

Trade name: R452A

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

**R452A**

#### 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-1234yf, HFC-32).

**2.3 Other hazards**

Danger of suffocation by displacement of air / oxygen. Contact with the liquid can cause cold burns or frostbite. Abuse or intentional inhalation can be fatal as a result of effects on the heart without alarming symptoms.

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****Chemical characterization**

Fluorinated hydrocarbons

**Hazardous ingredients**

No	Substance name	Additional information	
	CAS / EC / Index / REACH no	Classification (EC) 1272/2008 (CLP)	Concentration %
1	<b>pentafluoroethane</b>		
	354-33-6 206-557-8 - 01-2119485636-25	Press. Gas liq.; H280	>= 50,00 - < 70,00 Vol%
2	<b>2,3,3,3-tetrafluoroprop-1-ene</b>		
	754-12-1 468-710-7 - 01-0000019665-61	Flam. Gas 1A; H220 Press. Gas liq.; H280	>= 25,00 - < 50,00 Vol%
3	<b>difluoromethane</b>		
	75-10-5 200-839-4 - 01-2119471312-47	Flam. Gas 1A; H220 Press. Gas liq.; H280	>= 10,00 - < 25,00 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**

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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**

The following symptoms may occur: cardiac arrhythmia; anesthetic effect; Light-headedness; Dizziness; confusion; Unconsciousness; muscle incoordination; respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

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

Treat symptomatically and supportively.

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

Product itself is non-combustible; adapt fire extinguishing measures to surrounding areas.

**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. The product is not flammable. Exposure to heat may cause bursting of the vessels.

**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. 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**

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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**

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. Provide eye wash fountain in work area.

**Advice on protection against fire and explosion**

The product is not combustible. 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**

Value > 10 a

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**

Do not store together with: self-heating substances and mixtures; self-reactive substances and mixtures; flammable substances; oxidizing agents; pyrophoric substances; explosives; toxic substances and mixtures; toxic substances and mixtures

**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****Occupational exposure limit values**

No	Substance name	CAS no.	EC no.
1	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
	<b>TRGS 900</b>		
	2,3,3,3-Tetrafluoropropen		
	WEL long-term (8-hr TWA reference period)	950	mg/m <sup>3</sup> 200 ml/m <sup>3</sup>
	Ceiling Limit	2 (II)	
	Notes	Y	

**Biological limit values**

No	Substance name
1	pentafluoroethane
	<b>TRGS 903</b>
	Fluorwasserstoff und anorganische Fluorverbindungen (Fluoride)

parameter	Fluorid
Value	7,0 mg/g Kreatinin
sample material	U
Sampling moment	b
<b>TRGS 903</b>	
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	<b>pentafluoroethane</b>	<b>354-33-6</b> <b>206-557-8</b>		
	inhalative	Long term (chronic)	systemic	16444 mg/m <sup>3</sup>
2	<b>2,3,3,3-tetrafluoroprop-1-ene</b>	<b>754-12-1</b> <b>468-710-7</b>		
	inhalative	Long term (chronic)	systemic	950 mg/m <sup>3</sup>
3	<b>difluoromethane</b>	<b>75-10-5</b> <b>200-839-4</b>		
	inhalative	Long term (chronic)	systemic	7035 mg/m <sup>3</sup>

**DNEL value (consumer)**

No	Substance name	CAS / EC no		
	Route of exposure	Exposure time	Effect	Value
1	<b>pentafluoroethane</b>	<b>354-33-6</b> <b>206-557-8</b>		
	inhalative	Long term (chronic)	systemic	1753 mg/m <sup>3</sup>
2	<b>2,3,3,3-tetrafluoroprop-1-ene</b>	<b>754-12-1</b> <b>468-710-7</b>		
	inhalative	Long term (chronic)	systemic	186400 mg/m <sup>3</sup>
3	<b>difluoromethane</b>	<b>75-10-5</b> <b>200-839-4</b>		
	inhalative	Long term (chronic)	systemic	750 mg/m <sup>3</sup>

**PNEC values**

No	Substance name	CAS / EC no	
	ecological compartment	Type	Value
1	<b>pentafluoroethane</b>	<b>354-33-6</b> <b>206-557-8</b>	
	water	fresh water	0,1 mg/L
	water	fresh water sediment	0,6 mg/kg dry weight
2	<b>2,3,3,3-tetrafluoroprop-1-ene</b>	<b>754-12-1</b> <b>468-710-7</b>	
	water	fresh water	0,1 mg/L
	water	Aqua intermittent	1 mg/L
3	<b>difluoromethane</b>	<b>75-10-5</b> <b>200-839-4</b>	
	water	fresh water	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**

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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	
<b>Form</b>	
liquified gas	
<b>Colour</b>	
colourless, clear	
<b>Odour</b>	
slightly like ether	
<b>pH value</b>	
No data available	
<b>Boiling point / boiling range</b>	
Value	< -47 °C
Source	supplier
<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>Oxidising properties</b>	
not oxidizing	

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<b>Explosive properties</b>			
The product does not have explosive properties.			
<b>Flammability</b>			
The product is not combustible.			
Source	supplier		
<b>Lower explosion limit</b>			
none			
Method	ASTM E 681		
Source	supplier		
<b>Upper explosion limit</b>			
none			
Method	ASTM E 681		
Source	supplier		
<b>Vapour pressure</b>			
Value	13159	hPa	
Reference temperature	25	°C	
Source	supplier		
<b>Relative vapour density</b>			
Value	3,64		
Source	supplier		
Comments	Air = 1		
<b>Evaporation rate</b>			
Value	>	1	
Source	supplier		
Comments	CCl4 = 1		
<b>Relative density</b>			
Value	1,13		
Reference temperature	25	°C	
Source	supplier		
<b>Density</b>			
No data available			
<b>Solubility</b>			
No data available			
<b>Partition coefficient n-octanol/water (log value)</b>			
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	
2	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
log Pow		appr. 2	
Reference temperature		25	°C
with reference to		pH 7	
Method		OECD 117	
Source		ECHA	
3	difluoromethane	75-10-5	200-839-4
log Pow		0,21	
Reference temperature		25	°C
with reference to		pH 6,1	
Method		OECD 107	

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Source | 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**

This material is considered to be non-reactive under normal use conditions.

**10.2 Chemical stability**

The product is chemically stable under recommended conditions of storage, use and temperature.

**10.3 Possibility of hazardous reactions**

Reacts with strong oxidizing agents.

**10.4 Conditions to avoid**

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

**10.5 Incompatible materials**

strong oxidizing agents

**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	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
LC50	>	405800	ppmV
Duration of exposure		4	h
State of aggregation	Gas		
Species	rat		
Method	OECD 403		
Source	ECHA		

**Skin corrosion/irritation**

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	pentafluoroethane	354-33-6	206-557-8



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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.		
<b>2</b>	<b>2,3,3,3-tetrafluoroprop-1-ene</b>	<b>754-12-1</b>	<b>468-710-7</b>
Type of examination	Genotoxicity in vitro		
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.		
<b>3</b>	<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	Substance name	CAS no.	EC no.
<b>1</b>	<b>2,3,3,3-tetrafluoroprop-1-ene</b>	<b>754-12-1</b>	<b>468-710-7</b>
Type of examination	2 generation study		
Method	OECD 416		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		
Type of examination	Prenatal Developmental Toxicity Study		
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.
<b>1</b>	<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.		

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2	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
Route of exposure		inhalational	
Species	rat		
Method	OECD 413		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		
3	difluoromethane	75-10-5	200-839-4
Route of exposure		inhalational	
Species	rat		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		
<b>Aspiration hazard</b>			
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**

<b>Toxicity to fish (acute)</b>			
No	Substance name	CAS no.	EC no.
1	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
LC50	>	197	mg/l
Duration of exposure		96	h
Species	Cyprinus carpio		
Method	OECD 203		
Source	ECHA		
<b>Toxicity to fish (chronic)</b>			
No data available			
<b>Toxicity to Daphnia (acute)</b>			
No	Substance name	CAS no.	EC no.
1	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
EC50	>	83	mg/l
Duration of exposure		48	h
Species	Daphnia magna		
Method	OECD 202		
Source	ECHA		
<b>Toxicity to Daphnia (chronic)</b>			
No data available			
<b>Toxicity to algae (acute)</b>			
No	Substance name	CAS no.	EC no.
1	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
EC50	>	100	mg/l
Duration of exposure		72	h
Species	Pseudokirchneriella subcapitata		
Method	OECD 201		
Source	ECHA		
<b>Toxicity to algae (chronic)</b>			
No data available			

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<b>Bacteria toxicity</b>
No data available

**12.2 Persistence and degradability**

<b>Biodegradability</b>			
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	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
Type		aerobic biodegradation	
Value	<	5	%
Duration		28	d
Method	OECD 301 F		
Source	ECHA		
Evaluation	not readily biodegradable		
3	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**

<b>Partition coefficient n-octanol/water (log value)</b>			
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		
2	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
log Pow		appr. 2	
Reference temperature		25	°C
with reference to		pH 7	
Method	OECD 117		
Source	ECHA		
3	difluoromethane	75-10-5	200-839-4
log Pow		0,21	
Reference temperature		25	°C
with reference to		pH 6,1	
Method	OECD 107		
Source	ECHA		

**12.4 Mobility in soil**

No data available.

**12.5 Results of PBT and vPvB assessment**

<b>Results of PBT and vPvB assessment</b>	
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**

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No data available.

**12.7 Other adverse effects****Other adverse effects**

Contains fluorinated greenhouse gases.

Product: Global warming potential within 100 years: 2,140.45

**12.8 Other information****Other information**

Do not discharge product uncontrolled 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**

Disposal should be observed in conformity with the Regional Waste Disposal Authority.

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

Class	2
Classification code	2A
Hazard identification no.	20
UN number	UN1078
Proper shipping name	REFRIGERANT GAS, N.O.S.
Technical name	pentafluoroethane 2,3,3,3-tetrafluoroprop-1-ene
Tunnel restriction code	C/E
Label	2.2 RID: (+13)

**14.2 Transport IMDG**

Class	2.2
UN number	UN1078
Proper shipping name	REFRIGERANT GAS, N.O.S.
Technical name	pentafluoroethane 2,3,3,3-tetrafluoroprop-1-ene
EmS	F-C, S-V
Label	2.2

**14.3 Transport ICAO-TI / IATA**

Class	2.2
UN number	UN1078
Proper shipping name	Refrigerant gas, n.o.s.
Technical name	pentafluoroethane 2,3,3,3-tetrafluoroprop-1-ene
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.

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GER**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.

**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.

**Full text of the H- and EUH- phrases drawn up in sections 2 and 3 (provided not already drawn up in these sections)**

H220

Extremely flammable gas.

**Creation of the safety data sheet**

UMCO GmbH

# Safety data sheet in accordance



with 1907/2006/EC

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**Trade name:** R452A

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

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

**Region:**  
GER

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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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