Safety Data Sheet

Hydrogen chloride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Referentni broj: RS-HCl-069
Issue date: 04/29/2022 Revision date: 09/01/2024 Supersedes: 09/01/2023 Version: 1C

Danger

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

1.1. Product identifier

Trade name	:	Hydrogen chloride 2.8
SDS no	:	RS-HCl-069
Other means of identification	:	Hydrochloric acid
CAS no.	:	7647-01-0
EC no.	:	231-595-7
Index no.	:	017-002-00-2
REACH no.	:	01-2119484862-27
Chemical formula	:	HCl

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

Relevant identified uses	:	See the list of identified uses and exposure scenarios in the annex of the safety data sheet. Industrial and professional uses. Perform risk assessment prior to use.
Uses advised against	:	Consumer use. Uses other than those listed above are not supported, contact your supplier for more information on other uses.

1.3. Details of the supplier of the safety data sheet

Messer Tehnogas AD Beograd
Banjicki put , 62
RS– 11090 Belgrade, Serbia
T +381 11 35 37 200 - F +381 11 35 37 291
postoffice@messer.rs - www.messer.rs

1.4. Emergency telephone number

Emergency telephone number	:	Poison Control Center, VMA Crnotravska 17, Belgrade Serbia Tel. : +381(0) 11 360 8440 (24h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Gases under pressure : Liquefied gas	H280
Health hazards	Skin corrosion/irritation, Category 1, Sub-Category 1A	H314
	Acute toxicity (inhal.), Category 3	H331

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS04 GHS05 GHS06

Signal word (CLP) : Danger

Hazard statements (CLP)	:	H280 - Contains gas under pressure; may explode if heated. H314 - Causes severe skin burns and eye damage. H331 - Toxic if inhaled. EUH071 - Corrosive to the respiratory tract.
Precautionary statements (CLP)		
- Prevention	:	P260 - Do not breathe gas, vapours. P264 - Wash exposed body parts thoroughly after handling. P271 - Use only outdoors or in a well-ventilated area. P280 - Wear protective gloves, protective clothing, eye protection, face protection, hand protection.
- Response	:	P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303+P361+P353 - IF ON SKIN (or hair): Take off Immediately all contaminated clothing. Rinse skin with water / shower. P304+P340 - IF INHALED : Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 - Immediately call a POISON CENTER or doctor. P321 - Specific treatment. P363 - Wash contaminated clothing before reuse.
- Storage	:	P403+P410+P233 - Protect from sunlight. Store in a well-ventilated place. Keep container tightly closed. P405 - Store locked up.
- Disposal	:	P501 - Dispose of container in accordance with local, regional, national and/or international regulation.

2.3. Other hazards

Not classified as PBT or vPvB.
The substance/mixture has no endocrine disrupting properties.

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP] ATE, EUH-statements, M-Factors
Hydrogen chloride	CAS no.: 7647-01-0 EC no.: 231-595-7 Index no.: 017-002-00-2 REACH no.: 01-2119484862-27	≤ 100	Press. Gas (Liq.), H280 Skin Corr. 1A, H314 Acute Tox. 3 (Inhalation), H331

Name	Product identifier	Specific concentration limits (%)
Hydrogen chloride	CAS no.: 7647-01-0 EC no.: 231-595-7 Index no.: 017-002-00-2 REACH no.: 01-2119484862-27	(1 ≤ C ≤ 100) STOT SE 3; H335

Contains no other components or impurities which will influence the classification of the product.

3.2. Mixtures Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Get immediate medical help. Provide oxygen. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Perform cardiopulmonary resuscitation in case of respiratory arrest. Avoid mouth-to-mouth artificial respiration due to the danger to the rescuer.
- Skin contact : Immediately call a POISON CENTER or doctor. Carefully remove contaminated clothing. Rinse clothing with water before removing or use gloves. In case of frostbite spray with water for at least 15 minutes. Mandatory wash contaminated clothing and footwear before reuse. Chemical injuries must be treated by a doctor.
- Eye contact : Get immediate medical attention or call a poison control center. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses. Continue rinsing. Chemical injuries must be treated by a doctor.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product.
Material is destructive to tissue of the mucuous membranes and upper respiratory tract.
Cough, shortness of breath, headache, nausea. See section 11.

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

Obtain medical assistance. Loosen tight clothing, such as a collar, tie or belt.
Place the unconscious person in a lateral position.
Treat with corticosteroid spray as soon as possible after inhalation.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
Product does not burn, use fire control measures appropriate for the surrounding fire.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products : None that are more hazardous than the product itself.

5.3. Advice for firefighters

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product.
Use water spray or fog to knock down fire fumes if possible.
Move containers away from the fire area if this can be done without risk.

Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Act in accordance with local emergency plan. Try to stop release.
Evacuate area. Ensure adequate air ventilation. Stay upwind.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
See section 8 of the SDS for more information on personal protective equipment.

For emergency responders	:	Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use chemically protective clothing. Monitor concentration of released product. See section 5.3 of the SDS for more information.

6.2. Environmental precautions

Reduce vapour with fog or fine water spray.
Try to stop release.

6.3. Methods and material for containment and cleaning up

Hose down area with water.
Wash contaminated equipment or sites of leaks with copious quantities of water.

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe use of the product	:	The product must be handled in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke while working with the product. Wash hands after use. Only experienced and properly instructed persons should handle gases under pressure. Wear personal protective equipment (See section 8). Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularily) checked for leaks before use. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Installation of a cross purge assembly between the container and the regulator is recommended. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis. Avoid exposure, obtain special instructions before use. Avoid contact with aluminium. Use only lubricants and sealings approved for the specific gas service. Do not breathe gas. Avoid release of product into work area.
Safe handling of the gas receptacle	:	Refer to supplier's container handling instructions. Protect containers from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If the protection cap is too tight, remove it with adjustable wrench. Never insert sharp objects into the cavities of the cap, this can lead to damage to the valve and leakage. Open valve slowly to avoid pressure shock. If user experiences any difficulty operating valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not allow backfeed into the container. Suck back of water into the container must be prevented. Do not remove or deface labels provided by the supplier for the identification of the content of the container.

7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers.
Containers should not be stored in conditions likely to encourage corrosion.
Container valve guards or caps should be in place.
Containers should be stored in the vertical position and properly secured to prevent them from falling over.
Stored containers should be periodically checked for general condition and leakage.
Keep container below 50°C in a well ventilated place.
Store containers in location free from fire risk and away from sources of heat and ignition.
Keep away from combustible materials.
Store locked up.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

hydrogen chloride (7647-01-0)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Hydrogen chloride
IOEL TWA	8 mg/m³
	5 ppm
IOEL STEL	15 mg/m³
	10 ppm
Regulatory reference	COMMISSION DIRECTIVE 2000/39/EC
Serbia - Occupational Exposure Limits	
Local name	водоник хлорид, хлороводоник
OEL TWA	8 mg/m³
	5 ppm
OEL STEL	15 mg/m³
	10 ppm
Remark	ЕУ* – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2000/39/ЕЗ (прва листа)
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)

hydrogen chloride (7647-01-0)	
DNEL: Derived no effect level (Workers)	
Acute - local effects, inhalation	15 mg/m³
Long-term - local effects, inhalation	8 mg/m³

PNEC (Predicted No-Effect Concentration) : None established.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation.
Product to be handled in a closed system.
Systems under pressure should be regularly checked for leakages.
Ensure exposure is below occupational exposure limits (where available).
Gas detectors should be used when toxic gases may be released.
Consider the use of a work permit system e.g. for maintenance activities.

8.2.2. Individual protection measures, e.g. personal protective equipment

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.
The following recommendations should be considered:
PPE compliant to the recommended EN/ISO standards should be selected.

• Eye/face protection : Wear goggles and a face shield when transfilling or breaking transfer connections.
Provide readily accessible eye wash stations and safety showers.
Standard EN 166 - Personal eye-protection - specifications.

• Skin protection

- Hand protection : Wear working gloves when handling gas containers.
Wear chemically resistant protective gloves.
Standard EN 374 - Protective gloves against chemicals.
Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher. Recommended types include wrist gloves from leather or synthetic material with equivalent performance, fabric gloves, fabric gloves with leather palms.
Permeation time: minimum >480min long term exposure: material / thickness [mm] Chloroprene rubber (CR) 0,5.
Consult glove manufacturer´s product information on material suitability and material thickness.
The breakthrough time of the selected gloves must be greater than the intended use period.
Standard EN 511 - Cold insulating gloves, performance level 1 or higher. Recommended types include insulated gauntlets or gloves specifically selected to prevent liquid penetration and ingress of cryogenic liquids and to provide mechanical resistance.

- Other : Keep suitable chemically resistant protective clothing readily available for emergency use.
Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.
Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

• Respiratory protection : Recommended: Filter E (yellow).
Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.
Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.
Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.
Gas filters do not protect against oxygen deficiency.
Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks .
Keep self contained breathing apparatus readily available for emergency use.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

• Thermal hazards : None in addition to the above sections.

8.2.3. Environmental exposure controls

Refer to local regulations for restriction of emissions to the atmosphere.
See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance		
- Physical state at 20°C / 101.3kPa	:	Gas.
- Colour	:	Gives off white fumes in moist air. Colourless.
Odour	:	Pungent.
Melting point / Freezing point	:	-114 °C
Boiling point	:	-85 °C
Flammability	:	Non flammable.
Lower explosion limit	:	Not applicable.
Upper explosion limit	:	Not applicable.
Flash point	:	Not applicable for gases and gas mixtures.
Auto-ignition temperature	:	Non flammable.
Decomposition temperature	:	Not applicable.
pH	:	If dissolved in water pH-value will be affected.
Viscosity, kinematic	:	No reliable data available.
Water solubility [20°C]	:	720000 mg/l
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable for inorganic products.
Vapour pressure [20°C]	:	42.6 bar(a)
Vapour pressure [50°C]	:	80.6 bar(a)
Density and/or relative density	:	Not applicable for gases and gas mixtures.
Relative vapour density (air=1)	:	1.3
Particle characteristics	:	Not applicable for gases and gas mixtures. Nanoforms are not relevant for gases and gas mixtures.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Explosion limits	:	Not known.
Oxidising properties	:	No oxidising properties.
Critical temperature [°C]	:	51.4 °C

9.2.2. Other safety characteristics

Molar mass	:	36.5 g/mol
Other data	:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May react violently with alkalis. Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas. With water causes rapid corrosion of some metals.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. Incompatible materials

Moisture, some metals, alkalis.
For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity : Toxic if inhaled.

Hydrogen chloride (7647-01-0)	
LC50 Inhalation - Rat [ppm]	2810 ppm/1h (ADR) 588 ppm/4h (CLP)

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

Serious eye damage/irritation : Causes serious eye damage.

Respiratory or skin sensitisation : No known effects from this product.

Germ cell mutagenicity : No known effects from this product.

Carcinogenicity : No known effects from this product.

Toxic for reproduction : Fertility : No known effects from this product.

Toxic for reproduction : unborn child : No known effects from this product.

STOT-single exposure : Severe corrosion to the respiratory tract at high concentrations.

STOT-repeated exposure : No known effects from this product.

Target organ(s) : Central nervous system.

Aspiration hazard : Not applicable for gases and gas mixtures.

11.2. Information on other hazards

Other information : Delayed fatal pulmonary oedema possible.
The substance/mixture has no endocrine disrupting properties.

SECTION 12: Ecological information

12.1. Toxicity

Assessment : Classification criteria are not met.

EC50 48h - Daphnia magna [mg/l] : 0.45 mg/l

EC50 72h - Algae [mg/l] : 0.73 mg/l

LC50 96 h - Fish [mg/l] : 20.5 mg/l

12.2. Persistence and degradability

Assessment : Not applicable for inorganic products.

12.3. Bioaccumulative potential

Assessment : No data available.
Product is an inorganic gas with a low potential to bioaccumulate in aquatic species.

12.4. Mobility in soil

Assessment : Because of its high volatility, the product is unlikely to cause ground or water pollution.
Partition into soil is unlikely.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

12.6. Endocrine disrupting properties

Assessment : The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.

Effect on the ozone layer : No effect on the ozone layer.

Effect on global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction. Contact supplier if guidance is required.
Ensure that the emission levels from local regulations or operating permits are not exceeded.
Refer to the EIGA code of practice Doc.30/21 "Disposal of Gases", downloadable at http://www.eiga.eu for more guidance on suitable disposal methods. Must not be discharged to atmosphere.
Return unused product in original container to supplier.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 04 *: Gases in pressure containers (including halons) containing hazardous substances.

13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transport information

14.1. UN number or ID number

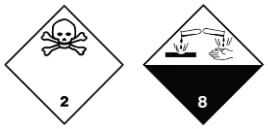
In accordance with ADR / RID / IMDG / IATA / ADN
UN-No. : 1050

14.2. UN proper shipping name

Transport by road/rail/inland waterways (ADR/RID/ADN) : HYDROGEN CHLORIDE, ANHYDROUS
Transport by air (ICAO-TI / IATA-DGR) : Hydrogen chloride, anhydrous
Transport by sea (IMDG) : HYDROGEN CHLORIDE, ANHYDROUS

14.3. Transport hazard class(es)

Labelling :



2.3 : Toxic gases.
8 : Corrosive substances.

Transport by road/rail/inland waterways (ADR/RID/ADN)
Class : 2
Classification code : 2TC
Hazard identification number : 268
Tunnel Restriction : C/D - Tank carriage : Passage forbidden through tunnels of category C, D and E. Other carriage : Passage forbidden through tunnels of category D and E

Transport by sea (IMDG)
Class / Div. (Sub. risk(s)) : 2.3 (8)
Emergency Schedule (EmS) - Fire : F-C
Emergency Schedule (EmS) - Spillage : S-U

14.4. Packing group

Transport by road/rail/inland waterways (ADR/RID/ADN) : Not applicable.
Transport by air (ICAO-TI / IATA-DGR) : Not applicable.
Transport by sea (IMDG) : Not applicable.

14.5. Environmental hazards

Transport by road/rail/inland waterways (ADR/RID/ADN) : None.
Transport by air (ICAO-TI / IATA-DGR) : None.
Transport by sea (IMDG) : None.

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail/inland waterways (ADR/RID/ADN)	:	P200.
Transport by air (ICAO-TI / IATA-DGR)		
Passenger and Cargo Aircraft	:	Forbidden.
Cargo Aircraft only	:	Forbidden.
Transport by sea (IMDG)	:	P200.
Special transport precautions	:	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

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

RS Regulations

Pravilnik o ograničenjima i zabranama proizvodnje, stavljanja u promet i korišćenja hemikalija ("Sl. glasnik RS", br. 105/2013, 52/2017, 21/2019 i 29/2024)	:	None.
Pravilnik o izvozu i uvozu određenih opasnih hemikalija („Sl. glasnik RS“ br. 93/23)	:	None.
Pravilnik o Listi opasnih materija i njihovim količinama i kriterijumima za određivanje vrste dokumenta koje izrađuje operater seveso postrojenja, odnosno kompleksa ("Sl. glasnik RS", br. 41/2010, 51/2015 i 50/2018)	:	Listed.

EU Regulations

Restrictions on use	:	None.
Other information, restriction and prohibition regulations	:	Not listed on the PIC list (Regulation EU 649/2012). Not listed on the POP list (Regulation EU 2019/1021).
Seveso Directive : 2012/18/EU (Seveso III)	:	Listed.

15.2. Chemical safety assessment

A CSA has been carried out.

SECTION 16: Other information

Indication of changes	:	Revised safety data sheet in accordance with commission regulation (EU) No 2020/878. In Section 2, the Safety Data Sheet is supplemented with information about label elements and other hazards. In Section 5, the Safety Data Sheet is supplemented with information about firefighting measures. In Section 7, the Safety Data Sheet is supplemented with information conditions for safe storage, including any incompatibilities. In Section 8, the Safety Data Sheet is supplemented with information about exposure control and personal protection. In Section 11, the Safety Data Sheet is supplemented with information about toxicological information. In Section 13, the Safety Data Sheet is supplemented with information about waste treatment methods. In Section 15, the Safety Data Sheet is supplemented with regulatory information.

Abbreviations and acronyms	:	ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road ATE - Acute Toxicity Estimate CAS - Chemical Abstract Service number CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008 CSA - Chemical Safety Assessment DNEL - Derived No Effect Levels EINECS - European Inventory of Existing Commercial Chemical Substances EC- European Community number EIGA - European Industrial Gases Association EN - European Standard IATA - International Air Transport Association ICAO - International Civil Aviation Organization IMDG code - International Maritime Dangerous Goods IMO - International Maritime Organization LC50 - Lethal Concentration to 50 % of a test population LD50 - Lethal Dose 50% LEL - Lower Explosive Limit OEL - Occupational exposure limits PBT - Persistent, Bioaccumulative and Toxic PNEC - Predicted No Effect Concentration PPE - Personal Protection Equipment REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006 RID - Regulations concerning the International Carriage of Dangerous Goods by Rail RMM - Risk Management Measures STOT - RE - Specific Target Organ Toxicity - Repeated Exposure STOT- SE - Specific Target Organ Toxicity - Single Exposure STEL - Short Term Exposure Limit TWA –8-hour total weight average UEL - Upper explosive limit UFI - Unique Formula Identifier UN - United Nations vPvB - Very Persistent and Very Bioaccumulative WGK - Water Hazard Class
Training advice	:	Receptacle under pressure. Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.
Further information	:	Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP). Key literature references and sources of data are maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at http://www.eiga.eu

Full text of H- and EUH-statements	
Acute Tox. 3* (Inhalation)	Acute toxicity (inhal.), Category 3*
EUH071	Corrosive to the respiratory tract.
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
H280	Contains gas under pressure; may explode if heated.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Skin Corr. 1A	Skin corrosion/irritation, Category 1, Sub-Category 1A
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation

DISCLAIMER OF LIABILITY	:	Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

End of Safety Data Sheet

Annex to the safety data sheet

This Annex documents the Exposure Scenarios (ESs) related to the identified uses of the registered substance. The ESs detail protective measures for workers and the environment in addition to those described in sections 7, 8, 11, 12 and 13 of the SDS that are required to ensure that the potential exposure to workers and the environment remains within acceptable levels for each of the identified uses.

Table of contents of the Annex

1. EIGA069-1: Industrial uses, closed contained conditions

1.1. Title section

Industrial uses, closed contained conditions	
ES Ref.: EIGA069-1 Revision date: 10/1/2016	

Processes, tasks, activities covered	Industrial uses, including product transfers and associated laboratory activities within different closed or contained systems

Environment	Use descriptors
CS1	ERC1, ERC2, ERC4, ERC6a, ERC6b, ERC8d

Worker	Use descriptors
CS2	PROC1
CS3	PROC2
CS4	PROC8b

Assessment method	ECETOC TRA 2.0

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: ERC1, ERC2, ERC4, ERC6a, ERC6b, ERC8d

ERC1	Manufacture of the substance
ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used, frequency and duration of use (or from service life)	
The actual tonnage handled per site is not considered to influence the immissions as such for this scenario as there is practically no release	
Emission Days (days/year)	260

Technical and organisational conditions and measures
Use appropriate abatement systems to ensure that the emission levels defined by local regulations are not exceeded.
Soil emission controls are not applicable as there is no direct release to soil
Ensure operatives are trained to minimise releases

Conditions and measures related to sewage treatment plant
Substance will dissociate upon contact with water, only the pH is affected, therefore after passing through the STP exposure is considered negligible and with no risk

Conditions and measures related to treatment of waste (including article waste)
See section 13 of the SDS

Other conditions affecting environmental exposure
No additional information

1.2.2. Control of worker exposure: PROC1

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≤ 8 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures
Handle product within a closed system
Apply a good standard of general or controlled ventilation when maintenance activities are carried out.
Ensure operatives are trained to minimise exposure
Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Conditions and measures related to personal protection, hygiene and health evaluation
See section 8 of the SDS.

Other conditions affecting workers exposure
Indoor use

1.2.3. Control of worker exposure: PROC2

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≤ 8 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures
Handle product within a closed system
Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
During indoor processes or in cases where natural ventilation is not sufficient, LEV should be in place at points were emissions could occur. Outdoor, LEV is not generally required.
Ensure samples are obtained under containment or extract ventilation.
Drain down and flush system prior to equipment break-in or maintenance.
Apply a good standard of general or controlled ventilation when maintenance activities are carried out.
Ensure operatives are trained to minimise exposure
Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Mandatory since the product is corrosive	Personal protection measures have to be applied in case of potential exposure only.
Wear gloves providing a minimum efficiency of (%):	95
Use suitable eye protection	
Wear suitable face shield	
Wear suitable working clothes	
Wear suitable coveralls to prevent exposure to the skin	
If inhalative exposure above the occupational exposure limit cannot be excluded, adequate respiratory protection equipment must be used.	
See section 8 of the SDS.	

Other conditions affecting workers exposure
Indoor use

1.2.4. Control of worker exposure: PROC8b

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≤ 4 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures
Handle product within a closed system
Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
During indoor processes or in cases where natural ventilation is not sufficient, LEV should be in place at points were emissions could occur. Outdoor, LEV is not generally required.
Ensure samples are obtained under containment or extract ventilation.
Fill containers at dedicated fill points supplied with local extract ventilation.
Drain down and flush system prior to equipment break-in or maintenance.
Apply a good standard of general or controlled ventilation when maintenance activities are carried out.
Ensure operatives are trained to minimise exposure
Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Mandatory since the product is corrosive	Personal protection measures have to be applied in case of potential exposure only.
Wear gloves providing a minimum efficiency of (%):	95
Use suitable eye protection	
Wear suitable face shield	
Wear suitable working clothes	
Wear suitable coveralls to prevent exposure to the skin	
If inhalative exposure above the occupational exposure limit cannot be excluded, adequate respiratory protection equipment must be used.	
See section 8 of the SDS.	

Other conditions affecting workers exposure
Indoor use

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: ERC1, ERC2, ERC4, ERC6a, ERC6b, ERC8d

Qualitative approach used to conclude safe use

1.3.2. Worker exposure: PROC1

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Dermal - Long-term - systemic effects		Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario	
Dermal - Acute - systemic effects		Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario	
Acute - Local - Inhalation	0.03 mg/m³		0.002
Long term - Local - Inhalation	0.015 mg/m³		0.002

1.3.3. Worker exposure: PROC2

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Dermal - Long-term - systemic effects		Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario	
Dermal - Acute - systemic effects		Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario	
Acute - Local - Inhalation	13.69 mg/m³	Indoor use, With LEV90%	0.913
Long term - Local - Inhalation	4.11 mg/m³	Indoor use, With LEV90%	0.514

1.3.4. Worker exposure: PROC8b

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Dermal - Long-term - systemic effects		Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario	
Dermal - Acute - systemic effects		Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario	
Acute - Local - Inhalation	13.69 mg/m³	Indoor use, With LEV90%	0.913
Long term - Local - Inhalation	4.11 mg/m³	Indoor use, With LEV90%	0.514

1.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

1.4.1. Environment

Guidance - Environment	Check that RMMs and OCs are as described above or of equivalent efficiency

1.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling see : http://www.ecetoc.org/tra

End of document