

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 25.07.2019

Version 1.6

SECTION 1. Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

Catalogue No.	845113
Product name	Phosphoryl chloride Msynth®plus
REACH Registration Number	01-2119433306-46-xxxx
CAS-No.	10025-87-3

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

Identified uses	Pharmaceutical production, Chemical for synthesis For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.com).
-----------------	--

1.3 Details of the supplier of the safety data sheet

Company	Merck KGaA * 64271 Darmstadt * Germany * Phone: +49 6151 72-0
Responsible Department	LS-QHC * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number **Please contact the regional company representation in your country.****SECTION 2. Hazards identification****2.1 Classification of the substance or mixture**
Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4, Oral, H302
Acute toxicity, Category 2, Inhalation, H330
Skin corrosion, Category 1A, H314
Specific target organ toxicity - repeated exposure, Category 1, Inhalation, Respiratory Tract, H372

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

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Danger

Hazard statements

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H330 Fatal if inhaled.

H372 Causes damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.

EUH014 Reacts violently with water.

EUH029 Contact with water liberates toxic gas.

Precautionary statements

Prevention

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

Response

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

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a 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.

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Reduced labelling (≤125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H314 Causes severe skin burns and eye damage.

H330 Fatal if inhaled.

H372 Causes damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.

EUH014 Reacts violently with water.

EUH029 Contact with water liberates toxic gas.

Precautionary statements

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

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

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

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.
P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Index-No. 015-009-00-5

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	POCl ₃	Cl ₃ OP (Hill)
Index-No.	015-009-00-5	
EC-No.	233-046-7	
Molar mass	153,33 g/mol	

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical name (Concentration)

CAS-No.	Registration number	Classification
		phosphoryl trichloride (>= 50 % - <= 100 %)
10025-87-3	01-2119433306-46-xxxx	Acute toxicity, Category 4, H302 Acute toxicity, Category 2, H330 Skin corrosion, Category 1A, H314 Specific target organ toxicity - repeated exposure, Category 1, H372
		phosphorus trichloride (>= 0,1 % - < 1 %)
7719-12-2	*)	Acute toxicity, Category 2, H330 Acute toxicity, Category 2, H300 Specific target organ toxicity - repeated exposure, Category 2, H373 Skin corrosion, Category 1A, H314

*) A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

3.2 Mixture

Not applicable

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.
Product name

845113
Phosphoryl chloride Msynth®plus

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice

First aider needs to protect himself.

After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed

conjunctivitis, Pain, Diarrhoea, Vomiting

Risk of corneal clouding.

Irritation and corrosion, Cough, Shortness of breath

Risk of blindness!

4.3 Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media

Water, Foam

5.2 Special hazards arising from the substance or mixture

Not combustible.

May not get in touch with:

Water

Caution! in contact with water product releases:

hydrochloric acid

Ambient fire may liberate hazardous vapours.

Fire may cause evolution of:

Oxides of phosphorus, Hydrogen chloride gas

5.3 Advice for firefighters

Special protective equipment for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

Further information

Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Unsuitable cleaning agents Water

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Keep workplace dry. Do not allow product to come into contact with water.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Dry.

Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.

Recommended storage temperature see product label.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.
Product name

845113
Phosphoryl chloride Msynth®plus

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection

Tightly fitting safety goggles

Hand protection

splash contact:

Glove material:	butyl-rubber
Glove thickness:	0,7 mm
Break through time:	120 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 898 Butoject® (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment

Acid-resistant protective clothing

Respiratory protection

required when vapours/aerosols are generated.

Recommended Filter type: Filter B-(P2)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer.

These measures have to be properly documented.

Environmental exposure controls

Do not let product enter drains.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	liquid
Colour	colourless
Odour	stinging
Odour Threshold	No information available.
pH	ca. 1,0 at 5 g/l 25 °C
Melting point	1 - 2 °C
Boiling point/boiling range	105,3 °C at 1.013 hPa
Flash point	Not applicable
Evaporation rate	No information available.
Flammability (solid, gas)	Not applicable
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapour pressure	36 hPa at 20 °C
Relative vapour density	No information available.
Density	1,68 g/cm ³ at 20 °C DIN 51757
Relative density	No information available.
Water solubility	at 20 °C Risk of violent reaction.
Partition coefficient: n-octanol/water	No information available.
Auto-ignition temperature	No information available.
Decomposition temperature	No information available.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

Viscosity, dynamic 1,112 mPa.s
at 22 °C

Explosive properties Not classified as explosive.

Oxidizing properties none

9.2 Other data

Ignition temperature Not applicable

SECTION 10. Stability and reactivity

10.1 Reactivity

Reacts violently with water.

10.2 Chemical stability

In case of decomposition in closed containers and tubes risk of bursting due to buildup of overpressure.
sensitive to moisture

10.3 Possibility of hazardous reactions

Risk of ignition or formation of inflammable gases or vapours with:

Zinc, carbon disulfide, boron triiodide, Organic Substances, chromyl chloride

A risk of explosion and/or of toxic gas formation exists with the following substances:

Dimethylformamide, Alkali metals, dimethyl sulfoxide

Water, Possible formation of:

Hydrogen chloride gas, phosphine

Violent reactions possible with:

Acetone

10.4 Conditions to avoid

Moisture.

10.5 Incompatible materials

no information available

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity

Symptoms: Pain, Vomiting, Diarrhoea, If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

Acute inhalation toxicity

LC50 Rat: 0,303 mg/l; 4 h ; dust/mist
OECD Test Guideline 403

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract, After a latency period:, Inhalation may lead to the formation of oedemas in the respiratory tract.

Acute dermal toxicity

This information is not available.

Skin irritation

Rabbit

Result: Causes severe burns.

OECD Test Guideline 404

Causes severe burns.

Eye irritation

Rabbit

Result: Causes burns.

OECD Test Guideline 405

Causes serious eye damage.

Risk of blindness!

Risk of corneal clouding. conjunctivitis

Sensitisation

This information is not available.

Germ cell mutagenicity

This information is not available.

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

Specific target organ toxicity - single exposure

This information is not available.

Specific target organ toxicity - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

Exposure routes: Inhalation

Target Organs: Respiratory Tract

Aspiration hazard

This information is not available.

11.2 Further information

Decomposition of the substance with tissue moisture.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to fish

LC50 Danio rerio (zebra fish): > 1.000 mg/l; 96 h

OECD Test Guideline 203

The value is given in analogy to the following substances: phosphorus trichloride

Toxicity to daphnia and other aquatic invertebrates

static test EC50 Daphnia magna (Water flea): 35,4 mg/l; 48 h

OECD Test Guideline 202

Toxicity to algae

static test EC50 Desmodesmus subspicatus (green algae): 29,71 mg/l; 72 h

OECD Test Guideline 201

static test NOEC Desmodesmus subspicatus (green algae): 12,5 mg/l; 72 h

OECD Test Guideline 201

Toxicity to bacteria

Respiration inhibition EC50 activated sludge: 9.450 mg/l; 3 h

ISO 8192

The value is given in analogy to the following substances: phosphorus trichloride

12.2 Persistence and degradability

Biodegradability

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

12.3 Bioaccumulative potential

No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects

Additional ecological information

Product reacts with water.

Depending on the concentration, phosphorus compounds may contribute to the eutrophication of water supplies.

Discharge into the environment must be avoided.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth@plus

SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 UN number	UN 1810
14.2 Proper shipping name	PHOSPHORUS OXYCHLORIDE
14.3 Class	6.1 (8)
14.4 Packing group	I
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes
Tunnel restriction code	C/D

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 UN number	UN 1810
14.2 Proper shipping name	PHOSPHORUS OXYCHLORIDE
14.3 Class	6.1 (8)
14.4 Packing group	
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes Not permitted for transport

Sea transport (IMDG)

14.1 UN number	UN 1810
14.2 Proper shipping name	PHOSPHORUS OXYCHLORIDE
14.3 Class	6.1 (8)
14.4 Packing group	I
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes
EmS	F-A S-B

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

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

Not relevant

SECTION 15. Regulatory information

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

EU regulations

Major Accident Hazard SEVESO III
Legislation ACUTE TOXIC
H2
Quantity 1: 50 t
Quantity 2: 200 t

SEVESO III
OTHER HAZARDS
O1
Quantity 1: 100 t
Quantity 2: 500 t

SEVESO III
OTHER HAZARDS
O3
Quantity 1: 50 t
Quantity 2: 200 t

Occupational restrictions Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Regulation (EC) No 1005/2009 on substances not regulated
that deplete the ozone layer

Regulation (EC) No 850/2004 of the not regulated
European Parliament and of the Council of 29
April 2004 on persistent organic pollutants
and amending Directive 79/117/EEC

Substances of very high concern (SVHC) This product does not contain
substances of very high concern
according to Regulation (EC) No
1907/2006 (REACH), Article 57
above the respective regulatory
concentration limit of $\geq 0.1\%$
(w/w).

National legislation

Storage class 6.1B

15.2 Chemical safety assessment

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 845113
Product name Phosphoryl chloride Msynth®plus

For this product a chemical safety assessment was not carried out.

SECTION 16. Other information

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

H300	Fatal if swallowed.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.

Training advice

Provide adequate information, instruction and training for operators.

Labelling

Hazard pictograms



Signal word

Danger

Hazard statements

H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H330 Fatal if inhaled.
H372 Causes damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.
EUH014 Reacts violently with water.
EUH029 Contact with water liberates toxic gas.

Precautionary statements

Prevention

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

Response

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

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a 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.

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.
Product name

845113
Phosphoryl chloride Msynth®plus

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.