



Gasmixture R410A

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: January 3, 2023

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Version: 2.0

SECTION 1: Identification

1.1. Identification

Product form : Mixture
Trade name : Gasmixture R410A
Product code : R410A
SGD No. : FHG03

1.2. Recommended use and restrictions on use

No additional information available

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1.4. Emergency telephone number

Emergency number : +86-(0)532-83889090

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Gases under pressure : Liquefied gas

Contains gas under pressure; may explode if heated.

2.2. GHS Label elements, including precautionary statements

GHS-US labelling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) : Warning

Hazard statements (GHS-US) : Contains gas under pressure; may explode if heated.

Precautionary statements (GHS-US) : Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : Asphyxiant in high concentrations. Contact with liquid may cause cold burns/frostbite.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
Difluoromethane (R32)	(CAS-No.) 75-10-5	48.5-50.5 w/w	Flam. Gas 1, H220 Press. Gas (Liq.), H280
Pentafluoroethane(R125)	(CAS-No.) 354-33-6	49.5-51.5 w/w	Press. Gas (Liq.), H280

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.

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| First-aid measures after skin contact | : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance. |
| First-aid measures after eye contact | : Immediately flush eyes thoroughly with water for at least 15 minutes. |
| First-aid measures after ingestion | : Ingestion is not considered a potential route of exposure. |

4.2. Most important symptoms and effects (acute and delayed)

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| Most important symptoms and effects, both acute and delayed | : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Refer to section 11. |
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4.3. Immediate medical attention and special treatment, if necessary

None.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

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| Suitable extinguishing media | : Water spray or fog. |
| Unsuitable extinguishing media | : Do not use water jet to extinguish. |

5.2. Specific hazards arising from the chemical

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| Reactivity | : No reactivity hazard other than the effects described in sub-sections below. |
| Hazardous combustion products | : Carbon monoxide. Hydrogen fluoride. Carbonyl fluoride. |

5.3. Special protective equipment and precautions for fire-fighters

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|--|--|
| Special protective equipment for fire fighters | : In confined space use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. |
| Specific methods | : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible. Move containers away from the fire area if this can be done without risk. |

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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|------------------|--|
| General measures | : Try to stop release. Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Oxygen detectors should be used when asphyxiating gases may be released. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Act in accordance with local emergency plan. Stay upwind. |
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6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

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| Methods and material for containment and cleaning up | : Ventilate area. |
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6.4. Reference to other sections

See also sections 8 and 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Safe handling of the gas receptacle : Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock.
- Safe use of the product : The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis. Do not breathe gas. Avoid release of product into atmosphere.

7.2. Conditions for safe storage, including any incompatibilities

- Conditions for safe storage, including any incompatibilities : Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Pentafluoroethane (354-33-6)

Not applicable

Difluoromethane (R32) (75-10-5)

Not applicable

8.2. Appropriate engineering controls

- Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available). Consider the use of a work permit system e.g. for maintenance activities.
- Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered: PPE compliant to the recommended EN/ISO standards should be selected.

Hand protection:

Wear cold insulating gloves when transfilling or breaking transfer connections. Standard EN 511 - Cold insulating gloves. Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.

Eye protection:

Wear goggles when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

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Respiratory protection:

Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Consult respiratory device supplier's product information for the selection of the appropriate device. Gas filters may be used in all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Gas filters do not protect against oxygen deficiency. Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks.

Thermal hazard protection:

None in addition to the above sections.

Other information:

Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Colour	: Mixture contains one or more component(s) which have the following colour(s): Colourless.
Odour	: Ethereal.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
pH	: Not applicable for gases and gas mixtures.
Melting point	: Not applicable for gas mixtures.
Freezing point	: No data available
Boiling point	: -51.6 °C
Critical temperature	: Not known.
Flash point	: Not applicable for gases and gas mixtures.
Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable for gases and gas mixtures.
Flammability (solid, gas)	: Non flammable.
Vapour pressure	: 16.53 bar(a)
Relative vapour density at 20 °C	: Not applicable.
Relative density	: No data available
Molecular mass	: Not applicable for gas mixtures.
Relative gas density	: Heavier than air.
Solubility	: No data available
LogPow	: Not known. Not applicable for gas mixtures.
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No reliable data available.
Explosive limits	: Non flammable.
Explosive properties	: Not applicable.
Oxidising properties	: Not applicable.

9.2. Other information

Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
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SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

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10.3. Possibility of hazardous reactions

May react violently with alkalis.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. Incompatible materials

May react violently with alkalis. For additional information on compatibility refer to ISO 11174.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

Pentafluoroethane (354-33-6)	
ATE US (gases)	805 ppm/4h
Skin corrosion/irritation	: Not classified pH: Not applicable for gases and gas mixtures.
Serious eye damage/irritation	: Not classified pH: Not applicable for gases and gas mixtures.
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Viscosity, kinematic	: No data available
Most important symptoms and effects, both acute and delayed	: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Refer to section 11.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Classification criteria are not met.

Pentafluoroethane (354-33-6)	
LC50 96 h - Fish [mg/l]	109 mg/l
EC50 48h - Daphnia magna [mg/l]	> 100 mg/l
EC50 72h - Algae [mg/l]	142 mg/l
Difluoromethane (R32) (75-10-5)	
LC50 96 h - Fish [mg/l]	1507 mg/l
EC50 48h - Daphnia magna [mg/l]	142 mg/l
EC50 72h - Algae [mg/l]	652 mg/l

12.2. Persistence and degradability

Gasmixture R410A	
Persistence and degradability	No data available.
Difluoromethane (R32) (75-10-5)	
Persistence and degradability	Not readily biodegradable.

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12.3. Bioaccumulative potential

Gasmixture R410A	
Log Pow	Not known.
Log Kow	Not applicable for gas mixtures.
Bioaccumulative potential	No data available.
Pentafluoroethane (354-33-6)	
Log Pow	Not known.
Log Kow	Not applicable for gas mixtures.
Difluoromethane (R32) (75-10-5)	
Log Pow	0.2
Log Kow	Not applicable for gas mixtures.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Gasmixture R410A	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.
Pentafluoroethane (354-33-6)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.
Difluoromethane (R32) (75-10-5)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

12.5. Other adverse effects

Other adverse effects	: No known effects from this product.
Effect on the ozone layer	: None.
Effect on global warming	: Contains fluorinated greenhouse gases. Calculated GWP of mixture : 2087.53 For quantities refer to cylinder label. When discharged in large quantities may contribute to the greenhouse effect.

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods	: Refer to supplier's waste gas recovery programme. Contact supplier if guidance is required. Discharge to atmosphere in large quantities should be avoided. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at http://www.eiga.eu for more guidance on suitable disposal methods. Return unused product in original cylinder to supplier.
Additional information	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
List of hazardous waste codes (from Commission Decision 2001/118/EC)	: 14 06 01 *: Chlorofluorocarbons, HCFC, HFC.

SECTION 14: Transport information

Department of Transportation (DOT)



In accordance with DOT

Transport document description	: UN3163 Liquefied gas, n.o.s. (Difluoromethane (R32), Pentafluoroethane), 2.2
UN-No.(DOT)	: UN3163
Proper Shipping Name (DOT)	: Liquefied gas, n.o.s. Difluoromethane (R32), Pentafluoroethane
Class (DOT)	: 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

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Hazard labels (DOT)	: 2.2 - Non-flammable gas
	 
DOT Packaging Non Bulk (49 CFR 173.xxx)	: 304
DOT Packaging Bulk (49 CFR 173.xxx)	: 314;315
DOT Symbols	: G - Identifies PSN requiring a technical name
DOT Special Provisions (49 CFR 172.102)	: T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 306
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 75 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 150 kg
DOT Vessel Stowage Location	: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number	: 126
Other information	: No supplementary information available.
Special transport precautions	: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transportation of Dangerous Goods

Not applicable

Transport by sea

Transport document description (IMDG)	: UN 3163 LIQUEFIED GAS, N.O.S. (Difluoromethane (R32), Pentafluoroethane), 2.2
UN-No. (IMDG)	: 3163
Proper Shipping Name (IMDG)	: LIQUEFIED GAS, N.O.S.
Class (IMDG)	: 2 - Gases
Limited quantities (IMDG)	: 120 ml
MFAG-No	: 126

Air transport

Transport document description (IATA)	: UN 3163 Liquefied gas, n.o.s. (Difluoromethane (R32), Pentafluoroethane), 2.2
UN-No. (IATA)	: 3163
Proper Shipping Name (IATA)	: Liquefied gas, n.o.s.
Class (IATA)	: 2

SECTION 15: Regulatory information

15.1. US Federal regulations

Pentafluoroethane (354-33-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	PMN - PMN - indicates a commenced PMN substance.
Difluoromethane (R32) (75-10-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

15.2. International regulations

CANADA

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Pentafluoroethane (354-33-6)

Listed on the Canadian DSL (Domestic Substances List)

Difluoromethane (R32) (75-10-5)

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. US State regulations

Component	State or local regulations
Pentafluoroethane(354-33-6)	
Difluoromethane (R32)(75-10-5)	

SECTION 16: Other information

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Revision date : 01/03/2020
Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.
Other information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Classification in accordance with the calculation methods of Regulation (EC) 1272/2008 CLP.

Full text of H-statements:

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Abbreviations and acronyms:

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	ATE - Acute Toxicity Estimate
	CLP - Classification, Labelling, Packaging Regulation; Regulation (EC) No 1272/2008
	REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
	EINECS - European Inventory of Existing Commercial Chemical Substances
	CAS# - Chemical Abstract Service number
	PPE - Personal Protection Equipment
	LC50 - Lethal Concentration to 50 % of a test population
	RMM - Risk Management Measures
	PBT - Persistent, Bioaccumulative and Toxic
	vPvB - Very Persistent and Very Bioaccumulative
	STOT - SE : Specific Target Organ Toxicity - Single Exposure
	CSA - Chemical Safety Assessment
	EN - European Standard
	UN - United Nations
	ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
	IATA - International Air Transport Association
	IMDG code - International Maritime Dangerous Goods
	RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
	WGK - Water Hazard Class
	STOT - RE : Specific Target Organ Toxicity - Repeated Exposure

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.