



# CORECO

## SAFETY DATA SHEET

# R-404A

Issue: January 2023 Version 2.2  
2023

Date: 2 January

### SECTION 1. Identification of the substance or mixture and of the company or undertaking

#### 1.1. Product identifier

Trade name: **R-404A**

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

Use of the substance/mixture: Refrigerant

Restrictions on use: For professional use only.

#### 1.3. Details of the supplier of the safety data sheet

Supplier name: GAS SERVEI S.A.  
Address: C/ Motors, 151-155 nave nº 9  
08038 Barcelona  
SPAIN

Telephone: +34 (93) 2231377

Fax: +34 (93) 2231479

[www.gas-servei.com](http://www.gas-servei.com)

Email address of the person responsible for the SDS: [gas-servei@gas-servei.com](mailto:gas-servei@gas-servei.com)

#### 1.4. Emergency telephone number

Gas-servei: +34 619373605

National Institute of Toxicology and Forensic Sciences: +34 (91) 5620420

### SECTION 2. Hazard identification

#### 2.1. Classification of the substance or mixture

Criteria EC Regulation 1272/2008 (Classification, Labelling and Packaging):

Pressurised gases, liquefied gas H280: Contains pressurised gas; danger of explosion if heated.

#### 2.2. Label elements

Hazard pictograms: Symbols: GHS04



Signal word: Warning

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

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

**Additional labelling:** Contains fluorinated greenhouse gases (HFC-143a, HFC-125, HFC-134a)



# CORECO

## 2.3. Other hazards

This mixture does not contain components that are considered to be persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components that have endocrine-disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The mixture does not contain components that have endocrine-disrupting properties according to Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

The vapours are heavier than air and can cause asphyxiation by reducing the oxygen in the air breathed.  
Incorrect use or intentional inhalation abuse can cause death without warning symptoms due to cardiac effects.  
Rapid evaporation of the product may cause frostbite. It may displace oxygen and cause rapid asphyxiation.

## SECTION 3. Composition/information on components

### 3.1. Substances

Not applicable

### 3.2. Mixtures

#### Components

Chemical name	Concentration (% by weight)	CAS No.	EC No.	REACH registration number	Classification
					EC Regulation No. 1272/2008
1,1,1-Trifluoroethane (HFC 143a)	52.0	420-46-2	206-996-5		 2.2/1 Flam. Gas 1 H221  2.5 Gas pressure H280
1,1,1,2,2-Pentafluoroethane (HFC 125)	44.0	354-33-6	206-557-8		 2.5 Press. Gas H280
1,1,1,2-Tetrafluoroethane (HFC 134a)	4.0	811-97-2	212-377-0		 2.5 Press. Gas H280

## SECTION 4. First aid

### 4.1. Description of first aid



General recommendations:

In case of accident or discomfort, seek medical attention immediately.  
If symptoms persist or in case of doubt, seek medical advice.

Protection of first responders:

No special precautions are required for first responders.

In case of inhalation:

If inhaled, move to fresh air.  
If not breathing, give artificial respiration. If breathing is difficult, give oxygen.  
Consult a doctor immediately.

In case of skin contact:

Thaw frozen parts with warm water. Do not rub the affected area.  
Consult a doctor immediately.



# CORECO

In case of  
contact with eyes:

Seek medical attention immediately.

If swallowed:

Ingestion is not considered a potential route of exposure.

## 4.2. Main symptoms and effects, acute and delayed

May cause cardiac arrhythmia.

Other symptoms possibly related to misuse or abuse of inhalation are:

Cardiac sensitisation

Anaesthetic effects

Mild dizziness

Vertigo

Confusion

Lack of coordination

Drowsiness

Unconsciousness

The gas reduces the oxygen available for breathing.

Contact with the liquid or refrigerated gas may cause cold burns and frostbite.

## 4.3. Indication of any medical attention and special treatments that must be administered immediately

Treatment:

Symptomatic treatment and supportive therapy as indicated.

Due to possible cardiac arrhythmias, catecholamines, such as epinephrine, which may be used in emergency life-support situations, should be used with particular caution.

## SECTION 5. Firefighting measures

### 5.1. Extinguishing media

Appropriate extinguishing media

Appropriate:

Not  
applicable  
Will not burn

Extinguishing media

Not applicable

Not  
applicable  
Will not burn

### 5.2. Specific hazards arising from the substance or mixture

Specific hazards in the  
firefighting:

Exposure to combustion products may be hazardous to health.

Do not inhale the gases produced.

Due to high vapour pressure, there is a risk of containers bursting if the temperature rises.

Combustion products  
hazards:

Hydrogen fluoride  
Carbonyl fluoride  
Carbon oxides  
Fluorinated compounds

### 5.3. Recommendations for firefighting personnel

Special protective  
equipment for firefighting  
personnel

firefighting personnel:

If necessary, use self-contained breathing apparatus for firefighting. Use personal protective equipment.

Specific methods

extinguishing methods:

Use extinguishing measures that are appropriate to the local circumstances and surroundings.

Fight the fire from a distance due to the risk of explosion. Use water spray to cool closed containers.

Remove undamaged containers from the fire area if it is safe to do so. Evacuate the area.



# CORECO

## SECTION 6. Measures in case of accidental spillage

### 6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas.

Use self-contained breathing apparatus and appropriate personal protective equipment when cleaning up spills. Avoid skin contact with dripping liquid (freezing hazard).

Ventilate the area.

Follow the safe handling advice (see section 7) and PPE recommendations (see section 8).

### 6.2. Environmental precautions

Do not disperse into the environment.

Prevent the product from entering the soil/subsoil.

Prevent it from entering surface water or the sewer system. Safely prevent further leaks or spills.

Contain and dispose of contaminated water.

In the event of a gas leak or penetration into watercourses, soil or the sewer system, inform the responsible authorities.

### 6.3. Containment and cleaning methods and materials

Clean-up methods: Ventilate the area.  
Wash with plenty of water.

Containment and cleaning materials:  
containment and cleaning: Suitable collection material: absorbent material, organic material, sand.

Local or national regulations may apply to the release and disposal of this material and to the materials and items used in cleaning up spills. You must determine which regulations apply. Sections 13 and 15 of this data sheet provide information on certain local or national requirements.

### 6.4. Reference to other sections

See also sections 7, 8, 11, 12 and 13.

## SECTION 7. Handling and storage

### 7.1. Precautions for safe handling

Technical measures: Use equipment rated for cylinder pressure. Use a backflow prevention device on the pipe. Close the valve after each use and after emptying.

Local/total ventilation: Use only with adequate ventilation.

Tips for safe handling:

- Avoid contact with skin and eyes.
- Avoid inhaling vapours and mists from the fluid.
- Do not use empty containers that have not been previously cleaned. Handle in accordance with good industrial safety and hygiene practices, based on the results of the workplace exposure assessment. Wear insulated gloves and protective equipment for the face/eyes. The protective valve caps and threaded plugs on the valve outlet must remain in place unless the container is secured with the valve outlet connected to the point of use.
- Use a non-return valve or trap (exhaust, siphon trap interceptor) in the discharge line to prevent dangerous reverse flow into the cylinder.
- Before carrying out transfer operations, ensure that there are no incompatible materials and/or residues in the containers.
- Prevent gas from flowing back into the gas container.
- Use a pressure regulator when connecting the cylinder to lower pressure systems or pipes.
- Close the valve after each use and after emptying. DO NOT change or force connections.

Prevent water from seeping into the gas container. Never attempt to lift the cylinder by its cap.  
 Do not drag, slide or roll cylinders.  
 Use a suitable hand truck to move the cylinder. Keep away from heat and sources of ignition.  
 The transfer of liquid refrigerant from refrigerant containers to systems and from systems may cause the generation of static electricity. Ensure that there is an adequate ground connection.  
 Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Avoid the build-up of electrostatic charges.  
 Take care to mitigate the risk of high pressures developing in systems, caused by temperature rise when liquid is trapped between closed valves or when containers have been overfilled.  
 Avoid spillage and waste. Minimise release into the environment.

Hygiene measures:

If exposure to chemicals is likely during normal use, provide eye wash stations and safety showers near the work area. Do not eat, drink or smoke during use.  
 Wash contaminated clothing before reuse.

## 7.2. Conditions for safe storage, including any incompatibilities

Technical requirements for storage facilities and containers:

Keep cylinders in a well-ventilated area away from fire hazards.  
 Cylinders must be stored upright and securely fastened to prevent them from falling or being knocked over.  
 Separate full containers from empty containers. Do not store near combustible materials.  
 Avoid areas where salt and other corrosive materials are present. Store in properly labelled containers.  
 Keep in a cool, well-ventilated place. Keep away from direct sunlight.  
 Store in accordance with specific national regulations.

Guidelines for joint storage:

Do not store with the following types of products:  
 Self-reactive substances and mixtures  
 Organic peroxides  
 Oxidising agents  
 Flammable liquids  
 Flammable solids  
 Pyrophoric liquids  
 Pyrophoric solids  
 Substances and mixtures that undergo spontaneous heating.  
 Substances and mixtures which, in contact with water, emit flammable gases. Explosives  
 Highly toxic mixtures and substances. Very toxic mixtures and substances.  
 Mixtures and substances with chronic toxicity

Temperature of Recommended storage:

< 50 °C

Storage time:

> 10 years

Further information on stability during storage:

The product has an indefinite shelf life when stored properly.

## 7.3. Specific end uses

Subject to Member State regulations, the uses to which it may be applied are as follows: Refrigerant.



# CORECO

## SECTION 8. Exposure controls/personal protection

### 8.1. Control parameters

Does not contain substances with occupational exposure limit values.

#### Derived no-effect level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	CAS No.	End use	Route of exposure	Potential health effects	Value (mg <sup>m</sup> )
1,1,1-Trifluoroethane	420-46-2	Workers	Inhalation	Long term - systemic effects	38,800
		Consumers	Inhalation		10,700
1,1,1,2,2-Pentafluoroethane	354-33-6	Workers	Inhalation	Long term - systemic effects	16,444
		Consumers	Inhalation		1,753
1,1,1,2-Tetrafluoroethane	811-97-2	Workers	Inhalation	Long term - systemic effects	13,936
		Consumers	Inhalation		2,476

#### Predicted no-effect concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Name of substance	CAS No.	Environmental compartment	Value
1,1,1-Trifluoroethane	420-46-2	Freshwater	0.350 mg/l
1,1,1,2,2-Pentafluoroethane	354-33-6	Fresh water	0.1 mg/l
		Fresh water - Intermittent	1 mg/l
		Freshwater sediment (dry weight)	0.6 mg/kg
1,1,1,2-Tetrafluoroethane	811-97-2	Freshwater	0.1 mg/l
		Seawater	0.01 mg/l
		Release/discontinuation of use	1 mg/l
		Freshwater sediment (dry weight)	0.75 mg/kg
		Wastewater treatment plant	73 mg/l

### 8.2. Exposure controls

#### Occupational exposure controls

Personal protective equipment must comply with current EN standards: Respiratory protection EN 136, 140, 149; Protective goggles/Eye protection EN 166; Protective clothing EN 340, 463, 469, 943-1, 943-2; Protective footwear EN-ISO 20345. Do not breathe vapours.

EN-ISO 20345. Do not breathe vapours.

#### Engineering measures

Ensure adequate ventilation, especially in confined areas. Minimise exposure concentrations in the workplace.

#### Personal protection



#### Respiratory protection:

If adequate exhaust ventilation is not available or exposure assessment shows exposure outside recommended limits, use self-contained breathing apparatus or a positive pressure air line and mask.

The equipment must comply with UNE EN 14387.

Filter type:

Low boiling point organic gas and vapour (AX).



# CORECO

## Protection of the skin and body:

Wash skin after any contact with the product.  
Protection of hands:



## Hand protection:

Material:  
Remarks:

Gloves resistant to low temperatures  
Select chemical protective gloves based on the quantity and concentration of hazardous substances to be handled in the workplace. It is recommended to check with the manufacturer of the above-mentioned protective gloves to ensure that they have the necessary resistance for applications with special chemicals. Wash hands before breaks and after finishing work. The break-through time has not been determined for this product.  
Change gloves frequently.



## Eye protection:

Wear the following personal protective equipment:  
Chemical-resistant goggles must be worn. Face shield.  
The equipment must comply with UNE EN 166.

## SECTION 9. Physical and chemical properties

Appearance:	Liquefied gas
Colour:	Colourless
Odour:	Slight, similar to ether
Odour threshold:	No data available
pH:	No data available
Melting/freezing point:	No data available
Initial boiling point and boiling range:	
:	-46.2 °C (1,013 hPa)
Flash point:	Not applicable
Evaporation rate:	> 1 (CCL4=1.0)
Flammability (solid, gas):	Will not burn
Upper explosion limit /Flammability limit Upper:	Upper flammability limit Method: ASTM E681 None.
Lower explosive limit /Lower flammability limit :	Lower flammability limit Method: ASTM E681 None.
Vapour pressure:	12,456 hPa (25 °C)
Relative density:	1.05 (25 °C) (as liquid)
Density:	1.044 g/cm <sup>3</sup> (25 °C) (as liquid)
Water solubility:	Insoluble
Partition coefficient (n-octanol/water):	Not applicable Auto-
ignition temperature:	No data available
Decomposition temperature: decomposition:	728 °C
Viscosity:	Not applicable
Explosive properties:	Non-explosive
Oxidising properties: oxidiser. Particle size:	The substance or mixture is not classified as an Not applicable
<b>Other data</b>	
Critical temperature:	72.07 °C
Critical pressure:	37.31 bar



# CORECO

## SECTION 10. Stability and reactivity

### 10.1. Reactivity

Not classified as a reactivity hazard.

### 10.2. Chemical stability

Stable if used according to instructions. Follow precautionary advice and avoid incompatible materials and conditions.

### 10.3. Possibility of hazardous reactions

Certain mixtures of HFC and chlorine may be flammable or reactive under certain conditions. May react with strong oxidising agents.

### 10.4. Conditions to avoid

This substance is not flammable in air at temperatures up to 100 °C (212 °F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature may become combustible in the presence of an ignition source.

This substance can also become combustible in an oxygen-enriched environment (oxygen concentrations higher than those found in air). Therefore, if a mixture containing air and this substance, or if this substance is in an oxygen-enriched environment, it can become combustible. This will depend on the relationship between 1) temperature, 2) pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be mixed with air at pressures above atmospheric pressure or at high temperatures, or in an oxygen-enriched environment. For example, this substance should NOT be mixed with air under pressure for leak detection testing or other purposes.

Avoid heat, flames and sparks.

### 10.5. Incompatible materials

Strong oxidising agents, alkali metals and alkaline earth metals, and other metals and transition metals, aluminium powder, zinc, etc.

### 10.6. Hazardous decomposition products

Hydrogen fluoride by thermal decomposition and hydrolysis.

## SECTION 11. Toxicological information

### 11.1. Information on the hazard classes defined in Regulation (EC) 1272/2008

Information on

possible routes of exposure:           Inhalation  
  Skin contact  
  Eye contact

#### a. Acute toxicity

Not classified based on available information.

##### **Components:**

##### **1,1,1-Trifluoroethane:**

Acute inhalation toxicity:   LC50 (Rat): > 591,000 ppm  
  Exposure time: 4 h  
  Atmosphere test: gas

##### **1,1,1,2-Pentafluoroethane:**

Acute inhalation toxicity:   LC50 (Rat): > 800,000 ppm  
  Exposure time: 4 h  
  Atmosphere test: gas  
  Method: OECD Test Guideline 403

No observed adverse effect concentration (dog): 75,000 ppm Observations: Cardiac sensitisation

Cardiac sensitisation threshold limit (dog): 368,159 mg/m<sup>3</sup> Observations: Cardiac sensitisation



# CORECO

## **1,1,1,2-Tetrafluoroethane:**

Acute oral toxicity:

Assessment: The substance or mixture does not present acute oral toxicity

Acute inhalation toxicity: LC50 (Rat): > 567,000 ppm

Exposure time: 4 hours

Atmosphere test: gas

Method: OECD Test Guideline 403

No observed adverse effect concentration (dog): 40,000 ppm Atmosphere test: gas

Observations: Cardiac sensitisation

Concentration with few adverse effects observed (dog): 80,000 ppm Atmosphere test: gas

Symptoms: May cause cardiac arrhythmia.

Cardiac sensitisation threshold limit (dog): 334,000 mg/m<sup>3</sup> Atmospheric test: gas

Symptoms: May cause cardiac arrhythmia.

Acute dermal toxicity:

Assessment: The mixture does not present any acute dermal toxicity.

## **b. Skin corrosion or irritation**

Not classified based on available information.

### **Components:**

#### **1,1,1,2-Tetrafluoroethane:**

Result:

Does not irritate the skin.

## **c. Serious eye damage or irritation**

Not classified based on available information.

### **Components:**

#### **1,1,1,2-Tetrafluoroethane:**

Result:

Does not irritate the eyes.

## **d. Respiratory or skin sensitisation**

### **Skin sensitisation**

Not classified based on available information.

### **Respiratory sensitisation**

Not classified based on available information.

### **Components:**

#### **1,1,1,2-Pentafluoroethane:**

Not tested on animals.

Classification: Not a skin sensitiser. Result: Does not cause skin sensitisation.

There are no reports of respiratory sensitisation in humans.

#### **1,1,1,2-Tetrafluoroethane:**

Exposure routes: Skin contact Result: Negative

Exposure routes: Inhalation Species: Rat

Result: Negative

Exposure routes: Inhalation Species: Humans

Result: Negative

## **e. Germ cell mutagenicity**

Not classified based on available information.

### **Components:**

#### **1,1,1-Trifluoroethane:**

In vitro genotoxicity:

Test type: Reverse mutation assay in bacteria (Ames test) Method: OECD Test Guideline 471

Result: Negative



# CORECO

	Test Type: In vitro chromosomal aberration test Result: Negative
	Test Type: In vivo mammalian cell gene mutation test Result: Negative
	Observations: Based on data from similar materials.
In vivo genotoxicity:	Test Type: Micronucleus test in mammalian erythrocytes (in vivo cytogenetic assay) cytogenetic in vivo) Species: Mouse Route of administration: inhalation (gas) Result: Negative
<b>Pentafluoroethane:</b>	
In vitro genotoxicity:	Test Type: Reverse mutation assay in bacteria (Ames test). Method: OECD Test Guideline 471 Result: Negative Observations: Based on data from similar materials. Test type: In vitro chromosome aberration test Method: OECD Test Guideline 473 Result: Negative
In vivo genotoxicity:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) cytogenetic in vivo). Species: Mouse Route of administration: inhalation (gas) Method: OECD Test Guideline 474 Result: Negative
<b>1,1,1,2-Tetrafluoroethane:</b>	
In vitro genotoxicity:	Test Type: Reverse mutation assay in bacteria (Ames test). Method: OECD Test Guideline 471 Result: Negative Test type: In vitro chromosome aberration test Method: OECD Test Guideline 473 Result: Negative
In vivo genotoxicity:	Test type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) cytogenetic assay). Species: Mouse Route of administration: inhalation (gas) Method: OECD Test Guideline 474 Result: Negative  Test type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo. Species: Rat Route of administration: inhalation (gas) Method: OECD Test Guideline 486 Result: Negative
Cell mutagenicity germ cells: mutagen.	Assessment: The weight of evidence does not support classification as a germ cell germ cells.

## f. Carcinogenicity

Not classified based on available information.

### **Components:**

#### **1,1,1-Trifluoroethane:**

Species: Rat  
Route of administration: Ingestion



# CORECO

Exposure time: 72 weeks Result:  
Negative

## **1,1,1,2-Tetrafluoroethane:**

Species: Rat  
Route of administration: Inhalation (gas)  
Exposure time: 2 years  
Method: OECD Test Guideline 453 Result:  
Negative

Carcinogenicity: Assessment: The weight of evidence does not support classification as a carcinogen.

## **g. Reproductive toxicity**

Not classified based on available information.

### **Components:**

#### **1,1,1-Trifluoroethane:**

Effects on fertility:

Type of test: Three-generation reproductive toxicity study.  
Species: Rat  
Route of administration: inhalation (gas)  
Result: Negative  
Observations: Based on data from similar materials.

Effects on foetal development:

Type of test: Embryonic and foetal development.  
Species: Rat  
Route of administration: inhalation (gas)  
Method: OECD Test Guideline 414 Result:  
Negative

#### **Pentafluoroethane:**

Effects on fertility:

Test Type: One-generation reproductive toxicity study.  
Species: Rat  
Route of administration: inhalation (vapour)  
Result: Negative  
Observations: Based on data from similar materials.

Effects on foetal development:

Test Type: Embryonic and foetal development.  
Species: Rat  
Route of administration: inhalation (gas)  
Method: OECD Test Guideline 414 Result:  
Negative

#### **1,1,1,2-Tetrafluoroethane:**

Effects on fertility:

Species: Mouse  
Route of administration: Inhalation  
Result: Negative

Effects on foetal development:

Type of test: Repeated dose toxicity study combined with reproductive/developmental toxicity screening test.  
Species: Rabbit  
Route of administration: Inhalation (gas)  
Method: OECD Test Guideline 414 Result:  
Negative

Reproductive toxicity: Assessment: The weight of evidence does not support classification for reproductive toxicity

## **h. Specific target organ toxicity (STOT) - single exposure**

Not classified based on available information.

### **Components:**

#### **1,1,1,2-Tetrafluoroethane:**

Assessment:

Exposure routes: inhalation (gas)  
No significant health effects were observed in animals at concentrations of 20,000 ppmV/4h or less.



# CORECO

## i. Specific target organ toxicity (STOT) - repeated exposure

Not classified based on available information.

### **Components:**

#### **1,1,1,2-Pentafluoroethane:**

Assessment: Exposure routes: inhalation (gas)  
No significant health effects were observed in animals at concentrations of 250 ppmV/6h/d or less.

#### **1,1,1,2-Tetrafluoroethane:**

Assessment: Exposure routes: inhalation (gas)  
No significant health effects were observed in animals at concentrations of 250 ppmV/6h/d or less.

## j. Aspiration hazard

No aspiration toxicity classification.

## 11.2. Information on other hazards

### a. Endocrine-disrupting properties

Assessment: The mixture does not contain components that have endocrine-disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

## SECTION 12. Ecological information

### 12.1. Toxicity

#### **Components:**

##### **1,1,1-Trifluoroethane:**

Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia  
and other aquatic invertebrates: EC50 (Daphnia magna (large water flea)): > 100 mg/l  
Exposure time: 48 hours  
Method: OECD Test Guideline 202

Toxicity to  
algae/aquatic plants: EC0 (Pseudokirchneriella subcapitata (green algae)): > 44 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 201 Observations: Based on data from similar materials.

Toxicity to  
microorganisms: EC0 (Pseudomonas putida): > 730 mg/l  
Exposure time: 6 h

##### **1,1,1,2-Pentafluoroethane:**

Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l  
Exposure time: 96 h  
Remarks: Based on data from similar materials

Toxicity to Daphnia  
and other aquatic invertebrates: EC50 (Daphnia magna (large water flea)): > 100 mg/l  
Exposure time: 48 h  
Remarks: Based on data from similar materials

Toxicity to  
algae/aquatic plants: ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201 Observations: Based on data from similar materials



# CORECO

NOEC (*Pseudokirchneriella subcapitata* (green algae)): > 1 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201 Observations: Based on data from similar materials

## **1,1,1,2-Tetrafluoroethane:**

Toxicity to fish:

LC50 (*Oncorhynchus mykiss* (rainbow trout)): 450 mg/l  
Exposure time: 96 h  
Method: Regulation (EC) No. 440/2008, Annex, C.1

Toxicity to Daphnia

and other aquatic invertebrates: EC50 (*Daphnia magna* (large water flea)): 980 mg/l  
Exposure time: 48 h

Method: Regulation (EC) No. 440/2008, Annex, C.2

Toxicity to

algae/aquatic plants:

ErC50 (green algae): > 100 mg/l  
Exposure time: 96 h

Remarks: Based on data from similar materials

## **12.2. Persistence and degradability**

### **Components:**

#### **1,1,1-Trifluoroethane:**

Biodegradability:

Result: Not intrinsically biodegradable.

Biodegradation: 3% Exposure  
time: 28 days

Remarks: Based on data from similar materials

#### **Pentafluoroethane:**

Biodegradability:

Result: Not readily biodegradable.

Biodegradation: 5% Exposure  
time: 28 days

Method: OECD 301D test guidelines

#### **1,1,1,2-Tetrafluoroethane:**

Biodegradability:

Result: Not readily biodegradable.

Method: OECD Test Guideline 301D

## **12.3. Bioaccumulation potential**

### **Components:**

#### **1,1,1-Trifluoroethane:**

Partition coefficient

(n-octanol/water): log Pow: 1.06 - &lt; 1.35

Remarks: Based on data from similar materials.

#### **Pentafluoroethane:**

Partition coefficient

(n-octanol/water): Pow: 1.48

Method: OECD Test Guideline 107

#### **1,1,1,2-Tetrafluoroethane:**

Bioaccumulation:

Observations: Bioaccumulation is unlikely.

Partition coefficient

(n-octanol/water): log Pow: 1.06

## **12.4. Soil mobility**

No data available.

## **12.5. Results of PBT and mPmB assessment**

Assessment:

This mixture does not contain any components that are considered to be persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.



# CORECO

## 12.6. Endocrine disrupting properties

Assessment: The mixture does not contain components that have endocrine-disrupting properties in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

## 12.7. Other adverse effects

### Global warming potential

Regulation (EU) No 517/2014 on fluorinated greenhouse gases

### Product:

Global warming potential over 100 years: 3,922

## SECTION 13. Disposal considerations

### 13.1. Methods for waste treatment

Product: Dispose of in accordance with local regulations. However, this product should be recycled or regenerated whenever possible.

Contaminated containers: Empty pressure vessels must be returned to the supplier. Operate in accordance with current local and national regulations.

## SECTION 14. Transport information

### 14.1. UN number

ADN: 3337  
ADR: 3337  
RID: 3337  
IATA: 3337  
IMDG: 3337

### 14.2. United Nations official transport designation

ADR/ADN/RID: REFRIGERANT GAS, R 404A  
IMDG: REFRIGERANT GAS, R 404A  
IATA: Refrigerant gas, R 404A

### 14.3. Transport hazard class(es)

	<u>Class</u>	<u>Subsidiary risks</u>	<u>classification code</u>	<u>Hazard identification number</u>	<u>Tunnel restriction code</u>
ADR:	2	2.2	2A	20	(C/E)
DNA:	2	2.2	2A	20	
RID:	2	2.2, (13)	2A	20	
IMDG:	2.2				
IATA:	2.2				

### 14.4. Packing group

Not assigned by regulation.

#### Labels

ADR/ADN/RID/IMDG: 2.2



IMDG/IATA: Non-flammable. Non-toxic Gas

#### Packaging instruction

IATA (Cargo): 200  
IATA (Passenger): 200



# CORECO

EmS code

IMDG:

F-C, S-V

## 14.5. Environmental hazards

No: (ADR/ADN/RID/IMDG)

## 14.6. Special precautions for users

The transport classification(s) listed are for informational purposes only and are based solely on the properties of the unpackaged material described in this Safety Data Sheet. Transport classifications may vary depending on the mode of transport, the size of the container/packaging, and variations in regional or country regulations.

## 14.7. Bulk maritime transport in accordance with IMO instruments

Not applicable.

## SECTION 15. Regulatory information

### 15.1. Safety, health and environmental regulations and legislation specific to the substance or mixture

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII):

Not applicable

REACH-List of candidate substances of very high concern for authorisation (Article 59):

This product does not contain substances of very high concern above the relevant legal concentration limit ( $\geq 0.1\%$  w/w).

Regulation (EC) 1005/2009 on substances that deplete the ozone layer:

Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast): Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council concerning the export and import of dangerous chemicals:

Not applicable

REACH-List of substances subject to authorisation (Annex XIV):

Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances:

Not applicable

Regulation (EC) No 517/2014 of the European Parliament and of the Council on certain fluorinated greenhouse gases:

The fluorinated greenhouse gas R-404A must be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases regulated by the Kyoto Protocol. Fluorinated greenhouse gases in containers or cylinders must not be vented into the atmosphere.

### 15.2. Chemical safety assessment

Chemical safety assessments have been carried out for these substances.

## SECTION 16. Other information

This sheet cancels and replaces all previous editions.

Date of issue: 2 January 2023 Version:

2.2



# CORECO

This Safety Data Sheet has been prepared in accordance with:  
Regulation (EC) No 1907/2006 and its subsequent amendments: Regulation (EU) No 2015/830 and Regulation (EU) No 2020/878

## **Text of the phrases used in section 3:**

H221: Flammable gas.

H280: Contains gas under pressure; danger of explosion if heated.

The information provided here is based on our knowledge as of the date indicated above. It refers exclusively to the product indicated and does not constitute a guarantee of particular qualities.

The user must ensure the suitability and accuracy of this information in relation to the specific use to be made of the product.

The information is considered correct but is not exhaustive and should be used only as a guide, based on current knowledge of the chemical substance or mixture and applicable to the appropriate safety precautions for the product.

The list of risks, legal, regulatory and administrative texts is not exhaustive. The recipient or user of the product is solely responsible for referring to the official regulations on the storage, handling and use of these products.

## **Glossary of abbreviations**

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways. ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

CMR: Carcinogenic, mutagenic or toxic to reproduction. DIN:

Standard of the German Institute for Standardisation.

CEx: Concentration associated with x% response.

EmS: Emergency procedure.

GHS: Globally Harmonised System of Classification and Labelling of Chemicals. IATA:

International Air Transport Association.

IBC: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

IMDG: International Maritime Dangerous Goods Code. LC50: Lethal

concentration for 50% of a test population. NOAEL: No observable adverse effect level.

NOEL: No Observable Effect Level.

NOELR: No Observable Effect Rate. IMO:

International Maritime Organisation.

RID: Regulations concerning the International Carriage of Dangerous Goods by Rail (COTIF). UN: United Nations.

ELVs: Environmental Limit Values.

UNRTDG: United Nations Recommendations on the Transport of Dangerous Goods.