

Trade name: R 1234ze**Current version:** 2.0.0, Revision: 21.05.2026**Replaced version:** 1.0.0, Revision: 10.02.2026**Region:**
GER**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name****R 1234ze**

Substance name (1E)-1,3,3,3-tetrafluoroprop-1-ene
REACH registration no. 01-0000019758-54

Identification numbers

CAS no. 29118-24-9
EC no. 471-480-0

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 uses
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

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 and 4 of Annex I to CLP.

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

29118-24-9 ((1E)-1,3,3,3-tetrafluoroprop-1-ene)

Hazard pictograms

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GHS04

Signal word

Warning

Hazard statement(s)

H280 Contains gas under pressure; may explode if heated.

Precautionary statement(s)

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

Supplemental label elements

Contains fluorinated greenhouse gas

2.3 Other hazards

This product does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. Vapours are heavier than air and can cause asphyxiation by displacing the oxygen in the air. 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 (1E)-1,3,3,3-tetrafluoroprop-1-ene

Formula C₃H₂F₄

Molecular weight 114

Identification numbers

CAS no. 29118-24-9

EC no. 471-480-0

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 soiled or soaked clothing immediately. Adhere to personal protective measures when giving first aid. Show MSDS to the attending physician.

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

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Rinse the mouth thoroughly with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor. Unlikely route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

No data available.

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**

Alcohol resistant foam, CO₂, powders, water spray; 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; 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**

Remove persons to safety. Provide good room ventilation even at ground level (vapours are heavier than air). Use personal protective clothing. Do not breathe gas. 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.

General protective and hygiene measures

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

Advice on protection against fire and explosion

When heating the product, explosive vapour-air mixtures can be formed. 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

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	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
	TRGS 900		
	trans-1,3,3,3-Tetrafluorpropen		
	WEL long-term (8-hr TWA reference period)	4700	mg/m ³ 1000 ml/m ³
	Ceiling Limit	2 (II)	
	Notes	Y	

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

CNEL values (worker)				
No	Substance name			CAS / EC no
	Route of exposure	Exposure time	Effect	Value
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene			29118-24-9 471-480-0
	inhalative	Long term (chronic)	systemic	1170.8 mg/m³

DNEL value (consumer)

DNEL value (consumer)				
No	Substance name			CAS / EC no
	Route of exposure	Exposure time	Effect	Value
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene			29118-24-9 471-480-0
	inhalative	Long term (chronic)	svstemic	208.1 mg/m³

PNEC values

PNEC values		
No	Substance name	CAS / EC no
	ecological compartment	Type
		Value
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9 471-480-0

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	water	fresh water	0,117	mg/L
	water	marine water	0,012	mg/L
	water	fresh water sediment	1,25	mg/kg dry weight
	water	marine water sediment	0,125	mg/kg dry weight
	soil	-	0,755	mg/kg dry weight

8.2 Exposure controls

Appropriate engineering controls

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

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.

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

No data available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

State of aggregation

gas

Form

liquified gas

Colour

colourless

Odour

slight; to ether

pH value

Not applicable

reason for missing pH

Source

substance/mixture is a gas

supplier

Boiling point / boiling range

Value

Source

-19 °C

supplier

Melting point/freezing point

No data available

Decomposition temperature

No data available

Flash point

Not applicable

Source

supplier

Ignition temperature

No data available

Oxidising properties

Not relevant

Source

supplier

Flammability

The product is non-flammable.

Source

supplier

Lower explosion limit

Not relevant

Source

supplier

Upper explosion limit

Not relevant

Source

supplier

Vapour pressure

Value

4271 hPa

Reference temperature

20 °C

Source

supplier

Value

11152 hPa

Reference temperature

54,4 °C

Source

supplier

Relative vapour density

Value

4

Source

supplier

Comments

Air = 1

Relative density

No data available

Density

Value

1,17 g/cm³

Reference temperature

21,1 °C

Source

supplier

Solubility in water

Value

0,373 g/l

Source

supplier

Solubility

No data available

Partition coefficient n-octanol/water (log value)

No

Substance name

CAS no.

EC no.

1

(1E)-1,3,3,3-tetrafluoroprop-1-ene

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log Pow

1,6

Source

ECHA

Kinematic viscosity

Not applicable

Source

supplier

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Region:
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Not applicable

Source supplier

9.2 Other information**Other information**

No data available.

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

No data available.

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.

10.4 Conditions to avoid

Temperatures > 50°C. Heat, naked flames and other ignition sources. Contact with incompatible substances.

10.5 Incompatible materials

Oxidizing agents; Alkali metals

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	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
LC50	>	207000	ppmV
Duration of exposure		4	h
State of aggregation	Gas		
Species	rat		
Method	OECD 403		
Source	ECHA		

Skin corrosion/irritation

No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
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	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
Type of examination		in vitro gene mutation study in bacteria	
Species		S. typhimurium TA 1535, TA 1537, TA 98 and TA 100	
Method		JAPAN: Guidelines for Screening Mutagenicity Testing Of Chemicals	
Evaluation/classification		Based on available data, the classification criteria are not met.	

Reproduction toxicity			
No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
Type of examination		Two-Generation Reproduction Toxicity Study	
Species		rats (male/female)	
Method		OECD 416	
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	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
Route of exposure		inhalational	
NOEC		5000	ppm
Species		rats (male/female)	
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

No data available.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish (acute)			
No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
LC50		>	117 mg/l
Duration of exposure		96	h
Species		Cyprinus carpio	
Method		OECD 203	
Source		ECHA	

Toxicity to fish (chronic)			
No data available			

Toxicity to Daphnia (acute)			
No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0

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EC50	>	160	mg/l
Duration of exposure		48	h
Species	Daphnia magna		
Method	OECD 202		
Source	ECHA		

Toxicity to Daphnia (chronic)

No data available

Toxicity to algae (acute)

No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
EC50	>	170	mg/l
Duration of exposure		72	h
Species	Raphidocelis subcapitata		
Method	OECD 201		
Source	ECHA		

Toxicity to algae (chronic)

No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
NOEC		170	mg/l
Duration of exposure		72	h
Species	Raphidocelis subcapitata		
Method	OECD 201		
Source	ECHA		

Bacteria toxicity

No data available

12.2 Persistence and degradability

Biodegradability			
No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
Type	aerobic biodegradation		
Value		0	%
Method	OECD 301 D		
Source	ECHA		
Evaluation/classification	Not readily biodegradable		

12.3 Bioaccumulative potential

Partition coefficient n-octanol/water (log value)			
No	Substance name	CAS no.	EC no.
1	(1E)-1,3,3,3-tetrafluoroprop-1-ene	29118-24-9	471-480-0
log Pow		1,6	
Source	ECHA		

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	
Product Name	
R 1234ze	
PBT assessment	The product is not considered to be a PBT.
vPvB assessment	The product is not considered to be a vPvB.
Source	ECHA

12.6 Endocrine disrupting properties

No data available.

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Global warming potential (GWP): 1.37

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

Containers must be completely emptied and disposed of in accordance with the legal requirements. Containers that have not been emptied must be taken to the disposal site after consultation with the disposal company.

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	(1E)-1,3,3,3-tetrafluoroprop-1-ene
IMDG	LIQUEFIED GAS, N.O.S.
Technical name	(1E)-1,3,3,3-tetrafluoroprop-1-ene
ICAO-TI / IATA	Liquefied gas, n.o.s.
Technical name	(1E)-1,3,3,3-tetrafluoroprop-1-ene

14.3 Transport hazard class(es)

ADR/RID/ADN - Class	2
Label	2.2 RID: (+13)
Classification code	2A
Tunnel restriction code	C/E
Hazard identification no.	20
IMDG - Class	2.2
Label	2.2
ICAO-TI / IATA - Class	2.2
Label	2.2

14.4 Packing group

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

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

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.

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

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").

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

The substance is not subject to the provisions of annex XVII (restriction entries) of the Reach regulation (EC) 1907/2006.

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

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

Other regulations

REGULATION (EU) No 2024/573 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

Identification number

9699

Source

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

Other regulations

REGULATION (EU) No. 517/2014 on fluorinated greenhouse gases; 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.

CAS no. 29118-24-9

EC no. 471-480-0

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.

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:

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Creation of the safety data sheet

UMCO GmbH

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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.

Alterations/supplements:

Alterations to the previous edition are marked in the left-hand margin.

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