

**Trade name:** R-455A

**Current version :** 2.0.1, issued: 24.07.2024

**Replaced version:** 2.0.0, issued: 26.06.2024

**Region:**  
GER

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

### 1.1 Product identifier

**Trade name**

**R-455A**

**UFI:**

**3A93-N0EP-X00W-JHTE**

### 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 [kaeltemittel@tega.de](mailto:kaeltemittel@tega.de)

**Advice on Safety Data Sheet**

[sdb\\_info@umco.de](mailto:sdb_info@umco.de)

### 1.4 Emergency telephone number

For medical advice (in German and English):

+49 (0)551 192 40 (Gif tinformat ionszentrum Nord)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification in accordance with Regulation (EC) No 1272/2008 (CLP)**

Flam. Gas 1B; H221

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**



GHS02



GHS04

**Signal word**

Danger

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H221 Flammable gas.  
H280 Contains gas under pressure; may explode if heated.

**Precautionary statement(s)**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381 In case of leakage, eliminate all ignition sources.  
P410+P403 Protect from sunlight. Store in a well-ventilated place.

**UFI:**

3A93-N0EP-X00W-JHTE

**2.3 Other hazards**

PBT assessment

The components of this product are not considered to be a PBT.

vPvB assessment

The components of this product are 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	Classification (EC) 1272/2008 (CLP)	Additional information	%
	CAS / EC / Index / REACH no		Concentration	
1	<b>2,3,3,3-tetrafluoroprop-1-ene</b>			
	754-12-1 468-710-7 - 01-0000019665-61	Flam. Gas 1B; H221 Press. Gas liq.; H280	>= 70,00 - < 90,00	Vol%
2	<b>difluoromethane</b>			
	75-10-5 200-839-4 - 01-2119471312-47	Flam. Gas 1B; H221 Press. Gas liq.; H280	>= 10,00 - < 25,00	Vol%
3	<b>carbon dioxide</b>			
	124-38-9 204-696-9 - -	Press. Gas liq.; H280	< 5,00	Vol%

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

No	Note	Specific concentration limits	M-factor (acute)	M-factor (chronic)
1	-	Flam. Gas 1A; H220: C >= 6,201% Flam. Gas 1B; H221: C >= 12,3%	-	-
3	U	-	-	-

Full text for the notes: pls. see section 16 "Notes relating to the identification, classification and labelling of substances ((EC) No 1272/2008, Annex VI)".

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

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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. Call a doctor.

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

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**

Alcohol resistant foam, CO<sub>2</sub>, powders, water spray

**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; Exposure to heat may cause bursting of the vessels. Vapours can form a highly flammable mixture with air.

**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**

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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. Use explosion-proof apparatus and fittings.

#### 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

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. Vapours can form an explosive mixture with air.

### 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

#### 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

#### Occupational exposure limit values

No	Substance name	CAS no.	EC no.
1	2,3,3,3-tetrafluorprop-1-ene	754-12-1	468-710-7
	<b>TRGS 900</b>		
	2,3,3,3-Tetrafluorpropen		
	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	
2	carbon dioxide	124-38-9	204-696-9
	<b>TRGS 900</b>		
	Kohlenstoffdioxid		
	WEL long-term (8-hr TWA reference period)	9100	mg/m <sup>3</sup> 5000 ml/m <sup>3</sup>

Ceiling Limit	2(II)			
<b>2006/15/EC</b>				
Carbon dioxide				
WEL long-term (8-hr TWA reference period)	9000	mg/m <sup>3</sup>	5000	ppm

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

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	<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>
	inhalative	Short term (acut)	systemic	186400	mg/m <sup>3</sup>
2	<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>2,3,3,3-tetrafluoroprop-1-ene</b>			<b>754-12-1</b> <b>468-710-7</b>	
	inhalative	Long term (chronic)	systemic	113,1	mg/m <sup>3</sup>
	inhalative	Short term (acut)	systemic	186400	mg/m <sup>3</sup>
2	<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>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	marine water	0,01	mg/L
	water	fresh water sediment	1,51	mg/kg dry weight
	water	marine water sediment	0,151	mg/kg dry weight
	soil	-	1,49	mg/kg dry weight
2	<b>difluoromethane</b>		<b>75-10-5</b> <b>200-839-4</b>	
	water	fresh water	0,313	mg/L
	water	fresh water sediment	1,807	mg/kg dry weight

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

Explosion-proof general and local exhaust ventilation.

**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.

**Eye / face protection**

Tightly fitting safety glasses (EN 166).

**Hand protection**

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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. Fire-resistant antistatic protective clothing. Protective shoes.

**Environmental exposure controls**

No data available.

**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>	
clear	
<b>Odour</b>	
slight	
<b>pH value</b>	
Not applicable	
reason for missing pH	substance/mixture is a gas
Source	supplier
<b>Boiling point / boiling range</b>	
No data available	
<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>	
Value	473 - 477 °C
Source	supplier
<b>Flammability</b>	
flammable	
Source	supplier
<b>Lower explosion limit</b>	
Value	11,8 % vol
Source	supplier
<b>Upper explosion limit</b>	
Value	12,9 % vol
Source	supplier
<b>Vapour pressure</b>	
Value	1235 kPa

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Reference temperature	21,1	°C
Source	supplier	
Value	2638	kPa
Reference temperature	54,4	°C
Source	supplier	

<b>Relative vapour density</b>
No data available

<b>Relative density</b>
No data available

<b>Density</b>
No data available

<b>Solubility</b>
No data available

Partition coefficient n-octanol/water (log value)			
No	Substance name	CAS no.	EC no.
1	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	
2	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	

<b>Kinematic viscosity</b>
No data available

<b>Particle characteristics</b>
No data available

## 9.2 Other information

<b>Other information</b>
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. Vapours can form a highly flammable mixture with air. Flammable gas.

### 10.4 Conditions to avoid

Heat, naked flames and other ignition sources. Temperatures > 50°C. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose containers heat or sources of ignition.

### 10.5 Incompatible materials

strong oxidizing agents; Metal as powder; Zinc

### 10.6 Hazardous decomposition products

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

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## 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	>	405000	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.		
2	difluoromethane	75-10-5	200-839-4
LC50	>	520000	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 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	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
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.		
Route of exposure	inhalational		
Type of examination	In vivo mammalian somatic cell study: cytogenicity / erythrocyte micronucleus		
Species	rat		
Method	OECD 474		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		
2	difluoromethane	75-10-5	200-839-4
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		



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Method	OECD 473
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are not met.
Type of examination	In vivo mammalian somatic cell study: cytogenicity / erythrocyte micronucleus
Species	mouse
Method	OECD 474
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are not met.

Reproduction toxicity			
No	Substance name	CAS no.	EC no.
1	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
Route of exposure		inhalational	
NOAEC	>	50000	ppm
Type of examination	2 generation study		
Species	rat		
Method	OECD 416		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		
Route of exposure		inhalational	
NOAEC	>	750	ppm
Type of examination	Prenatal Developmental Toxicity Study		
Species	rabbit		
Method	OECD 414		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		
2	difluoromethane	75-10-5	200-839-4
Route of exposure		inhalational	
NOAEL	>	50000	ppm
Type of examination	Prenatal Developmental Toxicity Study		
Species	rabbit		
Method	OECD 414		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		

Carcinogenicity			
No	Substance name	CAS no.	EC no.
1	difluoromethane	75-10-5	200-839-4
Source		ECHA	
Evaluation/classification		Based on available data, the classification criteria are not met.	

STOT - single exposure			
No data available			

STOT - repeated exposure			
No	Substance name	CAS no.	EC no.
1	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
Route of exposure		inhalational	
NOAEC	>	50000	ppm
Species	rat		
Method	OECD 413		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		
2	difluoromethane	75-10-5	200-839-4
Route of exposure		inhalational	
NOAEL	>	49100	ppm
Species	rat		
Method	OECD 413		
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	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		
Evaluation/classification	Based on available data, the classification criteria are not met.		

**Toxicity to fish (chronic)**

No data available

**Toxicity to Daphnia (acute)**

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		48	h
Species	Daphnia magna		
Method	OECD 202		
Source	ECHA		
Evaluation/classification	Based on available data, the classification criteria are not met.		

**Toxicity to Daphnia (chronic)**

No data available

**Toxicity to algae (acute)**

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		
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	2,3,3,3-tetrafluoroprop-1-ene	754-12-1	468-710-7
Type	aerobic biodegradation		

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Value	<	5	%
Duration		28	d
Method	OECD 301 F		
Source	ECHA		
Evaluation	not readily biodegradable		
<b>2</b>	<b>difluoromethane</b>	<b>75-10-5</b>	<b>200-839-4</b>
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	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		
<b>2</b>	<b>difluoromethane</b>	<b>75-10-5</b>	<b>200-839-4</b>
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

Results of PBT and vPvB assessment	
PBT assessment	The components of this product are not considered to be a PBT.
vPvB assessment	The components of this product are not considered to be a vPvB.

### 12.6 Endocrine disrupting properties

No data available.

### 12.7 Other adverse effects

Other adverse effects
Global warming potential within 100 years: 146

## 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

Empty containers contain product residue and may be hazardous. Do not pressurize, cut, weld, braze, solder, drill or expose these containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death. Residues must be removed from packaging and when emptied completely disposed of in accordance with the regulations for waste removal. Incompletely emptied packaging must be disposed of in the form of disposal specified by the regional disposer.

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**14.1 UN number or ID number**

<b>ADR/RID/ADN</b>	UN3161
<b>IMDG</b>	UN3161
<b>ICAO-TI / IATA</b>	UN3161

**14.2 UN proper shipping name**

<b>ADR/RID/ADN</b>	LIQUEFIED GAS, FLAMMABLE, N.O.S.
Technical name	2,3,3,3-tetrafluoroprop-1-ene difluoromethane
<b>IMDG</b>	LIQUEFIED GAS, FLAMMABLE, N.O.S.
Technical name	2,3,3,3-tetrafluoroprop-1-ene difluoromethane
<b>ICAO-TI / IATA</b>	Liquefied gas, flammable, n.o.s.
Technical name	2,3,3,3-tetrafluoroprop-1-ene difluoromethane

**14.3 Transport hazard class(es)**

<b>ADR/RID/ADN - Class</b>	2
Label	2.1 RID:+13
Classification code	2F
Tunnel restriction code	B/D
Hazard identification no.	23
<b>IMDG - Class</b>	2.1
Label	2.1
<b>ICAO-TI / IATA - Class</b>	2.1
Label	2.1

**14.4 Packing group**

Not classified as dangerous in the meaning of transport regulations.

**14.5 Environmental hazards**

EmS F-D, S-U

**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.

Trade name: R-455A

Current version : 2.0.1, issued: 24.07.2024

Replaced version: 2.0.0, issued: 26.06.2024

Region:  
GER**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**

A Chemical Safety Assessment has been carried out for one or more of the substances within this mixture.

**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.

**Notes relating to the identification, classification and labelling of substances and mixtures ((EC) No 1272/2008, Annex VI)**

U

When put on the market gases have to be classified as 'Gases under pressure', in one of the groups compressed gas, liquefied gas, refrigerated liquefied gas or dissolved gas. The group depends on the physical state in which the gas is packaged and therefore has to be assigned case by case.

**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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Prod-ID 773548