

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

Revision date 06-Sep-2024

Revision Number 2

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

1.1. Product identifier

Product Code(s)	66880
Safety data sheet number	66880
Product Name	SULPHURIC ACID 19 - 22% SOL
Index No	016-020-00-8
EC Number	231-639-5
CAS No	7664-93-9
Synonyms	SULPHURIC ACID 1140 20% SOL, SULPHURIC ACID 20% SOL, SULPHURIC ACID 20% SOL ITA, SULPHURIC ACID 20% SOL FR
Pure substance/mixture	Substance

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

Recommended use	Chemical intermediate Chemical Process Additive Industry Cleaner Laboratory reagent For further information, see attached Exposure Scenario
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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

Skin corrosion/irritation	Category 1 Sub-category A - (H314)
Serious eye damage/eye irritation	Category 1 - (H318)

2.2. Label elements**Signal word**

Danger

Hazard statements

H314 - Causes severe skin burns and eye damage

Precautionary statements

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

P280 - Wear protective gloves/protective clothing and eye/face protection

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

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

Additional information

This product requires child resistant fastenings if supplied to the general public. This product requires tactile warnings if supplied to the general public. Acquisition, possession or use by the general public is restricted.

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)
SULPHURIC ACID ...% 7664-93-9	19 - 22%	231-639-5 (016-020-00-8)	-	Skin Corr. 1A (H314)	Eye Irrit. 2 :: 5%≤C<15% Skin Corr. 1A :: C≥15% Skin Irrit. 2 :: 5%≤C<15%	-	-

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

This product does not contain candidate substances of very high concern at a concentration ≥ 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	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Get immediate 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	Burning sensation.
Inhalation	Coughing and/ or wheezing.
Eyes	Burning sensation. May cause permanent damage if eye is not immediately irrigated.
Dermal	Burning sensation.
Ingestion	Can burn mouth, throat, and stomach

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

Note to doctors	Product is a corrosive material. Use of gastric lavage or emesis is contra-indicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media	Alcohol resistant foam. Carbon dioxide (CO ₂). Dry chemical. Water spray or fog.
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	The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapours.
Hazardous combustion products	Carbon oxides. Oxides of sulphur.

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. Use personal protection equipment.
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Use personal protection recommended in Section 8. Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.
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	Local authorities should be advised if significant spillages cannot be contained. Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.
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6.3. Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. 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.
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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	Ensure that eyewash stations and safety showers are close to the workstation location. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash it before reuse.
General hygiene considerations	Remove contaminated clothing and protective equipment before entering eating areas. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions	Store away from other materials. alkali. Strong oxidising agents. Reducing agents. See section 10 for more information. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children.
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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**

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

Chemical name	United Kingdom
SULPHURIC ACID ...% 7664-93-9	TWA: 0.05 mg/m ³ STEL: 0.15 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
SULPHURIC ACID ...% 7664-93-9			0.05 mg/m ³ [5] [6] 0.1 mg/m ³ [5] [7]

Derived No Effect Level (DNEL) - General Public No information available.**Predicted No Effect Concentration (PNEC)**

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
SULPHURIC ACID ...% 7664-93-9	0.0025 - 0.003 mg/l		0.00025 mg/l		

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
SULPHURIC ACID ...% 7664-93-9	0.002 mg/kg sediment dw	0.002 mg/l	8.8 mg/L		8.8 mg/l

8.2. Exposure controls**Engineering controls**

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

Personal protective equipment**Eye/face protection**

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

Hand protection

Gloves must conform to standard EN 374. Wear suitable gloves. Impervious gloves.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
Long term (repeated)	Viton™	0.7 mm	8 hours

Skin and body protection	Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.
Respiratory protection	In case of inadequate ventilation wear respiratory protection.
Recommended filter type:	Type E. full face mask (DIN EN 136).
General hygiene considerations	Remove contaminated clothing and protective equipment before entering eating areas. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Colour	Colourless
Odour	Odourless.
Odour threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point	< -8 °C	
Initial boiling point and boiling range	100 °C	
Flammability		No information available.
Flammability Limit in Air		No information available.
Upper flammability or explosive limits		
Lower flammability or explosive limits		
Flash point		No information available.
Autoignition temperature		No information available.
Decomposition temperature		No information available.
pH	< 1	
pH (as aqueous solution)		No information available.
Kinematic viscosity		No information available.
Dynamic viscosity		No information available.
Water solubility	Soluble in water	
Solubility(ies)		No information available.
Partition coefficient		No information available.
Vapour pressure		No information available.
Relative density	1.10 - 1.40	@15 °C.
Bulk density		No information available
Liquid Density	No information available	No information available
Relative vapour density		No information available.
Particle characteristics		No information available.
Particle Size	No information available	
Particle Size Distribution	No information available	
Explosive properties	No information available	
Oxidising properties	No information available	

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	Stable under normal conditions.
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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 Contact with metals (aluminium, zinc, tin) may release hydrogen gas.

10.4. Conditions to avoid

Conditions to avoid Avoid excessive heat for prolonged periods of time. Exposure to air or moisture over prolonged periods.

10.5. Incompatible materials

Incompatible materials Alkali. Strong oxidising agents. Strong reducing agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon oxides. Oxides of sulphur.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information

Inhalation	Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.
Eye contact	Specific test data for the substance or mixture is not available. Causes serious eye damage. (based on components). Corrosive to the eyes and may cause severe damage including blindness. May cause irreversible damage to eyes.
Skin contact	Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns.
Ingestion	Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Acute toxicity

Numerical measures of toxicity

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
SULPHURIC ACID ...%	> 2000 mg/kg (Rat)	-	> 0.37 mg/L (Rat) 4 h

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

Skin corrosion/irritation Classification based on data available for ingredients. Causes severe skin burns and eye damage.

SULPHURIC ACID ...% (7664-93-9)

Method	Species	Exposure route	Effective dose	Exposure time	Results
	Rabbit				Corrosive

Serious eye damage/eye irritation Classification based on data available for ingredients. Causes serious eye damage. Causes burns.

SULPHURIC ACID ...% (7664-93-9)

Method	Species	Exposure route	Effective dose	Exposure time	Results
	Rabbit				Corrosive

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

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

Component Information

SULPHURIC ACID ...% (7664-93-9)

Method	Species	Results
OECD Test No. 471: Bacterial Reverse Mutation Test	in vitro	Negative
OECD Test No. 476: In Vitro Mammalian Cell Gene Mutation Tests using the Hprt and xprt genes	in vitro	Negative
Ames Test		Negative

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

Component Information

SULPHURIC ACID ...% (7664-93-9)

Method	Species	Results
OECD Test No. 451: Carcinogenicity Studies	Mouse	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

SULPHURIC ACID ...% (7664-93-9)

Method	Species	Exposure route	Effective dose	Exposure time	Results
OECD Test No. 412: Sub-acute Inhalation Toxicity: 28-Day Study	Rat	Inhalation	0.3 mg/m ³	28 days	Based on available data, a STOT-RE classification is not warranted.
	human data	Inhalation	>1 mg/m ³		Based on available

					data, a STOT-RE classification is not warranted.
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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 The product contains no substances known to be hazardous to health or to the environment in concentrations which need to be taken into account. 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.

SULPHURIC ACID ...% (7664-93-9)

Method	Species	Endpoint type	Effective dose	Exposure time	Results
	Daphnia magna	EC50	> 100 mg/L	48 hours	
	Desmodesmus subspicatus	IC50	> 100 mg/L	72 hours	
	Lepomis macrochirus	LC50	16 - 28 mg/L	96 hours	
	activated sludge	NOEC	26 g/L	37 days	
	Daphnia magna	EC50	29 mg/L	24 hours	
	Fish	NOEC	0.025 mg/L	65 days	
	Crustacea	NOEC	0.15 mg/L		

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation Not likely to bioaccumulate.

12.4. Mobility in soil

Mobility in soil 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
SULPHURIC 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

Do not reuse empty containers.

SECTION 14: Transport information**IATA**

14.1 UN number or ID number	UN2796
14.2 UN proper shipping name	SULPHURIC ACID
14.3 Transport hazard class(es)	8
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
ERG Code	8L

IMDG

14.1 UN number or ID number	UN2796
UN proper shipping name	SULPHURIC ACID
14.3 Transport hazard class(es)	8
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
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	UN2796
14.2 UN proper shipping name	SULPHURIC ACID
14.3 Transport hazard class(es)	8
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
Classification code	C1

ADR

14.1 UN number or ID number	UN2796
14.2 UN proper shipping name	SULPHURIC ACID
14.3 Transport hazard class(es)	8
14.4 Packing group	II
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
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**Persistent Organic Pollutants**

Not applicable

Export Notification requirements

Not applicable

Named dangerous substances per COMAH Regulations 2015 (as amended)

Not applicable

The Ozone-Depleting Substances Regulations 2015

Not applicable

The Biocidal Products Regulations 2001 (as amended)

Not applicable

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
SULPHURIC ACID ...%	Explosive precursor, Regulated 15 % 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	Contact supplier for inventory compliance status
NZIoC	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

Full text of H-Statements referred to under section 3

H314 - Causes severe skin burns and eye damage

H318 - Causes serious eye damage

Legend

SVHC: Substances of Very High Concern for Authorisation:

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 ***Indicates updated data since last publication

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 Amy Whitfield

Revision date 06-Sep-2024

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 SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
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
 PROC3 - Use in closed batch process (synthesis or formulation)
 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)
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
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)

Amounts used

Type	Annual site tonnage
Value	300000
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Partial personal enclosure with ventilation Efficiency of at least 30% 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Wear suitable face shield Avoid contact with eyes and skin Use suitable eye protection Wear suitable working clothes
Organisational measures to prevent /limit releases, dispersion and exposure	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
Operational conditions	Covers use at ambient temperatures

Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	100%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear

	suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
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	100%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
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	100%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor use
Use in room with a volume of minimum	1000 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to
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	vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately

	Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	100%
Physical form of product	Liquid
Vapour pressure	6 Pa
Exposure duration	Avoid carrying out operation for more than 8 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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear a respirator providing a minimum efficiency of 95% Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
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	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local
 Worker - inhalative, short-term - local

0.05 mg/m³
 0.1 mg/m³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.0088 mg/m ³	0.088
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.0011 mg/m ³	0.022
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	0.0025 mg/m ³	0.025
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	0.00031 mg/m ³	0.006
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	0.00004 mg/m ³	0
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	0.000005 mg/m ³	0
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	0.0000019 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.0003 mg/m ³	0.003
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.000038 mg/m ³	0.001
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.0000019 mg/m ³	0
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.0023 mg/m ³	0.046
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.0033 mg/m ³	0.033
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.0008 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.0001 mg/m ³	0.002

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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

Chemical name SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
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)
 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
 PROC28 - Manual maintenance (cleaning and repair) of machinery

Product category(ies) PC19 - Intermediate
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU4 - Manufacture of food products SU6b - Manufacture of pulp, paper and paper products SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU14 - Manufacture of basic metals, including alloys

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)

Amounts used

Type	Annual site tonnage
Value	300000
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	98%

Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Partial personal enclosure with ventilation Efficiency of at least 30% 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Wear suitable face shield Avoid contact with eyes and skin Use suitable eye protection Wear suitable working clothes
Organisational measures to prevent /limit releases, dispersion and exposure	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Demonstrable and effective housekeeping practices are in place 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure

Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to

	points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Exposure duration	Avoid carrying out operation for more than 8 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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
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	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.0088 mg/m ³	0.088
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.0011 mg/m ³	0.022
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	0.0025 mg/m ³	0.025
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	0.00031 mg/m ³	0.006
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	0.043 mg/m ³	0.43
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	0.0054 mg/m ³	0.108
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	0.00033 mg/m ³	0.003
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.0000019 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.0003 mg/m ³	0.003
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.000037 mg/m ³	0.001
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.053 mg/m ³	0.53
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.0066 mg/m ³	0.132
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.0033 mg/m ³	0.033
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.0008 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.0001 mg/m ³	0.002

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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

Chemical name SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
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) 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)
 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)
 PROC13 - Treatment of articles by dipping and pouring
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU4 - Manufacture of food products SU5 - Manufacture of textiles, leather, fur SU6b - Manufacture of pulp, paper and paper products SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU11 - Manufacture of rubber products SU23 - Recycling

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Annual site tonnage
Value	100000
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
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Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Partial personal enclosure with ventilation Efficiency of at least 30% 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Wear suitable face shield Avoid contact with eyes and skin Use suitable eye protection Wear suitable working clothes
Organisational measures to prevent /limit releases, dispersion and exposure	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately

	Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor use

Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Exposure duration	Avoid carrying out operation for more than 8 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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable

	and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local
Worker - inhalative, short-term - local

0.05 mg/m³
0.1 mg/m³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.0088 mg/m ³	0.088
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.0011 mg/m ³	0.022
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	0.043 mg/m ³	0.43
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	0.0054 mg/m ³	0.108
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	0.043mg/m ³	0.43
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	0.0054 mg/m ³	0.108
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	0.014 mg/m ³	0.0042
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	0.014 mg/m ³	0.28
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	0.00033 mg/m ³	0.003
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.0000019 mg/m ³	0
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.0023 mg/m ³	0.046
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	0.0044 mg/m ³	0.044
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	0.00055 mg/m ³	0.011
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.0033 mg/m ³	0.033
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.0008 mg/m ³	0.008

PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.0001 mg/m ³	0.002
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Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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

Chemical name SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
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
Process category(ies) PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 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
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents
 PC40 - Extraction agents
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU2a - Mining (without offshore industries) SU14 - Manufacture of basic metals, including alloys

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

Amounts used

Type	Annual site tonnage
Value	2600
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	130 Pa

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear

	suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	98%

Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
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

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	0.0025 mg/m ³	0.025
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	0.00031 mg/m ³	0.006
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	0.0025 mg/m ³	0.025
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	0.00031 mg/m ³	0.006
PROC4 - Use in batch and other	Worker - inhalative, short-term	0.014 mg/m ³	0.14

process (synthesis) where opportunity for exposure arises	- local		
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	0.014 mg/m ³	0.28
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.0000019 mg/m ³	0
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.0023 mg/m ³	0.046
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.0033 mg/m ³	0.033
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.0008 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.0001 mg/m ³	0.002

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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

Chemical name SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
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) 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)
 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)
 PROC13 - Treatment of articles by dipping and pouring
 PROC15 - Use as laboratory reagent
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC14 - Metal surface treatment products, including galvanic and electroplating products
 PC15 - Non-metal-surface treatment products
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU2a - Mining (without offshore industries) 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) - ERC6b - Industrial use of reactive processing aids

Amounts used

Type	Annual site tonnage
Value	10000
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
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Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Partial personal enclosure with ventilation Efficiency of at least 70% 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable face shield Avoid contact with eyes and skin Wear suitable working clothes
Organisational measures to prevent /limit releases, dispersion and exposure	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to

	points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
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	10%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Efficiency of at least 90% Local exhaust ventilation - efficiency of at least 90% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and

	training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use

Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
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Section 3 - Exposure estimation

Environmental release category(ies) - ERC6b - Industrial use of reactive processing aids

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.0088 mg/m ³	0.088
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.0011 mg/m ³	0.022
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	0.0025 mg/m ³	0.025
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	0.00031 mg/m ³	0.006
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	0.0025 mg/m ³	0.025
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	0.00031 mg/m ³	0.006
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	0.014 mg/m ³	0.14
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	0.014 mg/m ³	0.28
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	0.003 mg/m ³	0.03
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	0.00034 mg/m ³	0.007
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging)	Worker - inhalative, long-term - local	0.0000019 mg/m ³	0

from/to vessels/large containers at dedicated facilities			
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.0003 mg/m ³	0.003
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.000037 mg/m ³	0.001
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.0023 mg/m ³	0.046
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	0.06 mg/m ³	0.6
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	0.0075 mg/m ³	0.15
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.0033 mg/m ³	0.033
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.0008 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.0001 mg/m ³	0.002

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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

Chemical name SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
Supplier Univar Solutions UK Ltd
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 6 Mid Point Business Park
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 GBR

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

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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) ERC7 - Industrial use of substances in closed systems
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 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
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents
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)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Amounts used

Type	Annual site tonnage
Value	30000
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Partial personal enclosure with ventilation Efficiency of at least 30% 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 Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Use suitable eye protection Wear suitable working clothes Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Process fully enclosed (air tight) and the integrity of the enclosure is monitored at least once a month (containment is not breached) Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95%

	Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa

Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - ERC7 - Industrial use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks

As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method

Used ART model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.0088 mg/m ³	0.088
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.0011 mg/m ³	0.022
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	0.0025 mg/m ³	0.025
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	0.00031 mg/m ³	0.006
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8b - Transfer of substance or	Worker - inhalative, long-term	0.0000019 mg/m ³	0

preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	- local		
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.0023 mg/m ³	0.046
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.0033 mg/m ³	0.033
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.0008 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.0001 mg/m ³	0.002

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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 6 Mid Point Business Park
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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) ERC5 - Industrial use resulting in inclusion into or onto a matrix
Process category(ies) 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
 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
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC14 - Metal surface treatment products, including galvanic and electroplating products
 PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU16 - Manufacture of computer, electronic and optical products, electrical equipment
 SU17 - General manufacturing

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Amounts used

Type	Annual site tonnage
Value	2500
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Covers indoor and outdoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Wear suitable coveralls to prevent exposure to the skin Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
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	130 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to

exposure	check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
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	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% 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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Outdoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	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	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99.9% Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Drain down and flush system prior to equipment break-in or maintenance Ensure procedures and training for emergency decontamination and disposal are in place Clear spills immediately Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur Use a sampling system designed to control exposure
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin

Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a closed system Use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) Supervision in place to check that the RMMS in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - ERC5 - Industrial use resulting in inclusion into or onto a matrix

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method

Used ART model

Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.0000000093 mg/m ³	0.000000093
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.0000000036 mg/m ³	0.00000019
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	0.00079 mg/m ³	0.008
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	0.000099 mg/m ³	0.002
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, short-term - local	0.00079 mg/m ³	0.008
PROC3 - Use in closed batch process (synthesis or formulation)	Worker - inhalative, long-term - local	0.000099 mg/m ³	0.002
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, short-term - local	0.01 mg/m ³	0.1
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises	Worker - inhalative, long-term - local	0.0013 mg/m ³	0.026
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.000015 mg/m ³	0
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.0000019 mg/m ³	0
PROC9 - Transfer of substance or preparation into small containers	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18

(dedicated filling line, including weighing)			
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.01 mg/m ³	0.2
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.0023 mg/m ³	0.046
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	0.018 mg/m ³	0.18
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	0.0062 mg/m ³	0.32
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.0033 mg/m ³	0.033
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.00041 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.0008 mg/m ³	0.008
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.0001 mg/m ³	0.002

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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

Chemical name SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
Supplier Univar Solutions UK Ltd
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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

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Section 1 - Title

Title Use in Cleaning Agents (Industrial)
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
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 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
 PROC28 - Manual maintenance (cleaning and repair) of machinery
Product category(ies) PC35 - Washing and cleaning products (including solvent based products)
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

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

Amounts used

Type	Annual site tonnage
Value	5000
Units	t(ons)/year

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	10%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards	Ensure containment of the emission source Efficiency of at least 99.9% Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

the worker	Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur
Conditions and measures related to personal protection, hygiene and health evaluation	Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable working clothes Wear suitable face shield Avoid contact with eyes and skin
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	1000 m3
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	10%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
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	10%
Physical form of product	Liquid
Vapour pressure	6 Pa
Use frequency	Covers daily exposures up to 8 hours (unless stated differently).
Technical conditions and measures to control dispersion from source towards the worker	Ensure containment of the emission source Efficiency of at least 99.9% Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	10%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 (not less than 3 to 5 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur
Conditions and measures related to	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee

personal protection, hygiene and health evaluation	training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Indoor/Outdoor use	Indoor use
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	10%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99% Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur
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 Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Process category(ies)	PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	10%
Physical form of product	Liquid
Vapour pressure	6 Pa
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 (not less than 3 to 5 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour Pre-employment screening and appropriate health surveillance Provide extract ventilation to points where emissions occur
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear a respirator providing a minimum efficiency of 95% Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
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

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, short-term - local	0.0000066 mg/m ³	0
PROC1 - Use in closed process, no likelihood of exposure	Worker - inhalative, long-term - local	0.0000083 mg/m ³	0
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, short-term - local	0.0003 mg/m ³	0.003
PROC2 - Use in closed, continuous process with occasional controlled exposure	Worker - inhalative, long-term - local	0.000037 mg/m ³	0.001
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, short-term - local	0.061 mg/m ³	0.61
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	Worker - inhalative, long-term - local	0.027 mg/m ³	0.053
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, short-term - local	0.0055 mg/m ³	0.055
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	Worker - inhalative, long-term - local	0.0048 mg/m ³	0.096
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, short-term - local	0.0003 mg/m ³	0.003
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Worker - inhalative, long-term - local	0.000037 mg/m ³	0.001
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, short-term - local	0.0014 mg/m ³	0.014
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Worker - inhalative, long-term - local	0.00017 mg/m ³	0.003
PROC10 - Roller application or brushing	Worker - inhalative, short-term - local	0.03 mg/m ³	0.3
PROC10 - Roller application or	Worker - inhalative, long-term	0.027 mg/m ³	0.54

brushing	- local		
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, short-term - local	0.0061 mg/m ³	0.061
PROC13 - Treatment of articles by dipping and pouring	Worker - inhalative, long-term - local	0.027 mg/m ³	0.54
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.000034 mg/m ³	0
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.0000042 mg/m ³	0
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, short-term - local	0.000084 mg/m ³	0.001
PROC28 - Manual maintenance (cleaning and repair) of machinery	Worker - inhalative, long-term - local	0.000011 mg/m ³	0

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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

Chemical name SULPHURIC ACID
REACH registration number 01-2119458838-20-XXXX
CAS No 7664-93-9
EC No (EU Index No) 231-639-5
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 Aquarius House
 6 Mid Point Business Park
 Bradford
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Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Laboratory activities
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) PROC15 - Use as laboratory reagent
Product category(ies) PC21 - Laboratory chemicals
Sector(s) of use 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 98%

Amounts used

Type	Annual site tonnage
Value	300000
Units	t(ons)/year

Product characteristics

Physical form of product	Liquid
Vapour pressure	6 hPa

Other operational conditions of use affecting environmental exposure

Type	Continuous use/release
Release fraction to air from process (initial release prior to RMM)	205 kg/day

Conditions and measures related to municipal sewage treatment plant

Type	Onsite STP
Sludge treatment	Can be landfilled or incinerated, when in compliance with local regulations No application of sewage sludge to soil

Further information

Operational conditions	Indoor use
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Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	No discharge of substance into waste water Trained staff, spill protection including waste reuse
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Control measures to prevent releases

Air	Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber - gas removal and/or air filtration - particle removal and/or thermal oxidation and/or vapour recovery - adsorption
Water	Onsite wastewater treatment required
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments. Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
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	Handle in an enclosing hood with exhaust ventilation Local exhaust ventilation - efficiency of at least 99% Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m ³
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	0.0025 mg /l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.0000443 mg/l	0.018
Marine water	0.00000642 mg/l	0.026
Freshwater sediment	0.0000356 mg/kg dwt	0.018
Marine sediment	0.00000516 mg/kg dwt	0.000001

Derived No Effect Level (DNEL):**Worker - inhalative, long-term - local**0.05 mg/m³**Worker - inhalative, short-term - local**0.1 mg/m³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC15 - Use as laboratory reagent	Worker - inhalative, short-term - local	0.000034 mg/m ³	0
PROC15 - Use as laboratory reagent	Worker - inhalative, long-term - local	0.0000042 mg/m ³	0

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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Section 1 - Title

Title Use in Cleaning Agents (Professional)
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
Process category(ies) PROC19 - Hand-mixing with intimate contact and only PPE available
Sector(s) of use SU22 - Professional 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

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
Waste treatment methods	Neutralisation is normally necessary before waste water is discharged into water treatment plants

Control of worker exposure

Process category(ies)	PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	98%
Physical form of product	Liquid
Vapour pressure	6 Pa
Exposure duration	Avoid carrying out operation for more than 0.5 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 basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place Do not inhale spray vapour
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes Wear suitable coveralls to prevent exposure to the skin Wear suitable face shield Avoid contact with eyes and skin
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	30 m ³
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

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg/l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, short-term - local	0.07 mg/m ³	0.7
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - local	0.0088 mg/m ³	0.176

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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CAS No 7664-93-9
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Section 1 - Title

Title Filling/preparation of equipment from drums or containers. (Batteries)
Type Worker
Main user group Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies) Not applicable
Process category(ies) PROC21 - Low energy manipulation of substances bound in materials and/or articles
Sector(s) of use SU22 - Professional uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - Not applicable

Conditions and measures related to external treatment of waste for disposal

Disposal	Dispose of waste product or used containers according to local regulations
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Control of worker exposure

Process category(ies)	PROC21 - Low energy manipulation of substances bound in materials and/or articles
Covers concentrations up to	35%
Physical form of product	Liquid
Vapour pressure	6 Pa
Exposure duration	Avoid carrying out activities involving exposure for more than 1 hour
Technical conditions and measures to control dispersion from source towards the worker	Provide a basic standard of general ventilation (1 to 3 air changes per hour) Demonstrable and effective housekeeping practices are in place
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training Efficiency of at least 95% Use eye protection according to EN 166, designed to protect against liquid splashes
Indoor/Outdoor use	Indoor use
Use in room with a volume of minimum	300 m3
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental release category(ies) - Not applicable

Predicted No Effect Concentration (PNEC)

Freshwater	0.0025 mg/l
Freshwater sediment	0.002 mg/kg dwt
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg dwt
Impact on Sewage Treatment	8.8 mg/l

Remarks As no environmental hazard was identified, no environmental-related exposure assessment and risk characterisation was performed.

Derived No Effect Level (DNEL):

Worker - inhalative, long-term - local	0.05 mg/m ³
Worker - inhalative, short-term - local	0.1 mg/m ³

Calculation method	Used ART model		
Process category(ies)	Exposure route	predicted exposure level	Risk characterisation ratio (RCR)
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, short-term - local	0.0023 mg/m ³	0.023
PROC19 - Hand-mixing with intimate contact and only PPE available	Worker - inhalative, long-term - local	0.002 mg/m ³	0.02
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, short-term - local	0.039 mg/m ³	0.39
PROC21 - Low energy manipulation of substances bound in materials and/or articles	Worker - inhalative, long-term - local	0.0049 mg/m ³	0.098

Section 4 - Guidance to check compliance with the exposure scenario

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.