

# Safety Data Sheet

## Trichlorsilane

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878  
 Reference number: D-HCL3SI-142  
 Issue date: 8/14/2023 Version: 0.0

### Danger



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

### 1.1. Product identifier

Trade name : Trichlorsilane  
 SDS no : D-HCL3SI-142  
 Other means of identification : Trichlorsilane  
 CAS-No. : 10025-78-2  
 EC-No. : 233-042-5  
 EC Index-No. : 014-001-00-9  
 REACH registration No : 01-2119494046-35  
 Chemical formula : HCL3Si

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

Relevant identified uses : Industrial use. Perform risk assessment prior to use.  
 Test gas/Calibration gas.  
 Chemical reaction / Synthesis.  
 Use for manufacture of electronic/photovoltaic components.  
 Laboratory use.  
 Attention: These products must not be applied to humans or animals unless they are expressly designated as medical or medicinal gases!.

Uses advised against : Consumer use.  
 Uses other than those listed above are not supported, contact your supplier for more information on other uses.

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

Messer Industriegase GmbH  
 Messer- Platz 1  
 D - 65812 Bad Soden am Taunus  
 Germany  
 T +49 (0) 6196 7760-200 - F +49 (0) 6196 7760-280  
[SDB.de@messergroup.com](mailto:SDB.de@messergroup.com) - [www.messer.de](http://www.messer.de)

### 1.4. Emergency telephone number

Emergency telephone number : Messer Produktionsgesellschaft mbH Salzgitter, +49 (0) 5341 21-9333, erreichbar Montags 0:00 bis Sonntags 24:00

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Flammable liquids, Category 1	H224
	Substances and Mixtures which, in contact with water, emit flammable gases, Category 1	H260
Health hazards	Acute toxicity (inhal.), Category 3	H331
	Acute toxicity (oral), Category 4	H302
	Skin corrosion/irritation, Category 1, Sub-Category 1A	H314

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Serious eye damage/eye irritation, Category 1

H318

### 2.2. Label elements

#### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Hazard statements (CLP)

: H314 - Causes severe skin burns and eye damage.  
H224 - Extremely flammable liquid and vapour.  
H260 - In contact with water releases flammable gases which may ignite spontaneously.  
H331 - Toxic if inhaled.  
H302 - Harmful if swallowed.  
EUH014 - Reacts violently with water.  
EUH029 - Contact with water liberates toxic gas.  
EUH071 - Corrosive to the respiratory tract.

Precautionary statements (CLP)

- Prevention

: P280 - Wear protective gloves, protective clothing, eye protection, face protection.  
P260 - Do not breathe vapours.  
P223 - Do not allow contact with water.  
P231+P232 - Handle and store contents under inert gas. Protect from moisture.  
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

- Response

: P303+P361+P353+P315 - IF ON SKIN : (or hair) Take off immediately all contaminated clothing. Rinse skin with water or shower. Get immediate medical advice.  
P304+P340+P315 - IF INHALED : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice / attention.  
P305+P351+P338+P315 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice.  
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

- Storage

: P403+P233 - Store in a well-ventilated place. Keep container tightly closed.  
P405 - Store locked up.

### 2.3. Other hazards

Not classified as PBT or vPvB.

The substance/mixture has no endocrine disrupting properties.

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Trichlorsilane	CAS-No.: 10025-78-2 EC-No.: 233-042-5 EC Index-No.: 014-001-00-9 REACH registration No: 01-2119494046-35	100	Flam. Liq. 1, H224 Water-react. 1, H260 Acute Tox. 3 (Inhalation), H331 Acute Tox. 4 (Oral), H302 Skin Corr. 1A, H314 Eye Dam. 1, H318

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Name	Product identifier	Specific concentration limits
Trichlorsilane	CAS-No.: 10025-78-2 EC-No.: 233-042-5 EC Index-No.: 014-001-00-9 REACH registration No: 01-2119494046-35	( 1 ≤C ≤ 100) STOT SE 3, H335

Contains no other components or impurities which will influence the classification of the product.

Not applicable

### 3.2. Mixtures

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- Skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Get immediate medical attention.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Get immediate medical attention.
- Ingestion : Rinse mouth, do not induce vomiting. (If vomiting occurs, keep head low so that stomach content doesn't get into lungs.). Get immediate medical attention.

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

May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product.  
Material is destructive to tissue of the mucuous membranes and upper respiratory tract.  
Cough, shortness of breath, headache, nausea.  
See section 11.

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

Obtain medical assistance.  
Treat with corticosteroid spray as soon as possible after inhalation.  
Do not give direct mouth-to-mouth resuscitation if swallowed. To protect rescuer, use air-viva, oxy-viva or one-way mask. Resuscitate in a well-ventilated area.  
If ingested, material may be aspirated into the lungs and cause chemical pneumonitis.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

- Suitable extinguishing media : Dry powder.  
Foam.  
Shutting off the source of the gas is the preferred method of control.  
Dry sand.
- Unsuitable extinguishing media : Do not use extinguishing media containing water.  
Do not use water jet to extinguish.  
Water.

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

- Specific hazards : Water reactive product.  
Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : Hydrogen chloride. Silica dust (inert - but may irritate respiratory tract and eyes).

### **5.3. Advice for firefighters**

Specific methods

- : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
- If possible, stop flow of product.
- Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
- Move containers away from the fire area if this can be done without risk.

Special protective equipment for fire fighters

- : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
- Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.
- Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

## **SECTION 6: Accidental release measures**

### **6.1. Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel

- : Act in accordance with local emergency plan.
- Evacuate area.
- Ensure adequate air ventilation.
- Eliminate ignition sources.
- Stay upwind.
- Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- Try to stop release.

For emergency responders

- : Monitor concentration of released product.
- Consider the risk of potentially explosive atmospheres.
- See section 5.3 of the SDS for more information.

### **6.2. Environmental precautions**

- Try to stop release.
- Prevent liquid from entering sewers, watercourses, and soil.

### **6.3. Methods and material for containment and cleaning up**

- Do not use water on leaking product.
- Ventilate area.
- Absorb remaining liquid with sand or inert absorbent and remove to safe place.

### **6.4. Reference to other sections**

- See also sections 8 and 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Safe use of the product

- : Take precautionary measures against static discharge.
- Avoid contact with aluminium.
- Keep away from ignition sources (including static discharges).
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Purge air from system before introducing gas.
- Avoid exposure, obtain special instructions before use.
- Do not smoke while handling product.
- Avoid suck back of water, acid and alkalis.
- Only experienced and properly instructed persons should handle gases under pressure.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Installation of a cross purge assembly between the container and the regulator is recommended.
- Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service.
- Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment.
- The product must be handled in accordance with good industrial hygiene and safety procedures.
- Consider pressure relief device(s) in gas installations.
- Consider the use of only non-sparking tools.
- Ensure equipment is adequately earthed.
- Do not use water on valves, flanges and other fittings.
- Do not breathe gas.
- Avoid release of product into work area.

Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions.
- Do not allow backfeed into the container.
- Protect containers from physical damage; do not drag, roll, slide or drop.
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
- Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
- If user experiences any difficulty operating valve discontinue use and contact supplier.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.
- Keep container valve outlets clean and free from contaminants particularly oil and water.
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never attempt to transfer gases from one cylinder/container to another.
- Never use direct flame or electrical heating devices to raise the pressure of a container.
- Do not remove or deface labels provided by the supplier for the identification of the content of the container.
- Suck back of water into the container must be prevented.
- Open valve slowly to avoid pressure shock.
- Avoid release of product into work area.
- Do not smoke while handling product.

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### 7.2. Conditions for safe storage, including any incompatibilities

Segregate from oxidant gases and other oxidants in store.  
All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.  
Observe all regulations and local requirements regarding storage of containers.  
Containers should not be stored in conditions likely to encourage corrosion.  
Container valve guards or caps should be in place.  
Containers should be stored in the vertical position and properly secured to prevent them from falling over.  
Stored containers should be periodically checked for general condition and leakage.  
Keep container below 50°C in a well ventilated place.  
Store containers in location free from fire risk and away from sources of heat and ignition.  
Keep away from combustible materials.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Trichlorsilane (10025-78-2)	
DNEL: Derived no effect level (Workers)	
Acute - local effects, inhalation	18.6 mg/m <sup>3</sup>
Long-term - local effects, inhalation	9.9 mg/m <sup>3</sup>

PNEC (Predicted No-Effect Concentration) : None available.

### 8.2. Exposure controls

#### **8.2.1. Appropriate engineering controls**

Provide adequate general and local exhaust ventilation.  
Product to be handled in a closed system.  
Systems under pressure should be regularly checked for leakages.  
Ensure exposure is below occupational exposure limits (where available).  
Gas detectors should be used when toxic gases may be released.  
Consider the use of a work permit system e.g. for maintenance activities.

#### **8.2.2. Individual protection measures, e.g. personal protective equipment**

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.  
The following recommendations should be considered:  
PPE compliant to the recommended EN/ISO standards should be selected.

- Eye/face protection : Wear goggles and a face shield when transfilling or breaking transfer connections.  
Provide readily accessible eye wash stations and safety showers.  
Standard EN 166 - Personal eye-protection - specifications.
- Skin protection : Wear chemically resistant protective gloves.  
Standard EN 374 - Protective gloves against chemicals.  
The breakthrough time of the selected gloves must be greater than the intended use period.  
Consult glove manufacturer's product information on material suitability and material thickness.  
Wear working gloves when handling gas containers.  
Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher.  
Suitable, heavy duty, plastic or rubber gauntlets should be worn: 5-layer laminate of PE and EVOH (4H) or Butyl & Viton types recommended; nitrile type may be used for short periods.

- Other : Keep suitable chemically resistant protective clothing readily available for emergency use.  
Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.  
Consider the use of flame resistant anti-static safety clothing.  
Standard EN 1149-5 - Protective clothing: Electrostatic properties.  
Standard EN ISO 14116 - Limited flame spread materials.
- Respiratory protection : Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.  
Keep self contained breathing apparatus readily available for emergency use.  
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.  
Consult respiratory device supplier's product information for the selection of the appropriate device.
- Thermal hazards : None in addition to the above sections.

### 8.2.3. Environmental exposure controls

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Appearance	
- Physical state at 20°C / 101.3kPa	: Liquid.
- Colour	: Colourless liquid.
Odour	: Pungent.
Melting point / Freezing point	: -126.5 °C
Boiling point	: 31.9 °C
Flammability	: In contact with water releases flammable gases which may ignite spontaneously, Flammable liquid and vapour.
Lower explosion limit	: 1.2 vol %
Upper explosion limit	: 90.5 vol %
Flash point	: -19.5 °C
Auto-ignition temperature	: 224 °C
Decomposition temperature	: No data available.
pH	: Not applicable.
Viscosity, kinematic	: 0.23 mm <sup>2</sup> /s
Water solubility [20°C]	: Not available
Partition coefficient n-octanol/water (Log Kow)	: No data available.
Vapour pressure [20°C]	: 0.66 bar(a)
Vapour pressure [50°C]	: No data available.
Density and/or relative density	: 1.342 g/l
Relative vapour density (air=1)	: Heavier than air.
Particle characteristics	: Not applicable.

### 9.2. Other information

#### 9.2.1. Information with regard to physical hazard classes

Oxidising properties	: No oxidising properties.
Emitted gas	: Hydrogen, Hydrogen Chloride.
Emitted gas ignition	: Yes

#### 9.2.2. Other safety characteristics

Molar mass	: 135.47 g/mol
Other data	: None.

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### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

Can form explosive mixture with air.  
May react violently with oxidants.  
Reacts violently with water.  
In contact with water releases flammable gases which may ignite spontaneously.

#### 10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.  
Avoid moisture in installation systems.  
Do not allow water (or moist air) contact with this material.

#### 10.5. Incompatible materials

Incompatible with water, humid air.  
Air, Oxidisers.  
For additional information on compatibility refer to ISO 11114.  
May react with aluminium.  
Moisture.

#### 10.6. Hazardous decomposition products

Hydrogen chloride on hydrolysis.

### SECTION 11: Toxicological information

#### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

**Acute toxicity** : Toxic if inhaled.

LD50 oral rat	1030 mg/kg bodyweight
LC50 Inhalation - Rat	1.1 mg/l

**Skin corrosion/irritation** : Causes severe skin burns and eye damage.

**Serious eye damage/irritation** : Causes serious eye damage.

**Respiratory or skin sensitisation** : No known effects from this product.

**Germ cell mutagenicity** : No known effects from this product.

**Carcinogenicity** : No known effects from this product.

**Toxic for reproduction : Fertility** : No known effects from this product.

**Toxic for reproduction : unborn child** : No known effects from this product.

**STOT-single exposure** : Severe corrosion to the respiratory tract at high concentrations.

**STOT-repeated exposure** : No known effects from this product.

**Aspiration hazard** : No data available.

#### 11.2. Information on other hazards

Other information : The substance/mixture has no endocrine disrupting properties.

### SECTION 12: Ecological information

#### 12.1. Toxicity

EC50 48h - Daphnia magna [mg/l] : > 75 mg/l

EC50 72h - Algae [mg/l] : > 100 mg/l  
LC50 96 h - Fish [mg/l] : > 100 mg/l

### **12.2. Persistence and degradability**

Assessment : Not applicable for inorganic products.

### **12.3. Bioaccumulative potential**

Assessment : No data available.

### **12.4. Mobility in soil**

Assessment : Because of its high volatility, the product is unlikely to cause ground or water pollution.  
Partition into soil is unlikely.

### **12.5. Results of PBT and vPvB assessment**

Assessment : Not classified as PBT or vPvB.

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

Assessment : The substance/mixture has no endocrine disrupting properties.

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

Other adverse effects : May cause pH changes in aqueous ecological systems.

Effect on the ozone layer : No effect on the ozone layer.

## **SECTION 13: Disposal considerations**

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

Contact supplier if guidance is required.  
Ensure that the emission levels from local regulations or operating permits are not exceeded.  
Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.eu> for more guidance on suitable disposal methods.  
Must not be discharged to atmosphere.  
Return unused product in original container to supplier.  
Gases formed by combustion should be washed with water to remove silica.  
List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 04 \*: Gases in pressure containers (including halons) containing hazardous substances.

### **13.2. Additional information**

External treatment and disposal of waste should comply with applicable local and/or national regulations.

## **SECTION 14: Transport information**

### **14.1. UN number or ID number**

In accordance with ADR / RID / IMDG / IATA / ADN

UN-No. : 1295

### 14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : TRICHLOROSILANE  
 Transport by air (ICAO-TI / IATA-DGR) : Trichlorosilane  
 Transport by sea (IMDG) : TRICHLOROSILANE

### 14.3. Transport hazard class(es)

#### Labelling



4.3 : Substances which, in contact with water, emit flammable gases.  
 3 : Flammable liquids.  
 8 : Corrosive substances.

#### Transport by road/rail (ADR/RID)

Class : 4.3  
 Classification code : WFC  
 Hazard identification number : X338  
 Tunnel Restriction : B/E - Tank carriage : Passage forbidden through tunnels of category B, C, D and E. Other carriage : Passage forbidden through tunnels of category E

#### Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 4.3 (8, 3)  
 Emergency Schedule (EmS) - Fire : F-G  
 Emergency Schedule (EmS) - Spillage : S-O

### 14.4. Packing group

Transport by road/rail (ADR/RID) : I - substances presenting high danger.  
 Transport by air (ICAO-TI / IATA-DGR) : I - High danger.  
 Transport by sea (IMDG) : I - substances presenting high danger.

### 14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None.  
 Transport by air (ICAO-TI / IATA-DGR) : None.  
 Transport by sea (IMDG) : None.

### 14.6. Special precautions for user

#### Packing Instruction(s)

Transport by road/rail (ADR/RID) : P401.  
 Transport by air (ICAO-TI / IATA-DGR)  
   Passenger and Cargo Aircraft : Forbidden.  
   Cargo Aircraft only : Forbidden.  
 Transport by sea (IMDG) : P401.

#### Special transport precautions

: Avoid transport on vehicles where the load space is not separated from the driver's compartment.  
 Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.  
 Before transporting product containers:  
 - Ensure there is adequate ventilation.  
 - Ensure that containers are firmly secured.  
 - Ensure valve is closed and not leaking.  
 - Ensure valve outlet cap nut or plug (where provided) is correctly fitted.  
 - Ensure valve protection device (where provided) is correctly fitted.

### 14.7. Maritime transport in bulk according to IMO instruments

No additional information available

### SECTION 15: Regulatory information

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

##### EU-Regulations

- Restrictions on use : None.  
Other information, restriction and prohibition regulations : Not listed on the PIC list (Regulation EU 649/2012).  
Not listed on the POP list (Regulation EU 2019/1021).  
Seveso Directive : 2012/18/EU (Seveso III) : Covered.

##### National regulations

- Water hazard class (WGK) : 1 - Slightly hazardous to water.  
Regulatory reference : Ensure all national/local regulations are observed.  
Gesetz zum Schutz der arbeitenden Jugend (Jugendarbeitsschutzgesetz-JArbSchG)  
Betriebssicherheitsverordnung-BetrSichV  
TRBS 3145/TRGS 745 - Ortsbewegliche Druckgasbehälter – Füllen, Bereithalten, innerbetriebliche Beförderung, Entleeren  
TRGS 510 - Lagerung von Gefahrstoffen in ortsbeweglichen Behältern  
TRGS 407 - Tätigkeiten mit Gasen – Gefährdungsbeurteilung  
TRBS 2141 - Gefährdungen durch Dampf und Druck - Allgemeine Anforderungen.  
TRGS 725 - Gefährliche explosionsfähige Atmosphäre -Mess-, Steuer- und Regeleinrichtungen im Rahmen von Explosionsschutzmaßnahmen.  
Gesetz zum Schutz von Müttern bei der Arbeit, in der Ausbildung und im Studium (Mutterschutzgesetz – MuSchG)  
Verordnung über Verbote und Beschränkungen des Inverkehrbringens gefährlicher Stoffe, Zubereitungen und Erzeugnisse nach dem Chemikaliengesetz (Chemikalien-Verbotsverordnung-ChemVerbotsV) .  
Classification for storage according to TRGS 510: 4.3 Hazardous substances which, in contact with water, emit flammable gases.  
Zwölfte Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (12. BImSchV-Störfall-Verordnung).  
Vierte Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung über genehmigungsbedürftige Anlagen - 4. BImSchV) Anhang 2 Stoffliste zu Nr. 9.3 des Anhangs 1.  
TA Luft.

#### 15.2. Chemical safety assessment

A CSA has been carried out.

### SECTION 16: Other information

- Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 2020/878.

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### Abbreviations and acronyms

: ATE - Acute Toxicity Estimate.  
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008.  
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.  
EINECS - European Inventory of Existing Commercial Chemical Substances.  
CAS# - Chemical Abstract Service number.  
PPE - Personal Protection Equipment.  
LC50 - Lethal Concentration to 50 % of a test population.  
RMM - Risk Management Measures.  
PBT - Persistent, Bioaccumulative and Toxic.  
vPvB - Very Persistent and Very Bioaccumulative.  
STOT- SE : Specific Target Organ Toxicity - Single Exposure.  
CSA - Chemical Safety Assessment.  
EN - European Standard.  
UN - United Nations.  
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road.  
IATA - International Air Transport Association.  
IMDG code - International Maritime Dangerous Goods.  
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail.  
WGK - Water Hazard Class.  
STOT - RE : Specific Target Organ Toxicity - Repeated Exposure.  
UFI : Unique Formula Identifier.

### Training advice

: Users of breathing apparatus must be trained.  
Ensure operators understand the flammability hazard.  
Ensure operators understand the toxicity hazard.

### Further information

: Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).  
Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Data is maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at : <http://www.eiga.eu>.

Full text of H- and EUH-statements	
Acute Tox. 3 (Inhalation)	Acute toxicity (inhal.), Category 3
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
EUH014	Reacts violently with water.
EUH029	Contact with water liberates toxic gas.
EUH071	Corrosive to the respiratory tract.
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Flam. Liq. 1	Flammable liquids, Category 1
H224	Extremely flammable liquid and vapour.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
Skin Corr. 1A	Skin corrosion/irritation, Category 1, Sub-Category 1A
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation
Water-react. 1	Substances and Mixtures which, in contact with water, emit flammable gases, Category 1

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### DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.  
Details given in this document are believed to be correct at the time of going to press.  
Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

**End of document**