

This safety data sheet was created pursuant to the requirements of:
UK REACH Regulations (SI 2019/758 as amended)

Revision date 14-Aug-2025

Revision Number 2

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

1.1. Product identifier

Product Code(s)	124467
Safety data sheet number	124467
Product Name	HYDROCHLORIC ACID 1-4% SOL
Index No	017-002-00-2
EC Number	231-595-7
CAS No	7647-01-0
Synonyms	HYDROCHLORIC ACID 1.75% SOL, HYDROCHLORIC ACID 3.6% 1M BP
Pure substance/mixture	Substance
Molecular weight	36.46 g/mol

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

Recommended use	pH control Cleaning agent Chemical intermediate Chemicals used in the synthesis and / or formulation of industrial products Industrial application For further information, see attached Exposure Scenario
Uses advised against	Any use involving aerosol formation, vapour release (>10 ppm) or risks of splashes to eyes / skin where workers are exposed without respiratory, eye or skin protection

1.3. Details of the supplier of the safety data sheet

Supplier

Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
GBR

For further information, please contact

E-mail address	SDS.EMEA@univarsolutions.com
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306

1.4. Emergency telephone number

Emergency Telephone	SGS - +32 (0)3 575 55 55 (24h)
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SECTION 2: Hazards identification**2.1. Classification of the substance or mixture**

Corrosive to metals	Category 1 - (H290)
Serious eye damage/eye irritation	Category 1 - (H318)

2.2. Label elements

Signal word
Danger

Hazard statements

H318 - Causes serious eye damage
H290 - May be corrosive to metals

Precautionary statements

P234 - Keep only in original packaging
P280 - Wear protective gloves/protective clothing and eye/face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor
P390 - Absorb spillage to prevent material damage

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients**3.1 Substances**

Chemical name	Weight-%	EC No (EU Index No)	UK REACH registration number	Classification according to GB CLP (SI 2020/1567 as amended)	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
WATER 7732-18-5	90 - 100%	231-791-2	-	Not Classified	-	-	-
HYDROCHLORIC ACID ...% 7647-01-0	1 - 4%	231-595-7 (017-002-01-X)	-	Met. Corr. 1 (H290) Skin Corr. 1A (H314) Eye Dam. 1 (H318) STOT SE 3 (H335)	Skin Corr. 1A :: C>=25% Skin Corr. 1B :: 10%<=C<25% STOT SE 3 (H335):: C>=10% Eye Dam. 1 :: C>=1% Met. Corr. 1 :: C>=0.1%	-	-

Full text of H- and EUH-phrases: see section 16

This product does not contain candidate substances of very high concern at a concentration $\geq 0.1\%$ (UK REACH Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical attention.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical attention.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical attention.
Ingestion	Immediately rinse mouth and drink plenty of water (200-300 ml). Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get medical attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Wear personal protective clothing (see section 8).

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

Symptoms	Adverse symptoms may include:
Eyes	Burning sensation. Causes serious eye damage.
Dermal	May cause slight irritation.

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

Note to doctors	Treat symptomatically.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	Product itself does not burn. Contact with metals may evolve flammable hydrogen gas. Exothermic reaction with water. Containers can burst violently when heated, due to excess pressure build-up. Thermal decomposition can lead to release of toxic and corrosive gases/vapours.
Hazardous combustion products	Hydrogen chloride. Chlorine. Hydrogen.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Cool containers with flooding quantities of water until well after fire is out. Collect contaminated fire extinguishing water separately. Do not allow it to enter drains or surface water.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions

Provide adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with eyes, skin and clothing. Use personal protection recommended in Section 8. Evacuate personnel to safe areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material.

Other information

Refer to protective measures listed in Sections 7 and 8.

For emergency responders

Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions

Avoid release to the environment. Keep out of drains, sewers, ditches and waterways. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Neutralise with soda ash (sodium carbonate) or lime over area of spill. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see Section 13).

Methods for cleaning up

Flush area with flooding quantities of water.

Prevention of secondary hazards

Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections

See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Avoid contact with eyes, skin and clothing. Avoid breathing vapours or mists. Ensure adequate ventilation. Use exhaust ventilation to keep airborne concentrations below exposure limits. Ensure that eyewash stations and safety showers are close to the workstation location. DO NOT add water to acid. Always add acid TO water. Dissolution and neutralisation reactions are highly exothermic.

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using the product. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat. Keep/store only in original container. Store away from incompatible materials. Strong oxidising agents. Strong bases. Sodium hypochlorite. Metals. Vinyl acetate monomer (VAM).

Packaging materials

Suitable container/equipment material: High density polyethylene (HDPE). Low density polyethylene (LDPE). Polyester with fibreglass reinforcement. Glass. Unsuitable container/equipment material. Paper/Fibreboard. Carbon Steel. Galvanized steel. Aluminium. Tinplate.

7.3. Specific end use(s)**Specific use(s)**

See section 1 for more information.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

SECTION 8: Exposure controls/personal protection**8.1. Control parameters****Exposure Limits**

Chemical name	United Kingdom
HYDROCHLORIC ACID ...% 7647-01-0	TWA: 1 ppm TWA: 2 mg/m ³ STEL: 5 ppm STEL: 8 mg/m ³

Biological occupational exposure limits

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
HYDROCHLORIC ACID ...% 7647-01-0			8 mg/m ³ [5] [6] 15 mg/m ³ [5] [7]

[5] Local health effects.
[6] Long term.
[7] Short term.

Derived No Effect Level (DNEL) - General Public

Chemical name	Oral	Dermal	Inhalation
HYDROCHLORIC ACID ...% 7647-01-0			8 mg/m ³ [5] [6] 15 mg/m ³ [5] [7]

[5] Local health effects.
[6] Long term.
[7] Short term.

Predicted No Effect Concentration (PNEC)

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
HYDROCHLORIC ACID ...% 7647-01-0	36 µg/l	45 µg/l	36 µg/l		

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
HYDROCHLORIC ACID				36 µg/l	

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
...% 7647-01-0					

8.2. Exposure controls**Engineering controls**

Ensure adequate ventilation. Ensure that eyewash stations and safety showers are close to the workstation location. Use engineering controls to keep exposures below the OEL or DNEL.

Personal protective equipment**Eye/face protection**

Use eye protection according to EN 166. Tight sealing safety goggles. Face protection shield.

Hand protection

Wear protective gloves. Use gauntlet type rubber gloves. Gloves must conform to standard EN 374. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves. Examples of acceptable glove barrier materials include: Polychloroprene. Nitrile rubber. Butyl rubber. Polyvinyl chloride (PVC). Unsuitable material: Leather.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
Long term (repeated)	Polychloroprene.	0.5 mm	= 8 hours
Long term (repeated)	Nitrile rubber	0.35 mm	= 8 hours
Long term (repeated)	Butyl rubber	0.5 mm	= 8 hours
Medium	Polyvinyl chloride (PVC)	0.5 mm	= 8 hours

Skin and body protection

Acid-proof protective clothing. EN14605.

Respiratory protection

In case of inadequate ventilation wear respiratory protection. Respirator fitted with an acid vapour filter. Where an air-purifying respirator is suitable, use EN141 or EN405, type E. Acid gases filter conforming to EN 14387.

Recommended filter type:**General hygiene considerations**

Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using the product. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas.

Environmental exposure controls

Avoid release to the environment. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state	Liquid
Appearance	Fuming liquid
Colour	Colourless
Odour	Acidic.
Odour threshold	1 - 5 ppm

Property	Values
Melting point / freezing point	~ -4 - 0 °C
Initial boiling point and boiling range	~ 100 °C
Flammability	
Flammability Limit in Air	
Upper flammability or explosive limits	

Remarks • Method
No information available.
No information available.
Not applicable.
Not applicable.

Lower flammability or explosive limits		
Flash point		Not applicable.
Autoignition temperature		Not applicable.
Decomposition temperature		No information available.
pH	1.0	No information available.
pH (as aqueous solution)		No information available.
Kinematic viscosity		No information available.
Dynamic viscosity		No information available.
Water solubility	Soluble in water	No information available.
Solubility(ies)		No information available.
Partition coefficient		No information available.
Vapour pressure		No information available.
Relative density	>1.05 @ 15.5°C	No information available.
Bulk density		No information available.
Liquid Density	.	No information available.
Relative vapour density		No information available.
Particle characteristics		Not applicable.
Particle Size	.	
Particle Size Distribution	.	
Explosive properties	No information available	
Oxidising properties	No information available	

9.2. Other information

Molecular weight 36.46 g/mol

SECTION 10: Stability and reactivity**10.1. Reactivity**

Reactivity May be corrosive to metals. Reacts with alkalis. Strong oxidising agents. Exothermic reaction with water.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions In contact with some metals can generate hydrogen gas, which can form explosive mixtures with air. Can react violently if in contact with oxidising agents, liberating chlorine. Exothermic reaction with alkalis.

10.4. Conditions to avoid

Conditions to avoid Aerosol or mist formation.

10.5. Incompatible materials

Incompatible materials Strong oxidising agents. Strong bases. Sodium hypochlorite. Metals. Vinyl acetate monomer (VAM).

10.6. Hazardous decomposition products

Hazardous decomposition products Thermal decomposition may release: Hydrogen chloride. Chlorine. Hydrogen.

SECTION 11: Toxicological information**11.1. Information on toxicological effects**

Information on likely routes of exposure**Product Information**

Inhalation	May cause respiratory irritation.
Eye contact	Causes serious eye damage.
Skin contact	May cause slight irritation.
Ingestion	May cause gastrointestinal discomfort if consumed in large amounts.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms May cause redness and tearing of the eyes. Burning.

Acute toxicity**Numerical measures of toxicity**

Based on available data, the classification criteria are not met

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
HYDROCHLORIC ACID ...%	-	-	8.3 mg/l (30 min)

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

Skin corrosion/irritation Based on available data, the classification criteria are not met.

HYDROCHLORIC ACID ...% (7647-01-0)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD 431	EPISKIN™	in vitro	10% Solution		Corrosive; H314, Cat.1B
OECD 431	EPISKIN™	in vitro	25% Solution		Corrosive; H314, Cat.1A

Serious eye damage/eye irritation Causes serious eye damage.

HYDROCHLORIC ACID ...% (7647-01-0)

Method	Species	Exposure route	Effective dose	Exposure time	Results
Expert judgment and weight of evidence determination			1% Solution		Corrosive Causes serious eye damage

Respiratory or skin sensitisation Based on available data the classification criteria are not met.

HYDROCHLORIC ACID ...% (7647-01-0)

Method	Species	Exposure route	Results
OECD Test No. 406: Skin Sensitisation	Guinea pig	Dermal	Not a skin sensitiser

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

Component Information

HYDROCHLORIC ACID ...% (7647-01-0)

Method	Species	Results
Similar to OECD Test No. 473: In vitro Mammalian Chromosome Aberration Test	Chinese hamster cells	Clastogenic effect (Due to pH)
Similar to OECD Test No. 476: In Vitro Mammalian Cell Gene Mutation Tests using the Hprt and xprt genes	Mouse lymphoma cells	Mutagenic (Due to pH)

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

Component Information
HYDROCHLORIC ACID ...% (7647-01-0)

Method	Species	Results
	Rat	NOAEC =0.015 mg/l Inhalation - Gas Not Carcinogenic

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

STOT - single exposure Based on available data the classification criteria are not met.

STOT - repeated exposure Based on available data, the classification criteria are not met.

Component Information
HYDROCHLORIC ACID ...% (7647-01-0)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD 413 Subchronic toxicity	Rat	Inhalation Gas	ppm/6h/d		NOAEL 20 ppm

Aspiration hazard Based on available data the classification criteria are not met.

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity Based on available data, the classification criteria are not met. Substantial amounts of the product may lead to a local change in acidity in small water systems which may have adverse effects on aquatic organisms.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
HYDROCHLORIC ACID ...%	EC50: 0.73 mg/l (72h, Algae)	LC50: 20.5 mg/l (96h, Lepomis macrochirus)	-	EC50: 0.45 mg/l (48h, Daphnia magna)

12.2. Persistence and degradability

Persistence and degradability The methods for determining biodegradability are not applicable to inorganic substances. Will freely dissociate to hydrogen and chloride ions.

HYDROCHLORIC ACID ...% (7647-01-0)

Method	Exposure time	Value	Results
			The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Bioaccumulation Not likely to bioaccumulate.

12.4. Mobility in soil

Mobility in soil No information available.

Mobility Soluble in water.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product does not contain any substance(s) classified as PBT or vPvB.

Chemical name	PBT and vPvB assessment
HYDROCHLORIC ACID ...%	The substance is not PBT / vPvB

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations**13.1. Waste treatment methods**

Waste from residues/unused products Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority.

Contaminated packaging Empty remaining contents. Do not reuse empty containers. Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14: Transport information**IATA**

14.1 UN number or ID number UN1789
14.2 UN proper shipping name HYDROCHLORIC ACID
14.3 Transport hazard class(es) 8
14.4 Packing group III
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
 Special Provisions A3, A803
 ERG Code 8L

IMDG

14.1 UN number or ID number UN1789
14.2 UN proper shipping name HYDROCHLORIC ACID
14.3 Transport hazard class(es) 8
14.4 Packing group III
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
 Special Provisions 223
 EmS-No F-A, S-B
14.7 Maritime transport in bulk according to IMO instruments No information available

RID

14.1 UN number or ID number UN1789
14.2 UN proper shipping name HYDROCHLORIC ACID
14.3 Transport hazard class(es) 8
14.4 Packing group III
14.5 Environmental hazards Not applicable
14.6 Special precautions for user
 Special Provisions 520
 Classification code C1

ADR

14.1 UN number or ID number	UN1789
14.2 UN proper shipping name	HYDROCHLORIC ACID
14.3 Transport hazard class(es)	8
14.4 Packing group	III
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	
Special Provisions	520
Classification code	C1
Tunnel restriction code	(E)

SECTION 15: Regulatory information

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

National regulations

Authorisations and/or restrictions on use:

This product contains one or more substances subject to restriction (UK REACH - Annex XVII).

This product does not contain substances subject to authorisation (UK REACH - Annex XIV).

Product restricted per REACH Annex XVII: 3

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
HYDROCHLORIC ACID ...% - 7647-01-0	75	-

Persistent Organic Pollutants

Not applicable

Export Notification requirements

Not applicable

Named dangerous substances per COMAH Regulations 2015 (as amended)

Not applicable

Chemical name	Lower-tier requirements (tons)	Upper-tier requirements (tons)
HYDROCHLORIC ACID ...% - 7647-01-0	25	250

The Ozone-Depleting Substances Regulations 2015

Not applicable

The Biocidal Products Regulations 2001 (as amended)

Not applicable

Chemical name	The Biocidal Products Regulations 2001 (as amended)
HYDROCHLORIC ACID ...% - 7647-01-0	Product-type 2: Disinfectants and algaecides not intended for direct application to humans or animals

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)

Not applicable

Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)

Not applicable

Chemical name	Poisons and Explosive Precursors
HYDROCHLORIC ACID ...%	Poison, Reportable 10 % w/w

International Inventories

TSCA

Contact supplier for inventory compliance status

DSL/NDL

Contact supplier for inventory compliance status

EINECS/ELINCS

Contact supplier for inventory compliance status

ENCS

Contact supplier for inventory compliance status

IECSC

Contact supplier for inventory compliance status

KECI

Contact supplier for inventory compliance status

PICCS

Contact supplier for inventory compliance status

AIIC
NZIoC

Contact supplier for inventory compliance status
Contact supplier for inventory compliance status

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals

15.2. Chemical safety assessment**Chemical Safety Report**

A Chemical Safety Assessment has been carried out for this substance

SECTION 16: Other information**Key or legend to abbreviations and acronyms used in the safety data sheet****Legend**

SVHC: Substances of Very High Concern for Authorisation:
PBT: Persistent, Bioaccumulative, and Toxic (PBT) Substances
vPvB: Very Persistent and very Bioaccumulative (vPvB) Substances

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation
+	Sensitisers		

Revision Note **Not applicable**

Classification procedure

Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
Reproductive toxicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGl(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals

Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
National Institute of Technology and Evaluation (NITE)
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Prepared By J Forth

Revision date 14-Aug-2025

**This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended)
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work**

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	HYDROCHLORIC ACID
REACH registration number	01-2119484862-27-XXXX
CAS No	7647-01-0
EC No (EU Index No)	231-595-7
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Manufacture of substance
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC1 - Manufacture of substances ERC2 - Formulation of preparations (mixtures)
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in 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 laboratory reagent
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC1 - Manufacture of substances
- ERC2 - Formulation of preparations (mixtures)

Covers concentrations up to 40%

Other operational conditions of use affecting environmental exposure

Type	Continuous
Emission days	360 days/year

Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Water-based process Process optimised for efficient use of raw materials Volatile compounds subject to air emission controls Wastewater emissions generated from equipment cleaning with water Prevent discharge of undissolved substance to or recover from onsite wastewater Contain leaks or spills within cabinets with removable trays
Additional good practice advice beyond the REACH Chemical Safety Report	Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases Prevent leaks and prevent soil/water pollution caused by leaks

Control measures to prevent releases

Water	Onsite wastewater treatment required
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Waste treatment methods	Substance will dissociate 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 All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	40%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Volatility	High
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	40%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	40%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to

	de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	40%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Volatility	High
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	40%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Volatility	High
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	40%

Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 Efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	40%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Volatility	High
Exposure duration	Avoid carrying out operation for more than 4 hours Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation Clean equipment and the work area every day
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

**Environmental release category(ies) - ERC1 - Manufacture of substances
- ERC2 - Formulation of preparations (mixtures)**

**Predicted No Effect Concentration
(PNEC)**

Freshwater	0.036 mg/l
Marine water	0.036 mg/l
Soil	0.036 mg/l
Impact on Sewage Treatment	0.036 mg/l
Intermittent release	0.045 mg/l

Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local

8 mg/m³

Worker - inhalative, short-term - local

15 mg/m³

Calculation method	Used ECETOC TRA model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.01 mg/m ³	0
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.04 mg/m ³	0
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1.5 mg/m ³	0.2
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	1.25 mg/m ³	0.25
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	5 mg/m ³	0.5
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.45 mg/m ³	0.09
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	1.8 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	4 mg/m ³	0.4

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to

define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Used ECETOC TRA model. Further information on the assumptions contained in this exposure scenario can be found at. <http://www.ecetoc.org/tra>.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	HYDROCHLORIC ACID
REACH registration number	01-2119484862-27-XXXX
CAS No	7647-01-0
EC No (EU Index No)	231-595-7
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Use as an intermediate
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in 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 laboratory reagent
Product category(ies)	PC19 - Intermediate
Sector(s) of use	SU0 - Other SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU4 - Manufacture of food products SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU11 - Manufacture of rubber products SU12 - Manufacture of plastics products, including compounding and conversion SU13 - Manufacture of other non-metallic mineral products SU19 - Building and construction work

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Covers concentrations up to 40%
Other operational conditions of use affecting environmental exposure

Type	Continuous
Emission days	360 days/year

Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Water-based process Process optimised for efficient use of raw materials Volatile compounds subject to air emission controls Wastewater emissions generated from equipment cleaning with water Prevent discharge of undissolved substance to or recover from onsite wastewater Contain leaks or spills within cabinets with removable trays
Additional good practice advice beyond the REACH Chemical Safety Report	Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases Prevent leaks and prevent soil/water pollution caused by leaks

Control measures to prevent releases

Water	Onsite wastewater treatment required
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Waste treatment methods	Substance will dissociate 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 All contaminated waste water must be processed in an industrial or municipal wastewatertreatment plant that incorporates both primary and secondary treatments.

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	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)
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%

Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation Clean equipment and the work area every day
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Freshwater	0.036 mg/l
Marine water	0.036 mg/l
Soil	0.036 mg/l
Impact on Sewage Treatment	0.036 mg/l
Intermittent release	0.045 mg/l

Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	8 mg/m ³
Worker - inhalative, short-term - local	15 mg/m ³

Calculation method	Used ECETOC TRA model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.01 mg/m ³	0
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.01 mg/m ³	0

PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	4 mg/m ³	0.4

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Used ECETOC TRA model. Further information on the assumptions contained in this exposure scenario can be found at. <http://www.ecetoc.org/tra>.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name HYDROCHLORIC ACID
REACH registration number 01-2119484862-27-XXXX
CAS No 7647-01-0
EC No (EU Index No) 231-595-7
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Formulation & (re)packing of substances and mixtures
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in 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 and articles (multi-stage 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)
Product category(ies) PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents
 PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Covers concentrations up to 40%

Other operational conditions of use affecting environmental exposure

Type	Continuous
Emission days	360 days/year

Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Water-based process Process optimised for efficient use of raw materials Volatile compounds subject to air emission controls Wastewater emissions generated from equipment cleaning with water Prevent discharge of undissolved substance to or recover from onsite wastewater Contain leaks or spills within cabinets with removable trays
Additional good practice advice beyond	Site should have a spill plan to ensure that adequate safeguards are in place to minimise

the REACH Chemical Safety Report	the impact of episodic releases Prevent leaks and prevent soil/water pollution caused by leaks
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Control measures to prevent releases

Water	Onsite wastewater treatment required
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Waste treatment methods	Substance will dissociate 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 All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	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 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down

the worker	and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 Efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Predicted No Effect Concentration (PNEC)

Freshwater	0.036 mg/l
Marine water	0.036 mg/l
Soil	0.036 mg/l
Impact on Sewage Treatment	0.036 mg/l
Intermittent release	0.045 mg/l

Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	8 mg/m ³
Worker - inhalative, short-term - local	15 mg/m ³

Calculation method

Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.01 mg/m ³	0
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.04 mg/m ³	0
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	1.25 mg/m ³	0.25
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	5 mg/m ³	0.5
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at	Worker - inhalative, long-term - local	0.45 mg/m ³	0.09

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	1.8 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	8 mg/m ³	0.8

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Used ECETOC TRA model. Further information on the assumptions contained in this exposure scenario can be found at: <http://www.ecetoc.org/tra>.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	HYDROCHLORIC ACID
REACH registration number	01-2119484862-27-XXXX
CAS No	7647-01-0
EC No (EU Index No)	231-595-7
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Formulation & (re)packing of substances and mixtures
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC2 - Formulation of preparations (mixtures)
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in 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 and articles (multi-stage 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)
Product category(ies)	PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals
Sector(s) of use	SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Covers concentrations up to 40%

Product characteristics

Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
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Other operational conditions of use affecting environmental exposure

Type	Continuous
Emission days	360 days/year

Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and	Water-based process Process optimised for efficient use of raw materials Volatile
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measures to reduce or limit discharges, air emissions	compounds subject to air emission controls Wastewater emissions generated from equipment cleaning with water Prevent discharge of undissolved substance to or recover from onsite wastewater Contain leaks or spills within cabinets with removable trays
Additional good practice advice beyond the REACH Chemical Safety Report	Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases Prevent leaks and prevent soil/water pollution caused by leaks

Control measures to prevent releases

Water	Onsite wastewater treatment required
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Waste treatment methods	Substance will dissociate 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 All contaminated waste water must be processed in an industrial or municipal wastewatertreatment plant that incorporates both primary and secondary treatments.

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	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)
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use

Process category(ies)	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)
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Predicted No Effect Concentration (PNEC)

Freshwater	0.036 mg/l
Marine water	0.036 mg/l
Soil	0.036 mg/l
Impact on Sewage Treatment	0.036 mg/l
Intermittent release	0.045 mg/l

Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	8 mg/m ³
Worker - inhalative, short-term - local	15 mg/m ³

Calculation method

Used ECETOC TRA model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.1 mg/m ³	0.02
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.4 mg/m ³	0.04
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3

dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	6 mg/m ³	0.6

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Used ECETOC TRA model. Further information on the assumptions contained in this exposure scenario can be found at: <http://www.ecetoc.org/tra>.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name	HYDROCHLORIC ACID
REACH registration number	01-2119484862-27-XXXX
CAS No	7647-01-0
EC No (EU Index No)	231-595-7
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Industrial use
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC6b - Industrial use of reactive processing aids
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in 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 laboratory reagent PROC19 - Hand-mixing with intimate contact and only PPE available
Product category(ies)	PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents PC34 - Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals
Sector(s) of use	SU0 - Other SU2a - Mining (without offshore industries) SU2b - Offshore industries SU4 - Manufacture of food products SU5 - Manufacture of textiles, leather, fur SU9 - Manufacture of fine chemicals SU14 - Manufacture of basic metals, including alloys SU15 - Manufacture of fabricated metal products, except machinery and equipment SU16 - Manufacture of computer, electronic and optical products, electrical equipment

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
- ERC6b - Industrial use of reactive processing aids

Covers concentrations up to 40%

Other operational conditions of use affecting environmental exposure

Type	Continuous
Emission days	360 days/year

Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Water-based process Process optimised for efficient use of raw materials Volatile compounds subject to air emission controls Wastewater emissions generated from equipment cleaning with water Prevent discharge of undissolved substance to or recover from onsite wastewater Contain leaks or spills within cabinets with removable trays
Additional good practice advice beyond the REACH Chemical Safety Report	Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases Prevent leaks and prevent soil/water pollution caused by leaks

Control measures to prevent releases

Water	Onsite wastewater treatment required
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Waste treatment methods	Substance will dissociate 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 All contaminated waste water must be processed in an industrial or municipal wastewatertreatment plant that incorporates both primary and secondary treatments.

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC10 - Roller application or brushing
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	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,
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	including weighing) PROC13 - Treatment of articles by dipping and pouring PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20 Efficiency of at least 95%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
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Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

- ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Freshwater	0.036 mg/l
Marine water	0.036 mg/l
Soil	0.036 mg/l
Impact on Sewage Treatment	0.036 mg/l
Intermittent release	0.045 mg/l

Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	8 mg/m ³
Worker - inhalative, short-term - local	15 mg/m ³

Calculation method	Used ECETOC TRA model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.01 mg/m ³	0
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.04 mg/m ³	0
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	6 mg/m ³	0.6

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	1.25 mg/m ³	0.25
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	5 mg/m ³	0.5
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	1.25 mg/m ³	0.25
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	5 mg/m ³	0.5
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - local	1.25 mg/m ³	0.25
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, short-term - local	5 mg/m ³	0.5

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Used ECETOC TRA model. Further information on the assumptions contained in this exposure scenario can be found at: <http://www.ecetoc.org/tra>.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name HYDROCHLORIC ACID
REACH registration number 01-2119484862-27-XXXX
CAS No 7647-01-0
EC No (EU Index No) 231-595-7
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

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Section 1 - Title

Title Professional use
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8e - Wide dispersive outdoor use of reactive substances in open systems
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in 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 laboratory reagent
 PROC19 - Hand-mixing with intimate contact and only PPE available
Product category(ies) 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
Sector(s) of use SU0 - Other SU20 - Health services SU22 - Professional uses SU23 - Recycling

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems
 - ERC8e - Wide dispersive outdoor use of reactive substances in open systems

Covers concentrations up to 40%
Other operational conditions of use affecting environmental exposure

Type	Continuous
Emission days	360 days/year

Further information

Operational conditions	Indoor/Outdoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Water-based process Process optimised for efficient use of raw materials Volatile compounds subject to air emission controls Wastewater emissions generated from equipment cleaning with water Prevent discharge of undissolved substance to or recover from onsite wastewater Contain leaks or spills within cabinets with removable trays
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Additional good practice advice beyond the REACH Chemical Safety Report	Site should have a spill plan to ensure that adequate safeguards are in place to minimise the impact of episodic releases Prevent leaks and prevent soil/water pollution caused by leaks
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Control measures to prevent releases

Water	Onsite wastewater treatment required
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Waste treatment methods	Substance will dissociate 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 All contaminated waste water must be processed in an industrial or municipal wastewatertreatment plant that incorporates both primary and secondary treatments.

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	40%
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points

	where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC10 - Roller application or brushing
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points

	where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Use bulk or semi-bulk handling systems Clean equipment and the work area every day Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Covers indoor and outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	40%
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Drain down and flush system prior to equipment break-in or maintenance Clear transfer lines prior to de-coupling Handle substance within a closed system Provide extract ventilation to points where emissions occur Efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with specific activity training Use suitable eye protection Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure control measures are regularly inspected and maintained Ensure operatives are trained to minimise exposures Ensure material transfers are under containment or extract ventilation
Remarks	Assumes a good basic standard of occupational hygiene is implemented
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems - ERC8e - Wide dispersive outdoor use of reactive substances in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.036 mg/l
Marine water	0.036 mg/l
Soil	0.036 mg/l
Impact on Sewage Treatment	0.036 mg/l
Intermittent release	0.045 mg/l

Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	8 mg/m ³
Worker - inhalative, short-term - local	15 mg/m ³

Calculation method	Used ECETOC TRA model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.1 mg/m ³	0.02
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.4 mg/m ³	0.04
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC10 - Roller application or brushing	Worker - inhalative, long-term - local	1 mg/m ³	0.2
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	4 mg/m ³	0.4
PROC11 - Non industrial spraying	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC11 - Non industrial spraying	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	1.5 mg/m ³	0.3
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	6 mg/m ³	0.6
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	2 mg/m ³	0.4
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	8 mg/m ³	0.8
PROC19 - Hand-mixing with intimate	Worker - inhalative, long-term	1 mg/m ³	0.2

contact and only PPE available	- local		
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, short-term - local	4 mg/m ³	0.4

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. Used ECETOC TRA model. Further information on the assumptions contained in this exposure scenario can be found at. <http://www.ecetoc.org/tra>.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Chemical name HYDROCHLORIC ACID
REACH registration number 01-2119484862-27-XXXX
CAS No 7647-01-0
EC No (EU Index No) 231-595-7
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Consumer use
Type Consumer
Main user group Consumer uses: Private households (= general public = consumers)
Environmental release category(ies) ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8e - Wide dispersive outdoor use of reactive substances in open systems
Product category(ies) 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, flux products
Sector(s) of use SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems
 - ERC8e - Wide dispersive outdoor use of reactive substances in open systems

Covers concentrations up to 20%
Other operational conditions of use affecting environmental exposure

Type	Continuous
Emission days	360 days/year

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
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Conditions and measures related to external treatment of waste for disposal

Disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
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Control of consumer exposure

Product categories [PC]	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, flux products
Covers concentrations up to	20%
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP

Amounts used	0.51 g/event
Exposure duration	Avoid carrying out activities involving exposure for more than 4 hours
Risk management measures	Do not inhale spray vapour Wear suitable gloves and eye/face protection Open doors and windows Regular cleaning of equipment Regular cleaning of work area Ensure that direct skin contact is avoided Open windows during application to ensure natural ventilation
Operational conditions	Covers use at ambient temperatures

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems - ERC8e - Wide dispersive outdoor use of reactive substances in open systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.036 mg/l
Marine water	0.036 mg/l
Soil	0.036 mg/l
Impact on Sewage Treatment	0.036 mg/l
Intermittent release	0.045 mg/l

Remarks Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	8 mg/m ³
Worker - inhalative, short-term - local	15 mg/m ³

Section 4 - Guidance to check compliance with the exposure scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.