Safety Data Sheet

Chlorine

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Reference number: EIGA022-ALBNL
Issue date: 1-7-2017 Revision date: 1-1-2022 Supersedes version of: 1-7-2017 Version: 5.0

Danger

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

1.1. Product identifier

Trade name	:	Chlorine
SDS no	:	EIGA022-ALBNL
Other means of identification	:	Chlorine
	CAS-No.	: 7782-50-5
	EC-No.	: 231-959-5
	EC Index-No.	: 017-001-00-7
REACH registration No	:	01-2119486560-35
Chemical formula	:	Cl2

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. 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

THE NETHERLANDS:
AIR LIQUIDE BV
De Witbogt 1
5652 AG Eindhoven
the Netherlands-Nederland

BELGIUM:
L'AIR LIQUIDE BELGE S.A./N.V.
Avenue de Bourget / Bourgetlaan 44
1130 Bruxelles-Brussel
Belgium-Belgique-België

LUXEMBURG:
L'AIR LIQUIDE LUXEMBOURG S.A.
ZONE P.E.D.-B.P.20
L-4801 RODANGE Luxemburg

infosafetydatasheet.albv@airliquide.com
www.airliquide-benelux.com

1.4. Emergency telephone number

Emergency telephone number	:	NL: +31 (0)40 250 35 03 / BE: +32 (0)2 431 72 00 / LUX: +352 50 62 63 1

Country	Organisation/Company	Address	Emergency number	Comment
Belgium	Centre Anti-Poisons/Antigifcentrum c/o Hôpital Central de la Base - Reine Astrid	Rue Bruyn 1 1120 Bruxelles/Brussel	+32 70 245 245	Please dial: 070 245 245 for any urgent questions about intoxication (free of charge 24/7), if not accessible, dial: 02 264 96 30 (standard fee)
Luxembourg	Centre Anti-Poisons/Antigifcentrum c/o Hôpital Central de la Base - Reine Astrid	Rue Bruyn 1 1120 Bruxelles/Brussel	+352 8002 5500	Free telephone number with a 24/7 access. Experts answer all urgency questions on dangerous products in French, or German
Netherlands	Nationaal Vergiftigingen Informatie Centrum	Huispostnummer B.00.118 Postbus 85500 3508 GA Utrecht	+31 88 755 80 00	Only for the purpose of informing medical personnel in cases of acute intoxications

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Physical hazards	Oxidising Gases, Category 1	H270	
	Gases under pressure : Liquefied gas	H280	
Health hazards	Skin corrosion/irritation, Category 2	H315	
	Serious eye damage/eye irritation, Category 2	H319	
	Acute toxicity (inhalation:gas) Category 2	H330	
	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	H335	
Environmental hazards	Hazardous to the aquatic environment – Acute Hazard, Category 1	H400	(M=100)
	Hazardous to the aquatic environment – Chronic Hazard, Category 1	H410	

2.2. Label elements

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

Hazard pictograms (CLP) :

GHS03 GHS04 GHS06 GHS09

Signal word (CLP) : Danger

Hazard statements (CLP) : H270 - May cause or intensify fire; oxidiser.
H280 - Contains gas under pressure; may explode if heated.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H330 - Fatal if inhaled.
H410 - Very toxic to aquatic life with long lasting effects.

EUH071 - Corrosive to the respiratory tract.

EUH071 supersedes H335 when assigned in the classification.

Precautionary statements (CLP)

- Prevention : P280 - Wear eye protection, face protection, protective clothing, protective gloves.
P273 - Avoid release to the environment.
P260 - Do not breathe gas, vapours.
P244 - Keep valves and fittings free from oil and grease.
P220 - Keep away from clothing and other combustible materials.
- Response : P332+P313 - If skin irritation occurs: Get medical advice/attention.
P304+P340+P315 - IF INHALED : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice / attention.
P305+P351+P338+P315 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice / attention.
P370+P376 - In case of fire: Stop leak if safe to do so.
P302+P352 - IF ON SKIN: Wash with plenty of water.
- Storage : P405 - Store locked up.
P403 - Store in a well-ventilated place.

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]
Chlorine	CAS-No.: 7782-50-5 EC-No.: 231-959-5 EC Index-No.: 017-001-00-7 REACH registration No: 01-2119486560-35	100	Ox. Gas 1, H270 Press. Gas (Liq.), H280 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Acute Tox. 2 (Inhalation:gas), H330 STOT SE 3, H335 Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410

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

3.2. Mixtures Not established.

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- Skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

May cause irritation to cornea (with temporary disturbance to vision).
May cause irritation to skin.
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.
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 : Supports combustion.
Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products : The combustion products are not poisonous 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.
Eliminate ignition sources.
Ensure adequate air ventilation.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Stay upwind.
See section 8 of the SDS for more information on personal protective equipment

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

6.2. Environmental precautions

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

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 : Do not breathe gas.
Avoid release of product into work area.
Use only lubricants and sealings approved for the specific gas service.
The product must be handled in accordance with good industrial hygiene and safety procedures.
Only experienced and properly instructed persons should handle gases under pressure.
Consider pressure relief device(s) in gas installations.
Ensure the complete gas system was (or is regularily) checked for leaks before use.
Do not smoke while handling product.
Avoid exposure, obtain special instructions before use.
Avoid contact with aluminium.
Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at http://www.eiga.eu.
Use no oil or grease.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Installation of a cross purge assembly between the container and the regulator is recommended.
Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service.
Avoid suck back of water, acid and alkalis.

Safe handling of the gas receptacle : Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
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 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 remove or deface labels provided by the supplier for the identification of the content of the container.
Suck back of water into the container must be prevented.
Open valve slowly to avoid pressure shock.

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.
Segregate from flammable gases and other flammable materials in store.
Store containers in location free from fire risk and away from sources of heat and ignition.
Keep away from combustible materials.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Chlorine (7782-50-5)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Chlorine
IOEL STEL	1,5 mg/m³
IOEL STEL [ppm]	0,5 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Belgium - Occupational Exposure Limits	
Local name	Chlore # Chloor
OEL STEL	1,5 mg/m³
OEL STEL [ppm]	0,5 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 19/11/2020
Luxembourg - Occupational Exposure Limits	
Local name	Chlore
OEL STEL	1,5 mg/m³
OEL STEL [ppm]	0,5 ppm
Regulatory reference	Mémorial A N° 684 de 2018 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Netherlands - Occupational Exposure Limits	
Local name	Chloor
TGG-15min (OEL STEL)	1,5 mg/m³
Regulatory reference	Arbeidsomstandighedenregeling 2021

Chlorine (7782-50-5)
DNEL: Derived no effect level (Workers)

Acute - local effects, inhalation	1,5 mg/m³
Acute - systemic effects, inhalation	1,5 mg/m³
Long-term - local effects, inhalation	0,75 mg/m³
Long-term - systemic effects, inhalation	0,75 mg/m³

Chlorine (7782-50-5)	
PNEC: Predicted no effect concentration	
Aqua (freshwater)	0,00021 mg/l
Aqua (marine water)	0,000042 mg/l
Aquatic, intermittent releases	0,00026 mg/l
Micro-organisms in sewage treatment plant (STP)	0,03 mg/l

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Product to be handled in a closed system and under strictly controlled conditions.
Provide adequate general and local exhaust ventilation.
Preferably use permanent leak-tight installations (e.g. welded pipes).
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.
Standard EN 166 - Personal eye-protection - specifications.
Provide readily accessible eye wash stations and safety showers.

• Skin protection

- Hand protection : Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk, performance level 1 or higher.
Standard EN 511 - Cold insulating gloves.
Wear chemically resistant protective gloves.
Standard EN 374 - Protective gloves against chemicals.
Permeation time: minimum >30min short term exposure: material / thickness [mm]
Chloroprene rubber (CR) 0,4.
Permeation time: minimum >480min long term exposure: material / thickness [mm]
Fluoroelastomer (FKM) 0,7.
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.

- 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	:	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. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Recommended: Filter B (grey). 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. Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.
• 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	:	Greenish gas.
Odour	:	Pungent. Odour threshold is subjective and inadequate to warn of overexposure.
pH	:	If dissolved in water pH-value will be affected.
Melting point / Freezing point	:	-101 °C
Boiling point	:	-34 °C
Flash point	:	Not applicable for gases and gas mixtures.
Flammability	:	Non flammable.
Explosive limits	:	Non flammable.
Lower explosive limit (LEL)	:	Not available
Upper explosive limit (UEL)	:	Not available
Vapour pressure [20°C]	:	6,8 bar(a)
Vapour pressure [50°C]	:	14,3 bar(a)
Density	:	Not applicable
Vapour density	:	Not applicable.
Relative density, liquid (water=1)	:	1,6
Relative density, gas (air=1)	:	2,5
Water solubility	:	8620 mg/l
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable for inorganic products.
Auto-ignition temperature	:	Non flammable.
Decomposition temperature	:	Not applicable.
Viscosity, kinematic	:	No reliable data available.
Particle characteristics	:	Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Oxidising properties	:	Oxidiser.
- Coefficient of oxygen equivalency (Ci)	:	0,7
Critical temperature [°C]	:	144 °C

9.2.2. Other safety characteristics

Molar mass	:	71 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

Violently oxidises organic material.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. Incompatible materials

May react violently with alkalis.
With water causes rapid corrosion of some metals.
Reacts with water to form corrosive acids.
Moisture.
May react violently with combustible materials.
May react violently with reducing agents.
Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at http://www.eiga.eu.
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 : Fatal if inhaled.

LC50 Inhalation - Rat [ppm]	146,5 ppm/4h

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation : Causes serious eye irritation.

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 : May cause inflammation of the respiratory system.
Severe corrosion to the respiratory tract at high concentrations.

Target organ(s) : Respiratory tract.

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

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	:	Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.
EC50 48h - Daphnia magna [mg/l]	:	0,141 mg/l
EC50 72h - Algae [mg/l]	:	0,001 - 0,01 mg/l
LC50 96 h - Fish [mg/l]	:	0,032 mg/l

12.2. Persistence and degradability

Assessment	:	Not applicable for inorganic products.

12.3. Bioaccumulative potential

Assessment	:	No data available.

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

No additional information available

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

Contact supplier if guidance is required.
Must not be discharged to atmosphere.
Ensure that the emission levels from local regulations or operating permits are not exceeded.
Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at http://www.eiga.org for more guidance on suitable disposal methods.
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.	:	1017

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : CHLORINE
Transport by air (ICAO-TI / IATA-DGR) : Chlorine
Transport by sea (IMDG) : CHLORINE

14.3. Transport hazard class(es)

Labelling :

2.3 : Toxic gases.
5.1 : Oxidizing substances.
8 : Corrosive substances.
Environmentally hazardous substances

Transport by road/rail (ADR/RID)
Class : 2
Classification code : 2TOC
Hazard identification number : 265
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 (5.1, 8)
Emergency Schedule (EmS) - Fire : F-C
Emergency Schedule (EmS) - Spillage : S-U

14.4. Packing group

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

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : Environmentally hazardous substance / mixture.
Transport by air (ICAO-TI / IATA-DGR) : Environmentally hazardous substance / mixture.
Transport by sea (IMDG) : Marine pollutant

14.6. Special precautions for user

Packing Instruction(s)
Transport by road/rail (ADR/RID) : 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

EU-Regulations

Restrictions on use : None.
Seveso Directive : 2012/18/EU (Seveso III) : Listed.

National regulations

Regulatory reference : Ensure all national/local regulations are observed.

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 453/2010.

Section	Changed item	Change	Comments
	UN-No. (RID)	Added	
	Reference number	Modified	
	Supersedes	Modified	
	Revision date	Modified	
	Safe use of the product	Modified	
2.3	Other hazards which do not result in classification	Modified	
8	Regulatory reference	Added	
8	Regulatory reference	Added	
8	Regulatory reference	Added	
8	Regulatory reference	Added	
8.1	Local name	Added	
8.1	Local name	Added	
8.1	Local name	Added	
8.1	Local name	Added	
8.1	OEL STEL [ppm]	Added	
8.1	OEL STEL	Added	
8.1	TGG-15min (OEL STEL)	Added	
8.1	IOEL STEL [ppm]	Added	
8.1	IOEL STEL	Added	
8.1	OEL STEL [ppm]	Added	
8.1	OEL STEL	Added	
9.1	Flash point	Removed	
11.1	ATE CLP (gases)	Modified	
11.1	Other information	Modified	
14.3	Danger labels (RID)	Added	

Abbreviations and acronyms	:	ATE - Acute Toxicity Estimate CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008 REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006 EINECS - European Inventory of Existing Commercial Chemical Substances CAS# - Chemical Abstract Service number PPE - Personal Protection Equipment LC50 - Lethal Concentration to 50 % of a test population RMM - Risk Management Measures PBT - Persistent, Bioaccumulative and Toxic vPvB - Very Persistent and Very Bioaccumulative STOT- SE : Specific Target Organ Toxicity - Single Exposure CSA - Chemical Safety Assessment EN - European Standard UN - United Nations ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road IATA - International Air Transport Association IMDG code - International Maritime Dangerous Goods RID - Regulations concerning the International Carriage of Dangerous Goods by Rail WGK - Water Hazard Class STOT - RE : Specific Target Organ Toxicity - Repeated Exposure UFI : Unique Formula Identifier
Training advice	:	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. 2 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 2
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
EUH071	Corrosive to the respiratory tract.
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H270	May cause or intensify fire; oxidiser.
H280	Contains gas under pressure; may explode if heated.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Ox. Gas 1	Oxidising Gases, Category 1
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Skin Irrit. 2	Skin corrosion/irritation, Category 2
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.

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. EIGA022-1 - Industrial uses, closed contained conditions

1.1. Title section

	Industrial uses, closed contained conditions
ES Ref.: EIGA022-1 ES Type: Worker - EIGA Revision date: 1-10-2016	

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

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids,

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)	365
Covers frequency up to:	Continuous release

Technical and organisational conditions and measures	
Soil emission controls are not applicable as there is no direct release to soil	
Wastewater emission controls are not applicable as there is no direct release to wastewater	
Ensure operatives are trained to minimise releases	

Conditions and measures related to sewage treatment plant	
Size of the sewage treatment plant (STP)	2000 m³/d

Conditions and measures related to treatment of waste (including article waste)	
No additional information	

Other conditions affecting environmental exposure	
Dilution of STP emissions at least:	10 Rivers
Dilution of STP emissions at least:	100 Coastal zones

1.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure

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 or outdoor use	

1.2.3. Control of worker exposure: Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Wide dispersive indoor use of reactive substances in open systems, <tx:_ERC9>

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	
Fill containers at dedicated fill points supplied with local extract ventilation.	
Ensure samples are obtained under containment or extract ventilation.	
Drain down and flush system prior to equipment break-in or maintenance.	
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.	
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	
Face mask with type B filter. Self-contained breathing apparatus should be worn in case of medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection. Wear suitable gloves tested to EN374. Neoprene rubber (HNBR)	Personal protection measures have to be applied in case of potential exposure only.
Wear suitable coveralls to prevent exposure to the skin	
See section 8 of the SDS.	

Other conditions affecting workers exposure	
Indoor or outdoor use	

1.3. Exposure estimation and reference to its source

No data available

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

End of document