

SAFETY DATA SHEET

in accordance with Annex II of Regulation (EC) No 1907/2006 (REACH) and its amendments

R410A

Section 1 - IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY/ UNDERTAKING

1.1 Product identifier

Product identifier: R 410A
Chemical formula: Refrigerant mixture HFC
Synonym(s): refrigerant gas R 410A

1.2 Relevant identified uses of the substance and uses advised against

Identified uses:

Sector of use	Product category
SU3 : Industrial uses: Uses of substances as such or in preparations at industrial sites SU17 : General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19 : Building and construction work SU22 : Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	PC16 : Heat transfer fluids

Recommended use restriction: use reserved for industrial or professional users.

1.3 Details of the supplier of the safety data sheet

Name: **CALORIE FLUOR**
Address: 411 rue Clément Ader
FR – 78530 BUC
Phone: +33 /1 39 24 16 70
Fax: +33 /1 39 56 07 18
e-mail address: service.commercial@calorie-fluor.fr
Web Site: <http://www.calorie-fluor.fr>

1.4 Emergency phone number

Phone: Outside the U.S.: 1-703-527-3887 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

2.1 Classification of the substance or the mixture

Classification of the substance according to CLP (1272/2008/EC):

Gases under pressure, liquefied gas, H280

2.2 Label elements

Hazardous components to be included on the label:

Pentafluoroethane N° CE : 206-557-8
Difluoromethane N° CE : 200-839-4

Hazard pictograms:



SGH04

Warning label:

WARNING

Hazard statements:

H280: Contains gas under pressure; may explode if heated

Precautionary statements:

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

Additional label information:

Eiga-0357: Asphyxiant in high concentrations

Eiga-0783: Contains fluorinated greenhouse gases , GWP = 1975 eq. CO₂

2.3 Other hazards

Frostbite possible from splashes of liquefied gas

Thermal decomposition giving toxic and corrosive products (see section 10)

Suffocation by reduction of oxygen content (vapors heavier than air).

Section 3 - COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixture

Chemical name of the substance	Pentafluoroethane (R125)	Difluoromethane (R32)
CAS number	354-33-6	75-10-5
CE number	206-557-8	200-839-4
Reach registration number	01-2119485636-25	01-2119471312-47
Concentration	49 - 52 %	48 - 51 %
Classification according to regulation 1272/2008(CLP)	Press. Gas Liquefied Gas H280	Flam. Gas 1B H221 Press. Gas Liquefied Gas H280

Section 4 - FIRST AID MEASURES

Generally, in case of doubt or if symptoms persist, always call a doctor.

Never give anything by mouth to an unconscious person.

4.1 Description of necessary first-aid measures

Inhalation:

Move the person away from the contaminated area, to breathe fresh air. Oxygen or artificial respiration if needed.

Consult a physician.

Contact with the skin:

Frostbites have to be treated as thermal burns: Wash immediately, abundantly and thoroughly with water.

Contact with the eyes:

Wash immediately, abundantly and thoroughly with water. If irritation persists, consult an ophthalmologist.

Ingestion:

Is not considered a potential route of exposure.

Rescuers protection:

In case of insufficient ventilation, wear suitable respiratory equipment.

4.2 Most important symptoms and effects, both acute and delayed

See section 11.

4.3 Indication of immediate medical attention and special treatment needed

Treatment: Do not give adrenaline or similar drugs.

Section 5 - FIREFIGHTING MEASURES

5.1 Firefighting measures

Suitable extinguishing media:

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Cool containers / tanks with water spray.

Unsuitable extinguishing media: None

5.2 Special hazards arising from the substance or mixture

This product is not flammable in air under ambient conditions of temperature and pressure.
Hazardous decomposition products formed under fire conditions.

5.3 Advice for firefighters

Wear self-contained breathing apparatus and protective clothing.
Wear chemical-resistant outerwear.

Section 6 - ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate unnecessary personnel or not equipped with individual protection.
Ensure adequate ventilation.
Avoid contact with skin, eyes and inhalation of vapours.
In a closed local, ventilate or wear a self-contained breathing apparatus (risk of anoxia).
Remove all sources of ignition. Do not smoke.

6.2 Environmental precautions

Do not release into the environment.
Avoid spills or leaks.
Retain and dispose of contaminated washing water.

6.3 Methods and material for containment and cleaning up

Ventilate the area.
Local or national regulations may apply to the disposal of this product, as well as to the materials and objects used for cleaning.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for information on disposal and treatment of waste.

Section 7 - HANDLING AND STORAGE

The regulations relating to storage premises apply to workshops where the mixture is handled.

7.1 Precautions for safe handling

Tips for safe handling:

Provide sufficient air and/or ventilation in the workshops.
Use a cylinder in accordance with the regulations of Transportable Pressure Equipment.
Use a device with check valve in the piping.
Close the valve after each use and when empty.
Avoid contact with skin, eyes and inhalation of fumes.
Do not eat, drink or smoke during use

7.2 Conditions for safe storage, including any incompatibilities

Gas cylinders must be stored vertically and securely to prevent falling or falling reversal.
Store well-closed containers in a dry and well-ventilated place. Store in the original container.
Keep away from heat and ignition sources. Avoid direct exposure to the sun.
Do not smoke.

Storage time: > 10 years

Recommended storage temperature: < 52 °C

Incompatible products:

Alkaline and alkaline earth metals, strong oxidizing agents, finely divided metals. May react violently with chlorine under certain conditions of temperature and pressure.

Packing material:

Recommended: Carbon Steel, Stainless Steel

To avoid: Alloy containing more than 2% magnesium, Plastics

7.3 Specific end use(s)

None.

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Exposure limit values

Component	Pentafluoroethane	Difluoromethane
N° CAS	354-33-6	75-10-5
Type of value	TWA	TWA
Value / unit	1 000 ppm 4 900 mg/m ³	1 000 ppm
Source / update	WEEL - 2006	SAEL (Solvay) - 2007

Derived No Effect Level (DNEL), inhalation

	Component	Pentafluoroethane	Difluoromethane
End use	Workers	16 444 mg/m ³ (LT, SE)	7 035 mg/m ³ (LT, SE)
	Consumers	1 753 mg/m ³ (LT, SE)	750 mg/m ³ (LT, SE)

LE : Local effects, SE : Systemic effects, LT : Long-term, ST : short-term

Predicted No Effect Concentration (PNEC)

Compartment:	Pentafluoroethane	Difluoromethane
Fresh water	0,1 mg/l	0,142 mg/l
Water (intermittent release)	1 mg/l	1,42 mg/l
Fresh water sediment	0,6 mg/kg dw	0,534 mg/kg dw

(dw : dry weight)

8.2 Exposure controls

General protection measures:

Minimize occupational exposure concentrations.

If sufficient ventilation is not available, use with local vacuum ventilation.

If advised by the assessment of local exposure potential, use only in a location equipped with explosion-proof ventilation.

II Personal protective equipment:



Eye protection

Wear protective eyewear (goggles, face shield, or safety glasses).



Skin protection

Wear thermal insulating gloves when handling liquefied gases.



Respiratory protection

In cases of insufficient ventilation, where exposure to high concentrations of vapour is possible, suitable respiratory protective equipment with positive air supply should be used.



Thermal hazards

See above - Skin protection

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information of basic physical and chemical properties

Appearance:

Physical state (20°C): Gaseous

Form: Liquefied gas

Colour: Colourless

Odour: Slightly ethereal

Boiling point / range: -52,6 °C

Vapor Pressure: 16,8 bar, at 25 °C

31,1 bar at 50°C

43,1 bar at 70°C

Vapour relative density /air: 2,2 (approximatively)

Liquid density: 1,063 g/cm³, at 25 °C

Water solubility: Difluoromethane : 1,68 g/l at 25°C
Pentafluoroethane : 0,43 g/l at 25°C (calculated)

Flash point: Not applicable

Flammability: Non-flammable product

Oxidizing properties: Not relevant (due to the chemical structure)

9.2 Other information

Molecular weight: 72,6 g/mol

Critical point:

Critical pressure: 49 bar

Critical temperature: 71 °C

Section 10 - STABILITY AND REACTIVITY

10.1 Reactivity

Stable under normal conditions of storage and handling.

10.2 Chemical stability

Product stable at room temperature

10.3 Possibility of hazardous reactions

|| Product that can react with strong oxidants

10.4 Conditions to avoid

|| Mixed with high concentrations of air under pressure and/or at high temperatures, this substance may be fuel in the presence of an ignition source.

Keep away from heat and ignition sources. Avoid contact with flames and metal surfaces red.

10.5 Incompatible materials

Alkaline and alkaline earth metals, strong oxidizing agents, finely divided metals powders.

10.6 Hazardous decomposition materials

At high temperature, thermal decomposition in toxic and corrosive products: hydrogen fluoride (HF) gas, carbon oxides.

Section 11 - TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:

Not classified on the basis of available information.

Acute inhalation toxicity:

Composant	Pentafluoroethane	Difluoromethane
LC50 /4 h/ rat (Method: OECD Guideline 403, gas)	> 800 000 ppm	520 000 ppm
NOAEC / dog	75 000 ppm	350 000 ppm
CSTL / dog	368 159 mg/m ³	> 735 000 mg/m ³

Corrosion / skin irritation and severe eye damage / eye irritation:

Not classified on the basis of available information.

Respiratory or skin sensitization:

Not classified on the basis of available information.

II Mutagenicity on germ cells

Not classified on the basis of available information.

Composant	Pentafluoroethane	Difluoromethane
In vitro genotoxicity:		
Ames test (Method: OECD Guideline 471)	Negative	Negative
in vitro chromosome aberration test (Method: OECD Guideline 473)	Negative	Negative
Genotoxicity in vivo:		
In vivo micronucleus test (Method: OECD Guideline 474)	Mouse (Negative)	Mouse (Negative)

Carcinogenicity

Not classified on the basis of available information.

II Reproductive toxicity

Not classified on the basis of available information

Composant	Pentafluoroethane	Difluoromethane
Fertility test Inhalation - based on data from similar components	Rat (Negative)	Mouse (Negative)
Effects on fetal development Study on the toxicity of prenatal development. (Method: OECD, Guideline 414, inhalation)	Rat (Negative)	Rat (Negative) Rabbit (Negative)

Specific target organ toxicity (STOT),

Single or repeated exposure

Not classified on the basis of available information.

Repeated dose toxicity

Not classified on the basis of available information.

Composant	Pentafluoroethane	Difluoromethane
NOAEL (Method: OECD, Guideline 413, inhalation, rat)	≥ 50 000 ppm 13 weeks	49 100 ppm 13 weeks

Aspiration toxicity

Not classified on the basis of available information

Section 12 - ECOLOGICAL INFORMATION

12.1 Toxicity

Due to its composition: Slightly harmful to fish, daphnia and alga.

	Difluoromethane	Pentafluoroethane
Fish IC50, 96h Species Method	1 507 mg/l Rainbow Trout ECOSAR	>100mg/l Rainbow Trout Analogy with a comparable product
Aquatic invertebrates EC50, 48 h Species Method	652 mg/l Daphnia ECOSAR	>100 mg/l Daphnia magna Analogy with a comparable product
Aquatic plants CE50, 96h Species Method	142 mg/l alga ECOSAR	>100 mg/l alga Analogy with a comparable product

12.2 Persistence and degradability

Not readily biodegradable.

	Difluoromethane	Pentafluoroethane
Biodegradability (in water) (Method: OECD Guideline 301D)	5% after 28 days	5% after 28 days
Photodegradation (in air) Degradation by OH radicals: Global Half-Life	1 237 days	29 years

12.3 Bioaccumulation potential

Almost not bioaccumulable

	Difluoromethane	Pentafluoroethane
Partition coefficient n-octanol/water: log Kow, at 25 °C (Method: OECD Guideline 107)	0,71	0.17 (Pow 1.48)

12.4 Mobility in the soil

Distribution between environmental compartments

	Difluoromethane	Pentafluoroethane
Henry's constant: At 25°C, method: calculated	29,5E+03 Pa.m ³ /mol	28,2E+03 Pa.m ³ /mol
Absorption / desorption: In soils and sediments, log Koc (method: calculated)	Low adsorption 1.52	Low adsorption 1,57
In aquatic compartment	Fast evaporation	Fast evaporation

12.5 Results of PBT and vPvB assessment

This mixture contains no substance fulfilling the PBT and vPvB criteria of REACH, annex XIII.

12.6 Endocrine Disrupting properties

Non applicable

12.7 Other adverse effects

Global warming potential (GWP)(CO₂ =1) : 1975
Ozone depletion potential (ODP) (R-11 = 1) : 0

Section 13 - DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product disposal:

Recycle or incinerate in accordance with local and national regulations. Consult supplier for information on recovery and recycling of the product and packaging.

Section 14 - TRANSPORT INFORMATION

14.1 UN number

UN 1078

14.2 Label



14.3 RID / ADR

Official designation for transport:	REFRIGERANT GAS , N.S.A (GAZ REFRIGERANT R 410A)
Class :	2
Classification code:	2A
Transport category:	3
Tunnel restriction code:	(C/E)
Hazard identification number:	20

14.4 ADN

No data

14.5 IMDG

Official designation for transport:	REFRIGERANT GAS ; N.O.S. (REFRIGERANT GAS R 410A)
Class or division:	2.2
FS :	F-C, S-V
Stowage and segregation:	category A

14.6 IATA-DGR

Official designation for transport:	REFRIGERANT GAS ; N.O.S. (REFRIGERANT GAS R 410A)
Class or division:	2.2
Passenger and cargo aircraft:	
Max Net Qty: package	75 kg
Cargo aircraft only:	
Max Net Qty: package	150 kg
D.S. :	-
IDC :	2L

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

Not applicable

Section 15 - REGULATORY INFORMATION

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

EU Legislation

- || • **CLP Regulation:**
 - || ○ *Regulation (CE) 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/CE and 1999/45/EC and amending Regulation (CE) No 1907/2006, with amendments.*
- **REACH regulation :**
 - *Regulation (EC) No 1907/2006 of the European Parliament and of the Council December 18, 2006 relating to Registration, Evaluation and Authorisation of Chemicals 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 and Directive 76/769/EEC and Council directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.*
 - || - **REACH (Article 59)** - List of candidate substances of very high concern an authorization: **not applicable**
 - || - **REACH (Annex XIV)** - List of substances subject to authorization: **not applicable**
 - || - **REACH (Annex XVII)** - Restrictions on manufacture, placing on the market and the use of certain dangerous substances and preparations and articles dangerous: **not applicable**
- **F-Gas regulation:**
 - *Regulation (EC) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006*

15.2 Chemical safety assessment

Satisfying neither the classification criteria for health and the environment, or the criteria for PBT or vPvB in accordance with Article 14 (3) of the REACH Regulation, specific exposure scenarios have not been developed.

Section 16 - OTHER INFORMATION

16.1 SDS update

Revision date: **August 2023** – Revision index: **5**

Nature of change:

SDS sections that have been updated		Type
1.2	Utilisations	Use reserved for industrialists and professionals
2.3	Others hazards	Add
3.2	Mixture	Modification
6.2	Precautions for environmental protection	Protection Supplements
6.3	Methods and material for containment and cleaning up	Ventilate area
7	Manipulation and storage	Add-Ins
8	Exposure checks / Personal protection	Individual Protection Update and Add Pictograms
10	Stability and responsiveness	Additional information on conditions to be avoided
11	Information on toxicological effects	New results
12	Ecological information - Toxicity	New results
15.1	Regulatory Information	Regulation
16.2	Abréviations et acronymes	CSTL and STOT addition

16.2 Abbreviations and acronyms

VLE: Threshold Limit Value, maximum concentration that can be achieved for up to 15 minutes, in the workplace

VME: exposure, maximum permissible average concentration of 8 hours, 40 hours per week in the workplace

TLV: Threshold Limit Value

TWA: Time Weighted Average, average concentration not to exceed a period of 6 hours 40 hours per week

LD50: Lethal Dose 50 = ingested or injected dose killing 50% of the tested population

LC50: Lethal Concentration 50 = concentration causing the death of 50% of the test population

DNEL: Derived No Effect Level (Derived No Effect)

PNEC: Predicted No Effect Concentration

NOAEL: No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

GWP: Global Warming Potential

ODP: Ozone Destruction Potential

PBT: Persistent, Bioaccumulative, Toxic

vPvB: very Persistent and very Bioaccumulative

ADR: European Agreement concerns the International Carriage of Dangerous Goods by Road

RID: Regulations concerning the international carriage of dangerous goods by rail

ADN: European Agreement concerning the International Carriage of Goods by Inland Waterways

IMDG: International Maritime Dangerous Goods code

IATA: International Air Transport Association

16.3 Full text of relevant H-Statements

H280: Contains gas under pressure, may explode if heated

NOTE: In case of formulations or mixtures, make sure that no new dangers can arise.

The information given in this sheet are given in good faith and based on our knowledge of the product, at the date of publication.

The user's attention is drawn to the risks incurred when a product is used for purposes other than those for which it is intended. This sheet shall only be used and reproduced for prevention and security. The list of laws, regulations and administrative cannot be considered exhaustive. It is the recipient of the product to refer to all official documents concerning the use, possession and handling of the product for which it is responsible.

The user must also bring to the attention of those who may come into contact with the product (usage, storage containers, and other processes) all information necessary to safety, protection of health and environment, by providing them with the safety data sheet.