

## ORTHOPHOSPHORIC ACID

This Safety Data Sheet contains information on potential risks to those involved in the handling, transport, and handling of the material, as well as describing potential risks to the user and the environment. This information should be provided to those who may encounter the material or are responsible for its use.

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1 Product identifier

Name of the substance	Orthophosphoric acid 98-100%
Name of the mixture:	Orthophosphoric acid 28% – 54 % (water solution)
Chemical name and formula:	Orthophosphoric acid, H <sub>3</sub> PO <sub>4</sub>
Trade name:	Orthophosphoric acid
CAS number:	7664-38-2
EINECS number:	231-633-2
ID № in Appendix VI/CLP:	015-011-00-6
Molecular weight range:	98 g/mol
Chemical composition:	monoconstituent, inorganic
REACH Registration number:	<b>01-2119485924-24-0013</b>
UFI #	<b>3WK0-405S-H00E-CY69</b>

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

##### Identified uses:

M1- Manufacture of orthophosphoric acid. Industrial uses: included as intermediate in synthesis of chemical products.

F1- Formulation: Industrial distribution / Industrial formulation for the formulation of mixtures of chemical products.

IW- Industrial use: as an intermediate in the synthesis of chemical products, in the formulation of mixtures, including packaging and distribution, in surface treatment of metals, as an acid cleaning agent, as a process aid substance in the chemical industry (including laboratory applications).

IW- Professional uses: Fertilizers.

Uses advised against not established.

#### 1.3 Details of the supplier of the safety data sheet

Producer/Supplier:	AGROPOLYCHIM JSC
Address:	INDUSTRIAL ZONE p.k. 9160, Devnya, Bulgaria
Phone number:	+359 / 519 97 419, mob.:+359 / 885 897 661
Contact person:	e-mail: <a href="mailto:m.tsetkova@agropolychim.bg">m.tsetkova@agropolychim.bg</a> Eng. Miroslava Tsvetkova

#### 1.4 Emergency telephone number

In case of emergency:

Contact your national emergency center		
European emergency phone number	112	Available 7days/24hours

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### 2.1.1 Classification according Regulation (EC) 1272/2008 (EU CLP):

Metal corrosion, Category 1, H290

Acute toxicity (oral), Category 4, H302

Skin corrosion, Category 1B, H314

#### 2.1.2 Additional information

For full text of Hazard statements and Precautionary statements, according to the classification: see section 16 of the SDS.

### 2.2 Label elements

#### Hazard pictogram:

GHS 05: Corrosion

GHS 07: Warning



**Signal word:** Danger

#### Hazard Statements:

H290- May be corrosive to metals

H302- Harmful if swallowed

H314- Causes severe skin burns and eye damage.

#### Precautionary Statements:

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

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

P390- Absorb spillage to prevent material damage.

P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

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

P304+P340 – IF INHALED: Remove victim to fresh air and keep at rest position comfortable for breathing.

P305+P351+P338 – IF IN EYES: rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P405- Store locked up.

### 2.3 Other hazards

**PBT/vPvB:** The substance does not meet the criteria for **PBT** or **vPvB** according to Regulation (EC) № 1907/2006, Annex XIII.

This substance does not have endocrine disrupting properties in relation to non-target organisms, as it does not meet the criteria set out in Section B of Regulation (EC) № 2017/2100.

This product does not contain nanoforms or nanoform-containing substances.

No other hazards were identified.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1 Composition:

Name of the substance	CAS Number	EINECS Number	% Concentration	REACH Registration number	Classification according to Regulation (EC) № 1272/2008	SCL- specific concentration limits
Orthophosphoric acid	7664-38-2	231-633-2	28-54	01-2119485924-24-0013	H314 -Skin corr. cat. 1B.  H290- Metal corr., cat. 1  H302- Acute toxicity, Oral, cat. 4	C≥ 25%: corrosive to skin H314, 1B.  10% ≤ C <25%: skin irritant H315, cat.2  C> 20% corrosion for metals H290, cat.1
Water	7732-18-5	231-791-2	73-56	n. a.	n. a.	

Refer to section 16 for the full text of the H-statements and classification.

### SECTION 4: FIRST AID MEASURES

#### 4.1 Description of first aid measures

##### General advice:

Phosphoric acid has a small oral toxicity, but is corrosive to eyes, skin, and mucous membranes.

An endoscope, because of the possible existence of several stomach or esophagus burns, must be consider, even though it might cause perforations or contractions, as well as a stomach wash with an endogastric tube. An observation period might be needed.

##### Following inhalation

Breathe fresh air. If respiratory discomfort occurs and persists after cessation of exposure, seek medical



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attention.

### **Following skin contact**

Wash thoroughly with soap and water. Take off all contaminated clothing immediately. If irritation persists, consult a physician.

### **Following eyes contact**

In case of contact with eyes, rinse immediately with plenty of water for at least 15 minutes. Ensure good rinsing by lifting the eyelids with your fingers. Remove contact lenses if possible. Seek medical attention.

### **After ingestion**

If swallowed, rinse mouth with water (only if the person is conscious). Do not induce vomiting. Seek medical attention immediately.

## **4.2 Most important symptoms and effects, both acute and delayed**

Skin contact with phosphoric acid causes sensory irritation and damaging burns. Vapors may cause slight irritation to the eyes, throat and skin.

As phosphoric acid is classified as corrosive, no further studies on acute inhalation and sensitization are required according to Annex VIII, section 8.5, column 2 of Regulation 1907/2006 (REACH).

No sensitization data available. The substance is classified as corrosive. No skin sensitization (delayed contact hypersensitivity) has been reported as a result of human exposure. The effects are dominated by local irritation.

## **4.3 Indication of any immediate medical attention and special treatment needed**

Follow the advice in section 4.1. Treat symptomatically. Seek emergency medical attention.

## **SECTION 5: FIREFIGHTING MEASURES**

### **5.1 Extinguishing media**

In case of fire in the environment: use suitable extinguishing media. Suitable agents may include water jet, dry chemical, mist or foam. There are no restrictions on fire extinguishers.

#### **5.1.1 Suitable extinguishing media**

Put out the fire using appropriate agents against the surrounding fire. Cool closed containers exposed to fire with water spray.

#### **5.1.2 Unsuitable extinguishing media**

None

### **5.2 Special hazards arising from the substance or mixture**

The substance is non-flammable. Phosphoric acid does not contain any chemical groups exhibiting explosive properties and is therefore not considered explosive.

### **5.3 Advice for firefighters**

#### **Fire extinguishing instructions:**

In case of fire: Evacuate area. Extinguish fire from a distance due to the risk of explosion.

#### **Protection during firefighting:**

Wear gas-tight protective clothing in combination with self-contained breathing apparatus. See section 8 for more information: "Exposure controls / personal protection".

## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

## 6.1 Personal precautions, protective equipment and emergency procedures

### General measures:

Evacuate unnecessary personnel. Provide adequate air ventilation. Do not breathe gas, fumes, vapor or spray.

### For non-emergency personnel:

Only qualified personnel equipped with appropriate protective equipment may intervene.

### For emergency responders:

Mandatory protective clothing and equipment. Do not attempt to take action without appropriate protective equipment. See section 8 for more information: "Exposure controls / personal protection".

Emergency procedure: Gas / steam is heavier than air. It can accumulate in enclosed spaces, especially at or below ground level.

## 6.2 Environmental precautions:

Hold and collect spillage with non-combustible absorbent material (e.g. sand, soil, diatomite, vermiculite).

Do not allow to enter drains, watercourses, manholes and water sources. If the product pollutes rivers and lakes, inform the relevant authorities.

## 6.3 Methods and material for containment and cleaning up

Ventilate the area and wash the spill area after collecting the material. Sprinkle sand, ash or cement powder to absorb the liquid.

Neutralize with lime milk (calcium hydroxide), sodium carbonate, calcium carbonate or sodium bicarbonate.

Place in a disposal container in accordance with local / national regulations.

## 6.4 Reference to other sections

For more information on exposure / personal protection or disposal issues, please check sections 8 and 13 of this Safety Data Sheet.

# SECTION 7: HANDLING AND STORAGE

## 7.1 Precautions for safe handling

### 7.1.1 Protective measures

Ensure good ventilation at the workplace - Observe European standards for exposure at the workplace. Use only acid-resistant materials.

When emptying and draining, it is preferable to use pumping techniques.

Provide an adapted restraint system.

Avoid direct contact with the product. Do not inhale the vapors. Never add water or any aqueous agent to tanks or containers containing acids. Solutions or neutralized substances are highly exothermic. Avoid splashes. Act slowly. Always add acid to the water. Do not mix with incompatible materials (see section 10.5).

### 7.1.2 Advice on general occupational hygiene

Do not eat, drink or smoke in the workplace.

Wash your hands after work, remove contaminated clothing and protective equipment before entering the dining area.

## 7.2 Conditions for safe storage, including any incompatibilities

### Technical measures and storage conditions:

Store in a cool, dry, clean, well-ventilated place, away from alkaline products and metals. Store in a corrosion-resistant container with a durable inner lining. It attacks many metals, producing extremely flammable hydrogen gas, which can form explosive mixtures with air. Flammable vapor concentrations may

accumulate in the upper space of the containers. Avoid all possible sources of ignition (spark or flame). Keep the containers locked. Keep tightly closed and sealed until ready to use. Open containers should be carefully sealed and kept upright to prevent leakage. Do not store in unmarked containers. Use appropriate retention to avoid environmental contamination. Do not store containers on top of each other.

Do not store in direct sunlight. Do not store at temperatures close to freezing.

**Compatible storage materials:**

316-L stainless steel.

High density polyethylene.

Glass.

### 7.3 Specific end uses

Please check the identified use in section 16 and in the exposure scenario appendix to this Safety Data Sheet.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

#### 8.1.1 Derivation of DNELs and other hazard conclusions on exposure:

##### 8.1.1.1. Available dose-descriptor(s) per endpoint as a result of its hazard assessment

Endpoint	Route	Dose descriptor or qualitative effect characterisation; test type
Acute toxicity	oral	adverse effect observed
Irritation / Corrosivity	skin	adverse effect observed (corrosive)
Irritation / Corrosivity	eye	adverse effect observed (irritating)
Repeated dose toxicity	oral	adverse effect observed (LOAEL): 155mg/kg bw/day (subchronic; rat [common rodent species])
Reproductive toxicity: effects on fertility	oral	no adverse effect observed
Reproductive toxicity: developmental toxicity	oral	no adverse effect observed (NOAEL): 370mg/kg bw/day (chronic; mouse [common rodent species])

##### 8.1.1.2 Selection of the DNEL(s) or other hazard conclusions for critical health effects

#### Hazard conclusions for workers:

Route	Type of effect	Hazard conclusion	Most sensitive endpoint
Inhalation	Systemic effects -	DNEL (Derived No Effect Level)	repeated dose toxicity



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	Long-term	10.7mg/m <sup>3</sup>	(Oral)
Inhalation	Systemic effects - Acute	hazard unknown (no further information necessary)	
Inhalation	Local effects - Long-term	DNEL (Derived No Effect Level) 1mg/m <sup>3</sup>	skin irritation/corrosion
Inhalation	Local effects - Acute	DNEL (Derived No Effect Level) 2mg/m <sup>3</sup>	skin irritation/corrosion
Dermal	Systemic effects - Long-term	hazard unknown (no further information necessary)	
Dermal	Systemic effects - Acute	hazard unknown (no further information necessary)	
Dermal	Local effects - Long-term	medium hazard (no threshold derived)	
Dermal	Local effects - Acute	medium hazard (no threshold derived)	
Eyes	Local effects	medium hazard (no threshold derived)	

**Hazard conclusions for the general population:**

Route	Type of effect	Hazard conclusion	Most sensitive endpoint
Inhalation	Systemic effects - Long-term	DNEL (Derived No Effect Level) 4.57mg/m <sup>3</sup>	repeated dose toxicity (Oral)
Inhalation	Systemic effects - Acute	hazard unknown (no further information necessary)	
Inhalation	Local effects - Long-term	DNEL (Derived No Effect Level) 0.36mg/m <sup>3</sup>	skin irritation/corrosion
Inhalation	Local effects - Acute	medium hazard (no threshold derived)	
Dermal	Systemic effects - Long-term	hazard unknown (no further information necessary)	



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Dermal	Systemic effects - Acute	hazard unknown (no further information necessary)	
Dermal	Local effects - Long-term	medium hazard (no threshold derived)	
Dermal	Local effects - Acute	medium hazard (no threshold derived)	
Oral	Systemic effects - Long-term	DNEL (Derived No Effect Level) 0.1mg/kg bw/day	repeated dose toxicity (Oral)
Oral	Systemic effects - Acute	low hazard (no threshold derived)	
Eyes	Local effects	medium hazard (no threshold derived)	

## 8.2 Exposure controls

### 8.2.1 Appropriate engineering controls

Provide adequate exhaust ventilation to the workstation. The facilities should be located outdoors and not close to buildings. The integrity of indoor processes should be fully monitored. Make sure that the primary emission sources are not located in the worker's respiratory area. There should be emergency eye fountains and safety showers in the immediate vicinity of any potential exposure.

### 8.2.2 Individual protection measures, such as personal protective equipment

#### Respiratory protection

- In case of dust or aerosol formation, use a respirator with an approved filter.
- Autonomous breathing apparatus in an environment with insufficient oxygen / in case of large uncontrolled emissions / in all circumstances when the mask and the filter do not provide adequate protection.
- Use only respiratory protection that meets international / national standards. - Use NIOSH approved respiratory protection.

#### Hand protection

- Consider the information provided by the manufacturer on permeability and drilling time and on special working conditions (mechanical stress, duration of contact).
- Protective gloves - chemical resistant: Gloves APF 10 (90%).
- Suitable material: butyl rubber

#### Eye protection

Wearing eye / face protection is necessary to control the risks. The face shield or goggles must comply with EN166 or equivalent. It must be worn together with respiratory protection.

#### Skin and body protection

- Chemically resistant apron
- If there is a possibility of splashes, wear: butyl rubber - boots;





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- Do not wear leather shoes.

### 8.2.3 Environmental exposure control

#### 8.2.3.1 Industrial use

Avoid uncontrolled release of orthophosphoric acid solutions into urban sewers or groundwater. In case of such release, this could cause a significant change in water pH. Regular check of the pH value for leakage in open water sources is required. In case of general drainage, care must be taken to minimize changes in the pH of the receiving groundwater.

Predictable No Effect Exposure Concentration (PNEC): pH approach - safe pH between 6 and 9.

#### 8.2.3.2 Professional use

Avoid uncontrolled discharging orthophosphoric acid solutions at high flow into municipal wastewater or to surface water

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

Appearance:	viscous liquid/solid
Odour:	odorless
pH:	< 1
pKa:	2.148, 7.198, 12.375
Melting point:	41.1°C at 1013 hPa
Boiling point:	296.5°C at 1013 hPa
Flash point:	not applicable (inorganic substance)
Evaporation rate:	No data available
Flammability:	non flammable
Explosive limits:	non explosive
Vapour pressure:	4 Pa at 20°C
Vapour density:	Not data
available Relative density:	1.84 at 20°C
Solubility in water:	1000 g/L at 20°C
Partition coefficient:	not applicable (inorganic substance)
Auto ignition temperature:	not applicable (inorganic substance)
Decomposition temperature:	not applicable
Viscosity:	600 mPa s at 25°C
Oxidising properties:	Non Oxidising
Explosive properties	Non explosive

### 9.2 Other information

Miscible with water in all proportions.

## SECTION 10: STABILITY AND REACTIVITY

### 10.1 Reactivity

Stable under recommended storage and handling conditions (see section 7)

#### 10.2 Chemical stability

Thermally stable in response to design storage conditions. Reacts violently with strong bases.

#### 10.3 Possibility of hazardous reactions

May form Phosphorous oxides.

Any contact with reactive metals (as steel to carbon and aluminum) may produce air-hydrogen flammable/explosive mixtures. Reacts violently with strong bases.

#### 10.4 Conditions to avoid

High temperature, direct light (See section 7.2).

#### 10.5 Incompatible materials

- alkaline and corrosive products
- base metals (see section 7)

#### 10.6 Hazardous decomposition products

When orthophosphoric acid is heated, phosphorus oxides can be formed.

### SECTION 11: TOXICOLOGICAL INFORMATION

#### 11.1 Information on basic physical and chemical properties (EC) №1272/2008

**Probable routes of exposure:** The most likely route of exposure for orthophosphoric acid is by inhalation. Inhalation of orthophosphoric acid vapors may cause immediate irritation of the respiratory tract, pain. In contact, orthophosphoric acid causes skin and eye burns. If swallowed, orthophosphoric acid causes burns to the digestive tract.

**Acute toxicity:** A limited toxicokinetic assessment based on available physico/chemical properties of phosphoric acid indicates oral and dermal absorption factors of 50 to 100% and an inhalation absorption factor of 100%. Phosphoric acid is furthermore not considered to have bioaccumulative potential.

**Acute oral toxicity:** rat [common species] (not specified) male/female: LD50: 1530 - 3400 mg/kg bw (male/female) based on: (test mat.)

LD50 on female rats similar to OECD 423: 1.7 mL/100 g body weight (2600 mg/kg bw)

**Acute inhalation toxicity:** Not determined.

In accordance with Annex VIII, Section 8.5, Column 2 of Regulation No. 1907/2006 (REACH) an acute toxicity test does not need to be conducted if the substance is classified as corrosive to the skin. Phosphoric acid is classified as a skin corrosive (category 1B) and therefore the acute inhalation study does not need to be conducted.

**Acute dermal toxicity:** Rabbit [common species] (New Zealand white [rabbit]): Dose level: > 2000 mg / kg body weight (not specified) based on: (test mat.).

There is no reliable information. No need for testing due to its corrosivity.

**Skin corrosion / irritation:** Orthophosphoric acid is corrosive to skin, category 1B. At concentration of > 25% phosphoric acid is corrosive to the skin.

**Serious eye damage / irritation:** Causes eye irritation. At concentration of 10% ≤ concentration <25% according to CLP Regulation, Annex VI, Table 3.1.

**Respiratory or skin sensitization:** No information available. Due to its corrosivity, no sensitization testing is required.

**Mutagenicity:** In vitro tests showed negative results for orthophosphoric acid:

- AMES (OECD 471) in Salmonella typhimurium of the species TA1535, TA1537, TA98, TA100 and Escherichia coli of the species WP2uvrA
- in vitro aberration test on the mammalian chromosome (OECD 473) in Chinese hamster liver cells (CHL / IU)
- Mammalian chromosome gene mutation test (mouse lymphoma test - OECD 476) in L5178Y TK +/- 3.7.2c lymphoma cells in mice with and without metabolic activation.

**Carcinogenicity:** In accordance with Regulation (EC) No 1272/2010 (EU CLP), phosphoric acid does not meet the criteria for classification as 'carcinogenic to humans' for the following reasons:

- There are no human studies on phosphoric acid to establish a causal relationship between exposure and the development of cancer. As such, classification as Category 1A is not guaranteed.
- There are no animal experiments that show evidence that phosphoric acid is a carcinogen. Therefore, classification as category 1B is not supported by the dataset.
- There is no supporting data that would provide "limited evidence" of the carcinogenicity of phosphoric acid. None of the studies reported a positive relationship between phosphoric acid exposure and cancer due to the lack of specific data on phosphoric acid. Due to the details above, a causal interpretation based on acidity and presumed similarities to sulfuric acid does not appear to be plausible and therefore category 2 is not considered appropriate.

**Reproductive / developmental toxicity:**

**Studies on fertility:**

Rat (Sprague-Dawley [rat]) male / female

Reproductive / developmental toxicity screening:

First parent generation (P0):

NOAEL (P0) >= 500 mg / kg body weight / day)

(male / female) based on fertility

F1 generation:

NOAEL (P0) >= 500 mg / kg body weight / day (male / female) - Reproductive and developmental toxicity: In case of changes in reproductive and developmental toxicity, the effects of the test substance are not recognized during mating, conception, birth and appearance of the newborn, the body of the newborn weight and survival rate.

**General reproductive toxicity:** not indicated; Lowest effective dose / concentration.

**Development studies:**

The 10-day maternal and developmental toxicity NOAEL after oral exposure (probe) in male / female CD-1 mice was > or = 370 mg / kg body weight / day, and in male / female Wistar rats was > or = 410 mg / kg body weight / day. The test was performed according to a method similar to OECD Guideline 414 (with defects).

**CSA value:** no adverse effect (NOAEL) was observed 370 mg / kg bw / day (chronic); (mouse [common rodent species]).

**STOT (specific target organ toxicity) - single exposure / repeated exposure:**

**Oral:** A combined repeated dose toxicity study and reproductive toxicity study / sieve analysis for toxicity

development according to OECD 422 (forced-fed rats) with phosphoric acid, 2008, gives a NOAEL of 1500 mg / kg / day.

**Observed adverse effect:**

(LOAEL): (155 mg / kg bw / day) (sub chronic); (rat [common rodent species])

**Inhalation:** No reliable data available

**Dermal:** No systemic effects

**11.2 Information on other toxicological effects**

See section 12, point 12.6 of SDS. No other information available.

**SECTION 12: ECOLOGICAL INFORMATION**

**12.1 Toxicity**

**12.1.1 Acute/Prolonged toxicity to fish**

Median lethal dose with pH (96h) 3-3.25 for *Lepomis macrochirus* (no guiding principle followed).

**12.1.2 Acute / prolonged toxicity to aquatic invertebrates**

EC50 (48 h) :> 100 mg / L test material (nominal) based on: immobilization (OECD 202 - *Daphnia magna*)

NOEC (48h): 56 mg / L test mat. (nominal) based on: immobilization (95% CL not specified)

**12.1.3 Acute / prolonged toxicity to aquatic plants**

EC50 (72 h) :> 100 mg / L test material (nominal) based on: growth rate (OECD 201- *Desmodesmus subspicatus* (algae))

NOEC (72 h) :> 100 mg / L test material (nominal) based on: growth rate (OECD 201- *Desmodesmus subspicatus* (algae))

**12.1.4 Toxicity to microorganisms, e.g. bacteria**

EC50 (3 hours)> 1000 mg / L for activated sludge from mainly domestic wastewater (OECD TG 209)

**12.1.5 Chronic toxicity to aquatic organisms**

No available data on orthophosphoric acid.

**12.1.6 Toxicity to soil-dwelling organisms**

No available data on orthophosphoric acid.

**12.1.7 Toxicity to terrestrial plants**

No available data on orthophosphoric acid.

**12.1.8 Overall effect**

Affects the pH level. Increasing the phosphate concentration has a negligible effect.

**12.2 Persistence and degradability**

Not relevant for inorganic substances

**12.3 Bioaccumulative potential**

Not relevant for inorganic substances

**12.4 Mobility in soil**

No data on orthophosphoric acid.

**12.5 Results of PBT and vPvB assessment**

Not relevant for inorganic substances.

#### **12.6 Endocrine disrupting properties**

This substance does not have endocrine disrupting properties with non-target organisms as it does not meet the criteria set out in Section B of Regulation (EC) 2017/2100.

#### **12.7 Other adverse effects**

No other information identified.

### **SECTION 13: DISPOSAL CONSIDERATIONS**

#### **13.1 Waste treatment methods**

**Neutralize carefully with lime or carbonates.**

Methods of disposal: Waste generation should be avoided or minimized whenever possible. Disposal of this product, solutions and any by-products must always comply with the requirements of environmental protection and waste disposal legislation and all the requirements of regional local authorities. Dispose of excess and non-recyclable products through a licensed waste disposal contractor. Waste should not be disposed untreated in wastewater unless it fully complies with the requirements of all competent authorities.

Hazardous waste: The classification of the product may meet the criteria for hazardous waste.

European Waste Catalog (EWC):

Waste code according to EWC on waste classification: 06 01 04 \*, Waste designation: orthophosphoric acid

**Methods of disposal:** Waste generation should be avoided or minimized whenever possible. Waste must be disposed of in accordance with the applicable regulations.

**Special precautions:** This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed. Empty containers or liners may retain some product residue. Avoid spillage, run-off and contact with soil, waterways, drains and sewers.

### **SECTION 14: TRANSPORT INFORMATION**

#### **Land transport UN RTDG/ADR/RID :**

##### **14.1 UN Number or ID number**

International regulation

UN №: 1805

##### **14.2 UN proper shipping name:**

ORTHOPHOSPHORIC ACID / ICAO-Label- Corrosive

##### **14.3 Transport hazard classes**

ADR/RID: Land transport Class: 8

##### **14.4 Packing group: III**

##### **14.5 Environmental hazards:**

**Classification code: C1**

Does not pollute the environment



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**Inland waterway transport (UN RTDG/ADN(R)):**

**14.1 UN Number or ID number**

International regulation

UN №: 1805

**14.2 UN proper shipping name:**

ORTHOPHOSPHORIC ACID / ICAO-Label- Corrosive

**14.3 Land transport Class: : 8**

**14.4 Packing group: III**

**14.5 Environmental hazards:**

Classification code: C1

Does not pollute the environment

**Marine transport (UN RTDG/IMDG) / IMDG – EmS code: F-A, S-B:**

**14.1 UN Number or ID number**

International regulation

UN №: 1805

**14.2 UN proper shipping name:**

ORTHOPHOSPHORIC ACID / ICAO-Label- Corrosive

**14.3 Land transport Class: : 8**

**14.4 Packing group: III**

**14.5 Environmental hazards:**

Classification code: C1

Marine pollutant: Does not pollute the marine water

**Air transport (UN RTDG/ICAO/IATA):**

**14.1 UN Number or ID number**

International regulation

UN №: 1805

**14.2 UN proper shipping name:**

ORTHOPHOSPHORIC ACID / ICAO-Label- Corrosive

**14.3 Land transport Class: : 8**

**14.4 Packing group: III**

Passenger aircraft: FORBBIDEN

**14.5 Environmental hazards:**

Classification code: C1

Does not pollute the environment

**14.6 Special precautions for users:: no available information**

**14.7 Maritime transport in bulk according to IMO instrument:** Not applicable

## SECTION 15: REGULATORY INFORMATION

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

**Seveso III:** Orthophosphoric acid is not a SEVESO substance, not an ozone depleting substance and not a persistent organic pollutant.

National regulations: Water hazard class 1 (Germany)

### 15.2 Chemical safety assessment

A chemical safety assessment has been carried out for this substance. See Annex for exposure scenarios.

## SECTION 16: OTHER INFORMATION

### 16.1 Hazard statement

H290- May be corrosive to metals

H302- Harmful if swallowed

H314- Causes severe skin burns and eye damage.

### 16.2 Other hazards:

Not considered PBT or vPvB

**16.3 Additional information:** Provide adequate information, instructions and training to operators. Conduct regular training for all transport staff (according to ADR, Chapter 1.3).

**16.4 Revision of the document:** The current version of the SDS is completely updated. It replaces version 2 / March 2015.

### 16.5 Abbreviations:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

EC: European Community

EN: European standard

ERC: Category for release into the environment

EU: European Union

GHS: Globally Harmonized System

H3PO4: Orthophosphoric acid

ICAO: International Civil Aviation Organization

IMDG: International Maritime Regulations for the Transport of Dangerous Goods by Sea

IATA: International Air Transport Association

LC50: Medium lethal dose

DNEL: Predictable no-effect level

NOAEC / NOAEL: Concentration / level of unobserved adverse effect

OECD: Organization for Economic Co-operation and Development

PBT: Persistence, bioaccumulation, toxicity

vPvB: High persistence and strong bioaccumulation





**AGROPOLYCHIM** EXTENDED PRODUCT SAFETY DATA SHEET prepared in accordance with Annex II to REACH Regulation (EC) № 1907/2006 as amended by Regulation (EU) 2020/878

Version 3.0/EN

Revision Date: March 2022

PNEC: Predictable no-effect exposure concentration

PROC: Process category

PVC: Polyvinyl chloride

STEL: Short-term exposure limit

SU: Sector of use

**Note:** The above regulatory information only indicates the basic product-specific rules described in the safety data sheet. The consumer's attention is drawn to the possible existence of additional provisions that supplement these provisions. See all applicable national, international and local regulations or regulations.

**Disclaimer:** This sheet supplements the technical sheets but does not replace them. The information provided is based on our knowledge of the product at the time of publication and is given in good faith. In addition, the consumer's attention is drawn to the possible risk arising from the use of the product for any use other than that for which it is intended. This in no way exempts the consumer from knowing and applying all the provisions controlling his activity. Only he will take responsibility for taking precautions regarding the use of the product. The purpose of all the above-mentioned mandatory provisions is to help the consumer to fulfill his obligations regarding the use of dangerous products. This information should not be considered exhaustive. This does not relieve the consumer of his responsibility to ensure that obligations other than those relating to the storage and use of the product can be applied.

## ANNEX: EVALUATION OF EXPOSURE SCENARIOS

### 1. Overview of the exposure scenarios:

Number	ES code	Name of the exposure scenario (ES)	Sector of use	Process category
1	ES 2	Manufacture of substance; Liquid	SU3	ERC 1; PROC 1; 2; 3; 8b; 15
2	ES 3	Formulation or re-packing - Formulation into mixture; Solid	SU3	ERC 2; PROC 1; 2; 3; 8b; 15
3	ES 5	Formulation or re-packing - Formulation into mixture; Liquid	SU3	ERC 2; PROC 1; 2; 3; 8b; 15
4	ES 12	Use at industrial sites - Use of intermediate; Solid	SU 3; SU 8; SU 9	ERC 6a; PROC 1; 2; 3; 14; 15
5	ES 14	Use at industrial sites - Use of intermediate; Liquid	SU 3; SU 8; SU 9	ERC 6a; PROC 1; 2; 3; 8b; 14; 15

#### Sector of Use:

**SU 3** Industrial uses: Uses of substances as such or in mixtures at industrial sites

**SU 8** Manufacture of bulk, large scale chemicals (including petroleum products)

**SU 9** Manufacture of fine chemicals

#### 1.1 Exposure scenario ES2: Manufacture:

This scenario is described by the following combinations of process descriptors. The relevant contributing scenarios are described in the relevant subchapters.

<b>Short Title</b>	Manufacture (ES 2)
<b>Systematic name based on a use descriptor</b>	ERC 1; PROC 1, 2, 3, 8b, 15
<b>Name of the complementary ERC-environmental scenario</b>	ERC 1 Manufacture of substance
<b>PROC-Process categories corresponding to the workers' exposure scenarios</b>	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8b - Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC 15 - Use as laboratory reagent

## 1.2. Conditions of use, affecting exposure

### 1.2.1 Contributing scenario (CS1) for environmental exposure control for ERC 1

#### 1.2.1.1 Conditions of use

Daily amount per site ≤ 31667 tonnes/day
Annual amount per site ≤ 9500000 tonnes/year
Municipal sewage treatment plant is assumed.
Assumed domestic sewage treatment plant flow ≥ 2000 m <sup>3</sup> /day
Receiving surface water flow ≥ 18000 m <sup>3</sup> /day

#### 1.2.2 Contributing scenario (CS2) for control of exposure for workers: PROC 1

Covers concentrations up to 100.0 %. Measured concentration >25%
Covers use up to 8.0 h/day
Physical state: Liquid
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 1.2.2.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

##### Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.04 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR < 0.01
Inhalation, systemic, acute	0.08 mg/m <sup>3</sup> (MEASE 1.02.01)	
Inhalation, local, long term	0.04 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.04
Inhalation, local, acute	0.08 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.04
Combined routes, systemic, long-term		RCR < 0.01

#### 1.2.3 Contributing scenario (CS3) for control of exposure for workers: PROC 2

Covers concentrations up to 100.0 %
Covers use up to 8.0 h/day
Physical state: Liquid
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation; Inhalation - minimum efficiency of
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 1.2.3.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.401 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.037
Inhalation, local, long term	0.401 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.401
Inhalation, local, acute	0.802 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.401
Combined routes, systemic, long-term		RCR = 0.037

Covers concentrations up to 100.0 %
Covers use up to 8.0 h/day
Physical state: Liquid
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation; Inhalation - minimum efficiency of
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.

Indoor use

#### 1.2.4 Contributing scenario (CS4) for control of exposure for workers: PROC 3

##### 1.2.4.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.12 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.011
Inhalation, local, long term	0.12 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.12
Inhalation, local, acute	0.24 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.12
Combined routes, systemic, long-term		RCR = 0.011

#### 1.2.5 Contributing scenario (CS6) for control of exposure for workers: PROC 8b

Covers concentrations up to 100.0 %
Covers use up to 8.0 h/day
Physical state: Liquid
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation; Inhalation - minimum efficiency of
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use

##### 1.2.5.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.601 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.056

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, local, long term	0.601 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.601
Inhalation, local, acute	1.202 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.601
Combined routes, systemic, long-term		RCR = 0.056

#### 1.2.6 Contributing scenario (CS8) for control of exposure for workers: PROC 15

Covers concentrations up to 100.0 %
Covers use up to 8.0 h/day
Physical state: Liquid
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation; Inhalation - minimum efficiency of
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use

##### 1.2.6.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.2 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.019
Inhalation, local, long term	0.2 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.2
Inhalation, local, acute	0.4 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.2
Combined routes, systemic, long-term		RCR = 0.019

#### 2.1 Exposure scenario 3: Formulation or re-packing - Formulation into mixture; Solid, low dustiness

This scenario is described by the following combinations of process descriptors. The relevant contributing scenarios are described in the relevant subchapters.

<b>Short Title</b>	Formulation into mixture (ES 3)
<b>Systematic name based on a use descriptor</b>	ERC 2; PROC 1, 2, 3, 8b, 15
<b>Name of the complementary ERC-environmental scenario</b>	ERC 2 Formulation into mixture
<b>PROC-Process categories corresponding to the workers` exposure scenarios</b>	<p>PROC 1: Use in closed process, no likelihood of exposure.</p> <p>PROC 2: Use in closed, continuous process with occasional controlled exposure.</p> <p>PROC 3: Use in closed batch process (synthesis or formulation).</p> <p>PROC 8b - Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC 15 - Use as laboratory reagent</p>

## 2.2. Conditions of use, affecting exposure

### 2.2.1 Contributing scenario (CS1) for environmental exposure control for ERC 2

#### 2.2.1.1 Conditions of use

Daily amount per site <= 16667 tonnes/day
Annual amount per site <= 5000000 tonnes/year
Municipal sewage treatment plant is assumed.
Assumed domestic sewage treatment plant flow >= 2000 m3/day
Receiving surface water flow >= 18000 m3/day

#### 2.2.2 Contributing scenario (CS2) for control of exposure for workers: PROC 1

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 2.2.2.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

##### Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, acute	0.028 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.014
Dermal, local, long term	1.98E-3 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	1.98E-3 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

##### Remarks on exposure dataset obtained with ECETOC TRA

The vapour pressure at operating temperature (40°C) used for the calculation is 14.83 Pa.

#### 2.2.3 Contributing scenario (CS3) for control of exposure for workers: PROC 2

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 2.2.3.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

##### Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01



Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, acute	0.028 mg/m <sup>3</sup> (TRA Workers)	
Inhalation, local, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, acute	0.028 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.014
Dermal, local, long term	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

#### 2.2.4 Contributing scenario (CS4) for control of exposure for workers: PROC 3

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 2.2.4.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

##### Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.07
Inhalation, local, acute	0.28 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.14
Dermal, local, long term	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

#### 2.2.5 Contributing scenario (CS8) for control of exposure for workers: PROC 8b

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 2.2.5.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.07
Inhalation, local, acute	0.28 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.14
Dermal, local, long term	0.2 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	0.2 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

#### 2.2.6 Contributing scenario (CS10) for control of exposure for workers: PROC 15

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well-maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.

Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 2.2.6.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.07
Inhalation, local, acute	0.28 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.14
Dermal, local, long term	0.02 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	0.02 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

#### 3.1 Exposure scenario 12: Use at industrial sites - Use of intermediate; Solid, low dustiness

This scenario is described by the following combinations of process descriptors. The relevant contributing scenarios are described in the relevant subchapters.

Short Title	Use of intermediate (ES 12)
Systematic name based on a use descriptor	ERC 2; PROC 1, 2, 3, 14, 15
Name of the complementary ERC-environmental scenario	ERC 6a Use of intermediate

<b>PROC-Process categories corresponding to the workers` exposure scenarios</b>	<p>PROC 1: Use in closed process, no likelihood of exposure.</p> <p>PROC 2: Use in closed, continuous process with occasional controlled exposure.</p> <p>PROC 3: Use in closed batch process (synthesis or formulation).</p> <p>PROC 14 - Tableting, compression, extrusion, pelettisation, granulation; Solid, low dustiness</p> <p>PROC 15 - Use as laboratory reagent</p>
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### 3.2. Conditions of use, affecting exposure

#### 3.2.1 Contributing scenario (CS1) for environmental exposure control for ERC 6a

##### 3.2.1.1 Conditions of use

Daily amount per site <= 3333 tonnes/day
Annual amount per site <= 1000000 tonnes/year
Municipal sewage treatment plant is assumed.
Assumed domestic sewage treatment plant flow >= 2000 m3/day
Receiving surface water flow >= 18000 m3/day

##### 3.2.2 Contributing scenario (CS2) for control of exposure for workers: PROC 1

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

##### 3.2.2.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, acute	0.028 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.014
Dermal, local, long term	1.98E-3 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	1.98E-3 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

#### **Remarks on exposure dataset obtained with ECETOC TRA**

The vapour pressure at operating temperature (40°C) used for the calculation is 14.83 Pa.

### **3.2.3 Contributing scenario (CS3) for control of exposure for workers: PROC 2**

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### **3.2.3.1 Exposure concentrations and risks for workers**

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### **Exposure concentrations and risks for workers:**

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, systemic, acute	0.028 mg/m <sup>3</sup> (TRA Workers)	
Inhalation, local, long term	7E-3 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, acute	0.028 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.014

Route of exposure and type of effects	Exposure concentration	Risk quantification
Dermal, local, long term	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

### 3.2.4 Contributing scenario (CS4) for control of exposure for workers: PROC 3

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 3.2.4.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

#### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.07
Inhalation, local, acute	0.28 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.14
Dermal, local, long term	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	0.04 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

### 3.2.5 Contributing scenario (CS9) for control of exposure for workers: PROC 14

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

### 3.2.5.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

#### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.07
Inhalation, local, acute	0.28 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.14
Dermal, local, long term	0.2 mg/cm <sup>2</sup> (TRA Workers)	

### 3.2.6 Contributing scenario (CS10) for control of exposure for workers: PROC 15

Covers concentrations up to 100.0 %; measured concentration >25%
Solid, low dustiness
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

### 3.2.6.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

#### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR < 0.01
Inhalation, local, long term	0.07 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.07
Inhalation, local, acute	0.28 mg/m <sup>3</sup> (TRA Workers)	RCR = 0.14
Dermal, local, long term	0.02 mg/cm <sup>2</sup> (TRA Workers)	
Dermal, local, acute	0.02 mg/cm <sup>2</sup> (TRA Workers)	
Combined routes, systemic, long-term		RCR < 0.01

### 4.1 Exposure scenario 14: Use at industrial sites - Use of intermediate; Liquid

This scenario is described by the following combinations of process descriptors. The relevant contributing scenarios are described in the relevant subchapters.

<b>Short Title</b>	Use of intermediate (ES 14)
<b>Systematic name based on a use descriptor</b>	ERC 2; PROC 1, 2, 3, 14, 15
<b>Name of the complementary ERC-environmental scenario</b>	ERC 6a Use of intermediate
<b>PROC-Process categories corresponding to the workers' exposure scenarios</b>	<p>PROC 1: Use in closed process, no likelihood of exposure.</p> <p>PROC 2: Use in closed, continuous process with occasional controlled exposure.</p> <p>PROC 3: Use in closed batch process (synthesis or formulation).</p> <p>PROC 14 - Tableting, compression, extrusion, pelettisation, granulation; Solid, low dustiness</p> <p>PROC 15 - Use as laboratory reagent</p>



#### 4.2. Conditions of use, affecting exposure

##### 4.2.1 Contributing scenario (CS1) for environmental exposure control for ERC 6a

###### 4.2.1.1 Conditions of use

Daily amount per site ≤ 3333 tonnes/day
Annual amount per site ≤ 1000000 tonnes/year
Municipal sewage treatment plant is assumed.
Assumed domestic sewage treatment plant flow ≥ 2000 m <sup>3</sup> /day
Receiving surface water flow ≥ 18000 m <sup>3</sup> /day

##### 4.2.2 Contributing scenario (CS2) for control of exposure for workers: PROC 1

Covers concentrations up to 100.0 %; measured concentration >25%
Liquid
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

###### 4.2.2.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (RCR) are reported in the following table.

###### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.04 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR < 0.01
Inhalation, systemic, acute	0.08 mg/m <sup>3</sup> (MEASE 1.02.01)	
Inhalation, local, long term	0.04 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.04
Inhalation, local, acute	0.08 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.04
Combined routes, systemic, long-term		RCR < 0.01

##### 4.2.3 Contributing scenario (CS3) for control of exposure for workers: PROC 2

Covers concentrations up to 100.0 %; measured concentration >25%
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Liquid
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 4.2.3.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.401 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.037
Inhalation, local, long term	0.401 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.401
Inhalation, local, acute	0.802 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.401
Combined routes, systemic, long-term		RCR = 0.037

#### 4.2.4 Contributing scenario (CS4) for control of exposure for workers: PROC 3

Covers concentrations up to 100.0 %; measured concentration >25%
Liquid
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 3.2.4.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

**Exposure concentrations and risks for workers:**

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.12 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.011
Inhalation, local, long term	0.12 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.12
Inhalation, local, acute	0.24 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.12
Combined routes, systemic, long-term		RCR = 0.011

**4.2.5 Contributing scenario (CS9) for control of exposure for workers: PROC 14**

Covers concentrations up to 100.0 %; measured concentration >25%
Liquid
Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

**4.2.5.1 Exposure concentrations and risks for workers**

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

**Exposure concentrations and risks for workers:**

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.2 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.019
Inhalation, systemic, acute	0.4 mg/m <sup>3</sup> (MEASE 1.02.01)	
Inhalation, local, long term	0.2 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.2
Inhalation, local, acute	0.4 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.2
Combined routes, systemic, long-term		RCR = 0.019

**4.2.6 Contributing scenario (CS10) for control of exposure for workers: PROC 15**

Covers concentrations up to 100.0 %; measured concentration >25%
Liquid

Covers use up to 8.0 h/day
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Wear suitable gloves tested to EN374.; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.
Indoor use
Assumes process temperature up to 40.0 °C

#### 4.2.6.1 Exposure concentrations and risks for workers

The exposure concentrations and risk characterization ratios (**RCR**) are reported in the following table.

##### Exposure concentrations and risks for workers:

Route of exposure and type of effects	Exposure concentration	Risk quantification
Inhalation, systemic, long term	0.2 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.019
Inhalation, local, long term	0.2 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.2
Inhalation, local, acute	0.4 mg/m <sup>3</sup> (MEASE 1.02.01)	RCR = 0.2
Combined routes, systemic, long-term		RCR = 0.019