

MATERIAL SAFETY DATA SHEET

HYDROCHLORIC ACID FOOD

Date of releasing: 2026-09-19

Date of revision: -

Version EN: 1.0



Material Safety Data Sheet in accordance with WE 1907/2006 of 18.12.2006 – REACH and 2020/878 of 18.06.2020.

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

- 1.1 Product identifier HYDROCHLORIC ACID FOOD
REACH registration number: 01-2119484862-27-0005
CAS: 7647-01-0
EINECS: 231-595-7
- 1.2 Relevant identified uses of the substance or mixture and uses advised against.
Identified applications: Hydrochloric acid is used in the food industry as an additive (E507) and for treatment of water intended for human consumption. Hydrochloric acid is widely used in industry and in consumers – see attachment of MSDS - Exposure scenarios.
Advised against applications: Any use involving aerosol formation or vapor release in excess of 10 ppm where workers are exposed without respiratory protection.
- 1.3 Details of the supplier of the safety data sheet.
Distributor: TOMCHEM Sp. z o.o.
95-050 Konstantynów Łódzki
ul. Niesięcin 5A
tel. 42 683-11-83
tel/fax.: 42-636-43-18
- 1.4 Emergency telephone number 112 (general emergency phone)

SECTION 2. Hazards identification.

2.1 Classification of the substance or mixture:

Classification and labelling have been determined in accordance with Regulation (EC) 1272/2008 (as amended).
Product has been classified as hazardous in accordance with Regulation (EC) 1272/2008.

Corrosive for skin, category 1B; H314 Causes severe skin burns and eye damage.

STOT Single 3 - Toxicity for specific target organ – single exposure, hazard category 3; H335 May cause respiratory irritation.

Corrosive to metals cat. 1; H290 May be corrosive to metals

2.2 Label elements:

Pictogram:



Signal word: Danger

Hazard statements:

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

H290 May be corrosive to metals.

Precautionary statements:

P234 Keep only in original container.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P305+P351 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
+P338 Continue rinsing.

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P303+P361 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
+P353

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P309+P311 IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

P501 Dispose of contents/container as hazardous waste according to local regulations.

2.3 Other hazards:

This substance does not meet the PBT criteria of REACH regulation, annex XIII.

This substance does not meet the vPvB criteria of REACH regulation, annex XIII.

Contains no PBT/vPvB substances $\geq 0.1\%$ assessed in accordance with REACH Annex XIII.

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 3. Composition/information on ingredients

3.1 Substances.

Product identifier	Amount [%]	Hazard class and category codes	Hazard statement codes and supplementary statements	Specific concentration limit, M-factor, Acute toxicity estimate ATE
Hydrochloric acid CAS: 7647-01-0 EINECS: 231-595-7	>31	Skin. Corr. 1B STOT Single 3 Corr. to metals cat. 1	H314 H335 H290	C $\geq 25\%$: Skin Corr. 1B; H314 10% $\leq$ C < 25%: Skin Irrit. 2; H315 10% $\leq$ C < 25%: Eye Irrit. 2; H319 C $\geq 25\%$: STOT Single 3; H335

Full text of H phrases in section 16.

*substance with a specific OEL value.

SECTION 4. First aid measures.

4.1 Description of first aid measures.

Call a physician if health problems occur or if you are not sure. In life-threatening conditions it is necessary to resuscitate:

- if the patient has breathing problems - start immediately the artificial respiration.
- in case of heart failure - start immediately the indirect heart massage.
- in case of unconsciousness - place a patient in the recovery position on one.

In case of skin contact:

Rinse the affected skin with big volume of water for 10 minutes, carefully remove dirty clothes and continue in rinsing of the affected skin for at least 15 minutes – use of the suds, weak solution of sodium bicarbonate or alkaline mineral water is suitable. Cover the affected place with clean cloth and provide for medical attendance.

In case of eye contact:

Place the patient on the side on which burnt eye is, use a thumb and a forefinger of a left hand to open lid and to rinse it with mild flush of water for at least 15 minutes in the way so as water can flow down from the inner can thus towards outer one. Provide for transport to medical workstation, during transport continue in rinsing.

In case of inhalation:

Remove to fresh air immediately. If not breathing, give artificial respiration. If it is possible, give oxygen. Call a physician.

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In case of swallowing:

Provide for fast medical attendance. In case of ingestion of strong acids including also hydrochloric acid, no vomiting should be brought on. Rinse the mouth with water, to dilute stomach content, drink 1/2 a litre of water. To neutralize, no NaHCO_3 , CaCO_3 shall be used, since generating CO_2 may cause stomach perforation. Administer milk slowly or MgO suspension in water.

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

Symptoms: HCl is strongly corrosive against eyes, mucosa and exposed part of skin.

Risks: It causes skin burning and eye damage.

It may cause irritation of respiratory tract.

It may be corrosive also for metals.

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

Cleansing: Immediately remove all contaminated clothes. Rinse the skin, eyes with water/shower. Transfer from hazardous premises.

SECTION 5. Firefighting measures.

5.1 Extinguishing media:

Suitable extinguishing media: Surrounding fire – water mist, fragmented water flows. Substance is non-combustible.

Inappropriate extinguishing media: Not defined.

5.2 Special hazards arising from the substance or mixture:

The substance reacts with some metals (zinc, copper, brass) creating easily inflammable hydrogen. In case of contact with lye an intense reaction may occur. The fluid evaporates when creating strongly corrosive fog heavier than air.

5.3 Advice for firefighters:

Self contained breathing apparatus and full protective clothing must be worn!

SECTION 6. Accidental release measures.

6.1 Personal precautions, protective equipment and emergency procedures.

For other than emergency personnel: Prevent direct contact with hydrochloric acid. Avoid contact with material occurring between packs. Keep unauthorized persons away from the contaminated area. Provide first aid to victims, get medical attention. Close dangerous zone considering wind direction. At work, wear protective equipment to protect skin, respiratory system, and eyes. Use full protection – protective clothes, rubber gloves, breathing apparatus.

For emergency personnel: Use personal protective means – protective clothes, breathing apparatus. Provide for adequate ventilation. See Section 8.

6.2 Environmental precautions.

Avoid unauthorized discharge to the environment. In case of bigger leakages of the substance, it is necessary to prevent leakage of the substance to the sewerage system, water courses and water tanks, and to restrict the scope of the area contamination as much as possible e.g. by creation of embankments from earth or sand.

6.3 Methods and material for containment and cleaning up.

Cover cloth residues with inflammable suction material, e.g. with dry earth, sand, ground limestone and other incombustible substances. Collect and transport them in a closed vessel to a safe place for liquidation.

6.4 Reference to other sections.

To obtain information on control of exposure and personal protection see also Section 8 and to obtain further information on measures during disposal see Section 13.

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SECTION 7. Handling and storage.

7.1 Precautions for safe handling.

Preferably use as closed systems as possible. Observe limit values of exposure in case of such use, where exposure is possible, e.g. creation of aerosols. Prevent contact with skin, eyes and mucosa. Protective clothes, gloves and shoes are inevitable at handling corrosive substances. Do not eat, drink or smoke when working. After work completion thoroughly wash hands with warm water and soap.

7.2 Conditions for safe storage, including any incompatibilities.

Store and handle in compliance with all common orders and regulations applicable to corrosive agents. Store in steel feeders with applied protective rubber coating inside. Another suitable material for tanks is glass, ceramics, polyethylene, polypropylene, polyvinyl-chloride. Hydrochloric acid has strong corrosive effect on iron, steel and aluminium.

7.3 Specific end use(s).

Specifics: Regarding corrosive properties of the substance, always wear protective clothes, protect your eyes and skin. Further information is available in Annex on exposure scenarios Use only metallic vessels resistant to acids.

SECTION 8. Exposure controls/personal protection.

8.1 Control parameters:

Ensure adequate ventilation.

Maximum allowable concentration values:

Regulation of the Minister of the Family, Labour and Social Policy of 24 June 2024 on the maximum permissible concentrations and intensities of factors harmful to health in the working environment (Journal of Laws item 1017, as amended).

Chemical name and CAS number	NDS [mg/m ³]	NDSch [mg/m ³]	NDSP [mg/m ³]	Notes: labeling of substances with the notation "skin"
Hydrochloric acid CAS: 7647-01-0	5	10	-	-

DNEL and PNEC values.

Short-term exposure: DNEL inhalant for workers: 15 mg/m³

Long-term exposure: DNEL inhalant for workers: 8 mg/m³

8.2 Exposure controls:

Effective exhaust ventilation system. Preferably use as closed systems as possible. Avoid contact with skin, eyes and mucosa.



Respiratory protection.

Respirator with suitable filter, respiratory apparatus (in case of high humidity, creation of aerosols).



Hand protection.

Rubber gloves.



Eye protection.

Wear safety glasses or face mask (compliant with EN 166).

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Body protection.

Impermeable working clothes.

Do not discharge to sewerage system, water courses and soil.

SECTION 9. Physical and chemical properties.

9.1 Information on basic physical and chemical properties.

Physical state	liquid
Colour	clear colourless to yellow
Odour	spicy odour
Melting point/freezing point	no data available
Boiling point or initial boiling point and boiling range	85°C (32% water solution)
Flammability	non-combustible substance
Lower and upper explosion limit	not applicable
Flash point	non-combustible substance
Auto-ignition temperature	not applicable
Decomposition temperature	no data available
pH	<1 (5% in water)
Kinematic viscosity	no data available
Solubility	The substance is perfectly soluble in water. It forms corrosive mixture also in case of big dilution. With higher temperatures corrosive vapour is created above the level of even very diluted solutions.
Partition coefficient n-octanol/water (log value)	no data available
Vapour pressure	2.0 kPa/20°C (32% water solution)
Density and/or relative density	1,26
Relative vapour density	1,27/20°C
Particle characteristics	not applicable

9.2 Other information:

Explosives	not applicable
Flammable gases	not applicable
Aerosols	not applicable
Oxidising gases	not applicable
Gases under pressure	not applicable
Flammable liquids	not applicable
Flammable solids	not applicable
Self-reactive substances and mixtures	not applicable
Pyrophoric liquids	not applicable
Self-heating substances and mixtures	not applicable

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Substances and mixtures, which emit flammable gases in contact with water	not applicable
Oxidising liquids	not applicable
Oxidizing solids	not applicable
Organic peroxides	not applicable
Corrosive to metals	May be corrosive to metals
Desensitised explosives	not applicable

SECTION 10. Stability and reactivity.

10.1 Reactivity:

It reacts with carbides of rubidium, calcium and caesium, which might ignite at reaction. When reacting with formaldehyde, bischlormethylether is released, which has carcinogenic effects on human organism. In a closed vessel it reacts with acetanhydride, ethylenediamine, ethylene imine, fuming sulphuric acid, chloro-sulphuric acid, propiolactone, sodium hydroxide, sulphuric acid and vinylacetate. In gaseous state and at temperature of 125°C it reacts sharply with cupric sulphate, in gaseous state it sharply reacts with sodium. In contact with commonly used metals, hydrogen is being released, which forms explosive mixture with air. It reacts with hydroxides, amines, bases, copper, zinc and brass.

10.2 Chemical stability:

The substance is stable under normal temperature.

10.3 Possibility of hazardous reactions:

When observing storage conditions, spontaneous dangerous reactions in the product do not occur.

10.4 Conditions to avoid:

Higher temperatures.

10.5 Incompatible materials:

Metals.

10.6 Hazardous decomposition products:

Hydrogen chloride/Chloride/Hydrogen, hydrogen at reaction with metals, bischlormethylether (carcinogen) when reacting with formaldehyde.

SECTION 11. Toxicological information.

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

Hydrochloric acid is strong, highly aggressive acid. It has just local effects, not systemic ones. In contact with water it fast dissociates almost fully, it releases chlorine and hydrogen ions which combined with water form hydronium ion. Both ions, chlorine and hydronium ion are present in a body.

a) acute toxicity

Based on available data, the classification criteria are not met.

LC50 inhalantly – rat HCl gas (5 min. exposure): 40,989 ppm

LC50 inhalantly – rat HCl gas (30 min. exposure): 4,701 ppm

LC50 inhalantly – rat HCl aerosol (5 min. exposure): 45.6 mg/l

LC50 inhalantly – rat HCl aerosol (30 min. exposure): 8.3 mg/l

Based on possible short-term effects, SCOEL recommends STEL (15 min.) 10ppm (15 mg/m3).

LCLo inhalantly – a human being: 1.300 ppm / 30 min

LCLo inhalantly – a human being: 3,000 ppm / 5 min

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- LC50 inhalantly – rat: 3,124 ppm / 1h (changes of scent, iritis).
LC50 inhalantly – mouse: 1,108 ppm / 1h (eye changes, respiratory irritation, after constantly repeating exposure dermatitis).
LD50 orally – rabbit: 900 mg/kg.
LCLo inhalantly– rabbit: 4,413 ppm/30 min (acute lung oedema, changes in the respiratory tract, fatty degeneration of liver).
- b) skin corrosion/irritation
Causes severe skin burns and eye damage.
Concentration $10\% \leq C < 25\%$ - irritable for skin and concentration $\geq 25\%$ - Corrosive for skin.
According to the CLP, the concentration limit for corrosion for skin: 25%.
According to the CLP, the concentration limit for skin irritation: $10\% \leq C < 25\%$.
- c) serious eye damage/irritation
Based on available data, the classification criteria are not met.
Eye - rabbit: 5 mg/30 sec. – weak irritation.
According to the CLP, the concentration limit for eye irritation: $10\% \leq C < 25\%$.
- d) respiratory or skin sensitisation
May cause respiratory irritation.
According to the CLP Regulation, the concentration limit for respiratory tract sensitization: $\geq 25\%$.
Respiratory or skin sensibility: Hydrochloric acid has no sensitizing potential for MEST and GPMT. HCl is not sensitizing either for skin or respiratory system.
- e) germ cell mutagenicity
Based on available data, the classification criteria are not met.
HCl is not genotoxic in case of in vitro tests with use of bacterial or simple eukaryotic cells.
- f) carcinogenicity
Based on available data, the classification criteria are not met.
- g) reproductive toxicity
Based on available data, the classification criteria are not met.
In case of common handling and use conditions, the substance has no effect either on embryo or reproduction.
- h) STOT-single exposure
Based on available data, the classification criteria are not met.
- i) STOT-repeated exposure
Based on available data, the classification criteria are not met.
- j) aspiration hazard.
Based on available data, the classification criteria are not met.

11.2 Information on other hazards.

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 12. Ecological information.

12.1 Toxicity:

Acute toxicity for fish:

LC0 Leuciscus idus melanotus: 784 mg/l

LC50 Leuciscus idus melanotus: 862 mg/l

LC100 Leuciscus idus melanotus: 896 mg/l

LC50 freshwater fish: 20.5 mg/l

Acute toxicity for water invertebrates (acute immobilization test):

EC50/LC50 freshwater invertebrates: 0.45 mg/l

Acute toxicity for freshwater alga (test of alga growth inhibition):

EC50/LC50 freshwater alga: 0.73 mg/l

EC10/LC10 or NOEC freshwater alga: 0.364 mg/l

Toxicity for water microorganisms:

EC50/LC50 water microorganisms: 0.23 mg/l

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12.2 Persistence and degradability:

HCl is strong acid, very well soluble in water and fully dissociating to form Cl^- and H_3O^+ . The substance is sterile, it is of biocidal nature and it is biologically not decomposed. It has no adsorption/desorption potential. Chemical degradation: In carbonate soils it reacts with rise of calcium chloride and hydrogen.

12.3 Bioaccumulative potential:

Regarding good solubility of HCl, its bioconcentration is not relevant. It fully dissociates in water. It is not known that organisms accumulate hydrochloric acid.

12.4 Mobility in soil:

Water Soluble. Will likely be mobile in the environment due to its water solubility Highly mobile in soils.

12.5 Results of PBT and vPvB assessment:

HCl fails to meet all criteria for PBT or vPvB substance. HCl fails to meet the criteria for persistence and bioaccumulation set in Annex XIII and thus it is not PBT. It is neither very persistent, nor bioaccumulative. It is not considered to be biodegradable in water and terrestrial environment. The test results show that the substance is persistent. Therefore it meets the criteria for P classification. The substance is considered to be cationic in the environment due to pH values, the value of log Kow is 2.65. According to the guidelines of Annex VIII this value has no bioaccumulative potential. According to the criteria in Annex XIII, TETA is a toxic substance and it meets the T criteria.

12.6 Endocrine disrupting properties:

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

12.7 Other adverse effects:

Hazardous substance for water.

SECTION 13. Disposal considerations.

13.1 Waste treatment methods.

Recommended method of disposal: Adhere to all applicable laws and regulations on waste. Do not discharge residues of hydrochloric acid to the sewerage system and other courses, neither close to water courses, and neither the flushing water with content of hydrochloric acid. Discharge of water containing hydrochloric acid to sewerage systems and other courses is admissible only after neutralization under conditions set by water management authorities. Residues of the substance to be covered with inflammable material, e.g. dry earth, sand, ground limestone etc. and in closed vessel to be transported to a safe place for disposal, neutralization (in the place of accident) and storage on a safe dumping site.

Recommended method of dirty packaging elimination: Empty packaging can be recycled after perfect emptying. Storage tanks used for transport of hydrochloric acid are returned to the producer. Liquidation of residues in cisterns shall be provided for by the producer.

Law dated 8 January 2013 on waste. (Journal of Laws 2013 item 21 as amended).

Law dated 13 June 2013 on the management of packaging and packaging waste. (Journal of Laws 2013 item 888 as amended).

Regulation of the Minister of Climate of January 02, 2020 on the waste catalog (Journal of Laws 2020 item 10 as amended).

SECTION 14. Transport information.

14.1 UN number or ID number.

UN 1789

14.2 UN proper shipping name.

Hydrochloric acid

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14.3 Transport hazard class(es).

8

14.4 Packing group.

II

14.5 Environmental hazards.

No

14.6 Special precautions for user.

No data available

14.7 Maritime transport in bulk according to IMO instruments.

No data available



SECTION 15. Regulatory information.

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

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH),
Commission Regulation (EU) 2020/878 of 18 June 2020 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No 1907/2006 (REACH)
Law dated 24 October 2011 on the transport of hazardous materials (Journal of Laws 227 item 1367 of 2011, as amended),
Government Statement of 6 March 2025 on the entry into force of the amendments to Annexes A and B to the Agreement concerning the international carriage of dangerous goods by road (ADR), done at Geneva on 30 September 1957.
Law dated 8 January 2013 on waste. (Journal of Laws 2013 item 21 as amended)
Law dated 13 June 2013 on the management of packaging and packaging waste. (Journal of Laws 2013 item 888 as amended),
Announcement of the Minister of Health of 2 March 2015 on the announcement of the consolidated text of the Regulation of the Minister of Health on the labelling of packaging of hazardous substances and hazardous mixtures and certain mixtures (Journal of Laws 2015, item 450)
Law dated 25 February 2011 on chemical substances and their mixtures (Journal of Laws 2011 No. 63 item 322, as amended),
Law dated 26 June 1974 Labour Code (consolidated text: Dz.U. 21 item 94 of 1998 as amended),
Regulation of the Minister of Family, Labour and Social Policy of 24 June 2024 on the maximum permissible concentrations and intensities of factors harmful to health in the work environment (Item 1017 with later amendments).
Regulation of the Minister of Climate of 2 January 2020 on the waste catalogue (Journal of Laws 2020, item 10).
Regulation (EC) 273/2004 of the European Parliament and of the Council of 11 February 2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances:
Hydrochloric Acid, CAS 7647-01-0, CN code: 2806 10 00

15.2 Chemical safety assessment.

Chemical safety assessment was carried out within registration of the substance pursuant to the REACH regulation.

SECTION 16. Other information.

H phrases:

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

H290 May be corrosive to metals.

Description of abbreviations, acronyms and symbols used:

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Skin Corr. 1B - skin corrosion/irritation, category 1, subcategory 1B

Skin Irritation. 2 - skin corrosion/irritation, category 2

NDS – Maximum allowable concentration

NDSP – Maximum allowable ceiling concentration

NDSch – Maximum allowable momentary concentration.

DNEL – Level of exposure to a substance above which humans should not be exposed.

PNEC – concentration of chemical which marks the limit at which below no adverse effects of exposure in ecosystem are measured.

LC50 - (lethal concentration) - median lethal concentration, a statistically determined concentration of a substance, after exposure to which 50 percent of the organisms (exposed to the substance) can be expected to die during the exposure or during a specified contractual post-exposure period.

LD50 - (lethal dose) - medial lethal dose, the statistically determined size of a single dose of a substance, after administration of which 50% of exposed test organisms can be expected to die.

EC50 - (effective concentration) - medial effective concentration, statistically calculated concentration that induces in the environmental medium the specified effect in 50% of the experimental organisms under specified conditions

NOEC (no observed effects concentration) - the highest concentration for which there is no statistically or biologically significant increase in the frequency or severity of the effects of the substance in the test organisms relative to the control sample.

vPvB - Very persistent and very bioaccumulative substance

PBT - persistent, bioaccumulative and toxic substances

ADR – European agreement on the road transport of hazardous goods.

RID – Regulations Concerning the International Carriage of Dangerous Goods by Rail

IMDG – International Maritime Dangerous Goods Code

IATA – Regulation on the transport of dangerous goods issued by the International Air Transport Association

Trainings:

Before starting work with the product it is mandatory to subject employees to EHS training in connection with the presence of chemical factors in work environment. Conduct, document and familiarize employees with the results of the occupational risk assessment at the work station related to the presence of chemical factors.

SOURCE MATERIALS:

Annex to Regulation (EU) 2020/878 of 18 June 2020.

Regulations mentioned in section 15 of the MSDS.

Changes to the previous version:

Section	Description
-	-

The information contained in the safety data sheet applies only to the product listed in title. Data contained in safety data sheet should be treated only as an help for safe use of the product. Since conditions of storage, transport and use are beyond our control they cannot constitute a guarantee in the legal sense. In each case the statutory provisions and any rights of third parties must be observed. Safety data sheet does not constitute an assessment of hazards in the workplace. The product should not be used for purposes other than those specified in section 1 without prior consultation with TOMCHEM Sp. z o.o.

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Attachment EXPOSURE SCENARIOS / MSDS/ HYDROCHLORIC ACID/

Exposure Scenario 1: Manufacture, Recycling and Distribution of Hydrochloric acid

1.1 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/m ³ - 8 hr. TWA - 15 mg/m ³ – 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

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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]. <u>Or</u> 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]. <u>Or</u> 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]. <u>Or</u> 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:	Handle in a fume cupboard or under extract ventilation (80% efficiency) [E83]. <u>Or</u> Carry out in a vented booth or extracted enclosure (80% efficiency)
PROC15: Laboratory activities [CS36]	[E57] Avoid carrying out operation for more than 4 hours [OC12] Avoid carrying out operation for more than 1 hour [OC11]

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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]
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

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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].
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1.2 Exposure estimation

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.

Consumer exposure

Not relevant.

Indirect exposure of humans via the environment,

Not relevant.

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Exposure Scenario 2: Use as Intermediate by Industry.

2.1 Exposure scenario

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/m ³ - 8 hr. TWA - 15 mg/m ³ – 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 [E119]
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	Handle substance within a closed system [E47].

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[CS1]. Remanufacture of reject articles [CS19]. Cleaning [CS47]. Use in contained batch processes [CS37]. With sample collection [CS56].	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]. <u>or</u> 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]. <u>or</u> Fill containers/cans at dedicated fill points supplied with local extract ventilation [E51].
PROC15: Laboratory activities [CS36]. <u>Or:</u> PROC15: Laboratory activities [CS36]	Handle in a fume cupboard or under extract ventilation (80% efficiency) [E83]. <u>Or</u> 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 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

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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	
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.

2.2 Exposure estimation

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.

Consumer exposure

Not relevant

Indirect exposure of humans via the environment

Not relevant.

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Exposure Scenario 3: Formulation and (re-)packing of Hydrochloric acid and its formulations by Industry and by Professionals

3.1 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/m ³ - 8 hr. TWA - 15 mg/m ³ – 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, <i>partial vapour pressures</i> (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]

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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].	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]

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Drum/batch transfers [CS8] General exposures (open systems) [CS16].	
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	

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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.

3.2 Exposure estimation

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.

Consumer exposure .

Not relevant .

Indirect exposure of humans via the environment .

Not relevant.

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Exposure Scenario 4: Industrial use of Hydrochloric acid and formulations

4.1 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].	

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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].	Handle substance within a closed system [E47]. Drain down and flush system prior to equipment break-in or maintenance [E55].
Cleaning [CS47]. Use in contained batch processes [CS37]. With sample collection [CS56].	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].	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]

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Or: PROC15: Laboratory activities [CS36]	Avoid carrying out operation for more than 1 hour [OC11]
PROC19: Mixing operations (open systems) [CS30]. Additive premixing [CS92]	Wear suitable gloves tested to EN374 [PPE15]. Wear a respirator conforming to EN140 Type A filter or better [PPE22]
Or:	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: <u>provided that</u> breathing equipment (half mask) is used; <u>or</u> 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	

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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	

4.2 Exposure estimation

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.

Consumer exposure.

Not relevant

Indirect exposure of humans via the environment Not relevant.

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Exposure Scenario 5: Professional use of Hydrochloric acid and Formulations

5.1 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 nondedicated 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

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	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].	Provide extract ventilation to points where emissions occur (90% efficiency) [E54]. and Wear a respirator conforming to EN140 with Type A filter or better.	
Spray Bottle [CS49].	[PPE22]	

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Or:	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:	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]	
PROC15: Laboratory activities [CS36]	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	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))	
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]	

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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) <u>plus</u> breathing equipment (half mask) is used; <u>or</u> 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: <u>provided that</u> breathing equipment (half mask) is used; <u>or</u> 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	

5.2 Exposure estimation

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.

Consumer exposure. Not relevant.

Indirect exposure of humans via the environment Not relevant.

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Exposure Scenario 6: Use of Hydrochloric acid and Formulations by Consumers

6.1 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	All contaminated waste water must be processed in an industrial or municipal wastewater treatment

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Conditions of use affecting environmental exposure	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 m³ - ventilation rate 2x/hr Results: Inhalation – mean event concentration: 15 mg/m³ Inhalation – mean concentration on day of exposure: 5 mg/m³ Inhalation – year average: 0.03 mg/m³/day <i>This inhalatory uptake is very unlikely to happen, as the substance will immediately start to irritate when it enters the inhalatory tract.</i> Dermal – load: 465 mg/cm² Dermal – acute (internal) dose: 0.016 mg/kg Dermal – chronic (internal) dose: 0.00008 mg/kg/day <i>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.</i>	
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	

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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

6.2 Exposure estimation

Workers exposure.

Not relevant.

Consumer exposure.

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

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

Dermal load is unlikely, but assuming that it would occur, the user will have reacted on the burning/itching skin sensation and will automatically start using gloves.

Indirect exposure of humans via the environment Not relevant.