R-22

Safety Data Sheet according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision Date: 03/20/2015 Date of issue: 0 3 /20/2015 Version: 1.0

SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Substance

Product Name: R-22

Intended Use of the Product

Refrigerant

Name, Address, and Telephone of the Responsible Party

Company

ICOR International
10640 E 59th St.
Indianapolis, IN 46236
800-497-6805 (Monday-Friday, 7:30 am-4:30 pm ET)

Emergency Telephone Number

Emergency number : CHEMTREC 800-424-9300 (24 Hours/Day, 7 Days/Week)

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)

Simple Asphyxiant
Liquefied gas H280
Ozone 1 H420

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

GHS04 GHS07

Signal Word (GHS-US) : Warning

Hazard Statements (GHS-US) : H280 - Contains gas under pressure; may explode if heated
May displace oxygen and cause rapid suffocation
H420 - Harms public health and the environment by destroying ozone in the upper atmosphere

Precautionary Statements (GHS-US) : P410+P403 - Protect from sunlight. Store in a well-ventilated place
P502 - Refer to manufacturer/supplier for information on recovery/recycling

Other Hazards

Other Hazards Not Contributing to the Classification: Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Liquid contact with eyes or skin may cause frostbite.

Unknown Acute Toxicity (GHS-US) Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances: Substance

Name	Product identifier	% (w/w)	Classification (GHS-US)
Chlorodifluoromethane (HCFC-22)	75-45-6	100.00%	Simple Asphyxiant, Liquefied gas, H280 Ozone 1, H420

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

Skin Contact: Rinse immediately with plenty of water. Obtain medical attention if irritation develops or persists.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

Most Important Symptoms and Effects Both Acute and Delayed

General: Vapors are heavier than air and may cause Asphyxiantxia by reduction of the oxygen content.

Inhalation: May cause respiratory irritation.

Skin Contact: May cause skin irritation. Liquid contact may cause frostbite.

Eye Contact: May cause eye irritation.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: None expected under normal conditions of use.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: None known.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Hot Shot is not flammable at atmospheric pressure and in air at temperatures up to 100 °C (212 °F). Hot shot should not exist with air/excess oxygen at elevated pressures and high temperatures. Hot Shot can become combustible with high concentrations of air at elevated pressure and/or temperature and in the presence of an ignition source. Theis substance can also become combustible in an oxygen enriched environment (oxygen concentrations greater tha that in air). For example, do not mix Hot Shot with air under pressure for leak detection purposes.

Explosion Hazard: Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO_2). Halogenated hydrocarbons. Hydrogen Fluoride (HF).

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid all contact with skin, eyes, or clothing. Avoid breathing vapor, gas.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Ventilate area.

Environmental Precautions
Should not be released into the environment.

Methods and Material for Containment and Cleaning Up
For Containment: Ventilate area.
Methods for Cleaning Up: Isolate area until gas has dispersed.

Reference to Other Sections
See Heading 8. Exposure controls and personal protection.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling
Additional Hazards When Processed: Ruptured cylinders may rocket.
Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities
Technical Measures: Comply with applicable regulations.
Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.
Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.
Storage Area: Store in a well-ventilated place.

Specific End Use(s)
Refrigerant.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE CONTROLS:

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
Personal Protective Equipment: Protective splash goggles. Gloves. Protective clothing.

Materials for Protective Clothing: Chemically resistant materials and fabrics. Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn.
Hand Protection: Impervious butyl rubber gloves.
Eye Protection: Chemical splash goggles or safety glasses.
Skin and Body Protection: Wear suitable protective clothing. Skin contact with refrigerant may cause frostbite.
Respiratory Protection: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
Environmental Exposure Controls: Do not allow the product to be released into the environment.
Consumer Exposure Controls: Do not eat, drink or smoke during use.

Control Parameters

Chlorodifluoromethane (HCFC-22) (75-45-6)

USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	3500 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m³)	4375 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	1250 ppm
Alberta	OEL TWA (mg/m³)	3500 mg/m³
Alberta	OEL TWA (ppm)	1000 ppm
British Columbia	OEL STEL (ppm)	1250 ppm
British Columbia	OEL TWA (ppm)	500 ppm
Manitoba	OEL TWA (ppm)	1000 ppm
New Brunswick	OEL TWA (mg/m³)	3540 mg/m³
New Brunswick	OEL TWA (ppm)	1000 ppm
Newfoundland & Labrador	OEL TWA (ppm)	1000 ppm
Nova Scotia	OEL TWA (ppm)	1000 ppm
Nunavut	OEL STEL (mg/m³)	4400 mg/m³
Nunavut	OEL STEL (ppm)	1250 ppm
Nunavut	OEL TWA (mg/m³)	3520 mg/m³
Nunavut	OEL TWA (ppm)	1000 ppm
Northwest Territories	OEL STEL (mg/m³)	4400 mg/m³
Northwest Territories	OEL STEL (ppm)	1250 ppm
Northwest Territories	OEL TWA (mg/m³)	3520 mg/m³
Northwest Territories	OEL TWA (ppm)	1000 ppm
Ontario	OEL TWA (ppm)	1000 ppm
Prince Edward Island	OEL TWA (ppm)	1000 ppm
Québec	VEMP (mg/m³)	3540 mg/m³
Québec	VEMP (ppm)	1000 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm
Saskatchewan	OEL TWA (ppm)	1000 ppm
Yukon	OEL STEL (mg/m³)	4375 mg/m³
Yukon	OEL STEL (ppm)	1250 ppm
Yukon	OEL TWA (mg/m³)	3500 mg/m³
Yukon	OEL TWA (ppm)	1000 ppm
ICOR AEL*	OEL 8 & 12 hr TWA (ppm)	1000 ppm
AIHA WEEL	OEL 8 hr TWA	1000 ppm, 4900 mg/m3

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State	:	Liquefied Gas
Appearance	:	Colorless
Odor	:	Slightly ethereal
Odor Threshold	:	Not available
pH	:	Neutral
Relative Evaporation Rate (=1)	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	@ 1 atm -41.45 °C (-41.45 °F)
Flash Point	:	Does Not Flash
Auto-ignition Temperature	:	Not available
Decomposition Temperature	:	632°C
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	@ 20 °C (68 °F) 131.99 psia @ 60 °C (140 °F) 352.08 psia
Relative Vapor Density at 20 °C	:	Not available
Relative Density	:	Not available
Density	:	Liquid @ 1 atm. 87.97 lb/ft^3 Vapor @ 1 atm. 0.293 lb/ft^3
Specific Gravity	:	Not available
Solubility	:	Not available
Partition coefficient: n-octanol/water	:	Not available
Viscosity	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.
Conditions to Avoid: Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C.
Decomposes under high temperatures. Can form a combustible mixture with air at pressures above atmospheric pressure.

Incompatible Materials: Alkali metals Alkaline earth metals, Powdered metals, Powdered metal salts.

Hazardous Decomposition Products: Decomposes at high temperatures forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides. Decomposition materials are toxic and therefore, avoid contact.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

IMMEDIATE (ACUTE) EFFECTS:
LC50 Data:
LC_{50} : 4 hr. (rat) - ≥300,000 ppm
Cardiac Sensitization threshold (dog) – 50,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:
Subchronic inhalation (rat) NOEL - 10,000 ppm
Not teratogenic
Not mutagenic in *in-vitro* or *in-vivo* tests
OTHER DATA:
Lifetime exposure of male rats was associated with a small increase in salivary gland fibrosarcomas.

CARCINOGENICITY: None of the ingredients of this product are listed on the NTP, IARC, or OSHA.

SECTION 12: ECOLOGICAL INFORMATION

Chlorodifluoromethane (HCFC-22)

Aquatic Toxicity

96 h LC50: Zebra fish 777 mg/l
96 h EC50: Algae 250 mg/l

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

Biodegradability : According to the results of tests of biodegradability this product is not readily biodegradable.
Toxicity: Not classified
Persistence and Degradability: Not available
Mobility in Soil Not available

Other Adverse Effects
This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82. This product contains greenhouse gases which may contribute to global warming. Do NOT vent to the atmosphere.
To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods : Observe all Federal, State, and Local Environmental regulations. Recover and reclaim for re-use or remove to a permitted waste disposal facility.

This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82. Do not vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. Contains: **Chlorodifluoromethane (HCFC-22)** which harms public health and the environment by destroying ozone in the upper

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name : **Chlorodifluoromethane**
Hazard Class : **2.2**

Identification Number : **UN1018**
Label Codes : **2.2**
ERG Number : **126**

14.2 In Accordance with IMDG

Proper Shipping Name	**: Chlorodifluoromethane**
Hazard Class	**: 2.2**
Identification Number	**: UN1018**
Label Codes	**: 2.2**
EmS-No. (Fire)	**: F-C**
EmS-No. (Spillage)	**: S-V**

14.3 In Accordance with IATA

Proper Shipping Name	**: Chlorodifluoromethane**
Hazard Class	**: 2.2**
Identification Number	**: UN1018**
Label Codes	**: 2.2**
ERG Code (IATA)	**: 2L**

14.4 In Accordance with TDG

Proper Shipping Name	**: Chlorodifluoromethane**
Hazard Class	**: 2.2**
Identification Number	**: UN1018**
Label Codes	**: 2.2**

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

National Regulatory Information:

SARA 302 Components : SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components : SARA 313: Chlorodifluoromethane

SARA 311/312 Hazards : Acute Health Hazard Sudden Release of Pressure Hazard

EPA Clean Air Act: This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82. Do not vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. Contains: **Chlorodifluoromethane (HCFC-22)** which harms public health and the environment by destroying ozone in the upper atmosphere.

Inventories

TSCA (Toxic Substances Control Act) Regulations, 40 CFR 710: All Ingredients are on the TSCA Chemical Substances Inventory.

California Proposition 65 – This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproduction harm.

U.S. Massachusetts – RTK Right to Know Hazardous Substance List of Regulated Chemical(s): Chlorodifluoromethane

U.S. New Jersey - RTK Right to Know List of Regulated Chemical(s): Chlorodifluoromethane

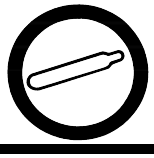
U.S. Pennsylvania – RTK Right to Know List of Regulated Chemical(s): Chlorodifluoromethane

Canada

Canadian Regulations: Canadian Environmental Protection

Chlorodifluoromethane (HCFC-22) – is a substance listed on the **Canadian Domestic Substances List (DSL).**

WHMIS	Class A - Compressed Gas



CEPA Toxic substances: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

CURRENT ISSUE DATE: March, 2015

PREVIOUS ISSUE DATE: August 2007

OTHER INFORMATION: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

H280	Contains gas under pressure; may explode if heated
Liquefied gas	Gases under pressure Liquefied gas
Simple Asphyxiant	Simple Asphyxiant
Ozone 1	Hazardous to the ozone layer Category 1

ICOR International
10640 E 59th St.
Indianapolis, IN 46236
800-497-6805

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

North America GHS US 2012 & WHMIS