

**DuPont™ Freon® 22 Refrigerant**

Version 2.1

Revision Date 03/16/2015

Ref. 130000024323

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : DuPont™ Freon® 22 Refrigerant
Tradename/Synonym : R-22
Freon® 22
CHLORODIFLUOROMETHANE
HCFC-22
DYMEL® 22

Product Grade/Type : ASHRAE Refrigerant number designation: R-22

Product Use : Refrigerant, For industrial use only.

Restrictions on use : Do not use product for anything outside of the above specified uses
Manufacturer/Supplier : DuPont
1007 Market Street
Wilmington, DE 19898
United States of America

Product Information : +1-800-441-7515 (outside the U.S. +1-302-774-1000)
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency : CHEMTREC: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

SECTION 2. HAZARDS IDENTIFICATION

Product hazard category
Gases under pressure Liquefied gas



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Label content

Pictogram :



Signal word : Warning

Hazardous warnings : Contains gas under pressure; may explode if heated.

Hazardous prevention measures : Protect from sunlight. Store in a well-ventilated place.

Other hazards

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing., Rapid evaporation of the liquid may cause frostbite., Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects., May cause cardiac arrhythmia.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS-No. | Concentration |
|---------------------------------|---------|---------------|
| Chlorodifluoromethane (HCFC-22) | 75-45-6 | 100 % |

SECTION 4. FIRST AID MEASURES



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- General advice : Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.
- Inhalation : Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Call a physician.
- Skin contact : Take off all contaminated clothing immediately. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.
- Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- Ingestion : Is not considered a potential route of exposure.
- Most important symptoms/effects, acute and delayed : No applicable data available.
- Protection of first-aiders : If potential for exposure exists refer to Section 8 for specific personal protective equipment.
- Notes to physician : Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : As appropriate for combustibles in area. Extinguishant for other burning material in area is sufficient to stop burning.
- Unsuitable extinguishing media : No applicable data available.



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- Specific hazards** : Cylinders are equipped with pressure and temperature relief devices, but may still rupture under fire conditions. Decomposition may occur. Contact of welding or soldering torch flame with high concentrations of refrigerant can result in visible changes in the size and colour of the torch flame. This flame effect will only occur in concentrations of product well above the recommended exposure limit. Therefore stop all work and ventilate to disperse refrigerant vapors from the work area before using any open flames. This substance is not flammable in air at temperatures up to 100 deg. C (212 deg. F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. This substance can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing this substance and air, or this substance in an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example this substance should NOT be mixed with air under pressure for leak testing or other purposes. Experimental data have also been reported which indicate combustibility of this substance in the presence of certain concentrations of chlorine.
- Special protective equipment for firefighters** : In the event of fire, wear self-contained breathing apparatus. Wear neoprene gloves during cleaning up work after a fire.
- Further information** : Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are released under fire conditions.
Cool containers/tanks with water spray. Water runoff should be contained and neutralized prior to release.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

- Safeguards (Personnel)** : Evacuate personnel to safe areas. Ventilate the area. Refer to protective measures listed in sections 7 and 8.
- Environmental precautions** : Should not be released into the environment.

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- Spill Cleanup : Evaporates.
Ventilate area using forced ventilation, especially low or enclosed places where heavy vapors might collect.
- Accidental Release Measures : Ventilate area, especially low or enclosed places where heavy vapours might collect. Avoid open flames and high temperatures. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

SECTION 7. HANDLING AND STORAGE

- Handling (Personnel) : Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8.
The product should not be mixed with air for leak testing or used with air for any other purpose above atmospheric pressure. Contact with chlorine or other strong oxidizing agents should also be avoided.
Handle in accordance with good industrial hygiene and safety practice.
- Handling (Physical Aspects) : No special protective measures against fire required.
- Dust explosion class : No applicable data available.
- Storage : Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over.
Separate full containers from empty containers. Keep at temperature not exceeding 52°C. Do not store near combustible materials. Avoid area where salt or other corrosive materials are present.
The product has an indefinite shelf life when stored properly.
- Storage period : > 10 yr
- Storage temperature : < 52 °C (< 126 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION



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- Engineering controls : Ensure adequate ventilation, especially in confined areas. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.
- Personal protective equipment
 - Respiratory protection : Under normal manufacturing conditions, no respiratory protection is required when using this product. For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
 - Hand protection : Additional protection: Impervious gloves
 - Hand protection : Additional protection: Protective gloves complying with EN 374., or, US OSHA guidelines
 - Eye protection : Safety glasses with side-shields Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.
 - Protective measures : Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines
Exposure Limit Values

| | | | |
|-----------------------|---------|-----------|-----|
| Chlorodifluoromethane | | | |
| TLV | (ACGIH) | 1,000 ppm | TWA |

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance
 - Physical state : gaseous
 - Form : Liquefied gas
 - Color : clear
- Odor : slight, ether-like
- Odor threshold : No applicable data available.
- pH : neutral

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| | |
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| Melting point/range | : No applicable data available. |
| Boiling point/boiling range | : Boiling point -40.8 °C (-41.4 °F) at 1,013 hPa |
| Flash point | : does not flash |
| Evaporation rate | : > 1 (CCL4=1.0) |
| Flammability (solid, gas) | : No applicable data available. |
| Upper explosion limit | : Method: None per ASTM E681 |
| Lower explosion limit | : Method: None per ASTM E681 |
| Vapor pressure | : 10,439.0 hPa at 25 °C (77 °F) |
| Vapor density | : 3.0 at 25°C (77°F) and 1013 hPa (Air=1.0) |
| Density | : 1.191 g/cm ³ at 25 °C (77 °F) (as liquid) |
| Specific gravity (Relative density) | : 1.19 at 25 °C (77 °F) |
| Water solubility | : 2.6 g/l at 25 °C (77 °F) |
| Solubility(ies) | : No applicable data available. |
| Partition coefficient: n-octanol/water | : No applicable data available. |
| Auto-ignition temperature | : No applicable data available. |
| Decomposition temperature | : 632 °C |
| Viscosity, kinematic | : No applicable data available. |
| Viscosity | : No applicable data available. |
| % Volatile | : 100 % |



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SECTION 10. STABILITY AND REACTIVITY

| | |
|------------------------------------|--|
| Reactivity | : Decomposes on heating. |
| Chemical stability | : Stable at normal temperatures and storage conditions. |
| Possibility of hazardous reactions | : Polymerization will not occur. Other burning materials may cause HCFC 22 to burn weakly. Chlorodifluoromethane is not flammable at ambient temperatures and atmospheric pressure. However, chlorodifluoromethane has been shown in tests to be combustible at pressures as low as 60 psig at ambient temperature when mixed with air at concentrations of 65 volume % air. Experimental data have also been reported which indicate combustibility of HCFC 22 in the presence of certain concentrations of chlorine. |
| Conditions to avoid | : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions. Avoid open flames and high temperatures. |
| Incompatible materials | : Alkali metals Alkaline earth metals, Powdered metals, Powdered metal salts |
| Hazardous decomposition products | : Decomposition products are hazardous., This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides., These materials are toxic and irritating., Avoid contact with decomposition products |

SECTION 11. TOXICOLOGICAL INFORMATION

| | |
|--|--|
| Chlorodifluoromethane (HCFC-22) | |
| Inhalation 4 h LC50 | : > 150000 ppm , Mouse |
| Inhalation Low Observed Adverse Effect Concentration (LOAEC) | : 50000 ppm , Dog Cardiac sensitization |
| Inhalation No Observed Adverse Effect Concentration | : 25000 ppm , Dog Cardiac sensitization |
| Skin irritation | : Not expected to cause skin irritation based on expert review of the properties of the substance. |


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- Eye irritation : Not expected to cause eye irritation based on expert review of the properties of the substance.
- Skin sensitization : Not expected to cause sensitization based on expert review of the properties of the substance.
- Repeated dose toxicity : Inhalation
 Mouse
 -
 gas
 No toxicologically significant effects were found.
- Carcinogenicity : Not classifiable as a human carcinogen.
 Overall weight of evidence indicates that the substance is not carcinogenic.
- Mutagenicity : Animal testing did not show any mutagenic effects.
 Experiments showed mutagenic effects in cultured bacterial cells.
- Reproductive toxicity : No toxicity to reproduction
- Teratogenicity : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

Carcinogenicity

The carcinogenicity classifications for this product and/or its ingredients have been determined according to HazCom 2012, Appendix A.6. The classifications may differ than those listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or those found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition).

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 12. ECOLOGICAL INFORMATION
Aquatic Toxicity
Chlorodifluoromethane (HCFC-22)

96 h LC50 : Zebra fish 777 mg/l

96 h EC50 : Algae 250 mg/l



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48 h EC50 : Daphnia magna (Water flea) 433 mg/l

Environmental Fate

Chlorodifluoromethane (HCFC-22)
Biodegradability

: According to the results of tests of biodegradability this product is not readily biodegradable.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste disposal methods - Product : Can be used after re-conditioning. Recover, reclaim by distillation, or remove to a permitted waste disposal facility. Comply with applicable Federal, State/Provincial and Local Regulations.

Contaminated packaging : Empty pressure vessels should be returned to the supplier.

SECTION 14. TRANSPORT INFORMATION

| | | |
|--------|----------------------|-------------------------|
| DOT | UN number | : 1018 |
| | Proper shipping name | : Chlorodifluoromethane |
| | Class | : 2.2 |
| | Labelling No. | : 2.2 |
| IATA_C | UN number | : 1018 |
| | Proper shipping name | : Chlorodifluoromethane |
| | Class | : 2.2 |
| | Labelling No. | : 2.2 |
| IMDG | UN number | : 1018 |
| | Proper shipping name | : CHLORODIFLUOROMETHANE |
| | Class | : 2.2 |
| | Labelling No. | : 2.2 |

SECTION 15. REGULATORY INFORMATION



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| | | |
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| TSCA | : | On the inventory, or in compliance with the inventory |
| SARA 313 Regulated Chemical(s) | : | Chlorodifluoromethane |
| PA Right to Know Regulated Chemical(s) | : | Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Chlorodifluoromethane |
| NJ Right to Know Regulated Chemical(s) | : | Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Chlorodifluoromethane |
| California Prop. 65 | : | Chemicals known to the State of California to cause cancer, birth defects or any other harm: none known |

SECTION 16. OTHER INFORMATION

Freon is a registered trademark of E. I. duPont de Nemours & Company, Inc.

® DuPont's registered trademark

Before use read DuPont's safety information. For further information contact the local DuPont office or DuPont's nominated distributors.

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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