

SPECIFICATION

REV_001-2011

DATE_26082011

Product Name : ORAFON HFC - 23

Packaging Size : 8 kgs/dac

TEST ITEM	Unit	SPECIFICATION
Appearance		Colorless
Purity HFC – 23	% wt.	≥ 99.8
Moisture	ppm	≤ 10
Evaporation Residue	ppm	≤ 100
Acidity (HCl)	ppm	≤ 0.1
Boiling Point	°C	- 82.2
Melting Point	°C	- 152.15

ORANOSS CO., LTD

Rosemali Panch
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ORAFON R23

1. PRODUCT AND COMPANY IDENTIFICATION

Identification of the substance/preparation

Product name : Refrigerant R23
Synonyms : HFC-23, HFA-23

Supplier : ORANOSS CO., LTD.
Address : 127/24 Panjathani Tower, 19th Floor, Non-si Rd., Chong Non-si, Yannawa, Bangkok 10120 Thailand

Emergency Phone : Tel: +66 (0) 2105 0499 Fax : +66 (0) 2105 0490 (Office hours)
Chemical Name : Trifluoromethane
Molecular formula : CHF₃
Molecular Weight : 70 g/mol

2. COMPOSITION/INFORMATION ON INGREDIENT

Trifluoromethane

CAS-No. : 75-46-7
EINECS-No. : 200-872-4
Concentration : >= 99.50 %

3. HAZARDS IDENTIFICATION

Appearance : compressed liquefied gas
Colour : colourless
Odour : ether-like

- Liquefied gas
- Substance non classified according to Directive Oxygen or cardiopulmonary resuscitation if necessary.
- If symptoms persist, call a physician.

4. FIRST AID MEASURES

4.1. Inhalation

- Remove to fresh air.
- Oxygen or cardiopulmonary resuscitation if necessary.
- If symptoms persist, call a physician.

4.2. Eye contact

- Keep eyelids open to allow evaporation of product.
- Flush eyes with running water for several minutes, while keeping the eyelids wide open.
- If eye irritation persists, consult a specialist.

4.3. Skin contact

- Allow to evaporate.
- Rinse with lukewarm running water.
- If symptoms persist, call a physician.

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4.4. Ingestion

The following actions are recommended:

- Not applicable

If victim is conscious:

- None

If victim is unconscious but breathing:

- Not applicable

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Extinguishing media which must not be used for safety reasons

- None.

5.3. Special exposure hazards in a fire

- The product is not flammable.
- Hazardous decomposition products

5.4. Special protective equipment for fire-fighters

- Evacuate personnel to safe areas.
- Wear self-contained breathing apparatus and protective suit.
- When intervention in close proximity wear acid resistant over suit.
- Clean contaminated surface thoroughly.

5.5. Other information

- If safe to do so, remove the exposed containers, or cool with large quantities of water.
- As for any fire, ventilate and clean the rooms before re-entry.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions

- Refer to protective measures listed in sections 7 and 8.
- Ventilate the area.
- Prevent further leakage or spillage if safe to do so.
- Keep away from incompatible products

6.2. Environmental precautions

- Should not be released into the environment.

6.3. Methods for cleaning up

- Allow to evaporate.
- Prevent product from entering drains.

7. HANDLING AND STORAGE

7.1. Handling

- Use only in well-ventilated areas.
- Prevent product vapours decomposition from contacting hot spots.
- Prevent product vapours decomposition from electric arc action (welding).
- Use only equipment and materials which are compatible with the product.
- Keep away from heat and sources of ignition.
- Keep away from incompatible products

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7.2. Storage

- Keep in a cool, well-ventilated place.
- Keep away from heat.
- Keep away from incompatible products

7.3. Specific use(s)

- For further information, please contact: Supplier

7.4. Packaging material

- Steel Cylinder

7.5. Other information

- Warn people about the dangers of the product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Exposure Limit Values

Trifluoromethane

- US. ACGIH Threshold Limit Values

Remarks: none established

8.2. Exposure controls

- Ensure adequate ventilation.
- Apply technical measures to comply with the occupational exposure limits.

8.2.1. Occupational exposure controls

8.2.1.1. Respiratory protection

- In case of insufficient ventilation, wear suitable respiratory equipment.
- Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.

8.2.1.2. Hand protection

- Wear suitable gloves.
- Recommended materials: Polyvinyl alcohol

8.2.1.3. Eye protection

- Chemical resistant goggles must be worn.
- If risk of splashing, chemical proof goggles/face shield.

8.2.1.4. Skin and body protection

- Apron/boots of neoprene if risk of splashing.

8.2.1.5. Hygiene measures

- Shower and eye wash stations.
- Gloves, overalls and boots have to be double layered (protection against cold temperature).

8.2.2. Environmental exposure controls

- Dispose of rinse water in accordance with local and national regulations.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information (appearance, odour)

Appearance	:	compressed liquefied gas
Colour	:	colourless
Odour	:	ether-like

9.2. Important health safety and environmental information

pH	:	Remarks: neutral
Boiling point/range	:	= -82.1°C
Flash point	:	Remarks: no data available
Flammability	:	<u>Lower explosion limit:</u> Remarks: No flammability limit in air, the product is not flammable.
Explosive properties	:	<u>Explosion danger:</u> Remarks: See section 10.
Oxidizing properties	:	Remarks: Non oxidizer
Vapour pressure	:	= 41.85 bar Temperature: 20°C
Relative density / Density	:	= 0.62
Solubility	:	Water = 1.001 g/l Temperature: 20 °C
Partition coefficient (n- octanol/water)	:	Remarks: Pressure = 1 bar Remarks: no data available
Viscosity	:	Dynamic viscosity (liquid) = 0.106 mPa.s Temperature: 25°C
Vapour density	:	= 2.4

9.3. Other data

Freezing point:	:	= -155°C
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10. STABILITY AND REACTIVITY

10.1. Stability

- Strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions.
- Vapours are heavier than air and may spread along floors.

10.2. Conditions to avoid

- Heat.

10.3. Materials to avoid

- Light and/or alkaline metals

10.4. Hazardous decomposition products

- Hydrogen fluoride
- Fluorophosgene

11. TOXICOLOGICAL INFORMATION

11.1. Toxicological data

Acute oral toxicity

- LD50, Remarks: not applicable

Acute inhalation toxicity

- LC0, 2 h, rat, 0.573 g/l

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Acute dermal toxicity

- LD50, Remarks: not applicable

Irritation (other route)

- No irritation signs noted during toxicity testing.

Sensitization

- No data

Chronic toxicity

- Inhalation, Repeated exposure, rat, NOEL: 1 %, no observed effect
- Inhalation, Repeated exposure, dog, NOEL: 0.50 %, no observed effect

Possible hazards (summary)

- No appreciable toxic effect
- Ambiguous mutagenic effect

11.2. Health effects

Inhalation

- At high concentrations, risk of asphyxia by lack of oxygen.

Eye contact

- (gas)
- Risk of moderate consequences experimentally observed or under certain conditions.
- (Liquefied gas)
- Severe eye irritation, watering, redness and swelling of the eyelids.
- Risk of burns (frostbite).

Skin contact

- (gas)
- Negligible
- (liquefied gas)
- Cold sensation followed by redness of the skin.
- May cause frostbite.

Ingestion

- Impossible risk (gas).

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity

- Remarks: no data available

Chronic toxicity

- Remarks: no data available

12.2. Mobility

- Air, Henry's law constant (H) ca. 290 kPa.m³/mol
Conditions: 20 °C / calculated value
Remarks: considerable volatility
- Soil/sediments, adsorption, log KOC: from 1.66 - 2.04
Conditions: calculated value

12.3. Persistence and degradability

Biodegradation

- Remarks: no data available

12.4. Bioaccumulative potential

- Result: no data available

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12.5. Other adverse effects

- Ozone Depletion Potential:
Ozone depletion potential; ODP; (R-11 = 1) = 0
Result: no effect on stratospheric ozone
Remarks: Ozone depletion potential; ODP; (R-11 = 1)
- Global Warming Potential:
GWP ca. 6
Remarks: Halocarbon global warming potential; HGWP; (R-11 = 1)

12.6. Possible hazards (summary)

- Product is persistent in air.

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.

13.2. Packaging treatment

- To avoid treatments, as far as possible, use dedicated containers.

14. TRANSPORT INFORMATION

UN-No.	1984
IATA-DGR	
Class	2.2
ICAO-Labels	NON FLAMMABLE GAS
Proper shipping name: TRIFLUOROMETHANE	
IMDG	
Class	2.2
IMDG-Labels	COMPRESSED GAS NON FLAMMABLE
HI/UN No.	1984
EmS: F-C, S-V	
Proper shipping name: TRIFLUOROMETHANE	
ADR	
Class	2
ADR/RID-Labels	2.2
HI/UN No.	20/1984
Proper shipping name: TRIFLUOROMETHANE	
RID	
Class	2
ADR/RID-Labels	2.2 + 13
HI/UN No.	20/1984
Proper shipping name: TRIFLUOROMETHANE	

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15. REGULATORY INFORMATION

EC Label

- Not classified according to Directive 67/548/EEC.


16. OTHER INFORMATION

Administrative information

- Update
This data sheet contains changes from the previous version in section(s): 1.4, 16
- Distribute new edition to clients

The information in this Material Safety Data Sheet only concerns the above-mentioned product and does not relate to use with other product(s) or in any process. This information is to our best present knowledge correct and complete and is given in good faith but without warranty. It remains the user's own responsibility to ensure that the information is appropriate and correct for his special use of this product.

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