

MATERIAL SAFETY DATA SHEET

R22

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Current Issue Date: February, 2003

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R ·22

OTHER/GENERIC NAMES: R-22, HCFC-22

PRODUCT USE: Refrigerant

MANUFACTURER: GALPA PANAMA, S.A.

URB. FRANCE FIELD, AV. 3 C/CALLE8 (507)431-1875/431-1876

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2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME CAS NUMBER WEIGHT%

Chlorodifluoromethane 75-45-6 100

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS.

These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

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 Hydrofluoric Acid (HF) and carbonyl halides such as

phosgene.

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 22 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.

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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.

DELAYED EFFECTS: None known

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME NTP STATUS IARC STATUS OSHA LIST

No ingredients listed in this section

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. Do not give epinephrine (adrenaline).

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): None*

LOWER FLAME LIMIT (volume% in air): None*

*Based on ASHRAE Standard 34 with match ignition

FLAME PROPAGATION RATE (solids): Not applicable

OSHA FLAMMABILITY CLASS: Not applicable

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EXTINGUISHING MEDIA:

Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)

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UNUSUAL FIRE AND EXPLOSION HAZARDS:

R 22 is not flammable at ambient temperatures and atmospheric pressure. However, this material will become

combustible when mixed with air under pressure and exposed to strong ignition sources.

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 lowlying

areas.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

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.

R 22 should not be mixed with air above atmospheric pressure for leak testing or any other purpose. See Section 5:

Unusual Fire and Explosion Hazards

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

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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 the 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 doselevel 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 ACGIH TLV OSHA PEL OTHER LIMIT

Chlorodifluoromethane 1000 ppm TWA
(8hr)

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1000 ppm TWA

(8hr)

None

* = Limit established by Honeywell.

** = 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: 86.45

CHEMICAL FORMULA: CHClF₂

ODOR: Faint ethereal odor

SPECIFIC GRAVITY (water = 1.0): 1.21 @ 21.1 °C (70 °F)

SOLUBILITY IN WATER (weight%): 0.3 wt% @ 25 °C and 1 atmosphere

pH: Neutral

BOILING POINT: -40.8 °C (-41.40 °F)

FREEZING POINT: -160 °C (-256 °F)

VAPOR PRESSURE: 136.1 psia @ 70 °F

311.4 psia @ 130 °F

VAPOR DENSITY (air = 1.0): 3.0

EVAPORATION RATE: >1 COMPARED TO: CCl₄ = 1

% VOLATILES: 100

FLASH POINT: Not applicable

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(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

The product is stable.

Do not mix with oxygen or air above atmospheric pressure. Any source of high temperature, 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 active metals: potassium, calcium,

powdered aluminum, magnesium

and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:

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Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LC50 : 4 hr. (rat) - $\geq 300,000$ 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.

12. ECOLOGICAL INFORMATION

Degradability (BOD): R 22 is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient: Unknown

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded? Not a hazardous waste

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No.	1018
Class	2.2
ERG No.	126
Hazchem warning	2 C Non-flammable gas

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STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME WEIGHT% COMMENT

No ingredients listed in this section

ADDITIONAL REGULATORY INFORMATION:

R 22 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 Chlorodifluoromethane, an HCFC substance which harms public health and the environment by destroying ozone

in the upper atmosphere. Destruction of the ozone layer can lead to increased ultraviolet

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radiation which, with excess

exposure to sunlight, can lead to an increase in skin cancer and eye cataracts.

WHMIS CLASSIFICATION (CANADA):

This product has been evaluated in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

FOREIGN INVENTORY STATUS:

Canada – Listed on DSL

EU – EINECS # 2008719

16. OTHER INFORMATION

CURRENT ISSUE DATE: February, 2003

PREVIOUS ISSUE DATE: January, 2000

CHANGES TOMSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

Section 1: Updated contact information

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0

NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0

ANSI/ASHRAE 34 Safety Group – A1

UL Classified

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101
3. Clean Air Act Class II Substance

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