MATERIAL SAFETY DATA

M32: DIFLUOROMETHANE

Version: R32.1 Last Revised Date: 12-05-2023

Section 1. Identification of Substance/Mixture and of Company/Undertaking

Product Name	Mafron® 32
Chemical Name	Difluoromethane
Synonyms	Methylene fluoride; HFC-32
Proper shipping name	Difluoromethane (R32)
Chemical Formula	CH_2F_2
CAS NO	75-10-5
Recommended Use	Refrigerant, Aerosol Propellant

Manufacturer Information **NAVIN FLUORINE INTERNATIONAL LIMITED**

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Section 2. Hazards Identification

Classification of the substance or mixture

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Label elements

Hazard pictograms (GHS-US)

Signal Word	Danger

Hazard Statement(s):

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H316	Causes mild skin irritation.
H333	May be harmful if inhaled.

Precautionary Statement(s) Prevention

P377	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P304+P312	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P332+P313	IF INHALED: Call a POISON CENTER/ doctor/physician/first aider if you feel unwell.
P381	If skin irritation occurs: Get medical advice/attention.
P410+P403	In case of leakage, eliminate all ignition sources.

Section 3. Hazards Identification

CAS No	75-10-5
Component	Difluoromethane
% Weight	> 99.9

Section 4. First Aid Measures

4.1 Description of Necessary Measures

Inhalation

Remove affected personal to fresh air. Place in a position comfortable for breathing.

Call a POISON CENTER or doctor/physician if you feel unwell.

Skin

Wash off immediately with plenty of water.

Change contaminated clothes and shoes.

Consult a physician if necessary.

Eyes

Remove any contact lenses.

Immediately flush with plenty of water for at least 10 minutes.

Keep eye wide open while rinsing.

If symptoms persist, get medical attention.

4.2 Most Important Symptoms/Effects	Most important symptoms/effects, acute and delayed: The most important known symptoms and effects are described in the labelling and/or in section 11.
4.3 Delayed	Not classified.

Section 5. First Aid Measures

Suitable Extinguishing Media	Dry chemical, carbon dioxide, or water spray to extinguish gas (only if absolutely necessary and safe to do so). DO NOT direct water at source of leak or venting safety devices as icing may occur.
Specific Hazards Arising from the Chemical	Contains gas under pressure. Flammable gas. In case of a fire or overheating, pressure may increase, with potential risk of bursting and explosion.
Hazardous Combustion Products	Thermal decomposition generates: hydrogen fluoride, carbon dioxide, carbon monoxide, halogenated compounds.

Section 6. Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions	Accidental releases pose fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For Emergency Responders	Suitable protective equipment mandatory prior to any action. Evacuate the area of all personal immediately.

	Ventilate the area, especially low or enclosed places where heavy vapours might collect. (R32 vapours heavier than air).
Environmental Precautions	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil, or air).
6.2 Methods and Materials for Containment and Cleaning Up	Material evaporates. Ventilate the area, especially low or enclosed places where heavy vapours might collect. Do not use equipment in the clean-up procedure which may produce sparks.

Section 7. Handling and Storage

Precautions for Safe Handling	Store in cool, dry place, away from direct sunlight. Ensure there is sufficient ventilation/exhaust system is present at the area. Do not handle it in a confined space. Earth any equipment used in handling. Use non-sparking tools. Smoking is forbidden.
Hygiene measures	Handle in accordance with good industrial hygiene and safety procedures.
Conditions for Safe Storage, Including any Incompatibilities	
Technical measures	Comply with applicable regulations.
Storage conditions	Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area.

	Eliminate all ignition sources. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Keep container tightly closed and sealed until ready for use.
Incompatible materials	Refer to Section 10 on Incompatible Materials.
Storage temperature	Cylinder temperatures should not exceed 52°C (125°F).

Section 8. Exposure Controls / Personal Protection

Control Parameter

Ingredient	TEEL*-1	TEEL-2	TEEL-3	TWA**
Difluoromethane	3000 PPM	6500 PPM	39000 PPM	1000 PPM

* Temporary Emergency Exposure Limits
** Total Weight Average

Appropriate Engineering Controls

Vented gas is flammable, and may spread from its origin. The vent path must not contain ignition sources, pilot lights, or naked flames.

Secondary containment and exhaust gas treatment may be required by certain jurisdictions.

Local exhaust ventilation (explosion-proof) is usually required in workplaces.

Consideration should be given to the use of doubly-contained piping; diaphragm or bellows-sealed, soft-seat valves; backflow prevention devices; flash arrestors and flow-monitoring or limiting devices.

Automated controls should ensure that workplace atmospheres do not exceed 25% of the lower explosive limit (LEL) (if available).

Monitor the work area and secondary containments for release of gas.

	Automated alerting systems with automatic shutdown of gas-flow may be appropriate and may in fact be mandatory in certain jurisdictions. Respiratory protection in the form of air-supplied or self-contained breathing equipment must be worn if the oxygen concentration in the workplace air is less than 19%. Cartridge respirators DO NOT give protection and may result in rapid suffocation.
Eye Protection	Safety eyewear complying with an approved standard should be used.
Skin Protection	Protective clothing should be worn including full body overalls, anti-static boots and gloves.
Glove Recommendations	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Cryogenic and leather gloves are recommended.
Respiratory Protection	Use suitable respiratory protective device in case of insufficient ventilation. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. IN CONFINED SPACES:
Other Protection	SCBA (Self-Contained Breathing Apparatus), Rescue Harness, lines etc. For large-scale or continuous use, wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets). Non-sparking safety or conductive footwear should be considered.

SECTION 9. Physical and Chemical Properties

Physical State	Compressed Gas
Appearance	Colourless gas
Odour	Odourless
pH	
Melting/Freezing Point	-136ºC
Boiling Point	-52 ºC
Flash point	Not Available
Auto Ignition Temperature	648ºC
Decomposition Temperature	>250ºC
Upper Flammability Limit (vol %)	33.4
Lower Flammability Limit (vol %)	13
Water Solubility	Sparingly soluble
Viscosity (cSt)	Not Available
Vapour Pressure	1705 kPa (25ºC)
Vapour Density (air = 1)	1.8
Relative density (Water = 1)	34.6
Molecular weight	52.03 (g/mol)
Evaporation rate	Not Available
Partition coefficient n-octanol/ water	Not Available

SECTION 10. Stability and Reactivity

Chemical Stability	Stable at normal conditions.
Possibility of Hazardous Reactions	Can form a potentially explosive atmosphere in air. May react violently with oxidants.

Conditions to Avoid	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Incompatible Materials	Strong oxidizing agents. Alkali metals like Calcium, Potassium, Magnesium and Aluminium.
Hazardous Decomposition	Under normal conditions of storage and use, hazardous decomposition products should not be produced. In case of decomposition at either elevated temperature or pressure products formed include hydrogen fluoride, carbon dioxide, carbon monoxide, halogenated compounds.
Hazardous polymerization	Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological Information

Acute toxicity	Oral: Based on available data, the classification criteria are not met.
Ingestion	Ingestion of liquid can cause burns similar to frostbite.
Skin Contact	Dermal contact with rapidly evaporating liquid could result in the freezing of the tissues or frostbite.
Eye Contact	Liquid can cause burns similar to frostbite.
Immediate Effects	May cause respiratory irritation.
Germ cell mutagenicity	No known significant effects or critical hazards.
Carcinogenicity	No classification data on the carcinogenic properties of this material is available from the EPA (environmental protection agency), IARC (international agency for research on cancer), OSHA (occupational safety and health administration), or ACGIH (American conference of governmental industrial hygienists).
Mutagenicity	No known significant effects or critical hazards.

Aspiration hazard	No effects are known.

Section 12. Ecological Information

12.1 Toxicity	
Acute toxicity	No ecological damage was caused by this product
Acute toxicity - Fish	LC-50 (96h): 1.507 mg/l
Algae or other aquatic plants	EC-50 (96h): 142mg/l
NOEC (ECx)	EC-50 (96h): 10 mg/l
12.2 Persistence and degradability	Water/Soil: Low Air: Low
12.3 Bio-accumulative potential	Bioaccumulation: Low (LOG K_{OW} = 0.2) Mobility in soil: Low (KOC=23.74)
12.5 Results of PBT and vPvB Assessment	The components in this formulation do not meet the criteria for classification as PBT or vPvB
12.6 Other adverse effects	Global warming potential: 675 Contains fluorinated greenhouse gases When discharged in large quantities may contribute to the greenhouse effect. For the GWP value of the mixture and quantities, refer to the container label.

Section 13. Disposal Considerations

Waste from residues/unused products	In accordance with applicable regulations.
Product / Packaging Disposal	Return empty containers to the supplier.
Contaminated packaging	In accordance with applicable regulations.
Other information	Recycle the material as far as possible.

Section 14. TRANSPORT INFORMATION

Labels required

Marine Pollutant NO

Land transport (UN)

UN number 3252

UN proper shipping name DIFLUOROMETHANE (REFRIGERANT GAS R 32)

Transport hazard class(es)

Class 2.1

Sub risk Not Applicable

Packing group Not applicable

Environmental hazard Not applicable

Special precautions for user

Special Provisions Not Applicable

Limited Quantity 0

Air transport (ICAO-IATA / DGR)

UN number 3252

UN proper shipping name Refrigerant gas R 32; Difluoromethane

Transport hazard class(es)

ICAO/IATA Class 2.1

ICAO/IATA Sub risk Not Applicable

ERG Code 10L

Packing group Not applicable

Environmental hazard Not applicable

Special precautions for user

Special provisions Not Applicable

Cargo Only Packing Instructions	200
Cargo Only Maximum Qty / Pack	150 kg
Passenger and Cargo Packing Instructions	Forbidden
Passenger and Cargo Maximum Qty / Pack	Forbidden
Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

Sea transport (ICAO-IATA / DGR)

UN number	3252
UN proper shipping name	Refrigerant gas R 32; Difluoromethane
Transport hazard class(es)	
ICAO/IATA Class	2.1
ICAO/IATA Sub risk	Not Applicable
ERG Code	10L
Packing group	Not applicable
Environmental hazard	Not applicable
Special precautions for user	
EMS Number	F-D, S-U
Several Provisions	Not Applicable
Limited Quantities	0

Transport in bulk according to Annex II of MARPOL and the IBC code	Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product Name	Difluoromethane
Group	Not Available

Transport in bulk in accordance with the ICG Code

Product Name	Difluoromethane
Group	Not Available

Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture
National Inventory Status

Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (difluoromethane)
China - IECSC	No (difluoromethane)
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Mexico - INSQ	Yes
Philippines - PICCS	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend	Yes = All CAS-declared ingredients are on the inventory

No = One or more of the CAS-listed ingredients are not on the inventory. These ingredients may be exempt or will require registration

Section 16. Other Information

Other Information

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. NFIL shall not be held liable for any damage resulting from handling or contact with the above product.