SAFETY DATA SHEET

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

1.1 Product identifier

- Product Name: Smartseal Brick Acid Cleaner
- Chemical Name: Hydrochloric acid 4 - 5 %
- CAS Number: 7647-01-0
- EC Number: 231-595-7
- Index No.: 017-002-01-X
- REACH Registration Number: 01-2119484862-27-XXXX

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

- Use of the substance/mixture: Micro etching concrete surfaces
- Use advised against: No information available

1.3 Details of the supplier of the safety data sheet

- Name of Supplier: Smartseal UK Ltd
- Address of Supplier: Unit 3
  65-67 Cutlers Road
  South Woodham Ferrers
  Chelmsford
  Essex
  CM3 5WA
  UK
- Telephone: +44 (0) 1268 722500
- Email: contactus@smartseal.co.uk

1.4 Emergency telephone number

- Emergency Telephone: +44 (0) 1268 722500
  (office hours only Mon– Fri 08:30 – 17:30)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

- Classification (REGULATION (EC) No 1272/2008) [CLP/GHS]: Met. Corr. 1, H290
- Additional information: For full text of Hazard- and EU Hazard-statements: see section 16

2.2 Label elements

- Signal Word: Warning
- Hazard statements
  H290 - May be corrosive to metals.
- Precautionary statements
  P234 - Keep only in original packaging.
  P390 - Absorb spillage to prevent material damage.
  P501 - Dispose of contents/container to an authorised waste collection point
- Supplemental Hazard Information (EU)

SECTION 2: Hazards identification (....)

None

2.3 Other hazards

- Not a PBT according to REACH Annex XIII
- Not a vPvB according to REACH Annex XIII

SECTION 3: Composition/information on ingredients

3.1 Substances

- hydrochloric acid 4 - 5%
  EC Number: 231-595-7
  Index No.: 017-002-01-X
  Classification (REGULATION (EC) No 1272/2008) [CLP/GHS]: Met. Corr. 1, H290; Skin Corr. 1B, H314; STOT SE 3, H335
  REACH Registration Number: 01-2119484862-27-XXXX

3.2 Mixtures

SECTION 4: First aid measures

4.1 Description of first aid measures

- Contact with eyes
  If substance has got into eyes, immediately wash out with plenty of water for several minutes
  Irrigate eyes thoroughly whilst lifting eyelids
  Remove contact lenses, if present and easy to do. Continue rinsing.
  If eye irritation persists: Get medical advice/attention.
- Contact with skin
  Take off contaminated clothing and wash it before reuse.
  Wash affected area with plenty of soap and water
  If skin irritation occurs: Get medical advice/attention.
- Ingestion
  Rinse mouth with water (do not swallow)
  Give plenty of water to drink
  Call a POISON CENTRE or doctor if you feel unwell.
- Inhalation
  If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
  Get medical advice/attention if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

- Contact with eyes
  May cause redness and irritation
- Contact with skin
  May cause skin irritation
- Ingestion
  May cause irritation of the throat
  May cause nausea/vomiting
- Inhalation
  May cause respiratory tract irritation.

4.3 Indication of any immediate medical attention and special treatment needed

- Treat symptomatically

SECTION 5: Firefighting measures

5.1 Extinguishing media

- In case of fire use water spray or fog, alcohol resistant foam, dry chemical or carbon dioxide
- Unsuitable extinguishing media: high volume water jet

5.2 Special hazards arising from the substance or mixture

- Decomposition products may include hydrogen chloride
- Reacts with metals liberating hydrogen

5.3 Advice for firefighters

- Collect contaminated fire extinguishing water separately. This MUST not be discharged into drains. Prevent fire extinguishing water from contaminating surface or ground water.
- Keep container(s) exposed to fire cool, by spraying with water
- Special protective equipment: Wear self-contained breathing apparatus (SCBA). Wear full protective clothing including chemical protection suit.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Rescuers should take suitable precautions to avoid becoming casualties themselves
- Personal precautions for non-emergency personnel: Avoid breathing vapours, mist or gas; Avoid contact with skin and eyes; Wear protective clothing as per section 8; Wash thoroughly after handling.
- Personal precautions for emergency responders: Evacuate the area and keep personnel upwind; Wear chemical protection suit; Wear self-contained breathing apparatus (SCBA).

6.2 Environmental precautions

- Avoid release to the environment.
- Do not allow to enter public sewers and watercourses
- If polluted water reaches drainage systems or water courses, immediately inform appropriate authorities

6.3 Methods and material for containment and cleaning up

- Stop leak if safe to do so.
- Contain the spillage using bunding
- Neutralise with soda ash
- Absorb spillage in inert material and shovel up
- Place in appropriate container
- Seal containers and label them
- Remove contaminated material to safe location for subsequent disposal
- Dispose of contents/container to an authorised waste collection point
- To be disposed of as hazardous waste

6.4 Reference to other sections

- See section(s): 7,8 &13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Do not eat, drink or smoke when using this product.
- Use only in well ventilated areas
- Engineering controls should be provided which maintain airborne concentrations below the relevant guidelines
- In case of inadequate ventilation wear respiratory protection.
- Eyewash bottles should be available

7.2 Conditions for safe storage, including any incompatibilities

SECTION 7: Handling and storage (....)

- Keep only in the original container
- Keep container tightly closed, in a cool, well ventilated place
- Opened containers should be carefully resealed and stored in an upright position
- Incompatible with alkalis (strong bases)
- Incompatible with metals
- Incompatible with oxidizing substances

7.3 Specific end use(s)

Micro etching concrete surfaces

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

- hydrochloric acid
  (EU) OELV (long term TWA) 5 ppm 8 mg/m3
  (EU) OELV (short term limit value) 10 ppm 15 mg/m3
  WEL (long term TWA) 1 ppm 2 mg/m3 (gas and aerosol mists, UK)
  WEL (short term limit value) 5 ppm 8 mg/m3 (gas and aerosol mists, UK)
  DNEL (inhalational) 8 mg/m3 Industry, Long Term, Local Effects
  DNEL (inhalational) 15 mg/m3 Industry, Acute/Short Term, Local Effects
  DNEL (inhalational) 8 mg/m3 Consumer, Long Term, Local Effects
  DNEL (inhalational) 15 mg/m3 Consumer, Acute/Short Term, Local Effects
  PNEC aqua (freshwater) 36 ug/l
  PNEC aqua (marine water) 36 ug/l
  PNEC (STP) 36 ug/l

8.2 Exposure controls

- Selection and use of personal protective equipment should be based on a risk assessment of exposure potential
- Engineering controls should be provided to prevent the need for ventilation
- Where a reusable half mask respirator is required, use EN 140, with gas/vapour filter EN 14387 type ABEK, or EN 405; EN 1827
- Where a full face mask respirator is required, use EN 136, with gas/vapour filter EN 14387 type ABEK
- Wear safety glasses approved to standard EN 166.
- Wear suitable protective clothing
- Contaminated clothing should be laundered before reuse
- Wear protective gloves. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and standard EN 374.
- The selection of a suitable glove depends on work conditions and whether the product is present on its own or in combination with other substances. Breakthrough time is dependent on the characteristics of the brand of glove used and the supplier should be consulted.
- Use good personal hygiene practices
- Do not eat, drink or smoke when using this product.
- Wash thoroughly after handling.
- Ensure eyewash stations and safety showers are nearby

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

SECTION 9: Physical and chemical properties (....)

- Appearance: Liquid, colourless
- Odour: Pungent odour
- Odour threshold: No information available
- pH: <1
- Melting point/freezing point: No information available
- Initial boiling point and boiling range: No information available
- Flashpoint: Not applicable
- Evaporation Rate: No information available
- Flammability (solid,gas): Not applicable
- Upper/lower flammability or explosive limits: Not applicable
- Vapour Pressure: No information available
- Vapour Density: No information available
- Relative Density: <1.05 @ 15.5 °C
- Solubility(ies): 500 g/L @ 20 °C
- Partition Coefficient (n-Octanol/Water): No information available
- Autoignition Temperature: No information available
- Decomposition temperature: No information available
- Viscosity: No information available
- Explosive Properties: Not applicable
- Oxidising properties: Not applicable

9.2 Other information

- May be corrosive to metals

SECTION 10: Stability and reactivity

10.1 Reactivity

- Decomposition products may include acidic and toxic gases

10.2 Chemical stability

- Considered stable under normal conditions

10.3 Possibility of hazardous reactions

- Reacts with metals liberating hydrogen

10.4 Conditions to avoid

- Keep away from heat and sources of ignition
- Avoid freezing
- Keep away from direct sunlight

10.5 Incompatible materials

- Incompatible with alkalis (strong bases)
- Incompatible with oxidizing substances
- Incompatible with reducing agents
- Incompatible with metals

10.6 Hazardous decomposition products

- Decomposition products may include hydrogen chloride

SECTION 11: Toxicological information

11.1 Information on toxicological effects

- Acute Toxicity
  Based on available data, the classification criteria are not met

SECTION 11: Toxicological information (....)

- Skin corrosion/irritation
  Based on available data, the classification criteria are not met
- Serious eye damage/irritation
  Based on available data, the classification criteria are not met
- Respiratory or skin sensitisation
  Based on available data, the classification criteria are not met
- Germ cell mutagenicity
  No evidence of mutagenic effects
- Carcinogenicity
  No evidence of carcinogenic effects
- Reproductive toxicity
  No evidence of reproductive effects
- Specific target organ toxicity (STOT) - single exposure
  Based on available data, the classification criteria are not met
- Specific target organ toxicity (STOT) - repeated exposure
  Based on available data, the classification criteria are not met
- Aspiration hazard
  Based on available data, the classification criteria are not met
- Contact with eyes
  May cause redness and irritation
- Contact with skin
  May cause redness and irritation
- Ingestion
  May cause irritation of the throat
  May cause nausea/vomiting
- Inhalation
  May cause respiratory tract irritation.

SECTION 12: Ecological information

12.1 Toxicity

- Based on available data, the classification criteria are not met
- hydrochloric acid

  LC50 (fish): 20.5 mg/l (24 hr)

  EC50 (Daphnia magna): 0.45 mg/l (48 hr)

12.2 Persistence and degradability

- Not applicable

12.3 Bioaccumulative potential

- No bioaccumulation potential

12.4 Mobility in soil

- No information available

12.5 Results of PBT and vPvB assessment

- Not a PBT according to REACH Annex XIII
- Not a vPvB according to REACH Annex XIII

12.6 Other adverse effects

- No information available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

- Disposal should be in accordance with local, state or national legislation
- Dispose of contents/container to an authorised waste collection point
- This material and its container must be disposed of as hazardous waste
- Do not reuse empty containers without commercial cleaning or reconditioning

13.2 Classification

- The waste must be identified according to the List of Wastes (2000/532/EC)

SECTION 14: Transport information

14.1 UN number

- UN No.: 1789

14.2 UN proper shipping name

- Proper Shipping Name: HYDROCHLORIC ACID

14.3 Transport hazard class(es)

- Hazard Class: 8

14.4 Packing group

- Packing Group: III

14.5 Environmental hazards

- Not applicable

14.6 Special precautions for user

- No special precautions are required for this product

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

- Not applicable

14.8 Road/Rail (ADR/RID)

- Proper Shipping Name: HYDROCHLORIC ACID
- ADR UN No.: 1789
- ADR Hazard Class: 8
- ADR Packing Group: III
- Tunnel Code: E

14.9 Sea (IMDG)

- Proper Shipping Name: HYDROCHLORIC ACID
- IMDG UN No.: 1789
- IMDG Hazard Class: 8
- IMDG Pack Group.: III

14.10 Air (ICAO/IATA)

- Proper Shipping Name: HYDROCHLORIC ACID
- ICAO UN No.: 1789
- ICAO Hazard Class: 8
- ICAO Packing Group: III

SECTION 15: Regulatory information

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

- This safety data sheet is provided in compliance with REACH Regulation (EC) No 1907/2006 as amended by Regulation (EU) 2015/830
- Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) applies in Europe

15.2 Chemical safety assessment

- A REACH chemical safety assessment has been carried out

SECTION 16: Other information

The above information is believed to be correct but does not purport to be all inclusive and shall only be used as a guide. The company will not be held liable for any damage resulting from handling or from contact with this product.

Sources of data: Information from published literature and internal company data

Text not given with phrase codes where they are used elsewhere in this safety data sheet:

- H290: May be corrosive to metals
- H314: Causes severe skin burns and eye damage
- H335: May cause respiratory irritation

Acronyms

- CAS: Chemical Abstracts Service
- DNEL: Derived No-Effect Level
- EC: European Community
- EC50: Effective Concentration, 50%
- GHS: Globally Harmonised System
- LC50: Lethal Concentration, 50%
- LD50: Lethal Dose, 50%
- NOAEL: No observed adverse effect level
- OEL: Occupational Exposure Limit
- PBT: Persistent, Bioaccumulative and Toxic
- PNEC: Predicted No-Effect Concentration
- REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals
- STOT RE: Specific Target Organ Toxicity Repeated Exposure
- STOT SE: Specific Target Organ Toxicity Single Exposure
- vPvB: very Persistent and very Bioaccumulative
- WEL: Workplace Exposure Limit

--- end of safety datasheet ---

Annex to extended Safety Data Sheet (eSDS)

HYDROCHLORIC ACID .....%

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	1, 2	NA	ES0004963
2	Use as an intermediate	3	4, 8, 9, 11, 12, 13, 19	NA	1, 2, 3, 4, 9, 15	6a	NA	ES0004629
3	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9	2	NA	ES0004648
4	Consumer use	21	NA	20, 21, 35, 37, 38	NA	8b, 8e	NA	ES0004794
5	Industrial use	3	2a, 2b, 5, 14, 15, 16	NA	1, 2, 3, 4, 9, 10, 13, 15, 19	4, 6b	NA	ES0004683
6	Professional use	22	20, 23	NA	1, 2, 3, 4, 8a, 10, 11, 13, 15, 19	8a, 8b, 8e	NA	ES0004748

HYDROCHLORIC ACID .....%

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals	
Process categories	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	
Environmental Release Categories	ERC1: Manufacture of substances ERC2: Formulation of preparations	

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2

No exposure assessment presented for the environment

Amount used	Not applicable	
Frequency and duration of use	Continuous exposure	360 days/year
Technical conditions and measures at process level to prevent release	Application Area	Industrial use
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments
Organizational measures to prevent/limit release from the site	Prevent leaks and prevent soil / water pollution caused by leaks. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 40 %
	Physical Form (at time of use)	Liquid, moderate fugacity
	Vapour pressure	0.5 - 10 kPa
	Process Temperature	20 °C
	Assumes use at not more than 20°C above ambient temperature., It should be noted that the process temperature may be higher, but the substance temperature is down to ambient at worker contact points.	
Amount used	Varies between milliliters (sampling) and cubic meters (material transfers).	
Frequency and duration of use	Exposure duration per day	480 min
	Exposure duration per day	< 60 min(Without Local Exhaust Ventilation PROC15)
	Frequency of use	5 days/week(Without Local Exhaust Ventilation PROC15)

HYDROCHLORIC ACID .....%

Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing.
	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Clear transfer lines prior to de-coupling.(PROC1, PROC2, PROC3, PROC4)
	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC2, PROC3)
	Use drum pumps. Use bulk or semi-bulk handling systems.(PROC4)
	Provide extraction ventilation at points where emissions occur. (Efficiency: 90 %)(PROC4, PROC8a, PROC8b)
	Handle substance within a predominantly closed system provided with extract ventilation.(PROC8a, PROC8b, PROC9)
	Fill containers/cans at dedicated filling points supplied with local extract ventilation.(PROC9)
	Handle in a fume cupboard or under extract ventilation. Carry out in a vented booth or extracted enclosure. (Efficiency: 80 %)(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Ensure that no inhalable aerosols are generated
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable coveralls to prevent exposure to the skin. Use suitable eye protection. Wear chemically resistant gloves.

Risk management measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

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

Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m³	0
PROC2	---	Worker - inhalative, long-term - local	1.50mg/m³	0.2
PROC4	---	Worker - inhalative, long-term - local	3.00mg/m³	0.4
PROC3	---	Worker - inhalative, long-term - local	3.75mg/m³	0.5
PROC8a, PROC8b, PROC9	---	Worker - inhalative, long-term - local	7.50mg/m³	0.9
PROC15	---	Worker - inhalative, long-term - local	1.8mg/m³	0.9

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by 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.

HYDROCHLORIC ACID .....%

For further information on the assessment method, see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

HYDROCHLORIC ACID .....%

1. Short title of Exposure Scenario 2: Use as an intermediate

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	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, e.g. plasters, cement SU19: Building and construction work
Process categories	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
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

2.1 Contributing scenario controlling environmental exposure for: ERC6a

No exposure assessment presented for the environment

Amount used	Not applicable	
Frequency and duration of use	Continuous exposure	360 days/year
Technical conditions and measures at process level to prevent release	Water	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. Prevent leaks and prevent soil / water pollution caused by leaks.	
Organizational measures to prevent/limit release from the site		

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC9, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 40 %
	Physical Form (at time of use)	Liquid, moderate fugacity
	Vapour pressure	0.5 - 10 kPa
	Process Temperature	20 °C Assumes use at not more than 20°C above ambient temperature., It should be noted that the process temperature may be higher, but the substance temperature is down to ambient at worker contact points.
Amount used	Varies between milliliters (sampling) and cubic meters (material transfers).	
Frequency and duration of use	Exposure duration per day	< 8 h
	Exposure duration per day	< 1 h(Without Local Exhaust Ventilation PROC15)
	Frequency of use	5 days/week(Without Local Exhaust Ventilation

	PROC15)
	Avoid splashing.
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Clear transfer lines prior to de-coupling.(PROC1, PROC2, PROC3, PROC4)
	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC2, PROC3)
	Drain down and flush system prior to equipment opening or maintenance.(PROC3, PROC4)
	Use drum pumps. Use bulk or semi-bulk handling systems.(PROC4)
	Provide extraction ventilation at points where emissions occur. (Efficiency: 90 %)(PROC4)
	Handle substance within a predominantly closed system provided with extract ventilation. Fill containers/cans at dedicated filling points supplied with local extract ventilation. (Efficiency: 90 %)(PROC9)
	Handle in a fume cupboard or under extract ventilation. Carry out in a vented booth or extracted enclosure. (Efficiency: 80 %)(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Ensure that no inhalable aerosols are generated
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable coveralls to prevent exposure to the skin. Use suitable eye protection. Wear chemically resistant gloves. Wear suitable gloves tested to EN374.(PROC3)

Risk management measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

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

Workers

PROC1: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m3	0
PROC2	---	Worker - inhalative, long-term - local	1.50mg/m3	0.2
PROC3	---	Worker - inhalative, long-term - local	3.75mg/m³	0.5
PROC4	---	Worker - inhalative, long-term - local	3.00mg/m3	0.4
PROC9	---	Worker - inhalative, long-term - local	7.5mg/m³	0.9
PROC15	---	Worker - inhalative, long-term - local	1.8mg/m³	0.9

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

HYDROCHLORIC ACID .....%

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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
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.
For further information on the assessment method, see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

HYDROCHLORIC ACID .....%

1. Short title of Exposure Scenario 3: Formulation & (re)packing of substances and mixtures

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	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 (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Categories	ERC2: Formulation of preparations
Activity	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC2

No exposure assessment presented for the environment

Amount used	Not applicable	
Frequency and duration of use	Continuous exposure	360 days/year
Technical conditions and measures at process level to prevent release	Water	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. Prevent leaks and prevent soil / water pollution caused by leaks.	
Organizational measures to prevent/limit release from the site		

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 20 %.
	Physical Form (at time of use)	Liquid, moderate fugacity
	Vapour pressure	0.5 - 10 kPa
	Process Temperature	20 °C
Amount used	Varies between milliliters (sampling) and cubic meters (material transfers).	
Frequency and duration of use	Exposure duration per day	< 8 h
	Frequency of use	5 days/week
Other operational conditions affecting workers exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature).	
Technical conditions and	Ensure material transfers are under containment or extract ventilation.	

measures to control dispersion from source towards the worker	(Efficiency: 90 %)(PROC2, PROC3)
	Drain down and flush system prior to equipment opening or maintenance.(PROC3, PROC4, PROC5)
	Avoid splashing.(PROC9, PROC15)
	Handle substance within a predominantly closed system provided with extract ventilation. (Efficiency: 90 %)(PROC8a, PROC8b, PROC9, PROC15)
	Clear transfer lines prior to de-coupling. Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Use bulk or semi-bulk handling systems.(PROC4)
	Provide extraction ventilation at points where emissions occur. (Efficiency: 90 %)(PROC4, PROC8a, PROC8b, PROC15)
	Use drum pumps.(PROC4, PROC5)
	Transfer materials directly to mixing vessels.(PROC5)
	Fill containers/cans at dedicated filling points supplied with local extract ventilation. (Efficiency: 90 %)(PROC9, PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable coveralls to prevent exposure to the skin. Use suitable eye protection. Wear chemically resistant gloves.
	Wear suitable gloves tested to EN374.(PROC3)

Risk management measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

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

Workers

PROC1: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m3	0
PROC2	---	Worker - inhalative, long-term - local	1.50mg/m3	0.2
PROC3	---	Worker - inhalative, long-term - local	3.75mg/m³	0.5
PROC4	---	Worker - inhalative, long-term - local	3.00mg/m3	0.4
PROC5, PROC8a, PROC8b, PROC9	---	Worker - inhalative, long-term - local	7.50mg/m³	0.9

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by 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.
For further information on the assessment method, see: http://www.ecetoc.org/tra

HYDROCHLORIC ACID .....%

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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1. Short title of Exposure Scenario 4: Consumer use

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC20: Products such as ph-regulators, flocculants, pre-cipitants, neutralization agents PC21: Laboratory chemicals PC35: Washing and cleaning products (including solvent based products) PC37: Water treatment chemicals PC38: Welding and soldering products (with flux coatings or flux cores.), flux products	
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	

2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC8e

~~No exposure assessment presented for the environment~~		
~~Amount used~~	~~Not applicable~~	
~~Frequency and duration of use~~	~~Continuous exposure~~	~~360 days/year~~
Technical conditions and measures at process level to prevent release	Water	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Technical onsite conditions and measures to reduce or limit releases to soil	Prevent leaks and prevent n to ensure that adequate safeguards are in place to soil / water pollution caused by leaks.	
Organizational measures to prevent/limit release from the site	Site should have a spill pla minimize the impact of episodic releases.	

2.2 Contributing scenario controlling consumer exposure for: PC20, PC21, PC35, PC37, PC38

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 20 %.
	Physical Form (at time of use)	Liquid, moderate fugacity
	Vapour pressure	0.5 - 10 kPa
	Process Temperature	20 °C
Amount used	Amount used per event	500 mL
	Exposure duration per event	240 min
~~Frequency and duration of use~~	~~Frequency of use~~	~~5 Times per year:~~
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
	Application Route	Consumer use
	Exposure routes	Dermal exposure
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	The substance may cause local irritating effects No systemic effects. Always use protective gloves during the handling and application activities mentioned under the Product Categories above.
	Risk management measures are based on qualitative risk characterisation.	

~~3. Exposure estimation and reference to its source~~

Environment

HYDROCHLORIC ACID .....%

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

Consumers

Exposures have not been estimated as the substance only causes local dermal and/or inhalatory effects and no systemic effects. The use is assessed to be safe.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by 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.

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1. Short title of Exposure Scenario 5: Industrial use

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU2a: Mining, (without offshore industries) SU2b: Offshore industries SU5: Manufacture of textiles, leather, fur 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
Process categories	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
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6b

No exposure assessment presented for the environment

Amount used	Not applicable	
Frequency and duration of use	Continuous exposure	360 days/year
Technical conditions and measures at process level to prevent release	Water	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Technical onsite conditions and measures to reduce or limit discharges, air emissions and Organisational measures to help to soil	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. Prevent leaks and prevent soil / water pollution caused by leaks.	
prevent/limit release from the site		

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC9, PROC10, PROC13, PROC15, PROC19

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 40 %
	Physical Form (at time of use)	Liquid, moderate fugacity
	Vapour pressure	0.5 - 10 kPa
	Process Temperature	< 100 °C
Amount used	Varies between milliliters (sampling) and cubic meters (material transfers).	
Frequency and duration of use	Exposure duration per day	< 8 h
	Exposure duration per day	< 1 h(Without Local Exhaust Ventilation PROC15)

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	Frequency of use	5 days/week(Without Local Exhaust Ventilation PROC15)
Other operational conditions affecting workers exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature).(PROC13)	
Technical conditions and measures to control dispersion from source towards the worker	Clear transfer lines prior to de-coupling.(PROC1, PROC2, PROC3)	
	Handle substance within a closed system.(PROC1, PROC2, PROC3)	
	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC2, PROC3)	
	Drain down and flush system prior to equipment opening or maintenance.(PROC3, PROC4)	
	Use bulk or semi-bulk handling systems. Use drum pumps.(PROC4)	
	Provide extraction ventilation at points where emissions occur. (Efficiency: 90 %)(PROC4)	
	Handle substance within a predominantly closed system provided with extract ventilation. Fill containers/cans at dedicated filling points supplied with local extract ventilation. (Efficiency: 90 %)(PROC9)	
	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 90 %)(PROC10)	
	Provide extract ventilation to material transfer points and other openings. (Efficiency: 90 %)(PROC13)	
	Carry out in a vented booth provided with laminar airflow.(PROC13)	
	Handle in a fume cupboard or under extract ventilation. Carry out in a vented booth or extracted enclosure. (Efficiency: 80 %)(PROC15)	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable coveralls to prevent exposure to the skin. Use suitable eye protection. Wear chemically resistant gloves.	
	Wear suitable gloves tested to EN374.(PROC3, PROC10, PROC13, PROC19)	
	Do not carry out the operation for more than 15 min. without respiratory protection Wear a respirator conforming to EN140 with Type A filter or better.(PROC19)	
Risk management measures are based on qualitative risk characterisation.		

3. Exposure estimation and reference to its source

Environment

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

Workers

PROC1: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Worker - inhalative, long-term - local	0.02mg/m³	0
PROC2	---	Worker - inhalative, long-term - local	1.50mg/m3	0.2
PROC3	---	Worker - inhalative, long-term - local	3.75mg/m³	0.5
PROC9, PROC10,	---	Worker - inhalative, long-term - local	3.00mg/m3	0.4

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PROC13, PROC19				
PROC4	---	Worker - inhalative, long-term - local	3.00mg/m3	0.4
PROC15	---	Worker - inhalative, long-term - local	1.8mg/m³	0.9

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by 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.
For further information on the assessment method, see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Sectors of end-use	SU20: Health services SU23: Recycling	
Process categories	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	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered	

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8e

No exposure assessment presented for the environment

Frequency and duration of use	Continuous exposure	360 days/year
	Continuous exposure	8 hours/day
Technical conditions and measures at process level to prevent release	Water	Ensure all waste water is collected and treated via a WWTP., All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Technical onsite conditions and measures to reduce or limit releases to soil discharges, air emissions and	Prevent leaks and prevent soil / water pollution caused by leaks.	
Organizational measures to prevent/limit release from the site		

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC10, PROC11, PROC13, PROC15, PROC19

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 40 %
	Physical Form (at time of use)	Liquid, moderate fugacity
	Vapour pressure	0.5 - 10 kPa
	Process Temperature	20 °C
	Assumes use at not more than 20°C above ambient temperature.	
Amount used	Varies between milliliters (sampling) and cubic meters (material transfers).	
Frequency and duration of use	Exposure duration per day	< 8 h
	Handle substance within a closed system (PROC1, PROC2, PROC3)	
	Frequency of use	5 days/week
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation. (Efficiency: 90 %)(PROC2, PROC3, PROC4)	
	Clear transfer lines prior to de-coupling.(PROC1, PROC2, PROC3, PROC4,	

	PROC8a)
	Drain down and flush system prior to equipment opening or maintenance.(PROC3, PROC4)
	Use bulk or semi-bulk handling systems. Use drum pumps.(PROC4)
	Provide extraction ventilation at points where emissions occur. (Efficiency: 90 %)(PROC4, PROC8a, PROC11)
	Handle substance within a predominantly closed system provided with extract ventilation. (Efficiency: 90 %)(PROC8a)
	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (Efficiency: 90 %)(PROC10)
	Carry out in a vented booth provided with laminar airflow. Allow time for product to drain from workpiece. Automate activity where possible.(PROC13)
	Provide extract ventilation to material transfer points and other openings. (Efficiency: 90 %)(PROC13)
	Handle in a fume cupboard or under extract ventilation. Carry out in a vented booth or extracted enclosure. (Efficiency: 80 %)(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures
	Ensure minimization of manual phases(PROC13)
	Avoid carrying out operation for more than 4 hours.(PROC15)
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable coveralls to prevent exposure to the skin. Use suitable eye protection. Wear chemically resistant gloves.
	Wear suitable gloves tested to EN374.(PROC3, PROC10, PROC11, PROC13, PROC19)
	Wear a half face respirator conforming to EN140 Type A filter or better(PROC11, PROC19)
	Do not carry out the operation for more than 15 min. without respiratory protection(PROC11, PROC19)
	Wear suitable gloves tested to EN374.(PROC3)
	Wear a respirator conforming to EN140 with Type A filter or better.
Risk management measures are based on qualitative risk characterisation.	

3. Exposure estimation and reference to its source

Environment

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

Workers

PROC2: Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	---	Worker - inhalative, long-term - local	1.50mg/m3	0.2
PROC3	---	Worker - inhalative, long-term - local	3.75mg/m³	0.5
PROC8a, PROC10, PROC13, PROC11, PROC19	---	Worker - inhalative, long-term - local	7.50mg/m³	0.9
PROC4	---	Worker - inhalative, long-term - local	3.00mg/m3	0.4

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PROC15	---	Worker - inhalative, long-term - local	1.8mg/m³	0.9

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by 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.
For further information on the assessment method, see: http://www.ecetoc.org/tra
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.