

SAFETY DATA SHEET

ACCORDING TO EC-REGULATION 1272/2008 (CLP/GHS).

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1	Product identifier	
	Product name	Chlorotrifluoroethylene
	Chemical name	Chlorotrifluoroethylene
	Trade name	Chlorotrifluoroethylene
	Alternative names	1-chloro-1,2,2-trifluoroethene, trifluorochloroethylene, trifluorochloro-ethylene
	Formula	C ₂ ClF ₃
	EC No.	201-201-8
	REACH registration No	01-2119965182-37-0007
	CAS No.	79-38-9
	MITI Number	2-113
1.2	Relevant identified uses of the substance or mixture and uses advised against	
	Identified use(s)	Intended for production of various polymers and copolymers, and various fluoroorganic compounds.
	Uses advised against	None when used as intended
1.3	Details of the supplier of the Safety Data Sheet	
1.3.1	Manufacturer	«HaloPolymer Kirovo-Chepetsk», LLC per. Pozharny, 2, 613040, Kirovo-Chepetsk, Kirov Region, The Russian Federation.
	Telephone	+7-83361-9-4281
	Fax	+7-83361-9-3594
	Website	www.halopolymer.com
1.3.2	Only representative of a non-Community manufacturer	URALCHEM Assist GmbH Johannssenstrasse 10 30159, Hannover, Germany +49-511/45 99 444
	Telephone	+49-511/45 99 446
	Fax	+49-511/45 99 446
	E-mail	info@uralchem-assist.de
1.4	Emergency telephone number	
	Manufacturer/supplier:	+7-83361-9-4250 [24 hours.]
	Emergency number	
	Europe	112
	Great Britain	+44 (0) 203 394 9870 (24/7)
	The USA	+1-877 271 7077
		Consult the relevant national official advisory body if necessary

2. SECTION 2: HAZARDS IDENTIFICATION

Classification and labeling have been performed according to Regulation (EC) No. 1272/2008 (CLP/GHP)

2.1	Classification of the substance or mixture	
2.1.1	Regulation (EC) No. 1272/2008	Hazard class and category: Flammable gases (Flam. Gas 1) Liquefied gas (Liq. Gas) Acute Toxicity - Inhalation (Acute Tox. 3) Specific target organ toxicity – repeated (STOT Rep. Exp. 1)
2.2	Label elements	
	Labeling according to Regulation (EC) No.1272/2008 [CLP/GHS]	
	Hazard Pictogram:	



GHS06



GHS02



GHS04



GHS08

Signal word:

Danger

Hazard statements:

H220: Extremely flammable gas.

Precautionary Statements:

H280: Contains gas under pressure; may explode if heated.
H331: Toxic if inhaled
H372: Causes damage to organs (kidneys) through prolonged or repeated exposure (Inhalation)

P210: Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
P260 Do not breathe dust/fume/ gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P304+P340+P311: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor
P314: Get medical advice/attention if you feel unwell
P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.
P410 + P403: Protect from sunlight. Store in a well-ventilated place.
When heated, the product is decomposed with formation of toxic and corrosive vapours.
When handling the product, there were functional nervous system disorders, irritation of mucous membranes of upper airways.
See Section 11

2.3 Other hazards

2.4 Additional Information

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Product identifier type in accordance with Article 18(2) of Regulation (EC) No 1272/2008	Identifier number	Identification name	Weight % content (or range)	EC Number
CAS number	79-38-9	Chlorotrifluoroethylene	over 99.9	201-201-8

3.2 Mixtures Not applicable.

3.3 Additional Information None.

4. SECTION 4: FIRST AID MEASURES



4.1 Description of first aid measures

Inhalation	Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Use oxygen as required, provided a qualified operator is present. Call a physician immediately.
Skin Contact	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water. Keep warm and in a quiet place. Call a physician or poison control centre immediately. Wash contaminated clothing before re-use.
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician or poison control centre immediately. Take victim immediately to hospital.

Ingestion	Unlikely route of exposure. As this product is a gas, refer to the inhalation section. Do not induce vomiting without medical advice. Call a physician immediately.
4.2 Most important symptoms and effects, both acute and delayed	Symptoms may include dizziness, headache, feeling drunk, sleepiness, throat irritation, disturbance of breathing rhythm and coordination.
4.3 Indication of immediate medical attention and special treatment needed	Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions. Treat frost-bitten areas as needed.

5. SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media	Use large volumes of water as fog. Large fires: sprayed water or fog. Small ignitions: dry chemical or CO ₂ . All fire-extinguishing means except carbon-dioxide fire extinguishers, inert gases, and sprayed water. Extremely flammable.
Suitable Extinguishing Media	
Unsuitable Extinguishing Media	
5.2 Special hazards arising from the substance or mixture	
5.3 Advice for fire-fighters	If possible, stop flow of product. Move away from the container and cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Use self-contained breathing apparatus and chemically protective clothing.

6. SECTION 6: ACCIDENTAL RELEASE MEASURES




6.1 Personal precautions, protective equipment and emergency procedures	Advice for non-emergency personnel: - Prevent further leakage or spillage if safe to do so. - Keep away from Incompatible products (see Section 10). Advice for emergency responders: - The product evaporates readily. - Evacuate personnel to safe areas. - Ventilate the area. - Suppress (knock down) gases/vapours/mists with a water spray jet. - Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. - Cover the spreading liquid with foam in order to slow down the evaporation. - Keep away from open flames, hot surfaces and sources of ignition. Refer to protective measures listed in sections 7 and 8.
6.2 Environmental precautions	Should not be released into the environment. Do not flush into surface water or sanitary sewer system.
6.3 Methods and material for containment and cleaning up	Suppress (knock down) gases/vapours/mists with a water spray jet. Soak up with inert absorbent material. Suitable material for picking up - Earth - Dry sand - Shovel into suitable container for disposal.
6.4 Reference to other sections	See Sections 7, 8 and 13
6.5 Additional Information	None

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling	Use only in well-ventilated areas. Keep away from heat and sources of ignition. To avoid thermal decomposition, do not overheat. Avoid skin contact with leaking liquid (danger of frostbite). Purge piping circuits and equipment with nitrogen. No sparking tools should be used.
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7.2	Conditions for safe storage, including any incompatibilities	<p>Use only explosion-proof equipment. Take measures to prevent the buildup of electrostatic charge.</p> <p>Storage:</p> <ul style="list-style-type: none"> - Keep away from heat and sources of ignition. - Keep in a well-ventilated place. - Vapours are heavier than air and may spread along floors. - Keep cool. Protect from sunlight. - Keep away from combustible material. - Keep away from Incompatible products. - Keep only in the original container at a temperature not exceeding 50 °C. - Provide electrical equipment safe for hazardous locations. - Ensure all equipment is electrically grounded before beginning transfer operations. - Do not confine the product in a circuit, between closed valves, or in a container without a vent. <p>Packaging material</p> <p>Suitable material:</p> <ul style="list-style-type: none"> - Stainless steel - Carbon steel - Warning! Container under pressure.
7.3	Specific end use(s)	<p>Intended for production of various polymers and copolymers, and various fluoroorganic compounds.</p>

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1	Control parameters	
8.1.1	Occupational Exposure Limits	<ul style="list-style-type: none"> - SAEL (Solvay Acceptable Exposure Limit) 2005 TWA = 5 ppm - SAEL (Solvay Acceptable Exposure Limit) 2005 Ceiling = 20 ppm
8.1.2	Biological limit value	No information available.
8.1.3	PNECs and DNELs	<p>Workers:</p> <ul style="list-style-type: none"> - Acute/short term exposure DNEL - 26.1 mg/m³ (Inhalation) - Long term exposure DNEL - 2.77 mg/m³ (Inhalation) <p>General Population:</p> <ul style="list-style-type: none"> - Long term exposure DNEL - 0.69 mg/m³
8.2	Exposure controls	
8.2.1	Appropriate engineering controls	Tightness of production process and process equipment. It is necessary to use exhaust ventilation. Use special systems to control chlorotrifluoroethylene content in the air.
8.2.2	Personal protection equipment	
	Eye/face protection	 <p>Tightly fitting safety goggles Chemical resistant goggles must be worn. If splashes are likely to occur, wear Face-shield</p>
	Skin protection	 <p>Handle in accordance with good industrial hygiene and safety practice. Neoprene gloves</p>
	Respiratory protection	 <p>Use respirator when performing operations involving potential exposure to vapour of the product. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used. Remove respiratory and skin/eye protection only after vapours have been cleared from the area. Use only respiratory protection that conforms to international/ national</p>

Skin and body protection	standards. Appropriate protective clothing, shoes, headwear that prevent the contact of chlorotrifluoroethylene with skin. All protective clothes must be clean, available each day, and put on before working.
Hygiene measures	Ensure that eyewash stations and safety showers are close to the workstation location. Gloves, overalls and boots have to be double layered (protection against cold temperature). Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. When using, do not eat, drink or smoke. Wash hands before breaks and at the end of workday. Handle in accordance with good industrial hygiene and safety practice.
8.2.3 Environmental Exposure Controls	Control of product content in atmospheric air. Use closed systems, ventilation. To avoid the product release to atmosphere, the workroom air must be cleaned and directed for dispersion to atmosphere. Waste water of production process must be treated according to the manufacturing instructions.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties	
Physical state at 20°C and 101.3 kPa	Liquefied gas
Colour	Colourless.
Odour	Odourless.
Melting Point (°C) / Freezing Point (°C)	-158
Boiling point	-27
Flash Point (°C)	-27.78
Flammability (solid, gas)	Extremely flammable
Explosive limit ranges at 20°C and 101.3 kPa	8.4 to 38.7% (v/v)
Vapour Pressure (MPa)	0.61
Surface tension	Not applicable
Relative density (g/cm ³) @ 20°C	1,289
Solubility (Water) (mg/L) @ 28°C	Slightly soluble
Stability in organic solvents and identity of relevant degradation products	Not applicable
Partition Coefficient (n-Octanol/water)	1.65
Viscosity (mPa.s)	Not applicable
Explosive properties	Not applicable
Oxidizing properties	Not applicable
9.2 Other information	None

10. SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity	Vapours may form explosive mixtures with air
10.2 Chemical stability	Stable under recommended storage conditions.
10.3 Possibility of hazardous reactions	Keep away from oxidizing agents. Potential for exothermic hazard
10.4 Conditions to avoid	Exposure to moisture. Heat, flames and sparks. To avoid thermal decomposition, do not overheat.
10.5 Incompatible materials	Flammable materials, Combustible material Oxidizing agents, Oxygen, Halogenated compounds, Water
10.6 Hazardous Decomposition Product(s)	Thermal degradation with formation of fluorine, hydrofluoride, carbon oxides, chlorine, phosgene is possible.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects	
11.1.1 Acute toxicity	
Inhalation / Skin Contact / Eye Contact	Inhalation: LC50(rat) (4 h): 1000 ppm LC50 (rat) (2 h): 5040 ppm

		LC50 (mouse) (4 h): 1800 ppm
11.1.2	Skin corrosion/irritation	When contacting the liquefied gas – skin frostbite
11.1.3	Serious eye damage/irritation	When contacting the liquefied gas – eye frostbite
11.1.4	Respiratory or skin sensitization	Not available
11.1.5	Mutagenicity	Negative results of mutagenicity test indicate the absence of classification.
11.1.6	Carcinogenicity	There is no evidence that this product poses a carcinogenic risk under normal conditions of handling and use.
11.1.7	Reproductive toxicity	Female rats, exposure: 20 weeks (6 hours / day, 7 days / week): exposure at 30 ppm - no-observed-adverse-effect (NOAEC) for maternal toxicity; exposure at 90 ppm - no-observed-adverse-effect for developmental toxicity; exposure at 180 ppm - no-observed-adverse-effect for teratogenicity.
11.1.8	Repeated dose toxicity: sub-acute / sub-chronic / chronic	Lesions of central nervous, respiratory and cardiovascular systems, liver, kidneys. Strong poison for kidneys (up to renal necrosis and death by uremia).
11.2	Other information	Chlorotrifluoroethylene was entered by the World Health Organization and the U.S. Environmental Protection Agency (EPA) on the list of potential endocrine disruptors.

12. SECTION 12: ECOLOGICAL INFORMATION

12.1	Toxicity	No aquatic toxicity data exist for chlorotrifluoroethylene. Direct and indirect exposure of the aquatic compartment to chlorotrifluoroethylene is not expected. Since it is a gas of low solubility any water-borne chlorotrifluoroethylene will rapidly partition to air, and thus impact on aquatic life is expected to be minimal.
12.2	Persistence and degradability	Half-life in air: 2.5 d Transforms in the environment. Data on transformation products are not available.
12.3	Bioaccumulative potential	In the aquatic environment, no hydrolysis of chlorotrifluoroethylene will occur. Chlorotrifluoroethylene is not prone to rapid biodegradation and bioaccumulation
12.4	Mobility in soil	Chlorotrifluoroethylene's Henry's Law (0.31 atm-cu m/mole (SRC)) constant indicates that volatilization from moist soil surfaces may occur (SRC). Chlorotrifluoroethylene is expected to volatilize from dry soil surfaces (SRC) based upon a vapor pressure of 4.59X10+3 mm Hg
12.5	Results of PBT and VPVB assessment	The substance is neither considered as PBT nor as vPvB, since the P (persistent), resp. vP (very persistent), and B (bioaccumulative), resp. vB (very bioaccumulative) criteria are not fulfilled.
12.6	Other adverse effects	No information available.

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1	Waste treatment methods	Pressurized gas bottle: dispose of only in empty condition! Dispose of contents in accordance with local, state or national legislation.
13.2	Additional Information	
13.2.1	Contaminated packaging:	Purge the container with nitrogen and direct the gas to a treatment plant. Where possible recycling is preferred to disposal or incineration. Dispose as unused product according to the local and national standards.

14. SECTION 14: TRANSPORT INFORMATION




14.1	Land transport (ADR/RID):	
	UN-No.:	1082
	Proper shipping name	TRIFLUOROCHLOROETHYLENE, STABILIZED
	Transport hazard class(es)	2
	Labels	2.1: flammable gas; 2.3: toxic gas

14.2	Inland waterway transport (ADN(R)):	
	UN-No.:	1082
	Proper shipping name	TRIFLUOROCHLOROETHYLENE, STABILIZED
	Transport hazard class(es)	2
	Labels	2.1: flammable gas; 2.3: toxic gas
14.2	Marine transport (IMDG)	
	UN-No.:	1082
	Proper Shipping Name:	TRIFLUOROCHLOROETHYLENE, STABILIZED
	Class:	2.3
	Hazard Label(s):	2.1: flammable gas; 2.3: toxic gas
	EmS number	F-D,S-U
14.3	Air transport (IATA):	
	Passenger Aircraft:	Not permitted for transport
	Cargo Aircraft:	Not permitted for transport
14.4	Additional information:	None.

15. SECTION 15: REGULATORY INFORMATION

15.1	Safety, health and environmental regulations/legislation specific for the substance or mixture	
15.1.1	EU regulations	
	Authorizations and/or restrictions on use	None known.
15.1.2	National regulations	
		Hazard classification - In accordance with: State Standard of Russian Federation (GOST 12.1.007). Label elements - In accordance with: State Standard of Russian Federation (GOST 31340-07).
15.2	Chemical Safety Assessment	Available.

16. SECTION 16: OTHER INFORMATION

16.1	Classification of the substance	
16.1.1	Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]	
		Hazard class and category: Flammable gases (Flam. Gas 1) Gases Under Pressure (Liq. Gas) Acute Toxicity - Inhalation (Acute Tox. 3)
	Label elements	
	Hazard Pictogram:	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  GHS06 </div> <div style="text-align: center;">  GHS02 </div> <div style="text-align: center;">  GHS04 </div> </div>
	Signal word:	Danger
	Hazard statements:	H220: Extremely flammable gas. H280: Contains gas under pressure; may explode if heated. H331: Toxic if inhaled
	Precautionary Statements	P210: Keep away from heat/sparks/open flames/hot surfaces. — No smoking. P261: Avoid breathing dust/fume/gas/mist/vapours/ spray. P271: Use only outdoors or in a well-ventilated area. P304+P340+P311: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor/... P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381 Eliminate all ignition sources if safe to do so. P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

16.2 LEGENDSTOT
DNEL
PNEC
PBTP405: Store locked up.
P410 + P403: Protect from sunlight. Store in a well-ventilated place.Specific Target Organ Toxicity
Derived No Effect Level
Predicted No Effect Concentration
PBT: Persistent, Bioaccumulative and Toxic

Additional Information

Occupational sanitary-hygienic standards of Russian Federation:
PDK = 5 mg/m³, 4th dangerous class (low - hazardous substance).
(PDK – Highest non-recurrent concentration in the air of working area).

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. HaloPolymer Kirovo-Chepetsk LLC gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. HaloPolymer Kirovo-Chepetsk LLC accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed. You should not use the product with the purposes other than those specified, without consultation with us. It is the Customer's responsibility to make an assessment of this product and use it observing safety precautions and requirements of relevant laws and legal norms. The Buyer of the product intended for a third party's usage is obliged to take all reasonable steps to afford access to all information contained in this SDS for any person making use of this product. An Employer must inform employees and other persons of the dangers they can be incurred and precautionary measures they should apply.

Annex to the extended Safety Data Sheet (eSDS)

Production of polymers

Process category	PROC 1: Use in closed process, no likelihood of exposure PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental release category	ERC 6c: Industrial use of monomers for manufacture of thermoplastics
Sector of end use	SU 0: Other: SU3: Industrial uses
Subsequent service life relevant for that use?	yes Use as reactant in polymerization process or use as intermediate
Process category	PROC 1: Use in closed process, no likelihood of exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 15: Use as laboratory reagent
Environmental release category	ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates)
Sector of end use	SU 0: Other: SU3: Industrial uses
Subsequent service life relevant for that use?	yes Production of polymers
Process category	PROC 3: Use in closed batch process (synthesis or formulation) PROC 1: Use in closed process, no likelihood of exposure PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 15: Use as laboratory reagent
Chemical product category	PC 19: Intermediate PC 21: Laboratory chemicals
Environmental release category	ERC 6c: Industrial use of monomers for manufacture of thermoplastics
Substance supplied to that use in form of	As such
Sector of end use	SU 12: Manufacture of plastics products, including compounding and conversion
Subsequent service life relevant for that use?	no Production of polymers
Process category	PROC 1: Use in closed process, no likelihood of exposure PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental release category	ERC 6c: Industrial use of monomers for manufacture of thermoplastics
Sector of end use	SU 0: Other: SU 3: industrial use