Safety Data Sheet

According to Annex II to REACH - Regulation 2020/878 and to Annex II to UK REACH

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

1.1 Product identifier

Item code	Regeneration solution
Product name	Regeneration solution

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

Intended use
Solution for electrode regeneration. Applies to code 32208083.

1.3 Details of the supplier of the safety data sheet

Business name	GIORGIO BORMAC srl
Full address	via della meccanica, 25
Town	Carpi
Postal code	41012
Province	MO
Country	Italy
Phone number	+39 059 653274
e-mail address of the competent person responsible for the Safety Data Sheet	sds@giorgiobormac.com

1.4 Emergency telephone number

For urgent inquiries refer to	+1 352-323-3500

2 Hazards identification

2.1 Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2020/878.
Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification		
Substance or mixture corrosive to metals, category 1	H290	May be corrosive to metals.
Acute toxicity, category 3	H301	Toxic if swallowed.
Acute toxicity, category 3	H311	Toxic in contact with skin.
Skin corrosion, category 1A	H314	Causes severe skin burns and eye damage.
Serious eye damage, category 1	H318	Causes serious eye damage.

2.2 Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms



Signal word
Danger

Hazard statements	
H290	May be corrosive to metals.
H301+H311	Toxic if swallowed or in contact with skin.
H314	Causes severe skin burns and eye damage.

Precautionary statements	
P264	Wash exposed body parts thoroughly after handling.
P260	Do not breathe spray, vapours.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P280	Wear protective gloves / protective clothing / eye protection / face protection.
P310	Immediately call a poison center/doctor.

Contains
FLUORHYDRIC ACID

2.3 Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.
The product does not contain substances with endocrine disrupting properties in concentration ≥ 0.1%.

3 Composition/information on ingredients

3.2 Mixtures

HYDROCHLORIC ACID

Concentration	9 %
CAS number	7647-01-0
EC number	231-595-7
INDEX number	017-002-01-X
Registration Number	01-2119484862-27-xxxx
Hazard classification	▪ Met. Corr. 1; H290 ▪ Skin Corr. 1B; H314 ▪ Eye Dam. 1; H318 ▪ STOT SE 3; H335
Specific concentration limits	▪ Met. Corr. 1; H290: ≥ 0.1 % ▪ STOT SE 3; H335: ≥ 10 % ▪ Skin Irrit. 2; H315: 10 ≤ x < 25 % ▪ Skin Corr. 1B; H314: ≥ 25 % ▪ Eye Irrit. 2; H319: 10 ≤ x < 25 % ▪ Eye Dam. 1; H318: ≥ 25 %
Classification note according to Annex VI to the CLP Regulation:	B
Substance with a community workplace exposure limit.	

FLUORHYDRIC ACID

Concentration	5 %
CAS number	7664-39-3
EC number	231-634-8

INDEX number	009-002-00-6
Hazard classification	▪ Acute Tox. 2; H300 ▪ Acute Tox. 1; H310 ▪ Skin Corr. 1A; H314 ▪ Eye Dam. 1; H318 ▪ Acute Tox. 2; H330
Specific concentration limits	▪ Skin Corr. 1B; H314: 1 ≤ x < 7 % ▪ Skin Corr. 1A; H314: ≥ 7 % ▪ Eye Irrit. 2; H319: 0.1 ≤ x < 1 %
ATE (Oral)	5 mg/kg
ATE (Dermal)	5 mg/kg
LC50 (Inhalation vapours):	1.34 mg/l (4h)
Substance with a community workplace exposure limit.	

The full wording of hazard (H) phrases is given in section 16 of the sheet.

4 First aid measures

4.1 Description of first aid measures

Immediately remove the contaminated person from the product. When symptoms occur or if in doubt, consult a doctor.
Provide resuscitation in life-threatening conditions as follows:
If the subject is not breathing: artificial respiration must be started immediately, through mouth-to-mouth resuscitation;
Cardiac arrest: cardiac massage should be started immediately;
Unconsciousness: The victim must be placed in a stable position. If vomiting occurs, keep the victim on their side to avoid aspiration of vomit into the lungs.
Do not leave affected persons unattended.
INHALATION:
take the person to a well-ventilated area and immediately consult a doctor.
If the subject is unconscious, place him in a safe lateral position for transport.
SKIN CONTACT:
Wash immediately with soap and water, rinsing thoroughly; If skin irritation persists, consult a doctor.
EYE CONTACT:
Wash open eyes for several minutes under running water. If symptoms persist, consult a doctor.
INGESTION:
Do not induce vomiting, call a doctor immediately.
If the patient is conscious: wash mouth with plenty of water.

Rescuers protection

It is good practice for rescuers lending support to a person who has been exposed to a chemical substance or to a mixture to wear personal protective equipment. The nature of such protection depends on the hazard level of the substance or mixture, on the type of exposure and on the extent of the contamination. In the absence of other more specific indications, use of disposable gloves in the event of possible contact with body fluids is recommended. For the type of PPE suitable for the characteristics of the substance or mixture, see section 8.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms of poisoning can appear after many hours, which is why health surveillance is necessary for at least 48 hours following the accident.

HYDROCHLORIC ACID

Acute effects-dependent effects.
Cute: irritation, burns, ulcer
Eyes: irritation, corneal damage
Nose: irritation
First airways: irritation
Lungs: irritation
Digerent apparatus: if ingested retrostern and epigastric pain, hematemesis

Chronic effects.
Cute: irritation, depigmentation, dry skin, epilation
Eyes: irritation
Nose: irritation
First airways: irritation
Lungs: irritation

FLUORHYDRIC ACID

Acute dose-dependent effects:
Skin: irritation, burn, corrosion.
Nervous System: paresthesias, fasciculations, myoclonia and convulsions.
Eyes: irritation, keratitis, conjunctivitis, corneal damage.
Nose: irritation, epistaxis.
Upper airways: irritation.
Lungs: irritation, cough, chemical pneumonia.
Digestive system: in case of ingestion nausea, vomiting, abdominal colic, hematemesis, melena.
Chronic effects:
Skin: irritation, depigmentation, necrosis.
Eyes: irritation, keratitis, conjunctivitis, tearing, eye burning.
Nose: irritation, epistaxis.
Upper airways: irritation.
Lungs: irritation, cough, dyspnea, chronic bronchitis.
Other: increased bone density (fluorosis), ligament calcification.

4.3 Indication of any immediate medical attention and special treatment needed

Follow your doctor's instructions.

Means to have available in the workplace for specific and immediate treatment

Running water for skin and eye wash.

FLUORHYDRIC ACID

Useful antidote: administer calcium, magnesium, milk, antacid liquids.
If symptoms are present, urgent medical examination.
The onset of symptoms may be delayed by a few hours.
Caustic lesions may appear after 4-12 hours.
Note: Always hospitalize the patient urgently.

5 Firefighting measures

5.1 Extinguishing media

SUITABLE EXTINGUISHING MEANS
The extinguishing media are traditional ones: carbon dioxide, foam, powder and water spray.
UNSUITABLE EXTINGUISHING MEANS
Do not use direct jets of water to avoid spreading of the material involved in the fire.

5.2 Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Do not breathe combustion products.

FLUORHYDRIC ACID

Hydrofluoric acid.

5.3 Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Block the leakage if there is no hazard.
Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2 Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3 Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.
Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4 Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

7 Handling and storage

7.1 Precautions for safe handling

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2 Conditions for safe storage, including any incompatibilities

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed. Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

Storage class TRGS 510 (Germany)
None

7.3 Specific end use(s)

Information not available.

8 Exposure controls/personal protection

8.1 Control parameters

Regulatory references	
ACGIH	ACGIH 2023
European Union-OEL	Directive (EU) 2022/431; Directive (EU) 2019/1831; Directive (EU) 2019/130; Directive (EU) 2019/983; Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 98/24/EC; Directive 91/322/EEC.
Malta-TLV	PROTECTION OF THE HEALTH AND SAFETY OF WORKERS FROM THE RISKS RELATED TO CHEMICAL AGENTS AT WORK REGULATIONS (S.L.424.24). PROTECTION OF WORKERS FROM THE RISKS RELATED TO EXPOSURE TO CARCINOGENS OR MUTAGENS AT WORK REGULATIONS (S.L.424.22)

HYDROCHLORIC ACID

	TWA		STEL		CEILING		Remarks	
	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm		
ACGIH					2.9	2	--	
European Union-OEL	8	5	15	10			--	
Malta-TLV	8	5	15	10			--	

Health - Derived no-effect level - DNEL / DMEL	Local effect	Systemic effect
Consumers, short-term, inhalation	15 mg/m³	
Consumers, long-term, inhalation	8 mg/m³	
Workers, short-term, inhalation	15 mg/m³	
Workers, long-term, inhalation	8 mg/m³	

Sampling methods
The following sampling methods for the substances mentioned in the previous tables are suggested.
http://amcaw.ifa.dguv.de/substance/methoden/093- Hydrogen_chloride_2016.pdf.

FLUORHYDRIC ACID

	TWA		STEL		CEILING		Remarks	
	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm		
ACGIH	2.3	0	0	0			--	
European Union-OEL	1.5	1.8	2.5	3			--	

https://amcaw.ifa.dguv.de/amcaw/substances/methods/4e068d1e-64d1-4f84-a9b5-4baad8db026e

8.2 Exposure controls

Provide an emergency shower with face and eye wash station.
As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.
When choosing personal protective equipment, ask your chemical substance supplier for advice.
Personal protective equipment must be CE marked, showing that it complies with applicable standards.

HAND PROTECTION
Protect hands with category III work gloves (see standard EN 374).
The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.
The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION
Wear category III professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION
Wear a hood visor or protective visor combined with airtight goggles (see standard EN 166).

In the presence of risks of exposure to splashes or squirts during work, adequate mouth, nose and eye protection should be used to prevent accidental absorption.

RESPIRATORY PROTECTION
If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type A filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required. Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.
If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	clear liquid	
Colour	colourless	
Odour	characteristic	
Melting point / freezing point	Not available	
Initial boiling point	Not available	
Flammability	Not applicable	
Lower explosive limit	Not applicable	
Upper explosive limit	Not applicable	
Flash point	Not available	
Auto-ignition temperature	Not applicable	
Decomposition temperature	Not available	
pH	$0 \leq x < 1$	
Kinematic viscosity (40 °C)	Not available	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Vapour pressure	Not available	
Density and/or relative density	1.08 kg/l	
Relative vapour density	Not available	

Particle characteristics

Information not available.

9.2 Other information

9.2.1 Information with regard to physical hazards

Information not available.

9.2.2 Other safety characteristics

Explosive properties	Not applicable	
Oxidising properties	Not applicable	

10 Stability and reactivity

10.1 Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

HYDROCHLORIC ACID

The water solution is a strong acid (IPCS, 2000).
By decomposition it develops hydrogen.

FLUORHYDRIC ACID

It reacts strongly with water with a highly exothermic reaction.

10.2 Chemical stability

The product is stable in normal conditions of use and storage.
Do not overheat.

HYDROCHLORIC ACID

The aqueous solutions are stable

10.3 Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

HYDROCHLORIC ACID

It reacts violently with bases and obsidants, developing toxic gaseous chlorine (IPCS, 2000). Attack many metals in the presence of water. This produces flammable/explosive gaseous hydrogen (IPCS, 2000).

FLUORHYDRIC ACID

It reacts violently with strong bases if concentrated or anhydrous, attacks silica and silicates, and forms corrosive volatile substances in the presence of water.

10.4 Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.
Do not overheat.

HYDROCHLORIC ACID

High temperature

FLUORHYDRIC ACID

Avoid contact with: glass.

10.5 Incompatible materials

HYDROCHLORIC ACID

Strong oxidant agents, bases, fluorine, amines, reducing agents, metals.

FLUORHYDRIC ACID

glass

10.6 Hazardous decomposition products

HYDROCHLORIC ACID

Hydrochloric acid, chlorine dioxide.
For thermal decomposition or in the event of a fire you can free gases and vapors potentially harmful to health (gaseous hydrochloric acid)

FLUORHYDRIC ACID

gaseous hydrofluoric acid.
Other information: unsuitable materials for processing: metals, glass, quartz/silicate ceramics.

11 Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

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

11.1.1 Metabolism, toxicokinetics, mechanism of action and other information

HYDROCHLORIC ACID

Following inhalation or ingestion it is quickly separated in H+ and cl- which after entering the circle is eliminated with the urine.
The activity of hydrogen chloride is associated with its high solubility in water, where it dissociates almost completely. The hydrogen ion forms with the water ion hydronio, this becomes a donor of a proton that has catalytic properties and is therefore capable of reacting with organic molecules. This explains the ability of hydrogen chloride to induce cellular lesions and necrosis.

FLUORHYDRIC ACID

In humans, 99% of inhaled substances are rapidly absorbed by the epithelium of the upper respiratory tract. The plasma concentration is directly linked to the exposure concentration.
In humans, absorption in the digestive tract is rapid, decreasing in the presence of fluorine-fixing cations (calcium, magnesium or aluminium).
In humans, the substance in liquid form is absorbed by the skin. The percutaneous passage is sufficiently important to cause the appearance of serious systemic intoxication in case of extensive contamination.
After absorption, the fluorine ion is transported with the blood, 75% in the plasma of which half is fixed to organic molecules, in particular fatty acids, and 25% to the red blood cells.
It is distributed in all tissues and crosses the placental barrier.
It is sequestered in the bones and teeth by incorporation into the structure after an exchange of the hydroxyl groups: this fixation represents approximately 50% of the absorbed fluoride and is more important in young and adult people than in middle age.
The plasma half-life in humans ranges from 2 to 9 hours.
The main route of elimination is urine by renal glomerular filtration. Reabsorption may occur in the renal tubules.
There is then a minor route of excretion, through saliva and sweat.
At the end of exposure, in humans, the stored fluoride is eliminated with a half-life of 8 to 20 years.

11.1.2 Information on likely routes of exposure

HYDROCHLORIC ACID

In the professional field, the main exposure routes are the inhalation and the skin.
The general population can be exposed to inhalation, ingestion, skin and eye contact.
Exposure to aerosols locally involves chemical burns whose gravity is according to the concentration of the solution, the importance of contamination and the duration of contact.
At the skin level, warm and painful erythema can be observed, flops or necrosis. Evolution can be complicated with overinfections, aesthetic or functional sequences.
At the eye level there is immediate pain, tearing, conjunctival hyperemia and often blepharospasm. Sequel can be: conjunctival adhesions, corneal opacity, cataracts, glaucoma and even blindness.
The exposure by inhalation to its vapors or aerosols immediately causes irritation of the respiratory system.
In the form of aerosol, the lesions depend on the sizes of the Airosol particles. You can have ricorrhea, sneezing, sensation of nasal and pharyngeal burning, cough, dyspnea, chest pain. Important complications are laryngeal or bronchospasm edema.
The ingestion of concentrated solutions determines buccal, retrostern and epigastric pain associated with hypersciaralorrhea and frequently bloody vomiting. There is metabolic acidosis and an increase in tissue enzymes due to necrosis, hyperleucocytosis, emolis and hypercloremia.

FLUORHYDRIC ACID

The main routes of potential exposure are inhalation and skin contact.

11.1.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure

HYDROCHLORIC ACID

A quick evaporation of the liquid can cause freezing (IPCS, 2000).
The inhalation of high gas concentrations can cause pneumonia and pulmonary edema with consequent reactive airway syndrome (Rads) (bronchial hyperreactivity). The effects can be delayed (IPCS, 2000).
Exposure to aerosols of solutions leads locally chemical burns whose gravity is according to the concentration of the solution, the importance of contamination and the duration of contact.
At the skin level, warm and painful erythema can be observed, flops or necrosis. Evolution can be complicated with overinfections, aesthetic or functional sequences.
At the eye level there is immediate pain, tearing, conjunctival hyperemia and often blepharospasm. Sequel can be: conjunctival adhesions, corneal opacity, cataracts, glaucoma and even blindness.
The exposure by inhalation to its vapors or aerosols immediately causes irritation of the respiratory system.
In the form of aerosol, the lesions depend on the sizes of the Airosol particles. You can have ricorrhea, sneezing, sensation of nasal and pharyngeal burning, cough, dyspnea, chest pain. Important complications are laryngeal or bronchospasm edema.
Upon cessation of exposure, the symptoms almost always regress, but in some cases you can have delayed pulmonary edema within 48 hours.
Secondary infections are a frequent complication.
At the expense of the respiratory system, in the event of extensive injuries, bronchial hypersecreation and the desquamation of the bronchial mucosa determine truncular obstruction and atheighting. Sequence for the respiratory system are: asthma (books of books), bronchial stenosis, bronchiectasias and pulmonary fibrosis.
The ingestion of concentrated solutions determines buccal, retrostern and epigastric pain associated with hypersciaralorrhea and frequently bloody vomiting. There is metabolic acidosis and an increase in tissue enzymes due to necrosis, hyperleucocytosis, emolis and hypercloremia.
The short-term complications are: esophageal or gastric perforation or digestive bleeding, fistulas, breathing difficulties for laryngeal edema, esophagus-tracheal fistula, shock, disseminated intravascular coagulation.
Long -term complications are: digestive stenosis, in particular esopharyngeal.
The exposure repeated to its vapors or aerosols of aqueous solutions can cause irritative effects: dermatitis and conjunctivitis; ulcerations of the nasal mucosa, buccal, epistaxis and gingivorragias; Dental erosions, chronic bronchitis (inrs, 2010).

FLUORHYDRIC ACID

Ingestion of a solution of substance is followed by buccal, retrosternal and epigastric pain. Vomiting is frequent, sometimes bloody. The time for these symptoms to appear is variable, even a few hours if the solution is diluted. Calcium chelation partly explains the causticity of the substance, which is responsible for the systemic effects. There are paresthesias, fasciculations, myoclonus and convulsions, cardiac conduction and repolarization disorders.
Caustic lesions occur in 4-12 hours. In addition to hypocalcemia, there is metabolic acidosis and increased tissue enzymes, evidence of necrosis.
Hyperleukocytosis is constant.
Possible complications are digestive hemorrhage, esophageal or gastric perforation, shock, metabolic acidosis, and/or consumptive coagulopathy, respiratory difficulty (laryngeal edema, esotracheal fistula).
Local complications are digestive stenosis.
The renal complications sometimes observed are due to hemodynamic imbalances rather than to direct toxicity of the substance to the renal tubules.
In 50% of cases, death occurs within 24 hours.
Exposure of the substance via gas or aerosols of aqueous solutions causes irritation of the ocular and respiratory mucous membranes, conjunctival hyperemia, lacrimation, cough and dyspnea.
At the end of the exposure the symptoms attenuate but the caustic lesions evolve.
Pulmonary edema may occur later.
In case of massive inhalation, absorption of substance can produce systemic intoxication.
Complications are bacterial super-infections of ocular and respiratory lesions. Bronchial hypersecretion and desquamation of damaged mucous membranes can be responsible for truncal obstructions and atelectasis.
In the case of skin and ocular projections, the lesions appear within 24 hours. The pain is not immediate unless in case of contact with concentrated solutions (> 15%).
Skin contamination on the surface of a hand can result in severe hypocalcemia within 2 to 3 hours.

11.1.4 Interactive effects

Information not available.

11.1.5 ACUTE TOXICITY

ATE (Inhalation - vapours) of the mixture	26.8 mg/l
ATE (Oral) of the mixture	100 mg/kg
ATE (Dermal) of the mixture	100 mg/kg

HYDROCHLORIC ACID

RATTO DL50 (oral): 700 mg/kg (inrs, 2010)
Rabbit DL50 (skin):> 5010 mg/kg (on, 2010)
Ratto CL50-30 minutes (inhalation): 5.7 - 8.3 mg/l (aerosol) (in, 2010).

FLUORHYDRIC ACID

LC50 (Inhalation vapours):	1.34 mg/l	Exposure duration: 4 hours
ATE (Oral)	5 mg/kg	estimate from table 3.1.2 of Annex I of the CLP (figure used for calculation of the acute toxicity estimate of the mixture)
ATE (Dermal)	5 mg/kg	estimate from table 3.1.2 of Annex I of the CLP (figure used for calculation of the acute toxicity estimate of the mixture)

ATE (Dermal): 5 mg/kg estimated from table 3.1.2 of Annex I of CLP (data used for the calculation of the acute toxicity estimate of the mixture)
ATE (Oral): 5.001 mg/kg estimated from table 3.1.2 of Annex I of CLP (data used for the calculation of the acute toxicity estimate of the mixture)
LC50 (Vapour inhalation): 1.34 mg/l/4h vapor (IUCLID)

11.1.6 SKIN CORROSION/IRRITATION

Corrosive for the skin
Classification according to the experimental pH value

HYDROCHLORIC ACID

Exposure to aerosols locally involves chemical burns whose gravity is according to the concentration of the solution, the importance of contamination and the duration of contact (in, 2010).
At the skin level, warm and painful erythema can be observed, flops or necrosis. Evolution can be complicated with superinfections, aesthetic or functional sequences (inrs, 2010).
In animals concentrations between 3.3% and 17% are irritating for the skin; higher concentrations become corrosive (inrs, 2010).

FLUORHYDRIC ACID

Skin - On rabbit
Result: Causes burns. - 4 hours
(OECD Test Guideline 404)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Tables 3.1/3.2)
Symptoms may be delayed. Possible damage: Necrosis after penetration of the substance, poor healing of wounds.

11.1.7 SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye damage.

HYDROCHLORIC ACID

Exposure to aerosols locally involves chemical burns whose gravity is according to the concentration of the solution, the importance of contamination and the duration of contact (in 2010).
At the eye level there is immediate pain, tearing, conjunctival hyperemia and often blepharospasm. The sequels can be: conjunctival adhesions, corneal opacity, cataracts, glaucoma and even blindness (on, 2010).
In animals, concentrations above 3.3% cause serious eye irritation; Symptoms can include redness, swelling, pain and tears.
A prolonged exposure or at higher concentrations induces opacity of the cornea, ulceration and decrease in view with the risk of permanent alteration. The severity of irritation is linked to the duration of the treatment (tears have buffer effect and dilute). In the rabbit, 0.1 ml of an aqueous solution at 10% causes permanent alteration of the vision; The non -irritating concentration is 0.33% (inrs, 2010).

FLUORHYDRIC ACID

Eyes - On rabbit
Result: Causes burns.
(OECD Test Guideline 405)
Remarks: (IUCLID)
Causes serious eye damage

11.1.8 RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

Skin sensitization

HYDROCHLORIC ACID

Negative results in the maximization test in the guinea pig (induction and unleashing: solution to 1 %) and in the test of the swelling of the ear in the mouse (induction at 1 %, 5 %unleashing) (inrs, 2010).

FLUORHYDRIC ACID

No data are available on its skin sensitizing power.

11.1.9 GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

HYDROCHLORIC ACID

In single studies, hydrochloric acid has induced chromium-somic mutual changes and aberrations in mammal cells.
He also induced chromosomal aberrations in insects and plants. He did not induce bacteria mutations (Iarc, 1992).

FLUORHYDRIC ACID

Test Type: Ames Test
Test system: S. typhimurium
Result: negative
Type of test: In vitro chromosomal aberration
Test system: Chinese hamster ovary cells
Result: Positive results were obtained in some in vitro experiments.
Species: Rat
Observations: Cytogenetic analysis

11.1.10 CARCINOGENICITY

Does not meet the classification criteria for this hazard class

HYDROCHLORIC ACID

In a study on deduction workers of the steel, an excess risk of pulmonary cancer in workers exposed mainly to hydrochloric acid was observed. In the same cohort, a increased risk of lady cancer was observed, however, no analysis was conducted on workers exposed to hydrochloric acid. Three studies control in industrial plants do not indicate any association between exposure to hydrochloric acid and cancer against lungs, brain or kidneys. A Canadian control case indicates increased risk for microcytoma in workers exposed to hydrochloric acid; However, no excess risk was observed for other histological types of lung cancer (Iarc, 1992).
In a study in rats m. Exposed for inhalation for the entire life of life at a dose level, hydrogen chloride has not been observed related increase in treatment in the incidence of tumors (Iarc, 1992).
The International Agency for Research on Cancer (IARC) allocates hydrochloric acid in group 3 (not classifiable as a carcinogen for humans) on the basis of evidence of inadequate carcinogenicity both in man and animals (Iarc, 1992).
In addition, in a recent evaluation, the data showed association between exposure to mists of strong inorganic acids and laryngeal cancer in the man while they were limited to affirm a causal association with bronchial cancer. The man was also observed in the positive association between exposure to mists of strong inorganic acids and lung cancer (Iarc, 2012)
- The International Agency for Research on Cancer (IARC) allocates the mists of strong inorganic acids in group 1 (carcinogen ascertained for humans) on the basis of evidence of sufficient carcinogenicity in humans (cancer against the larynx and positive association between exposure to mists of strong inorganic acids and lung cancer) (Iarc, 2012).

FLUORHYDRIC ACID

No studies are available on the carcinogenicity of hydrofluoric acid. Sodium fluoride did not show carcinogenic potential in studies in rats and mice that received the substance orally (NTP, 1990).

11.1.11 REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

Adverse effects on sexual function and fertility

HYDROCHLORIC ACID

There are no data on humans that allow to evaluate the effects for reproduction of hydrogen chloride exposure. These effects do not seem plausible in professional exposure conditions (in, 2010).
In rats (females) exposed to hydrochloric acid at 450 mg/m3 for 1 hour, both 12 days before the mating and on the 9th day of gestation, effects were observed only at toxic concentrations for mothers (in the, 2010).
Reliable studies on toxicity for reproduction and development in animals are not available after oral, skin or inhalation exposure to hydrochloric acid. Since protons and chloride ions are normal constituents in the body fluids of animal species, low concentrations of gas/mists or of hydrochloric acid solutions do not seem to cause adverse effects in animals. In fact, the cells of gastric glands secrete hydrochloric acid in the cavity of the stomach and also the oral administration of sulfuric acid which determines alteration of the pH, have not caused toxicity on the development in laboratory animals. These facts indicate that the hydrogen chloride and hydrogen chloride present toxicity for development is not expected. Furthermore, in a 90 -day inhalation study of good quality, concentrations up to 50 ppm of the substance did not produce any effect on the Gonadi (Oecd, 2002).

FLUORHYDRIC ACID

No studies are available on the effects of hydrofluoric acid on fertility.
Available human and animal studies do not allow the potential of fluoride to induce reproductive effects in humans to be assessed.

Adverse effects on development of the offspring

HYDROCHLORIC ACID

There are no data on humans that allow to evaluate the effects for reproduction of hydrogen chloride exposure. These effects do not seem plausible in professional exposure conditions (in, 2010).
In rats (females) exposed to hydrochloric acid at 450 mg/m3 for 1 hour, both 12 days before the mating and on the 9th day of gestation, effects were observed only at conc. Toxic for mothers (inrs, 2010).
Reliable studies on toxicity for reproduction and development in animals are not available after oral, skin or inhalation exposure to hydrochloric acid. Since protons and chloride ions are normal constituents in the body fluids of animal species, low conc. of gas/mists or hydrochloric acid solutions do not seem to cause adverse effects in animals. In fact, the cells of gastric glands secrete hydrochloric acid in the cavity of the stomach and also the oral administration of sulfuric acid which determines alteration of the pH, have not caused toxicity on the development in laboratory animals.
These facts indicate that the hydrogen chloride and hydrogen chloride present toxicity for development is not expected.
Furthermore, in a 90 -day inhalation study of good quality, conc. Up to 50 ppm of the substance did not produce any effect on the Gonadi (Oecd, 2002).

FLUORHYDRIC ACID

No studies are available on the toxicity of hydrofluoric acid on development and on embryo-feto toxicity.
The fluoride ion passes the placental barrier and enters the fetus. Studies on animals, at doses slightly toxic to the mother, have shown that the concentration is too low to cause effects on the bone growth of the fetus.

Effects on or via lactation

FLUORHYDRIC ACID

exposure to very high levels of hydrofluoric acid can cause serious cardiovascular effects, which are attributed to a combination of hypocalcemia and hyperkalemia; Cardiac arrhythmias have been observed in humans after splashes of hydrofluoric acid in the facial region, and myocardial necrosis and congestion have been observed in rabbits. Hepatic (fatty degeneration and necrosis) and renal (tubular degeneration and necrosis) effects were also observed in animal studies.
Inhalation exposure to the substance can damage the respiratory tract, especially in the nasal mucosa.

11.1.12 STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

HYDROCHLORIC ACID

The exposure by inhalation immediately causes irritation of the respiratory system (inrs, 2010).
In the form of aerosol, the lesions depend on the sizes of the Airosol particles. You can have ricorrhea, sneezing, sensation of nasal and pharyngeal burning, cough, dyspnea, chest pain. Important complications are laryngeal or bronchospasm edema (inrs, 2010).

FLUORHYDRIC ACID

Exposure to very high levels of hydrofluoric acid can cause serious cardiovascular effects, which are attributed to a combination of hypocalcemia and hyperkalemia; Cardiac arrhythmias have been observed in humans after hydrofluoric acid splashes in the facial region, and myocardial necrosis and congestion have been observed in rabbits. Hepatic (fatty degeneration and necrosis) and renal (tubular degeneration and necrosis) effects were also observed in animal studies.
Inhalation exposure to the substance can damage the respiratory tract, especially in the nasal mucosa.

11.1.13 STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

HYDROCHLORIC ACID

The exposure by inhalation immediately causes irritation of the respiratory system (inrs, 2010).
In the form of aerosol, the lesions depend on the sizes of the Airosol particles. You can have ricorrhea, sneezing, sensation of nasal and pharyngeal burning, cough, dyspnea, chest pain. Important complications are laryngeal or bronchospasm edema (inrs, 2010).

FLUORHYDRIC ACID

Acute inhalation toxicity - burning of mucous membranes, cough, shortness of breath. Possible damage: damage to the respiratory system, resulting lesions may cause: bronchitis, pneumonia, pulmonary edema.

11.1.14 ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

11.2 Information on other hazards

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with human health effects under evaluation.

FLUORHYDRIC ACID

Fluoride ion can reduce serum calcium levels, sometimes causing fatal hypocalcemia. The product can cause severe burns and the formation of blisters which may not be immediately painful or visible. Tissue lesions may not appear in their full extent for 12-24 hours following exposure. The product seriously damages the mucous membranes and upper respiratory tract as well as the eyes and skin, skin necrosis.

12 Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1 Toxicity

HYDROCHLORIC ACID

Short -term effects
Fish (Cyprinus Carpio) CL50-96 hours: 4.92 mg/l a pH 4.3 [OECD 203] (Oecd Sids, 2002).
Fish (Gambusia Affinis) CL50-96 hours = 282 mg/l (pH 6.0-8,2) (HSDB, 2015).
Crustaceans (Daphnia Magna) Ce50-48 hours = 0.492 mg/l (Ph 5,3) [Oecd 202] (Oecd Sids, 2002).
Alga (pseudokirkinchneriella subcapitated) cbe50-72 hours = 0.780 mg/l (pH 5.1); Cbe50-72 hours = 0.492 mg/l (Ph 5,3) [Oecd 201] (Oecd Sids, 2002).
In the air it can be phytotoxic.
Tomatoes, sugar beets and some fruit trees are sensitive to hydrogen chloride in the air (HSDB, 2015).
The aqueous solutions of hydrochloric acid have a corrosive action on plant tissues.
Long -term effects
Algae (pseudokirkinchneriella subcapitated) Noec = 0.097 mg/l (Ph 6.0) [Oecd 201] (effect: growth rate and biomass) (Oecd Sids,

2002).

FLUORHYDRIC ACID

EC50 - for Crustacea	154 mg/l	Exposure duration: 48 hours Species/guidelines: Come NaF
LC50 - for Fish	51 mg/l	Exposure duration: 96 hours Species/guidelines: come fluoruri
EC50 - for Algae / Aquatic Plants	43 mg/l	Exposure duration: 96 hours Species/guidelines: come fluoruri
Chronic NOEC for Crustacea	3.7 mg/l	Species/guidelines: 21 giorni

Fish (Oncorhynchus mykiss) LC50*-96 hours: 51 mg/l
*as fluorides
Crustaceans (Daphnia magna) LC50*-48 hours: 154 mg/l
* as NaF
Algae (Scenedesmus sp) EC50*-96 hours: 43 mg/l
*as fluorides
Long-term effects
Crustacean (Daphnia magna) NOEC-21 days = 3.7 mg/l

12.2 Persistence and degradability

HYDROCHLORIC ACID

Solubility in water	> 10,000 mg/l
Degradability	Unavailable

In the water it dissociates.
The substance is not photo -degradable.

FLUORHYDRIC ACID

The predominant mode of degradation of inorganic fluorides in the atmosphere is hydrolysis. Fluorides in the atmosphere can be present in gaseous form or as particulates and degrade mainly by hydrolysis. Fluorides emitted in particulate matter into the atmosphere are generally stable and do not hydrolyze rapidly, although they can be degraded by radiation if they persist in the atmosphere.

12.3 Bioaccumulative potential

HYDROCHLORIC ACID

Biochoncentration is not significant.
BCF given not available.

FLUORHYDRIC ACID

Fluorides have been shown to accumulate in some marine aquatic organisms. Fluorides accumulate mainly in the exoskeleton of crustaceans and in the bones of fish.
The limited data available indicates that accumulation through the food chain is of little significance in the aquatic environment. The relatively high concentrations of fluoride in predators indicate a moderate degree of fluoride biomagnification in the terrestrial environment.
The BCF in freshwater fish is 53-58 (dry weight) or < 2 (w/w), in crustaceans < 1 (dry weight) or 3.2 (w/w).
The BCF in marine fish is 149, for crustaceans it varies from 27 to 62.

12.4 Mobility in soil

HYDROCHLORIC ACID

It is mobile on the ground

FLUORHYDRIC ACID

The mobility of inorganic fluorides in soil is influenced by pH and the formation of complexes, mainly of aluminum and calcium. The adsorption of fluorides to the solid phase of the soil is greater at slightly acidic pH values (5.5-6.5). Fluoride does not leach readily from the soil.
In water, the transport and transformation of inorganic fluorides are influenced by pH, water hardness and the presence of ion

exchange materials such as clays. Once dissolved, in conditions of low pH and water hardness values and in the presence of ion exchange materials, these compounds remain in solution. Soluble inorganic fluorides can form aerosols at the air-water interface or vaporize into the atmosphere, while undissolved species typically undergo sedimentation.

12.5 Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.

12.6 Endocrine disrupting properties

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with environmental effects under evaluation.

FLUORHYDRIC ACID

Released into the environment it remains for a long time.
Hydrofluoric acid vapors penetrate the leaves causing chlorosis and necrosis, decreasing the chlorophyll content.
Based on available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with effects on the environment being evaluated.

12.7 Other adverse effects

HYDROCHLORIC ACID

Despite dilution, it still forms corrosive mixtures with water. Harmful effect due to pH variation.

13 Disposal considerations

13.1 Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Waste transportation may be subject to ADR restrictions.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

Hazardous waste classification - Reg. (UE) 1357/2014
HP 6 – Acute Toxicity
HP 8 – Corrosive

14 Transport information

14.1 UN number or ID number

ADR / RID	IMDG	IATA
2922	2922	2922

14.2 UN proper shipping name

ADR / RID	CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROCHLORIC ACID – FLUORHYDRIC ACID)
IMDG	CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROCHLORIC ACID – FLUORHYDRIC ACID)
IATA	CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROCHLORIC ACID – FLUORHYDRIC ACID)

14.3 Transport hazard class(es)

	Class:	Label	
ADR / RID	8	8 (6.1)	
IMDG	8	8 (6.1)	
IATA	8	8 (6.1)	

14.4 Packing group

ADR / RID	IMDG	IATA
II	II	II

14.5 Environmental hazards

ADR / RID	No	
IMDG	Not marine pollutant	
IATA	No	

14.6 Special precautions for user

ADR / RID			
Hazard identification No. - Kemler	86	Limited Quantities	1 L
Tunnel restriction code	(E)	Special provisions	274
IMDG			
EmS	F-A, S-B	Limited Quantities	1 L
IATA			
Maximum quantity (Cargo)	30 L	Packaging instructions (Cargo)	855
Maximum quantity (Passengers)	1 L	Packaging instructions (Passengers)	851
Special provisions	A3, A803		

14.7 Maritime transport in bulk according to IMO instruments

Not applicable

15 Regulatory information

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

Seveso Category - Directive 2012/18/EU:
None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006		
	Restrictions	Registration Number EU
Product restrictions	3	
Contained substance		

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006		
	75	

Regulation (EU) 2019/1148 - on the marketing and use of explosives precursors
Not applicable

Substances in Candidate List (Art. 59 REACH)	Registration Number EU
On the basis of available data, the product does not contain any SVHC in percentage ≥ than 0,1%.	

Substances subject to authorisation (Annex XIV REACH)	Authorisation Number	Sunset date	Registration Number EU
None			

Substances subject to exportation reporting pursuant to Regulation (EU) 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Regulation (EU) 2019/1021 - on persistent organic pollutants
None

Healthcare controls
Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
None

15.2 Chemical safety assessment

A chemical safety assessment has been performed for the following contained substances

HYDROCHLORIC ACID

16 Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:	
Acute Tox. 1	Acute toxicity, category 1
Acute Tox. 2	Acute toxicity, category 2
Eye Dam. 1	Serious eye damage, category 1
Eye Irrit. 2	Eye irritation, category 2
Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Skin Corr. 1A	Skin corrosion, category 1A
Skin Corr. 1B	Skin corrosion, category 1B
Skin Irrit. 2	Skin irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
H290	May be corrosive to metals.
H300	Fatal if swallowed.
H310	Fatal in contact with skin.

Section 16

Text of hazard (H) indications mentioned in section 2-3 of the sheet:	
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.

Legend

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- ATE: Acute Toxicity Estimate
- CAS: Chemical Abstract Service Number
- CLP: Regulation (EC) 1272/2008
- DNEL: Derived No Effect Level
- EC50: Effective concentration (required to induce a 50% effect)
- EC: Identifier in ESIS (European archive of existing substances)
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent, bioaccumulative and toxic
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PMT: Persistent, mobile and toxic
- PNEC: Predicted no effect concentration
- REACH: Regulation (EC) 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA: Time-weighted average exposure limit
- TWA STEL: Short-term exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very persistent and very bioaccumulative
- vPvM: Very persistent and very mobile
- WGK: Water hazard classes (German).

General Bibliography

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 2020/878 (II Annex of REACH Regulation)
4. Regulation (EC) 790/2009 (I Atp. CLP) of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)

General Bibliography

15. Regulation (EU) 2019/521 (XII Atp. CLP)
16. Delegated Regulation (UE) 2018/1480 (XIII Atp. CLP)
17. Regulation (EU) 2019/1148
18. Delegated Regulation (UE) 2020/217 (XIV Atp. CLP)
19. Delegated Regulation (UE) 2020/1182 (XV Atp. CLP)
20. Delegated Regulation (UE) 2021/643 (XVI Atp. CLP)
21. Delegated Regulation (UE) 2021/849 (XVII Atp. CLP)
22. Delegated Regulation (UE) 2022/692 (XVIII Atp. CLP)
23. Delegated Regulation (UE) 2023/707
24. Delegated Regulation (UE) 2023/1434 (XIX Atp. CLP)
25. Delegated Regulation (UE) 2023/1435 (XX Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

Calculation methods for classification

Chemical and physical hazards:
Product classification derives from criteria established by the CLP Regulation, Annex I, Part 2. The data for evaluation of chemical-physical properties are reported in section 9.
Health hazards:
Product classification is based on calculation methods as per Annex I of CLP, Part 3, unless determined otherwise in Section 11.
Environmental hazards:
Product classification is based on calculation methods as per Annex I of CLP, Part 4, unless determined otherwise in Section 12.

Changes from the previous revision

2 Hazards identification
- 2.1 Classification of the substance or mixture
- 2.2 Label elements
- 2.3 Other hazards

3 Composition/information on ingredients
- 3.2 Mixtures

4 First aid measures
- 4.1 Description of first aid measures
- 4.2 Most important symptoms and effects, both acute and delayed
- 4.3 Indication of any immediate medical attention and special treatment needed

5 Firefighting measures
- 5.1 Extinguishing media
- 5.2 Special hazards arising from the substance or mixture
- 5.3 Advice for firefighters

6 Accidental release measures

Changes from the previous revision
6.1 Personal precautions, protective equipment and emergency procedures
6.2 Environmental precautions
6.3 Methods and material for containment and cleaning up
6.4 Reference to other sections
7 Handling and storage
7.1 Precautions for safe handling
7.2 Conditions for safe storage, including any incompatibilities
7.3 Specific end use(s)
8 Exposure controls/personal protection
8.1 Control parameters
10 Stability and reactivity
10.1 Reactivity
10.2 Chemical stability
10.3 Possibility of hazardous reactions
10.4 Conditions to avoid
10.5 Incompatible materials
10.6 Hazardous decomposition products
11 Toxicological information
11.1 Information on toxicological effects
Metabolism, toxicokinetics, mechanism of action and other information
Information on likely routes of exposure
Delayed and immediate effects as well as chronic effects from short and long-term exposure
Interactive effects
ACUTE TOXICITY
SKIN CORROSION/IRRITATION
SERIOUS EYE DAMAGE / IRRITATION
RESPIRATORY OR SKIN SENSITISATION
GERM CELL MUTAGENICITY
CARCINOGENICITY
REPRODUCTIVE TOXICITY
STOT - SINGLE EXPOSURE
STOT - REPEATED EXPOSURE
ASPIRATION HAZARD
11.2 Information on other hazards
12 Ecological information
12.1 Toxicity
12.2 Persistence and degradability
12.3 Bioaccumulative potential
12.4 Mobility in soil
12.5 Results of PBT and vPvB assessment
12.6 Endocrine disrupting properties
12.7 Other adverse effects
13 Disposal considerations
13.1 Waste treatment methods
15 Regulatory information
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
15.2 Chemical safety assessment

5 - Exposure scenario of hydrochloric acid (CAS 7647-01-0)

1. Professional use of hydrochloric acid

List of use descriptors

Use sector	SU3 : Industrial uses
Name of contributing environmental scenario and corresponding environmental release category (ERC)	Unknown.
List of contributing worker scenario names and corrisponding process categories (PRoc)	PROC1: Production and refining of chemicals in closed processes with no Exposure expected or processes with equivalent containment conditions PROC2: Production and refining of chemicals in a closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Production or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions PROC4: Production of chemicals where exposure is possible PROC8a: Transfer of a substance or mixture (filling/emptying) at non-dedicated facilities PROC8b: Transfer of a substance or mixture (filling/emptying) at dedicated facilities PROC10: Application with rollers or brushes PROC11: Non-industrial spraying PROC13: Treatment of items by dipping and pouring PROC15: Use of laboratory reagents PROC19: Manual activities involving hand contact

2.2.1. Contributing scenario controlling worker exposure for Production and refining of chemicals in closed processes with no likelihood of exposure or in processes with equivalent containment conditions

Process categories beyond REACH CSA	Production and refining of chemicals in closed continuous processes with occasional controlled exposure or processes with equivalent containment conditions Production or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions Production of chemicals where exposure is possible Transfer of a substance or mixture (filling/emptying) at non-dedicated facilities Transfer of a substance or mixture (filling/emptying) at dedicated facilities Application with rollers or brushes Non-industrial spraying Treatment of articles by dipping and pouring Use of laboratory reagents Manual activities involving contact with the hands

Product characteristics

Physical form of the product	Liquid.
Vapor pressure	Unknown.
Quantities used	Unknown.

Frequency and duration of use	**Duration**	**Frequency of use**	**Notes**
PROC1, PROC2, PROC3, PROC4, PROC8a, PROC10, PROC11, PROC13, PROC19 (with personal respiratory protection)	> 4		(Duration unit = hour)
PROC15 without local exhaust ventilation of vapors	0,25 – 1		(Duration unit = hour)
PROC11, PROC19 (without personal respiratory protection)	< 15		(Duration unit = minutes)

Human factors not influenced by risk management

Unknown.

Other relevant operating conditions

Unknown.

Other given operating conditions affecting worker exposure

Unknown.

Risk management measures (RMM)

Technical conditions and process-level measures (source) to prevent release	PROC1, PROC2, PROC3: Continuous process PROC4: ensure additional ventilation at points where emissions occur. Keep waste sealed until disposal or subsequent recycling. PROC8a: Handle the substance in a predominantly closed system with air extraction. PROC13: Store the substance in a closed system. Perform in a ventilated booth or extraction enclosure. Wear a respirator compliant with EN140 with a type A filter or higher.
Technical conditions and measures to control dispersion from the source to the worker	PROC2, PROC3: Ensure that material transfer takes place in closed systems or with air extraction. PROC4, PROC8a, PROC11: Ensure additional ventilation at points where emissions occur. PROC10: Ensure sufficient controlled ventilation (10 to 15 air changes per hour). PROC13: Allow the product to flow out of the work area.
Organisational measures to prevent/limit emissions, dispersion and exposure	PROC1, PROC2: drain the transfer lines prior to disconnection. PROC3: Shut down and clean systems before opening or maintenance. Drain the transfer lines prior to disconnection. PROC4: Shut down and clean systems before opening or maintenance. PROC11: Avoid activities that involve exposure for more than 15 minutes per day. PROC15 without local vapour extraction: Avoid activities involving exposure for more than 1 hour per day. PROC19 without personal respiratory protection: Avoid activities involving exposure for more than 15 minutes per day.
Organisational measures to prevent/limit emissions, dispersion and exposure	PROC3, PROC10, PROC13, PROC19: Wear appropriate gloves tested in accordance with EN374. PROC11: Wear a respirator compliant with EN140 with a type A filter or higher.

3. Exposure assessment

Environment

Not relevant.

Health

	Exposure level	PCR	Method	Notes
PROC1	0,02 mg/m3	0	ECETOC TRA v.2.0 Workers	Without local extraction ventilation systems
PROC2	1,5 mg/m3	0,2	ECETOC TRA v.2.0 Workers	Local exhaust ventilation 90%
PROC3	3,75 mg/m3	0,5	ECETOC TRA v.2.0 Workers	Local exhaust ventilation 90%
PROC4	3 mg/m3	0,4	ECETOC TRA v.2.0 Workers	Local exhaust ventilation 90%
PROC8a	7,5 mg/m3	0,9	ECETOC TRA v.2.0 Workers	Local exhaust ventilation 90%
PROC10	7,5 mg/m3	0,9	ECETOC TRA v.2.0 Workers	Local exhaust ventilation 90%
PROC11	7,5 mg/m3	0,9	ECETOC TRA v.2.0 Workers	Local exhaust ventilation 90%
PROC13	7,5 mg/m3	0,9	ECETOC TRA v.2.0 Workers	Local exhaust ventilation 90%
PROC15	7,5 mg/m3	0,9	ECETOC TRA v.2.0 Workers	Without local extraction ventilation systems
PROC19	7,5 mg/m3	0,9	ECETOC TRA v.2.0 Workers	Without local extraction ventilation systems

3. Guidance for downstream users (DU) to assess whether they operate within the limits established by the ES

the estimates of worker exposure and risk characterisation reports (RCR) for the activities associated with this scenario have been carried out using the ECETOC TRA v2.0 as the assessment method. The relationships between operating conditions and safety of use (RCR (inhalation) <1) are indicated.