

**Trade name:** R-1233zd**Current version :** 1.0.0, issued: 30.07.2024**Replaced version:** -, issued: -**Region:**  
GER**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name****R-1233zd**

Substance name	trans-1-chloro-3,3,3-trifluoropropene
REACH registration no.	01-2119855084-38

**Identification numbers**

CAS no.	102687-65-0
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**1.2 Relevant identified uses of the substance or mixture and uses advised against****Relevant identified uses of the substance or mixture**Refrigerant  
Heat transfer medium**Uses advised against**

Consumer use

**1.3 Details of the supplier of the safety data sheet****Address**TEGA - Technische Gase und Gasetechnik GmbH  
Werner-von-Siemens-Straße 18  
97076 Würzburg

Telephone no.	+49 931 2093-220
Fax no.	+49 931 2093-180
e-mail	kaeltmittel@tega.de

**Advice on Safety Data Sheet**

sdb\_info@umco.de

**1.4 Emergency telephone number**For medical advice (in German and English):  
+49 (0)551 192 40 (Giftinformationszentrum Nord)**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****Classification in accordance with Regulation (EC) No 1272/2008 (CLP)**Aquatic Chronic 3; H412  
Press. Gas liq.; H280**Classification information**

This product is assessed and classified using the methods and criteria below referred to in Article 9 of Regulation (EC) n° 1272/2008:

Physical hazards: determined through assessment data based on the methods or standards referred to in part 2 of Annex I to CLP

Health hazards and environmental hazards: determined through toxicological and ecotoxicological assessment data based on the methods or standards referred to in Part 3 and 4 of Annex I to CLP.

**2.2 Label elements****Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)****Product identifier**

102687-65-0 (trans-1-chloro-3,3,3-trifluoropropene)

**Hazard pictograms**

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GHS04

**Signal word**

Warning

**Hazard statement(s)**

H280 Contains gas under pressure; may explode if heated.

H412 Harmful to aquatic life with long lasting effects.

**Precautionary statement(s)**

P273 Avoid release to the environment.

P410+P403 Protect from sunlight. Store in a well-ventilated place.

P501 Dispose of contents/container to a facility in accordance with local and national regulations.

**Supplemental label elements**

Contains fluorinated greenhouse gas: R-1233zd

**2.3 Other hazards**

Danger of suffocation by displacement of air / oxygen. Contact with the liquid can cause cold burns or frostbite.

PBT assessment

The product is not considered to be a PBT.

vPvB assessment

The product is not considered to be a vPvB.

**SECTION 3: Composition/information on ingredients****3.1 Substances****Chemical characterization**

Substance name trans-1-chloro-3,3,3-trifluoropropene

Degree of purity 100

Formula C<sub>3</sub>H<sub>2</sub>ClF<sub>3</sub>

Molecular weight 130,5

**Identification numbers**

CAS no. 102687-65-0

**3.2 Mixtures**

Not applicable. The product is not a mixture.

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

Remove affected person from danger area, lay him down. Remove contaminated clothing and clean before reuse. Adhere to personal protective measures when giving first aid.

**After inhalation**

Ensure supply of fresh air. Irregular breathing/no breathing: artificial respiration. Call a doctor immediately.

**After skin contact**

In case of contact with skin wash off immediately with soap and water. Rinse with much water in case of frostbites. Remove clothes only after unfreezing. Cover wounds with sterile dressing. Call a doctor immediately.

**After eye contact**

Remove contact lenses. Rinse eye thoroughly under running water keeping eyelids wide open and protecting the unaffected eye (at least 10 to 15 minutes). Seek medical assistance.

**After ingestion**

Rinse mouth. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor.

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Gas reduces oxygen available for breathing. Contact with liquid or refrigerated gas can cause cold burns and frostbite.

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

Treat symptomatically.

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

The product is not flammable. Extinguishing measures to suit surroundings. recommended: alcohol resistant foam, CO<sub>2</sub>, powders, water spray/mist

**Unsuitable extinguishing media**

High power water jet

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

In the event of fire, the following can be released: Hydrogen fluoride (HF); Hydrogen chloride (HCl); Carbon monoxide and carbon dioxide; carbonyl halides; halogenated compounds; Liquefied gas: Spilled liquid can cause cold burns. This gas is heavier than air and may accumulate in low areas.

**5.3 Advice for firefighters**

Use self-contained breathing apparatus. Wear full protective suit. Containers close to fire should be transferred to a safe place. Cool closed containers exposed to fire with water. Pressure increase, bursting and explosion hazard during heating. Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures****For non-emergency personnel**

Refer to protective measures listed in sections 7 and 8. Provide good room ventilation even at ground level (vapours are heavier than air). Remove persons to safety. Cordon and mark contaminated area. Use personal protective clothing. Do not breathe gas. Keep away from ignition sources. Avoid skin contact with leaking liquid (danger of frostbite!).

**For emergency responders**

No data available. Personal protective equipment (PPE) - see Section 8.

**6.2 Environmental precautions**

Avoid release in the environment. Suppress gases/vapours/mists with water spray jet.

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

Ensure adequate ventilation. Dispose of absorbed material in accordance with the regulations.

**6.4 Reference to other sections**

Information regarding safe handling, see section 7. Information regarding personal protective measures, see section 8. Information regarding waste disposal, see section 13.

**SECTION 7: Handling and storage****7.1 Precautions for safe handling****Advice on safe handling**

Only qualified and trained persons are authorised to handle. Provide good ventilation at the work area (local exhaust ventilation, if necessary). To be used only according to instructions for use. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose containers heat or sources of ignition. In case of accidental release: danger due to low temperature of the liquid product. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Comply with the health and safety at work laws.

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Wash hands before breaks and after work. Do not inhale gases. Do not eat, drink or smoke during work time. Keep away from foodstuffs and beverages. Provide eye wash fountain in work area. Have emergency shower available. Remove soiled or soaked clothing immediately.

**Advice on protection against fire and explosion**

Isolate from sources of heat, sparks and open flame. Take precautionary measures against electrostatic loading (earthing necessary during loading operations). Electrical equipment should be protected to the appropriate standard. May form a flammable mixture with air at superatmospheric pressure.

**7.2 Conditions for safe storage, including any incompatibilities****Technical measures and storage conditions**

Keep container tightly closed in a cool, well-ventilated place, open and handle carefully. Protect from heat and direct sunlight.

**Requirements for storage rooms and vessels**

Containers which are opened must be carefully closed and kept upright to prevent leakage. Always keep in containers of same material as the original.

**Incompatible products**

Substances to be avoided, see section 10.

**Storage Class according TRGS 510**

2A Gases (except aerosol dispensers and lighters)

**7.3 Specific end use(s)**

No data available.

**SECTION 8: Exposure controls/personal protection****8.1 Control parameters****DNEL, DMEL and PNEC values****DNEL values (worker)**

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	trans-1-chloro-3,3,3-trifluoropropene			102687-65-0	
	inhalative	Long term (chronic)	systemic	-	-
				1779	mg/m <sup>3</sup>

**DNEL value (consumer)**

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	trans-1-chloro-3,3,3-trifluoropropene			102687-65-0	
	oral	Long term (chronic)	systemic	-	-
				109	mg/kg/day
	inhalative	Long term (chronic)	systemic	379	mg/m <sup>3</sup>

**PNEC values**

No	Substance name		CAS / EC no	
	ecological compartment	Type	Value	
1	trans-1-chloro-3,3,3-trifluoropropene		102687-65-0	
				-
	water	fresh water	0,038	mg/L
	water	marine water	0,004	mg/L
	water	fresh water sediment	0,691	mg/kg dry weight
	water	marine water sediment	0,069	mg/kg dry weight
	soil	-	0,126	mg/kg dry weight

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## 8.2 Exposure controls

### Appropriate engineering controls

Ensure adequate ventilation, local exhaust at the work station if necessary.

### Personal protective equipment

#### Respiratory protection

In case of insufficient ventilation or long-term effect use breathing apparatus. Danger of suffocation due to high concentrations in breathing air. Type organic gases and vapours of low boilers (AX)

#### Eye / face protection

Tightly fitting safety glasses (EN 166).

#### Hand protection

Low-temperature-resistant gloves (EN 511). Sufficient protection is given wearing suitable protective gloves checked according to i.e. EN 374, in the event of risk of skin contact with the product. Before use, the protective gloves should be tested in any case for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer's instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Design operations thus to avoid permanent use of protective gloves.

Appropriate Material viton

#### Other

Chemical-resistant work clothes. Protective shoes.

#### Environmental exposure controls

Avoid release into sewage and environment.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

<b>State of aggregation</b>	
gas	
<b>Form</b>	
liquified gas	
<b>Colour</b>	
colourless	
<b>Odour</b>	
slight	
<b>pH value</b>	
No data available	
<b>Boiling point / boiling range</b>	
Value	19 °C
Method	OECD 103
Source	supplier
<b>Melting point/freezing point</b>	
Value	< -90 °C
Method	OECD 102
Source	supplier
<b>Decomposition temperature</b>	
Value	250 °C
Source	supplier
<b>Flash point</b>	
Not applicable	
Method	ISO 2719
Source	supplier

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<b>Ignition temperature</b>			
No data available			
<b>Oxidising properties</b>			
not classified			
Source	supplier		
<b>Flammability</b>			
The product is non-flammable.			
Source	supplier		
<b>Lower explosion limit</b>			
none			
Source	supplier		
<b>Upper explosion limit</b>			
none			
Source	supplier		
<b>Vapour pressure</b>			
Value	1065	hPa	
Reference temperature	20	°C	
Source	supplier		
Value	1516	hPa	
Reference temperature	30	°C	
Source	supplier		
<b>Relative vapour density</b>			
not determined			
Source	supplier		
Comments	Air = 1		
<b>Relative density</b>			
No data available			
<b>Density</b>			
Value	1,27	g/cm <sup>3</sup>	
Source	supplier		
<b>Solubility in water</b>			
Value	1,90	g/L	
Reference temperature	20	°C	
Method	OECD 105		
Source	supplier		
<b>Solubility</b>			
No data available			
<b>Partition coefficient n-octanol/water (log value)</b>			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
	log Pow	appr.	2,2
	Reference temperature		25 °C
	with reference to	pH 7,4	
	Method	OECD 117	
	Source	ECHA	
<b>Kinematic viscosity</b>			
No data available			
<b>Particle characteristics</b>			
No data available			

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No data available.

**SECTION 10: Stability and reactivity****10.1 Reactivity**

Dangerous reactions are not expected if the product is handled according to its intended use.

**10.2 Chemical stability**

Stable under recommended storage and handling conditions (See section 7).

**10.3 Possibility of hazardous reactions**

No hazardous reaction when handled and stored according to provisions. May form a flammable mixture with air at superatmospheric pressure. Polymerization can occur.

**10.4 Conditions to avoid**

Temperatures &gt; 50°C. Heat, naked flames and other ignition sources.

**10.5 Incompatible materials**

strong oxidizing agents; Acids; Magnesium; Aluminium

**10.6 Hazardous decomposition products**

None if stored, handled and transported properly. In case of fire: see section 5.

**SECTION 11: Toxicological information****11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008****Acute oral toxicity**

No data available

**Acute dermal toxicity**

No data available

**Acute inhalational toxicity**

No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
LC50		120000	ppmV
Duration of exposure		4	h
State of aggregation	Gas		
Species	rat		
Method	OECD 403		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		

**Skin corrosion/irritation**

No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
Duration of exposure		4	h
Species	rabbit		
Method	OECD 404		
Source	ECHA		
Evaluation	non-irritant		
Evaluation/classification	Based on available data, the classification criteria are not met.		

**Serious eye damage/irritation**

No data available

**Respiratory or skin sensitisation**

No data available

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Germ cell mutagenicity			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
Type of examination		In vitro bacterial reverse mutation assay	
Species		Salmonella typhimurium: TA 1535, TA 1537, TA 98, TA 100; Escherichia coli WP2 uvrA	
Method		OECD 471	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
Type of examination		in vitro gene mutation study in mammalian cells	
Species		Human Lymphocyte	
Method		OECD 473	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
Type of examination		Genotoxicity in vivo	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	

Reproduction toxicity			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
Route of exposure		inhalational	
NOEC		>=	15000 ppm
Type of examination		Two-Generation Reproduction Toxicity Study	
Species		rat	
Method		OECD 416	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
Route of exposure		inhalational	
NOEC		>=	15000 ppm
Type of examination		Prenatal Developmental Toxicity Study	
Species		rat	
Method		OECD 414	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	

Carcinogenicity	
No data available	

STOT - single exposure	
No data available	

STOT - repeated exposure			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
Route of exposure		inhalational	
LOAEC		>=	4000 ppm
Species		rat (male)	
Method		OECD 413	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	

Aspiration hazard	
No data available	

## 11.2 Information on other hazards

### Endocrine disrupting properties

No data available.

### Other information



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Higher exposure may lead to effects on the central nervous system, drowsiness and dizziness.

Cardiac sensitization (dog): Highest test concentration with no observed effect - 100000 ppm.

## SECTION 12: Ecological information

### 12.1 Toxicity

Toxicity to fish (acute)			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
LC50	appr.	38	mg/l
Duration of exposure		96	h
Species	Oncorhynchus mykiss		
Method	OECD 203		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are met.		

Toxicity to fish (chronic)			
No data available			

Toxicity to Daphnia (acute)			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
EC50		82	mg/l
Duration of exposure		48	h
Species	Daphnia magna		
Method	OECD 202		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are met.		

Toxicity to Daphnia (chronic)			
No data available			

Toxicity to algae (acute)			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
EC50	>	215	mg/l
Duration of exposure		72	h
Species	Pseudokirchneriella subcapitata		
Method	OECD 201		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		

Toxicity to algae (chronic)			
No data available			

Bacteria toxicity			
No data available			

### 12.2 Persistence and degradability

Biodegradability			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
Type	aerobic biodegradation		
Value		1	%
Duration		28	day(s)
Method	OECD 301 D		
Source	ECHA		
Evaluation	not readily biodegradable		

### 12.3 Bioaccumulative potential

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Partition coefficient n-octanol/water (log value)			
No	Substance name	CAS no.	EC no.
1	trans-1-chloro-3,3,3-trifluoropropene	102687-65-0	-
log Pow		appr.	2,2
Reference temperature			25 °C
with reference to		pH 7,4	
Method		OECD 117	
Source		ECHA	

**12.4 Mobility in soil**

No data available.

**12.5 Results of PBT and vPvB assessment**

Results of PBT and vPvB assessment	
PBT assessment	The product is not considered to be a PBT.
vPvB assessment	The product is not considered to be a vPvB.

**12.6 Endocrine disrupting properties**

No data available.

**12.7 Other adverse effects**

Other adverse effects
Product: Global warming potential within 100 years: 3.88

**12.8 Other information**

Other information
Do not discharge into drains or waters and do not dispose of in public landfills.

**SECTION 13: Disposal considerations****13.1 Waste treatment methods****Product**

Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company.  
dispose of in accordance with local regulation.

**Packaging**

Take empty containers to an approved waste disposal facility for recovery or disposal.  
Return empty pressure vessels to the supplier.

**SECTION 14: Transport information****14.1 UN number or ID number**

ADR/RID/ADN	UN3163
IMDG	UN3163
ICAO-TI / IATA	UN3163

**14.2 UN proper shipping name**

ADR/RID/ADN	LIQUEFIED GAS, N.O.S.
Technical name	trans-1-chloro-3,3,3-trifluoropropene
IMDG	LIQUEFIED GAS, N.O.S.
Technical name	trans-1-chloro-3,3,3-trifluoropropene
ICAO-TI / IATA	Liquefied gas, n.o.s.
Technical name	trans-1-chloro-3,3,3-trifluoropropene

**14.3 Transport hazard class(es)**

ADR/RID/ADN - Class	2
Label	2.2 RID: (+13)
Classification code	2A
Tunnel restriction code	C/E

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Hazard identification no.	20
<b>IMDG - Class</b>	2.2
Label	2.2
<b>ICAO-TI / IATA - Class</b>	2.2
Label	2.2

**14.4 Packing group**

<b>ADR/RID/ADN</b>	-
<b>IMDG</b>	-
<b>ICAO-TI / IATA</b>	-

**14.5 Environmental hazards**

EmS	F-C, S-V
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**14.6 Special precautions for user**

To be transported always in closed, upright and safe containers. Make sure that persons handling these containers are aware of the rules of conduct in case of incident or spillage.

**14.7 Maritime transport in bulk according to IMO instruments**

Not relevant

**SECTION 15: Regulatory information**

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

**EU regulations**

<b>Regulation (EC) No 1907/2006 (REACH) Annex XIV (List of substances subject to authorisation)</b>	
In accordance with the REACH regulation (EC) 1907/2006, the product does not contain any substances that are considered as subject to listing in annex XIV, inventory of substances requiring authorisation.	
<b>REACH candidate list of substances of very high concern (SVHC) for authorisation</b>	
In accordance with article 57 and article 59 of the Reach regulation (EC) 1907/2006, this substance is not considered as subject to listing in annex XIV, inventory of substances requiring authorisation ("Authorization list").	
<b>Regulation (EC) No 1907/2006 (REACH) Annex XVII: RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES</b>	
The substance is not subject to the provisions of annex XVII (restriction entries) of the Reach regulation (EC) 1907/2006.	
<b>Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances</b>	
This substance is not subject to Part 1 or 2 of Annex I	
<b>Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control)</b>	
VOC-value	100 %
<b>Other regulations</b>	
REGULATION (EU) No 517/2014 on fluorinated greenhouse gases Adhere to the national sanitary and occupational safety regulations when using this product.	

**National regulations**

**Water Hazard Class (Germany)**

Class	1
Source	Classification according to AwSV (Regulation on facilities for handling substances that are hazardous to water).

**Other regulations**

Take into account: TRGS 510 "Storage of hazardous substances in non-stationary containers"

**15.2 Chemical safety assessment**

A chemical safety assessment has been carried out for this substance.

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## SECTION 16: Other information

**Sources of key data used to compile the data sheet:**

Regulation (EC) No 1907/2006 (REACH), 1272/2008 (CLP) as amended in each case.

Directives 2000/39/EC, 2006/15/EC, 2009/161/EU, (EU) 2017/164.

National Threshold Limit Values of the corresponding countries as amended in each case.

Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.

The data sources used to determine physical, toxic and ecotoxic data, are indicated directly in the corresponding section.

**Creation of the safety data sheet**

UMCO GmbH

This information is based on our present knowledge and experience.

The safety data sheet describes products with a view to safety requirements.

It does not however, constitute a guarantee for any specific product properties and shall not establish a legally valid contractual relationship.

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