

**Safety Data Sheet according to Regulation (EC)
No. 1907/2006 (REACH)**

Printed 19.06.2012
revision 19.06.2012 (GB) Version 14.0
R 134a
0045 + 0046



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

Product identifier

Name of product	R 134a Art-Nr: 0045 + 0046
Name of substance	1,1,1,2-Tetrafluoroethane (R 134a)
EC No	212-377-0
REACH registration number	01-2119459374-33
CAS No	811-97-2

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

Recommended intended purpose(s)

Refrigerant.

Details of the supplier of the safety data sheet

Manufacturer/distributor

GHC Gerling, Holz & Co. Handels GmbH
Ruhrstraße 113, D-22761 Hamburg
Phone +49 (0) 40 853 123-0, Fax +49 (0) 40 853 123-66
E-Mail hamburg@ghc.de
Internet www.ghc.de

Advice

GHC Gerling, Holz & Co. Handels GmbH
Phone +49 (0) 40 853 123-0
Fax +49 (0) 40 853 123-66
E-mail (competent person):
msds@ghc.de

Emergency telephone number

Emergency advice

Giftinformationszentrum (Poison Control Centre) Mainz
Phone +49 (0) 6131 19240

SECTION 2: Hazards identification

Classification of the substance or mixture

Classification according to 67/548/EEC or 1999/45/EC

Additional hints

The substance is not classified as hazardous according to directive 67/548/EEC.

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
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Liquef. Gas	H280
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Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

Additional hints

The substance is not classified as hazardous according to directive 67/548/EEC.

Label elements

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Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]



GHS04

Signal word

Warning

Hazard statements for physical hazards

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Precautionary Statements

Storage

P403 Store in a well-ventilated place.

Hazardous ingredients for labeling

1,1,1,2-Tetrafluoroethane (R 134a)

Supplemental Hazard information (EU)

Health properties

Asphyxiant in high concentrations.

Environmental properties

Contains fluorinated greenhouse gases covered by the Kyoto Protocol.

Other hazards

! Adverse human health effects and symptoms

Contact with liquid may cause cold burns/frostbite.

The inhalation of gas / vapour in high concentrations may cause cardiac arrhythmia.

Information pertaining to special dangers for human and environment

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 3: Composition/ information on ingredients

Substances

CAS No 811-97-2

1,1,1,2-Tetrafluoroethane (R 134a)

EC No 212-377-0

REACH registration number 01-2119459374-33

! SECTION 4: First aid measures

Description of first aid measures

General information

Remove contaminated soaked clothing immediately.

Adhere to personal protective measures when giving first aid.

Seek medical advice immediately.

In case of inhalation

Remove the casualty into fresh air and keep him immobile.

Seek medical treatment immediately.

In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

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In case of skin contact

In case of contact with skin wash off with warm water.

In case of frostbite rinse with plenty of water. Don't remove clothing.

In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

In case of eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Call for a doctor immediately.

In case of ingestion

Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed

! Physician's information / possible symptoms

The following symptoms may occur in case of an excessive exposure:

Cardiac arrhythmia (disordered cardiac rhythm).

Anaesthetic state

Headache

Nausea

Dizziness

! Physician's information / possible dangers

In case of strong exposition risk of cardiac rhythm disturbances.

Indication of any immediate medical attention and special treatment needed

Treatment (Advice to doctor)

Symptomatical treatment and give antidote.

Do not give any preparations of the adrenalin-ephedrine group.

Long-term inhaling of separation products may cause pulmonary oedema.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media

Product does not burn, fire-extinguishing activities according to surrounding.

Extinguishing media which must not be used for safety reasons

Full water jet

Special hazards arising from the substance or mixture

In case of fire formation of dangerous gases possible.

Hydrogen fluoride (HF)

Carbonyl fluoride.

Advice for firefighters

Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply (isolated).

Wear full protective clothing.

Additional information

Cool endangered containers with water spray jet.

Exposure to fire may cause containers to rupture / explode.

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SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

See chapter 8.

Remove persons to safety.

Environmental precautions

If possible, stop flow of product.

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

Prevent spread over a wide area (e.g. by containment or oil barriers).

Do not discharge into the subsoil/soil.

Methods and material for containment and cleaning up

Ensure adequate air ventilation.

Allow to vaporise.

Reference to other sections

Informations for safe handling see chapter 7.

Informations for personal protective equipment see chapter 8.

! SECTION 7: Handling and storage

Precautions for safe handling

Advice on safe handling

Use only in thoroughly ventilated areas.

Transfer and handle only in enclosed systems.

Provide good room ventilation even at ground level (vapours are heavier than air).

Prevent cylinders from falling over.

Ensure valve protection device is correctly fitted.

Ensure valve outlet cap nut or plug (where provided) is correctly fitted.

Open valve slowly to avoid pressure shock.

Do not allow backfeed into the container.

Suck back of water into the container must be prevented.

No water to valves, flanges and other fittings.

Purging of pipes and valves with inert gases - to avoid: water, solvents.

Advice on protection against fire and explosion

The product is not combustible.

Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep in closed original container.

Ventilate store-rooms thoroughly.

Suitable materials: Normalised steel and carbon steel, tempered steel, aluminium alloys, stainless steel.

Valve: Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, stainless steel.

Advice on storage compatibility

Do not store with combustible materials.

Do not store with spontaneously flammable materials.

Do not store together with combustible liquids or combustible solids.

Do not store together with animal feedstuffs.

Do not store together with explosives.

Do not store together with infectious substances.

Do not store together with radioactive material.

Do not store together with toxic liquids or toxic solids.

Do not store together with food.

Do not store together with oxidizing liquids or oxidizing solids.

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Further information on storage conditions

Keep container tightly closed.
Store only in original container at temperature of 50°C maximum (=122°F).
Prevent cylinders from falling over.
Keep container in a well-ventilated place
Protect of heat.

Specific end use(s)

Recommendation(s) for intended use

Use in accordance with regulation (EC) No 842/2006 on certain fluorinated greenhouse gases.

! SECTION 8: Exposure controls/personal protection

Control parameters

Ingredients with occupational exposure limits to be monitored

CAS No	Name	Code	[mg/m ³]	[ppm]	Remark
811-97-2	1,1,1,2-Tetrafluoroethane (HFC 134a)	WEL, 8 hours	4240	1000	EH40 / 2005, United Kingdom

Additional advice

DNEL (consumers, inhalation): 2476 mg/m³; chronic effects, systemic toxicity.
DNEL (workers, inhalation): 13936 mg/m³; chronic effects, systemic toxicity.

Exposure controls

Respiratory protection

Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Keep self contained breathing apparatus readily available for emergency use.
In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation by edging out of air oxygen

Hand protection

Leather gloves

Eye protection

safety goggles, in case of increased risk add protective face shield

Skin protection

Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk.

General protective measures

Do not inhale gases/vapours/aerosols.

Hygiene measures

At work do not eat, drink and smoke.

! Limitation and surveillance of the environment

PNEC (freshwater): 0,1 mg/l
PNEC (sea water): 0.01 mg/l
PNEC (water): 1 mg/l (temporary use / release)
PNEC (freshwater sediment): 0,75 mg/kg
PNEC (water): 73 mg/l (wastewater treatment plants)

! Additional advice on system design

Transfer and handle only in enclosed systems.

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! SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Form	Colour	Odour
Gaseous / liquefied under pressure.	colourless	ethereal

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value in delivery state	not applicable				
boiling point	-26,1 °C		1013 hPa		
melting point	-108 °C				
Flash point	no				
Autoignition	743 °C				
Lower explosion limit	no				
Upper explosion limit	no				
Vapour pressure	5740 hPa	20 °C			
Density	1,226 g/cm ³	20 °C			liquid phase
Rel. vapour density	4,24	20 °C			air = 1
Solubility in water	1 g/l	25 °C			
Partition coefficient (log p_{OW})	1,06	25 °C		OECD 107	
Viscosity dynamic	0,22 mPa*s	20 °C			liquid phase

Oxidizing properties

no

Explosive properties

no

Other information

Vapours are heavier than air.

! SECTION 10: Stability and reactivity

Reactivity

See section "Possibility of hazardous reactions".

Chemical stability

Stable under normal conditions.

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Possibility of hazardous reactions

May react violently with oxidants.

Conditions to avoid

May form a flammable mixture with air or oxidizing agents at high pressure.
Heat sources / heat - risk of bursting.

Incompatible materials

! Materials to avoid

Metals in powder form.
Metallic salts in powder form.
Oxidants.
Alkali metals.
Earth alkali metals.

Hazardous decomposition products

Carbon monoxide
Carbon dioxide
Fluorophosgene on contact open flame or glowing objects
Hydrogen fluoride

Thermal decomposition

Remark No decomposition if used as directed.

! SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral	not applicable			
LD50 acute dermal	not applicable			
LC50 acute inhalation	567000 ppm (4 h)	rat	OECD 403	
Irritability skin	low irritant effect - not necessary to label	rabbit		
Irritability eye	low irritant - no labeling duty	rabbit eye		
Skin sensitization	non-sensitizing	Laboratory animals		
Sensitization respiratory system	non-sensitizing	Laboratory animals		

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
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	Value	Species	Method	Validation
Subchronic Toxicity	NOAEL 50000 ppm Inhalation	Rat		No effects of toxicological significance.
Mutagenicity			OECD 471 / 473	No experimental information on genotoxicity in vitro and in vivo available.
Reproduction-Toxicity	NOAEL 50000 ppm Inhalation	Rat	OECD 414	No indications of toxic effects were observed in reproduction studies in animals.
Carcinogenicity	NOAEL 10000 ppm (2 a) Inhalation	Rat		No indications of carcinogenic effects are available from long-term trials.

! Experiences made from practice

Long-term inhaling of separation products may cause pulmonary oedema.
The inhalation of gas / vapour in high concentrations may cause cardiac arrhythmia.
Gases have a suffocating effect.

SECTION 12: Ecological information

Toxicity

Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 450 mg/l (96 h)	Oncorhynchus mykiss		
Daphnia	EC50 980 mg/l (48 h)	Daphnia magna		
Bacteria	EC10 > 730 mg/l (6 h)	growth of Ps. putida		

Persistence and degradability

Physico-chemical degradability

At normal temperature very highly volatile or gaseous product that can be released to atmosphere.
Elimination test cannot be employed.

Biological degradability

3 % (28 d) OECD 301 D not readily degradable

Bioaccumulative potential

Does not bioaccumulate.

Mobility in soil

not applicable

Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

Other adverse effects

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General regulation

Avoid emission in atmosphere.

ODP: 0

GWP: 1300

! SECTION 13: Disposal considerations

Waste treatment methods

Waste code No.

14 06 01*

Name of waste

chlorofluorocarbons, HCFC, HFC

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 91/689/EEC on hazardous waste.

! Recommendations for the product

Dispose of as hazardous waste.

Return to manufacturer.

Recommendations for packaging

Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

! SECTION 14: Transport information

Land and inland navigation transport ADR/RID

UN 3159 REFRIGERANT GAS R 134a (1,1,1,2-TETRAFLUORETHAN), 2.2, (C/E), Classification code: 2A

Marine transport IMDG

UN 3159 REFRIGERANT GAS R 134a (1,1,1,2-TETRAFLUROETHANE), 2.2

EmS: F-C, S-V

Air transport ICAO/IATA-DGR

UN 3159 Refrigerant gas R 134a (1,1,1,2-TETRAFLUROETHANE), 2.2

Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

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

No transport as bulk according IBC - Code.

! SECTION 15: Regulatory information

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

! Other regulations (EU)

Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases.

Regulation (EC) No 303/2008 establishing minimum requirements and the conditions for mutual recognition for the certification of companies and personnel as regards stationary refrigeration, air conditioning and heat pump equipment containing certain fluor

Regulation (EC) No 1494/2007 establishing, pursuant to Regulation (EC) No 842/2006, the form of labels and additional labelling requirements as regards products and equipment containing certain fluorinated greenhouse gases.

VOC standard

VOC content >=99 % 20 °C 5740 hPa

Chemical Safety Assessment

For this substance a chemical safety assessment is not required because it is not classified regarding health and environmental hazards.

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SECTION 16: Other information

Recommended uses and restrictions

Use in accordance with regulation (EC) No 842/2006 on certain fluorinated greenhouse gases.
National and local regulations concerning chemicals shall be observed.

Further information

All declarations of safety-data-sheet refer to pure substance.
The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

H280 Contains gas under pressure; may explode if heated.