

**Trade name:** R410A

**Product no.:** R410A

**Current version :** 1.0.0, issued: 14.12.2023

**Replaced version:** -, issued: -

**Region:**  
GER

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

### 1.1 Product identifier

**Trade name**

**R410A**

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

**Relevant identified uses of the substance or mixture**

Industrial Use

Professional use

Refrigerant

**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)**

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, 4 and 5 of Annex I to CLP.

### 2.2 Label elements

**Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)**

**Hazard pictograms**



GHS04

**Signal word**

Warning

**Hazard statement(s)**

H280

Contains gas under pressure; may explode if heated.

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

**Supplemental label elements**

Contains fluorinated greenhouse gases (HFC-125, HFC-32).

**2.3 Other hazards**

Danger of suffocation by displacement of air / oxygen. Contact with the liquid can cause cold burns or frostbite. Please observe the information given in this safety data sheet.

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**

Not applicable. The product is not a substance.

**3.2 Mixtures****Hazardous ingredients**

No	Substance name		Additional information	
	CAS / EC / Index / REACH no	Classification (EC) 1272/2008 (CLP)	Concentration	
1	<b>perfluoroethane</b>			
	354-33-6 206-557-8 - 01-2119485636-25	Press. Gas liq.; H280	>= 50,00 - < 70,00	Vol%
2	<b>difluoromethane</b>			
	75-10-5 200-839-4 - 01-2119471312-47	Flam. Gas 1A; H220 Press. Gas liq.; H280	>= 50,00 - < 70,00	Vol%

Full Text for all H-phrases and EUH-phrases: pls. see section 16

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

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove affected person from danger area, lay him down. Seek medical advice immediately.

**After inhalation**

Remove affected persons from dangerous area by observing suitable respiratory protection measures. 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 the mouth thoroughly with water. Do not induce vomiting. Never give anything by mouth to an unconscious person.

**4.2 Most important symptoms and effects, both acute and delayed****Symptoms**

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The following symptoms may occur: respiratory arrest. Shortness of breath; Light-headedness; muscle incoordination; Unconsciousness; cardiac arrhythmia; Dizziness; confusion; anesthetic effect; Skin irritation; red eyes; nausea; frostbite; Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. May be fatal if inhaled.

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

Treat symptomatically. Do not administer any preparations of the adrenaline-ephedrine group.

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

recommended: alcohol resistant foam, CO<sub>2</sub>, powders, water spray/mist; Extinguishing measures to suit surroundings.

**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: Carbon monoxide and carbon dioxide; Hydrogen fluoride (HF); Carbonyl fluoride; fluorine 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). Do not breathe gas. Keep away from ignition sources. Use personal protective clothing. Cordon and mark contaminated area. Remove persons to safety.

**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. Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. 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.

**General protective and hygiene measures**

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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. Have emergency shower available.

**Advice on protection against fire and explosion**

The product is not combustible. The substance can form a combustible mixture with air at elevated pressure. 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.

**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.

**Recommended storage temperature**

Value < 50 °C

**Storage stability**

Comments When stored properly, the storage life is unlimited.

**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****Biological limit values**

No	Substance name	
1	pentafluoroethane	
	TRGS 903	
	Fluorwasserstoff und anorganische Fluorverbindungen (Fluoride)	
	parameter	Fluorid
	Value	7,0 mg/g Kreatinin
	sample material	U
	Sampling moment	b
	TRGS 903	
	Fluorwasserstoff und anorganische Fluorverbindungen (Fluoride)	
	parameter	Fluorid
	Value	4,0 mg/g Kreatinin
	sample material	U
	Sampling moment	d

**DNEL, DMEL and PNEC values****DNEL values (worker)**

No	Substance name			CAS / EC no
	Route of exposure	Exposure time	Effect	Value
1	pentafluoroethane			354-33-6 206-557-8
	inhalative	Long term (chronic)	systemic	16444 mg/m <sup>3</sup>
2	difluoromethane			75-10-5 200-839-4

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inhalative	Long term (chronic)	systemic	7035	mg/m <sup>3</sup>
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**DNEL value (consumer)**

No	Substance name	Route of exposure	Exposure time	Effect	CAS / EC no	Value
1	pentafluoroethane	inhalative	Long term (chronic)	systemic	354-33-6 206-557-8	1753 mg/m <sup>3</sup>
2	difluoromethane	inhalative	Long term (chronic)	systemic	75-10-5 200-839-4	750 mg/m <sup>3</sup>

**PNEC values**

No	Substance name	ecological compartment	Type	CAS / EC no	Value
1	pentafluoroethane	water	fresh water	354-33-6 206-557-8	0,1 mg/L
		water	fresh water sediment		0,6 mg/kg dry weight
2	difluoromethane	water	fresh water	75-10-5 200-839-4	0,142 mg/L
		water	Aqua intermittent		1,42 mg/L
		water	fresh water sediment		0,543 mg/kg dry weight

**8.2 Exposure controls****Appropriate engineering controls**

Ensure adequate ventilation, local exhaust at the work station if necessary. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

**Personal protective equipment****Respiratory protection**

Self-contained breathing apparatus. In case of insufficient ventilation or long-term effect use breathing apparatus. Danger of suffocation due to high concentrations in breathing air.

Respiratory filter (gas) : 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 Leather

**Other**

Chemical-resistant work clothes. Protective shoes.

**Environmental exposure controls**

Information regarding waste disposal, see chapter 13.

**SECTION 9: Physical and chemical properties****9.1 Information on basic physical and chemical properties**

<b>State of aggregation</b>
gas

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<b>Form</b>	
liquified gas	
<b>Colour</b>	
colourless	
<b>Odour</b>	
slightly like ether	
<b>pH value</b>	
Comments	neutral
<b>Boiling point / boiling range</b>	
Value	-51,4 °C
Reference pressure	1013 hPa
<b>Melting point/freezing point</b>	
No data available	
<b>Decomposition temperature</b>	
No data available	
<b>Flash point</b>	
No data available	
<b>Ignition temperature</b>	
No data available	
<b>Flammability</b>	
No data available	
<b>Lower explosion limit</b>	
none	
Reference substance	mixture R410A
Source	supplier
<b>Upper explosion limit</b>	
none	
Reference substance	mixture R410A
Source	supplier
<b>Vapour pressure</b>	
Value	16574 hPa
Reference temperature	25 °C
Value	30520 hPa
Reference temperature	50 °C
<b>Relative vapour density</b>	
Value	3
Comments	Air = 1
<b>Evaporation rate</b>	
Value	> 1
Comments	CCl4 = 1
<b>Relative density</b>	
No data available	
<b>Density</b>	
Value	1,062 g/cm <sup>3</sup>
Reference temperature	25 °C
Comments	as liquid
<b>Solubility in water</b>	
Value	1,5 g/l

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Solubility	
No data available	

Partition coefficient n-octanol/water (log value)			
No	Substance name	CAS no.	EC no.
1	pentafluoroethane	354-33-6	206-557-8
log Pow		1,48	
Reference temperature		25	°C
with reference to			
Method		pH 6.34	
Source		OECD 107	
		ECHA	
2	difluoromethane	75-10-5	200-839-4
log Pow		0,21	
Reference temperature		25	°C
with reference to			
Method		pH 6,1	
Source		OECD 107	
		ECHA	

Kinematic viscosity	
No data available	

Particle characteristics	
No data available	

## 9.2 Other information

Other information	
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. For the avoidance of thermal reaction does not overheat.

### 10.2 Chemical stability

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

### 10.3 Possibility of hazardous reactions

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

### 10.4 Conditions to avoid

Temperatures > 50°C. Heat, naked flames and other ignition sources.

### 10.5 Incompatible materials

Alkali metals; Earth alkali metals; Metal as powder; powdered metal salts

### 10.6 Hazardous decomposition products

None, if handled according to intended use. 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 data available	

Skin corrosion/irritation	

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No data available

**Serious eye damage/irritation**

No data available

**Respiratory or skin sensitisation**

No data available

**Germ cell mutagenicity**

No	Substance name	CAS no.	EC no.
1	<b>pentafluoroethane</b>	<b>354-33-6</b>	<b>206-557-8</b>
Type of examination		in vitro gene mutation study in bacteria	
Species		Salmonella typhimurium / Escherichia coli	
Method		OECD 471	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
Type of examination		In vitro Mammalian Chromosomal Aberration Test	
Species		Chinese hamster Ovary (CHO)	
Method		OECD 473	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
Route of exposure		inhalational	
Type of examination		Mammalian Erythrocyte Micronucleus Test, In vivo	
Species		mouse	
Method		OECD 474	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
2	<b>difluoromethane</b>	<b>75-10-5</b>	<b>200-839-4</b>
Type of examination		in vitro gene mutation study in bacteria	
Species		Salmonella typhimurium / Escherichia coli	
Method		OECD 471	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
Type of examination		In vitro Mammalian Chromosomal Aberration Test	
Species		Human Lymphocyte	
Method		OECD 473	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	

**Reproduction toxicity**

No data available

**Carcinogenicity**

No data available

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No	Substance name	CAS no.	EC no.
1	<b>pentafluoroethane</b>	<b>354-33-6</b>	<b>206-557-8</b>
Route of exposure		inhalational	
Species		rat	
Method		OECD 413	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	
2	<b>difluoromethane</b>	<b>75-10-5</b>	<b>200-839-4</b>
Route of exposure		inhalational	
Species		rat	
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	



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No data available

**11.2 Information on other hazards****Endocrine disrupting properties**

No data available.

**Other information**

No data available.

**SECTION 12: Ecological information****12.1 Toxicity****Toxicity to fish (acute)**

No data available

**Toxicity to fish (chronic)**

No data available

**Toxicity to Daphnia (acute)**

No data available

**Toxicity to Daphnia (chronic)**

No data available

**Toxicity to algae (acute)**

No data available

**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	pentafluoroethane	354-33-6	206-557-8
Type		aerobic biodegradation	
Value		appr. 5	%
Duration		28	d
Method		Closed Bottle Test (OECD 301D)	
Source		ECHA	
Evaluation		not readily biodegradable	
2	difluoromethane	75-10-5	200-839-4
Type		aerobic biodegradation	
Value		5	%
Duration		28	d
Method		OECD 301 D	
Source		ECHA	
Evaluation		not readily biodegradable	

**12.3 Bioaccumulative potential****Partition coefficient n-octanol/water (log value)**

No	Substance name	CAS no.	EC no.
1	pentafluoroethane	354-33-6	206-557-8
log Pow		1,48	
Reference temperature		25	°C
with reference to		pH 6.34	
Method		OECD 107	
Source		ECHA	

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2	difluoromethane	75-10-5	200-839-4
log Pow		0,21	
Reference temperature with reference to		25	°C
Method	pH 6,1		
Source	OECD 107 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
Contains fluorinated greenhouse gases. Global Warming Potential (GWP): 2088

**12.8 Other information**

Other information
Do not discharge product unmonitored into the environment.

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

dispose of in accordance with local regulation.

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

**Packaging**

Compressed gas packaging under pressure. Do not open by force. Do not heat above 50°C. Dispose of compressed gas packagings only if completely discharged. Do not burn empty compressed gas packagings. Do not pierce, cut or weld uncleaned containers.

**SECTION 14: Transport information****14.1 Transport ADR/RID/ADN**

Class	2
Classification code	2A
Hazard identification no.	20
UN number	UN3163
Proper shipping name	LIQUEFIED GAS, N.O.S.
Technical name	perfluoroethane difluoromethane
Tunnel restriction code	C/E
Label	2.2 RID: (+13)

**14.2 Transport IMDG**

Class	2.2
UN number	UN3163
Proper shipping name	LIQUEFIED GAS, N.O.S.
Technical name	perfluoroethane difluoromethane
EmS	F-C, S-V
Label	2.2

Trade name: R410A

Product no.: R410A

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Class	2.2
UN number	UN3163
Proper shipping name	Liquefied gas, n.o.s.
Technical name	pentafluoroethane difluoromethane
Label	2.2

**14.4 Other information**

No data available.

**14.5 Environmental hazards**

Information on environmental hazards, if relevant, please see 14.1 - 14.3.

**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****Regulation (EC) No 1907/2006 (REACH) Annex XIV (List of substances subject to authorisation)**

According to the data available and/or specifications supplied by upstream suppliers, this product does not contain any substances considered as substances requiring authorisation as listed on Annex XIV of the REACH regulation (EC) 1907/2006.

**REACH candidate list of substances of very high concern (SVHC) for authorisation**

According to available data and the information provided by preliminary suppliers, the product does not contain substances that are considered substances meeting the criteria for inclusion in annex XIV (List of Substances Subject to Authorisation) as laid down in Article 57 and article 59 of REACH (EC) 1907/2006.

**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**

According to the data available and/or specifications supplied by upstream suppliers, this product does not contain any substances subject to restriction as listed in Annex XVII of the REACH regulation (EC) 1907/2006.

**Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances**

This product is not subject to Part 1 or 2 of Annex I.

**Other regulations**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**

Chemical safety assessments have been conducted for the substances in this mixture. For a mixture a chemical safety assessment according to (EC) 1907/2006 is not mandatory.

