

SAFETY DATA SHEET

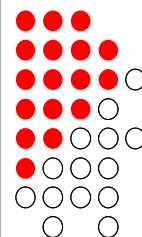
according to Regulations (EC) 1907/2006 and (EU) 2015/830

R-422d

Issue date: 28. 02. 2013

Revision: 08. 08. 2019

Version: 4.00



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

1.1. Product identifier

Product name: R-422d
Substance/Mixture: Mixture

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

Identified use: Refrigerant gas.

1.3. Details of the supplier of the safety data sheet

Producer/supplier: Vrec-Co Kft.
Address: H-6763 Szatymaz Kossuth u. 12.
Phone: +36-62-283-481
Fax: +36-62-583-550
E-mail: info@vrec-co.hu

Safety data sheet prepared by: TOXICHEM KFT.
Address: 6721 Szeged Osztróvszky u. 27.
Phone: +36 30 999 77 82
Fax: +36 62 64 12 13
E-mail: info@toxichem.hu

1.4. Emergency telephone number:

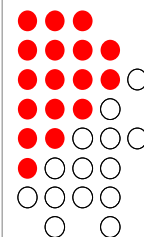
Austria tel.: +431 406 43 43, Belgium tel.: 070/245.245, Bulgaria tel.: +359 2 9154 409, Czech Republic tel.: +420 224 919 293, +420 224 915 402, Denmark tel.: 82 12 12 12, Estonia tel.: 112, Finland tel.: (09) 471 977 (direct) or (09) 4711 (exchange), France tel.: ORFILA (INRS) : + 33 (0)1 45 42 59 59, Ireland tel.: 01 809 2166, Lithuania tel.: +370 5 236 20 52, +370 687 53378, Malta tel.: 2545 0000, Medicines & Poisons Info Office tel.: 2545 6504, Norway tel.: 22 59 13 00, Portugal tel.: 808 250 143, Romania tel.: 021.318.36.06 (8:00 – 15:00), Slovakia tel.: +421 2 5477 4166, Spain tel.: + 34 91 562 04 20, Sweden tel.: 112; 08-331231 (9:00-17:00).

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture:

Regulation EC 1272/2008 (CLP):

Gases under pressure - Liquefied gas – (Press. Gas, H280)

See H-statements in Section 2.2. and 16.

2.2. Label elements

Regulation (EC) 1272/2008:

Pictogram:



Signal word:

Warning

Hazard statement:

H280

Contains gas under pressure; may explode if heated.

Precautionary statement:

P410+P403

Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

Physical hazards:

Liquefied gas.

Environmental hazards:

In high concentrations may cause greenhouse effect.

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SECTION 3: Composition/information on ingredients

3.2. Mixtures

Components	EU-number	REACH number	CAS-number	Index number	Weight %	Classification (Regulation (EC) No 1272/2008)
1,1,1,2,2-pentafluoroethane	206-557-8	01-2119485636-25	354-33-6	-	65.1	Press. Gas H280
1,1,1,2-tetrafluoroethane (R134a)	212-377-0	01-2119459374-33	811-97-2	-	31.5	Press. Gas H280
isobutane	200-857-2	01-2119474691-32	75-28-5	-	3.4	Flam. Gas 1 H220 Press. Gas H280

H-statements in Section 16 below.

SECTION 4: First aid measures

4.1. Description of first aid measures

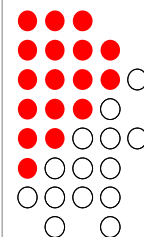
Medical intervention:	Call physician in case of asphyxiation, frostbite.
Inhalation:	Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rest. Call a doctor. Apply artificial respiration if breathing stopped.
Ingestion:	Ingestion is not considered a potential route of exposure.
Skin contact:	In case of frostbite spray with water for at least 15 minutes. Apply a sterile bandage. Obtain medical assistance.
– frostbite	
Eye contact:	Immediately flush eyes thoroughly with water for at least 15 minutes. Obtain medical assistance.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation:	In low concentration: Symptoms az include dizziness, headache, nausea and loss of co-ordination. In high concentration: Symptoms may include loss of mobility/consciousness.
Ingestion:	Ingestion is not considered a potential route of exposure.
Skin contact:	Skin contact with the liquid may cause frostbite.
Eye contact:	Contact with the liquid may cause frostbite.
Delayed effects:	Not expected.
General:	May produce irregular heart beat and nervous symptoms.

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

Advice for physician:	Symptomatic treatment is recommended .
Special equipment at the workplace:	Not needed.

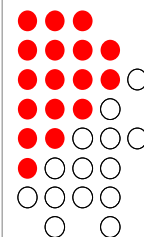


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SECTION 5: Firefighting measures

5.1. Extinguishing media

Applicable extinguishing media All known extinguisher can be used.

Not applicable extinguishing media No information.

5.2. Special hazards arising from the substance or mixture

Specific risk: Exposure to fire may cause containers to rupture/explode.
If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: carbonyl fluoride, carbon monoxide, hydrogen fluoride.

5.3. Advice for firefighters

Special protective equipment: Respiratory protective devices. (EN 14593-1)
Protective clothing against liquid chemicals. (EN 14605)

Advice: If possible, stop flow of product.
Move away from the container and cool with water from a protected position.
Use self-contained breathing apparatus and chemically protective clothing.

Fire classification: Non-flammable.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal emergency procedures: Evacuate the area.
Wear a self-contained breathing apparatus when entering the area unless atmosphere is proved to be safe. The affected area in the direction of the wind and other personnel carrying out damage control does not stay! The evacuation of persons facing the wind to be performed.
Ensure adequate air ventilation.

6.2. Environmental precautions

Environmental precautions: Try to stop release. Land of the danger area should be closed. High safety zone must be established.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Ventilate area.

6.4. Reference to other sections

Personal protective equipment: See the Section 8.

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Waste management: See the Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Recommendations for safe handling: This product should be used by properly trained person! Suck back of water into the container must be prevented.
Do not allow back-feed into container.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Refer to supplier's container handling instructions.

Fire and explosion protection: Do not smoke while working, any action to avoid the use of tools, which can cause sparks! In order to avoid electrostatic charging equipment must be grounded in the explosive region, adequate security can only speed electrical devices and equipment used.

Hygiene standards: The people in contact with product should be maintained the workplace hygiene standards. After the treatment of the product at breaks, before eating, after work the hot hand and face washing is necessary.

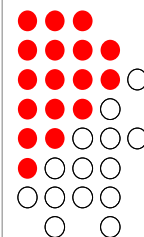
7.2. Conditions for safe storage, including any incompatibilities

Technical measures / Storage conditions: Can only be stored in a closed system, should be checked regularly for tightness. Store only in the original packaging. Tightly closed.
Protect from sunlight and sources of heat.
The bottles, containers are stored in an upright position, so as to prevent any contact with the liquid phase from the gas phase designed parts. Do not allow the temperature to rise above 50 ° C. After use, close the air outlet of the valve. Propane is only suitable for use with a pressure hose grade.

Incompatible materials: Aluminium.

7.3. Specific end use(s)

Special uses -



SECTION 8: Exposure controls/personal protection

8.1. Control parameters

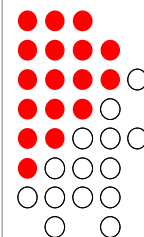
	CAS-NUMBER	Limit value, Eight hours (mg/m ³)	Limit value, Short term (mg/m ³)	Country
1,1,1,2,2-pentafluoroethane	354-33-6	2500	3750	Sweden
1,1,1,2-tetrafluoroethane (R134a)	811-97-2	4240	16800	Austria
		4200	33600	Germany (AGS)
		4200	33600	Germany (DFG)

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	CAS-NUMBER	Limit value, Eight hours (mg/m ³)	Limit value, Short term (mg/m ³)	Country
Isobutane	75-28-5	2000	3000	Sweden
		4200	-	Switzerland
		4240	-	United Kingdom
		2400	9600	Germany (AGS)
		2400	9600	Germany (DFG)
		1900	-	Switzerland

8.2. Exposure controls

Engineering measures:

Do not inhale the gas! Avoid contact with liquefied gas with eyes or skin! Provide adequate ventilation! Only in closed, leak-proof network. No smoking, open flames and ignition sources related activities are prohibited!

Hygiene standards:

The people in contact with product should be maintained the workplace hygiene standards. After the treatment of the product at breaks, before eating, after work the hot hand and face washing is necessary.

Personal protective equipment

Eye and face protection:

Safety glasses with side-shields or face shield recommended to wear.

Skin protection

Hand protection:

Avoid hand contact. Avoid hand contact, wear EN 511 standard cold contact protective gloves is recommended.

Other:

Long sleeve antistatic protective clothing and footwear EN ISO 20345 is recommended.

Inhalation protection:

In case of gas leak, EN 14593 standard compressed air breathing apparatus is recommended.

Environmental exposure controls

Environmental exposure control : Not needed.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical condition (20°C):

Gas

Colour:

Colourless gas

Odour:

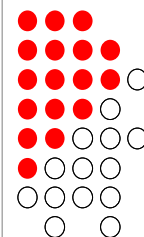
Ethereal. Poor warning properties at low concentrations.

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Properties

Value

pH (20°C):	No information.
Melting point / Freezing point:	No information.
Initial boiling point and boiling range:	-46,2°C - -41,5°C
Fire point:	No information.
Evaporating rate:	No information.
Flammability:	Non-flammable.
Upper / lower flammability or explosive limits	
– lower explosive limit:	No information.
– upper explosive limit:	No information.
Vapor Pressure (20°C):	9,6 bar.
Vapor density:	
Relative density, gas:	3,8 (air=1)
Relative density, liquefied gas:	1,16 (water=1)
Solubility	
– In water:	No data, but considered to have low solubility.
– Organic solvents:	No information.
Partition coefficient: n-octanol/water:	No information.
Auto-ignition temperature:	No information.
Decomposition temperature:	No information.
Kinematic viscosity:	No information.
Explosive properties:	No information.
Oxidizing properties:	No information.

9.2. Other information

No other information.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity: Thermal decomposition will evolve toxic substances, which may be corrosive in wet environments. May react with aluminium.

10.2. Chemical stability

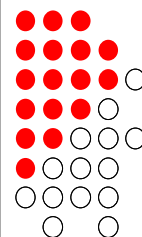
Stability: Stable in the recommended storage conditions.

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10.3. Possibility of hazardous reactions

Hazardous reactions: There are no under normal conditions of use.

10.4. Conditions to avoid

Situations to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Aluminium.

10.6. Hazardous decomposition products

Hazardous decomposition products: No information.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity:

Skin: Not classified as hazardous.

Frostbite may possible.

Eyes: Frostbite may possible.

Inhalation: Not classified as hazardous.

In low concentration: Symptoms az include dizziness, headache, nausea and loss of co-ordination.

In high concentration: Symptoms may include loss of mobility/consciousness.

Ingestion: Not classified as hazardous.

Ingestion is not considered a potential route of exposure.

Irritation: Not classified as hazardous.

Corrosion: Not classified as hazardous.

Sensitisation: Not classified as hazardous.

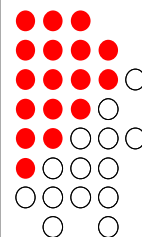
Repeated dose toxicity: No information.

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Carcinogenicity:	No information.
Mutagenicity:	No information.
Toxicity for reproduction:	Do not contain known or suspected reproductive toxic ingredients.
Target organ toxicity (STOT):	
Single exposure	Not classified as hazardous.
Repeated exposure	Not classified as hazardous.
Aspiration toxicity	
	Not classified as hazardous.

SECTION 12: Ecological information

12.1. Toxicity

General informations: No information.

12.2. Persistence and degradability

General informations: No information.

12.3. Bioaccumulative potential

General informations: No information.

log P_{ow} No information.

12.4. Mobility in soil

- Air: No information.
- Water: No information.
- Soil: No information.

12.5. Results of PBT and vPvB assessment

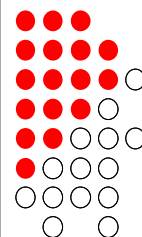
No information.

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12.6. Other adverse effects

High concentrations can contribute to the greenhouse effect.

Global warming factor of each constituent substances:

- Pentafluoroethane: 3200 (CO₂ = 1)
- 1,1,1,2 - tetrafluoroethane: 1300 (CO₂ = 1)
- Isobutane: 3 (CO₂ = 1)

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Should not be released into the environment. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Mixture:

Avoid discharge to atmosphere.

Do not discharge into any place where its accumulation could be dangerous.

Refer to supplier's waste gas recovery program.

Contact supplier if guidance is required.

Contaminated packaging:

Recycling.

SECTION 14: Transport information

14.1. UN-number

UN-number: UN3163

14.2. UN proper shipping name

International transport: LIQUEFIED GAS, N.O.S. (1,1,1,2,2-pentafluoroethane; 1,1,1,2-tetrafluoroethane)

14.3. Transport hazard class(es)

Classification code 2A

Labels: 2.2

14.4. Packing group

None

14.5. Environmental hazards

ADR/RID -

IMDG -

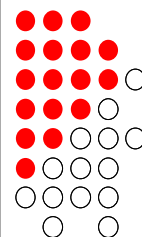
ADN -

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14.6. Special precautions for user

ADR/RID

Shipping category: 3
Tunnel restriction code (C/E)
Hazard number: 20
Limited quantity: 120 ml
Special specification (s): CV9 CV10 CV36

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 and:

- cylinder valve is closed and not leaking
- valve outlet cap nut or plug (where provided) is correctly fitted
- valve protection device (where provided) is correctly fitted
- there is adequate ventilation.
- compliance with applicable regulations.

IMDG

EMS Code: F-C, S-V
Stowage category: Category A

ICAO

Limited quatity: forbidden
Passanger and Cargo Aircraft: 75 kg (200)
Cargo Aircraft only: 150 kg (200)

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

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SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

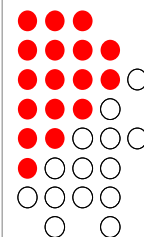
- REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
- COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

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- Regulation (EC) No 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer
- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) applicable from 1st of January 2019

15.2. Chemical safety assessment

No information.

SECTION 16: Other information

The risk of choking is often overlooked, so it should be emphasized during the operational training. Users should be trained in the method of artificial respiration.

The full H-statements from the Section 2. and 3:

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

The full abbreviation from the Section 2. and 3:

Flam. Gas	Flammable gas
Press. Gas	Gas under pressure

Used evaluation of hazard information:

According to Regulation (EC) 1272/2008 Article 9 for the classification used paragraph 1. and 5.

The safety data sheet comply with Regulation (EU) No. 2015/830. All points in the previous SDS have been changed.

This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk. The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The regulatory texts indicated herein are intended to aid the user to fulfill his obligations. This list is not to be considered complete and exhaustive. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.

End of safety data sheet