SECTION 1: IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier

Chemical name:	Hydrochloric acid (aqueous solution of hydrogen chloride)
EC number:	231-595-7
CAS number (EC inventory):	7647-01-0
Index number:	017-002-01-X
Registration number:	01-2119484862-27-0069
Chemical characterization:	Inorganic mono constituent substance

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

Relevant identified uses (see corresponding ES as attachment to this SDS)	• Production, Recycling and Distribution of HCl – Exposure Scenario 1 – Annex 1 • Industrial use as an intermediate product for industry – Exposure Scenario – Annex 2 • Formulation and (re)packaging of HCl and its formulations by industry and by professionals – Exposure Scenario 3 – Annex 3 • Industrial use of HCl and formulations – Exposure Scenario 4 – Annex 4 • Professional uses of HCl and formulations – Exposure Scenario 5 – Annex 5 • Consumer use of HCl and its formulations – Exposure Scenario 6 – Annex 6
Uses advised against	Any use involving aerosol formation, vapour release (>10 ppm) or risk of splashing into eyes or onto skin where workers without protective breathing or eye/skin equipment may be exposed

1.3 Details of the supplier of the safety data sheet

See footnote.

1.4 Emergency telephone number

ELECTROQUÍMICA DEL NOROESTE,S.A.U. Telf: 0034 986 866 569 Fax: 0034 986 866 822
Emergency National Number: 112

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance

Regulation (EC) No 1272/2008

Hazard Class	Hazard Category	Hazard Statements
Skin Corrosion	1B	H314: Causes severe skin burns and eye damage
STOT	Single Exp. 3ª	H335: May cause respiratory irritation
May be corrosive to metals	1	H290: May be corrosive to metals

Additional information

Human and environmental risks:

Concentrated hydrochloric acid (hydrochloric acid gas) forms acid clouds. Both the gas and the solution have a corrosive effect on human tissue and can potentially damage respiratory organs, skin and intestines. When hydrochloric acid is mixed with common

oxidising chemicals such as sodium hypochlorite (bleach, NaClO) or potassium permanganate (KMnO4), the toxic gas chlorine is produced.

Environmental consequences may occur on a local scale due to the pH effects.

2.2 Label Elements

Regulation (EC) No 1272/2008

Signal word		DANGER	
Symbol(s):	GHS 05	Corrosion	
	GHS 07	Exclamation mark	
Hazard statements:	H290 H314 H335	May be corrosive to metals Causes severe skin burns and eye damage. May cause respiratory irritation.	
Precautionary statements for end user:	P234 P260 P501 P304+P340 P303+P361+P353 P305+P351+P338	Keep only in original container. Do not breathe dust/fume/gas/mist/vapours/spray. Dispose of contents/container to... (permitted recycling or waste destruction company) IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	

When the substance is sold to the general public at a concentration of 0.2% or above, the following is compulsory:

- The packaging must be fitted with child-resistant fastenings.
- The label must carry a tactile hazard warning.

The product packaging must have:
- A single seal fastener for opening.
- EC No.
- Indication of "EC Labelling".

2.3 Other Hazard

Not available.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Hazardous substances

Chemical name	CAS-No.	EC No.	REACH No.	Concentration[%]
Hydrogen Chloride	7647-01-0	231-595- 7	01-21194 84862-27- 0069	32

Hydrogen chloride (in gas) and HCl in aqueous acid (hydrochloric acid) have the same CAS Registry No. Since the gas transforms into acid in aqueous systems and the gas may become volatile from aqueous systems, it is often difficult to determine which is being considered in any particular article in the literature.

3.2 Mixtures

Not applicable.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General advice	If exposed to the substance and victim feels unwell: Call 112 , a POISONS CENTERS or consult a physician. Show this safety sheet to the physician on duty.
If inhaled	Remove victim to fresh air and place in a comfortable position to enable normal breathing.
In case of skin contact	Remove contaminated clothing immediately. Rinse the skin with water/shower. Leave the danger zone.
In case of eye contact	Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
If swallowed	Rinse the mouth. Do NOT induce vomiting.

Self protection of rescuer

Respiratory protection:	*Use "E" filter masks.*
Hand protection:	*Wear suitable gloves tested through EN374 (i.e. PVC or rubber gloves).*
Eye protection:	*Wear safety goggles designed to protect against liquid splashes.*

4.2 Most important symptoms and effects, both acute and delayed

4.2.1 Inhalation

May cause respiratory irritation.

4.2.2 Skin contact

Causes severe skin burns.

4.2.3 Eye contact

Causes eyesight to deteriorate.
Highly corrosive to eyes.

4.2.4 Swallowing

If swallowed, causes burns in mucosa.

4.3 Indication of immediate medical attention and special treatment needed

Skin contact: Remove contaminated clothing immediately and rinse immediately with water.
Eye contact: Rinse the skin/eyes with water/shower.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media:	Use extinguishing media suited to the local circumstances and surroundings (for example): Dry chemical powder and CO_2).
Unsuitable extinguishing media:	Water may be ineffective.

5.2 Special hazards arising from the substance or mixture

- Product is not flammable and does not induce combustion.
- Remove container from the fire and cool with water in a protected area.
- Product reacts with most metals, producing explosive hydrogen gas and hydrogen chloride.
- Hydrogen chloride is easily disassociated in water into hydrated protons and chloride ions.

5.3 Advice for firefighters

- In case of fire or insufficient ventilation, use self-contained breathing apparatus.
- Use personal protective equipment.
- Wear chemically resistant suit.
- Cool containers/tanks with pulverised water.

SECTION 6: ACIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

- Prevent additional spillage, if safe to do so.
- Keep product away from incompatible products.
- Evacuate staff to safe areas.
- Keep people away from and upwind of the spillage.
- Ventilate the area.
- Wear suitable protective clothing.

6.1.1 For staff not involved in emergency response

- Move people to a safe area.

6.1.2 For staff responsible for emergency response

- Wear suitable personal protective equipment (e.g.: chemical protection suit; goggles, protective footwear, gloves and suitable respiratory protective equipment)
- Evacuate staff to safety areas.
- Keep people away.
- Ventilate the area.

6.2 Environmental precautions

- Do not release into the environment.
- Do not flush into surface water or into sanitary sewer system.
- If the product contaminates rivers, lakes or sewers, inform the responsible authorities.
- Absorb with inert, damp and non-combustible material, then rinse with water.
- Gather the spilt product in containers, seal them and hand over for destruction at the appropriate locations according to legal regulations.

6.3 Methods and materials for containment and cleaning up

6.3.1 - Contain the spill with protective barriers.
- Cover sewer entrances.

6.3.2 - Use absorbent material.
- Gather the waste in suitable containers for this substance.
- Keep the waste in duly labelled containers.

6.3.3 - Do not use water on spills of this product.

6.4 Reference to other sections

- See *sections* 7 and 8 for protective measures.
- See *section* 13 on waste treatment.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

- Use the product in closed systems.
- Do not smoke, eat or drink in handling areas.
- When diluting, add the product to water. Never add water to the product.
- Use only equipment and materials compatible with the product.
- Keep it away from incompatible products.
- To avoid thermal decomposition, do not overheat.
- Transfer preferably using pump or gravity.

7.2 Conditions for safe storage, including any incompatibilities

- Do not store with alkaline products and oxidising agents.
- Store in plastic tanks.
- Keep in a dry, well-ventilated place.
- Keep in duly labelled and sealed containers.

- Avoid aerosol formation.
- Corrosive to metals.

7.3 Specific end use(s)

Given the corrosive properties of the substance, always wear suitable protective clothing and protect eyes and skin.

For further information, consult the additional exposure scenario. Use only metal containers with an inner layer resistant to acid since the product can be corrosive to metals.

SECTION 8: EXPOSURE CONTROL/ PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Legal basis
Hydrogen chloride(*)	7647-01-0	STEL 15 min	10 ppm 15 mg/m³	NP 1796:2014
		TLV-TWA 8 h	5 ppm 8 mg/m³	
		TLV-C	2 ppm	

(*)Form of exposure: Aerosols, vapour and gas

STEL: Short Term Exposure Limit
TLV-TWA: Threshold Limit Value – Time Weighted Average
TLV-C: Threshold Limit Value – Maximum Concentration

8.1.2 DNEL/PENEC value(s)

DNEL: Acute exposure through inhalation: SCOEL recommends a STEL (15 min) of 10 ppm (15 mg/m3)
Long-term exposure through inhalation: SCOEL recommends a TLV-TWA of 8 hours of 5 ppm (8 mg/m3)

PNEC: PNEC water (seawater): 36 µg/L
PNEC water (freshwater): 36 µg/L
PNEC water (intermittent discharges): 45 µg/L

8.2 Exposure controls

8.2.1 Appropriate Engineering Controls

- Ensure adequate ventilation.
- Ensure that there are eye-baths and an emergency shower next to the workplace.

8.2.2 Individual Protection Measures, Suchs as Personal Protective Equipment

Respiratory protection:	Use air extraction in places of physical transfer and other openings. Work in an exhaust booth. Automate activities wherever possible. *Use "E" filter masks.*

Hand protection:	Wear suitable gloves tested through EN374 (i.e. PVC or rubber gloves).
Eye protection:	Wear safety goggles designed to protect against liquid splashes. Well-fitting safety goggles.
Body and skin protection:	Protective suit. Choose a protective suit according to the quantity and concentration of the substance in the workplace.

Hygiene measures:	Handle according to good health and safety practices. Do not eat, drink or smoke when using the product. Wash hands before breaks and at the end of the workday.
Protective measures:	Plan first aid action before starting to work with this product.

8.2.3 Environmental exposure controls

Discard rinse water in compliance with applicable regulations:

- Commision Decision 2014/955/EU - list of waste
- Directive 2006/12/EC of the European Parliament ando f the Council of 5 April 2006 - on waste
- Commision Regulation (EU) No 1357/2014 of 18 December 2014 - replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives
- Directive 2008/98/EC of the European Parliament ando f the Council of 19 November 2008 on waste

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance:	Colourless to slightly yellow liquid
b) Odour:	Pungent and irritant
c) Odour threshold:	0.25 at 10 ppm
d) pH:	<1 (5% water)
e) Melting point/freezing point:	- 20 ºC at 36 hPa
f) Initial boiling point and boiling range:	50 ºC at 56 hPa
g) Flash point:	Product is not flammable
h) Evaporation rate:	No available data *(*)*
I) Flammability (solid, gas):	Product is not flammable
j) Upper/lower limits of flammability or explosivity *limits*:	The product is neither flammable nor explosive
k) Vapour pressure:	20 mbar, at 20 ºC
l) Vapour density:	1.26 (Air = 1)
m) Relative density:	1.18 (Water)
n) Solubility(ies):	Water soluble; Soluble in ethanol and 2-propanol
o) Partition coefficient n-octanol/water:	No available data *(*)*
p) Auto-ignition temperature:	Product is not flammable
q) Decomposition temperature:	No available data
r) Viscosity:	1.68 cP at 25 ºC
s) Explosive properties:	*Non Explosive*
t) *Oxidising* Properties:	*Non Oxidising*

(*) No reliable data source for this data
(**) According to EU Risk Assessment Report – Vol. 73

9.2 Other information

Dissociation constant:	Turning point not reached: Study is scientifically impossible. HCl is a very strong acid and pKa is therefore infinite.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Reacts with strong oxidising agents and with alkaline substances (bases).

10.2 Chemical stability

Stable in the recommended storage conditions.

10.3 Possibility of hazardous reactions

Product reacts with metals and produces highly flammable hydrogen. Acid reacts violently with alkali when heat is produced.

10.4 Conditions to avoid

Any use involving aerosol formation or vapour release and where workers may be exposed without respiratory protective equipment. Any use involving risk of splashing eyes/skin where workers may be exposed without eye or skin protection

10.5 Incompatible materials

Metals and oxidising agents.

10.6 Hazardous decomposition products

Hydrogen Chloride, Chlorine and Hydrogen.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Hydrochloric acid is a very strong and highly corrosive acid. The substance causes only local and non-systemic effects. Hydrochloric acid disassociates rapidly and almost completely in contact with water, releasing the chloride ion and the hydrogen ion that combine with water to form the hydronic ion. Both chlorine and hydronic ions are generally present in our body.

Test results/Data: There are no data available, information provided based on hydrochloric acid properties (see toxicological summary).

Hazard Class	Dose descriptor	Method/reference
Acute toxicity: oral	Oral Mouse LD50 238-277 mg/kg	OECD SIDS Hydrogen chloride UNEP PUB US, Oct 2002
Acute toxicity: skin:	Skin Rabbit LD50 >5010 mg/kg	OECD SIDS Hydrogen chloride UNEP PUB US, Oct 2002
Acute toxicity: inhalation:	Signs of toxicity in mice during exposure to HCl gas or aerosols were essentially identical. HCl proved highly irritable to eyes, mucosa and exposed areas of the skin. HCL gas LC50 (mouse - 5 min of exposure): 40989 ppm (34803-48272) LC50 (mouse - 30 min of exposure): 4701 ppm (4129-5352)	

	HCl aerosols LC50 (mouse - 5 min of exposure): 45.6 mg/L (39.5-52.8) equivalent to 31008 ppm (26824-35845) LC50 (mouse - 30 min of exposure): 8.3 mg/L (7.2-9.7) equivalent to 5666 ppm (4855-6614)	
Corrosion:	Corrosive. Studies whose results indicate corrosiveness for skin: Rabbit: 0.5 ml 37%, exposure 1 to 4 hours, occlusive/semi-occlusive. Rabbit 37% hydrochloric acid aq. (1 h, 4 h) caused serious damage. Rabbit 0.5 mL of 17% hydrochloric acid aq. Applied for 4 h.	OECD 404, pre-GLP
Skin irritation	Non-irritant (< 10% of HCl solutions): Tests on humans in a 10% HCl solution, suggesting that a 10% HCl solution should not be classified as "skin irritant". Moderately irritant: Rabbit 0.5 mL of 3.3% of hydrochloric acid aq. Application for 5 days. Non-irritant: Rabbit 0.5 mL of 1% hydrochloric acid aq. Application for 5 days did not become irritant.	OECD SIDS Hydrogen Chloride UNEP PUB US, Oct 2002
Serious Eye Lesions/ Eye irritation:	Risk of very serious damage to eyes (non-reversible). Corrosive based on skin corrosiveness data. Corrosive: Rabbit 0.1 mL, 10%. Corrosive to eyes 1 and Highly irritant: Rabbit 0.1 mL of 10% of hydrochloric acid aq. Serious irritation with cornea lesion that may result in permanent damage to eyesight. Corrosive: Rabbit 0.03 mL or more of 5% of hydrochloric acid aq. Proves to be highly irritant or corrosive. Slight irritant: Rabbit 0.1 mL of 3.3% of hydrochloric acid aq. Non-irritant: Rabbit 0.1 mL of 0.33% of hydrochloric acid aq. Was applied to conjunctive sac, period of observation, 48 h.	Method: OECD 405, not GLP OECD SIDS Hydrogen Chloride UNEP PUB US, Oct 2002
Respiratory or Skin Sensitivity:	May cause respiratory irritation.	
Germ cell mutagenicity:	Non-mutagenic, non-clastogenic.	
Carcinogenicity:	Hydrochloric acid did not provoke any carcinogenic response in the mice treated.	Orientation test OECD 451, 1981.
Reproductive toxicity:	No data.	
STOT – SE:	Lungs; respiratory system.	
STOT– RE:	No data available.	
Aspiration Hazard:	Irritant to respiratory tract.	

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

In formation on environmental effects

For hydrochloric acid it is not relevant to determine toxicity in terms of mg/L due to buffering capacity of different test systems and different aquatic ecosystems. Aquatic studies are being made using buffered media and, therefore, as discussed in the acute toxicity aquatic studies, the standard chronic test methods led to different results based on the different buffering capacity of the specific test systems. Apart from that, the exact maintenance of pH values over time in chronic tests may be problematic.
It is possible that the results of the aquatic toxicity of hydrochloric acid arise from the fact that there is sufficient acid to produce a lower pH (i. e. pH 3-5).

Given that the environmental exposure assessment shows insignificant disturbance in aquatic pH levels, both in product formulation and use, there is considered to be no long-term risk to aquatic organisms, and, therefore, information on the chronic effects on fish is unnecessary.

In the aquatic environment the effects of HCl are clearly related to the effects of pH, since HCl dissociates completely in the H3O+ & Cl ions, and the latter does not constitute a harmful substance. The substance itself will therefore not reach land environment or sediments.

Hazard Class	Dose descriptor	Method/reference
Toxicity in fish:	Acute toxicity Lepomis macrochirus, freshwater, semi-static: 96h-LC50 = 20.5 mg/l (pH 3.25 - 3.5).	
Toxicity to daphnia and other aquatic invertebrates:	EC50/LC50 for freshwater invertebrates: 0.45 mg/L. Immobilisation test, 4-hours	OECD Guideline 202 (Daphnia sp. Immobilisation test).
Toxicity in algae:	Chlorella vulgaris, freshwater: 72h-ErC50 = 0.76 (pH 4.7) mg/l, 72h-NOErC = 0.364 mg/l (pH 5.0) (OECD 201). EC50/LC50 for freshwater algae: 0.73 mg/L. Growth inhibition, Monitoring analysis: negative.	OECD guideline 201 (Algae, Growth inhibition test).
Toxicity in bacteria:	EC50 (3 h, freshwater, breathing rate): pH 5.0 -5.5. Inhibiting effect on breathing rate of activated sludge.	OECD Guideline 209 (Activated sludge, respiration inhibition test).

12.2 Persistence and degradability

Biodegradability: Data not available.
Degradation (abiotic): Data not available.

12.3 Bioaccumulative potential

Data not available.

12.4 Mobility in soil

Land behaviour is not expected to be relevant. If released into soil, soil particle absorption will be insignificant. Depending on the buffering capacity of the soil, the H+ will be neutralised in soil water by natural organic or inorganic matter or pH may decrease.

12.5 Results of PBT/vPvB assessment

HCl does not meet all the criteria to be classified as a PBT or vPvB substance.

12.6 Other adverse effects

Data unavailable.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment procedures

Waste disposal procedures:

- Dilute with large amounts of water.
- Solutions with low pH must be neutralised with inorganic base before disposal.
- *It is not advisable to discharge hydrochloric acid waste through the sewage system.*
- EWC Code 06 01 02(*) – Hydrochloric Acid.
- EWC Code 06 01 99 – Waste not otherwise specified (Contaminated Hydrochloric Acid).
- EWC Code 15 02 02(*) – Absorbents, filter materials contaminated by hazardous substances.

Packaging treatment:

- Recycling of packaging is preferable to elimination or incineration.
- Rinse containers with water.
- EWC Code 15 01 10(*) – Packaging containing residues of or contaminated by hazardous substances.

Applicable regulations:

- Commision Decision 2014/955/EU - list of waste
- Directive 2006/12/EC of the European Parliament ando f the Council of 5 April 2006 - on waste
- Commision Regulation (EU) No 1357/2014 of 18 December 2014 - replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives
- Directive 2008/98/EC of the European Parliament ando f the Council of 19 November 2008 on waste

SECTION 14: TRANSPORT INFORMATION

ADR

UN number:	1789
UN proper shipping name:	HYDROCHLORIC ACID
Transport hazard class(es):	8
Packing group:	II
Classification Code:	C1
Hazard identification No:	80
Labels:	8
Tunnel restriction code:	(E)
Environmentally hazardous :	No

IATA

UN number:	1789
UN proper shipping name:	HYDROCHLORIC ACID
Transport hazard class(es):	8
Packing group:	II
Labels:	8
Packing instruction (cargoaircraft):	855 Liquid Quantities max Qty/Pkg: 30 L

Packing instruction (passenger aircraft):	851 Liquid Quantities max Qty/Pkg: 1 L
Packing instruction (LQ):	Y840 Liquid Quantities max Qty/Pkg: 0,5 L
Environmentally hazardous:	No

IMDG

UN number:	1789
UN proper shipping name:	HYDROCHLORIC ACID
Transport hazard class(es):	8
Packing group:	II
Hazard identification no.:	80
Hazard Label:	8
EmS Number 1:	F-A,S-B
Marine pollutant:	No

RID

UN number:	1789
UN proper shipping name:	HYDROCHLORIC ACID
Transport hazard class(es):	8
Packing group:	II
Classification Code:	C1
Hazard identification No:	80
Labels:	8
Environmentally hazardous:	No

SECTION 15: REGULATORY INFORMATION

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

This safety sheet was made taking into consideration the following legislation:

Community Legislation:

- Regulation (EC) No.1907/2006 of the European Parliament and of the Council of 18 December, concerning the registration, evaluation, authorisation and restriction of chemicals (REACH), and respective amendments;
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations, and respective amendments;
- Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and respective amendments;
- Council Directive 67/548/EEC of 27 June 1967 concerning the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of hazardous substances, and amendments;
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work and respective amendments;
- Commission Directive 2000/39/EC of 8 June 2000 establishing a first list of occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work, and respective amendments;
- Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste;
- *Commision Regulation (EU) No 1357/2014 of 18 December 2014 - replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives*
- *Commision Decision 2014/955/EU - list of waste Directive 2006/12/EC of the European Parliament ando f the Council of 5 April 2006 - on waste*
- *Commision Regulation (EU) No 1357/2014 of 18 December 2014 - replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives*

15.2 Chemical safety assessment

A chemical safety study was made.

SECTION 16: OTHER INFORMATION

This information refers only to the aforementioned product and is not valid if used with any other product or process. This information is in accordance with our current knowledge; it is complete and given in good faith but with no guarantee. The user is responsible for ensuring that the information is complete and appropriate for his specific use of the product.

Recommendations for occupational training:

- Provide the operators with suitable information, instruction and training on the product.

List of Changes:

DATE	REVISION	CHANGES MADE
29/01/2015	2	Points 1.2.to 1.4.
		Points 2.1.to 2.3.
		Point 3.1.
		Points 4.2.to 4.3.
		Point 4.3.
		Points 5.1.to 5.3.
		Points 6.1.to 6.4.
		Points 7.1. and 7.2.
		Points 8.1. and 8.2.
		Points 9.1. and 9.2.
		Points 10.1., 10.5. and 10.6.
		Point 11.1.
		Points 1.2., 12.3. and 12.6.
		Point 13.1.
		Points 14 to 16
20/07/2016	3	Change logo
30/01/2017	*4*	*Word "SECTION" added to all section titles*
		Sections 1.1., 1.3. and 1.4
		Section 2.1 and 2.2 – Classification and labelling relative to directive 67/548/EEC or 1999/45/EC
		Section 3.1
		Section 4.1
		Sections 6.1.1 and 6.1.2
		Sections 6.4
		Sections 8.2.2
		Sections 9.1
		Section 13.1
		Section 14
		Sections 15.1
		Section 16

Abbreviations mentioned on the Sheet:

ADR – The European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS – World authority for chemical information
EC – European Community
MC – Maximum concentration
DNEL – Derived Non Effect Concentration
EC50 – Exposure Response – Effective Concentration
ERC – Environmental Release Category
WWTP – Wastewater Treatment Plant
SDS – Safety Data Sheet
GLP – Good Laboratories Practices
IATA – International Air Transport Association
IMDG – International Maritime Dangerous Goods
LC50 – Median Lethal Concentration
LEV – Low exposure level
m/m – Mass concentration
vPmB - Very persistent and very bioaccumulative.
UNO – United Nations Organisation
PBT - Persistent, bioaccumulative and toxic.
PC – Product Category
PNEC – Predicted Non Effect Concentration
PROC – Process Category
RID – International Rule for Transport of Dangerous Substances by Railway
SCOEL – Scientific Committee on Occupational Exposure Limits
STEL – Short Time Exposure Limit
STOT – SE – Specific Target Organ Toxicant - Single Exposure
STOT – Specific Target Organ Toxicant
STOT- RE – Specific Target Organ Toxicant - Repeated Exposure
SU - Sector of Use
TLV – Threshold limit value
TWA – Time weighted average

References:

- Barrow C. S., Lucia H. and Alarie Y. C. (1979). A comparison of the acute inhalation toxicity of hydrogen chloride versus the thermal decomposition products of polyvinylchloride. Journal of Combustion Toxicology 6: 3-12. Testing laboratory: not specified. Report no.: not specified. Study number: not specified.
- Basketter D. A. et al. (1994). Identification of irritation and corrosion hazards to skin: an alternative strategy to animal testing. Fd Chem. Toxic. Vol. 32, No.6, pp. 539-542. Testing laboratory: Unilever Environmental Safety Laboratory, Sharnbrook, Bedford, MK44 ILQ, UK. Report no.: Not specified. Study number: Not specified.
- Brown, R. J. (2008). Hydrochloric Acid: Toxicity to the green alga Chlorella vulgaris. Not applicable; not published. Testing laboratory: Brixham Environmental Laboratory, AstraZeneca UK Limited, Brixham, Devon, TQ5 8BA, UK. Report no.: BL8644/B. Owner company: Reckitt Benckiser. Study number: 08-0146/B.
- Buckley L. A., Jiang X. Z., James R. A., Morgan K. T. and Barrow C. S. (1984). Respiratory Tract Lesions Induced by Sensory Irritants at the RD50 Concentration. Toxicol. and Applied Pharmacol. 74: 417-429. Testing laboratory: not specified. Report no.: not specified. Study number: not specified.
- Burleigh-Flayer H., Wong K. L. and Alarie Y. (1985). Evaluation of the Pulmonary Effects of HCl Using CO2 Challenges in Guinea Pigs. Fundam. and Appl. Toxicol. 5: 978-985. Testing laboratory: not specified. Report no.: not specified. Study number: not specified.
- Cairns, J. and Scheier, A. (1959). The relationship of bluegill sunfish body size to tolerance for some common chemicals. BullBull., 96, 243-252, Proc. 13th Ind. Waste Conf., Purdue Univ. Eng. Testing laboratory: Not specified. Report no.: Not specified. Study number: Not specified.

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Annexes:

Annex 1: Production, Recycling and Distribution of Hydrochloric Acid – Exposure Scenario
Annex 2: Industrial use as an intermediate product for industry – Exposure Scenario
Annex 3: Formulation and (re)packaging of HCl and its formulations by industry and by professionals – Exposure Scenario
Annex 4: Industrial Use of Hydrochloric Acid and Formulations – Exposure Scenario
Annex 5: Professional Uses of Hydrochloric Acid and Formulations – Exposure Scenario
Annex 6: Consumer use of HCl and its formulations - Exposure Scenario

Annex 1
Production, Recycling and Distribution of Hydrochloric Acid – Exposure Scenario

Worker – ES1 – Hydrochloric acid	
Section 1	Exposure Scenario Title
Title	ES1 – Manufacture of Hydrochloric acid; CAS: 7647-01-0
Use Descriptor	Sector of Use: Industrial (SU8, SU9)
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure (PROC1 is also applicable to the manufacture of HCl gas for the production of hydrochloric acid by absorption into water under SCC.) PROC2: Use in a closed, continuous process with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC1: Manufacture of substances ERC2: Formulation of preparations (mixtures)
Processes, tasks, activities covered	Manufacture of Substance. Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).
ES Exposure Criteria	SCOEL: - 8 mg/m³ - 8 hr. TWA - 15 mg/m³ – 15 min. TWA
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 – 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 40% (unless stated differently) [G13].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [[G2].
Other Operational Conditions affecting worker exposure	Assumes use at not >20 °C above ambient [G15] It should be noted that the process temperature may be higher, but the substance temperature is down to ambient at worker contact points. Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI119]
Contributing Scenarios	Risk Management Measures
Due to the corrosive properties of the substance, always wear suitable protective clothing, eye and skin protection	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54].	Handle substance within a closed system [E47]. Clear transfer lines prior to de-coupling [E39]

PROC2: General exposures [CS1]. Process sampling [CS2] Continuous process [CS54].	Handle substance within a closed system [E47].Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39]
PROC3: General exposures [CS1]. Remanufacture of reject articles [CS19]. Cleaning [CS47]. Use in contained batch processes [CS37]. With sample collection [CS56].	Handle substance within a closed system [E47]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39] Wear suitable gloves tested to EN374 [PPE15].
PROC4: Drum/batch transfers [CS8] Bulk transfers [CS14]. General exposures (open systems) [CS16]. Cleaning [CS47]. Remanufacture of reject articles [CS19]. With sample collection [CS56].	Use bulk or semi-bulk handling systems [E43]. Or Use drum pumps [E53]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Provide extract ventilation to points where emissions occur (90% efficiency) [E54].
PROC8a: Bulk transfers [CS14]. Process sampling [CS2]. Drum/batch transfers [CS8]. General exposures (open systems) [CS16]. Equipment cleaning and maintenance [CS39] Transport [CS58]. Internal [CS59].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. Or Provide extract ventilation to points where emissions occur (90% efficiency) [E54]
PROC8b: Bulk transfers [CS14]. Process sampling [CS2]. Equipment cleaning and maintenance [CS39]. Transport [CS58]. Internal [CS59]. Drum/batch transfers [CS8] General exposures (open systems) [CS16].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. Or Provide extract ventilation to points where emissions occur (90% efficiency) [E54]
PROC9: Drum and small package filling [CS6]. Drum/batch transfers [CS8]. Equipment cleaning and maintenance [CS39].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. Fill containers/cans at dedicated fill points supplied with local extract ventilation (90% efficiency) [E51]
PROC15: Laboratory activities [CS36]. Or: PROC15: Laboratory activities [CS36]	Handle in a fume cupboard or under extract ventilation (80% efficiency) [E83]. Or Carry out in a vented booth or extracted enclosure (80% efficiency) [E57] Avoid carrying out operation for more than 4 hours [OC12] Avoid carrying out operation for more than 1 hour [OC11]
Section 2.2	Control of environmental exposure
Product characteristics	Liquid, vapor pressure 0.5 – 10 kPa [OC4].
Amounts used	NR
Frequency and duration of use	360 days per year
Other Operational Conditions of use affecting environmental exposure	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases [W2]

releases to soil	Prevent leaks and prevent soil / water pollution caused by leaks[S4]
Organizational measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic released. [W2]
Conditions and measures related to municipal sewage treatment plant	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external treatment of waste for disposal	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external recovery of waste	NR
Other environmental control measures additional to above	NR
Section 3	Exposure Estimation
3.1. Health	
PROC1: Safe use for exposures >4 hours is safe, also without the use of LEV or personal breathing protection. PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9: Exposure safe for >4 hrs, provided that LEV (90% efficiency) is used. PROC15: exposures during 15 min-1 hr are safe, also without the use of LEV; For exposures >1 hr, LEV (80% efficiency) must be used.	
3.2. Environment	
Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
Worker exposure has been evaluated using ECETOC TRA V2.0	
4.1.1 Health – Uses advised against	
- Any use involving aerosol formation or vapor release in excess of 10 ppm where workers are exposed without respiratory protection - Any use carrying a risk of splashes to eyes / skin where workers are exposed without eye / skin protection	
4.2. Environment	
4.2.1 Environment – Uses advised against	
Any uses involving direct releases to air / surface water that cannot be buffered by natural systems to maintain pH at the naturally occurring level.	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Process sampling [CS2].	Wear suitable gloves tested to EN374 [PPE15]
Equipment cleaning and maintenance [CS39]	Drain down and flush system prior to equipment break-in or maintenance [E55]. Clear spills immediately [C&H13].
Control of environmental exposure	
Equipment cleaning and maintenance [CS39]	Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].

Exposure estimation

1 Workers exposure

Worker exposure for this scenario has been assessed using ECETOC TRA V2.0. In Chapter 10 the relationships between the Operational Conditions and safe uses (RCRs (inhalation) <1) are given.

In Section 3.1 of the scenario above, the Safe Uses, and conditions under which, are given.

2 Consumer exposure

Not relevant

3 Indirect exposure of humans via the environment

Not relevant.

Annex 2
Industrial use as an intermediate product for industry – Exposure Scenario

WORKER – ES2 – Hydrochloric acid	
Section 1	Exposure Scenario Title
Title	ES2 - Industrial use of Hydrochloric acid as Intermediate; CAS: 7647-01-0
Use Descriptor	Sector of Use: Industrial (SU3, SU4, SU8, SU9, SU11, SU12, SU13, SU19)
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure (PROC1 is also applicable to the use of HCl gas as intermediate under SCC.) PROC2: Use in a closed, continuous process with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as a laboratory reagent
	Environmental Release Categories: ERC6A: Industrial use, resulting in manufacture of another substance (use of intermediates)
Processes, tasks, activities covered	Use as Intermediate by Industry; -Sampling -Material transfers
ES Exposure Criteria	SCOEL: - 8 mg/m³ - 8 hr. TWA - 15 mg/m³ – 15 min. TWA
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 – 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 40 % (unless stated differently) [G13].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]; It should be noted that the process temperature may be higher, but the substance temperature is down to ambient at worker contact points. Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI119]
Contributing Scenarios	Risk Management Measures
Due to the corrosive properties of the substance, always wear suitable protective clothing, eye and skin protection	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54].	Handle substance within a closed system [E47]. Clear transfer lines prior to decoupling [E39]
PROC2: General exposures [CS1]. Process sampling [CS2] Continuous process [CS54].	Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39]

PROC3: General exposures [CS1]. Remanufacture of reject articles [CS19]. Cleaning [CS47]. Use in contained batch processes [CS37]. With sample collection [CS56].	Handle substance within a closed system [E47]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39] Wear suitable gloves tested to EN374 [PPE15].
PROC4: Drum/batch transfers [CS8] Bulk transfers [CS14]. General exposures (open systems) [CS16]. Cleaning [CS47]. Remanufacture of reject articles [CS19]. With sample collection [CS56].	Use bulk or semi-bulk handling systems [E43]. or Use drum pumps [E53]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Provide extract ventilation to points where emissions occur (90% efficiency) [E54].
PROC9: Drum and small package filling [CS6]. Drum/batch transfers [CS8]. Equipment cleaning and maintenance [CS39].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. or Fill containers/cans at dedicated fill points supplied with local extract ventilation [E51].
PROC15: Laboratory activities [CS36].	Handle in a fume cupboard or under extract ventilation (80% efficiency) [E83]. Or Carry out in a vented booth or extracted enclosure (80% efficiency) [E57] Avoid carrying out operation for more than 4 hours [OC12]
Or: PROC15: Laboratory activities [CS36]	Avoid carrying out operation for more than 1 hour [OC11]
Section 2.2	Control of environmental exposure
Product characteristics	Liquid, vapor pressure 0.5 - 10 kPa [OC4].
Amounts used	NR
Frequency and duration of use	360 days per year
Other Operational Conditions of use affecting environmental exposure	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases [W2] Prevent leaks and prevent soil / water pollution caused by leaks [S4]
Organisation measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic released. [W2]
Conditions and measures related to municipal sewage treatment plant	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external treatment of waste for disposal	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external recovery of waste	NR
Other environmental control measures additional to above	NR
Section 3	Exposure Estimation
3.1. Health	

PROC1: safe use for activities >4 hrs, also without the use of LEV or breathing equipment. PROC2, PROC3, PROC4, PROC9: safe use for activities >4 hrs, provided that LEV (90% efficiency) is used. PROC15: safe use for activities 15 min – 1 hr, also without LEV; For activities >1 hr, LEV (80% efficiency) must be used.
3.2. Environment
Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk

Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
Worker exposure has been evaluated using ECETOC TRA V2.0	
4.1.1 Health – Uses advised against	
- Any use involving aerosol formation or vapor release in excess of 10 ppm where workers are exposed without respiratory protection - Any use carrying a risk of splashes to eyes / skin where workers are exposed without eye / skin protection	
4.2. Environment	
4.2.1 Environment – Uses advised against	
Any uses involving direct releases to air / surface water that cannot be buffered by natural systems to maintain pH at the naturally occurring level.	

Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Process sampling [CS2]	Wear suitable gloves tested to EN374 [PPE15]
Equipment cleaning and maintenance [CS39]	Drain down and flush system prior to equipment break-in or maintenance [E55]. Clear spills immediately [C&H13].
Control of environmental exposure	
Selecção de Frases RMM relevantes	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

Exposure estimation

1 Workers exposure
Worker exposure for this scenario has been assessed using ECETOC TRA V2.0. In Chapter 10 the relationships between the Operational Conditions and safe uses (RCRs (inhalation) <1) are given.
In Section 3.1 of the scenario above, the Safe Uses, and conditions under which, are given.

2 Consumer exposure
Not relevant

3 Indirect exposure of humans via the environment
Not relevant.

Annex 3
Formulation and (re)packaging of HCl and its formulations by industry and by professionals – Exposure Scenario

Worker – ES3 – Hydrochloric acid	
Section 1	Exposure Scenario Title
Title	Formulation & (Re)Packaging of Hydrochloric acid and its formulations by Industry & by Professionals; CAS: 7647-01-0
Use Descriptor	Sector of Use: SU10
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed, continuous process with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations (mixtures) and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
	Environmental Release Categories: ERC2: Formulation of preparations (mixtures)
Processes, tasks, activities covered	Formulation, blending, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance and associated laboratory activities.
ES Exposure Criteria	SCOEL: - 8 mg/m³ - 8 hr. TWA - 15 mg/m³ – 15 min. TWA
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 – 10 kPa [OC4] for 40% HCl For activities under PROC5 : Liquid, partial vapour pressures (cf. ELECNRTL in Aspenplus (vs 2004.1)) : 20 °C : 22.1 Pa 30 °C : 51 Pa 40 °C : 112 Pa
Concentration of substance in product	Covers percentage substance in the product up to 20 % (unless stated differently) [G13].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Other Operational Conditions affecting worker exposure	Some operations are carried out at elevated temperature (> 20°C above ambient temperature) [OC7].; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI119]

Risk Management Measures [GT7]	
Due to the corrosive properties of the substance, always wear suitable protective clothing, eye and skin protection	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54].	Handle substance within a closed system [E47]. Clear transfer lines prior to decoupling [E39]
PROC2: General exposures [CS1]. Process sampling [CS2] Continuous process [CS54].	Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39]
PROC3: General exposures [CS1]. Remanufacture of reject articles [CS19]. Cleaning [CS47]. Use in contained batch processes [CS37]. With sample collection [CS56].	Handle substance within a closed system [E47]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39] Wear suitable gloves tested to EN374 [PPE15].
PROC4: Drum/batch transfers [CS8] Bulk transfers [CS14]. General exposures (open systems) [CS16]. Cleaning [CS47]. Remanufacture of reject articles [CS19]. With sample collection [CS56].	Use bulk or semi-bulk handling systems [E43]. or Use drum pumps [E53]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Provide extract ventilation to points where emissions occur (90% efficiency) [E54].
PROC5: Drum/batch transfers [CS8]. Bulk transfers [CS14]. General exposures (open systems)[CS16]. Mixing operations (open systems) [CS30]. Cleaning [CS47].	Transfer materials directly to mixing vessels [E45]. Use drum pumps [E53]. If not available and pouring from container is necessary, use extra safeguards: spill containment, splash protection for skin and eyes, use respirator to prevent inhalation of vapors/aerosols. Drain down and flush system prior to equipment break-in or maintenance [E55].
PROC8a: Bulk transfers [CS14]. Process sampling [CS2] Drum/batch transfers [CS8]. General exposures (open systems) [CS16]. Equipment cleaning and maintenance [CS39] Transport [CS58]. Internal [CS59].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. or Provide extract ventilation to points where emissions occur (90% efficiency) [E54]
PROC8b: Bulk transfers [CS14]. Process sampling [CS2]. Equipment cleaning and maintenance [CS39]. Transport [CS58]. Internal [CS59]. Drum/batch transfers [CS8] General exposures (open systems) [CS16].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. or Provide extract ventilation to points where emissions occur (90% efficiency) [E54]
PROC9: Drum and small package filling [CS6]. Drum/batch transfers [CS8]. Equipment cleaning and maintenance [CS39].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. Fill containers/cans at dedicated fill points supplied with local extract ventilation (90% efficiency) [E51]
Section 2.2	Control of environmental exposure
Product characteristics	Liquid, vapor pressure 0.5 - 10 kPa [OC4].

Amounts used	NR
Frequency and duration of use	360 days per year
Other Operational Conditions of use affecting environmental exposure	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases [W2] Prevent leaks and prevent soil / water pollution caused by leaks [S4]
Organisation measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic released. [W2]
Conditions and measures related to municipal sewage treatment plant	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external treatment of waste for disposal	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external recovery of waste	NR
Other environmental control measures additional to above	NR
Section 3	Exposure Estimation
3.1. Health	
PROC1: Safe use for activities >4 hrs, also without LEV or without breathing equipment. PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9: safe use for activities >4 hrs, provided that LEV (90% efficiency) is used. PROC5: uses are safe for activities >4 hrs, at operating temperatures of 20, 30 or 40 °C, without the use of LEV or breathing protection.	
3.2. Environment	
Standard phrases. Ability to Include a web link.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
Worker exposure has been evaluated using ECETOC TRA V2.0	
4.2. Environment	
Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Process sampling [CS2].	Wear suitable gloves tested to EN374 [PPE15]
Equipment cleaning and maintenance [CS39]	Drain down and flush system prior to equipment break-in or maintenance [E55]. Clear spills immediately [C&H13].
Control of environmental exposure	
Selection of relevant RMM Core Phrases	Good practice RMM phrases may be incorporated in this section or consolidated into the main sections of the SDS, depending on the preference of the Registrant and functionality of the available e-SDS system.

Exposure estimation

1 Workers exposure
Worker exposure for this scenario has been assessed using ECETOC TRA V2.0. In Chapter 10 the relationshipsbetween the Operational Conditions and safe uses (RCRs (inhalation) <1) are given.
In Section 3.1 of the scenario above, the Safe Uses, and conditions under which, are given.

2 Consumer exposure
Not relevant

3 Indirect exposure of humans via the environment
Not relevant.

Annex 4
Industrial use of Hydrochloric acid and formulations - Exposure scenario

Worker – ES4 – Hydrochloric acid	
Section 1	Exposure Scenario Title
Title	ES4 – Industrial Use of Hydrochloric acid and Formulations; CAS: 7647-01-0
Use Descriptor	Sector of Use: Industrial (SU2a, SU2b, SU3, SU5, SU14, SU15, SU16)
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed, continuous process with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC15: Use as a laboratory reagent PROC19:Hand-mixing with intimate contact and only PPE available
	Environmental Release Categories: ERC4:Industrial use of processing aids in processes and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids
Processes, tasks, activities covered	Use of HCl & its Formulations by Industry
ES Exposure Criteria	SCOEL: - 8 mg/m³ - 8 hr. TWA - 15 mg/m³ – 15 min. TWA
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapor pressure 0.5 - 10 kPa [OC4]. PROC13: Partial vapor pressures over the bath with a 15% HCl solution are : T °C pHCl Pa 20 1.89 30 4.93 40 12.2 50 28.6 60 64.5 70 139 80 290 90 584 100 1140 (Cf. ELECNRTL in Aspenplus (vs. 2004.1))
Concentration of substance in product	Covers percentage substance in the product up to 40 % (unless stated differently) [G13].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1].

	Ensure operatives are trained to minimize exposures [EI119] Under PROC13, operating temperatures may differ from 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100 °C
Contributing Scenarios	Risk Management Measures
Due to the corrosive properties of the substance, always wear suitable protective clothing, eye and skin protection	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54].	Handle substance within a closed system [E47]. Clear transfer lines prior to decoupling [E39]
PROC2: General exposures [CS1]. Process sampling [CS2] Continuous process [CS54].	Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39]
PROC3: General exposures [CS1]. Remanufacture of reject articles [CS19]. Cleaning [CS47]. Use in contained batch processes [CS37]. With sample collection [CS56].	Handle substance within a closed system [E47]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39] Wear suitable gloves tested to EN374 [PPE15].
PROC4: Drum/batch transfers [CS8] Bulk transfers [CS14] General exposures (open systems) [CS16] Cleaning [CS47]. Remanufacture of reject articles [CS19]. With sample collection [CS56].	Use bulk or semi-bulk handling systems [E43]. or Use drum pumps [E53]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Provide extract ventilation to points where emissions occur (90% efficiency) [E54].
PROC9: Drum and small package filling [CS6]. Drum/batch transfers [CS8]. Equipment cleaning and maintenance [CS39].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. Fill containers/cans at dedicated fill points supplied with local extract ventilation (90% efficiency) [E51]
PROC10: Rolling, Brushing [CS51]. Equipment cleaning and maintenance [CS39].	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour) (90% efficiency) [E40]. Wear suitable gloves (tested to EN374) [PPE15]
PROC13: Dipping, immersion and pouring [CS4]. Treatment by dipping and pouring [CS35].	Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82] Carry out in a vented booth provided with laminar airflow [E59]. Automate activity where possible [AP16]. Allow time for product to drain from workpiece [EI21]. Wear suitable gloves (tested to EN374) [PPE15].
PROC15: Laboratory activities [CS36]. Or: PROC15: Laboratory activities [CS36]	Handle in a fume cupboard or under extract ventilation (80% efficiency) [E83]. Or Carry out in a vented booth or extracted enclosure (80% efficiency) [E57] Avoid carrying out operation for more than 4 hours [OC12] Avoid carrying out operation for more than 1 hour [OC11]
PROC19: Mixing operations (open systems) [CS30]. Additive premixing [CS92] Or:	Wear suitable gloves tested to EN374 [PPE15]. Wear a respirator conforming to EN140 Type A filter or better [PPE22] Wear suitable gloves tested to EN374 [PPE15]. Avoid carrying out operation for more than 15 minutes [OC10]
Section 2.2	Control of environmental exposure
Product characteristics	Liquid, vapor pressure 0.5 - 10 kPa [OC4].
Amounts used	NR
Frequency and duration of use	360 days per year

Other Operational Conditions of use affecting environmental exposure	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases [W2] Prevent leaks and prevent soil / water pollution caused by leaks [S4]
Organisation measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic released. [W2]
Conditions and measures related to municipal sewage treatment plant	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external treatment of waste for disposal	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external recovery of waste	NR
Other environmental control measures additional to above	NR
Section 3	Exposure Estimation
3.1. Health	
PROC1: Safe use for activities >4 hrs, also without LEV or breathing protection. PROC2, PROC3, PROC4, PROC9, PROC10: Safe use for activities >4 hrs, provided that LEV (90% efficiency) is used. PROC13: Safe use at all temperatures as mentioned above (2.1) provided that LEV (90% efficiency) is used. PROC15: Safe use for 1`5 min. – 1 hrs; if used >1 hr, LEV (80% efficiency) must be used. PROC19: safe use for >4 hrs: provided that breathing equipment (half mask) is used; or limit exposure to <15 min.	
3.2. Environment	
Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
Worker exposure has been evaluated using ECETOC TRA V2.0	
4.2. Environment	Standard phrases
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment - (Section Optional)
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Process sampling [CS2].	Wear suitable gloves tested to EN374 [PPE15]
Equipment cleaning and maintenance [CS39]	Drain down and flush system prior to equipment break-in or maintenance [E55]. Clear spills immediately [C&H13].
Control of environmental exposure	

Exposure estimation

1 Workers exposure
Worker exposure for this scenario has been assessed using ECETOC TRA V2.0. In Chapter 10 the relationshipsbetween the Operational Conditions and safe uses (RCRs (inhalation) <1) are given.
In Section 3.1 of the scenario above, the Safe Uses, and conditions under which, are given.

2 Consumer exposure
Not relevant

3 Indirect exposure of humans via the environment
Not relevant.

Annex 5
Professional use of Hydrochloric acid and Formulations - Exposure scenario

Worker – ES5 – Hydrochloric acid	
Section 1	Exposure Scenario Title
Title	ES5 – Professional Use of Hydrochloric acid and Formulations
Use Descriptor	Sector of Use: Industrial (SU20, SU22, SU23)
	Process Categories: PROC1: Use in a closed process, no likelihood of exposure PROC2: Use in a closed, continuous process with occasional controlled exposure PROC3: Use in a closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC15: Use as a laboratory reagent PROC19:Hand-mixing with intimate contact and only PPE available
	Environmental Release Categories: ERC4 Industrial use of processing aids in processes and products, not becoming part of articles ERC6b Industrial use of reactive processing aids ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems
Processes, tasks, activities covered	Professional Use of Hydrochloric acid and Formulations
ES Exposure Criteria	SCOEL: - 8 mg/m³ - 8 hr. TWA - 15 mg/m³ – 15 min. TWA
Section 2	Operational conditions and risk management measures
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapor pressure 0.5 - 10 kPa [OC4]. PROC13: Partial vapor pressures over the bath with a 15% HCl solution are : T°C pHCl Pa 20 1,89 30 4,93 40 12,2 50 28,6 60 64,5 70 139 80 290 90 584 100 1140 (Cf. ELECNRTL in Aspenplus (vs. 2004.1))
Concentration of substance in product	Covers percentage substance in the product up to 40 % (unless stated differently) [G13].
Amounts used	Varies between milliliters (sampling) and cubic meters (material transfers) [OC13]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]

Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]; Assumes a good basic standard of occupational hygiene is implemented [G1]. Ensure operatives are trained to minimize exposures [EI119]
Contributing Scenarios	Risk Management Measures
Due to the corrosive properties of the substance, always wear suitable protective clothing, eye and skin protection	
PROC1: General exposures (closed systems) [CS15]. Continuous process [CS54].	Handle substance within a closed system [E47]. Clear transfer lines prior to decoupling [E39]
PROC2: General exposures [CS1]. Process sampling [CS2] Continuous process [CS54].	Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39]
PROC3: General exposures [CS1]. Remanufacture of reject articles [CS19]. Cleaning [CS47]. Use in contained batch processes [CS37]. With sample collection [CS56].	Handle substance within a closed system [E47]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Ensure material transfers are under containment or extract ventilation (90% efficiency) [E66]. Clear transfer lines prior to decoupling [E39] Wear suitable gloves tested to EN374 [PPE15].
PROC4: Drum/batch transfers [CS8] Bulk transfers [CS14]. General exposures (open systems) [CS16]. Cleaning [CS47]. Remanufacture of reject articles [CS19]. With sample collection [CS56].	Use bulk or semi-bulk handling systems [E43]. or Use drum pumps [E53]. Drain down and flush system prior to equipment break-in or maintenance [E55]. Provide extract ventilation to points where emissions occur (90% efficiency) [E54].
PROC8a: Bulk transfers [CS14]. Process sampling [CS2]. Drum/batch transfers [CS8]. General exposures (open systems) [CS16]. Equipment cleaning and maintenance [CS39] Transport [CS58]. Internal [CS59].	Handle substance within a predominantly closed system provided with extract ventilation (90% efficiency) [E49]. or Provide extract ventilation to points where emissions occur (90% efficiency) [E54]
PROC10: Rolling, Brushing [CS51]. Equipment cleaning and maintenance [CS39].	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour) (90% efficiency) [E40]. Wear suitable gloves (tested to EN374) [PPE15]
PROC11: Spraying/fogging by manual application [CS24]. Spraying/fogging by machine application [CS25]. Spray Bottle [CS49]. Or:	Provide extract ventilation to points where emissions occur (90% efficiency) [E54]. and Wear a respirator conforming to EN140 with Type A filter or better. [PPE22] Provide extract ventilation to points where emissions occur (90% efficiency) [E54]. Avoid carrying out operation for more than 15 minutes [OC10]
PROC13: Dipping, immersion and pouring [CS4]. Treatment by dipping and pouring [CS35].	Provide extract ventilation to material transfer points and other openings (90% efficiency) [E82] Carry out in a vented booth provided with laminar airflow [E59]. Automate activity where possible [AP16]. Allow time for product to drain from workpiece [EI21]. Wear suitable gloves (tested to EN374) [PPE15].

PROC15: Laboratory activities [CS36]. Or: PROC15: Laboratory activities [CS36]	Handle in a fume cupboard or under extract ventilation (80% efficiency) [E83]. Or Carry out in a vented booth or extracted enclosure (80% efficiency) [E57] Avoid carrying out operation for more than 4 hours [OC12] Avoid carrying out operation for more than 1 hour [OC11]
PROC19: Mixing operations (open systems) [CS30]. Additive premixing [CS92] Or:	Wear suitable gloves tested to EN374 [PPE15]. Wear a respirator conforming to EN140 Type A filter or better [PPE22] Wear suitable gloves tested to EN374 [PPE15]. Avoid carrying out operation for more than 15 minutes [OC10]
Section 2.2	Control of environmental exposure
Product characteristics	Liquid, vapor pressure 0.5 - 10 kPa [OC4]. PROC13: Partial vapor pressures over the bath with a 15% HCl solution are : T°C pH Cl Pa 20 1,89 30 4,93 40 12,2 50 28,6 60 64,5 70 139 80 290 90 584 100 1140 (Cf. ELECNRTL in Aspenplus (vs. 2004.1))
Amounts used	NR
Frequency and duration of use	8 h/d for 360 days per year
Other Operational Conditions of use affecting environmental exposure	Ensure all waste water is collected and treated via a WWTP [W6]
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Ensure all waste water is collected and treated via a WWTP [W6]
Organisation measures to prevent/limit release from site	Prevent leaks and prevent soil / water pollution caused by leaks [S4]
Conditions and measures related to municipal sewage treatment plant	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external treatment of waste for disposal	NR
Conditions and measures related to external recovery of waste	NR
Other environmental control measures additional to above	NR
Section 3	Exposure Estimation
3.1. Health	
PROC1: Safe use for activities >4 hrs, without the use of LEV or without breathing protection. PROC2, PROC3, PROC4, PROC8a, PROC10, PROC19: Safe uses for activities >4 hrs, provided that LEV (90% efficiency) is used.	

PROC11: Safe use for activities >4 hrs. ONLY if LEV (90% efficiency) plus breathing equipment (half mask) is used; or limit exposure to <15 min., plus use LEV (90% efficiency). PROC13: Safe use at all temperatures as mentioned above (2.1) provided that LEV (90% efficiency) is used. PROC15: Safe use for activities 15 min – 1 hr, also without LEV; For activities >1 hr, LEV (80% efficiency) must be used. PROC19: safe use for >4 hrs: provided that breathing equipment (half mask) is used; or limit exposure to <15 min.	
3.2. Environment	
Standard phrases. Ability to Include a web link.	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
Worker exposure has been evaluated using ECETOC TRA V2.0	
4.2. Environment	
Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk	
Section 5	Additional good practice advice beyond the REACH Chemical Safety Assessment
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH.	
Control of Worker Exposure	
Process sampling [CS2].	Wear suitable gloves tested to EN374 [PPE15]
Equipment cleaning and maintenance [CS39]	Drain down and flush system prior to equipment break-in or maintenance [E55]. Clear spills immediately [C&H13].
Control of environmental exposure	

Exposure estimation

1 Workers exposure
Worker exposure for this scenario has been assessed using ECETOC TRA V2.0. In Chapter 10 the relationshipsbetween the Operational Conditions and safe uses (RCRs (inhalation) <1) are given.
In Section 3.1 of the scenario above, the Safe Uses, and conditions under which, are given.

2 Consumer exposure
Not relevant

3 Indirect exposure of humans via the environment
Not relevant.

Annex 6
Consumer use of HCl and its formulations - Exposure scenario

Consumer – ES6 – Hydrochloric acid	
Section 1	Exposure Scenario Title
Title	ES6 – Use of Hydrochloric acid and Formulations by Consumers
Use Descriptor	Sector of Use: Consumer Uses: Private Households (SU21)
	Process Categories: (PROC) N.A.
	Environmental Release Categories: ERC8b: Wide dispersive indoor use of processing aids in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems
	Product categories: PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents PC21: Laboratory chemicals PC35: Washing and cleaning products (including solvent based products) PC37: Water treatment chemicals PC38: Welding and soldering products
Processes, tasks, activities covered	Use of HCl solution at a maximum concentration of 20% for purposes as mentioned under the PCs above.
Section 2	Operational conditions and risk management measures
Field for additional statements to explain scenario if required.	
Section 2.1	Control of worker exposure
Product characteristics	
Physical form of product	Liquid, vapor pressure 0.5 - 10 kPa [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 20 % (unless stated differently) [G13].
Amounts used	Max. 500 ml per activity
Frequency and duration of use	Covers daily exposures up to 4 hours (unless stated differently) [G2]; up to 5 times/year
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
Risk Management Measures related to Consumer uses	
The substance may cause local irritating effects; no systemic effects. For that reason: always use protective gloves during the handling and application activities mentioned under the Product Categories above.	
Section 2.2	Control of environmental exposure
Product characteristics	Liquid, vapor pressure 0.5 - 10 kPa [OC4].
Amounts used	NR
Frequency and duration of use	360 days per year
Other Operational Conditions of use affecting environmental exposure	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases [W2] Prevent leaks and prevent soil / water pollution caused by leaks [S4]
Organisation measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic released. [W2]
Conditions and measures related to municipal sewage treatment plant	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]
Conditions and measures related to external treatment of waste for disposal	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments [W1]

Conditions and measures related to external recovery of waste	NR
Other environmental control measures additional to above	NR
Section 3	Exposure Estimation

3.1. Health

Exposures have not been estimated as the substance only causes local dermal and/or inhalatory effects and no systemic effects.

However, one worst case application has been calculated. Assuming the following application conditions:
- use for removal of cement rests from bricks, tiles, etc.
- use of a 20% HCl solution in water
- duration 8 hrs.
- room volume 50 m^3
- ventilation rate 2x/hr

Results:
Inhalation – mean event concentration: 15 mg/m^3
Inhalation – mean concentration on day of exposure: 5 mg/m^3
Inhalation – year average: 0.03 mg/m^3/day

This inhalatory uptake is very unlikely to happen, as the substance will immediately start to irritate when it enters the inhalatory tract.

Dermal – load: 465 mg/cm^2
Dermal – acute (internal) dose: 0.016 mg/kg
Dermal – chronic (internal) dose: 0.00008 mg/kg/day

Such an unrealistic high dermal load is unlikely, but assuming that it occurs the user will have reacted on the burning/itching skin sensation and will automatically start using gloves.

3.2. Environment

Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk

Section 4	Guidance to check compliance with the Exposure Scenario

4.1. Health

4.2. Environment

Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk

Exposure estimation

1 Workers exposure
Not relevant

2 Consumer exposure
Exposures have not been estimated as the substance only causes local dermal and/or inhalatory effects and nosystemic effects.
Inhalatory uptake is very unlikely to happen, as the substance will immediately start to irritate when it enters theinhalatory tract.
Dermal load is unlikely, but assuming that it would occur, the user will have reacted on the burning/itching skinsensation and will automatically start using gloves.

3 Indirect exposure of humans via the environment
Not relevant.