



SAFETY DATA SHEET EPICHLOROHYDRIN

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

1.1. Product identifier

Product name	EPICHLOROHYDRIN
REACH registration number	01-2119457436-33-0021
CAS number	106-89-8
EU index number	603-026-00-6
EC number	203-439-8

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) P.O.BOX - 11919 Jubail Industrial City - 31961 Saudi Arabia Tel. +966 13 3478888 ext 351 Fax. +966 13 3476705 safety@nama.com.sa
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EPICHLOROHYDRIN

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

1.4. Emergency telephone number

Emergency telephone JANA
 Tel. +966 509058826
 Tel. +966 501580466

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 Not Classified

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008 The substance is classified and labelled according to the CLP regulation.

EC number 203-439-8

Pictogram



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.

Precautionary statements P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 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/ 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.
 P405 Store locked up.
 P501 Dispose of contents/ container in accordance with national regulations.

2.3. Other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances

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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

Ingestion	IF SWALLOWED: Do not induce vomiting. Get medical attention immediately. Promptly get affected person to drink large volumes of water to dilute the swallowed chemical.
Skin contact	IF ON SKIN: Wash skin thoroughly with soap and water.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove any contact lenses and open eyelids wide apart. Get medical attention immediately.

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

Notes for the doctor	No information available.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Water spray, dry powder or carbon dioxide. Alcohol-resistant foam.
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5.2. Special hazards arising from the substance or mixture

Specific hazards	No information available.
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5.3. Advice for firefighters

Special protective equipment for firefighters	Wear suitable protective equipment, including gloves, goggles/face shield, respirator, boots, clothing or apron, as appropriate.
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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.
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6.2. Environmental precautions

Environmental precautions	Flush contaminated area with plenty of water.
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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.
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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. Handle and open container with care.

Information about fire - and explosion protection Eliminate all ignition sources if safe to do so. Do not smoke in work area. Take precautionary measures against static discharges. In case of insufficient ventilation, wear suitable respiratory equipment.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions No special storage precautions required.

Storage class Keep container tightly sealed when not in use.

7.3. Specific end use(s)

Specific end use(s) No information available.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

MAK (Germany)/MAK (EU) Long-term value: 200 mg/m³, 300 ppm

DNEL Workers - Oral, Inhalation; 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



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.

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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

Appearance	Fluid
Colour	Colourless.
Odour	Like Chlorine.
Melting point	-57.2°C
Initial boiling point and range	116°C (DIN 51751)
Flash point	28°C (DIN 51755)
Vapour pressure	16 hPa
Density	1.18 g/m ³
Solubility(ies)	60 g/l @20°C
Auto-ignition temperature	385°C (DIN 51794)
Viscosity	Not determined.
Explosive properties	Not considered to be explosive.
Organic solvents	0.0%
VOC (EC)	0,00%
VOC (CH)	0,00%

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	No information available.
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10.2. Chemical stability

Stability	Avoid the following conditions: Heat, sparks, flames. Stable at normal ambient temperatures and when used as recommended.
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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	No potentially hazardous reactions known.
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10.4. Conditions to avoid

Conditions to avoid	No information available.
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10.5. Incompatible materials

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Materials to avoid Keep away from heat, sparks and open flame. Avoid contact with strong oxidising agents. The following materials may react strongly with the product: Strong acids. Strong alkalis. Amines. Aluminium.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon monoxide (CO). Carbon dioxide (CO₂). Hydrogen chloride (HCl). Phosgene (COCl₂).

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

Skin corrosion/irritation Causes severe skin burns and eye damage.

Serious eye damage/irritation

Serious eye damage/irritation Causes severe skin burns and eye damage.

Respiratory sensitisation

Respiratory sensitisation Toxic if inhaled.

Skin sensitisation

Skin sensitisation May cause an allergic skin reaction.

Germ cell mutagenicity

Genotoxicity - in vitro Based on available data the classification criteria are not met.

Carcinogenicity

Carcinogenicity May cause cancer.

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

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

12.1. Toxicity

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours: 23.9 mg/l, Daphnia magna

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 Dispose of waste via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labelled with their contents. Remove contamination with soap and water or recognised skin cleansing agent.

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

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 2023

UN No. (IMDG) 2023

UN No. (ICAO) 2023

14.2. UN proper shipping name

Proper shipping name (ADR/RID) UN2023 EPICHLOROHYDRIN

Proper shipping name (IMDG) EPICHLOROHYDRIN

Proper shipping name (ICAO) EPICHLOROHYDRIN

14.3. Transport hazard class(es)

ADR/RID class 6.1

ADR/RID subsidiary risk 3

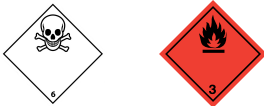
ADR/RID classification code TF1

ADR/RID label 6.1

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IMDG class	6.1
IMDG subsidiary risk	3
ICAO class/division	6.1
ICAO subsidiary risk	3
ADN class	6.1
ADN subsidiary risk	3

Transport labels



14.4. Packing group

ADR/RID packing group	II
IMDG packing group	II
ICAO packing group	II

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant



14.6. Special precautions for user

EmS	F-E, S-D
Stowage Category	A
ADR transport category	2
Emergency Action Code	•3W
Hazard Identification Number (ADR/RID)	63
Tunnel restriction code	(D/E)

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

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

ADR and 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
Transport Category:	2

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Tunnel Restriction Code: D/E

UN "Model Regulation": UN 2023 EPICHLOROHYDRIN, 6.1 (3), II

SECTION 15: Regulatory information

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

National regulations Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

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 Transport Association"(IATA).

ICAO: International Civil Aviation Organisation

ICAO-TI: Technical Instructions for the Safe Transport of Dangerous Goods by Air.

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 date 07/08/2018

Revision 00

SDS number 4593

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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.

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) 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
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
Filter AX
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.