TAZZETTI

SAFETY DATA SHEET (SDS)

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Identification of the substance:

Name:	R32
CAS Number:	75-10-5
EC Number:	200-839-4
REACH Number:	01-2119471312-47-0022

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

Recommended use:
Refrigerant
Industrial and professional

1.3. Details of the supplier of the safety data sheet

Company:
TAZZETTI S.P.A
CORSO EUROPA 600/A
10088 VOLPIANO (TO) - ITALY-
Tel. +39 011 97021
Fax +39 011 9702460
rsg.inquiry@tazzetti.com

1.4. Emergency telephone number

Tel. +39 02 66101029 (24 h / 24 h) – Centro antiveleni ospedale Niguarda di Milano (Italia)

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP):
Warning, Flam. Gas 1B, Flammable gas.
Warning, Press. Gas, Contains gas under pressure.

2.2. Label elements

Symbols:

Danger
Hazard statements:
H221 Flammable gas
H280 Contains gas under pressure; may explode if heated.
Precautionary statements:
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.
P410+403: Protect from sunlight. Store in a well ventilated place.
Special Provisions: N.A.

2.3. Other Hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at concentrations of 0.1% or higher.
Contact with liquid may cause cold burns/frostbite.
In hight concentration may be asphyxiant.
Vapour heavier than air, may accumulate below ground level and cause choking.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Identification of the substance:

Name:	R32
Chemical name:	Difluoromethane
CAS Number:	75-10-5
EC Number:	200-839-4
REACH Number:	01-2119471312-47-0022

3.2. Mixtures

Not applicable

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

In case of skin contact:
In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
Take off all contaminated clothing immediately.
In case of eyes contact:
In case of contact with eyes, rinse immediately (for at least 15 minutes) with plenty of water and seek medical advice.
In case of ingestion:
Obtain medical assistance.
In case of 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.

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

Exposures to high concentrations can cause an abnormal heart rhythm and suddenly become fatal.
Inhalation of high concentration may cause central nervous system depression resulting in dizziness, weakness, nausea, headache and possibly unconsciousness. Anaesthetic effects, light-headedness, confusion, incoordination drowsiness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness.
In high concentration it can cause asphyxiation. Symptoms may include loss of mobility and / or unconsciousness. Victims may not be aware of asphyxiation.

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

Treatment: Do not give adrenaline or similar drugs.

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:
CO2 or dry chemical fire extinguishe.
Extinguishing media which must not be used for safety reasons:
None in particular.

5.2. Special hazards arising from the substance or mixture
Containers may explode if heated
Do not inhale explosion and combustion gases. Hazardous thermal decomposition products: carbon oxides, hydrogen fluoride, fluorinated compounds.
The vapor phase is heavier than air, is distributed at ground level and remote ignition is possible. The attack of fire on the tanks can lead to an explosion of boiling liquid and expanding steam (BLEVE).

5.3. Advice for fire-fighters
Use self-contained breathing apparatus and chemically protective clothing.
If feasible in terms of safety, move from immediate danger undamaged containers.
Do not turn off the ignited gas unless absolutely necessary. Explosive re-ignition may occur. Extinguish all surrounding flames.
If possible, stop the spillage of product.
Coordinate the fire-fighting intervention according to the surrounding fire. Exposure to fire and heat can cause the container to break. Cool the containers exposed to the risk with jets of shower water from a protected position. Do not pour the contaminated water from the fire into the sewage system.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Provide adequate ventilation.
Remove all sources of ignition.
Evacuate area.
Attempt to stop the spill.
Try to disperse the gas or direct the flow to a safe place, for example using water spray.
Take precautionary measures against electrostatic discharge. Ensure electrical continuity by connecting and grounding all equipment. Monitor the area with a combustible gas meter. Perform tests on the atmospheric concentrations of flammable gas to ensure that the working conditions are safe before allowing access to personnel in the area.
Consider the risk of explosive atmospheres.
Avoid entry into sewers, basements, excavations and areas where accumulation can be dangerous.
Consult the protective measures set out in points 7 and 8.
Air dry contaminated clothing in a well-ventilated area before washing them.

6.2. Environmental precautions
Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.
Retain contaminated washing water and dispose it.
In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

6.3. Methods and materials for containment and cleaning up
Reduce vapour with fog or fine water spray.
Provide containment for water used
Wash with plenty of water
Ventilate area

6.4. Reference to other sections
See also section 8 and 13

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling
Use only equipment suitable for the product and the operating pressure
Take precautions against electrostatic discharge.

Keep away from sources of ignition (including electrostatic charges).
Avoid contact with skin and eyes, inhalation of vapors and mists.
Use the localized ventilation system.
At work do not eat or drink. During work do not smoke.
See also paragraph 8 for the recommended protective devices.
Only experienced and properly trained personnel must handle the compressed gases.
The product must be handled in accordance with good industrial hygiene and safety practices.
Remove the air from the system before introducing the gas.
Make sure that the entire gas distribution system has been (or is regularly) checked against leaks before use.
Assess the risk of potential explosive atmospheres and the need for explosion-proof equipment.
Assess the need to use only non-sparking tools.
Protect the cylinders from physical damage; do not drag, roll, slide or drop.
Do not remove or make illegible the labels affixed by the supplier to identify the contents of the cylinder.
If the operator encounters any difficulty during valve operation, discontinue use and contact the supplier.
Close the container valve after each use and when empty, even if still connected to the equipment.
Never attempt to repair or modify container valves or safety devices.
Refit the caps and / or caps of the valves and containers, where provided, as soon as the container is disconnected from the equipment.
Do not use direct flames to increase the internal pressure of the container.
Do not use compressed air for filling, draining or handling. Electrostatic charges can occur during handling. Electrostatic discharge can cause fire.
Ground all equipment. The discharge lines can reach extremely low temperatures with the consequent risk of cold burns.
Containers, even those that have been emptied, may contain explosive vapors. Do not cut, drill, grind, weld or perform other similar operations on the containers or in the immediate vicinity.

7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers.
All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere.
Keep container below 50°C in a well ventilated area.
Keep away from ignition sources (including static discharges).
Do not store near oxidizing containers.
Always keep in a well ventilated place.
Keep away from unguarded flame, sparks, and heat sources.
Keep away from food, drink and feed.
Segregate from oxidant gases and other oxidants in store.
Incompatible materials:
Do not store near oxidizing containers.
Incompatible materials: Strong oxidizing agents Alkali metals Alkaline earth metals
Packing material: Recommended: Ordinary steel
Avoid: Alloy containing more than 2% magnesium
Instruction as regards storage premises:
Adequately ventilated.
Containers should not be stored in conditions likely to encourage corrosion.

7.3. Specific end use(s)

If annexed, please make reference to the scenario

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limit values Source ARKEMA TWA 1.000 2.130
DNEL exposure limit values Long Term Systemic Effects:
Worker Industry: 7035 mg/m3 - Consumer: 750 mg/m3

PNEC exposure limit values:
fresh water 0,313 mg/l
water (release Use) 3,13 mg/l
fresh water sediment 1,8069 mg/kg dw

8.2. Exposure controls

The product should be handled in a closed circuit..
Provide adequate general and local ventilation.
Make sure the exposure is well below the occupational exposure limits.
If the risk assessment indicates this is necessary, use the following protection
Eye protection:
If foreseeable a risk of spurts or squirts, please wear safety glasses with lateral protection in compliance with rule of law EN 166.
Protection for skin:
Protective clothing
Protection for hands:
If foreseeable a direct contact with liquid or with cold machineries/equipments for which exist a risk of cold burn, please use cold protection gloves in compliance with rule of law EN511 – 020.
Respiratory protection:
Wear self-contained breathing apparatus in compliance with EN 137 when entering area unless atmosphere is proved to be safe.
Thermal Hazards:
Contact with liquid may cause cold burns/frostbite.
Environmental exposure controls:
Refer to environment legislation
Contact with liquid may cause cold burns/frostbite.
In high concentrations may cause asphyxiation.
Vapour heavier than air, may accumulate below ground level and cause choking.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state (20°C):	liquified gas
Colour:	Incolour
Odour:	Slightly similar to ether
pH:	Not applicable to substance
Melting point / freezing point:	-136 °C
Initial boiling point and boiling range:	-51.7 °C
Solid/gas flammability:	Flammable
Upper/lower flammability or explosive limits:	from 13 to 33 % (V/V)
Vapor pressure:	1.119 kPa, at 10 °C (Method A4 (D. 92/69/ECC)) 1.701 kPa, at 25 °C (Method A4 (D. 92/69/ECC)) 1,52 MPa , at 21,1 °C
Density:	961 Kg/m3 , at 25 °C / 16,900 hPa liquid
Density (water=1):	0,96 at 25 °C
Density (vapours):	2,1 Kg/m3 , at 25 °C / 1.013 hPa (calculated)
Density (vapours air=1):	1,82 , at 25 °C
Solubility in water:	1,68 g/l at 25 °C
Solubilità in altri solventi:	Solubile in: alcool
Partition coefficient (n-octanol/water):	log Kow : 0,21 , a 25 °C (OCDE Guideline 107)
Autoignition temperature:	530°C at 1.018 hPa (standard A15 D.92/69/EEC)
Decomposition temperature:	550 °C
Flash point:	Not available
Viscosity:	Not available

9.2. Other informations

Molecular weight:	52,0 g/mol
Critical Point:	
Critical Pressure:	5,83 MPa,
Critical Temperature:	78,4 °C
Explosive properties:	Not applicable to substance
Oxidising properties:	Not applicable to substance

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

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity
Hazardous polymerisation does not occur.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Vapours may form flammable mixture with air.
May react violently with oxidants.

10.4. Conditions to avoid
Keep away from: heat, flames, and sparks. Don't smoke.
Keep away from ignition sources

10.5. Incompatible materials
Alkali metals, alkaline earth metals, powdered metals, powdered metal salts.

10.6. Hazardous decomposition products
Decomposition temperature: 550 °C
At elevated temperature: thermal decomposition into toxic and corrosive products:
Hydrogen fluoride, carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects
Toxicological information of the substance:
Acute toxicity:
CL50/4h - inhalation – rat = 1890 g/m^3
CL50/4h - inhalation – mouse = 1810 g/m^3
Inhalation:
At strong concentrations of vapours/mists: headache, dizziness, drowsiness
CL50/4h inhalation – mouse>520000 ppm (Metodo: Linee Guida 403 per il Test dell'OECD)

Skin corrosion/irritation/ Serious eye damage):
Skin Contact: Freezing possible by splashes of liquefied gas
Eye Contacti: Freezing possible by splashes of liquefied gas

Respiratory or skin sensitisation: Inhalation:
Level within which no effects are observed 35 % (cardiac sensitisation, dog)
Skin Contact: Not applicable (gas)

CMR Effects:
Mutagenicity: Remarks: Not mutagenic Based on available data, it is not possible to meet the classification criteria
In vitro Test di Ames: Inactive (Method: OCDE Guideline 471)
In vitro (Method: OCDE Guideline 473) on human lymphocytes: Inactive

It can be considered comparable to a similar product whose experimental results are:
Gene mutation test in vitro on mammalian cells: Inactive (Method: OCDE Guideline 476)
In vivo micronucleus test in mice: Inactive (Method: OCDE Guideline 474)

Carcinogenicity: Available experimental data do not indicate any particular concern for humans (under normal conditions of use)

Reproductive toxicity:
Fertility: Based on the available data, it cannot be assumed that the substance has a reprotoxic potential.
On animals: It can be considered comparable to a similar product whose experimental results are:
NOAEL (parents toxicity): > 50.000 ppm
NOAEL (Fertility): > 50.000 ppm
NOAEL (Developmental toxicity): > 50000 ppm (rat, mouse, Inhalation)
Fetal development: Based on the available data, it cannot be assumed that the substance has developmental potential.

On animals: Absence of toxic effects on the development of the fetus.
NOAEL (Developmental toxicity): 50.000 ppm
NOAEL (Maternal toxicity): 50.000 ppm (Method: OCDE Guideline 414, rat, rabbit, Inhalation)

STOT — single exposure: no data disponible
STOT — repeated exposure:
Remarks: Low systemic toxicity by repeated exposure. Based on available data, it is not possible to meet the classification criteria.
On animals: Inhalation: No specific toxic effects found
NOAEL= 50000ppm (Method: OCDE Guideline 413, Rat, 3 Months)

Aspiration hazard: Not applicable to substance

11.2 Information on other hazards

Endocrine-disrupting properties: No data disponible

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Toxicity to fish: CL50/96h/fish (fresh water species): 1.731 mg/l (Method: calculated)
Toxicity to aquatic invertebrates: EC50/48h/daphnia: 833 mg/l (Method: calculated)
Toxicity to aquatic plants:EC50r/96h/algae: 313 mg/l (Method: calculated)

12.2. Persistence and degradability:

In water: not readily biodegradable: 5 % after 28 d (Method: OCDE Guideline 301 D)
In air fotodegradation: Degradation by OH radicals: direct photolysis (half-life time): 3,39 y

12.3. Bioaccumulative potential:

Bioaccumulation: Low potential.
Partition coefficient (n-octanol/water): log Kow: 0,21 , at 25 °C (Method: OCDE Guideline 107)

12.4. Mobility in soil:

Diffusion in the various environmental compartments:
Water: 0,01 %
Air: 99,99 %
Soil: 0 % sediment: 0 % (Method: Calculated by Mackay method, level I)

Pressure vapour : 1.119 kPa, 10 °C, (Method A4 (D. 92/69/ECC))
1.701 kPa, 25 °C, (Method A4 (D. 92/69/ECC))
1,52 MPa, 21,1 °C

Adsorbiment / desorbiment: log Koc: 0,17 - 1,34 (Method: calculated)

12.5. Results of PBT and vPvB assessment

Assessment: The substance does not fully meet all the screening criteria for persistence, bioaccumulation and toxicity, therefore it is not considered PBT or vPvB.

12.6 Endocrine-disrupting properties

No data disponible.

12.7 Other adverse effects

Additional ecological information: Contains greenhouse gases regulated by the Kyoto Protocol.
GWP: 675

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force.
Gas may be scrubbed in water.
Avoid discharge in 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.
Contact supplier if guidance is required.

SECTION 14. TRANSPORT INFORMATIONS

14.1. UN Number

ONU ADR/RID/IMDG/IATA -Number: 3252
If the substance is inside a refrigerating machines, you must applies UN number 3358

14.2. UN proper shipping name

ADR/RID/IMDG - shipping name: DIFLUOROMETHANE (REFRIGERANT GAS R32)
IATA Technical name: DIFLUOROMETHANE (REFRIGERANT GAS R32)
If the substance is inside a refrigerating machines the name and description will be: REFRIGERATING MACHINES containing flammable, non-toxic, Iiquefied gas – UN 3358

14.3. Transport hazard class(es)

ADR/RID - Class: 2
ADR - Label: 2.1
RID - Labe: 2.1 (+13)
ADR/RID - Hazard identification number: 23
Classification code: 2F
IATA/IMDG - Class: 2.1

14.4. Packing group
ADR - Packing group: -

14.5. Environmental hazards: No

14.6. Special precautions for user
ADR-Tunnel restriction code: B/D
IATA - Passenger aircraft: Not available
IATA - Cargo Aircraft: Not available
IMDG EmS: F-D, S-U
Ensure there is adequate ventilation
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.
Compliance with applicable regulations.
Before transporting product containers :
- 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.
Avoid transport on vehicles where the load space is not separated from the driver's compartment.

14.7. Transport in bulk according to annex II of MARPOL 73/78 and the IBC code: N.A.

SECTION 15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Reg. (CE) n. 1907/2006 (REACH), Reg. (CE) n. 1272/2008 (CLP), Reg. (UE) n. 2015/830, Reg. (UE) n. 2020/878.
Where applicable, refer to the following regulatory provisions :
Directive 2003/105/CE ('Activities linked to risks of serious accidents') and subsequent amendments.
1999/13/EC (VOC directive)

15.2. Chemical safety assessment: yes

SECTION 16. OTHER INFORMATION

Revised safety data sheet in accordance with commisssion regulation 878/2020.
Points that have changed since the previous version are highlighted with a vertical line in the body of this document.
Ensure operators understand the flammability hazard.
Users of breathing apparatus must be trained.
Ensure operators understand the toxicity hazard.
This document was prepared by a competent person who has received appropriate training.
Main bibliographic sources:
ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities
SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold
CCNL - Appendix 1
EIGA
The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.
It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD.
The MSDS cancels and replaces any preceding release.

ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS:	Chemical Abstracts Service (divisione della American Chemical Society).
CLP:	Classification, Labeling, Packaging.
DNEL:	Derived No Effect Level.
EINECS:	European Inventory of Existing Commercial Chemical Substances.
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals.
IATA:	International Air Transport Association.
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO:	International Civil Aviation Organization.
ICAO-TI:	Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG:	International Maritime Code for Dangerous Goods.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
LTE:	Long-term exposure.
PNEC:	Predicted No Effect Concentration.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STE:	Short-term exposure.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.
TWATLV:	Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).
N.A.	Not available