

ORAFON R-32

MATERIAL SAFETY DATA SHEET (MSDS)

ORAFON R-32

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name : ORAFON R-32
Synonyms : HFC-32, Refrigerant Gas (R-32, Difluoromethane HFC-32)
Supplier : ORANOSS CO., LTD.
Address : 89 Moo 12, Soi Raikhing 42, Phutthamonthon Sai 5 Road., Tambol Raikhing, Ampur Sampran, Nakhonpathom 73210 Thailand
Emergency Phone : Tel : +66 (0) 2105 0499 (Auto) Fax : +66 (0) 2105 0490

2. HAZARDS IDENTIFICATION

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.

Label elements



GHS02 flame



GHS04

Signal word

Danger

Hazard Statements

H220

Extremely flammable gas.

H280

Contains gas under pressure; may explode if heated.

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.

POTENTIAL HEALTH HAZARDS

Skin

Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

Eyes

Liquid contact can cause severe irritation and frostbite. Mist may irritate.

Inhalation

R-32 is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

Ingestion

Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

EMERGENCY OVERVIEW

Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrochloric Acid (HCl), Hydrofluoric Acid (HF) and carbonyl halides.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name

Difluoromethane

CAS Number

75-10-5

Weight

100%

4. FIRST AID MEASURES

Skin

Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

Eyes

Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite, water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

Inhalation

Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. DO NOT give epinephrine (adrenaline).

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Ingestion

Ingestion is unlikely because of the physical properties and is not expected to be hazardous. DO NOT induce vomiting unless instructed to do so by a physician.

Advice to Physician

Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

5. FIRE-FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT	: Gas, not applicable per DOT regulations
FLASH POINT METHOD	: Not applicable
AUTOIGNITION TEMPERATURE	: Unknown
UPPER FLAME LIMIT (volume % in air)	: 33.4%
LOWER FLAME LIMIT (volume % in air)	: 12.7%
FLAME PROPAGATION RATE (solids)	: Not applicable
OSHA FLAMMABILITY CLASS	: Not applicable

EXTINGUISHING MEDIA

Use any standard agent - choose the one most appropriate for type of surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE

(Always wear recommended personal protective equipment.)

Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low-lying areas.

Spills and releases may have to be reported to Federal and/or local authorities.

7. HANDLING AND STORAGE

NORMAL HANDLING

(Always wear recommended personal protective equipment.)

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

STORAGE RECOMMENDATIONS

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

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EYE PROTECTION

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

EXPOSURE GUIDELINES

INGREDIENT NAME

Difluoromethane

ACGIH TLV

none

OSHA PEL

none

OTHER LIMIT

**1000 ppm TWA (8hr)

* = Limit established by National Refrigerants, Inc.

** = Workplace Environmental Exposure Level (AIHA)

*** = Biological Exposure Index (ACGIH)

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS

Hydrogen Fluoride: ACGIH TLV = 3 ppm ceiling

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	: Clear, colorless liquid and vapor
PHYSICAL STATE	: Gas at ambient temperatures
MOLECULAR WEIGHT	: 52
CHEMICAL FORMULA	: CH ₂ F ₂
ODOR	: Faint ethereal odor
SPECIFIC GRAVITY (water = 1.0)	: 1.002 @ 26.7 °C (80 °F)
SOLUBILITY IN WATER (weight %)	: unknown
PH	: Neutral
BOILING POINT	: -51.7 °C (-61°F)
FREEZING POINT	: -136 °C (-212 °F)
VAPOR PRESSURE	: 220.3 psia @ 70 °F 504.8 psia @ 130 °F
VAPOR DENSITY (air = 1.0)	: 1.8
EVAPORATION RATE	: >1 COMPARED TO : CC1 ₄ = 1
% VOLATILES	: 100
FLASH POINT	: Not applicable

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

The product is stable under normal conditions. Explosions may result if in the flammable range. Any source of high temperatures, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

INCOMPATIBILITIES

(Under specific conditions: e.g. very high temperatures and/or appropriate pressures) - Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS

Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

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IMMEDIATE (ACUTE) EFFECTS

LC50: 4 hr. (rat) - > 520,000 ppm / Cardiac Sensitization NOEL -350,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Teratogenic NOEL (rat and rabbit)- 50,000 ppm

Subchronic inhalation (rat) NOEL - 50,000 ppm

OTHER DATA

Not active in four genetic tests.

12. ECOLOGICAL INFORMATION

Degradability (BOD)

R-32 is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient

Not applicable

13. DISPOSABLE CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded?

Not a hazardous waste

If yes, the RCRA ID number is: Not applicable

OTHER DISPOSAL CONSIDERATIONS

Disposal must comply with federal, state, and local disposal or discharge laws. R-32 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORTATION INFORMATION

US DOT PROPER SHIPPING NAME : Difluoromethane

US DOT HAZARD CLASS : 2.1

US DOT PACKING GROUP : Not applicable

US DOT ID NUMBER : UN3252

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS : Listed on the TSCA inventory

OTHER TSCA ISSUES : None

ADDITIONAL REGULATORY INFORMATION

R-32 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.

WARNING: DO NOT vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. Contains Difluoromethane, a greenhouse gas which may contribute to global warming

16. OTHER INFORMATION

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product that conforms to the specification, unless otherwise stated. In the case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and environment.

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