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

1.1 Product identifier
Trade name Phosphorus(V) oxychloride

Stock number: 11847
CAS Number: 10025-87-3
EC number: 233-046-7
Index number: 015-009-00-5

1.2 Relevant identified uses of the substance or mixture and uses advised against. No further relevant information available.

Identified use: SU24 Scientific research and development

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier: Thermo Fisher (Kandel) GmbH
Zeppelinstr. 7 b
76185 Karlsruhe / Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300
Email: tech@alfa.com
www.alfa.com
Informing department: Product safety Tel + +049 (0) 7275 988687-0

1.4 Emergency telephone number:
Carechem 24: +44 (o) 1235 239 670 (Multi-language emergency number)
Poison Information Center Mainz
www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

GHS05 skull and crossbones
GHS06 health hazard
GHS08 no health hazard

Acute Tox.2 H330 Fatal if inhaled.
STOT RE 1 H372 Causes damage to the lung, the kidneys, the liver and the musculoskeletal system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

SKIN Corr. 1A H314 Causes severe skin burns and eye damage.

Additional information:
EUH014 Reacts violently with water.
EUH029 Contact with water liberates toxic gas.

2.2 Label elements

Label according to Regulation (EC) No 1272/2008 The substance is classified and labelled according to the CLP regulation.

Hazard pictograms

GHS05 GHS06 GHS08

Signal word Danger

Hazard statements
H302 Harmful if swallowed.
H330 Fatal if inhaled.
H314 Causes severe skin burns and eye damage.
H372 Causes damage to the lung, the kidneys, the liver and the musculoskeletal system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

Precautionary statements
P260 Do not breathe dusts or mists.
P303+P361+P353 IF ON SKIN (or hair): Take off 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.
P320 Specific treatment is urgent (see on this label).
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Substances

CAS# Designation: 10025-87-3 Phosphorus(V) oxychloride
Concentration: 500%
Identification number(s):
EC number: 233-046-7
Index number: 015-009-00-5
SECTION 4: First aid measures
4.1 Description of first aid measures
General information
Instantly remove any clothing soiled by the product.
In case of irregular breathing or respiratory arrest provide artificial respiration.
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
Seek immediate medical advice.
After skin contact
Instantly wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult doctor.
After swallowing
Seek medical treatment.
4.2 Most important symptoms and effects, both acute and delayed
Causes severe skin burns.
Harmful if swallowed.
Fatal if inhaled.
Seek immediate medical advice.
4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

SECTION 5: Firefighting measures
5.1 Extinguishing media
Suitable extinguishing agents
Product is not flammable. Use fire-fighting measures that suit the surrounding fire.
For safety reasons unsuitable extinguishing agents
Water.
5.2 Special hazards arising from the substance or mixture
Reacts violently with water
If this product is involved in a fire, the following can be released:
Hydrogen chloride (HCl)
Phosphorus oxides.
5.3 Advice for firefighters
Protective equipment:
Wear self-contained breathing apparatus.
Wear full protective suit.

SECTION 6: Accidental release measures
6.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.
6.2 Environmental precautions:
Do not allow material to be released to the environment without proper governmental permits.
6.3 Methods and material for containment and cleanup
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralising agent.
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents.
Prevention of secondary hazards:
No special measures required.
6.4 Reference to other sections
See Section 7 for information on safe handling.
See section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage
7.1 Precautions for safe handling
Handle under dry protective gas.
Keep containers tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation/exhaustion at the workplace.
Open and handle container with care.
Information about protection against explosions and fires:
The product is not flammable.
7.2 Conditions for safe storage, including any incompatibilities
Store away from amines.
Store away from water.
Do not store together with acids.
Do not store with organic materials.
Store away from alcohols.
Further information about storage conditions:
This product is moisture sensitive.
Protect from humidity and keep away from water.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Store in a locked cabinet or with access restricted to technical experts or their assistants.
7.3 Specific end use(s)
No further relevant information available.

SECTION 8: Exposure controls/personal protection
Additional information about design of technical systems:
Property operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
8.1 Control parameters
Components with critical values that require monitoring at the workplace:
10025-87-3 Phosphorus(V) oxychloride (100.0%)
AGW (Germany) Long-term value: 0,13 mg/m³, 0,02 ppm
REL (USA) Short-term value: 3 mg/m³, 0,5 ppm
TLV (USA) Long-term value: 0,63 mg/m³, 0,1 ppm
Additional information: No data.

(Contd. on page 3)
2.5 Exposure controls

General protective and hygienic measures

The usual precautionary measures should be adhered to in handling the chemicals.

Keep away from foodstuffs, beverages and food.

Instantly remove any soiled and impregnated garments.

Wash hands during breaks and at the end of the work.

Store protective clothing separately.

Avoid contact with the eyes and skin.

Maintain an ergonomically appropriate working environment.

Breathing equipment: Use self-contained respiratory protective device in emergency situations.

Recommended filter device for short term use:

Use a respirator with multi-purpose combination (US) or type ABEK (EN 14387) as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).

Protection of hands:

Check protective gloves prior to each use for their proper condition.

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Material of gloves: Nitrile rubber, NBR

Penetration time of glove material (in minutes): Not determined

Glove thickness: 0.4 mm

Eye protection:

Tightly sealed safety glasses.

Full face protection:

Safety glasses with side shields / NIOSH (US) or EN 166 (EU)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance: Liquid

Odour: Pungent

Odour threshold: Not determined

pH-value: Not determined

Change in condition

Melting point/freezing point: 1.2 °C

Initial boiling point and boiling range: 105.3 °C

Sublimation temperature / start: Not determined

Inflammability (solid, gaseous): Not determined

Ignition temperature: Not determined

Decomposition temperature: Not determined

Self-inflammability: Not determined

Explosive properties: Not determined

Critical values for explosion:

Lower: Not determined

Upper: Not determined

Steam pressure at 20 °C: 36 hPa

Density at 20 °C: 1.685 g/cm³

Relative density: Not determined

Evaporation rate: Not determined

Solubility in / Miscibility with:

Water: Reacts violently

Partition coefficient: n-octanol/water: Not determined

Viscosity:

Dynamic: Not determined

Kinematic: Not determined

9.2 Other information

No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity

Reacts violently with water.

10.2 Chemical stability

Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions

Contact with water evolves corrosive fumes.

Reacts violently with water.

10.4 Conditions to avoid

No further relevant information available.

10.5 Incompatible materials:

Acids

Organic materials

Alcohols

Amines

Water/moisture

10.6 Hazardous decomposition products:

Hydrogen chloride (HCl)

Phosphorus oxides (e.g. P2O5)

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Harmful if swallowed.

Fatal if inhaled.

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

Harmful if swallowed.

Fatal if inhaled.

LD/LC50 values that are relevant for classification:

Oral: LC50 126 mg/kg (rat)

Inhalation: LC50 32 ppm/4H (rat)

Skin irritation or corrosion:

Causes severe skin burns

Causes severe skin burns and eye damage.

(Contd. on page 4)
44.0

Eye irritation or corrosion:
Causes serious eye damage.

Causes severe skin burns and eye damage.

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

Germ cell mutagenicity: No effects known.

Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

Reproductive toxicity: No effects known.

Specific target organ system toxicity - repeated exposure:
Causes damage to the lung, the kidneys, the liver and the musculoskeletal system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

Specific target organ system toxicity - single exposure: No effects known.

Aspiration hazard: No effects known.

Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

Harmful if swallowed.

SECTION 12: Ecological information

12.1 Toxicity
Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability: No further relevant information available.

12.3 Bioaccumulative potential: No further relevant information available.

12.4 Mobility in soil: No further relevant information available.

Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.
Water hazard class 1 (Self-assessment): slight hazards for water.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.

12.5 Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

12.6 Other adverse effects: No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Recommendation
Hand over to disposers of hazardous waste.
Must be specially treated under adherence to official regulations.
Consult state, local or national regulations for proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

UN-Number
ADR, IMDG, IATA

UN1810

14.2 UN proper shipping name

ADR
IMDG, IATA

1810 PHOSPHORUS OXYCHLORIDE

PHOSPHORUS OXYCHLORIDE

14.3 Transport hazard class(es)

ADR

Class
6.1 (TC3) Toxic substances.

Label
6.1+8

IMDG

Class
8 Corrosive substances.

Label
6.1/8

IATA

Class
8 Corrosive substances.

Label
6.1 (8)

Packing group
ADR, IMDG, IATA

1

14.5 Environmental hazards:
Not applicable.

14.6 Special precautions for user

Kemler Number:

x668

EMS Number:

F-A,S-B

Segregation groups:

Acids

Stowage Category:

D

Stowage Code:

SW2 Clear of living quarters.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code:

Not applicable.

Transport/Additional information:

ADR

Excepted quantities (EQ): E0

Limited quantities (LQ): 0

Excepted quantities (EQ): Code: E0

Transport category: Not permitted as Excepted Quantity
Safety data sheet
according to 1907/2006/EC, Article 31

Trade name Phosphorus(V) oxychloride

(Contd. of page 4)

Tunnel restriction code C/D
IMDG
Limited quantities (LQ) 0
Excepted quantities (EQ) Code: E0
Not permitted as Excepted Quantity
UN "Model Regulation": UN 1810 PHOSPHORUS OXYCHLORIDE, 6.1 (8), 1

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Australian Inventory of Chemical Substances Substance is listed.
Standard for the Uniform Scheduling of Medicines and Poisons Substance is not listed.
Directive 2012/18/EU Named dangerous substances - ANNEX I Substance is not listed.
Seveso category H2 ACUTE TOXIC
O3 Substances or mixtures with hazard statement EUH029
Qualifying quantity (tonnes) for the application of lower-tier requirements 50 t
Qualifying quantity (tonnes) for the application of upper-tier requirements 200 t
REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 3
National regulations
Information about limitation of use: Employment restrictions concerning young persons must be observed. For use only by technically qualified individuals.
Classification according to VbF: Not applicable
UN "Model Regulation": UN 1810 PHOSPHORUS OXYCHLORIDE, 6.1 (8), 1

SECTION 16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety and Health Administration (USA)
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Acute Tox. 4: Acute toxicity – Category 4
Acute Tox. 2: Acute toxicity – Category 2
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1