

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**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**  
**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.de

**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 67/548/EEC or 1999/45/EC**

no

**R-phrases**

no

**Additional hints**

The preparation is not classified as hazardous according to Directive 1999/45/EC.

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

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
--------------------------------------	-------------------	--------------------------

---

<b>Liquef. Gas</b>	<b>H280</b>
--------------------	-------------

**Hazard statements for physical hazards**

**H280** Contains gas under pressure; may explode if heated.

**2.2. Label elements**

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028

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



**GHS04**

**Signal word**  
**Warning**

**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 covered by the Kyoto Protocol.

**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.

**Results of PBT and vPvB assessment**

The substances in this mixture do 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 67/548/EEC
354-33-6	206-557-8	Pentafluoroethane (R 125)	49,5 - 51,5	F+; R 12
75-10-5	200-839-4	Difluoromethane (R 32)	48,5 - 50,5	

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0

**R 410A**  
0028

**Hazardous ingredients (continued)**

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 R-phrases is shown in section 16.  
The text of the H-phrases is shown in section 16.  
Contains fluorinated greenhouse gases covered by the Kyoto Protocol.

**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. 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:

Cardiac arrhythmia (disordered cardiac rhythm).  
Shortness of breath  
Anaesthetic state  
Headache  
Nausea  
Dizziness  
Contact with liquid may cause cold burns/frostbite.

**Physician's information / possible dangers**

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

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0

**R 410A**  
0028

---

**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.

**Unsuitable extinguishing media**

Full water jet

**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)

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.

---

**SECTION 6: Accidental release measures**

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

**For non-emergency personnel**

See chapter 8.

Evacuate area.

**For emergency responders**

Remove persons to safety.

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

Keep people away and stay on the upwind side.

**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).

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

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028



---

**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.  
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/vapours/aerosols.

**Hygiene measures**

At work do not eat, drink and smoke.

**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.  
Ventilate store-rooms thoroughly.  
Use transportable pressure equipment.  
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 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.

**Further information on storage conditions**

Store closed container at cool and aired place.  
Store only in original container at temperature of 50°C maximum (=122°F).  
Prevent cylinders from falling over.  
Protect of heat.

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028



---

**7.3. Specific end use(s)**

**Recommendation(s) for intended use**

See section 1.2

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

---

**! SECTION 8: Exposure controls/personal protection**

**8.1. Control parameters**

**Additional advice**

Difluoromethane (R 32) (EC-No: 200-839-4; CAS-No: 75-10-5): DNEL (workers, inhalation, long-term, systemic effects): 7035 mg/m<sup>3</sup> (3259 ppm).

Difluoromethane (R 32) (EC-No: 200-839-4; CAS-No: 75-10-5): DNEL (consumers, inhalation, long-term, systemic effects): 750 mg/m<sup>3</sup>.

Pentafluoroethane (R 125) (EC-No: 206-557-8; CAS-No: 354-33-6): DNEL (workers, inhalation, long-term, systemic effects): 16444 mg/m<sup>3</sup>.

Pentafluoroethane (R 125) (EC-No: 206-557-8; CAS-No: 354-33-6): DNEL (consumers, inhalation, long-term, systemic effects): 1753 mg/m<sup>3</sup>.

**8.2. Exposure controls**

**Respiratory protection**

Breathing apparatus in the event of high concentrations.

Keep self contained breathing apparatus readily available for emergency use.

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

Protective gloves complying with EN 374.

**Eye protection**

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

Safety goggles with side protection complying with EN 166.

**Other protection measures**

Safety shoes with steel toe.

Body covering work clothing, or chemical resistant suit at increased risk.

**Limitation and surveillance of the environment**

Difluoromethane (R 32) (EC-No: 200-839-4; CAS-No: 75-10-5): PNEC (freshwater): 0,142 mg/l.

Difluoromethane (R 32) (EC-No: 200-839-4; CAS-No: 75-10-5): PNEC (water): 1,42 mg/l (intermittent emission).

Difluoromethane (R 32) (EC-No: 200-839-4; CAS-No: 75-10-5): PNEC (freshwater sediment): 0,534 mg/kg sediment

Pentafluoroethane (R 125) (EC-No: 206-557-8; CAS-No: 354-33-6): PNEC (freshwater): 0,1 mg/l.

Pentafluoroethane (R 125) (EC-No: 206-557-8; CAS-No: 354-33-6): PNEC (water): 1 mg/l (intermittent emission).

Pentafluoroethane (R 125) (EC-No: 206-557-8; CAS-No: 354-33-6): PNEC (freshwater sediment): 0,6 mg/kg sediment

See chapter 7.

**Appropriate engineering controls**

Transfer and handle only in enclosed systems.

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028



**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
<b>pH value</b>	not applicable				
<b>boiling point</b>	-52,6 °C		1013 hPa		
<b>melting point</b>	not determined				
<b>Flash point</b>	not applicable				
<b>Vapourisation rate</b>	not determined				
<b>Flammable (solid)</b>	not applicable				
<b>Flammability (gas)</b>	no				EN 378-1
<b>Ignition temperature</b>	no				EN 378-1
<b>Self ignition temperature</b>	not applicable				
<b>Lower explosion limit</b>	no				EN 378-1
<b>Upper explosion limit</b>	no				EN 378-1
<b>Vapour pressure</b>	16530 hPa	25 °C			
<b>Relative density</b>	1,062 g/cm <sup>3</sup>	25 °C			information concerns to liquid phase
<b>Bulk density</b>	not applicable				
<b>Vapour density</b>	ca. 2,5				
<b>Solubility in water</b>	not determined				
<b>Solubility/other</b>				not determined	

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0

**R 410A**  
0028

---

	Value	Temperature	at	Method	Remark
<b>Partition coefficient n-octanol/water (log P O/W)</b>	1,48	20 °C			R-125
<b>Decomposition temperature</b>	not determined				
<b>Viscosity dynamic</b>	0,15 mPa*s	25 °C			information concerns to liquid phase

**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 normal conditions.

**10.3. Possibility of hazardous reactions**

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

**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**

Metals in powder form.  
Metallic salts in powder form.  
Fine metal particles.  
Strong oxidizing agents.  
Alkali metals.  
Earth alkali metals.

**10.6. Hazardous decomposition products**

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

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028

---

**Thermal decomposition**

Remark not applicable

---

**! SECTION 11: Toxicological information**

**11.1. Information on toxicological effects**

**Acute toxicity/Irritability/Sensitization**

	Value/Validation	Species	Method	Remark
<b>LD50 acute oral</b>	not applicable			
<b>LD50 acute dermal</b>	not applicable			
<b>LC50 acute inhalation</b>	> 520000 ppm (4 h)	rat	OECD 403	R-32
<b>Irritability skin</b>	no			
<b>Irritability eye</b>	no			
<b>Skin sensitization</b>	non-sensitizing			
<b>Sensitization respiratory system</b>	not determined			

**Subacute Toxicity - Carcinogenicity**

	Value	Species	Method	Validation
<b>Subchronic Toxicity</b>	NOAEL 50000 ppm (90 d) Inhalation	Rat	OECD 408	No effects of toxicological significance.

**Mutagenicity**

No experimental information on genotoxicity in vitro and in vivo available.

**Reproduction-Toxicity**

No indications of toxic effects were observed in reproduction studies in animals.

**Carcinogenicity**

The existing data do not justify a classification as a carcinogen.

**Specific target organ toxicity (single exposure)**

No data available

**Specific target organ toxicity (repeated exposure)**

No data available

**! Aspiration hazard**

not applicable

---

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028



**Experiences made from practice**

May cause frostbite.  
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
<b>Fish</b>	LC50 1507 mg/l (96 h)	freshwater fish	Calculated	R-32
<b>Daphnia</b>	EC50 652 mg/l (48 h)	Daphnia magna	Calculated	R-32
<b>Algae</b>	EC50 > 114 mg/l (72 h)	Pseudokirchneriella subcapitata		R-125. The product has not been tested. The information was derived from products of similar structure or composition.
<b>Bacteria</b>	not determined			

**12.2. Persistence and degradability**

**Biological degradability** 5 % (28 d) OECD 301 D not readily degradable

**12.3. Bioaccumulative potential**

Does not bioaccumulate.

**12.4. Mobility in soil**

Adsorption in the soil is not likely.

**12.5. Results of PBT and vPvB assessment**

The substances in this mixture do not meet the PBT/vPvB criteria of REACH, annex XIII.

**12.6. Other adverse effects**

GWP: 2088

ODP: 0

**General regulation**

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.  
Avoid release to the environment.

**SECTION 13: Disposal considerations**

**13.1. 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 2008/98/EC on hazardous waste.

**Recommendations for the product**

Dispose of as hazardous waste.  
Return to manufacturer.

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028



**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**

	<b>ADR/RID</b>	<b>IMDG</b>	<b>IATA-DGR</b>
<b>14.1. UN number</b>	1078	1078	1078
<b>14.2. UN proper shipping name</b>	REFRIGERANT GAS, N.O.S. (50 % Pentafluoroethan, 50 % Difluormethan)	REFRIGERANT GAS, N.O.S. (50 % Pentafluoroethane, 50 % Difluoromethane)	Refrigerant gas, n.o.s. (50 % Pentafluoroethane, 50 % Difluoromethane)
<b>14.3. Transport hazard class(es)</b>	2.2	2.2	2.2
<b>14.4. Packing group</b>	-	-	-
<b>14.5. Environmental hazards</b>	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

Classification code 2A

**! 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 (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** >=99,5 % 25 °C 16530 hPa

**15.2. Chemical Safety Assessment**

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.

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

Printed 20.05.2015  
revision 19.05.2015 (GB) Version 11.0  
**R 410A**  
0028

---



**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: 10.0

**Wording of the R/H-phrases specified in chapter 3 (not the classification of the mixture!)**

R 12 Extremely flammable.

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.