



R-434A (RS-45)

Revision: March 2012

Date 14.03.2012

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/ UNDERTAKING

1.1. Product Identifier

Mixture identification:
Trade name: **R-434A (RS-45)**
Product type and use: Refrigerant gas

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

Recommended use:
Refrigerant gas

1.3. Details of the supplier of the safety data sheet

Company:
GAS-SERVEI, SA.
C/ Motores, 151-155 nave nº 9
08038 Barceona
ESPAÑA
Tel: +34 (93) 2231377
Fax: +34 (93) 2231479
www.gas-servei.com
Competent person responsible for the safety data sheet:
gas-servei@gas-servei.com

1.4. Emergency telephone number

+ 34 609305378

2. HAZARDS IDENTIFICATION


2.1. Classification of the substance or mixture

Directive criteria, 67/548/CE, 99/45/EC and following amendments thereof:

Properties / Symbols:

None.

EC regulation criteria 1272/2008 (CLP):

 Warning, Liquef. Gas, Contains gas under pressure

Adverse physicochemical, human health and environmental effects:

No other hazards

2.2. Label elements

Symbols:



Warning

Hazard statements:
H280 Contains gas under pressure; may explode if heated.

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

Special Provisions:
None

The preparation should not be considered as dangerous accordingly to dir. 1999/45/EC.

2.3. Other hazards

vPvB Substances: None - PBT Substances: None

Other Hazards

The product or equipment contains fluorinated greenhouse gases covered by the Kyoto Protocol

3. COMPOSITION/INFORMATION ON INGREDIENTS







Chemical characteristics

3.1. Substances

N.A.

3.2. Mixtures

Hazardous components within the meaning of EEC directive 67/548 and CLP regulation and corresponding classification:

Components	Conc. (% w/w)	N° CAS	N° CE	N° Index CEE	REACH n°	Classification	
						Reglament CE N°1272/2008	67/548/CE o 1999/45/C E
1,1,1,2,2-Pentafluoroethane (R125)	63,2	354-33-6	206-557-8	N/A	01-2119485636-25-00000	 2.5 Press. Gas H280	N.A.
1,1,1-Trifluoroethane (HFC R143a)	18,0	420-46-2	206-996-5	N/A	01-2119492869-13-0000	 2.2/1 Flam. Gas 1 H220  2.5 Press. Gas H280	F+; R12;
1,1,1,2-Tetrafluoroethane (R 134a)	16,0	811-97-2	212-377-0	N/A	01-2119459374-33-0000	 2.5 Press. Gas H280	N.A.
Isobutane (R600a)	2,8	75-28-5	200-857-2	601-004-00-0	n/a	 2.2/1 Flam. Gas 1 H220  2.5 Press. Gas H280	F+; R12;



4. FIRST AID MEASURES

4.1. Description of first aid measures

For exhibitions to the liquid, the recommendation of the first aids given for contact with the skin(leather), I contact the eyes and ingestion, it(he,she) is equally applicable. Section sees also 11.

In case of skin contact:

Wash frost-bitten areas with plenty of water. Do not remove clothing. Cover wound with sterile dressing.

In case of eyes contact:

Wash immediately and thoroughly with running water, keeping eyelids raised, for at least 10 minutes. Following this, protect the eyes with sterile gauze or a clean, dry, handkerchief. OBTAIN A MEDICAL EXAMINATION.

In case of Ingestion:

Ingestion is not considered a potential route of exposure.

In case of Inhalation:

Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen. Remove casualty to fresh air and keep warm and at rest.

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

The direct contact with the liquid can provoke freezings.

Direct contact with eyes can cause irritation, tearing, risk of burns by freezing.

Inhalation of high concentrations may cause risks of narcosis, heart rhythm disturbances, asphyxia by lack of oxygen, vertigo and nausas.

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

Treatment:

Symptomatic treatment and therapy of support, as turn out to be indicated.

After an exhibition there must be avoided the administration of adrenaline or other drugs simpatomiméticas similar, since one can produce a cardiac arrhythmia with a possible later heart failure.

5. FIRE-FIGHTING MEASURES

Generally

This Cooling Gas is not inflammable in the air in normal conditions of temperature and pressure. Certain mixtures of cooling this one and air under pressure can turn out to be inflammable. The mixtures must be avoided of cooling this one and air under pressure.

Certain mixtures HFC and chlorine can be inflammable or you reactivate in certain conditions. The thermal decomposition detaches very toxic and corrosive steams (fluoride of hydrogen). The packings can burst if they are overheated.

5.1. Extinguishing media

Suitable extinguishing media:

Water.

Carbon dioxide (CO2).

Extinguishing media which must not be used for safety reasons:

None in particular.





5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.

5.3. Advice for fire-fighters

Use suitable breathing apparatus .

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear personal protection equipment.

Remove persons to safety.

See protective measures under point 7 and 8.

6.2. Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.

Retain contaminated washing water and dispose it.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

Suitable material for taking up: absorbing material, organic, sand

6.3. Methods and material for containment and cleaning up

Wash with plenty of water.

6.4. Reference to other sections

See also section 8 and 13

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Only experienced and properly instructed persons should handle liquefied gases liquids. Protect packages from physical damage; do not drag, roll, slide or drop.

Avoid contact with skin and eyes, inhalation of vapours and mists.

Do not eat or drink while working.

See also section 8 for recommended protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from food, drink and feed.

Incompatible materials:

None in particular.

Instructions as regards storage premises:

Adequately ventilated premises.

7.3. Specific end use(s)

In accordance with the regulation of the member states, the uses in which it is possible to apply are the following ones: cooling, frothing agent.

Safety classification **A1/A1 Group L1**

7.4 Risks of the process

The transfer of cooling liquid of the packings/packages) of cooling to the systems and from the systems there can cause the generation of static electricity. Make sure itself that a connection exists to suitable land.

HFC's certain mixtures and chlorine can be inflammable or you reactivate in certain conditions.

It must be payed attention to mitigating the risk of developing discharges press in systems, caused by an increase of the temperature when the liquid remains caught between closed valves or in cases in which the containers have been filled in excess.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Threshold Limit Value	CAS	VLA-ED (8 h ppm)	VLA- ED (8 h mg/m ³)	VLA- EC (15m. ppm)	VLA-EC (15m. g/m ³)	Note
1,1,1,2-Tetrafluoroethane (HFC 134a)	811-97-2	1000	4240	-	-	WEL
1,1,1,2,2-Pentafluoroethane (R125)	354-33-6	1000	4900	-	-	COM
1,1,1- Trifluoroethane (R143a)	420-46-2	1000	3400	-	-	COM
Isobutane	75-28-5	1000	-	-	-	

8.2. Exposure controls

Eye protection:

Safety glasses recommended when handling packages

Protection for skin:

Safety shoes are recommended when handling packages

Protection for hands:

Sturdy work gloves are recommended for handling packages.

Respiratory protection:

Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere.

Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.

Thermal Hazards:

Use gloves thermos insulating

Environmental exposure controls:

Ensure adequate ventilation, especially in confined areas.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance and colour:	Liquefied, colorless gas
Odour:	Ether like.
Odour threshold:	N.A.
pH:	neutral
Melting point / freezing point:	N.A.
Initial boiling point and boiling range:	-44,9 °C (1013 hPa)

Solid/gas flammability:	N.A.
Upper/lower flammability or explosive limits:	Non flammable
Flash point:	N.A.
Evaporation rate:	N.A.
Vapour pressure:	11,8 bar (25°C)
Relative density:	Liq. 1096 Kg/m ³ (25°C) Gas 53,1 Kg/m ³ (25°C)
Solubility in water:	Not soluble
Lipid solubility:	N.A.
Partition coefficient (n-octanol/water):	N.A.
Auto-ignition temperature:	N.A.
Decomposition temperature:	N.A.
Viscosity:	N.A.
Explosive properties:	N.A.
Oxidizing properties:	N.A.
9.2. Other information	
Miscibility:	N.A.
Fat Solubility:	N.A.
Conductivity:	N.A.
Substance Groups relevant properties	N.A.
Critical temperature:	77,8 °C
Critical Pressure:	3979 kPa

10. STABILITY AND REACTIVITY

10.1. Reactivity

Stable under normal conditions

10.2. Chemical stability

Stable under normal conditions

10.3. Possibility of hazardous reactions

Halides of hydrogen dioxide of carbon, monoxide of carbon, hydrocarbons fluorides and halides of carbonyl.

10.4. Conditions to avoid

Alkali and alkaline earth metals - powdered aluminium, zinc, etc.

10.5. Incompatible materials

Metals finely divided, magnesium and alloys containing more than 2 % of magnesium. It can react violently, if it enters in touch with alkaline metals and metals alcalinotérreos , sodium, potassium, barium.

10.6. Hazardous decomposition products

Fluoride of hydrogen for thermal decomposition and hidrolisis.



11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity

Inhalation

1,1,1,2-Tetrafluoroethane (R134a): CL 50 / 4h / rat: > 2 085 mg / l

Pentafluoroethane (R125) : ALC / 4h / rat: > 3 480 mg. / l

1,1,1- Trifluoroethane (R-143a): CL 50 / 4h / rat :> 1 856 mg. / l

Skin contact

Slightly irritating.

The splashes of the liquid or the pulverizations can cause burns for cold. It is improbable that is dangerous for absorption across the skin.

Eyes contact

Slightly irritating.

The splashes of the liquid or the pulverizations it can cause burns for cold.

Ingestion

It is very improbable - but if this happened, it would produce burns for cold.

Long-term exhibition

HFC R-125: A study of inhalation in animals has showed that repeated exhibitions do not produce significant effects (50000ppm in rates)

HFC R-134a: A study of inhalation in the course(year) of the life of a few rates has demonstrated that the exhibition ppm produces benign tumors to 50000 in the testicles. The increase of the incident of tumors was observed only after an exhibition prolonged to high quantities, and it thinks that it(he,she) is not pertinent for human beings exposed to the HFC 134a to the limit of occupational exhibition or below this one.

HFC R-143a: A study of inhalation in animals has showed that repeated exhibitions do not produce significant effects (40000 ppm in rates)

Carcinogenicity

The animal tests did not show any effect carcinogen.

Germ cell mutagenicity

Pentafluoroetano (R125): it did not damage in bacterial cultivated cells.

Toxicity for the reproduction

He does not present effects mutagenics or teratogenics in the experienced animals.

Toxicity for repeated doses

Pentafluoroethane (R 125): were not significant toxical effects.

Tetrafluoroethane (R-134a): were not significant toxical effects.

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

Acute toxicity:

R-134a : CL 50 / 96h / Rainbow trout: 450 mg / l

R-134a : CE 50 / 48h / Daphnia: 980 mg / l

R-125 : CL 50 / 96h / Rainbow trout:>81,8 mg / l

R-125 : CE 50 / 48h / Daphnia : >200 mg / l

R-143a : CL 50 / 96h / Rainbow trout: > 450 mg / l
R-143a : CE 50/ 48h / Daphnia: 300 mg / l

12.2. Persistence and degradability

Air, fotolisis, (ODP) = 0.
Result: absence of effect on the stratospheric ozone.
Air, effect of greenhouse, GWP ca. 3238

The product persists in the air duration of atmospheric life of the components:

- R134a: 14.6 years
- R125: 32.6 years
- R143a: 48 years
- Isobutane: Aprox. 10 years

12.3. Bioaccumulative potential

None

12.4. Mobility in soil

N.A.

12.5. Results of PBT and vPvB assessment

vPvB Substances: None - PBT Substances: None

12.6. Other adverse effects

None

12.7. Other information

Contains fluorated gas of greenhouse effect covered by the Protocol of Kyoto.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover if possible. In so doing, comply with the local and national regulations currently in force.

14. TRANSPORT INFORMATION

14.1. UN number

ADR-UN number:	1078
IATA-Un number:	1078
IMDG-Un number:	1078

14.2. UN proper shipping name

ADR-Shipping Name:	REFRIGERANT GAS, N.O.S R-4234A (RS-45) (1,1,1,2-Tetrafluoroethane / 1,1,1,2,2-Pentafluoroethane / Trifluoroethane/Isobutane)
IATA-Technical name:	REFRIGERANT GAS, N.O.S R-434A (RS-45) (1,1,1,2- Tetrafluoroethane / 1,1,1,2,2-Pentafluoroethane / Trifluoroethane/Isobutane)

IMDG-Technical name: REFRIGERANT GAS, N.O.S R-434A (RS-45)
(1,1,1,2-Tetrafluoroethane / 1,1,1,2,2-Pentafluoroethane /
Trifluoroethane/Isobutane)

14.3. Transport hazard class(es)

ADR-Class: 2
ADR-Label: 2.2
ADR-Upper number: 20
IATA-Class: 2.2
IATA-Label: 2.2
IMDG-Class: 2.2
IMDG-Label: 2.2



14.4. Packing Group

N.A.

14.5. Environmental hazards

Marine pollutant: No

14.6. Special Precautions for User

ADR-Tunnel Restriction Code: (C/E)
Rail (RID): 1078
IMDG-EMS: F-C, S-V

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

N.A.

15. REGULATORY INFORMATION

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

Dir. 67/548/EEC (Classification, packaging and labelling of dangerous substances). Dir. 99/45/EEC (Classification, packaging and labelling of dangerous preparations). Dir. 98/24/EC (Risks related to chemical agents at work). Dir. 2000/39/EC (Occupational exposure limit values); Dir. 2006/8/CE. Regulation (CE) n. 1907/2006 (REACH), Regulation (CE) n.1272/2008 (CLP), Regulation (CE) n.790/2009.

Where applicable, refer to the following regulatory provisions :

Directive 82/501/EEC ('Activities linked to risks of serious accidents') and subsequent amendments.

Regulation (EC) nr 648/2004 (detergents).

1999/13/EC (VOC directive)

Special restrictions

The gas fluorado with greenhouse effect R-434A (RS-45) must be supplied in containers retornables (cans / cylinders). The container contains gases fluorados of greenhouse effect covered by the Protocol of Kyoto. The gases fluorados of greenhouse effect in containers or cylinders cannot be sniffed to the atmosphere

(EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases.

(EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer



15.2. Chemical Safety Assessment

No

16. OTHER INFORMATION

Text of phrases referred to under heading 3:

R12 Extremely flammable.

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold

CCNL - Appendix 1

Insert further consulted bibliography

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.

This safety data sheet has been completely updated in compliance to Regulation 453/2010/EU.

We advise be sent to the regulations:

(EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer

(EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases

The enumeration of the risks, legal, regulation and administrative texts they are not exhaustive,

since responsible only one will correspond(fit) to the addressee or user of the product to be sent to the official regulations of storage, manipulation and utilization of these products.

GLOSSARY

TLV: Threshold Limit Value of the ACGIH

TLV-C: Threshold Limit Value - ceiling of the ACGIH

WEL: The Manufacturer has for aim control the exhibition in the place of work at the level of the standard of the United Kingdom

COM: The Manufacturer has for aim control the exhibition in his places of work to this one limit.

VLA-ED: Value environmental limit daily exhibition.