SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

SULPHURIC ACID 96% (F0031)

Version 1.0 Print Date 28.04.2022

Revision date / valid from 20.08.2020

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

1.1. Product identifier

Trade name	:	SULPHURIC ACID 96% (F0031)
Substance name	:	sulphuric acid
Index-No.	:	016-020-00-8
CAS-No.	:	7664-93-9
EC-No.	:	231-639-5
EU REACH-Reg. No.	:	01-2119458838-20-xxxx

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

Use of the Substance/Mixture	:	Identified use: See table in front of appendix for a complete overview of identified uses.
Uses advised against	:	At this moment we have not identified any uses advised against
Remarks	:	Before referring to any Exposure Scenario attached to this Safety Data Sheet please check the grade of the product: the Exposure Scenarios presented are not related to all product grade

1.3. Details of the supplier of the safety data sheet

Company	:	Indufarm N.V. Leon Bekaertstraat 5 8770 Ingelmunster (B)
Telephone	:	+32 (0)51-624245
E-mail address	:	info@indufarm.com
Website	:	www.indufarm.com

1.4. Emergency telephone number

Emergency telephone	:	Belgium: Antipoison Center - Brussels TEL: +32(0)70 245 245

number

Netherland: National Poisoning Information Center - Bilthoven
TEL: +31(0) 88 755 8000 (Only for the purpose of informing medical personnel in cases of acute intoxications)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	**Hazard category**	**Target Organs**	**Hazard statements**
Skin corrosion	Category 1A	---	H314
Serious eye damage	Category 1	---	H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

Most important adverse effects

Human Health : See section 11 for toxicological information.

Physical and chemical hazards : See section 9/10 for physicochemical information.

Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Precautionary statements

Prevention : P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response : P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Hazardous components which must be listed on the label:

- sulphuric acid

2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical nature : Aqueous solution

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)	
		Hazard class / Hazard category	Hazard statements
sulphuric acid			
Index-No. : 016-020-00-8 CAS-No. : 7664-93-9 EC-No. : 231-639-5	>= 94 - <= 99	Met. Corr.1 Skin Corr.1A	H290 H314

Remarks : The product doesn't meet the criteria for classification with H290. More diluted aqueous solutions needs to be classified with H290.

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : Take off all contaminated clothing immediately.

If inhaled	: In case of accident by inhalation: remove casualty to fresh air and keep at rest. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.
In case of skin contact	: Wash off immediately with plenty of water. Call a physician immediately.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.
If swallowed	: Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician immediately.

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

Symptoms	: See Section 11 for more detailed information on health effects and symptoms.
Effects	: Extremely corrosive and destructive to tissue. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach. See Section 11 for more detailed information on health effects and symptoms.

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

Treatment	: Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product itself does not burn.
Unsuitable extinguishing media	:	High volume water jet

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	The formation of caustic fumes is possible.
Hazardous combustion products	:	Sulphur oxides

5.3. Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.Wear appropriate body protection (full protective suit)
Specific extinguishing	:	Control smoke with water spray.

methods
Further advice : Cool closed containers exposed to fire with water spray.Heating will cause a pressure rise - with risk of bursting.Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Keep away unprotected persons. Use personal protective equipment. Danger of slipping if spilled Ensure adequate ventilation. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist.

6.2. Environmental precautions

Environmental precautions : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up : Neutralize with soda and flush with plenty of water. Taking into account local regulations the product may be disposed of as waste water after neutralisation. Clean-up methods - small spillage: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Keep in suitable, closed containers for disposal.

Further information : Treat recovered material as described in the section "Disposal considerations".

6.4. Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on personal protective equipment.
See Section 13 for waste treatment information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling : Keep container tightly closed. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Use respirator with appropriate filter if vapours or aerosol are released. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity. When diluting, always add the product to water. Never add water to the product.

Hygiene measures : Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area.

Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Store in original container. Keep in an area equipped with acid resistant flooring. Suitable materials for containers: reinforced plastic; Stainless Steel only for the concentrate; Unsuitable materials for containers: Stainless steel for making dilutions or store the diluted product at less than 90%.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection. The product is not flammable. Gives off hydrogen by reaction with metals. Risk of explosion.
Fire-fighting class	:	oxydativ material
Further information on storage conditions	:	Keep tightly closed in a dry and cool place. Keep in a well-ventilated place. Product is hygroscopic.
Advice on common storage	:	Keep away from food, drink and animal feedingstuffs. Keep away from combustible material.

7.3. Specific end use(s)

Specific use(s)	:	Identified use: See table in front of appendix for a complete overview of identified uses.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component:	sulphuric acid	CAS-No. 7664-93-9

Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)

DNEL Workers, Acute - local effects, Inhalation	:	0,1 mg/m3
DNEL Workers, Long-term - local effects, Inhalation	:	0,05 mg/m3

Predicted No Effect Concentration (PNEC)

Fresh water	:	0,0025 mg/l
Marine water	:	0,00025 mg/l
Fresh water sediment	:	0,002 mg/kg

Marine sediment	:	0,002 mg/kg
Sewage treatment plant (STP)	:	8,8 mg/l

Other Occupational Exposure Limit Values

EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended, Time Weighted Average (TWA):, Mist.
0,05 mg/m3
Indicative

Belgium. OELs. Exposure Limit Values to Chemical Substances at Work, Code of Well-being at work, Book VI, Title 1, as amended, Time Weighted Average (TWA):, Mist.
0,2 mg/m3

Netherlands. OELs (binding), as amended, Time Weighted Average (TWA):, Thoracic fraction.
0,05 mg/m3
Section B: List of Carcinogens

8.2. Exposure controls

Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection

Advice	:	In case of brief exposure or low pollution use breathing filter apparatus. Respiratory protection complying with EN 141. Recommended Filter type: BE2P3 In case of intensive or longer exposure use self-contained breathing apparatus.

Hand protection

Advice	:	Protective gloves complying with EN 374. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Protective gloves should be replaced at first signs of wear.
Material	:	Fluorinated rubber
Break through time	:	>= 8 h
Glove thickness	:	0,4 mm
Material	:	butyl-rubber

Break through time	:	>= 2 h
Glove thickness	:	0,5 mm

Eye protection

Advice	:	Safety goggles Face-shield

Skin and body protection

Advice	:	Impervious clothing Chemical resistant apron

Environmental exposure controls

General advice	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	:	liquid
Colour	:	colourless
Odour	:	odourless
Odour Threshold	:	no data available
pH	:	< 1 (20 °C)
Freezing point	:	-30 °C 94% solution -11 °C 96% solution
Boiling point	:	288 °C 94% solution 310 °C 98% solution
Flash point	:	Not applicable
Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit	:	Not applicable
Lower explosion limit	:	Not applicable
Vapour pressure	:	< 0,001 hPa (20 °C)
Relative vapour density	:	no data available
Density	:	1,83 g/cm3 95% solution

Water solubility	:	completely soluble
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	Not applicable
Thermal decomposition	:	no data available
Viscosity, dynamic	:	ca. 22,5 mPa.s (20 °C)
Explosivity	:	Product is not explosive.
Oxidizing properties	:	no data available

9.2. Other information

Molecular weight	:	98,08 g/mol
Corrosion to metals	:	Not classified due to data which are conclusive although insufficient for classification.

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice : No decomposition if stored and applied as directed.
Corrosive in contact with metals
The product doesn't meet the criteria for classification with H290. More diluted aqueous solutions needs to be classified with H290.

10.2. Chemical stability

Advice : Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions : Reacts exothermically with water. Gives off hydrogen by reaction with metals. Exothermic reaction with: Alkali metals Bases Hydrogen peroxide Risk of explosion.

10.4. Conditions to avoid

Conditions to avoid : Heat

10.5. Incompatible materials

Materials to avoid : Organic materials, Bases, Reducing agents, Metals

10.6. Hazardous decomposition products

Hazardous decomposition products : Under fire conditions: Sulphur oxides

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Data for the product	
Acute toxicity	
Oral	
Not classified based on the calculation method according to CLP regulation.	
Inhalation	
Not classified based on the calculation method according to CLP regulation.	
Dermal	
Study scientifically not justified.	
Irritation	
Skin	
Result	: Classified based on the calculation method according to CLP regulation.
Eyes	
Result	: Classified based on the calculation method according to CLP regulation.
Sensitisation	
Result	: Study scientifically not justified.
CMR effects	
CMR Properties	
Carcinogenicity	: Based on available data, the classification criteria are not met.
Mutagenicity	: Based on available data, the classification criteria are not met.
Teratogenicity	: Based on available data, the classification criteria are not met.
Reproductive toxicity	: Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity	
Single exposure	
Remarks	: The substance or mixture is not classified as specific target organ toxicant, single exposure.
Repeated exposure	
Remarks	: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Other toxic properties	

Repeated dose toxicity

no data available

Aspiration hazard

Not applicable,

Component:	**sulphuric acid**	**CAS-No. 7664-93-9**

Acute toxicity

Oral

LD50 : 2140 mg/kg (Rat)

Inhalation

No valid data available.

Dermal

Study scientifically not justified.

Irritation

Skin

Result : corrosive effects

Eyes

Result : corrosive effects

Sensitisation

Result : Study scientifically not justified.

CMR effects

CMR Properties

Carcinogenicity : Animal testing did not show any carcinogenic effects.
Mutagenicity : Animal testing did not show any mutagenic effects.
Teratogenicity : Did not show teratogenic effects in animal experiments.
Reproductive toxicity : Study scientifically not justified.

Specific Target Organ Toxicity		
Single exposure		
Remarks	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.
Repeated exposure		
Remarks	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Other toxic properties		
Aspiration hazard		
		Not applicable,

SECTION 12: Ecological information

12.1. Toxicity

Component:	sulphuric acid	CAS-No. 7664-93-9
Acute toxicity		
Fish		
LC50	:	794 mg/l (Fish; 24 h) (Toxicity to fish; OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates		
EC50	:	29 mg/l (Daphnia (water flea); 24 h) (Toxicity to daphnia; ISO 6341)
algae		
EC50	:	> 50 mg/l (algae; 24 h) (Toxicity to algae; End point: Growth rate; OECD Test Guideline 201)

12.2. Persistence and degradability

Component:	sulphuric acid	CAS-No. 7664-93-9
Persistence and degradability		

Persistence		
Result	:	decomposition by hydrolysis.

Biodegradability		
Result	:	The methods for determining the biological degradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Component:	sulphuric acid	CAS-No. 7664-93-9
Bioaccumulation		
Result	:	Bioaccumulation is not expected.

12.4. Mobility in soil

Component:	sulphuric acid	CAS-No. 7664-93-9
Mobility		
	:	study scientifically unjustified

12.5. Results of PBT and vPvB assessment

Component:	sulphuric acid	CAS-No. 7664-93-9
Results of PBT and vPvB assessment		
Result	:	The PBT or vPvB criteria of Annex XIII to the REACH Regulation does not apply to inorganic substances.

12.6. Other adverse effects

Component:	sulphuric acid	CAS-No. 7664-93-9
Additional ecological information		
Result	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. Harmful effects to aquatic organisms due to pH-shift.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product : Disposal together with normal waste is not allowed. Special

		disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.
Contaminated packaging	:	Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning. If recycling is not practicable, dispose of in compliance with local regulations.
European Waste Catalogue Number	:	No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

SECTION 14: Transport information

14.1. UN number

1830

14.2. UN proper shipping name

ADR : SULPHURIC ACID
RID : SULPHURIC ACID
IMDG : SULPHURIC ACID

14.3. Transport hazard class(es)

ADR-Class	:	8
(Labels; Classification Code; Hazard Identification Number; Tunnel restriction code)		8; C1; 80; (E)
RID-Class	:	8
(Labels; Classification Code; Hazard Identification Number)		8; C1; 80
IMDG-Class	:	8
(Labels; EmS)		8; F-A, S-B

14.4. Packaging group

ADR : II
RID : II
IMDG : II

14.5. Environmental hazards

Environmentally hazardous according to ADR	:	no
Environmentally hazardous according to RID	:	no
Marine Pollutant according to IMDG-Code	:	no

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

SECTION 15: Regulatory information

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

Data for the product		
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	Point Nos.: , 3; Listed
EU. Directive 2012/18/EU (SEVESO III) Annex I	:	; The substance/mixture does not fall under this legislation.

Component:	**sulphuric acid**	**CAS-No. 7664-93-9**
EU. Regulation EU No. 649/2012 concerning the export and import of dangerous chemicals	:	; The substance/mixture does not fall under this legislation.
EU. Regulation 273/2004, Drug Precursors, Category 3	:	Scheduled substance Combined Nomenclature (CN) code: , 2807 00 10
EU. Annexes I and II, Regulation 98/2013/EU on the Marketing and Use of Explosives Precursors	:	; Annex II: Substances on their own or in mixtures or in substances for which suspicious transactions shall be reported.; Listed Combined Nomenclature (CN) Number(s): 2807 00 10; Combined Nomenclature (CN) code for a separate chemically defined compound; Listed Combined Nomenclature (CN) Number(s): 3824 90 97; Combined Nomenclature (CN) code for a mixture without constituents; Listed
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation	:	Point Nos.: , 3; Listed

1907/2006/EC)

EU. Regulation No 1451/2007 [Biocides], Annex I, OJ (L 325)	:	EC Number: , 231-639-5; Listed
EU. Directive 2012/18/EU (SEVESO III) Annex I	:	; The substance/mixture does not fall under this legislation.

Notification status sulphuric acid:

Regulatory List	Notification	Notification number
AICS	YES	
DSL	YES	
EINECS	YES	231-639-5
ENCS (JP)	YES	(1)-430
IECSC	YES	
ISHL (JP)	YES	(1)-430
KECI (KR)	YES	97-1-405
KECI (KR)	YES	KE-32570
NZIOC	YES	HSR001572
NZIOC	YES	HSR001573
NZIOC	YES	HSR001588
PICCS (PH)	YES	
TSCA	YES	

15.2. Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

Abbreviations and Acronyms

AU AIICL	Australia. Industrial Chemicals Act (AIIC) List
BCF	bioconcentration factor
BOD	biochemical oxygen demand
CAS	Chemical Abstracts Service

CLP	Classification, Labelling and Packaging
CMR	carcinogenic, mutagenic or toxic to reproduction
COD	chemical oxygen demand
DNEL	derived no-effect level
DSL	Canada. Environmental Protection Act, Domestic Substances List
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
ENCS (JP)	Japan. Kashin-Hou Law List
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
IECSC	China. Inventory of Existing Chemical Substances
INSQ	Mexico. National Inventory of Chemical Substances
ISHL (JP)	Japan. Inventory of Industrial Safety & Health
KECI (KR)	Korea. Existing Chemicals Inventory
LC50	median lethal concentration
LOAEC	lowest observed adverse effect concentration
LOAEL	lowest observed adverse effect level
LOEL	lowest observed effect level
NDSL	Canada. Environmental Protection Act. Non-Domestic Substances List
NLP	no-longer polymer
NOAEC	no observed adverse effect concentration
NOAEL	no observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
NZIOC	New Zealand. Inventory of Chemicals
OECD	Organisation for Economic Cooperation and Development

Further information

Key literature references and sources for data	:	Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.
Methods used for product classification	:	The classification for human health, physical and chemical hazards and environmental hazards were derived from a combination of calculation methods and if available test data.
Hints for trainings	:	The workers have to be trained regularly on the safe handling of the products based on the information provided in the Safety Data Sheet and the local conditions of the workplace. National regulations for the training of workers in the handling of hazardous materials must be adhered to.
Other information	:	The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and

does not constitute a legal relationship.

The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

|| Indicates updated section.

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	NA	NA	1, 2, 3, 4, 8a, 8b, 9	1	NA	ES529
2	Use as an intermediate	3	4, 6b, 8, 9, 14	19	1, 2, 3, 4, 8a, 8b, 9	6a	NA	ES679
3	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 3, 5, 8a, 8b, 9	2	NA	ES689
4	Use in Cleaning Agents	22	NA	35	8a	8a	NA	ES904
5	Use in laboratories	22	NA	21	15	8a, 8b	NA	ES906
6	Use for extractions and processing of minerals, ores	3	2a, 14	20, 40	2, 3, 4	4, 6b	NA	ES784
7	Use as processing aid	3	4, 5, 6b, 8, 9, 11, 23	20	1, 2, 3, 4, 8a, 8b, 9, 13	6b	NA	ES782
8	Use in electrolytic processes	3	14, 15, 17	14, 20	1, 2, 8b, 9, 13	5, 6b	NA	ES788
9	Use in the process of surface treatments, purification and etching	3	2a, 14, 15, 16	14, 15	1, 2, 3, 4, 8a, 8b, 9, 13	6b	NA	ES786
10	Use in gas treatment	3	8	20	1, 2, 8b	7	NA	ES790
11	Use in production of sulphuric acid contained batteries	3	NA	NA	2, 3, 4, 9	2, 5	NA	ES792
12	Use in recycling of sulphuric acid contained batteries	3	NA	NA	2, 4, 5, 8a	1	NA	ES794
13	Use in maintenance of sulphuric acid contained batteries	22	NA	NA	19	8b, 9b	NA	ES798
14	Use of sulphuric acid contained batteries	21	NA	NA	NA	9b	3	ES1117

1. Short title of Exposure Scenario 1: Manufacture of substance		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Environmental Release Categories	ERC1: Manufacture of substances	
2.1 Contributing scenario controlling environmental exposure for: ERC1		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 100%
Amount used	Annual amount per site	1,2 Million tonnes/year
	Annual amount used per region	19 Million tonnes/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Exhaust gases may be treated by scrubbers or emissions may be measured and controlled according to local legislation
	Water	The wastewater neutralisation process is extremely efficient with almost total neutralisation achieved
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	On-site waste water treatment
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC1, PROC2, PROC3, PROC4,		

PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 100%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker exposure considered to be negligible due to the specialized systems and closed nature of the production process	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings(PROC1, PROC2, PROC8a, PROC8b)	
	Outdoors near to buildings(PROC3, PROC4)	
	Indoors, any sized room, with good natural ventilation(PROC9)	
	Process may involve high temperature (50 - 150°C)(PRO C1, PROC2, PROC3, PROC4)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system(except PROC8a)	
	Provide local exhaust ventilation (LEV).(PROC1, PROC3, PROC8b)	
	Complete segregation(PROC1, PROC2)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1	---	Fresh water	PEC	0,011µg/L	0,00440
ERC1	---	Marine water	PEC	0,0016µg/L	0,00640
ERC1	---	Fresh water sediment	PEC	0,97ng/kg	0,00049
ERC1	---	Marine sediment	PEC	0,14ng/kg	0,00007
ERC1	---	Soil	PEC	0,05µg/kg	---
ERC1	---	Air	PEC	0,18ng/m3	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	90th percentile value	worker inhalation, long term - systemic	0,0094ng/m3	---
PROC2	90th percentile value	worker inhalation, long term - systemic	0,092ng/m3	---
PROC3	90th percentile value	worker inhalation, long term - systemic	0,42µg/m³	---
PROC4	90th percentile value	worker inhalation, long term - systemic	14µg/m³	---
PROC8a	90th percentile value	worker inhalation, long term - systemic	23µg/m³	---
PROC8b	90th percentile value	worker inhalation, long term - systemic	0,0048µg/m³	---
PROC9	90th percentile value	worker inhalation, long term - systemic	2,8µg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 2: Use as an intermediate		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU4: Manufacture of food products 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	
Chemical product category	PC19: Intermediate	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
2.1 Contributing scenario controlling environmental exposure for: ERC6a		
Product characteristics	Concentration of the Substance in Mixture/Article	The substance is used up in the process
Amount used	Annual amount per site	300000 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Exhaust gases may be treated by scrubbers or emissions may be measured and controlled according to local legislation
	Water	The wastewater neutralisation process is extremely efficient with almost total neutralisation achieved
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	On-site waste water treatment

	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	The substance is used up in the process
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker contact is generally very low as most operations are remotely controlled and sampling/analysis events are of short duration.	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings(PROC1, PROC2, PROC8a, PROC8b)	
	Outdoors near to buildings(PROC3, PROC4)	
	Indoors, any sized room, with good natural ventilation(PROC9)	
	Process may involve high temperature (50 - 150°C)(PRO C1, PROC2, PROC3, PROC4)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system(except PROC8a)	
	Provide local exhaust ventilation (LEV).(PROC1, PROC3, PROC8b)	
	Complete segregation(PROC1, PROC2)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6a	---	Fresh water	PEC	0,2µg/L	0,08
ERC6a	---	Marine water	PEC	0,03µg/L	0,12
ERC6a	---	Fresh water sediment	PEC	0,0018µg/kg	0,0009
ERC6a	---	Marine sediment	PEC	0,0026µg/kg	0,0013
ERC6a	---	Soil	PEC	0,92µg/kg	---
ERC6a	---	Air	PEC	0,0032µg/m³	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	90th percentile value	worker inhalation, long term - systemic	0,0094ng/m3	---
PROC2	90th percentile value	worker inhalation, long term - systemic	0,092ng/m3	---
PROC3	90th percentile value	worker inhalation, long term - systemic	0,42µg/m³	---
PROC4	90th percentile value	worker inhalation, long term - systemic	14µg/m³	---
PROC8a	90th percentile value	worker inhalation, long term - systemic	23µg/m³	---
PROC8b	90th percentile value	worker inhalation, long term - systemic	0,0048µg/m³	---
PROC9	90th percentile value	worker inhalation, long term - systemic	2,8µg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management

Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 3: Formulation & (re)packing of substances and mixtures		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC3: Use in closed batch process (synthesis or formulation) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Environmental Release Categories	ERC2: Formulation of preparations	
2.1 Contributing scenario controlling environmental exposure for: ERC2		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	300000 ton(s)/year
	Annual amount used per region	3 Million tonnes/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Exhaust gases may be treated by scrubbers or emissions may be measured and controlled according to local legislation
	Water	The wastewater neutralisation process is extremely efficient with almost total neutralisation achieved
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	On-site waste water treatment
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill

2.2 Contributing scenario controlling worker exposure for:PROC1, PROC3, PROC5, PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker exposure considered to be negligible due to the specialized systems.	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings(PROC1, PROC8a, PROC8b)	
	Outdoors near to buildings(PROC3)	
	Indoors, any sized room, with good natural ventilation(PROC5, PROC9)	
	Process may involve high temperature (50 - 150°C)(PRO C1, PROC3)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system(except PROC5)	
	Provide local exhaust ventilation (LEV).(PROC1, PROC3, PROC5, PROC8b)	
	Complete segregation(PROC1)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Fresh water	PEC	0,0443µg/L	0,01772
ERC2	---	Marine water	PEC	0,0064µg/L	0,02568
ERC2	---	Fresh water sediment	PEC	0,0038µg/kg	0,00192
ERC2	---	Marine sediment	PEC	0,0005µg/kg	0,00028
ERC2	---	Soil	PEC	0,2µg/kg	---
ERC2	---	Air	PEC	0,0007µg/m³	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	90th percentile value	worker inhalation, long term - systemic	0,0009ng/m3	---
PROC3	90th percentile value	worker inhalation, long term - systemic	0,42µg/m³	---
PROC5	90th percentile value	worker inhalation, long term - systemic	0,016mg/m³	---
PROC8a	90th percentile value	worker inhalation, long term - systemic	0,023mg/m³	---
PROC8b	90th percentile value	worker inhalation, long term - systemic	0,0004µg/m³	---
PROC9	90th percentile value	worker inhalation, long term - systemic	0,0028mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 4: Use in Cleaning Agents		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Chemical product category	PC35: Washing and cleaning products (including solvent based products)	
Process categories	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	1 kg
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	None (emissions to drains)
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Amount of substance in waste resulting from service life of articles:, Not applicable.
	Waste treatment	Release fraction to air from waste handling:, Not applicable.
	Waste treatment	Release fraction to wastewater from waste handling:, Not applicable.
	Waste treatment	Fraction disposed of as secondary waste:, Not applicable.
2.2 Contributing scenario controlling worker exposure for:PROC8a		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per	480 min

	day	
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Indoors, any sized room, with good natural ventilation	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	LEV not required	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
Conditions and measures related to personal protection, hygiene and health evaluation	Only basic skin protection is required	
	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment.

Workers

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 5: Use in laboratories		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Chemical product category	PC21: Laboratory chemicals	
Process categories	PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	5000 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker exposure considered to be negligible due to the specialized systems.	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	

Other operational conditions affecting workers exposure	Indoors, any sized room, with good natural ventilation
	Due to the nature of the substance the process should be kept as contained as possible
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance
	Substance-handling procedures shall be well documented and strictly supervised
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a	---	Fresh water	PEC	0,138µg/L	0,05520
ERC8a	---	Marine water	PEC	0,0074µg/L	0,02956
ERC8a	---	Fresh water sediment	PEC	0,011µg/kg	0,00580
ERC8a	---	Marine sediment	PEC	0,639ng/kg	0,00032
ERC8a	---	Soil	PEC	0,134µg/kg	---
ERC8a	---	Air	PEC	0,48ng/m3	---
ERC8b	---	Fresh water	PEC	2,12ng/L	0,00085
ERC8b	---	Marine water	PEC	0,0666ng/L	0,00026
ERC8b	---	Fresh water sediment	PEC	0,183ng/kg	0,00009
ERC8b	---	Marine sediment	PEC	0,0058ng/kg	0,00000
ERC8b	---	Soil	PEC	0,134ng/kg	---
ERC8b	---	Air	PEC	0,0048ng/m3	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	90th percentile value	worker inhalation, long term - systemic	0,023µg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 6: Use for extractions and processing of minerals, ores		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU2a: Mining (without offshore industries) SU14: Manufacture of basic metals, including alloys	
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents PC40: Extraction agents	
Process categories	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	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids	
2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	438 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Metal recovery, incineration or landfill
2.2 Contributing scenario controlling worker exposure for:PROC2, PROC3, PROC4		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker contact is generally very low as most operations are remotely controlled and sampling/analysis events are of short duration.	
Frequency and duration of use	Frequency of use	220 days/year

	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings(PROC2)	
	Outdoors near to buildings(PROC3, PROC4)	
	Process may involve high temperature (50 - 150°C)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system(PROC2, PROC4)	
	Provide local exhaust ventilation (LEV).(PROC2)	
	Complete segregation(PROC2)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	Fresh water	PEC	0,025µg/L	0,01000
ERC4	---	Marine water	PEC	0,0036µg/L	0,01424
ERC4	---	Fresh water sediment	PEC	0,0021µg/kg	0,00106
ERC4	---	Marine sediment	PEC	0,0003µg/kg	0,00015
ERC4	---	Soil	PEC	0,112µg/kg	---
ERC4	---	Air	PEC	0,0004µg/m³	---
ERC6b	---	Fresh water	PEC	0,026ng/L	0,00001
ERC6b	---	Marine water	PEC	0,0037ng/L	0,00001

ERC6b	---	Fresh water sediment	PEC	0,0000µg/kg	0,00000
ERC6b	---	Marine sediment	PEC	0,0000µg/kg	0,00000
ERC6b	---	Soil	PEC	0,0001µg/kg	---
ERC6b	---	Air	PEC	0,0000µg/m³	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	90th percentile value	worker inhalation, long term - systemic	0,092ng/m3	---
PROC3	90th percentile value	worker inhalation, long term - systemic	0,42µg/m³	---
PROC4	90th percentile value	worker inhalation, long term - systemic	0,014mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 7: Use as processing aid		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU4: Manufacture of food products 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: Electricity, steam, gas water supply and sewage treatment	
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring	
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids	
2.1 Contributing scenario controlling environmental exposure for: ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	100000 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to	Air	Exhaust gases may be treated by scrubbers or emissions may be measured and controlled according to local legislation
	Water	The wastewater neutralisation process is extremely efficient with almost total neutralisation achieved

prevent/limit release from the site		
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	On-site waste water treatment
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker contact is generally very low as most operations are remotely controlled and sampling/analysis events are of short duration.	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings(PROC1, PROC2, PROC8a, PROC8b)	
	Outdoors near to buildings(PROC3, PROC4)	
	Indoors, any sized room, with good natural ventilation(PROC9, PROC13)	
	Process may involve high temperature (50 - 150°C)(PRO C1, PROC2, PROC3, PROC4)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system(except PROC8a, PROC13)	
	Provide local exhaust ventilation (LEV).(PROC1, PROC2, PROC3, PROC8b)	
	Complete segregation(PROC1, PROC2)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	

Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6b	---	Fresh water	PEC	0,0059µg/L	0,00236
ERC6b	---	Marine water	PEC	0,0009µg/L	0,00344
ERC6b	---	Fresh water sediment	PEC	0,0005µg/kg	0,00026
ERC6b	---	Marine sediment	PEC	0,074ng/kg	0,00004
ERC6b	---	Soil	PEC	0,027µg/kg	---
ERC6b	---	Air	PEC	0,0000µg/m³	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	90th percentile value	worker inhalation, long term - systemic	0,0094ng/m3	---
PROC2	90th percentile value	worker inhalation, long term - systemic	0,092ng/m3	---
PROC3	90th percentile value	worker inhalation, long term - systemic	0,42µg/m³	---
PROC4	90th percentile value	worker inhalation, long term - systemic	0,014mg/m³	---
PROC8a	90th percentile value	worker inhalation, long term - systemic	0,023mg/m³	---
PROC8b	90th percentile value	worker inhalation, long term - systemic	0,0048µg/m³	---
PROC9	90th percentile value	worker inhalation, long term - systemic	0,0028mg/m³	---
PROC13	90th percentile value	worker inhalation, long term - systemic	0,016mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 8: Use in electrolytic processes	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU14: Manufacture of basic metals, including alloys SU15: Manufacture of fabricated metal products, except machinery and equipment SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Chemical product category	PC14: Metal surface treatment products, including galvanic and electroplating products PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents
Process categories	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) PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6b: Industrial use of reactive processing aids

2.1 Contributing scenario controlling environmental exposure for: ERC5, ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 95-98%
Amount used	Annual amount per site	2306 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Metal recovery, incineration or landfill

2.2 Contributing scenario controlling worker exposure for:PROC1, PROC2, PROC8b, PROC9, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 95-98%

	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker exposure should be low and controlled	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings(PROC1, PROC2, PROC8a, PROC8b)	
	Indoors, any sized room, with good natural ventilation(PROC9, PROC13)	
	Process may involve high temperature (50 - 150°C)(PRO C1, PROC2)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system(except PROC13)	
	Provide local exhaust ventilation (LEV).(PROC1, PROC8b)	
	Complete segregation(PROC1, PROC2)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	
	Wear respiratory protection (Efficiency: 90 %)(PROC13)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC5	---	Fresh water	PEC	0,0681µg/L	0,02724
ERC5	---	Marine water	PEC	0,0099µg/L	0,03948
ERC5	---	Fresh water sediment	PEC	0,0059µg/kg	0,00294

ERC5	---	Marine sediment	PEC	0,0008µg/kg	0,00043
ERC5	---	Soil	PEC	0,309µg/kg	---
ERC5	---	Air	PEC	0,0011µg/m³	---
ERC6b	---	Fresh water	PEC	0,136ng/L	0,00005
ERC6b	---	Marine water	PEC	0,0197ng/L	0,00008
ERC6b	---	Fresh water sediment	PEC	0,0118ng/kg	0,00001
ERC6b	---	Marine sediment	PEC	0,0017ng/kg	0,00000
ERC6b	---	Soil	PEC	0,618ng/kg	---
ERC6b	---	Air	PEC	0,0022ng/m3	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	90th percentile value	worker inhalation, long term - systemic	0,0094ng/m3	---
PROC2	90th percentile value	worker inhalation, long term - systemic	0,092ng/m3	---
PROC8b	90th percentile value	worker inhalation, long term - systemic	0,0048µg/m³	---
PROC9	90th percentile value	worker inhalation, long term - systemic	0,0028mg/m³	---
PROC13	90th percentile value	worker inhalation, long term - systemic	0,47mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 9: Use in the process of surface treatments, purification and etching	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU2a: Mining (without offshore industries) 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
Chemical product category	PC14: Metal surface treatment products, including galvanic and electroplating products PC15: Non-metal-surface treatment products
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids

2.1 Contributing scenario controlling environmental exposure for: ERC6b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	10000 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill

2.2 Contributing scenario controlling worker exposure for:PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker exposure considered to be negligible due to the specialized systems and closed nature of the production process	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings(PROC1, PROC2, PROC8a, PROC8b)	
	Outdoors near to buildings(PROC3, PROC4)	
	Indoors, any sized room, with good natural ventilation(PROC9, PROC13)	
	Process may involve high temperature (50 - 150°C)(PRO C1, PROC2, PROC3, PROC4)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system(except PROC8a, PROC13)	
	Provide local exhaust ventilation (LEV).(PROC1, PROC2, PROC3, PROC8b)	
	Complete segregation(PROC1, PROC2)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6b	---	Fresh water	PEC	0,591ng/L	0,00024
ERC6b	---	Marine water	PEC	0,0856ng/L	0,00034
ERC6b	---	Fresh water sediment	PEC	0,051ng/kg	0,00003
ERC6b	---	Marine sediment	PEC	0,0074ng/kg	0,00000
ERC6b	---	Soil	PEC	2,68ng/kg	---
ERC6b	---	Air	PEC	0,0096ng/m3	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	90th percentile value	worker inhalation, long term - systemic	0,0094ng/m3	---
PROC2	90th percentile value	worker inhalation, long term - systemic	0,0920ng/m3	---
PROC3	90th percentile value	worker inhalation, long term - systemic	0,42µg/m³	---
PROC4	90th percentile value	worker inhalation, long term - systemic	0,014mg/m³	---
PROC8a	90th percentile value	worker inhalation, long term - systemic	0,023mg/m³	---
PROC8b	90th percentile value	worker inhalation, long term - systemic	0,0048µg/m³	---
PROC9	90th percentile value	worker inhalation, long term - systemic	0,0028mg/m³	---
PROC13	90th percentile value	worker inhalation, long term - systemic	0,016mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 10: Use in gas treatment		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products)	
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents	
Process categories	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	
Environmental Release Categories	ERC7: Industrial use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC7		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	30000 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Spent acid solutions are neutralized to circumneutral pH prior to discharge
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC1, PROC2, PROC8b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid

	Vapour pressure	0,06 hPa
Amount used	Worker exposure should be low and controlled	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Outdoors not close to buildings	
	Process may involve high temperature (50 - 150°C)	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Use vapour recovery system	
	Provide local exhaust ventilation (LEV).(PROC1, PROC8b)	
	Complete segregation(PROC1, PROC2)	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC7	---	Fresh water	PEC	0,0886µg/L	0,03544
ERC7	---	Marine water	PEC	0,0128µg/L	0,05120
ERC7	---	Fresh water sediment	PEC	0,0076µg/kg	0,00383
ERC7	---	Marine sediment	PEC	0,0011µg/kg	0,00056
ERC7	---	Soil	PEC	0,0029mg/kg	---
ERC7	---	Air	PEC	0,0014µg/m³	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	90th percentile value	worker inhalation, long term - systemic	0,0094ng/m3	---
PROC2	90th percentile value	worker inhalation, long term - systemic	0,092ng/m3	---
PROC8b	90th percentile value	worker inhalation, long term - systemic	0,0048µg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 11: Use in production of sulphuric acid contained batteries		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Environmental Release Categories	ERC2: Formulation of preparations ERC5: Industrial use resulting in inclusion into or onto a matrix	
2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC5		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
Amount used	Annual amount per site	2500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC2, PROC3, PROC4, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 98%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker exposure should be low and controlled	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²

	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases
Other operational conditions affecting workers exposure	Indoors, any sized room, with good natural ventilation
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.
	Due to the nature of the substance the process should be kept as contained as possible
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance
	Substance-handling procedures shall be well documented and strictly supervised
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Fresh water	PEC	0,0369µg/L	0,01476
ERC2	---	Marine water	PEC	0,0054µg/L	0,02144
ERC2	---	Fresh water sediment	PEC	0,0032µg/kg	0,00160
ERC2	---	Marine sediment	PEC	0,0005µg/kg	0,00023
ERC2	---	Soil	PEC	0,166µg/kg	---
ERC2	---	Air	PEC	0,0006µg/m³	---
ERC5	---	Fresh water	PEC	0,0788µg/L	0,03152
ERC5	---	Marine water	PEC	0,0107µg/L	0,04280
ERC5	---	Fresh water sediment	PEC	0,0064µg/kg	0,00319
ERC5	---	Marine sediment	PEC	0,0009µg/kg	0,00046
ERC5	---	Soil	PEC	0,335µg/kg	---
ERC5	---	Air	PEC	0,0012µg/m³	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	90th percentile value	worker inhalation, long term - systemic	1,4µg/m³	---
PROC3	90th percentile value	worker inhalation, long term - systemic	0,014mg/m³	---
PROC4	90th percentile value	worker inhalation, long term - systemic	0,0012mg/m³	---
PROC9	90th percentile value	worker inhalation, long term - systemic	0,0012mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 12: Use in recycling of sulphuric acid contained batteries		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	
Environmental Release Categories	ERC1: Manufacture of substances	
2.1 Contributing scenario controlling environmental exposure for: ERC1		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 40%
Amount used	Annual amount per site	2500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC2, PROC4, PROC5, PROC8a		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 40%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,06 hPa
Amount used	Worker exposure considered to be negligible due to the specialized systems.	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day

	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Indoors, any sized room, with good natural ventilation	
	Room size and ventilation rate are not relevant as workers work in a control room, with no direct contact to the installations housing the material.	
	Due to the nature of the substance the process should be kept as contained as possible	
Technical conditions and measures to control dispersion from source towards the worker	Provide local exhaust ventilation (LEV).	
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance	
	Substance-handling procedures shall be well documented and strictly supervised	
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks	
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)	

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1	---	Fresh water	PEC	0,0074µg/L	0,00295
ERC1	---	Marine water	PEC	0,0011µg/L	0,00428
ERC1	---	Fresh water sediment	PEC	0,0638ng/kg	0,00032
ERC1	---	Marine sediment	PEC	0,0093ng/kg	0,00005
ERC1	---	Soil	PEC	0,0335µg/kg	---
ERC1	---	Air	PEC	0,0001µg/m³	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	90th percentile value	worker inhalation, long term - systemic	0,0012mg/m³	---
PROC4	90th percentile value	worker inhalation, long	0,004mg/m³	---

		term - systemic		
PROC5	90th percentile value	worker inhalation, long term - systemic	0,013mg/m³	---
PROC8a	90th percentile value	worker inhalation, long term - systemic	0,006mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 13: Use in maintenance of sulphuric acid contained batteries		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC19: Hand-mixing with intimate contact and only PPE available	
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC9b: Wide dispersive outdoor use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC9b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 40%
Amount used	Annual amount per site	2500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling worker exposure for:PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 40%
	Physical Form (at time of use)	liquid
	Vapour pressure	2,14 hPa
Amount used	Worker exposure considered to be negligible due to the specialized systems.	
Frequency and duration of use	Frequency of use	220 days/year
	Exposure duration per day	480 min
	Intermittent contact is expected	
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
	Please note that due to the corrosive nature of the substance dermal exposure is not considered relevant for risk characterization as it must be prevented in all cases	
Other operational conditions affecting workers exposure	Indoors, any sized room, with good natural ventilation	

	Due to the nature of the substance the process should be kept as contained as possible
Organisational measures to prevent /limit releases, dispersion and exposure	Only properly trained and authorised personal shall handle the substance
	Substance-handling procedures shall be well documented and strictly supervised
	Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimize exposure and risks
Conditions and measures related to personal protection, hygiene and health evaluation	Workers wear protective clothing (face/eye protection, helmet, anti-acid gloves, boots and protective coverall)

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8b	---	Fresh water	PEC	0,001µg/L	0,00424
ERC8b	---	Marine water	PEC	0,333ng/L	0,00133
ERC8b	---	Fresh water sediment	PEC	0,914ng/kg	0,00046
ERC8b	---	Marine sediment	PEC	0,0288ng/kg	0,00001
ERC8b	---	Soil	PEC	0,671ng/kg	---
ERC8b	---	Air	PEC	0,002ng/m3	---
ERC9b	---	Fresh water	PEC	0,003µg/L	0,01340
ERC9b	---	Marine water	PEC	1,85ng/L	0,00740
ERC9b	---	Fresh water sediment	PEC	2,89ng/kg	0,00140
ERC9b	---	Marine sediment	PEC	0,16ng/kg	0,00008
ERC9b	---	Soil	PEC	0,003µg/kg	---
ERC9b	---	Air	PEC	0,12ng/m3	---

Workers

Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
---	90th percentile value	worker inhalation, long term - systemic	0,002mg/m³	---

The ECETOC exposure estimation is considered to be unsatisfactory and is not considered relevant for the risk characterisation purposes

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

Exposure Scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario 14: Use of sulphuric acid contained batteries		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Article categories	AC3: Electrical batteries and accumulators	
Environmental Release Categories	ERC9b: Wide dispersive outdoor use of substances in closed systems	
2.1 Contributing scenario controlling environmental exposure for: ERC9b		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 40%
Amount used	Annual amount per site	2500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Incineration or in a landfill
2.2 Contributing scenario controlling consumer exposure for:AC3		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 25% - 40%
	Physical Form (at time of use)	liquid
	Vapour pressure	< 0,1 hPa
Frequency and duration of use	Exposure duration per day	240 min
Human factors not influenced by risk management	Breathing volume	10 m3/day
	Exposed skin surface	480 cm²
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Batteries should only be opened in a well-ventilated place
	Consumer Measures	Batteries should not be opened unnecessarily
	Consumer Measures	Batteries should stand on firm ground to prevent spill
	Consumer Measures	Wear suitable coveralls to prevent exposure to the skin.
	Consumer Measures	Wear acid-resistant gloves

	Consumer Measures	Wear protective eye glasses for protection against liquid splashes.

3. Exposure estimation and reference to its source

Environment

EUSES V2.1 tier 2

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC9b	---	Fresh water	PEC	0,0335µg/L	0,0134
ERC9b	---	Marine water	PEC	0,0018µg/L	0,0074
ERC9b	---	Fresh water sediment	PEC	2,89ng/kg	0,0014
ERC9b	---	Marine sediment	PEC	0,16ng/kg	0,0001
ERC9b	---	Soil	PEC	33,5ng/kg	---
ERC9b	---	Air	PEC	0,12ng/m3	---

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.