

Safety data sheet

Difluoromethane (R 32)

Creation date : 28.01.2005
Revision date : 11.05.2011

Version : 1.51

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

1.1. Product identifier

Product name

Difluoromethane (R 32)

EC No (from EINECS): 200-839-4

CAS No: 75-10-5

Index-Nr.

Chemical formula CH₂F₂

REACH Registration number:

01-2119471312-47

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

Relevant identified uses

Industrial and professional. Perform risk assessment prior to use.
Refrigerant.

Uses advised against

Consumer use.

1.3. Details of the supplier of the safety data sheet

Company identification

BOC, Priestley Road, Worsley, Manchester M28 2UT

E-Mail Address ReachSDS@boc.com

1.4. Emergency telephone number

Emergency phone numbers (24h): 0800 111 333

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)

Press. Gas (Liquefied gas) - Contains gas under pressure; may explode if heated.

Flam. Gas 1 - Extremely flammable gas.

Classification acc. to Directive 67/548/EEC & 1999/45/EC:

Proposed by the industry

F+; R12

Extremely flammable.

Risk advice to man and the environment

Liquefied gas.

Contact with liquid may cause cold burns/frost bite.

2.2. Label elements

- Labelling Pictograms



- Signal word

Danger

- Hazard Statements

H280

Contains gas under pressure; may explode if heated.

H220

Extremely flammable gas.

- Precautionary Statements

Precautionary Statement Prevention

P210

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Precautionary Statement Response

P377

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381

Eliminate all ignition sources if safe to do so.

Precautionary Statement Storage

P403

Store in a well-ventilated place.

Precautionary Statement Disposal

None.

2.3. Other hazards

Contact with liquid may cause cold burns/frost bite.

SECTION 3: Composition/information on ingredients

Substance / Mixture: Substance.

3.1. Substances

Difluoromethane (R 32)

CAS No: 75-10-5

Index-Nr.:

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Contains no other components or impurities which will influence the classification of the product.

3.2. Mixtures

Not applicable.

SECTION 4: First aid measures

4.1. Description of first aid measures

First Aid General Information:

Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First Aid Inhalation:

Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First Aid Skin / Eye:

In case of frostbite spray with water for at least 15 minutes.

Apply a sterile dressing. Obtain medical assistance.

Immediately flush eyes thoroughly with water for at least 15 minutes.

First Aid Ingestion:

Ingestion is not considered a potential route of exposure.

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

In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of coordination. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

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

None.

SECTION 5: Fire fighting measures

5.1. Extinguishing media

Suitable extinguishing media

All known extinguishants can be used.

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5.2. Special hazards arising from the substance or mixture

Specific hazards

Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products

If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:
Hydrogen fluoride, Carbon monoxide, Carbonyl fluoride.

5.3. Advice for fire-fighters

Specific methods

If possible, stop flow of product. Move container away or cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Prevent water used in emergency cases from entering sewers and drainage systems.

Special protective equipment for fire-fighters

Use self-contained breathing apparatus and chemically protective clothing. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to EN 469 will provide a basic level of protection from chemical incidents. EN 469:2005: Protective clothing for fire-fighters. Performance requirements for protective clothing for fire-fighting.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Consider the risk of potentially explosive atmospheres. Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Eliminate ignition sources. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

Ventilate area. Keep area evacuated and free from ignition sources until any spilled liquid has evaporated. (Ground free from frost).

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Take precautionary measures against static discharges. Ensure equipment is adequately earthed. Purge air from system before introducing gas. Do not smoke while handling product. Assess the risk of potentially explosive atmosphere and the need for explosion-proof equipment. Consider the use of only non-sparking tools. Ensure the complete gas system has been (or is regularly) checked for leaks before use. Refer to supplier's handling instructions. Suck back of water into the container must be prevented. 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.

7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers. Segregate from oxidant gases and other oxidants in store. Keep container below 50°C in a well ventilated place. Containers should be stored in the vertical position and properly secured to prevent falling over. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere. Containers should not be stored in conditions likely to encourage corrosion.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit value

Value type	value	Note
TLV (ACGIH)	1.000 ppm	ACGIH 1995 - 1996

Derived No Effect Levels

Type	Exposure	Value	Population	Effects
DNEL	Long term	7.035	Workers	Systemic
	Inhalation	mg/m ³		
DNEL	Long term	750	Consumers	Systemic
	Inhalation	mg/m ³		

Predicted No Effect Concentrations

Type	Compartment Detail	Value
PNEC	Fresh water	0,142 mg/l
PNEC	Water (Intermittent release)	1,42 mg/l
PNEC	Fresh water sediment	0,534 mg/kg dw

8.2. Exposure controls

Appropriate engineering controls

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. Gas detectors should be used when quantities of flammable gases/vapours may be released. Consider work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages. Provide adequate general or local ventilation. Keep concentrations well below occupational

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exposure limits. Product to be handled in a closed system. The substance must be handled in accordance with good industrial hygiene and safety procedures.

Personal protective equipment

Eye and face protection

Wear a face-shield when transfilling and breaking transfer connections. Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases.

Skin protection

Hand protection

Advice: Wear cold insulating gloves.
Guideline: EN 511 Protective gloves against cold.

Body protection

Protect eyes, face and skin from contact with product.

Other protection

Wear flame resistant/retardant clothing. Take precautionary measures against static discharges. Wear working gloves and safety shoes while handling gas cylinders. ISO 20345 Safety footwear.

Thermal hazards

If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures

Environmental Exposure Controls

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General information

Appearance/Colour: Colourless gas.

Odour: Ethereal Poor warning properties at low concentrations.

Odour threshold:

Odour threshold is subjective and inadequate to warn for over exposure.

Melting point: -136 °C

Boiling point: -51,70 °C

Flash point: Not applicable for gases and gas mixtures.

Evaporation rate:

Not applicable for gases and gas mixtures.

Flammability range: 14 %(V) - 33 %(V)

Vapour Pressure 20 °C: 13,8 bar

Relative density, gas: 1,8

Solubility in water: 280000 mg/l

Partition coefficient: n-octanol/water: 0,2 logPow

Autoignition temperature: 648 °C

Molecular weight: 52,024 g/mol

Critical temperature: 78,4 °C

Relative density, liquid: 1,1

Critical pressure: 58,1 bar

9.2. Other information

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

SECTION 10: Stability and reactivity

10.1. Reactivity

Unreactive under normal conditions.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Can form potential explosive atmosphere in air., May react violently with oxidants.

10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

10.5. Incompatible materials

Air, Oxidiser. Moisture. May react violently with alkaline-earth and alkali metals.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:
Hydrogen fluoride, Carbonyl fluoride, Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity

Not applicable.

Acute inhalation toxicity

Value: LC50

Species: Rat

Value in non-standard unit: 520000 ppm

Irregular cardiac activity., Depression of central nervous system.

Acute dermal toxicity

Not applicable.

Acute toxicity other routes

Ingestion is not considered a potential route of exposure.

Skin irritation

Not classified as an irritant.

Eye irritation

Not classified as an irritant.

Sensitization

This substance is not classified as a sensitizer.

Repeated dose toxicity

Species: Rat

Value type: NOAEL

Value: 50000 ppm

Exposure time: 3 months

Route of application: Inhalation

No known effects from this product.

Genetic toxicity in vitro

Test type: Ames test in vitro:

Method: OECD Test Guideline 471

Inactive.

Test type: In vitro chromosomal abnormality test on human lymphocytes:

Method: OECD Test Guideline 473

Inactive.

Test type: In vitro gene mutations test on mammalian cells:

Method: OECD Test Guideline 476

Inactive.

Genetic toxicity in vivo

Test type: Micronucleus test in vivo mouse:

Method: OECD Test Guideline 474

Result: Inactive.

Assessment mutagenicity

There is no evidence of mutagenic potential.

Assessment carcinogenicity

No evidence of carcinogenic effects.

Toxicity to reproduction/fertility

Species: Mouse

Value type: NOAEL

Value: 50.000 ppm

Route of application: Inhalation

Assessment toxicity to reproduction

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No indication of toxic effects.

Developmental toxicity/teratogenicity

Species: Rabbit
Value type: NOAEL
Value: 50.000 ppm
Route of application: Inhalation

SECTION 12: Ecological information

12.1. Toxicity

When discharged in large quantities may contribute to the greenhouse effect.

Acute and prolonged toxicity fish

Species: Various (Freshwater)
Exposure time: 96 h
Value type: LC50
Value in standard unit mg/l: 1.057 mg/l
Method: Calculated
Not harmful to fish.

Acute toxicity aquatic invertebrates

Species: Daphnia magna
Exposure time: 48 h
Value type: EC50
Value in standard unit mg/l: 652 mg/l
Method: Calculated
Harmful to invertebrates.

Toxicity aquatic plants

Species: Algae
Exposure time: 96 h
Value type: EC50
Value in standard unit mg/l: 142 mg/l
Method: Calculated
Harmful to algae.

12.2. Persistence and degradability

Aerobic 3,38 mg/l /28 d
Biodegradation: 5 %
Not readily biodegradable.

Photo degradation

Half life (direct photolysis): 1.237 d
Degradation by radicals OH.

12.3. Bioaccumulative potential

Log Kow: 0,21
Because of the partition coefficient of the contaminant in the organic fraction of the soil (log Kow), accumulation in organisms is not to be expected.

12.4. Mobility in soil

Distribution among environmental compartments :

Water: 0.01 %
Air: 99.99 %

(Method: Calculation according Mackay, Level I)

Henry constant: 29.60E+03 Pa.m³/mol, (Method: calculated)

Absorption / desorption: In soils and sediments: Slight adsorption, log Koc: 0,17 – 1,34 (Method: calculated)

12.5. Results of PBT and vPvB assessment

Not classified as PBT or vPvB.

12.6. Other adverse effects

Global Warming Potential GWP

Contains fluorinated greenhouse gases covered by the Kyoto protocol.
550

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Avoid discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required.

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SECTION 14: Transport information

ADR/RID

14.1. UN number

3252

14.2. UN proper shipping name

DIFLUOROMETHANE (REFRIGERANT GAS R 32)

14.3. Transport hazard class(es)

Class: 2
Classification Code: 2F
Labels: 2.1
Hazard number: 23
Tunnel restriction code: (B/D)
Emergency Action Code: 2YE

14.4. Packing group (Packing Instruction)

P200

14.5. Environmental hazards

None.

14.6. Special precautions for user

None.

IMDG

14.1. UN number

3252

14.2. UN proper shipping name

DIFLUOROMETHANE (REFRIGERANT GAS R 32)

14.3. Transport hazard class(es)

Class: 2.1
Labels: 2.1
EmS: F-D,S-U

14.4. Packing group (Packing Instruction)

P200

14.5. Environmental hazards

None.

14.6. Special precautions for user

None.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

IATA

14.1. UN number

3252

14.2. UN proper shipping name

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14.3. Transport hazard class(es)

Class: 2.1
Labels: 2.1

14.4. Packing group (Packing Instruction)

P200

14.5. Environmental hazards

None.

14.6. Special precautions for user

None.

Other transport information

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 that they are firmly secured. Ensure that the cylinder valve is closed and not leaking. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

SECTION 15: Regulatory information

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

Seveso Directive 96/82/EC: Covered

Other regulations

Regulation on Fluorinated greenhouse gases 842/2006/EC: Listed.

15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

SECTION 16: Other information

Ensure all national/local regulations are observed. Ensure operators understand the flammability hazard. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Advice

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

Further information

Note:

When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

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