

KRYON 32

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

1.1. Product identifier

Code:	GG_GF 020R
Product name	HFC – R32 , KRYON® 32
Chemical name	DIFLUOROMETHANE (R32)
EC number	200-839-4
CAS number	75-10-5
Registration Number	01-2119471312-47-XXXX

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

Intended use	Refrigerant. ONLY FOR PROFESSIONAL AND INDUSTRIAL USE
Uses advised against	Uses other than those stated.

1.3. Details of the supplier of the safety data sheet

Name	General Gas S.r.l.
Full address	Via Aosta, 5
District and Country	20063 Cernusco sul Naviglio (MI) ITALY
	tel. +39 02 92141835
	fax +39 02 92141841

e-mail address of the competent person

responsible for the Safety Data Sheet m.migliaccio@gas-tec.it

1.4. Emergency telephone number

For urgent inquiries refer to

IRELAND:	Healthcare Professionals: +353 (01) 809 2566 (24 hour service)
MALTA:	112
General Gas Srl	tel. +39355644288 (Only for technical support)

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2020/878. Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Flammable gas, category 1B	H221	Flammable gas.
Liquefied gas	H280	Contains gas under pressure; may explode if heated.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words:

Danger

KRYON 32

Hazard statements:

H221 Flammable gas.
H280 Contains gas under pressure; may explode if heated.

Precautionary statements:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.
P410+P403 Protect from sunlight. Store in a well-ventilated place.

Contains: DIFLUOROMETHANE (R32)
Nr. EC: 200-839-4

2.3. Other hazards

Asphyxiant in high concentrations. Contact with liquid can cause cryogenic burns.

The substance does not have persistence, bioaccumulation and toxicity (PBT) properties and is not very persistent and very bioaccumulative. (vPvB).

The substance does not have endocrine disrupting properties.

SECTION 3. Composition/information on ingredients

3.1. Substances

Contains:

Identification	Conc. %	Classification (EC) 1272/2008 (CLP)
DIFLUOROMETHANE (R32)		
INDEX -	100	Flam. Gas 1B H221, Press. Gas (Liq.) H280
EC 200-839-4		
CAS 75-10-5		
REACH Reg. 01-2119471312-47-XXXX		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

No episodes of harm to the staff authorised to use the product have been reported. The following general measures should be adopted as necessary:

INHALATION: Remove to open air. If the subject stops breathing, administer artificial respiration. Get medical advice/attention.

INGESTION: Get medical advice/attention. Induce vomiting only if indicated by the doctor. Do not give anything by mouth to an unconscious person.

EYES: Remove any contact lenses. Wash immediately and abundantly with water for at least 30/60 minutes, opening the eyelids wide. Consult a doctor immediately if the patient shows signs of frostbite, pain, swelling, tearing or persistent photophobia or damage caused by high pressure jets.

SKIN: In case of accidental contact with the skin, take the first aid measures specified below:

Do not remove clothing that adheres to burned skin.

PROTECTIVE MEASURES FOR THE FIRST RESCUE WORKERS: for PPE (personal protection equipment) required for first aid refer to section 8.2 of this safety data sheet.

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

Contact with skin can cause cold burns.

Inhalation of high concentrations may cause depression of the central nervous system with the following effects: dizziness, weakness, nausea, headache, anesthetic effects, possible unconsciousness, lightheadedness, confusion, lack of coordination, drowsiness, irregular heartbeat with a strange feeling in

KRYON 32

the chest, heart pounding, apprehension, feeling faint, dizzy or weak.

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

Treat symptomatically.

In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).

SECTION 5. Firefighting measures**5.1. Extinguishing media**

SUITABLE EXTINGUISHING EQUIPMENT

Dry chemical powder. Carbon dioxide (CO₂). Water fog. Foam.

UNSUITABLE EXTINGUISHING EQUIPMENT

Do not use a water jet as an extinguishing agent as it will spread the fire.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Highly flammable pressurized gas. The pressurized vessel may explode if exposed to flame or heat. Thermal decomposition of the substance produces toxic gases (carbon oxides).

Avoid breathing combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Do not fight fires unless gas flow can be stopped safely. Explosive reignition may occur. Use fire fighting measures appropriate to the surrounding fire. Exposure to flame and heat can cause the container to break. Cool containers exposed to risk with water spray jets from a protected position. Do not pour contaminated fire water into drains.

If possible, use nebulised water to reduce the fumes. Always wear full fire protection gear..

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**6.1.1 For non-emergency personnel

Remove all sources of ignition (cigarettes, flames, sparks, electricity, etc.) or heat from the area where the leak occurred and ensure adequate ventilation. Evacuate the surrounding areas and prevent the entry of external and unprotected personnel. Notify emergency crews.

Stop the leak if there is no danger. Do not handle damaged containers or leaked product without first donning the appropriate protective equipment.

Avoid breathing the gas. For information relating to environmental and health risks, respiratory protection, ventilation and personal protective equipment, refer to section 8.

6.1.2 For emergency responders

Extremely flammable asphyxiant gas. When release of asphyxiating gases is possible, oxygen detectors should be used.

Considering the hermetic nature of the container, it is rather unlikely that considerable spillages can occur. However, in the event that any container is damaged such as to cause a leak, insulate the container in question by placing it in the open air or by covering it with inert and non-combustible material (eg sand, earth, vermiculite). Stay upwind.

6.2. Environmental precautions

Do not disperse in the environment.

6.3. Methods and material for containment and cleaning up

Provide sufficient ventilation of the place affected by the leak and allow the product to evaporate, favoring its dispersion.

Disposal of contaminated material must be carried out in accordance with the provisions of point 13.

KRYON 32

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Keep away from heat/sparks/open flames/hot surfaces. - Not smoking. Do not handle, store or open near open flames, sources of heat or ignition. Protect the material from direct light. Not smoking. All equipment used when handling the product must be properly grounded. Do not breathe gas. Avoid prolonged exposure. Do not enter storage areas or confined spaces that are not adequately ventilated. Use only outdoors or in a well-ventilated area. The oxygen concentration must not drop below 19.5% at sea level (pO₂ = 135 mmHg). Mechanical ventilation or localized exhaust ventilation may be required. Wear appropriate personal protective equipment. Observe the rules of good industrial hygiene.

7.2. Conditions for safe storage, including any incompatibilities

Store in a place where adequate ventilation is ensured, away from direct sunlight at a temperature below 50°C / 122°F, away from any combustion sources.

Prevent the buildup of electrostatic discharge using normal grounding and bonding techniques. Store in a cool, dry place away from direct sunlight. Cylinders must be stored in an upright position, with the valve protection cap in place e securely fastened to prevent them from falling or being knocked over. Protect cylinders from damage. The stored containers must be subjected to periodic checks to check their general conditions and the possible presence of leaks. Store in the original container tightly closed.

Keep in a well-ventilated place. Store away from incompatible materials (see Section 10 of the safety data sheet).

7.3. Specific end use(s)

No use other than as indicated in section 1.2 of this safety data sheet

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

DIFLUOROMETHANE (R32)

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,142	mg/l
Normal value for fresh water sediment	0,534	mg/kg/d
Normal value for water, intermittent release	1,42	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation				750 mg/m3				7035 mg/m3

VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified ; LOW = low hazard ; MED = medium hazard ; HIGH = high hazard.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

In the identification phase of the relevant material and the relative thickness to be used, it is highly recommended to deal directly with the PPE manufacturer to evaluate the effective protection with regard to the specific characteristics of the same on the basis of use and duration of use.

The following must be considered: compatibility, degradation, breakthrough time and permeation. The gloves have a wear time that depends on the duration and method of use. Latex gloves can give rise to sensitization phenomena.

KRYON 32

THERMAL HAZARDS

Wear cryogenic gloves during the transfer operations or any other operation which may involve contact with the refrigerated gas (ref. UNI EN 511 standard).

SKIN PROTECTION

Wear category I professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

Consider the appropriateness of providing antistatic clothing in the case of working environments in which there is a risk of explosion.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION

A mask with a type AX filter combined with a type P filter should be worn (see standard EN 14387).

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	Liquefied gas	
Colour	colourless	
Odour	ethereal	
Melting point / freezing point	-136 °C	
Initial boiling point	-51,7 °C	
Flammability	Flammable gas	Method: ASTM 681-85
Lower explosive limit	12,7 % (v/v)	Method: ASTM 681-85
Upper explosive limit	33,4 % (v/v)	Method: ASTM 681-85
Flash point	not applicable	
Auto-ignition temperature	648 °C	
Decomposition temperature	not available	
pH	not available	
Kinematic viscosity	not available	
Solubility (water)	280000 mg/l	
Partition coefficient: n-octanol/water	0,2 Log Kow	Method: OECD 107 Temperature: 25 °C
Vapour pressure	13,8 Bar	Temperature: 20 °C
Relative density liquid (water=1)	1,1	
Relative density gas (air=1)	1,8	
Relative vapour density	not available	
Particle characteristics	not applicable	

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Critical temperature (Pure gases)	78,5 °C
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KRYON 32

9.2.2. Other safety characteristics

Information not available

SECTION 10. Stability and reactivity**10.1. Reactivity**

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

Avoid overheating.

10.5. Incompatible materials

Strong reducing or oxidising agents, strong acids or alkalis, hot material.

10.6. Hazardous decomposition products

Hydrogen fluoride (HF), carbon monoxide (CO), carbonyl fluoride reactions COF₂, Carbonyl Fluoride.

SECTION 11. Toxicological information**11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008**ACUTE TOXICITY

Does not meet the classification criteria for this hazard class

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

KRYON 32**CARCINOGENICITY**

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

11.2. Information on other hazards

Based on the available data, the substance is not listed in the main European lists of potential or suspected endocrine disruptors with human health effects under evaluation.

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

LC50 - for Fish	1507 mg/l/96h (ECOSAR v1.00)
EC50 - for Crustacea	652 mg/l/48h (ECOSAR v1.00)
EC50 - for Algae / Aquatic Plants	142 mg/l/72h (ECOSAR v1.00)

12.2. Persistence and degradability

Not rapidly biodegradable, 5% in 28 days (OECD 301 D).

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

The substance does not have persistence, bioaccumulation and toxicity (PBT) properties and is not very persistent and very bioaccumulative. (vPvB).

12.6. Endocrine disrupting properties

Based on the available data, the substance is not listed in the main European lists of potential or suspected endocrine disruptors with environmental

KRYON 32

effects under evaluation.

12.7. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations. (Directive 2008/98/EC and subsequent amendments and adjustments and related national transpositions). Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

The legal responsibility for disposal is the producer / holder of the waste.

To this mixture different CER codes could be applied (European Waste Code) based on the specific circumstances that generated the waste, possible alterations and / or possible contamination.

The product as such, contained in the original packaging, or decanted in an appropriate container for the purpose of disposal, or no longer usable (for example following an accidental spill), must be classified with a CER code that is compatible with the description of the use indicated in section 1.2.

The suitable final destination of the waste must be evaluated by the manufacturer on the basis of the chemical-physical characteristics of the waste, the compatibility with the authorized facility to which it will be given for recovery, and the definitive treatment or disposal according to the procedures established by current regulations .

Disposal through wastewater discharge is not permitted.

For hazardous substances registered according to Regulation EC 1907/2006 (REACH), for which a chemical safety report has been drawn up, refer to the specific information contained in the exposure scenarios attached to this SDS.

CONTAMINATED PACKAGING

Contaminated packaging must be sent, properly labeled, to recovery or disposal in compliance with national waste management regulations and must be classified with the following CER code:

15 01 10*: packaging containing residues of or contaminated by dangerous substances.

SECTION 14. Transport information

14.1. UN number or ID number

ADR / RID, IMDG, IATA: 3252

14.2. UN proper shipping name

ADR / RID: DIFLUOROMETHANE (REFRIGERANT GAS R 32)

IMDG: DIFLUOROMETHANE (REFRIGERANT GAS R 32)

IATA: DIFLUOROMETHANE (REFRIGERANT GAS R 32)

14.3. Transport hazard class(es)

ADR / RID: Class: 2 Label: 2.1

IMDG: Class: 2 Label: 2.1

IATA: Class: 2 Label: 2.1



14.4. Packing group

KRYON 32

ADR / RID, IMDG, IATA: -

14.5. Environmental hazards

ADR / RID: NO
IMDG: NO
IATA: NO

14.6. Special precautions for user

ADR / RID:	HIN - Kemler: 23	Limited Quantities: -	Tunnel restriction code: (B/D)
	Special provision: 662		
IMDG:	EMS: F-D, S-U	Limited Quantities: -	
IATA:	Cargo:	Maximum quantity: 150 Kg	Packaging instructions: 200
	Passengers:	Maximum quantity: Forbidden	Packaging instructions: Forbidden
	Special provision:	A1	

14.7. Maritime transport in bulk according to IMO instruments

Information not relevant

SECTION 15. Regulatory information

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

Seveso Category - Directive 2012/18/EU: P3a

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006

Product

Point *40. Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to that Regulation or not.*

Regulation (EU) 2019/1148 - on the marketing and use of explosives precursors

not applicable

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage \geq than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

KRYON 32

Substances subject to exportation reporting pursuant to Regulation (EU) 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Information not available

Regulation (UE) n. 517/2014 (fluorinated greenhouse gases)

Substances present in Annex I

HFC-32- Difluoromethane (CH₂F₂)

GWP: 675

15.2. Chemical safety assessment

Has not been performed / is not yet available a chemical safety assessment for the substance.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Flam. Gas 1B	Flammable gas, category 1B
Press. Gas (Liq.)	Liquefied gas
H221	Flammable gas.
H280	Contains gas under pressure; may explode if heated.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- ATE: Acute Toxicity Estimate
- CAS: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE: Identifier in ESIS (European archive of existing substances)
- CLP: Regulation (EC) 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: Regulation (EC) 1907/2006

KRYON 32

- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA: Time-weighted average exposure limit
- TWA STEL: Short-term exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
 2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
 3. Regulation (EU) 2020/878 (II Annex of REACH Regulation)
 4. Regulation (EC) 790/2009 (I Atp. CLP) of the European Parliament
 5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
 6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
 7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
 8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
 9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
 10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
 11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
 12. Regulation (EU) 2016/1179 (IX Atp. CLP)
 13. Regulation (EU) 2017/776 (X Atp. CLP)
 14. Regulation (EU) 2018/669 (XI Atp. CLP)
 15. Regulation (EU) 2019/521 (XII Atp. CLP)
 16. Delegated Regulation (UE) 2018/1480 (XIII Atp. CLP)
 17. Regulation (EU) 2019/1148
 18. Delegated Regulation (UE) 2020/217 (XIV Atp. CLP)
 19. Delegated Regulation (UE) 2020/1182 (XV Atp. CLP)
 20. Delegated Regulation (UE) 2021/643 (XVI Atp. CLP)
 21. Delegated Regulation (UE) 2021/849 (XVII Atp. CLP)
 22. Delegated Regulation (UE) 2022/692 (XVIII Atp. CLP)
- The Merck Index. - 10th Edition
 - Handling Chemical Safety
 - INRS - Fiche Toxicologique (toxicological sheet)
 - Patty - Industrial Hygiene and Toxicology
 - N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
 - IFA GESTIS website
 - ECHA website
 - Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for the recipient of the Safety Data Sheet (SDS):

The recipient of this SDS shall make sure of reading and understanding the information included by all people who handle, store, use, or otherwise come into contact in any way with the substance or mixture to which this SDS is referred to. In particular, the recipient shall provide adequate training to the personnel for the use of hazardous substances and/or mixtures. The recipient shall verify the suitability and completeness of the provided information according to the specific use of the substance or mixture.

However, the substance or mixture referred to by this SDS shall not be used for uses other than those specified in Section 1. The Supplier don't assume responsibility for improper uses. Since the use of the product does not fall under the direct control of the Supplier, the user shall, under his own responsibility, fulfill national and EU regulations concerning health and safety.

The information included in this SDS are provided in good faith and are based on the current state of scientific and technical knowledge, at the revision date indicated, available to the Supplier indicated in Section 1 of this SDS. It shall not be meant that the SDS is a guarantee of any specific property of the substance or mixture. The information concern only to the substance or mixture specifically designated in Section 1 and it could not be valid for the substance or mixture used in combination with other materials or in any process not specified in the text.

This version of the SDS substitutes all the previous versions.

Changes to previous review:

The following sections were modified:

01/ 02 / 03 / 04 / 05 / 06 / 07 / 08 / 09 / 10 / 11 / 12 / 13 / 14 / 15 / 16.