# SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

## Cl3HSi 100 %

| | | | |
|---|---|---|---|
| Issue Date:<br>Revision Date:<br>Last revised date : | 06.08.2013<br>07.12.2023<br>14.04.2022 | Version: 5.0 | SDS No.: 000010021945<br>1/37 |

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

### 1.1 Product identifier

**Product name:** Cl3HSi 100 %

**Trade name:** Trichlorosilane 3.7

Additional identification

| | |
|---|---|
| **Chemical name:** | Trichlorosilane |
| **Chemical formula:** | Cl3HSi |
| **INDEX No.** | 014-001-00-9 |
| **CAS-No.** | 10025-78-2 |
| **EC No.** | 233-042-5 |
| **REACH Registration No.** | 01-2119494046-35 |

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

**Identified uses:** Industrial and professional use for chemical analysis, calibration, (routine) quality control, laboratory use. Under controlled conditions.

**Uses advised against** Contact supplier for more information on uses. Uses other than those listed above are not supported.

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

Supplier

Linde Gas AB
Rättarvägen 3
169 68 Solna

**Telephone:** +46 8 7069500

**E-mail:** sds.ren@linde.com

**1.4 Emergency telephone number:** Poison center: 020-99 60 00 (24 h). Emergency number: 112

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended.

| | | |
|---|---|---|
| **Physical Hazards** | | |
| Flammable liquids | Category 1 | H224: Extremely flammable liquid and vapor. |
| Substances and mixtures, which in contact with water, emit flammable gases | Category 1 | H260: In contact with water releases flammable gases which may ignite spontaneously. |
| Substances and mixtures, which in contact with water, emit flammable gases | Category 1 | H260: In contact with water releases flammable gases which may ignite spontaneously. |
| **Health Hazards** | | |
| Acute toxicity (Inhalation - vapor) | Category 3 | H331: Toxic if inhaled. |
| Acute toxicity (Inhalation - dust and mist) | Category 3 | H331: Toxic if inhaled. |
| Acute toxicity (Oral) | Category 4 | H302: Harmful if swallowed. |
| Skin corrosion | Category 1 | H314: Causes severe skin burns and eye damage. |
| Serious eye damage | Category 1 | H318: Causes serious eye damage. |

## 2.2 Label Elements

**Contains:** Trichlorosilane

**Signal Word:** Danger

**Hazard Statement(s):**
H224: Extremely flammable liquid and vapor.
H260: In contact with water releases flammable gases which may ignite spontaneously.
H331: Toxic if inhaled.
H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.

## Precautionary Statements

**General** None.

**Prevention:**
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P231+P232: Handle and store contents under inert gas. Protect from moisture.
P233: Keep container tightly closed.
P260: Do not breathe dust/fume/gas/mist/vapors/spray.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

**Response:**
P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P334: Immerse in cool water [or wrap in wet bandages].
P335: Brush off loose particles from skin.
P310: Immediately call a POISON CENTER or doctor/ physician.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

**Storage:** P403+P233: Store in a well-ventilated place. Keep container tightly closed.

**Disposal** None.

## Supplemental information

EUH071: Corrosive to the respiratory tract.
EUH014: Reacts violently with water.
EUH029: Contact with water liberates toxic gas.

## Unknown toxicity - Health

| | |
|---|---|
| Acute toxicity, oral | 0 % |
| Acute toxicity, dermal | 100 % |
| Acute toxicity, inhalation, vapor | 100 % |
| Acute toxicity, inhalation, dust or mist | 100 % |
| Acute toxicity, inhalation, vapor | 0 % |

| | |
|---|---|
| Acute toxicity, inhalation, dust or mist | 0 % |

**Unknown toxicity - Environment**

| | |
|---|---|
| Acute hazards to the aquatic environment | 100 % |
| Chronic hazards to the aquatic environment | 100 % |

**2.3 Other hazards**

**Endocrine disrupting properties-Toxicity**
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

**Endocrine disrupting properties-Ecotoxicity**
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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## SECTION 3: Composition/information on ingredients

### 3.1 Substances

**Chemical name** Trichlorosilane
**INDEX No.:** 014-001-00-9
**CAS-No.:** 10025-78-2
**EC No.:** 233-042-5
**REACH Registration No.:** 01-2119494046-35
**Purity:** 100%
The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.
**Trade name:** Trichlorosilane 3.7

| Chemical name | Chemical formula | Concentration | CAS-No. | EC No. | REACH Registration No. | M-Factor: | Notes |
|---|---|---|---|---|---|---|---|
| Trichlorosilane | Cl3HSi | 100% | 10025-78-2 | 233-042-5 | 01-2119494046-35 | - | # |

The concentrations of the components in the SDS header, product name on page one and in section 3.2 are in mol due to regulatory requirements. All concentrations are nominal.
# This substance has workplace exposure limit(s).
## This substance is listed as SVHC.PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.

## SECTION 4: First aid measures

**General:** Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

### 4.1 Description of first aid measures

**Inhalation:** Move the exposed person to fresh air at once. If breathing stops, provide artificial respiration. Symptoms may include: Dizziness. Nausea, vomiting.

**Eye contact:** Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes.

**Skin Contact:** Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately.

**Ingestion:** Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs. Get medical attention immediately.

**4.2 Most important symptoms and effects, both acute and delayed:** Causes severe skin burns and eye damage. May be fatal if swallowed. May be fatal if inhaled. Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other severe central nervous system effects.

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

**Hazards:** Causes severe skin burns and eye damage. May be fatal if swallowed. May be fatal if inhaled. Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other severe central nervous system effects.

**Treatment:** 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. Treat appropriately. Treat with a corticosteroid spray as soon as possible after inhalation. Get immediate medical advice/attention.

## SECTION 5: Firefighting measures

**General Fire Hazards:** Heat may cause the containers to explode. USE WATER WITH CAUTION.

**5.1 Extinguishing media**

**Suitable extinguishing media:** Use water spray to reduce vapors or divert vapor cloud drift. Water Spray or Fog. Dry powder. Foam. Carbon Dioxide. Dry powder. Dry sand. Foam. Carbon Dioxide.

**Unsuitable extinguishing media:** Do not use water jet as an extinguisher, as this will spread the fire. Water. Water Spray or Fog.

**5.2 Special hazards arising from the substance or mixture:** Fire or excessive heat may produce hazardous decomposition products.

**Hazardous Combustion Products:** Silicon oxides Hydrogen chloride

**5.3 Advice for firefighters**

**Special fire-fighting procedures:** In case of fire: Stop leak if safe to do so. Use of water may result in the formation of very toxic aqueous solutions. Keep run-off water out of sewers and water sources. Dike for water control. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.

**Special protective equipment for fire-fighters:** Gas tight chemically protective clothing (Type 1) in combination with self contained breathing apparatus.
Guideline: EN 943-2 Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams (ET)

## SECTION 6: Accidental release measures

**6.1 Personal precautions, protective equipment and emergency procedures:** Evacuate area. Provide adequate ventilation. Consider the risk of potentially explosive atmospheres . In case of leakage, eliminate all ignition sources. Monitor the concentration of the released product. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

**6.2 Environmental Precautions:** Prevent further leakage or spillage if safe to do so. Reduce vapour with fog or fine water spray. Keep run-off water out of sewers and water sources. Dike for water control.

**6.3 Methods and material for containment and cleaning up:** Provide adequate ventilation. Eliminate sources of ignition. Wash contaminated equipment or sites of leaks with copious quantities of water.

**6.4 Reference to other sections:** Refer to sections 8 and 13.

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## SECTION 7: Handling and storage:

**7.1 Precautions for safe handling:**

Do not handle until all safety precautions have been read and understood. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Purge system with dry inert gas (e.g. helium or nitrogen) before product is introduced and when system is placed out of service. Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Assess the risk of a potentially explosive atmosphere and the need for suitable equipment i.e. explosion-proof. Take precautionary measures against static discharges. Keep away from ignition sources (including static discharges). Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Use non-sparking tools. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Ensure the complete system has been (or is regularly) checked for leaks before use. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. 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. Close container valve after each use and when empty, even if still connected to equipment.

**7.2 Conditions for safe storage, including any incompatibilities:**

All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Segregate from oxidant gases and other oxidants being stored. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

**7.3 Specific end use(s):**

None.

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## SECTION 8: Exposure controls/personal protection

### 8.1 Control Parameters

#### Occupational Exposure Limits

| Chemical name | Type | Form of exposure | Exposure Limit Values | | Source |
|---|---|---|---|---|---|
| trichlorosilane | TWA | as HCl | 5 ppm | 8 mg/m3 | EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended (12 2009) |
| | STEL | as HCl | 10 ppm | 15 mg/m3 | EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended (12 2009) |

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

#### Biological Limit Values

No biological exposure limits noted for the ingredient(s).

#### DNEL-Values

| Critical component | Type | Value | Remarks |
|---|---|---|---|
| Trichlorosilane | Workers - Inhalation, Systemic, long-term, Systemic, short-term | | No hazard identified |
| | Workers - Inhalation, Local, long-term | 9,9 mg/m3 | respiratory tract irritation |
| | Workers - Inhalation, Local, short-term | 18,6 mg/m3 | respiratory tract irritation |
| | Workers - Dermal, Systemic, long-term, Systemic, short-term | | No hazard identified |
| | Workers - Dermal, Local, long-term, Local, short-term | | High hazard (no threshold derived), Skin irritation/corrosion |
| | Workers - Eyes | | High hazard (no threshold derived) |

8.2 Exposure controls

**Appropriate engineering controls:**

Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below occupational exposure limits. Gas detectors should be used when toxic quantities may be released. Gas detectors should be used when quantities of flammable gases or vapours may be released. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system and under strictly controlled conditions. Only use permanent leak tight installations (e.g. welded pipes). Take precautionary measures against static discharges. Do not eat, drink or smoke when using the product.

**Individual protection measures, such as personal protective equipment**

**General information:**

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. Keep self contained breathing apparatus readily available for emergency use. Keep suitable chemically resistant protective clothing readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Protect eyes, face and skin from contact with product. Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

**Eye/face protection:**

Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Guideline: EN 166 Personal Eye Protection.

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**Skin protection**

**Hand Protection:**

Guideline: EN 388 Protective gloves against mechanical risks.
Additional Information: Wear working gloves while handling containers
Guideline: EN 374-1/2/3 Protective gloves against chemicals and micro-organisms.
Additional Information: Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Material: Nitrile.
Additional Information: Materials suitable for short-term contact and/or liquid splashes
Material: Viton rubber (fluor rubber).
Additional Information: Materials suitable for prolonged direct contact.
Break-through time: 6 hrs

**Body protection:**

Wear fire resistant or flame retardant clothing. Wear acid-resistant protective clothing.
Guideline: ISO/TR 2801:2007 Clothing for protection against heat and flame -- General recommendations for selection, care and use of protective clothing.Guideline: EN 14605 Protective clothing against liquid chemicals.

**Other:**

Wear safety shoes while handling containers
Guideline: ISO 20345 Personal protective equipment - Safety footwear.

**Respiratory Protection:**

Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances. When allowed by a risk assessment Respiratory Protective Equipment (RPE) may be used The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD. Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres

Guideline: EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.Material: Filter B
Guideline: EN 14387 Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements, testing, marking.
Guideline: EN 136 Respiratory protective devices. Full face masks. Requirements, testing, marking.

| | |
|---|---|
| **Thermal hazards:** | No precautionary measures are necessary. |
| **Hygiene measures:** | Obtain special instructions before use. Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product. |
| **Environmental exposure controls:** | For waste disposal, see section 13 of the SDS. |

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Appearance

| | |
|---|---|
| **Physical state:** | liquid |
| **Form:** | No data available. |
| **Color:** | Colorless |
| **Odor:** | Pungent |
| **Odor Threshold:** | Odor threshold is subjective and is inadequate to warn of over exposure. |
| **Freezing point:** | -195,7 °F/-126,5 °C Other, Key study 2 = reliable with restrictions |
| **Boiling Point:** | 90 °F/32 °C (1.013 hPa) Experimental result, Supporting study |
| **Flammability:** | Flammable liquid |

Upper/lower limit on flammability or explosive limits

| | |
|---|---|
| **Explosive limit - upper:** | 70 %(V) Experimental result, Supporting study |
| **Explosive limit - lower:** | 6,9 %(V) |
| **Flash Point:** | < -3,1 °F/< -19,5 °C (Closed Cup) 1 = reliable without restrictions |
| **Autoignition Temperature:** | 224 °C Experimental result, Key study 2 = reliable with restrictions |
| **Decomposition Temperature:** | Decomp at elevated temp to liberate hydrogen and deposit a high purity silicon, which leads to some of the principal uses of silanes. |
| **pH:** | Not applicable |

Viscosity

| | |
|---|---|
| **Dynamic viscosity:** | 0,332 mPa.s (68 °F/20 °C) Experimental result, Key study |
| **Kinematic viscosity:** | 0,23 mm2/s (77 °F/25 °C) Experimental result, Supporting study |

Solubility(ies)

| | |
|---|---|
| Solubility in Water: | Reacts violently with water. |
| Solubility (other): | No data available. |
| Partition coefficient (n-octanol/water): | Not known. |
| Dispersion Stability: | No data available. |
| Vapor pressure: | 72.188 Pa (72,5 °F/22,5 °C) Experimental result, Key study |
| Relative density: | 1,3417 (68 °F/20 °C) |
| Density: | 1,34 g/cm3 (68 °F/20 °C) Experimental result, Supporting study |
| Relative vapor density: | 4,67 AIR=1 |
| Particle characteristics: | Not applicable |

9.2 Other information

| | |
|---|---|
| Flammability: | Tci: 1 |
| Evaporation Rate: | No data available. |
| Molecular weight: | 135,47 g/mol (Cl3HSi) |
| VOC Content: | EC Directive 2004/42: 1.000 g/l ~100 % (calculated)<br>EU. Directive 2010/75/EU on Industrial Emissions (IPPC), Annex II, L 334/17: 0 % (calculated) |

## SECTION 10: Stability and reactivity

| | |
|---|---|
| 10.1 Reactivity: | No reactivity hazard other than the effects described in sub-section below. |
| 10.2 Chemical Stability: | Stable under normal conditions. |
| 10.3 Possibility of hazardous reactions: | Can form a potentially explosive atmosphere in air. May react violently with oxidants. Reacts with water. |
| 10.4 Conditions to avoid: | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| 10.5 Incompatible Materials: | Air and oxidizers. Reacts with water to form corrosive acids. With water causes rapid corrosion of some metals. For material compatibility see latest version of ISO-11114. |

**10.6 Hazardous Decomposition Products:** Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Silica dust (inert - but may irritate respiratory tract and eyes) Hydrogen chloride

## SECTION 11: Toxicological information

**General information:** None.

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

**Acute toxicity - Oral**
**Product** Harmful if swallowed.

Trichlorosilane: LD 50 (Rat): 1.030 mg/kg Remarks: Experimental result, Key study

**Acute toxicity - Dermal**
**Product**

**Acute toxicity - Inhalation**
**Product** Toxic if inhaled.Toxic if inhaled.

Trichlorosilane: Vapour: LC 50 (Sprague-Dawley rat, Female, Male, 1 h): > 1000 ppm Remarks: Experimental result, Supporting study

**Repeated dose toxicity**
Trichlorosilane: NOAEL (Sprague-Dawley rat(Female, Male), Oral, 90 d): >= 2.000 mg/kg Experimental result, Key study

**Skin Corrosion/Irritation**
**Product** Based on available data, the classification criteria are not met.

**Serious Eye Damage/Eye Irritation**
**Product** Causes serious eye damage.

**Respiratory or Skin Sensitization**

**Product** — Based on available data, the classification criteria are not met.

**Germ Cell Mutagenicity**

**Product** — Based on available data, the classification criteria are not met.

**In vitro**

Trichlorosilane — In vitro gene mutations test on mammalian cells: (OECD Guideline 476 (In Vitro Mammalian Cell Gene Mutation Test)): Negative.

**In vivo**

Trichlorosilane — Micronucleus test in vivo mouse: (OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)) Inhalation (Rat, Female): Negative.

**Carcinogenicity**

**Product** — Based on available data, the classification criteria are not met.

**Reproductive toxicity**

**Product** — Based on available data, the classification criteria are not met.

**Reproductive toxicity (Fertility)**

Trichlorosilane — Rat Oral NOAEL - No Observable Adverse Effect Level: 1.000 mg/kg bw/day

**Developmental toxicity (Teratogenicity)**

Trichlorosilane — Rat Oral
NOAEL - No Observable Adverse Effect Level: 1.000 mg/kg bw/day

**Specific Target Organ Toxicity - Single Exposure**

**Product** — Based on available data, the classification criteria are not met.

**Specific Target Organ Toxicity - Repeated Exposure**

**Product** — Based on available data, the classification criteria are not met.

**Aspiration Hazard**

**Product** — No data available.

### 11.2 Information on other hazards

**Endocrine disrupting properties**

**Product:** The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.;

**Components:**

Trichlorosilane: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.;

**Other information**

**Product:** No data available.

## SECTION 12: Ecological information

**General information:** Not applicable

### 12.1 Toxicity

**Acute toxicity**

**Product** No ecological damage caused by this product.

**Toxicity to microorganisms**

Trichlorosilane: Static EC 50 (Algae (Pseudokirchneriella subcapitata), 72 h): > 100 mg/l (OECD Guideline 201 (Freshwater Alga and Cyanobacteria, Growth Inhibition Test))

**Toxicity to Aquatic Plants**

Trichlorosilane: EC50 (Alga, 72 h): > 100 mg/l

### 12.2 Persistence and Degradability

**Product** not relevant

Trichlorosilane: Not readily biodegradable. Inorganic compound.

12.3 Bioaccumulative potential

Product: Study not necessary due to exposure considerations.

12.4 Mobility in soil

Product: The substance has low mobility in soil.

12.5 Results of PBT and vPvB assessment

Product: Not classified as PBT or vPvB.

Other Ecological Information

May cause pH changes in aqueous ecological systems.

12.6 Endocrine disrupting properties:

Product: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Components:

Trichlorosilane: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects:

Other hazards

Product: No data available.

Other effects:

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

**General information:** Must not be discharged to atmosphere. Consult supplier for specific recommendations. Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

**Disposal methods:** Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws. Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Gases formed by combustion should be washed with water to remove silica.

European Waste Codes

**Container:** 16 05 04*: Gases in pressure containers (including halons) containing hazardous substances.

## SECTION 14: Transport information

ADR

| | |
|---|---|
| 14.1 UN number or ID number: | UN 1295 |
| 14.2 UN Proper Shipping Name: | TRICHLOROSILANE |
| 14.3 Transport Hazard Class(es) | |
| Class: | 4.3 |
| Label(s): | 4.3, 3, 8 |
| Hazard No. (ADR): | X338 |
| Tunnel restriction code: | (B/E) |
| 14.4 Packing Group: | I |
| Limited quantity | None. |
| Excepted quantity | E0 |
| 14.5 Environmental hazards: | Not applicable |

14.6 Special precautions for user: –

RID

14.1 UN number or ID number: UN 1295
14.2 UN Proper Shipping Name TRICHLOROSILANE
14.3 Transport Hazard Class(es)
Class: 4.3
Label(s): 4.3, 3, 8
14.4 Packing Group: I
Limited quantity None.
Excepted quantity E0
14.5 Environmental hazards: Not applicable
14.6 Special precautions for user: –

IMDG

14.1 UN number or ID number: UN 1295
14.2 UN Proper Shipping Name: TRICHLOROSILANE
14.3 Transport Hazard Class(es)
Class: 4.3
Label(s): 4.3, 8, 3
EmS No.: F-G, S-O
14.4 Packing Group: I
Limited quantity None.
Excepted quantity E0
14.5 Environmental hazards: Not applicable
14.6 Special precautions for user: –

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| | | | |
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IATA

| | |
|---|---|
| 14.1 UN number or ID number: | UN 1295 |
| 14.2 Proper Shipping Name: | Trichlorosilane |
| 14.3 Transport Hazard Class(es): | |
| Class: | 4.3 |
| Label(s): | – |
| 14.4 Packing Group: | – |
| Limited quantity | None. |
| Excepted quantity | None. |
| 14.5 Environmental hazards: | Not applicable |
| 14.6 Special precautions for user: | – |
| Other information | |
| Passenger and cargo aircraft: | Forbidden. |
| Cargo aircraft only: | Forbidden. |

14.7 Maritime transport in bulk according to IMO instruments
Not applicable for product as supplied.

Additional identification: 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 that they are firmly secured. Ensure that the container valve is closed and not leaking. Ensure adequate air ventilation.

## SECTION 15: Regulatory information

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

EU Regulations

EU. REACH Annex XIV, Substances Subject to Authorization as amended: None present or none present in regulated quantities.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as

**amended:** None present or none present in regulated quantities.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended:** None present or none present in regulated quantities.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended:** None present or none present in regulated quantities.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended:** None present or none present in regulated quantities.

**Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use:**

| Chemical name | CAS-No. |
|---|---|
| Trichlorosilane | 10025-78-2 |

**EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, Annex I:**

| Classification | Lower-tier Requirements | Upper-tier Requirements |
|---|---|---|
| P5a: Flammable liquids, Category 1; Flammable liquids Category 2 or 3 maintained at a temperature above their boiling point; Other liquids with a flash point ≤ 60 °C, maintained at a temperature above their boiling point | 10 t | 50 t |
| O1: Substances or mixtures with hazard statement EUH014 | 100 t | 500 t |
| O3: Substances or mixtures with hazard statement EUH029 | 50 t | 200 t |

**Directive 98/24/EC on the protection of workers from the risks related to chemical agents at work:**

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| Chemical name | CAS-No. | Concentration |
|---|---|---|
| Trichlorosilane | 10025-78-2 | 100% |

National Regulations

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work Directive 2016/425/EEC on personal protective equipment Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX) Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.
This Safety Data Sheet has been produced to comply with Regulation (EU) 2020/878.

**15.2 Chemical safety assessment:** CSA has been carried out.

## SECTION 16: Other information

**Revision Information:** Not relevant.

**Abbreviations and acronyms:**

ECTLV: EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
ECTLV / STEL: Short Term Exposure Limit (STEL):
ECTLV / TWA: Time Weighted Average (TWA):

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; EIGA - European Industrial Gases Association; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test

population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

**Key literature references and sources for data:**

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/).
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.
European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search
European Industrial Gases Association (EIGA) Doc. 169 "Classification and Labelling guide", as amended.
International Programme on Chemical Safety (http://www.inchem.org/)
ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
Matheson Gas Data Book, 7th Edition.
National Institute for Standards and Technology (NIST) Standard Reference Database Number 69.
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
The European Chemical Industry Council (CEFIC) ERICards.
United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html)
Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).
Substance specific information from suppliers.
Details given in this document are believed to be correct at the time of publication.

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Wording of the H-statements in section 2 and 3

| | |
|---|---|
| H224 | Extremely flammable liquid and vapor. |
| 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. |

**Training information:** Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.

Classification according to Regulation (EC) No 1272/2008 as amended.

Flam. Liq. 1, H224

Water-react. 1, H260

Acute Tox. 3, H331

Acute Tox. 3, H331

Water-react. 1, H260

Acute Tox. 4, H302

Skin Corr. 1, H314

Eye Dam. 1, H318

**Other information:** Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. 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.

**Last revised date:** 07.12.2023

**Disclaimer:** This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

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# Annex to the extended Safety Data Sheet (eSDS)

Content



## Exposure Scenario 1.

Exposure scenario worker

### 1. Industrial use, Formulation & (re)packing of substances and mixtures

| List of use descriptors | |
|---|---|
| Sector(s) of use | |
| Product categories [PC]: | PC0: Other |

| | |
|---|---|
| Name of contributing environmental scenario and corresponding ERC | Formulation & (re)packing of substances and mixtures:<br>ERC2: Formulation into mixture |

| | |
|---|---|
| Contributing Scenarios | Formulation & (re)packing of substances and mixtures:<br>PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions<br><br>PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities |

### 2.1. Contributing exposure scenario controlling environmental exposure for: Formulation & (re)packing of substances and mixtures

Product characteristics

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| | | | |
|---|---|---|---|
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| | |
|---|---|
| Concentration of the substance in a mixture: | Covers percentage substance in the product up to 100 % (unless stated differently). |

| | |
|---|---|
| Physical form of the product | Liquid |

| | |
|---|---|
| Viscosity: | |
| Kinematic viscosity: | 0,23 mm2/s (68 °F/20 °C) |
| Dynamic viscosity: | 0,332 mPa.s (68 °F/20 °C) |

Amounts used

| | |
|---|---|
| Regional use tonnage (tons/year): | No data available. |

Frequency and duration of use

| | |
|---|---|
| Batch process: | not relevant |
| Continuous process: | 260 Emission days |

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure

| | |
|---|---|
| Other relevant operational conditions | not relevant |

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

See chapter 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

| | |
|---|---|
| Technical and organisational measures | Exhaust air scrubber |

| | |
|---|---|
| Air | Air - minimum efficiency of 99 % |
| Soil | not relevant |
| Water | not relevant |
| Remarks: | not relevant |

**Organisational measures to prevent/limit release from site:**

| |
|---|
| none |

**Conditions and measures related to sewage treatment plant**

| | |
|---|---|
| type: | No data available |
| Discharge rate: | not relevant |
| Treatment effectiveness: | not relevant |
| Sludge treatment technique: | not relevant |
| Measures to limit air emissions: | not relevant |
| Remarks: | not relevant |

**Conditions and measures related to external treatment of waste for disposal**

Fraction of used amount transferred to external waste treatment:

| Suitable waste treatment | Treatment effectiveness | Remarks |
|---|---|---|
| See section 13 of the SDS | | External treatment and disposal of waste should comply with applicable local and/or national regulations. |

**Conditions and measures related to external recovery of waste**

Fraction of used amount transferred to external waste treatment:

| Suitable recovery operations: | Treatment effectiveness | Remarks |
|---|---|---|
| See section 13 of the SDS | | External recovery and recycling of waste should comply with applicable local and/or national regulations. |

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| | | | |
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**Additional good practice advice beyond the REACH CSA**

This information is not available.

## 2.2. Contributing exposure scenario controlling worker exposure for: Formulation & (re)packing of substances and mixtures

| | |
|---|---|
| Process Categories: | PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions<br>PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities |

**Product characteristics**

| | |
|---|---|
| Concentration of the substance in a mixture: | Covers percentage substance in the product up to 100 % (unless stated differently). |

| | |
|---|---|
| Physical form of the product: | liquid |
| Vapour pressure: | 72,188 Pa |
| Process temperature: | 22,5 °C |
| Remarks | not relevant |

**Amounts used**

| | |
|---|---|
| Annual amount per site | No data available. |

**Frequency and duration of use**

| | Use duration: | Frequency of use: | Remarks |
|---|---|---|---|
| Exposure time | > 240 min | 5 days per week | PROC1, PROC8b |

**Human factors not influenced by risk management**

Exposed skin areas:

| | |
|---|---|
| Palm of one hand | 240 cm² |

| | |
|---|---|
| Both hands | 960 cm² |
| Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions: | 240 cm² |
| Transfer of substance or mixture (charging and discharging) at dedicated facilities: | 960 cm² |

Other given operational conditions affecting workers exposure

| Area of use | Room size: | Temperature: | Ventilation rate | Remarks |
|---|---|---|---|---|
| Indoor use | | | 5 | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| | |
|---|---|
| Other relevant operational conditions: | Closed systems: |

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

See chapter 7 of the safety data sheet

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

| inhalation exposure | dermal exposure | eye exposure | oral exposure | Remarks |
|---|---|---|---|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).: 95 % | | | | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions |

| | | | | |
|---|---|---|---|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).: 95 % | | | | Transfer of substance or mixture (charging and discharging) at dedicated facilities |
| Local exhaust ventilation: 95 % | | | | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

Organisational measures to prevent/limit releases, dispersion and exposure

| inhalation exposure | dermal exposure | eye exposure | oral exposure | Remarks |
|---|---|---|---|---|
| | | | | See section 7 of the SDS. |
| | | | | Ensure operatives are trained to minimise exposures. |
| | | | | Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed |

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

| inhalation exposure | dermal exposure | eye exposure | oral exposure | Remarks |
|---|---|---|---|---|
| Wear a full face respirator conforming to EN136.: 95 % | Wear protective gloves/protective clothing.: 95 % | Wear eye protection/face protection.: 100 % | Not applicable | See chapter 8 of the safety data sheet (Personal protection equipment) |

Additional good practice advice beyond the REACH CSA

This information is not available.

## 3. Exposure estimation

Environment:
Formulation & (re)packing of substances and mixtures:

none

Health:
Formulation & (re)packing of substances and mixtures:

none

## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Check that RMMs and OCs are as described above or of equivalent efficiency Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling see http://www.ecetoc.org/tra

## Exposure Scenario 2.

Exposure scenario worker

## 1. Industrial use, Use for electronic component manufacture.

| List of use descriptors | |
|---|---|
| Sector(s) of use | SU16: Manufacture of computer, electronic and optical products, electrical equipment |
| Product categories [PC]: | PC33: Semiconductors |

| | |
|---|---|
| Name of contributing environmental scenario and corresponding ERC | Use for electronic component manufacture.:<br>ERC6a: Use of intermediate |

| | |
|---|---|
| Contributing Scenarios | Use for electronic component manufacture.:<br>PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions |

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| | | | |
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| | |
|---|---|
| | |

**2.1. Contributing exposure scenario controlling environmental exposure for:** Use for electronic component manufacture.

**Product characteristics**

| | |
|---|---|
| Concentration of the substance in a mixture: | Covers percentage substance in the product up to 100 % (unless stated differently). |

| | |
|---|---|
| Physical form of the product | Liquid |

| | |
|---|---|
| Viscosity: | |
| Kinematic viscosity: | 0,23 mm2/s (68 °F/20 °C) |
| Dynamic viscosity: | 0,332 mPa.s (68 °F/20 °C) |

**Amounts used**

| | |
|---|---|
| Regional use tonnage (tons/year): | No data available. |

**Frequency and duration of use**

| | |
|---|---|
| Batch process: | 260 Emission days |
| Continuous process: | not relevant |

**Environment factors not influenced by risk management**

**Other given operational conditions affecting environmental exposure**

| | |
|---|---|
| Other relevant operational conditions | not relevant |

**Risk management measures (RMM)**

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| | | | |
|---|---|---|---|
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**Technical conditions and measures at process level (source) to prevent release**

See chapter 8 of the safety data sheet (Environmental exposure controls).

**Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil**

| | |
|---|---|
| Technical and organisational measures | Exhaust air scrubber |
| Air | Air - minimum efficiency of 99 % |
| Soil | not relevant |
| Water | not relevant |
| Remarks: | not relevant |

**Organisational measures to prevent/limit release from site:**

none

**Conditions and measures related to sewage treatment plant**

| | |
|---|---|
| type: | No data available |
| Discharge rate: | not relevant |
| Treatment effectiveness: | not relevant |
| Sludge treatment technique: | not relevant |
| Measures to limit air emissions: | not relevant |
| Remarks: | not relevant |

**Conditions and measures related to external treatment of waste for disposal**

Fraction of used amount transferred to external waste treatment:

| Suitable waste treatment | Treatment effectiveness | Remarks |
|---|---|---|
| See section 13 of the SDS | | External treatment and disposal of waste should comply with applicable local and/or national regulations. |

**Conditions and measures related to external recovery of waste**

Fraction of used amount transferred to external waste treatment:

| Suitable recovery operations: | Treatment effectiveness | Remarks |
|---|---|---|
| See section 13 of the SDS | | External recovery and recycling of waste should comply with applicable local and/or national regulations. |

Additional good practice advice beyond the REACH CSA

This information is not available.

## 2.2. Contributing exposure scenario controlling worker exposure for: Use for electronic component manufacture.

| | |
|---|---|
| Process Categories: | PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions |

Product characteristics

| | |
|---|---|
| Concentration of the substance in a mixture: | Covers percentage substance in the product up to 100 % (unless stated differently). |

| | |
|---|---|
| Physical form of the product: | liquid |
| Vapour pressure: | 72,188 Pa |
| Process temperature: | 22,5 °C |
| Remarks | not relevant |

Amounts used

| | |
|---|---|
| Annual amount per site | No data available. |

Frequency and duration of use

| | Use duration: | Frequency of use: | Remarks |
|---|---|---|---|
| Exposure time | > 240 min | 5 days per week | PROC1 |

## Human factors not influenced by risk management

Exposed skin areas:

| | |
|---|---|
| Palm of one hand | 240 cm² |
| Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions: | 240 cm² |

## Other given operational conditions affecting workers exposure

| Area of use | Room size: | Temperature: | Ventilation rate | Remarks |
|---|---|---|---|---|
| Indoor use | | | 5 | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions |

| | |
|---|---|
| Other relevant operational conditions: | Closed systems: |

## Risk management measures (RMM)

## Technical conditions and measures at process level (source) to prevent release

See chapter 7 of the safety data sheet

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

| inhalation exposure | dermal exposure | eye exposure | oral exposure | Remarks |
|---|---|---|---|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).: 95 % | | | | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions |

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| | | | |
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## Organisational measures to prevent/limit releases, dispersion and exposure

| inhalation exposure | dermal exposure | eye exposure | oral exposure | Remarks |
|---|---|---|---|---|
| | | | | See section 7 of the SDS. |
| | | | | Ensure operatives are trained to minimise exposures. |
| | | | | Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed |

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

| inhalation exposure | dermal exposure | eye exposure | oral exposure | Remarks |
|---|---|---|---|---|
| Wear a full face respirator conforming to EN136.: 95 % | Wear protective gloves/protective clothing.: 95 % | Wear eye protection/face protection.: 100 % | Not applicable | See chapter 8 of the safety data sheet (Personal protection equipment) |

## Additional good practice advice beyond the REACH CSA

This information is not available.

## 3. Exposure estimation

Environment:
Use for electronic component manufacture.:

none

Health:
Use for electronic component manufacture.:

none

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Cl3HSi 100 %

| | | | |
|---|---|---|---|
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## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Check that RMMs and OCs are as described above or of equivalent efficiency Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling see http://www.ecetoc.org/tra