

Safety Data Sheet according to Regulation (EC)

No. 1907/2006 (REACH)

Printed 27.06.2018

Revision 19.06.2018 (GB) Version 12.0

R 410A

0028

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

1.1. Product identifier

Name of product R 410A
Art-Nr(n).: 0028

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

Identified uses

Remark

Restricted to professional users.

! Recommended intended purpose(s)

Refrigerant.

1.3. Details of the supplier of the safety data sheet

Manufacturer/distributor

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

Advice

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

1.4. Emergency telephone number

Emergency advice

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

! SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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.
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2.2. Label elements

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



GHS04

Signal word

Warning

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Hazard statements for physical hazards
H280 Contains gas under pressure; may explode if heated.

Precautionary Statements

Storage
P403 Store in a well-ventilated place.

Hazardous ingredients for labeling
Difluoromethane (R 32), Pentafluoroethane (R 125)

Supplemental Hazard information (EU)

! Health properties

Asphyxiant in high concentrations.

Environmental properties

Contains fluorinated greenhouse gases.

Special rules for supplemental label elements for certain mixtures

Withdrawal out of the liquid phase only.

2.3. 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.

Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.

! 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.

Receptacle under pressure.

! Results of PBT and vPvB assessment

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

! SECTION 3: Composition/ information on ingredients

3.1. Substances

not applicable

3.2. Mixtures

Hazardous ingredients

CAS No	EC No	Name	[% weight]	Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]
354-33-6	206-557-8	Pentafluoroethane (R 125)	49,5 - 51,5	Liq. Gas, H280
75-10-5	200-839-4	Difluoromethane (R 32)	48,5 - 50,5	Flam.Gas1, H220 / Liq.Gas, H280

REACH

CAS No	Name	REACH registration number
354-33-6	Pentafluoroethane (R 125)	01-2119485636-25
75-10-5	Difluoromethane (R 32)	01-2119471312-47

! Additional advice

The text of the H-and EUH-phrases is shown in section 16.

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! SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Remove contaminated soaked clothing immediately.

In the event of persistent symptoms receive medical treatment.

Adhere to personal protective measures when giving first aid.

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.

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. Do not remove clothing frozen to the skin. Thaw it with lukewarm water. 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.

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

! Physician's information / possible symptoms

The following symptoms may occur in case of strong exposition:

Unconsciousness

Cardiac arrhythmia (disordered cardiac rhythm).

Headache

Nausea

Confusion

Dizziness

Contact with liquid may cause cold burns/frostbite.

Physician's information / possible dangers

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

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

Treatment (Advice to doctor)

Treat symptoms.

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

! SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

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

Alcohol-resistant foam

Dry powder

Carbon dioxide

Water spray jet

Unsuitable extinguishing media

Full water jet

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5.2. Special hazards arising from the substance or mixture

In case of fire formation of dangerous gases possible.

Formation of explosive gas mixtures in air.

Carbon monoxide (CO)

Carbon dioxide (CO₂)

Hydrogen fluoride (HF)

Carbonyl fluoride.

5.3. 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.

Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

! SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Evacuate area.

Keep people away and stay on the upwind side.

! For emergency responders

Remove persons to safety.

Personal protection by wearing close-fitting protective clothing and breathing apparatus.

Pay attention to extension of gas especially at ground (heavier than air) and in direction of the wind.

6.2. 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).

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

If necessary, secure leaky pressure receptacles in a salvage packaging.

Do not discharge into the subsoil/soil.

6.3. Methods and material for containment and cleaning up

Ensure adequate air ventilation.

Allow to vaporise.

6.4. Reference to other sections

Safe handling: see section 7

Disposal: see section 13

Personal protection equipment: see section 8

! SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Use only in thoroughly ventilated areas.

Transfer and handle only in enclosed systems.

Containers' temperature may not be increased above 50 °C.

Do not heat with open flames.

The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.

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Provide good room ventilation even at ground level (vapours are heavier than air).
Prevent cylinders from falling over.
Avoid release to the environment.
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.

! **General protective measures**

Do not inhale gases.

! **Hygiene measures**

At work do not eat, drink and smoke.
Wash hands before breaks and after work.

Advice on protection against fire and explosion

The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air, oxygen or other oxidants, it may become flammable.
Pay attention to general rules of internal fire prevention.

7.2. Conditions for safe storage, including any incompatibilities

! **Requirements for storage rooms and vessels**

Keep in closed original container.
Only use containers that are approved specifically for the substance/product.
Suitable materials: Normalised carbon steel, tempered alloy steel, aluminium alloys, austenitic stainless steels.
Valve: Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, austenitic stainless steels.
Other material details see ISO 11114.
All regulations and local requirements for the storage of containers have to be respected.

Advice on storage compatibility

Do not store with combustible materials.
Do not store together with spontaneously flammable materials.
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.

! **Further information on storage conditions**

Ensure valve protection device is correctly fitted.
Store only in original container at temperature of 50°C maximum (=122°F).
Protect from heat and direct solar radiation.
Prevent cylinders from falling over.
Store container at cool and aired place.

7.3. Specific end use(s)

Recommendation(s) for intended use

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.

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! SECTION 8: Exposure controls/personal protection

8.1. Control parameters

DNEL-/PNEC-values

DNEL worker

CAS No	Substance name	Value	Code	Remark
354-33-6	Pentafluoroethane (R 125)	16444 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 7,5, repeated dose toxicity.
75-10-5	Difluoromethane (R 32)	7035 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 7,5, repeated dose toxicity.

DNEL Consumer

CAS No	Substance name	Value	Code	Remark
354-33-6	Pentafluoroethane (R 125)	1753 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 25, repeated dose toxicity.
75-10-5	Difluoromethane (R 32)	750 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 25, repeated dose toxicity.

PNEC

CAS No	Substance name	Value	Code	Remark
354-33-6	Pentafluoroethane (R 125)	1 mg/l	PNEC aquatic, intermittent release	Assessment factor 100, assessment factor.
		0,6 mg/kg dw	PNEC sediment, freshwater	
		0,1 mg/l	PNEC aquatic, freshwater	
75-10-5	Difluoromethane (R 32)	1,42 mg/l	PNEC aquatic, intermittent release	Assessment factor 100
		0,142 mg/l	PNEC aquatic, freshwater	Assessment factor 1000
		0,534 mg/kg dw	PNEC sediment, freshwater	

8.2. Exposure controls

! Respiratory protection

Breathing apparatus in the event of high concentrations.
Keep self contained breathing apparatus readily available for emergency use.
Do not use any filter apparatus.
Respiratory protection complying with EN 137.
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
Safety gloves according EN 388

Eye protection

Protective goggles according to EN 166, in case of increased risk add protective face shield.

Other protection measures

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

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Appropriate engineering controls
Transfer and handle only in enclosed systems.

! SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance Gaseous / liquefied under pressure. **Colour** colourless **Odour** ethereal

Odour threshold
not determined

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not applicable				
boiling point	-51,4 °C		1013 hPa		
melting range	-136 - -103 °C				Data refer to the components of the mixture.
Flash point	not applicable				
Vapourisation rate	> 1				CCI4=1
Flammable (solid)	not applicable				
Flammability (gas)	no				
Ignition temperature	not determined				
Self ignition temperature	530 °C				R-32
Lower explosion limit	no				
Upper explosion limit	no				
Vapour pressure	16574 hPa	25 °C			
Relative density	66 kg/m3	25 °C			
Vapour density	not determined				Air = 1.
Solubility in water	0,43 - 3,65 g/l	25 °C			Data refer to the components of the mixture.

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	Value	Temperature	at	Method	Remark
Solubility/other	not determined				
Partition coefficient n-octanol/water (log P O/W)	0,2 - 1,34				Data refer to the components of the mixture.
Decomposition temperature	not determined				
Viscosity	not applicable				
Oxidising properties	no				
Explosive properties	no				
9.2. Other information	Vapours are heavier than air.				

! SECTION 10: Stability and reactivity**10.1. Reactivity**

See section "Possibility of hazardous reactions".

10.2. Chemical stability

Stable under recommended conditions of use and storage (see section 7).

10.3. Possibility of hazardous reactions

When pressurised with air, oxygen or other oxidants, the substance may become flammable.

Reactions with oxidizing agents.

Reactions with alkali metals.

Reactions with earth alkali metals.

Reactions with metals in powder form.

Reactions with metal salts in powder form.

Reactions with alkalies.

10.4. Conditions to avoid

Heat sources / heat - risk of bursting.

Avoid contact with open flames, glowing metal surfaces, etc..

10.5. Incompatible materials**! Substances to avoid**

Alkali (lye)

Metals in powder form.

Metallic salts in powder form.

Oxidants.

Alkali metals.

Earth alkali metals.

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10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide.

Fluorophosgene on contact open flame or glowing objects

Hydrogen fluoride

Carbonyl fluoride

! SECTION 11: Toxicological information**11.1. Information on toxicological effects****Acute toxicity/Irritation/Sensitization**

	Value/Validation	Species	Method	Remark
LD50 acute oral	Study technically not feasible.			
LD50 acute dermal	Study technically not feasible.			
LC50 acute inhalation	> 520000 ppm (4 h)	rat (male / female)	OECD 403	
Skin irritation	Study technically not feasible.			
Eye irritation	Study technically not feasible.			
Skin sensitization	Study technically not feasible.			
Sensitization respiratory system	not determined			

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subchronic Toxicity	NOAEL > 49100 ppm (91 d) Inhalation 6 h/d, 5 d/w	Rat (male / female)	OECD 413	No effects of toxicological significance.
Mutagenicity				No experimental information on genotoxicity in vitro and in vivo available.
Reproduction-Toxicity			OECD 414	No indications of toxic effects were observed in reproduction studies in animals.
	The product has not been tested. The information is derived from products of similar composition.			

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Value	Species	Method	Validation
Carcinogenicity			The existing data do not justify a classification as a carcinogen.

Specific target organ toxicity (single exposure)

Substance or mixture is not classified in GHS-criteria as specific target organ toxic with single exposure.

Specific target organ toxicity (repeated exposure)

Substance or mixture is not classified in GHS-criteria as specific target organ toxic with repeated exposure.

Aspiration hazard

not applicable

! Experiences made from practice

May cause frostbite.
Inhalation causes disordered cardiac rhythm.
Gases have a suffocating effect.
Inhalation causes narcotic effect/intoxication.

Additional information

The product has not been tested. The information is derived from the properties of the individual components.

! SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 > 100 mg/l (96 h)	freshwater fish		
Daphnia	EC50 > 200 mg/l (48 h)	Daphnia magna		
Algae	EC50 > 114 mg/l (72 h)	Algae		

12.2. Persistence and degradability

	Elimination rate	Method of analysis	Method	Validation
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	5 % (28 d)		OECD 301 D	not readily degradable

12.3. Bioaccumulative potential

Does not bioaccumulate.
Because of the n-octanol/water distribution coefficient (log K_{ow}) accumulation in organisms is not expected.

12.4. Mobility in soil

Because of its high volatility, it is unlikely that the product soil, water caused.

12.5. Results of PBT and vPvB assessment

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

12.6. Other adverse effects

GWP: 2088
ODP: 0

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! General regulation

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.
The product has not been tested. The data are derived from the individual components of the mixture.
Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste code No.	Name of waste
14 06 01*	chlorofluorocarbons, HCFC, HFC

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC 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.

General information

Operators of stationary equipment shall be responsible for putting in place arrangements for the proper recovery.

! SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	1078	1078	1078
14.2. UN proper shipping name	REFRIGERANT GAS, N.O.S. (50 % Pentafluorethan, 50 % Difluormethan)	REFRIGERANT GAS, N.O.S. (50 % Pentafluoroethane, 50 % Difluoromethane)	Refrigerant gas, n.o.s. (50 % Pentafluoroethane, 50 % Difluoromethane)
14.3. Transport hazard class(es)	2.2	2.2	2.2
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	No

14.6. Special precautions for user

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

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

not applicable
No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID

Hazard label(s) 2.2
tunnel restriction code C/E
Special provisions 274, 582, 662
Classification code 2A

Marine transport IMDG

EmS: F-C, S-V

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! SECTION 15: Regulatory information

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

Other regulations (EU)

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

Regulation (EU) 2015/2068 establishing, pursuant to Regulation (EU) No 517/2014, the format of labels for products and equipment containing fluorinated greenhouse gases.

Regulation (EU) 2015/2067 establishing, pursuant to Regulation (EU) No 517/2014, ~ certification ~ as regards stationary refrigeration, air conditioning and heat pump equipment, and ~ containing fluorinated greenhouse gases.

! VOC standard

VOC content >=99 % 25 °C 16574 hPa

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out for this mixture.

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

An exposure scenario is not required.

Chemical safety assessments for substances in this mixture were carried out.

SECTION 16: Other information

Recommended uses and restrictions

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.

National and local regulations concerning chemicals shall be observed.

Further information

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.

Indication of changes: "!" = Data changed compared with the previous version. Previous version: 11.3

Sources of key data used

For the preparation of this safety data sheet, information from our suppliers as well as data from the "database of registered substances" of the European Chemicals Agency (ECHA) were used.

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.