazard Identification Number</td>
<td>63</td>
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<tr>
<td>(ADR/RID)</td>
<td></td>
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</tbody>
</table>
Epichlorohydrin

Tunnel restriction code (D/E)

Transportation Additional Information: ADR/IMDG

Excepted Quantities (EQ): E4

Limited Quantities (LQ): 100 ml

Maximum Net Quantity per Inner Packaging: 1 ml

Maximum Net Quantity per Outer Packaging: 500 ml

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Not applicable.

SECTION 15: Regulatory information

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


Qualifying quantity for application of lower-tier requirements (2012/18/EU): 50MT

Qualifying quantity for application of upper-tier requirements (2012/18/EU): 200MT

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information
Epichlorohydrin

Abbreviations and acronyms used in the safety data sheet

RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
IATA-DGR: Dangerous Goods Regulation by the "International Air Trasport Association" (IATA).
ICAO: International Civil Aviation Organisation
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
IMDG: International Maritime Dangerous Goods.
IATA: International Air Transport Association.
GHS: Globally Harmonized System.
EINECS: European Inventory of Existing Commercial and Chemical Substances
CAS: Chemical Abstracts Service.
VOC: Volatile Organic Compounds (USA, EU)
DNEL: Derived No Effect Level.
PNEC: Predicted No Effect Concentration.
LC50: Lethal Concentration to 50% of a test population.
LD50: Lethal Dose to 50% of a test population (Median Lethal Dose).
PBT: Persistent, Bioaccumulative and Toxic substance.
vPvB: Very Persistent and Very Bioaccumulative.
Skin Corr. = Skin corrosion
Eye Dam. = Serious eye damage
Aquatic Acute = Hazardous to the aquatic environment (acute)
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 3: Acute toxicity – Category 3
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
Skin Sens. 1: Sensitisation- Skin, Hazard Category 1
Carc. 1B: Carcinogenicity – Category 1B

Revision comments

SECTION 01: Identification of the substance/mixture and of the company/undertaking
SECTION 02: Hazards Identification
SECTION 03: Composition/information on ingredients
SECTION 08: Exposure Controls/Personal Protection
SECTION 09: Physical and Chemical Properties
SECTION 10: Stability and Reactivity
SECTION 11: Toxicological Information
SECTION 12: Ecological Information
SECTION 14: Transportation Information
SECTION 15: Regulatory Information
SECTION 16: Other Information

Revision date

13/09/2020

Revision

02

Supersedes date

01/11/2018

SDS number

4593

Hazard statements in full

H226 Flammable liquid and vapour.
H301 Toxic if swallowed.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H350 May cause cancer.
H412 Harmful to aquatic life with long lasting effects.
Disclaimer

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.
Annex: Exposure scenario 1

- Short title of the exposure scenario Manufacture
- Sector of Use SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
- Product category PC19 Intermediate
- Process category
  - PROC15 Use as laboratory reagent
  - PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
  - PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
- Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
- PROC2 Chemical production or refinery in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
- PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
- Environmental release category ERC1 Manufacture of the substance
- Description of the activities / processes covered in the Exposure Scenario
  - See section 1 of the annex to the Safety Data Sheet.
- Conditions of use
  - Duration and frequency 5 workdays/week.
  - Worker 8hrs (full working shift).
- Physical parameters
  - The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
- Physical state Fluid
- Concentration of the substance in the mixture Raw material.
- Used amount per time or activity
  - According to directions for use.
  - not tons per day
- Other operational conditions
  - Other operational conditions affecting environmental exposure No special measures required.
- Other operational conditions affecting worker exposure
  - Avoid contact with eyes.
  - Avoid contact with the skin.
  - Avoid long-term or repeated skin contact. Do not breathe gas/vapour/aerosol.
  - Take precautionary measures against static discharge. Keep away from sources of ignition - No smoking.
- Other operational conditions affecting consumer exposure No special measures required.
- Other operational conditions affecting consumer exposure during the use of the product Not applicable.
- Risk management measures
  - Worker protection
  - Organisational protective measures No special measures required.
  - Technical protective measures
    - Ensure good ventilation/exhaustion at the workplace.
    - Ensure that suitable extractors are available on processing machines
    - Provide explosion-proof electrical equipment.
  - Personal protective measures
    - Do not inhale gases / fumes / aerosols.
    - Avoid contact with the skin. Avoid contact with the eyes. Tightly sealed goggles
  - Use suitable respiratory protective device in case of insufficient ventilation.
  - Protective gloves
    - The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
    - Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
    - Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
  - Suitable respiratory protective device recommended. Wear respiratory Type A Filter or better [PPE22] Wear Butyl rubber gloves
- Measures for consumer protection Ensure adequate labelling.
- Environmental protection measures
  - Water
    - Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required.
  - Disposal measures
    - Disposal must be made according to official regulations.
    - Ensure that waste is collected and contained.
  - Disposal procedures
Must not be disposed together with household garbage. Do not allow product to reach sewage system.

- Waste type: Partially emptied and uncleaned packaging
- Exposure estimation
  - Worker (dermal) The highest dermal exposure to be expected is 0.685 mg / kg / day.
  - Worker (inhalation) The highest inhalative exposure to be expected is 0.675 ppm.
- Environment
  - The highest environmental exposure to be expected for surface waters is 0.0013 mg / L.
  - The highest exposure to be expected for humans via environment is 0.007 mg / kg body weight / day.
- Consumer Not relevant for this Exposure Scenario.
- Guidance for downstream users No further relevant information available.

Annex: Exposure scenario 2

- Short title of the exposure scenario ES2 Use as monomer (industrial)
- Sector of Use
  - SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
  - SU9 Manufacture of fine chemicals
  - SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
- Product category PC19 Intermediate
- Process category
  - PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
  - PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
  - PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
  - PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities.
  - PROC15 Use as laboratory reagent.
- Environmental release category
  - ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
- Description of the activities / processes covered in the Exposure Scenario.
  - See full text of the descriptors in section 1.
- Conditions of use
- Duration and frequency: 5 workdays/week.
- Worker daily exposure up to 15 minutes.
- Physical parameters
  - The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
  - Physical state: Fluid.
  - Concentration of the substance in the mixture: Raw material.
- Used amount per time or activity: According to directions for use. not relevant tons per day.
- Other operational conditions
- Other operational conditions affecting environmental exposure: No special measures required.
- Other operational conditions affecting worker exposure
  - Avoid contact with eyes.
  - Avoid contact with the skin.
  - Avoid long-term or repeated skin contact. Do not breathe gas/vapour/aerosol.
  - Take precautionary measures against static discharge. Keep away from sources of ignition - No smoking.
- Other operational conditions affecting consumer exposure
No special measures required.
Keep out of the reach of children.

- Other operational conditions affecting consumer exposure during the use of the product Not applicable.
- Risk management measures
- Worker protection
- Organisational protective measures No special measures required.
- Technical protective measures
  Ensure good ventilation/exhaustion at the workplace.
  Ensure that suitable extractors are available on processing machines
  Provide explosion-proof electrical equipment.
- Personal protective measures
  Do not inhale gases / fumes / aerosols.
  Avoid contact with the skin. Avoid contact with the eyes. Tightly sealed goggles Protective gloves
  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
  Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
  Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
  Suitable respiratory protective device recommended.
  In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
  Wear respiratory Type A filter or better [PPE22] Butyl rubber gloves
- Measures for consumer protection
  Ensure adequate labelling.
  Keep locked up and out of the reach of children.
- Environmental protection measures.
  Water.
  Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required.
- Disposal measures
  Disposal must be made according to official regulations.
  Ensure that waste is collected and contained.
- Disposal procedures
  Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- Waste type Partially emptied and uncleaned packaging
- Exposure estimation
  - Worker (dermal) The highest dermal exposure to be expected is 0.686 mg / kg / day.
  - Worker (inhalation) The highest inhalative exposure to be expected is 0.675 ppm.
  - Environment
    The highest exposure to be expected for humans via environment is 0.092 mg / kg body weight / day.
    The highest environmental exposure to be expected for surface waters is 0.0017 mg / L.
- Consumer Not relevant for this Exposure Scenario.
- Guidance for downstream users No further relevant information available.