

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

· **1.1 Product identifier**

· Trade name: **Epichlorohydrin**

· CAS Number:

106-89-8

· EC number:

203-439-8

· Index number:

603-026-00-6

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

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:

Monomer in industrial manufacture of polymeric ion exchange resins, monomer in manufacture of wet strength resins for polymeric paper coating products and monomer for industrial manufacture of polymeric rubber products.

· **Title of the Application for the following the sector of use, Product category, Process category, Environmental release category**

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

· **Article category** -

· **Application of the substance / the mixture** Chemicals for synthesis

· **1.3 Details of the supplier of the safety data sheet**

· **Manufacturer/Supplier:**

Jubail Chemical Industries Company (JANA)

P.O.Box - 11919

Jubail Industrial City - 31961

Saudi Arabia

Phone + 966 13 347 8888 ext. 555 fax + 966 13 347 6705

· **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

· **Further information obtainable from:** safety: e-mail: safety@nama.com.sa

· **1.4 Emergency telephone number:**

Jana

tel +966 509058826

Trade name: Epichlorohydrin

(Contd. of page 1)

SECTION 2: Hazards identification

- 2.1 Classification of the substance or mixture
- Classification according to Regulation (EC) No 1272/2008



flame

Flam. Liq. 3 H226 Flammable liquid and vapour.



skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed.
Acute Tox. 3 H311 Toxic in contact with skin.
Acute Tox. 3 H331 Toxic if inhaled.



health hazard

Carc. 1B H350 May cause cancer.



corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.



Skin Sens. 1 H317 May cause an allergic skin reaction.

- 2.2 Label elements
- Labelling according to Regulation (EC) No 1272/2008
The substance is classified and labelled according to the CLP regulation.
- Hazard pictograms



GHS02



GHS05



GHS06



GHS08

- 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.

(Contd. on page 3)

Trade name: Epichlorohydrin

(Contd. of page 2)

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.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Additional information:**

Restricted to professional users.

· **2.3 Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

SECTION 3: Composition/information on ingredients

· **3.1 Chemical characterisation: Substances**

· **CAS No. Description**

106-89-8 1-chloro-2,3-epoxypropane

· **Identification number(s)**

· **EC number:** 203-439-8

· **Index number:** 603-026-00-6

SECTION 4: First aid measures

· **4.1 Description of first aid measures**

· **General information:**

Immediately remove any clothing soiled by the product.

Remove breathing equipment only after contaminated clothing have been completely removed.

In case of irregular breathing or respiratory arrest provide artificial respiration.

· **After inhalation:**

Supply fresh air or oxygen; call for doctor.

In case of unconsciousness place patient stably in side position for transportation.

· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.

· **After swallowing:**

Do not induce vomiting; call for medical help immediately.

Drink plenty of water and provide fresh air. Call for a doctor immediately.

· **Information for doctor:**

· **Most important symptoms and effects, both acute and delayed** No further relevant information available.

· **4.3 Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**

· **Suitable extinguishing agents:**

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· **5.2 Special hazards arising from the substance or mixture** No further relevant information available.

· **5.3 Advice for firefighters**

· **Protective equipment:** Mouth respiratory protective device.

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(Contd. on page 4)

Trade name: Epichlorohydrin

(Contd. of page 3)

SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
- **6.2 Environmental precautions:** Dilute with plenty of water.
- **6.3 Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralising agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
- **Information about fire - and explosion protection:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep container tightly sealed.
- **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**

106-89-8 1-chloro-2,3-epoxypropane

MAK (EU)	Long-term value: 200 mg/m ³ , 300 ppm
MAK (Switzerland)	Long-term value: 8 mg/m ³ , 2 ppm
	H S C ₁ R _f _i ;

· **DNELs**

106-89-8 1-chloro-2,3-epoxypropane

Inhalative	Kurzzeit-Acute	1.52 mg/m ³ (Workers)
	Langzeit-Long term	1.52 mg/m ³ (Workers)

· **PNECs**

106-89-8 1-chloro-2,3-epoxypropane

STP (Sewage treatment plant)	35 mg/l
Freshwater	0.0106 mg/l
Freshwater sedim.	0.0572 mg/kg/dwt
Marine water	0.00106 mg/l
Marine water sed.	0.00572 mg/kg/dwt

(Contd. on page 5)

Trade name: Epichlorohydrin

(Contd. of page 4)

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

· **8.2 Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.

· **Respiratory protection:**

Filter AX
Suitable respiratory protective device recommended.

· **Protection of hands:**



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

· **Material of gloves**

Butyl rubber, BR

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Recommended thickness of the material: ≥ 0.7 mm

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

For the mixture of chemicals mentioned below the penetration time has to be at least 480 minutes (Permeation according to EN 374 Part 3: Level 6).

· **Eye protection:**



Tightly sealed goggles

SECTION 9: Physical and chemical properties

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

· **General Information**

· **Appearance:**

Form:	Fluid
Colour:	Colourless
Odour:	Like chlorine

· **pH-value:** Not determined.

· **Change in condition**

Melting point/freezing point:	-57,2 °C
Initial boiling point and boiling range:	116 °C (DIN 51751)

· **Flash point:** 28 °C (DIN 51755)

· **Ignition temperature:** 385 °C (DIN 51794)

(Contd. on page 6)

Trade name: Epichlorohydrin

(Contd. of page 5)

· Explosive properties:	Product does not present an explosion hazard.
· Explosion limits:	
Lower:	2,3 Vol %
Upper:	34,4 Vol %
· Vapour pressure at 20 °C:	16 hPa
· Density at 20 °C:	1,18 g/cm ³
· Solubility in / Miscibility with water at 20 °C:	60 g/l
· Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
· Solvent content:	
Organic solvents:	0,0 %
VOC (EC)	0.00 %
VOC (CH)	0.00 %
· 9.2 Other information	No further relevant information available.

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
Heat, flames and sparks.
No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:**
Heat, sparks, open flames.
Strong oxidising materials, strong alcalis, strong acids, amines, aluminium.
- **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)
Phosgen

SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity**
Toxic if swallowed, in contact with skin or if inhaled.

· **LD/LC50 values relevant for classification:**

ATE (Acute Toxicity Estimates)

Oral	LD50	175 mg/kg (rat)
Dermal	LD50	515 mg/kg (rabbit)

106-89-8 1-chloro-2,3-epoxypropane

Oral	LD50	175 mg/kg (rat)
Dermal	LD50	515 mg/kg (rabbit)
Inhalative	LC50/4 h	4,114 mg/l (rat)

(Contd. on page 7)

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Trade name: Epichlorhydrin

(Contd. of page 6)

- **Primary irritant effect:**
- **Skin corrosion/irritation**
Causes severe skin burns and eye damage.
- **Serious eye damage/irritation**
Causes severe skin burns and eye damage.
- **By Inhalation:** Toxic if inhaled.
- **By ingestion:** Toxic if swallowed
- **Respiratory or skin sensitisation**
May cause an allergic skin reaction.
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity**
May cause cancer.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity:

106-89-8 1-chloro-2,3-epoxypropane

EC50 (48h) 23.9 mg/l (daphnia magna)

- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:** Must not reach sewage water or drainage ditch undiluted or unneutralised.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Recommendation

Must not be disposed together with household garbage. Do not allow product to reach sewage system.
Hand over to hazardous waste disposers.

European waste catalogue

07 01 04* other organic solvents, washing liquids and mother liquors

- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

SECTION 14: Transport information

14.1 UN-Number

ADR, IMDG, IATA

UN2023

14.2 UN proper shipping name




ADR

2023 EPICHLOROHYDRIN

(Contd. on page 8)

Trade name: Epichlorohydrin

(Contd. of page 7)

<ul style="list-style-type: none"> · IMDG · IATA 	<p>EPICHLOROHYDRIN Epichlorohydrin</p>
<ul style="list-style-type: none"> · 14.3 Transport hazard class(es) · ADR 	
	
<ul style="list-style-type: none"> · Class · Label 	<p>6.1 Toxic substances. 6.1+3</p>
<ul style="list-style-type: none"> · IMDG 	
	
<ul style="list-style-type: none"> · Class · Label 	<p>6.1 Toxic substances. 6.1/3</p>
<ul style="list-style-type: none"> · IATA 	
	
<ul style="list-style-type: none"> · Class · Label 	<p>6.1 Toxic substances. 6.1 (3)</p>
<ul style="list-style-type: none"> · 14.4 Packing group · ADR, IMDG, IATA 	<p>II</p>
<ul style="list-style-type: none"> · 14.5 Environmental hazards: · Marine pollutant: 	<p>Yes (Symbol fish and tree)</p>
<ul style="list-style-type: none"> · 14.6 Special precautions for user · Danger code (Kemler): · EMS Number: · Stowage Category · Stowage Code 	<p>Warning: Toxic substances. 63 F-E,S-D A SW2 Clear of living quarters.</p>
<ul style="list-style-type: none"> · 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code 	<p>Not applicable.</p>
<ul style="list-style-type: none"> · Transport/Additional information: 	
<ul style="list-style-type: none"> · ADR · Excepted quantities (EQ): · Limited quantities (LQ) · Excepted quantities (EQ) 	<p>E4 100 ml Code: E4 Maximum net quantity per inner packaging: 1 ml Maximum net quantity per outer packaging: 500 ml</p>
<ul style="list-style-type: none"> · Transport category · Tunnel restriction code 	<p>2 D/E</p>
<ul style="list-style-type: none"> · IMDG · Limited quantities (LQ) · Excepted quantities (EQ) 	<p>100 ml Code: E4 Maximum net quantity per inner packaging: 1 ml Maximum net quantity per outer packaging: 500 ml</p>

(Contd. on page 9)

Trade name: Epichlorohydrin

(Contd. of page 8)

· UN "Model Regulation":

UN 2023 EPICHLOROXYDRIN, 6.1 (3), II

SECTION 15: Regulatory information

- 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
- Labelling according to Regulation (EC) No 1272/2008
The substance is classified and labelled according to the CLP regulation.
- Hazard pictograms



GHS02 GHS05 GHS06 GHS08

- 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 [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.*
 - P405 *Store locked up.*
 - P501 *Dispose of contents/container in accordance with local/regional/national/international regulations.*
- Directive 2012/18/EU
- Qualifying quantity (tonnes) for the application of lower-tier requirements 50 t
- Qualifying quantity (tonnes) for the application of upper-tier requirements 200 t
- 15.2 Chemical safety assessment: A Chemical Safety Assessment has been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing SDS: product safety department
- Abbreviations and acronyms:
 - RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
 - IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
 - ICAO: International Civil Aviation Organisation
 - ICAO-TI: Technical Instructions by the "International Civil Aviation Organisation" (ICAO)
 - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
 - IMDG: International Maritime Code for Dangerous Goods
 - IATA: International Air Transport Association
 - GHS: Globally Harmonised System of Classification and Labelling of Chemicals
 - EINECS: European Inventory of Existing Commercial Chemical Substances

(Contd. on page 10)

Safety data sheet
according to 1907/2006/EC, Article 31



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Trade name: Epichlorohydrin

(Contd. of page 9)

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VOCV: Lenkungsabgabe auf flüchtigen organischen Verbindungen, Schweiz (Swiss Ordinance on volatile organic compounds)

VOC: Volatile Organic Compounds (USA, EU)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Flam. Liq. 3: Flammable liquids – Category 3

Acute Tox. 3: Acute toxicity – Category 3

Skin Corr. 1B: Skin corrosion/irritation – Category 1B

Skin Sens. 1: Skin sensitisation – Category 1

Carc. 1B: Carcinogenicity – Category 1B

· *** Data compared to the previous version altered.**

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(Contd. on page 11)

Trade name: Epichlorohydrin

(Contd. of page 10)

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.
? 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.*

(Contd. on page 12)

Trade name: Epichlorohydrin

(Contd. of page 11)

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.

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(Contd. on page 13)

Trade name: Epichlorohydrin

(Contd. of page 12)

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.

(Contd. on page 14)

Trade name: Epichlorohydrin

(Contd. of page 13)

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.