

MS Cementex

Code : 14924

1.1. Product identifier

Chemical description : Phosphoric acid , Orthophosphoric acid , solution (>=25%).
Type of product : Pure product in solution .
Reach registration number : 01-2119485924-24

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

Identified use(s) : See table on the front page of the annex.
Use(s) advised against : This product is not recommended for any industrial, professional or consumer use other than identified in table on the front page of the annex.
Not for use in ornamental articles, in tricks and jokes and in games (in accordance with Annex XVII to Regulation (EC) No 1907/2006) (3. Liquid substances or mixtures, which are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: (a) hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F, (b) hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10, (c) hazard class 4.1, (d) hazard class 5.1).

1.3. Details of the supplier of the safety data sheet

Company identification : Schippers Europe B.V.
Rond Deel 12, 5531 AH Bladel Nederland
Tel. +31 497 382 017
Fax: +31 497 382 096
E-mail: contact.nl@schippers.eu
www.schippers.nl

1.4. Emergency telephone number

Emergency phone number : Belgium : Antipoison Center - Brussels
TEL: +32(0)70/245.245

The Netherlands : National Poisoning Information Center - Bilthoven
TEL: +31(0)30/274.88.88 (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

- * Corrosive to metals - Category 1 - Warning (Met. Corr. 1; H290)
- Acute toxicity, oral - Category 4 - Warning (Acute Tox. 4, oral; H302)
- Skin corrosion - Category 1B - Danger (Skin Corr. 1B; H314)

2.2. Label elements

Label in accordance with Regulation (EC) No 1272/2008

- Dangerous ingredient(s) : Phosphoric acid ... %
- * • Hazard pictogram(s)

- Signal word : Danger
- * • Hazard statements : H290 - May be corrosive to metals. H302 - Harmful if swallowed. H314 - Causes severe skin burns and eye damage.

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- * • Precautionary statements
- * - Prevention : P260 - Do not breathe dust/fume/gas/mist/vapours/spray. 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) : Remove immediately all contaminated clothing. Rinse skin with water/shower. P305+P351+P338 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 - Immediately call a POISON CENTER/doctor/...
- * - Storage : P234 - Keep only in original container.

2.3. Other hazards

- Physical/chemical hazards : The substance decomposes on heating to form pyrophosphoric acid, metaphosphoric acid, phosphorous pentoxide. Attacks metals with liberation of hydrogen gas.
- Hazards for the health : A health dangerous concentration in the air will rather slowly be reached by evaporation of this substance at app. 20°C; by spraying much faster.
- Hazards for the environment : Product causes a strong drop of the pH-value of water and soil. This product is no substance or contains no PBT or vPvB (in accordance with Annex XIII).
- Hazards for the safety : Vapor mixes readily with air.

SECTION 3. Composition/information on ingredients

3.1. Substances

Name component(s)	Weight %	CAS nr	EINECS nr	Index nr	Reach nr	CLASSIFICATION
* Phosphoric acid ...%	: >= 25 %	7664-38-2	231-633-2	015-011-00-6	01-2119485924-24	Met. Corr. 1; H290 Acute Tox. 4 (oral); H302 Skin Corr. 1B; H314

- * Note B (Regulation (EC) No 1272/2008) applies to the product or one or more of its components.
Note: SCL applicable

The full text of the (EU)H-statements is in section 16.

SECTION 4. First aid measures

4.1. Description of first aid measures

- General : In case of doubt or persistent symptoms, call a physician.
Never give anything by mouth to an unconscious person.
- First Aid Measures
- Inhalation : Remove victim into fresh air.
Allow the affected person to rest in semi-sitting position.
If not breathing, give artificial respiration.
Get immediate medical advice/attention.
- Skin Contact : Remove contaminated clothing while rinsing.
Rinse skin immediately with mild soap and plenty of water. (at least 20') (shower if necessary).
Immediately call a POISON CENTER or doctor/physician.
- Eye Contact : Rinse immediately thoroughly and long (at least 15 min.) with plenty of water.
Remove contact lenses.
Immediately call a POISON CENTER or doctor/physician.
Keep rinsing or dripping the eye during transport.

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- Ingestion : DO NOT INDUCE VOMITING. Rinse mouth with water.
Give victim plenty of water to drink.
Take the patient IMMEDIATELY to the hospital.

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

See section 11.

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

For specialist advice doctors should contact the NVIC or the Belgian Poison center.

SECTION 5. Firefighting measures

5.1. Extinguishing media

Extinguishing Media

- Suitable : Extinguishing powder , Alcohol resistant foam , Water spray .
- Insuitable : Heavy water stream .

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards : Fire may liberate toxic and biting vapours of phosphoric oxides.

5.3. Advice for firefighters

Special Protective Equipment for Firefighters : Use self-contained breathing apparatus and wear protective clothes when in close proximity to fire.
Special Procedures : Apply water spray or fog to cool nearby equipment. Avoid fire-fighting water to enter environment.
Neutralize extinguishing water with a basic product.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal Precautions : Evacuate all personnel immediately and ventilate area.
Avoid breathing vapour and contact with skin, eyes and clothing. Wear recommended personal protective equipment. (See section 8)

6.2. Environmental precautions

Environmental Precautions : Shut off leaks if without risks.
Dike in the spilled product as much as possible with inert material.
Prevent entry of product in public water, sewers or soil.
Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for Cleaning Up : Collect the spillage in closable, corrosion resistant, suitable disposal containers.
Neutralize spills with lime, Sodium-, Calcium-carbonate or Sodiumbicarbonate.
Rinse abundantly with water.

6.4. Reference to other sections

For personal protection, see section 8.
For the removal of the waste product, see section 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Handling : STRONG HYGIENE !
Avoid breathing vapour and contact with skin, eyes and clothing. Wear recommended personal protective equipment. (See section 8)

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Avoid heating, splashing and formation of vapour when emptying, pouring, diluting or dissolving the product.
When diluting, always pour the acid solution upon the water, never the other way round.
When using, do not eat, drink or smoke.
Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure.

7.2. Conditions for safe storage, including any incompatibilities

- Storage : Keep only in the original, safely locked container in a well ventilated and dark place.
All dangerous products should be placed on a drip tray or should be barreled. Keep away from : Oxidizing agents , Bases .
- Packaging Material : Stainless steel , Polypropylene , Glass .
- Insuitable Packaging Material : Several metals .

7.3. Specific end use(s)

For identified uses, see subsection 1.2 and/or exposure scenarios.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

- Occupational Exposure Limits : Phosphoric acid ...% : Limit value (BE) : 1 mg/m³ (2014)
Phosphoric acid ...% : Short time value (BE) : 2 mg/m³ (2014)
Phosphoric acid ...% : Limit value (TWA 8 h) (NL) : 0,2 ppm (1 mg/m³) (2007)
Phosphoric acid ...% : Limit value (TWA 15 min) (NL) : 0,5 ppm (2 mg/m³) (2007)
- Biological limit values : • Phosphoric acid ...% : Biological limit values : They will be included when available.
- DNELs : • Phosphoric acid ...% : Worker, long-term - local effects, inhalation : 2,92 mg/m³
• Phosphoric acid ...% : Worker, long-term - systemic effects, inhalation : 1 mg/m³
• Phosphoric acid ...% : Consumer, long-term - local effects, inhalation : 0,73 mg/m³
- PNECs : • Phosphoric acid ...% : Not applicable

8.2. Exposure controls

- Engineering Measures : Ventilation (If possible through the floor) , Local exhaust .
- Personal Protection Equipment
- Respiratory protection : CE-approved gas respirator (Filter type BE/P2).
 - Skin protection : Suitable protective clothing (Acid proof).
 - Hand protection : Suitable material for safety gloves (EN 374):
The suitability of the gloves and the breakthrough time for a specific workplace should be discussed with the producers of the protective gloves.
 - material : Nitril rubber
 - thickness : 0,11 mm
 - breakthrough time : > 480'
 - Eye/Face protection : Closed safety glasses or face shield.
- Environmental exposure controls : See sections 6, 7, 12 and 13.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

See technical data sheet for detailed information.

- Physical State (20°C) : Liquid (>75%: Viscous liquid).

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Form/Colour	: Clear , Colourless .
Odour	: Almost odourless .
Odour threshold	: No data available.
pH value	: 1,2 (85 g/100ml)
Melting/Freezing point	: -11,8 - 21,1 °C (30%-85%)
Boiling Point/Range (1013 hPa)	: 101,8 - 158 °C (30%-85%)
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Explosion limits in air	: Not applicable.
Vapour pressure (20°C)	: 0,2 - 0,4 kPa
Relative vapour density (air=1)	: 3,4
Relative density of saturated vapour/air mixture (air=1)	: 1,0
Relative density (water=1)	: 1,7
Density (20°C)	: 1,2 - 1,8 kg/l
Solubility in water	: 100 g/100ml
Log P Octanol/Water (20°C)	: Not established.
Auto-ignition temperature	: Not applicable.
Minimum ignition energy	: Not applicable.
Decomposition temperature	: No data available.
Viscosity	: 2,0 - 32 mPa.s (30-85%; 30 °C) (Dynamic)
Explosive properties	: No chemical groups associated with explosive properties .
Oxidizing properties	: No chemical groups associated with oxidizing properties .
<u>9.2. Other information</u>	
Specific leading	: 4,85 pS/m (85% solution in water)

SECTION 10. Stability and reactivity

10.1. Reactivity

Reactivity : Reacts violently with oxidizing agents and lyes.

10.2. Chemical stability

Stability : Stable at normal circumstances .

10.3. Possibility of hazardous reactions

Hazardous reactions : The substance decomposes on heating to form pyrophosphoric acid, metaphosphoric acid, phosphorous pentoxide.
Contact with metallic substances may release inflammable hydrogen gas.
Contact with : Acids => Creation of toxic gases. (Sulfides , Cyanides)

10.4. Conditions to avoid

Conditions to avoid : High temperatures , Light .

10.5. Incompatible materials

Materials to avoid : Oxidizing agents , Bases , Several metals , Acids .

10.6. Hazardous decomposition products

Hazardous Decomposition Products : Pyrophosphoric acid , Metaphosphoric acid , Phosphorus pentoxide , Sulfides , Cyanides .

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11.1. Information on toxicological effects

Acute toxicity

- Inhalation : Symptoms include: Burning feeling , Sore throat , Cough , Shortness of breath , Difficulty in breathing .
• Phosphoric acid ...% : LC50 (Rat, inhalation, 1 h) : 3,846 mg/l (OECD Guideline 403)
- Skin contact : Skin contact can damage eczema.
Symptoms include: Redness , Pain , Burning feeling , Blisters .
• Phosphoric acid ...% : LD50 (Rabbit, dermal) : 2740 mg/kg
- * - Ingestion : Harmful if swallowed. Symptoms include: Nausea , Vomiting , Abdominal pain , Diarrhea .
• Phosphoric acid ...% : LD50 (Rat, oral) : > 300 mg/kg (OECD Guideline 423)
- Skin corrosion/irritation : Causes severe burns.
- Serious eye damage/irritation : Causes serious eye damage.
- Aspiration hazard : Symptoms of lungoedema mostly reveal after a few hours, intensified by physical effort.
- Respiratory or skin sensitisation : Not sensitive .
- Carcinogenicity : Not listed as carcinogenic .
- Mutagenicity : Not listed as mutagenic .
- Reproductive toxicity : Not listed for reproductive toxicity .
- Specific target organ toxicity - single exposure : To human : Listed not for organ toxicity .
For animals : No effects known.
- Specific target organ toxicity - repeated exposure : To human : Listed not for organ toxicity .
For animals : No effects known.

SECTION 12. Ecological information

12.1. Toxicity

- Ecotoxicity : • Phosphoric acid ...% : LC50 (Fish, 96 h) : 3 - 3,25 mg/l (Lepomis macrochirus)
• Phosphoric acid ...% : EC50 (Algae, 72 h) : >100 mg/l (Desmodesmus subspicatus) (OECD Guideline 201)
• Phosphoric acid ...% : EC50 (Daphnia magna, 48 h) : >100 mg/l (OECD Guideline 202)
• Phosphoric acid ...% : NOEC (Algae, 72 h) : 100 mg/l (Desmodesmus subspicatus) (OECD Guideline 201)
• Phosphoric acid ...% : NOEC (Daphnia magna, 48 h) : 56 mg/l (OECD Guideline 202)

12.2. Persistence and degradability

- Persistence and degradability : • Phosphoric acid ...% : Persistence and degradability : Inorganic .

12.3. Bioaccumulative potential

- Bioaccumulation : • Phosphoric acid ...% : Bioaccumulation : Not applicable.

12.4. Mobility in soil

- Mobility : • Phosphoric acid ...% : Mobility : No data available.

12.5. Results of PBT and vPvB assessment

- Evaluation : • Phosphoric acid ...% : PBT/vPvB : No

12.6. Other adverse effects

- Photochemical ozone creation potential : No data available.
- Ozone depletion potential : None .

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Endocrine disrupting potential : No data available.

Global warming potential : None .

13.1. Waste treatment methods

Waste from residues/Unused products : The product has to be destroyed according to national or local legislation, by a company specialised in handling hazardous waste products.

European list of waste products : XXXXXX - European waste product code. This code is assigned on the basis of the most current applications and can not be representative for pollutions which are arisen at the effective use of the product. The producer of the waste has to evaluate its process himself and has to grant the appropriate waste coding. See Decision 2001/118/EC.

Removal contaminated packaging : Packing is to be used exclusively for the packing of this product. After use, empty and close the packing very carefully. In case of returned packing, the empty packing can be offered back to the supplier.

SECTION 14. Transport information

14.1. UN number

UN Number : 1805

14.2. UN proper shipping name

ADR/RID Name : UN 1805 Phosphoric acid, solution, 8, III, (E)

ADN Name : UN 1805 Phosphoric acid , solution , 8, III

IMDG Name : UN 1805 Phosphoric acid, solution , 8, III

IATA Name : UN 1805 Phosphoric acid, solution , 8, III

14.3. Transport hazard classe(s)

Class : 8

14.4. Packing group

Packaging Group : III

14.5. Environmental hazards

Environmentally hazard : No

Marine pollutant : No

14.6. Special precautions for user

Danger number : 80

Hazard Label(s) : 8

EmS-N° : F-A , S-B

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

Type ship : No data available.

Pollution category : No data available.

SECTION 15. Regulatory information

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

Inventories : Australian inventory (AICS): Listed in inventory.
Canadian inventory (DSL): Listed in inventory.
Chinese inventory (IECS): Listed in inventory.

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Japanese inventory (ENCS): Listed in inventory.
Korean inventory (KECI): Listed in inventory.
Philippine inventory (PICCS): Listed in inventory.
Inventory of the United States (TSCA): Listed in inventory.

NFPA n° : 3-0-0

Relevant EU Rule(s) : Directive 98/24/EC of the Council of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work
Decision 2001/118/EC of the Commission of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (Reach)

The restrictions in Annex XVII to Regulation (EC) No 1907/2006 must be observed.

National regulations

- Belgium

- Germany

: WGK : 1

* - Netherlands

: Water damaging : B
Decontamination exertion : 5

15.2. Chemical Safety Assessment

A chemical safety assessment has been carried out for the material.

* This safety data sheet has been drawn up in accordance with Regulation (EC) No 1907/2006 and the corresponding current changes.
This safety data sheet is exclusively made for industrial/professional use.

* Has changed compared to previous revision.

* Changes : General revision

Sources of used key data : See also on the webaddress:
<http://apps.echa.europa.eu/registered/registered-sub.aspx#search>

(EU)H-statement(s) : H290 - May be corrosive to metals.
H302 - Harmful if swallowed.
H314 - Causes severe skin burns and eye damage.

* Classification procedure : Met. Corr. 1; H290 - Based on test data (producer of component)
Acute Tox. 4, oral; H302 - Calculation method
Skin Corr. 1B; H314 - Additivity method

* List of abbreviations and acronyms : ACGIH : American Conference of Governmental Industrial Hygienists
ADN (Accord européen relatif au transport international des marchandises Dangereuses par voie de Navigation interieur) : European agreement concerning the international carriage of dangerous goods by inland waterways
ADR (Accord européen relatif au transport international des marchandises Dangereuses par Route) : European agreement concerning the international carriage of dangerous goods by road
CO : Carbon monoxide
DNEL (Derived No Effect Level) : an estimated safe exposure level
EC50 : median Effective Concentration
EmS (Emergency Schedule) : the first code refers to the relevant fire schedule and the second code refers to the relevant spillage schedule

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IATA (International Air Transport Association) : provisions concerning the international carriage of dangerous goods by air
IMDG (International Maritime Dangerous Goods code)
LC50 : median Lethal Concentration
LD50 : median Lethal Dose
M-Factor : a multiplying factor that is applied to the concentration of a substance classified as hazardous to the aquatic environment (Aquatic Acute 1; H400 or Aquatic Chronic 1; H410) and is used to derive by the summation method the classification of a mixture in which the substance is present
NFPA (National Fire Protection Association) or fire diamant
NOEC (No Observed Effect Concentration)
NVIC : National Poisoning Information Center
OECD : Organisation for Economic Cooperation and Development
PBT : persistent, bioaccumulative and toxic
PNEC (Predicted No Effect Concentration) : concentration below which exposure to a substance is not expected to cause adverse effects
RCP (Reciprocal Calculation Procedure)
REACH : Registration, Evaluation, Authorisation and restriction of Chemicals
RID (Règlement concernant le transport International ferroviaire des marchandises Dangereuses) : Regulation concerning the International carriage of Dangerous goods by rail
TWA (Time-Weighted Average) : the average exposure over a specified period
WGK (Wassergefährdungsklasse) : a German classification of substances that indicate the environmental hazard for surface water
vPvB : very persistent and very bioaccumulative

This information is to our knowledge correct and complete on the date of issue of this safety data sheet. The information only concerns the product and does not give any guarantee for the quality and the completeness of the properties of the product, or in case of mixing or using in any other process. It remains the responsibility of the user to assure himself that the information is suitable and complete concerning the special use he makes of the product.
BRENNTAG denies all responsibility for loss or damage resulting from the use of these data.

End of document

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

MS Cementex

Version 1.1

Print Date 27.02.2013

Revision Date 27.02.2013

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8, 9	NA	1, 2, 3, 4, 8b, 9, 15	1	NA	ES1433
2	Industrial use	3	8, 9, 10, 15, 16, 17	0, 1, 7, 9a, 9b, 13, 14, 19, 20, 21, 23, 24, 25, 26, 32, 34, 35, 37, 39	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15, 19, 22, 23	2, 3, 4, 6a, 6b, 6d	NA	ES1460
3	Professional use	22	1, 19	9a, 9b, 12, 14, 15, 31, 35, 37, 38	5, 8a, 8b, 9, 10, 11, 13, 15, 19, 25	8a, 8b, 8c, 8e	NA	ES1470
4	Consumer use	21	NA	0, 12, 28, 31, 35, 38, 39	NA	8a, 8b, 8e, 10a, 11a	NA	ES1513

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

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Version 1.1

Print Date 27.02.2013

Revision Date 27.02.2013

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
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances

2.1 Contributing scenario controlling environmental exposure for: ERC1

Product characteristics	Concentration of the Substance in Mixture/Article	Aqueous solutions contain more than 25% up to 100% of solid form
Amount used	The daily and annual amount/emission per site is not considered to be the main determinant for environmental exposure	
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	Acid release is negligible, due to its low vapour pressure
	Water	The production of acid can potentially result in aquatic emissions and locally increase the phosphate concentration while decreasing the pH in the aquatic environment, The pH of industrial effluents is normally measured frequently and can be neutralized easily, Wastewater should be reused or discharged to the industrial wastewater and further neutralized if needed
	Soil	Infiltration, partial neutralization, dispersion, dilution
	Sediment	There will be no absorption on particulate matter or surfaces
	Procedural and/or control technologies are required to minimize emissions and the resulting exposure during cleaning and maintenance procedures Acid is not expected to be found in the solid waste nor to reach the air compartment, due to its low vapor pressure and high water solubility Due to its high water solubility and low vapor pressure, acid is mainly found in soil and water compartments There, acid progressively dissociates affecting the pH of the receiving compartment Bioaccumulation is not expected.	

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Conditions and measures related to sewage treatment plant

The pH of wastewater released from manufacturing sites should be between 6 and 9.

Conditions and measures related to external treatment of waste for disposal

Waste treatment

Acid dissociates and will be neutralized before reaching WWTP

Disposal methods

The neutralised liquid can be spilled in accordance to regulatory norm

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

Product characteristics

Concentration of the Substance in Mixture/Article

Aqueous solutions contain more than 25% up to 100% of solid form

Physical Form (at time of use)

liquid, solid

Frequency and duration of use

Frequency of use

220 days/year

Frequency of use

8 hours/day

Technical conditions and measures to control dispersion from source towards the worker

Use closed systems or covering of open containers (e.g. screens)
 Transport over pipes, technical barrel filling/emptying of barrel with automatic systems (suction pumps etc.)
 Use of pliers, grip arms with long handles with manual use to avoid direct contact and exposure by splashes (no working over one's head)
 Store in cool, dry, clean, well ventilate areas away from alkaline products and metals
 Do not store under direct sun light
 Do not pile up the containers
 Do not store at temperatures close to freezing point.
 Compatible materials: stainless steel 316-L; high density polyethylene; glass

Organisational measures to prevent /limit releases, dispersion and exposure

Workers in the risky process/areas identified should be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects and c) to follow the safety procedures instructed by the employer.
 The employer has also to ascertain that the required PPE is available
 Effective control measures are in place to prevent dermal exposure

Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves.
 Wear eye glasses with side protection according to EN 166.
 Wear acid-resistant protective clothing.
 Wear rubber boots.
 Material: chloroprene gloves or equivalent
 Protective clothing and gloves are mandatory when handling corrosive substances

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

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Workers

ECETOC TRA

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
Relevant for all PROCs	liquid	Inhalation worker exposure	0,375mg/m ³	0,375
PROC4	solid	Inhalation worker exposure	0,5mg/m ³	0,5
PROC1, PROC2, PROC3, PROC8b, PROC9, PROC15	solid	Inhalation worker exposure	0,01mg/m ³	0,01

Good industrial hygiene practice has to be followed if oral exposure is not expected for workers. As reported in the CLP Regulation No 1272/2008 Annex VI Table 3.1, the substance is corrosive above the 25% concentration limit Repeated daily dermal exposure to product is considered negligible

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

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

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

Additional good practice advice beyond the REACH Chemical Safety Assessment

Local exhaust ventilation is not required but good practice.

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1. Short title of Exposure Scenario 2: Industrial use

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) SU15: Manufacture of fabricated metal products, except machinery and equipment SU16: Manufacture of computer, electronic and optical products, electrical equipment SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Chemical product category	PC0: Other products: PC1: Adhesives, sealants PC7: Base metals and alloys PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC13: Fuels PC14: Metal surface treatment products, including galvanic and electroplating products PC19: Intermediate PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents PC21: Laboratory chemicals PC23: Leather tanning, dye, finishing, impregnation and care products PC24: Lubricants, greases, release products PC25: Metal working fluids PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC32: Polymer preparations and compounds PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35: Washing and cleaning products (including solvent based products) PC37: Water treatment chemicals PC39: Cosmetics, personal care 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 PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying 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

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PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC10: Roller application or brushing
 PROC13: Treatment of articles by dipping and pouring
 PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation
 PROC15: Use as laboratory reagent
 PROC19: Hand-mixing with intimate contact and only PPE available
 PROC22: Potentially closed processing operations with minerals/metals at elevated temperature; industrial setting
 PROC23: Open processing and transfer operations with minerals/metals at elevated temperature

Environmental Release Categories

ERC2: Formulation of preparations
 ERC3: Formulation in materials
 ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
 ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
 ERC6b: Industrial use of reactive processing aids
 ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC3, ERC4, ERC6a, ERC6b, ERC6d

Product characteristics	Concentration of the Substance in Mixture/Article	Aqueous solutions contain more than 25% up to 100% of solid form
Amount used	The daily and annual amount/emission per site is not considered to be the main determinant for environmental exposure	
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	Acid release is negligible, due to its low vapour pressure
	Water	The production of acid can potentially result in aquatic emissions and locally increase the phosphate concentration while decreasing the pH in the aquatic environment, The pH of industrial effluents is normally measured frequently and can be neutralized easily, Wastewater should be reused or discharged to the industrial wastewater and further neutralized if needed
	Soil	Infiltration, partial neutralization, dispersion, dilution
	Sediment	There will be no absorption on particulate matter or surfaces
	Procedural and/or control technologies are required to minimize emissions and the resulting exposure during cleaning and maintenance procedures Acid is not expected to be found in the solid waste nor to reach the air compartment, due to its low vapor pressure and high water solubility Due to its high water solubility and low vapor pressure, acid is mainly found in	

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	soil and water compartments There, acid progressively dissociates affecting the pH of the receiving compartment Bioaccumulation is not expected.	
Conditions and measures related to sewage treatment plant	The pH of wastewater released from manufacturing sites should be between 6 and 9.	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Acid dissociates and will be neutralized before reaching WWTP
	Disposal methods	The neutralised liquid can be spilled in accordance to regulatory norm

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC19, PROC22, PROC23

Product characteristics	Concentration of the Substance in Mixture/Article	Aqueous solutions contain more than 25% up to 100% of solid form
	Physical Form (at time of use)	liquid, solid
Frequency and duration of use	Frequency of use	220 days/year
	The maximum duration considered for this exposure scenario is a working shift of above 4h/day (worst case assumption)	
	Frequency of use	8 hours/day
Technical conditions and measures to control dispersion from source towards the worker	<p>Use closed systems or covering of open containers (e.g. screens) Transport over pipes, technical barrel filling/emptying of barrel with automatic systems (suction pumps etc.) Use of pliers, grip arms with long handles with manual use to avoid direct contact and exposure by splashes (no working over one's head) Store in cool, dry, clean, well ventilate areas away from alkaline products and metals Do not store under direct sun light Do not pile up the containers Do not store at temperatures close to freezing point. Compatible materials: stainless steel 316-L; high density polyethylene; glass</p>	
Organisational measures to prevent /limit releases, dispersion and exposure	<p>Workers in the risky process/areas identified should be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects and c) to follow the safety procedures instructed by the employer. The employer has also to ascertain that the required PPE is available Effective control measures are in place to prevent dermal exposure</p>	
Conditions and measures related to personal protection, hygiene and health evaluation	<p>Wear chemically resistant gloves. Wear eye glasses with side protection according to EN 166. Wear acid-resistant protective clothing. Wear rubber boots. Material: chloroprene gloves or equivalent Protective clothing and gloves are mandatory when handling corrosive</p>	

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substances

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

ECETOC TRA

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
Relevant for all PROCs	liquid	Inhalation worker exposure	0,375mg/m ³	0,375
PROC1, PROC2, PROC3, PROC8b, PROC9, PROC15	solid	Inhalation worker exposure	0,01mg/m ³	0,01
PROC4, PROC5	solid	Inhalation worker exposure	0,5mg/m ³	0,5

Good industrial hygiene practice has to be followed if oral exposure is not expected for workers. As reported in the CLP Regulation No 1272/2008 Annex VI Table 3.1, the substance is corrosive above the 25% concentration limit Repeated daily dermal exposure to product is considered negligible

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

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

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

Additional good practice advice beyond the REACH Chemical Safety Assessment

Local exhaust ventilation is not required but good practice.

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1. Short title of Exposure Scenario 3: Professional use

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU1: Agriculture, forestry, fishery SU19: Building and construction work
Chemical product category	PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC12: Lawn and garden preparations, including fertilizers (- Fertilizers) PC14: Metal surface treatment products, including galvanic and electroplating products PC15: Non-metal-surface treatment products PC31: Polishes and wax blends PC35: Washing and cleaning products (including solvent based products) PC37: Water treatment chemicals PC38: Welding and soldering products (with flux coatings or flux cores), flux products
Process categories	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) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC15: Use as laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available PROC25: Other hot work operations with metals
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 ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8e: Wide dispersive outdoor use of reactive substances in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8c, ERC8e

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations more than 25%
Amount used	The daily and annual amount/emission per site is not considered to be the main determinant for environmental exposure	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Air	Acid release is negligible, due to its low vapour pressure
	Water	The production of acid can potentially result in aquatic emissions and locally increase the phosphate concentration while decreasing the pH in

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releases to soil
Organizational measures to prevent/limit release from the site

	the aquatic environment, The pH of industrial effluents is normally measured frequently and can be neutralized easily, It is required that the flow of release to municipal wastewater or to surface water do not cause significant in pH changes, Wastewater should be reused or discharged to the industrial wastewater and further neutralized if needed, Different rules apply to professional users regarding control of their effluents
Soil	Infiltration, partial neutralization, dispersion, dilution, For release to soil for fertilizer uses, the pH will be naturally neutralized by the medium before reaching the groundwater
Sediment	There will be no absorption on particulate matter or surfaces
Procedural and/or control technologies are required to minimize emissions and the resulting exposure during cleaning and maintenance procedures Acid is not expected to be found in the solid waste nor to reach the air compartment, due to its low vapor pressure and high water solubility Due to its high water solubility and low vapor pressure, acid is mainly found in soil and water compartments There, acid progressively dissociates affecting the pH of the receiving compartment Bioaccumulation is not expected.	

Conditions and measures related to external treatment of waste for disposal

Waste treatment	Acid dissociates and will be neutralized before reaching WWTP
Disposal methods	The neutralised liquid can be spilled in accordance to regulatory norm, The residue of the containers or the used container itself should be disposed in accordance with local requirements

2.2 Contributing scenario controlling worker exposure for: PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC15, PROC19, PROC25

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations more than 25%
	Physical Form (at time of use)	liquid, solid
Amount used	This substance is used during the production phase of various cleaning products, although often the amount in the end products is limited due to its reactivity, The amount used per worker varies from activity to activity	
Frequency and duration of use	Frequency of use	220 days/year
	The maximum duration considered for this exposure scenario is a working shift of above 4h/day (worst case assumption)	
	Frequency of use	8 hours/day

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Organisational measures to prevent /limit releases, dispersion and exposure	Because the substance is corrosive, the risk management measures for human health should focus on the prevention of direct contact with the substance
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

3. Exposure estimation and reference to its source

Environment

Qualitative approach used to conclude safe use.

Workers

ECETOC TRA

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
Relevant for all PROCs	liquid	Inhalation worker exposure	0,375mg/m ³	0,375

Good industrial hygiene practice has to be followed if oral exposure is not expected for workers. As reported in the CLP Regulation No 1272/2008 Annex VI Table 3.1, the substance is corrosive above the 25% concentration limit Repeated daily dermal exposure to product is considered negligible

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

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

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

Additional good practice advice beyond the REACH Chemical Safety Assessment

Local exhaust ventilation is not required but good practice.

Since automated, closed systems and local exhaust ventilation may be less feasible to implement for professional settings, product related design measures should be taken (low concentration for example) as well as good practices that prevent direct eye/skin contact with the substance and prevent formation of aerosols and splashes are more important along with the personal protective equipment measures

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1. Short title of Exposure Scenario 4: Consumer use

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC0: Other products: PC12: Lawn and garden preparations, including fertilizers (- Fertilizers) PC28: Perfumes, fragrances PC31: Polishes and wax blends PC35: Washing and cleaning products (including solvent based products) PC38: Welding and soldering products (with flux coatings or flux cores), flux products PC39: Cosmetics, personal care products
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC11a: Wide dispersive indoor use of long-life articles and materials with low release

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8e, ERC10a, ERC11a

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant, Chemical/biological
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Batteries should be recycled as much as possible (e.g. by returning to a public recycling facility).
	Disposal methods	Contaminated packaging material will contain negligible amounts of substance, It will be disposed as domestic/ municipal waste, The substance is not expected to cause a significant pH effect to the environment when incinerated or land filled

2.2 Contributing scenario controlling consumer exposure for: PC0, PC12, PC28, PC31, PC35, PC38, PC39

Product characteristics	Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 25 %.
	Physical Form (at time of use)	liquid
Amount used	Amount used per event	0,110 kg
	The substance is employed as electrolyte in batteries, Furthermore the amounts of the product used in these mixtures will interact with other ingredients in acid-base reactions and thus only residues of the substance will remain as such in the final product	

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Frequency and duration of use	Frequency of use	1 Times per day
	Frequency of use	20 minutes/event
	Frequency of use	360 days/year
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	It is required to use resistant labelling-package to avoid its auto-damage and loss of the label integrity, under normal use and storage of the product. The lack of quality of the package provokes the physical loss of information on hazards and use instructions.
	Consumer Measures	Keep out of the reach of children.
	Consumer Measures	Wear suitable gloves.
	Recommended:	
	Consumer Measures	If splashes are likely to occur:

3. Exposure estimation and reference to its source

Environment

There is no environmental release as batteries are sealed articles with a long service life Consumer uses relate to already diluted products which will further be neutralized quickly in the sewer, well before reaching a WWTP or surface water. Qualitative approach used to conclude safe use.

Consumers

ConsExpo 4.1

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
relevant for all PCs	---	Consumer inhalation exposure	0,442mg/m ³	0,6

Given that batteries are sealed articles and that acid involved in their maintenance is not intended for direct release (>,<) exposure to and emission from acid in these life-cycle stages should be negligible and therefore an exposure assessment is not considered deemed Although accidental exposure to the substance at a concentration higher than 10% is normally excluded from an EU chemical safety assessment and accidental exposure is not considered in the present assessment, several risk management measures for consumers are included in the dossier There is no environmental release as batteries are sealed articles with a long service life

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

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

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

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Environment

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Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2
For scaling see: <http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp>
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES