

## MONOCHLOROSILANE

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

**Product name** : MONOCHLOROSILANE  
**EC number** : 236-705-7  
**CAS number** : 13465-78-6  
**Product description** : Not available.  
**Product type** : Liquefied gas.  
**Other means of identification** : MCS  
**Chemical formula** : ClH<sub>3</sub>Si

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

**Product use** : Not available.  
**Area of application** : Industrial applications.

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

REC Silicon Inc.  
119140 Rick Jones Way  
Silver Bow, Montana 59750  
United State of America  
406-496-9877

3322 Road N Northeast  
Moses Lake, Washington 98837  
United State of America  
509-793-9000

**e-mail address of person responsible for this SDS** : [RECSiliconMSDS@recsilicon.com](mailto:RECSiliconMSDS@recsilicon.com)

**1.4 Emergency telephone number****Supplier**

**Telephone number** : CHEMTREC, U.S. : 1-800-424-9300 International: +1-703-527-3887

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**

**Product definition** : Mono-constituent substance

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

Flam. Gas 1, H220  
Press. Gas Liq. Gas, H280  
Water-react. 1, H260  
Acute Tox. 3, H331  
Skin Corr. 1B, H314  
Eye Dam. 1, H318  
STOT SE 2, H371i

**Classification according to Directive 67/548/EEC [DSD]**

**MONOCHLOROSILANE**

**SECTION 2: Hazards identification**

F+; R12  
F; R15  
T; R23  
C; R34

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

**2.2 Label elements**

**Hazard pictograms**



**Signal word**

: Danger

**Hazard statements**

: Extremely flammable gas.  
Contains gas under pressure; may explode if heated.  
In contact with water releases flammable gases which may ignite spontaneously.  
Toxic if inhaled.  
Causes severe skin burns and eye damage.  
May cause damage to organs if inhaled.

**Precautionary statements**

**Prevention**

: Wear protective gloves: >8 hours (breakthrough time): Leather.. Wear eye or face protection: Recommended: full-face mask. Wear protective clothing. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Keep away from any possible contact with water, because of violent reaction and possible flash fire. Do not breathe gas.

**Response**

: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Immediately call a POISON CENTER or physician. IF IN EYES: Immediately call a POISON CENTER or physician.

**Storage**

: Protect from sunlight.

**Disposal**

: Not applicable.

**Supplemental label elements**

: Not applicable.

**2.3 Other hazards**

**Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII**

: No.  
P: Not available. B: Not available. T: No.

**Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII**

: Not available.

**Other hazards which do not result in classification**

: Liquid can cause burns similar to frostbite.

**MONOCHLOROSILANE****SECTION 3: Composition/information on ingredients****Substance/mixture** : Mono-constituent substance

Product/ingredient name	Identifiers	%	<u>Classification</u>		Type
			67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	
chlorosilane	EC: 236-705-7 CAS: 13465-78-6	100	F+; R12 F; R15  T; R23 C; R34  <b>See section 16 for the full text of the R-phrases declared above</b>	Flam. Gas 1, H220 Press. Gas Liq. Gas, H280 Water-react. 1, H260 Acute Tox. 3, H331 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 2, H371i  <b>See Section 16 for the full text of the H statements declared above.</b>	[A]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

[A] Constituent

[B] Impurity

[C] Stabilising additive

Occupational exposure limits, if available, are listed in Section 8.

**SECTION 4: First aid measures****4.1 Description of first aid measures**

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
- Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Immerse in cool water or wrap in wet bandages. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Continue to rinse for at least 10 minutes. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Chemical burns must be treated promptly by a physician. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

**MONOCHLOROSILANE****SECTION 4: First aid measures**

- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**4.2 Most important symptoms and effects, both acute and delayed****Potential acute health effects**

- Eye contact** : Causes serious eye damage. Liquid can cause burns similar to frostbite.
- Inhalation** : Toxic if inhaled. May cause damage to organs following a single exposure if inhaled. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
- Skin contact** : Causes severe burns. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
- Ingestion** : May cause burns to mouth, throat and stomach. Ingestion of liquid can cause burns similar to frostbite.

**Over-exposure signs/symptoms**

- Eye contact** : Adverse symptoms may include the following:  
pain  
watering  
redness  
frostbite
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur  
frostbite
- Ingestion** : Adverse symptoms may include the following:  
frostbite  
stomach pains

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

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.

**SECTION 5: Firefighting measures****5.1 Extinguishing media**

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : Do not use water or foam.

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

- Hazards from the substance or mixture** : Contains gas under pressure. Extremely flammable gas. In contact with water releases flammable gases which may ignite spontaneously. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion. Runoff to sewer may create fire or explosion hazard.
- Hazardous combustion products** : Decomposition products may include the following materials:  
halogenated compounds  
metal oxide/oxides

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## SECTION 5: Firefighting measures

hydrogen chloride  
hydrogen  
silicon (Oxide.)

### 5.3 Advice for firefighters

#### Special precautions for fire-fighters

: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

#### Special protective equipment for fire-fighters

: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

## SECTION 6: Accidental release measures

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

#### For non-emergency personnel

: Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

#### For emergency responders

: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

### 6.2 Environmental precautions

: Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### 6.3 Methods and materials for containment and cleaning up

#### Small spill

: Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

#### Large spill

: Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see section 1 for emergency contact information and section 13 for waste disposal.

### 6.4 Reference to other sections

: See Section 1 for emergency contact information.  
See Section 8 for information on appropriate personal protective equipment.  
See Section 13 for additional waste treatment information.

**MONOCHLOROSILANE****SECTION 7: Handling and storage**

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**7.1 Precautions for safe handling**

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Do not breathe gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Keep away from any possible contact with water, because of violent reaction and possible flash fire. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

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

- : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10). Store locked up. Eliminate all ignition sources. Keep away from water or moist air. Keep container tightly closed and sealed until ready for use.

**7.3 Specific end use(s)**

- Recommendations** : Not available.
- Industrial sector specific solutions** : Not available.

**SECTION 8: Exposure controls/personal protection**

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**8.1 Control parameters****Occupational exposure limits**

No exposure limit value known.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. 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.

**Derived effect levels**

No DELs available.

**Predicted effect concentrations**

No PECs available.

**8.2 Exposure controls**



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## SECTION 8: Exposure controls/personal protection

<b>Appropriate engineering controls</b>	: Use only with adequate ventilation. Engineering controls may be required to control the primary or secondary risks associated with this product. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.
<b><u>Individual protection measures</u></b>	
<b>Hygiene measures</b>	: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
<b>Eye/face protection</b>	: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. Recommended: full-face mask
<b><u>Skin protection</u></b>	
<b>Hand protection</b>	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. >8 hours (breakthrough time): Leather.
<b>Body protection</b>	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
<b>Other skin protection</b>	: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
<b>Respiratory protection</b>	: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
<b>Thermal hazards</b>	: If there is a risk of contact with the liquid, all protective equipment worn should be suitable for use with extremely low temperature materials.
<b>Environmental exposure controls</b>	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: Gas. [Liquefied gas]
<b>Colour</b>	: Colourless.
<b>Odour</b>	: hydrochloric acid
<b>Odour threshold</b>	: Not available.
<b>pH</b>	: Not available.
<b>Melting point/freezing point</b>	: -118°C
<b>Initial boiling point and boiling range</b>	: -30.417°C
<b>Flash point</b>	: Closed cup: -90°C [Tagliabue.]
<b>Evaporation rate</b>	: 82 (butyl acetate = 1)
<b>Flammability (solid, gas)</b>	: Flammable in the presence of the following materials or conditions: heat.
<b>Burning time</b>	: Not applicable.
<b>Burning rate</b>	: Not applicable.
<b>Upper/lower flammability or explosive limits</b>	: Lower: 4.6 to 4.8% Upper: 94 to 98%

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## SECTION 9: Physical and chemical properties

<b>Vapour pressure</b>	: 16.7 kPa [50°C]
<b>Vapour density</b>	: 2.3 [Air = 1]
<b>Relative density</b>	: Not available.
<b>Solubility(ies)</b>	: Reacts violently with water.
<b>Partition coefficient: n-octanol/water</b>	: Not available.
<b>Auto-ignition temperature</b>	: Not available.
<b>Decomposition temperature</b>	: Not available.
<b>Viscosity</b>	: Not available.
<b>Explosive properties</b>	: Explosive in the presence of the following materials or conditions: heat.
<b>Oxidising properties</b>	: Not available.

### 9.2 Other information

**Physical/chemical properties comments** : Volatility (W/W (%)): 100%

No additional information.

## SECTION 10: Stability and reactivity

<b>10.1 Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	: The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	: Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following: contact with water Reactions may include the following: spontaneous flammability liberation of flammable gas
<b>10.4 Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow gas to accumulate in low or confined areas.
<b>10.5 Incompatible materials</b>	: Reactive or incompatible with the following materials: oxidizing materials. Ammonia, water, air, alcohols, amines
<b>10.6 Hazardous decomposition products</b>	: In contact with water releases flammable gases which may ignite spontaneously.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

Acute toxicity

**Conclusion/Summary** : Not available.

Irritation/Corrosion

**Conclusion/Summary** : Not available.

Sensitiser

**Conclusion/Summary** : Not available.

Mutagenicity



**MONOCHLOROSILANE****SECTION 11: Toxicological information****Conclusion/Summary** : Not available.**Carcinogenicity****Conclusion/Summary** : Not available.**Reproductive toxicity****Conclusion/Summary** : Not available.**Teratogenicity****Conclusion/Summary** : Not available.**Specific target organ toxicity (single exposure)**

Product/ingredient name	Category	Route of exposure	Target organs
chlorosilane	Category 2	Inhalation	Not determined

**Specific target organ toxicity (repeated exposure)**

Not available.

**Aspiration hazard**

Not available.

**Information on the likely routes of exposure** : Routes of entry anticipated:Dermal, Inhalation.**Potential acute health effects**

- Inhalation** : Toxic if inhaled. May cause damage to organs following a single exposure if inhaled. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
- Ingestion** : May cause burns to mouth, throat and stomach. Ingestion of liquid can cause burns similar to frostbite.
- Skin contact** : Causes severe burns. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
- Eye contact** : Causes serious eye damage. Liquid can cause burns similar to frostbite.

**Symptoms related to the physical, chemical and toxicological characteristics**

- Inhalation** : No specific data.
- Ingestion** : Adverse symptoms may include the following:  
frostbite  
stomach pains
- Skin contact** : Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur  
frostbite
- Eye contact** : Adverse symptoms may include the following:  
pain  
watering  
redness  
frostbite

**Delayed and immediate effects and also chronic effects from short and long term exposure****Short term exposure****Potential immediate effects** : Not available.**Potential delayed effects** : Not available.**Long term exposure****Potential immediate effects** : Not available.**Potential delayed effects** : Not available.**Potential chronic health effects****Date of issue/Date of revision** : 9 January 2017**9/13**

**MONOCHLOROSILANE****SECTION 11: Toxicological information**

Not available.

<b>Conclusion/Summary</b>	: Not available.
<b>General</b>	: No known significant effects or critical hazards.
<b>Carcinogenicity</b>	: No known significant effects or critical hazards.
<b>Mutagenicity</b>	: No known significant effects or critical hazards.
<b>Teratogenicity</b>	: No known significant effects or critical hazards.
<b>Developmental effects</b>	: No known significant effects or critical hazards.
<b>Fertility effects</b>	: No known significant effects or critical hazards.
<b>Other information</b>	: Contains material that can cause target organ damage (Respiratory system, eyes, skin)

**SECTION 12: Ecological information****12.1 Toxicity**

**Conclusion/Summary** : Not available.

**12.2 Persistence and degradability**

**Conclusion/Summary** : Not available.

**12.3 Bioaccumulative potential**

Not available.

**12.4 Mobility in soil**

**Soil/water partition coefficient ( $K_{oc}$ )** : Not available.

**Mobility** : Not available.

**12.5 Results of PBT and vPvB assessment**

**PBT** : No.  
P: Not available. B: Not available. T: No.

**vPvB** : Not available.  
vP: Not available. vB: Not available.

**12.6 Other adverse effects** : No known significant effects or critical hazards.

**SECTION 13: Disposal considerations**

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**13.1 Waste treatment methods****Product**

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

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













**Packaging**

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## SECTION 13: Disposal considerations

- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
- Special precautions** : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

## SECTION 14: Transport information

	ADR/RID	ADN/ADNR	IMDG	IATA
<b>14.1 UN number</b>	UN3309	UN3309	UN3309	UN3309
<b>14.2 UN proper shipping name</b>	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. (chlorosilane)	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. (chlorosilane)	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. (chlorosilane)	Liquefied gas, toxic, flammable, corrosive, n.o.s. (chlorosilane)
<b>14.3 Transport hazard class(es)</b>	2 (2, 8)   	2 (2, 8)   	2.3 (2.1, 8)   	2.3 (2.1, 8)   
<b>14.4 Packing group</b>	-	-	-	-
<b>14.5 Environmental hazards</b>	No.	No.	No.	No.
<b>14.6 Special precautions for user</b>	Not available.	Not available.	Not available.	Not available.
<b>Additional information</b>	<b>Hazard identification number</b> 263 <b>Limited quantity</b> 0 <b>Special provisions</b> 274 <b>Tunnel code</b> (B/D)	-	<b>Emergency schedules (EmS)</b> _F-D_, S-U	<b>Passenger and Cargo Aircraft</b> Quantity limitation: Forbidden Packaging instructions: Forbidden <b>Cargo Aircraft Only</b> Quantity limitation: Forbidden Packaging instructions: Forbidden <b>Limited Quantities - Passenger Aircraft</b> Quantity limitation: Forbidden Packaging instructions: Forbidden

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

**SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****EU Regulation (EC) No. 1907/2006 (REACH)****Annex XIV - List of substances subject to authorisation****Substances of very high concern**

None of the components are listed.

**Annex XVII - Restrictions** : Not applicable.  
**on the manufacture,  
 placing on the market and  
 use of certain dangerous  
 substances, mixtures and  
 articles**

**Other EU regulations**

**Europe inventory** : This material is listed or exempted.

**Black List Chemicals** : Not listed

**Priority List Chemicals** : Not listed

**Integrated pollution  
 prevention and control  
 list (IPPC) - Air** : Not listed

**Integrated pollution  
 prevention and control  
 list (IPPC) - Water** : Not listed

**International regulations**

**Chemical Weapons  
 Convention List Schedule I  
 Chemicals** : Not listed

**Chemical Weapons  
 Convention List Schedule II  
 Chemicals** : Not listed

**Chemical Weapons  
 Convention List Schedule III  
 Chemicals** : Not listed

**15.2 Chemical Safety  
 Assessment** : Not available.

**15.3 Registration status** : Applicable.

**SECTION 16: Other information**

Indicates information that has changed from previously issued version.

**Abbreviations and  
 acronyms** : ATE = Acute Toxicity Estimate  
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No.  
 1272/2008]  
 DNEL = Derived No Effect Level  
 EUH statement = CLP-specific Hazard statement  
 PNEC = Predicted No Effect Concentration  
 RRN = REACH Registration Number

**Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]**

Classification	Justification

**Date of issue/Date of revision** : 9 January 2017

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**SECTION 16: Other information**

Flam. Gas 1, H220 Press. Gas Liq. Gas, H280 Water-react. 1, H260 Acute Tox. 3, H331 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 2, H371i	Expert judgment On basis of test data Expert judgment Expert judgment Expert judgment Expert judgment Expert judgment
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<b>Full text of abbreviated H statements</b>	: H220 Extremely flammable gas. H260 In contact with water releases flammable gases which may ignite spontaneously. H280 Contains gas under pressure; may explode if heated. H314 Causes severe skin burns and eye damage. H318 Causes serious eye damage. H331 Toxic if inhaled. H371i May cause damage to organs if inhaled.
<b>Full text of classifications [CLP/GHS]</b>	: Acute Tox. 3, H331 ACUTE TOXICITY: INHALATION - Category 3 Eye Dam. 1, H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 Flam. Gas 1, H220 FLAMMABLE GASES - Category 1 Press. Gas Liq. Gas, H280 GASES UNDER PRESSURE - Liquefied gas Skin Corr. 1B, H314 SKIN CORROSION/IRRITATION - Category 1B STOT SE 2, H371i SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE): INHALATION - Category 2 Water-react. 1, H260 SUBSTANCES AND MIXTURES, WHICH IN CONTACT WITH WATER, EMIT FLAMMABLE GASES - Category 1
<b>Full text of abbreviated R phrases</b>	: R12- Extremely flammable. R15- Contact with water liberates extremely flammable gases. R23- Toxic by inhalation. R34- Causes burns.
<b>Full text of classifications [DSD/DPD]</b>	: F+ - Extremely flammable F - Highly flammable T - Toxic C - Corrosive
<b>Date of issue/ Date of revision</b>	: 9 January 2017
<b>Date of previous issue</b>	: 24 May 2011
<b>Version</b>	: 2

**Notice to reader**

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.