

Material safety data sheet according regulation (EU) 2015/830  
Version 4 – Date: 15<sup>th</sup> February, 2019 (replaces version 3 - 11/2016)

**1. Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

<b>Commercial name</b>	R32
<b>Our code</b>	TR32
<b>Chemical description</b>	Difluoromethane CAS No.: 75-10-5 CE No.: 200-839-4 REACH No.: 01-211947312-47-0024 Chemical formula: CH <sub>2</sub> F <sub>2</sub>

**1.2 Relevant identified uses of substance or mixture and uses advised against**

<b>Industrial sector</b>	Refrigeration and air-conditioning
<b>Relevant identified uses</b>	Refrigerant gas for refrigeration and air-conditioners systems
<b>Application</b>	Industrial and professional.

**1.3 Details of the supplier of the safety data sheet**

**MARIEL SRL**  
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Telephone: +39 0322 838319  
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**1.4 Emergency telephone number**

<b>Mariel Srl</b>	<b>+39 0322 838319</b>	<b>Mon/Fri: 8.30-12.30 / 13.30-17.30</b>
CAV-CNIT Anti-Poison (toxicological) National Information Centre	+39 0382 24444	Hours: 24 h / 24 h

**2. Hazards identification****2.1 Classification of the substance or mixture****Classification according to Regulation (EC) 1272/2008 (CLP)**

Flammable gas – Category 1 – Danger (H220)  
Gases under pressure – Liquefied gas – Warning (H280)

**2.2 Label elements****Dangerous pictogram**

Signal word	Warning. Danger.
Hazard statements (H)	H220 Extremely flammable gas H280 Contains gas under pressure; may explode if heated
Precautionary statements (P)	P210 Keep away from heat/sparks/open flames/hot surfaces – No smoking P377 Leaking gas fire: Do not extinguish unless leak can be stopped safely P381 Eliminate all ignition sources if safe to do so P403 Store in a well ventilated place P410 Protect from sunlight
Symbol(s)	F+ Extremely flammable
List of R-phrases	R12 Extremely flammable
List of S-phrases	S2 Keep out of the reach of children S9 Keep container in a well-ventilated place S16 Keep away from sources of ignition - No smoking

**2.3 Other hazards**

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.  
 Contact with liquid may cause frostbite and serious damage to eyes.

**3. Composition/information on ingredients**

**3.1 Substances**

Substance name	%	CAS No.	CE No.	REACH No.	Classification Reg. (CE) 1272/2008 (CLP) and Directive 67/548/EEC
Difluoromethane	100	75-10-5	200-839-4	01-211947312-47-0024	Flam. Gas 1 (H220) Press. Gas (H280) F+ ; R12

For more information, see section 8, 11, 12 and 16.

**4. First aid measures**



**General information:** If the person is unconscious, place it in the recovery position and get immediately medical attention. Do not give anything to an unconscious person. If breathing is irregular, give oxygen. If breathing stopped, administer artificial respiration. If symptoms persist, call a physician.

**Notes to physician:** Do not give adrenaline-ephedrine or similar drugs group.

**4.1 Description of first aid measures**

- Inhalation Remove patient from exposure to fresh air. Administer oxygen if necessary. Obtain immediate medical attention.
- Skin contact In case of contact with skin, wash immediately with plenty of water. Remove contaminated clothing. If irritation or blistering occurs, call a physician.
- Eye contact Remove contact lenses, if present. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.
- Ingestion Unlikely route of exposure. As this product is a gas, refer to the section "Inhalation". Do not induce vomiting without medical advice. Obtain immediate medical attention.

**4.2. 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. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of coordination.

**5. Firefighting measures**

**5.1 Extinguishing media**

- Suitable extinguishing media Dry powder, water spray, carbon dioxide (CO2) all known suitable extinguishing media
- No suitable extinguishing media High water jet

**5.2 Special hazards arising from the substance or mixture**

- Specific hazards
  - Contents under pressure.
  - On heating: heating will cause a rise in pressure with a risk of bursting.
  - Toxic and corrosive vapours are released.
  - Cool down the containers exposed to heat with a water spray.
  - Vapours are heavier than air and can cause rapid suffocation by reducing oxygen available for breathing.
- Hazardous combustion In case of fire, decomposition products may include the following materials: carbonyl fluoride, carbon dioxide and monoxide, hydrofluoric acid.

**5.3 Advice for firefighters**

- Specific methods
  - Coordinate fire measure to the surrounding fire.
  - Exposure to flames and heat can cause the container to rupture.
  - From protected position, cool endangered containers with water spray jet.
  - Do not discharge contaminated water into drains.
  - If possible, stop flow of the product.

	If possible, use water spray to knock down the fumes. Explosive re-ignition may occur, turn off all the other fire. Move containers from fire area if this can be done without risk.
Protective equipment	Firefighters must use standard protective equipment including SCBA. Avoid contact with eyes and skin. Do not breathe the fumes.

#### Other information

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
For more information, see section 10.

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### 6. Accidental release measure

#### 6.1 Personal precautions, protective equipment and emergency procedures

Immediately contact emergency personnel.  
Immediately evacuate personnel to safe areas. Unprotected persons must be kept away.  
Wear personal protective equipment reported in section 8 "Exposure controls/personal protection".  
Remove all ignition sources.  
Avoid contact of the liquid with the skin (possible cold burns).  
Ventilate the area/local. In case of insufficient ventilation, wear self-contained breathing apparatus.

#### 6.2 Environmental precautions

Prevent the product from entering sewers or water courses.

#### 6.3 Methods and material for containment and cleaning up

Ventilate / aerate the area or local.

#### 6.4 Reference to other sections

For more information, see section 8 and 13.

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### 7. Handling and storage

#### 7.1 Precautions for safe handling

Technical measures	Use only properly specified equipment that is suitable for this product, its supply pressure and temperature. In case of doubt, refer to supplier's handling instructions. Only experienced and properly instructed persons should handle gases under pressure. Service technician must check regularly your entire gas system to ensure that it is leak-free.
Safe handling	The substance must be handled in accordance with good industrial hygiene and safety procedures. Refer to supplier's / manufacturer's handling instructions. Handle and open container with care. Caution when opening, pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50° C (122 °F). Do not spray on a naked flame or any incandescent material. Do not use in area without adequate ventilation. Protect containers from physical damage; do not drag, roll, slide or drop. Do not pierce or burn, even after use. Leave valve protection caps in place until the container is ready for use. Close container valve after each use and when empty, even if still connected to equipment. Do not remove or deface labels provided by the supplier for the identification of the container contents.
Industrial hygiene	Ensure adequate ventilation of the working area. Do not drink, eat or smoke in the working area and when handling the product.

#### 7.2 Conditions for safe storage, including any incompatibility

##### *Requirements for storage areas and containers*

Keep containers tightly closed in a dry, cool and well-ventilated place, away from any ignition or heat sources. Store in original container.  
Container valves or caps should be in place.

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*Incompatible materials*

Avoid storage with oxidizing products, acids and, in general, with chemicals.  
 Avoid storage with tools or equipment that may cause sparks.

**7.3 Specific end use(s)**

Only for professional and industrial use.

**8. Exposure controls/personal protection**

**8.1 Control parameters**

OEL (Occupational Exposure Limit): No data available.

Components	CAS No.	TLV-TWA	Control parameters	Font	Year
Difluoromethane	75-10-5	8 h	2,200 mg/m <sup>3</sup> 1,000 ppm	AGCIH (WEEL)	1995 - 1996

DNEL			
Components	CAS No.	Inhalation	
Difluoromethane	75-10-5	Workers Users	7035 mg/m <sup>3</sup> (long-term – systemic effects) 750 mg/m <sup>3</sup> (long-term – systemic effects)

PNEC			
Components	CAS No.	Values	
Difluoromethane	75-10-5	0,142 mg/l 0,534 mg/kg dw* 1,42 mg/l	Fresh water Fresh water sediment Intermittent release

\*dry weight

**8.2 Exposure controls**

Ensure and provide adequate air ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Consider a work permit system e.g. for maintenance activities.

The personal protective equipment must comply with EN regulations: EN 136, 140, 149 respiratory protection; EN 166 eye protection (glass); EN 340, 463, 468, 943-1, 943-2 skin protection; EN 374 hand protection (gloves), EN ISO 20345 safety shoes.

**8.2.2 Individual protection measures, such as personal protective equipment**

**a) Eye/face protection** Safety glasses with side-shields (according to directive EN 166).

**b) Skin protection**

i) Hand protection Thermal-protective gloves resistant to chemical products (EN 374). The penetration time of the gloves must be greater than the period of expected use. Gloves should be replaced immediately if they show signs of wear or deterioration.

ii) Other Evaluate the need for flame resistant workwear.  
 EN ISO 14116 Protective clothing - Protection against heat and flame - Limited flame spread materials, material assemblies and clothing.  
 EN ISO 1149-5 Protective clothing - Electrostatic properties.  
 Wear safety shoes while handling containers.  
 EN ISO 20345 Personal protective equipment - Safety shoes.  
 Apron or protective clothing are not necessary.

**c) Respiratory protection**

Mask filter for gases and vapours (EN141). To obtain an adequate protection, filter class you should choose according to the type and concentration of contaminants. The breathing apparatus with filters do not operate satisfactorily when the air contains high concentrations of vapours. In case of insufficient ventilation, wear self-contained breathing apparatus (EN529).



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### 8.2.3. Environmental exposure controls

Handling in accordance with good industrial hygiene and safety practice.

Prevent spillage or leakage of the product in watercourse or sewers (explosion danger). Avoid air emissions.

For more information, see section 7 and 13.

## 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

a) Appearance	Gas
Colour	Colourless
b) Odour	Ethereal
c) Odour threshold	Odour threshold is subjective and is inadequate to warn of over exposure
d) pH	Neutral
e) Melting point [°C]	- 136° C @ 1,013 bar
f) Initial boiling point	- 51,6 °C @ 1,013 bar
g) Flash point	n.a.
h) Evaporation rate	n.a.
i) Flammability (solid, gas)	High flammable gas
j) Upper/lower flammability	29,90 Vol. % / 13,80 Vol. %
k) Vapour pressure	13,8 Bar @ 20 °C 31,4 Bar @ 50 °C
l) Vapour density	0.56 g/cm <sup>3</sup> @ 20 °C
m) Relative density	1,80 (air = 1) 1,10 (water = 1)
n) Solubility (in the water)	280 g/l
o) Partition coefficient: n-Octanol/water	0,2 log Kow
p) Auto-ignition temperature	630 °C @ 1018 hPa
q) Decomposition temperature	n.d.a.
r) Viscosity	n.d.a.
s) Explosive properties	n.a.
t) Oxidising properties	n.a.

### 9.2 Other information

Density	0,959 g/cm <sup>3</sup> @ 25 °C
Molecular mass [g/mol]	52 g/mol.
Critical temperature (°C)	- 78,5 °C

## 10. Stability and reactivity

### 10.1 Reactivity

Stable under normal handling and storage conditions.

### 10.2 Chemical stability

Stable under normal handling and storage conditions.

### 10.3 Possibility of hazardous reactions

Can react violently if in contact with oxidants, alkaline metals and alkaline earth-metals.

Can form explosive mixtures with air.

### 10.4 Conditions to avoid

Pressurized container. Heating will cause rise in pressure with risk of bursting.

Protect from sunlight and do not expose to temperatures exceeding 50 °C.

Keep away from heat, sparks, open flame or other sources of ignition. Do not smoke.

Do not pierce or burn, even after use.

Do not spray on a naked flame or any incandescent material.

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### 10.5 Incompatible materials

Air, oxidizing agents.

### 10.6 Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
In case of combustion, toxic compositions may be formed: carbonyl fluoride, carbon monoxide and dioxide, hydrofluoric acid.

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## 11. Toxicological information

### 11.1 Information on toxicological effects

#### a) Acute toxicity

Inhalation LC50: > 520 000 ppm (OECD 403)  
LC50: 1107000 mg/m<sup>3</sup> (OECD 403)  
Exposition time: 4 h  
Animal species: Rat

**b) Skin corrosion/irritation** Based on available data, the classification criteria are not met.

**c) Serious eye damage/irritation** Based on available data, the classification criteria are not met.

**d) Respiratory or skin sensitization** Based on available data, the classification criteria are not met.

#### e) Germ cell mutagenicity

in vitro genotoxicity Test: Ames  
Result: Negative

in vivo genotoxicity Exposed tissue: Bone marrow  
Method: Mutagenicity (micronucleus test)  
Result: Negative  
Animal species: Mouse

**f) Carcinogenicity** Based on available data, the classification criteria are not met.

**g) Reproductive toxicity** Based on available data, the classification criteria are not met.

**h) STOT-single exposure** Based on available data, the classification criteria are not met.

#### i) STOT-repeated exposure

Inhalation NOAEL: 49500 ppm  
Exposition time: 28 days  
Animal species: Rat

**j) Aspiration hazard** Based on available data, the classification criteria are not met.

### Other information

Cardiac sensitization NOAEC: > 350 000 ppm  
LOAEC: > 350 000 ppm  
Animal species: Dog (Beagle)

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## 12. Ecological information

### 12.1 Toxicity

Fish LC50: 1.045 mg/l  
Exposure time: 96 h  
Species: Pimephales promelas  
Remarks: QSAR, supporting study

Aquatic invertebrates EC50: 1.573 mg/l  
Exposure time: 48 h  
Species: Daphnia magna  
Remarks: QSAR, supporting study

Algae EC50: 142 mg/l  
Exposure time: 96 h  
Species: Algae

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**Transport by air (IATA/ICAO)**

<b>14.3 Transport hazard class(es)</b>	2
Class/Division	2.1
<b>14.4 Packing group</b>	n.a.
Passenger and cargo aircraft	Forbidden
Cargo aircraft only	200
<b>14.5 Environmental hazards</b>	No

**Transport by sea (IMDG)**

<b>14.3 Transport hazard class(es)</b>	2
Class/Division	2.1
Emergency Schedule (EmS)	F-C, S-V
<b>14.4 Packing group</b>	n.a.
Packing instruction	P200
<b>14.5 Environmental hazards</b>	No

**14.6 Special precautions for user**

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.  
 Ensure that containers are firmly secured.  
 Ensure there is adequate ventilation.

**14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code**

Not applicable.

**15. Regulatory information**

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

Ozone Depletion Potential ODP (R-11=1) = 0  
 Global Warming Potential GWP (CO2=1) = 675

**Additional regulations/legislations**

Regulation (EU) n. 517/2014  
 Seveso Directive 96/82/EC: Included

**15.2 Chemical safety assessment**

A Chemical Safety Assessment (CSA) has been made for this product.

**16. Other information**

This Material Safety Data Sheet has been made according European Directive in force.

**Text of hazard (H) and precautionary (P) statements in section 2 and 3**

- H220 Extremely flammable gas
- H280 Contains gas under pressure; may explode if heated
- P210 Keep away from heat/sparks/open flames/hot surfaces – No smoking
- P377 Leaking gas fire – do not extinguish unless leak can be stopped safely
- P381 Eliminate all ignition sources if safe to do so
- P403 Store in a well ventilated place

**Text of S-phrases in section 2**

- S2 Keep out of the reach of children
- S9 Keep container in a well-ventilated place
- S16 Keep away from sources of ignition - No smoking



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**Text of “Hazard Class and Category Code” in section 2 and 3, according to Regulation (EC) n. 1272/2008 (CLP) and Directive 67/548/EEC**

Press. Gas (Liq.) Gas under pressure : Liquefied gas  
F+ Extremely flammable  
R12 Extremely flammable: liquids having a boiling point lower or equal to 35 °C

<b>History</b>	Version 4 by Mariel Srl	Version 3	Version 2	Version 1
	Revision date: 02/2019	Date: 11/2016	Date: 09/2012	Date: 09/2011

**b) Abbreviations and acronyms**

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	Accord Dangerous Route
CAS	Chemical Abstracts Service number
CE / EC	European Community
CLP	Classification, Labelling, Packaging
CSA	Chemical Safety Assessment
DNEL	Derived No Effect Level
DMEL	Derived Minimum Effect Level
EC50	Effective Concentration 50%
EmS	Emergency Schedule
EWC	European Waste Code
GHS	Globally Harmonized System
GWP	Global Warming Potential
HCFC	Hydro-Chloro-Fluoro-Carbons
HFC	Hydro-Fluoro-Carbons
IATA	International Air Transport Association
IBC code	International Bulk Chemical code
ICAO	International Civil Aviation Organization
IMDG code	International Maritime Dangerous Goods code
LC50	Lethal Concentration 50%
LOAEC	Low Observed Adverse Effect Concentration
Log Kow	Logarithm of coefficient partition n-Octanol/Water
MARPOL	MARitime POLLution
n.a.	not applicable
n.d.a.	no data available
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
ODP	Ozone Depletion Potential
OEL	Occupational Exposure Limit
OECD	Organization for Economic Co-operation and Development
PBT	Persistent, Bioaccumulative, Toxic
PNEC	Predicted No Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restrictions of Chemicals
RID	Rail International Dangerous goods transport
STOT-RE	Specific Target Organ Toxicity – repeat exposure
STOT-SE	Specific Target Organ Toxicity – single exposure
TLV-TWA	Threshold Limit Value – Time Weighted Average
UE / EU	European Union
vPvB	very Persistent very Bioaccumulative
WEEL	Workplace Environmental Exposure Level

**Notice of liability**

This information should not constitute a guarantee for any specific product properties. This information are only a guidance for safe handling, use, processing, storage, transportation, disposal and release and are not to be considered a warranty or a quality specification.

The information contained in this safety data sheet are based on our current knowledge and EU and national laws; they describe the product only with regard to safety requirements. The conditions of the user are beyond our knowledge and control. The product should not be used for purpose other than those specified. It is always the responsibility of the user to take all the necessary measures to comply with the requirements of current legislation. The information contained in this form should not considered as a guarantee of its properties.