

EC safety data sheet

Trade name: R404a

Current version : 1.0.0, issued: 23.08.2016

Replaced version: -, issued: -

Region: GB

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

1.1 Product identifier

Trade name

R404a

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

Relevant identified uses of the substance or mixture

Refrigerant for professional use in ultra-low temperature freezers

Uses advised against

No data available.

1.3 Details of the supplier of the safety data sheet

Address

Eppendorf AG
Barkhausenweg 1
D-22339 Hamburg

Telephone no. +49 40 53801-0

Information provided by / telephone

Eppendorf Application-Hotline
Tel.: +49 1803 66 67 89
Fax: +49 4053 99 01 25
email: support@eppendorf.com

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 statements

H280 Contains gas under pressure; may explode if heated.

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Precautionary statements

P403 Store in a well-ventilated place.

Supplemental label elements

Contains fluorinated greenhouse gases covered by the Kyoto protocol.

2.3 Other hazards

Liquefied gas: Spilled liquid can cause cold burns. This gas is heavier than air and may accumulate in low areas.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable. The product is not a substance.

3.2 Mixtures

Chemical characterization

Pressurised liquified gas

Hazardous ingredients

No	Substance name	Classification (EC) 1272/2008 (CLP)	Additional information	%
	CAS / EC / Index / REACH no		Concentration	
1	1,1,1-trifluoroethane			
	420-46-2 206-996-5 - 01-2119492869-13	Flam. Gas 1; H220 Press. Gas liq.; H280	>= 60.00 - < 70.00	Vol%
2	pentafluoroethane			
	354-33-6 206-557-8 - 01-2119485636-25	Press. Gas liq.; H280	>= 30.00 - < 40.00	Vol%
3	norflurane			
	811-97-2 212-377-0 - 01-2119459374-33	Press. Gas; H280	< 5.00	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

Remove contaminated clothing and shoes immediately, and launder thoroughly before reusing. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

After inhalation

Ensure supply of fresh air. Remove affected person from the immediate area. Irregular breathing/no breathing: artificial respiration. Take medical treatment.

After skin contact

In case of cold burns after contact with liquified gas: rinse with plenty of warm water (40°C approx.). If clothing is burnt onto the wound DO NOT pull off. Seek medical attention.

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). Get immediate ophthalmic treatment.

After ingestion

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

4.2 Most important symptoms and effects, both acute and delayed

Symptoms

respiratory arrest. Contact with liquified gas can cause damage (frostbite) due to rapid evaporative cooling.

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

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

No data available.

5.2 Special hazards arising from the substance or mixture

In case of fire: danger of pressure build up, which could result in container rupture. In the event of fire, the following can be released: Carbon monoxide and carbon dioxide; Hydrogen fluoride (HF); Carbonyl fluoride; Fluorinated hydrocarbons; When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.

5.3 Advice for firefighters

Use self-contained breathing apparatus. Cool endangered containers with water spray jet. Wear protective clothing.

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. Ensure adequate ventilation. Keep away sources of ignition.

For emergency responders

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

6.2 Environmental precautions

Do not discharge into the drains/surface waters/groundwater. Do not discharge into the subsoil/soil.

6.3 Methods and material for containment and cleaning up

Ventilate room.

6.4 Reference to other sections

Information regarding personal protective measures, see chapter 8. Information regarding waste disposal, see chapter 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Provide good ventilation at the work area (local exhaust ventilation, if necessary). If workplace exposure limits are exceeded, respiratory protection approved for this particular job must be worn. Product inherent handling risks must be minimised taking the appropriate measures for protection and preventive actions. The working process should be designed to rule out the release of hazardous substances or skin contact as far it is possible by the state of the art.

General protective and hygiene measures

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

Advice on protection against fire and explosion

Isolate from sources of heat, sparks and open flame.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions

Keep container tightly closed and dry in a cool, well-ventilated place. Store upright.

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 one.

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Advice on storage assembly

Do not store together with: Acids; Oxidizing agents; Magnesium; Zinc; Calcium; Aluminium powder; Alkali metals; Earth alkali metals

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	norflurane	811-97-2	212-377-0
List of approved workplace exposure limits (WELs) / EH40			
1,1,1,2-Tetrafluoroethane			
	TWA	4240	mg/m ³ 1000 ml/m ³

DNEL and PNEC values

DNEL values (worker)

No	Substance name	CAS / EC no		
	Route of exposure	Exposure time	Effect	Value
1	1,1,1-trifluoroethane	420-46-2 206-996-5		
	inhalative	Long term (chronic)	systemic	38800 mg/m ³
2	pentafluoroethane	354-33-6 206-557-8		
	inhalative	Long term (chronic)	systemic	16444 mg/m ³
3	norflurane	811-97-2 212-377-0		
	inhalative	Long term (chronic)	systemic	13936 mg/m ³

DNEL value (consumer)

No	Substance name	CAS / EC no		
	Route of exposure	Exposure time	Effect	Value
1	1,1,1-trifluoroethane	420-46-2 206-996-5		
	inhalative	Long term (chronic)	systemic	10700 mg/m ³
2	pentafluoroethane	354-33-6 206-557-8		
	inhalative	Long term (chronic)	systemic	1753 mg/m ³
3	norflurane	811-97-2 212-377-0		
	inhalative	Long term (chronic)	systemic	2476 mg/m ³

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PNEC values

No	Substance name	CAS / EC no		
	ecological compartment	Type	Value	
1	1,1,1-trifluoroethane	420-46-2 206-996-5		
		water	fresh water	350 µg/l
2	pentafluoroethane	354-33-6 206-557-8		
		water	fresh water	0.1 mg/l
		water	fresh water sediment	0.6 mg/kg dry weight
		water	Aqua intermittent	1 mg/l
3	norflurane	811-97-2 212-377-0		
		water	fresh water	0.1 mg/l
		water	marine water	0.01 mg/l
		water	fresh water sediment	0.75 mg/kg dry weight
		water	Aqua intermittent	1 mg/l
		sewage treatment plant	-	73 mg/l

8.2 Exposure controls

Appropriate engineering controls

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

Personal protective equipment

Respiratory protection

If workplace exposure limits are exceeded, a respiration protection approved for this particular job must be worn. In case of aerosol and mist formation, take appropriate measures for breathing protection in the event workplace threshold values are not specified.

Eye / face protection

Safety glasses (EN 166)

Hand protection

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.

Other

Normal chemical work clothing.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form/Colour
liquified gas
colourless
Odour
sweetish
Odour threshold
No data available
pH value
Not applicable

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Boiling point / boiling range	
Value	-47.8 °C
Melting point / melting range	
Value	< -100 °C
Sublimation point / sublimation range	
Not applicable	
Decomposition point / decomposition range	
No data available	
Flash point	
Not applicable	
Auto-ignition temperature	
Not applicable	
Oxidising properties	
Not applicable	
Explosive properties	
Not applicable	
Flammability (solid, gas)	
The product is not combustible.	
Lower flammability or explosive limits	
No data available	
Upper flammability or explosive limits	
No data available	
Vapour pressure	
Value	1.261 kPa
Reference temperature	21.1 °C
Vapour density	
Value	3.43
Reference temperature	15 °C
Remarks	Air = 1
Evaporation rate	
No data available	
Relative density	
No data available	
Density	
No data available	
Solubility in water	
No data available	
Solubility(ies)	
No data available	
Partition coefficient: n-octanol/water	
No data available	
Viscosity	
No data available	

9.2 Other information

Other information
Critical temperature: 72 °C

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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

Dangerous reactions are not to be expected when handling product according to its intended use.

10.4 Conditions to avoid

Heat, naked flames or other ignition sources, electrostatic charge and discharge, formation of vapours/aerosols.

10.5 Incompatible materials

Aluminium powder; calcium; Zinc; Magnesium; Oxidizing agents; Alkali metals; Earth alkali metals

10.6 Hazardous decomposition products

Fluorinated hydrocarbons

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

Acute dermal toxicity	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

Acute inhalational toxicity	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

Skin corrosion/irritation	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

Serious eye damage/irritation	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation	
No	Product Name
1	R404a
Route of exposure	Skin
Evaluation/classification	Based on available data, the classification criteria are not met.

Germ cell mutagenicity	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

Reproduction toxicity	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

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Carcinogenicity	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

STOT-single exposure	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

STOT-repeated exposure	
No	Product Name
1	R404a
Evaluation/classification	Based on available data, the classification criteria are not met.

Aspiration hazard	
Based on available data, the classification criteria are not met.	

Delayed and immediate effects as well as chronic effects from short and long-term exposure	
Product specific toxicological data are not available.	

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish (acute)			
No	Substance name	CAS no.	EC no.
1	pentafluoroethane	354-33-6	206-557-8
LC50		109	mg/l
Duration of exposure		96	h
Species	Oncorhynchus mykiss		
Source	Manufacturer		
2	norflurane	811-97-2	212-377-0
LC50		450	mg/l
Duration of exposure		96	h
Species	Oncorhynchus mykiss		
Method	440/2008/EC C.1.		
Source	ECHA		

Toxicity to fish (chronic)	
No data available	

Toxicity to Daphnia (acute)			
No	Substance name	CAS no.	EC no.
1	pentafluoroethane	354-33-6	206-557-8
EC50	>	100	mg/l
Duration of exposure		48	h
Species	Daphnia magna		
Source	Manufacturer		
2	norflurane	811-97-2	212-377-0
EC50		980	mg/l
Duration of exposure		48	h
Species	Daphnia magna		
Method	440/2008/EC C.2.		
Source	ECHA		

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Toxicity to Daphnia (chronic)	
No data available	

Toxicity to algae (acute)			
No	Substance name	CAS no.	EC no.
1	pentafluoroethane	354-33-6	206-557-8
EC50		142	mg/l
Duration of exposure		72	h
Species	green alga		
Source	Manufacturer		

Toxicity to algae (chronic)	
No data available	

Bacteria toxicity	
No data available	

12.2 Persistence and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

No data available.

12.6 Other adverse effects

No data available.

12.7 Other information

Other information	
Do not discharge product unmonitored into the environment.	

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste code 14 06 01* chlorofluorocarbons, HCFC, HFC
 The listed waste code numbers, according to the European Waste Catalogue, are to be understood as a recommendation. A final decision must be made in agreement with the regional waste disposal company. Refer to the EIGA code of practice (Doc.30 "Disposal of Gases"; <http://www.eiga.org>).
 dispose of in accordance with local regulation.

Packaging

Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse. Packaging that cannot be cleaned should be disposed of in agreement with the regional waste disposal company.

SECTION 14: Transport information

14.1 Transport ADR/RID/ADN

Class	2
Classification code	2A
Hazard identification no.	20
UN number	UN3337
Technical name	REFRIGERANT GAS R 404A
Danger releasing substance	1,1,1-trifluoroethane pentafluoroethane
Tunnel restriction code	C/E
Label	2.2

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14.2 Transport IMDG

Class	2.2
UN number	UN3337
Proper shipping name	REFRIGERANT GAS R 404A
Danger releasing substance	1,1,1-trifluoroethane pentafluoroethane
EmS	F-C+S-V
Label	2.2

14.3 Transport ICAO-TI / IATA

Class	2.2
UN number	UN3337
Proper shipping name	Refrigerant gas R 404A
Danger releasing substance	1,1,1-trifluoroethane pentafluoroethane
Label	2.2

14.4 Other information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Container valve guards or caps should be in place.

14.5 Environmental hazards

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

14.6 Special precautions for user

No data available.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

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, PREPARATIONS AND ARTICLES

According to the data available and/or specifications supplied by upstream suppliers, this product does not contain any substances requiring authorisation as listed on Annex XIV 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

Adhere to the national sanitary and occupational safety regulations when using this product.

15.2 Chemical safety assessment

For this mixture a chemical safety assessment has not been carried out.

