



安全資料表

危害物料資料

1. 產品與用途								
1.1 物料名稱	R502 Refrigerant							
1.2 用途	雪種							
2. 危害成份								
2.1 危害分類及標籤：								
	有害	有毒	腐蝕性	易燃	刺激性	爆炸性	助燃	
	()	()	()	()	()	()	()	
2.2 酸鹼值(pH)	不適用			2.3 曝露限制(OEL)	不適用			
2.4 致癌物質	沒有			2.5 其他危害	無資料			
2.5 潛在危害	吸入：大量吸入可能會引致麻醉，包括昏迷，心跳不規律及死亡。							
	皮膚接觸：液態濺射可能引致凍傷。							
	眼睛接觸：液態濺射或霧化噴射可能會引致凍傷。							
3. 火警和爆炸資料								
3.1 燃燒物成份比例	無資料		3.2 沸點()	-45.6		3.3 溶點()	無資料	
3.4 閃點()	無資料		3.5 比重	20°C @ 1.24		3.6 氣壓力	20°C @ 7657mmHg	
3.7 爆炸極限(濃度)	不適用		3.8 溶解度	輕微溶解		3.9 氣味	微弱	
3.10 滅火設備	使用合適著火現場的滅火器，用水把火降溫。							
4. 急救處理								
4.1 眼睛接觸	立刻用眼藥水及清水清洗最少 10 分鐘，立刻求醫							
4.2 皮膚接觸	移開沾污之衣服，因衣服會黏緊皮膚，這情況下會凍傷，一旦凍傷，立刻用大量溫水沖洗。							
4.3 食入	不要引起嘔吐，給傷者飲 200-300 毫升之水，立刻求醫。							
4.4 吸入	移開傷者，保持溫暖，如發現有呼吸困難，就須施行人工呼吸及安排約見醫生。							
5. 個人防護裝備								
<input checked="" type="checkbox"/> 防凍手套		<input checked="" type="checkbox"/> 防化學品護眼罩			<input checked="" type="checkbox"/> 口罩			
6. 處理及使用應知事項								
6.1 儲存注意事項:		<ul style="list-style-type: none"> 存放於乾爽清涼的地方 避免太陽直接照射 遠離熱源 儲存溫度：不可高於45°C 						



6.2 意外洩漏處理的方法:	在清除洩漏雪種時，穿上個人防護裝備。分隔洩漏根源，在足夠通風下，令雪種蒸發。 嚴重洩漏時：可用沙、泥土及適當物品吸乾。
7. 其他資料	
- 有害反應：不相容物質會分開金屬、鎂及合金包含有2%以上之鎂，對鹼性金屬會有強烈的化學反應。	
- 如通風不良，應有適當之呼吸裝備供應氧氣	



NATIONAL REFRIGERANTS, INC.

R-502

Safety Data Sheet

R-502

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-502
OTHER NAME: Chlorodifluoromethane, Chloropentafluoroethane
USE: Refrigerant Gas
DISTRIBUTOR: National Refrigerants, Inc.
661 Kenyon Avenue
Bridgeton, New Jersey 08302

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-262-0012

IN CASE OF EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

2. HAZARDS IDENTIFICATION

CLASSIFICATION:	Gases under pressure, Liquefied Gas
SIGNAL WORD:	WARNING
HAZARD STATEMENT:	Contains gas under pressure, may explode if heated
SYMBOL:	Gas Cylinder
PRECAUTIONARY STATEMENT:	STORAGE: Protect from sunlight, store in a well-ventilated place



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.

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-502 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.

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

3. COMPOSITION / INFORMATION ON INGREDIENTS**INGREDIENT NAME****CAS NUMBER****WEIGHT %**

Chlorodifluoromethane (HCFC-22)

75-45-6

48.8

Chloropentafluoroethane (CFC-115)

76-15-3

51.2

COMMON NAME and SYNONYMS

R-502; CFC502

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).

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

EXTINGUISHING MEDIA:

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

UNUSUAL FIRE AND EXPLOSION HAZARDS:



R-502 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 low-lying 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-502 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 damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

INCOMPATIBILITIES:

Freshly abraded aluminum surfaces at specific temperatures and pressures may cause a strong exothermic reaction. Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

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.

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

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Chlorodifluoromethane	1000 ppm TWA (8hr)	1000 ppm TWA (8hr)	None
Chloropentafluoroethane	1000 ppm TWA (8hr)	1000 ppm TWA (8hr)	None

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV = 2ppm ceiling, 0.5ppm TLV-TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid and vapor	
PHYSICAL STATE:	Gas at ambient temperatures	
MOLECULAR WEIGHT:	111.6	
CHEMICAL FORMULA:	CHClF ₂ , CClF ₂ CF ₃	
ODOR:	Faint ethereal odor	
SPECIFIC GRAVITY (water = 1.0):	1.258 @ 21.1°C (70°F)	
SOLUBILITY IN WATER (weight %):	490 ppm @ 21.1°C and 1 atmosphere	
pH:	Neutral	
BOILING POINT:	-45.4°C (-49.72°F)	
FREEZING POINT:	Unknown	
VAPOR PRESSURE:	152.7 psia @ 70°F 335.7 psia @ 130°F	
VAPOR DENSITY (air = 1.0):	3.62	
EVAPORATION RATE:	>1	COMPARED TO: CCl ₄ = 1
% VOLATILES:	100	
ODOR THRESHOLD:	Not established	
FLAMMABILITY:	Not applicable	
LEL/UEL:	None/None	
RELATIVE DENSITY:	1.26 g/cm ³ @ 21.1°C	
PARTITION COEFF (n-octanol/water)	Not applicable	
AUTO IGNITION TEMP:	Not Determined	



DECOMPOSITION TEMPERATURE: >250C
VISCOSITY: Not applicable
FLASH POINT: Not applicable

(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 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

IMMEDIATE (ACUTE) EFFECTS:

HCFC-22: LC₅₀ : 4 hr. (rat) - $\geq 300,000$ ppm / Cardiac Sensitization threshold (dog) - 50,000 ppm

CFC-115: 100,000 ppm – 150,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Subchronic inhalation (rat) NOEL – 10,000 ppm

Not teratogenic

Not mutagenic in *in-vitro* or *in-vivo* tests

POTENTIAL HEALTH HAZARDS

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INHALATION: R-502 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.

DELAYED EFFECTS: None Known

**OTHER DATA:**

Lifetime exposure of male rats was associated with a small increase in salivary gland fibrosarcomas.

INGREDIENT NAME**NTP STATUS****IARC STATUS****OSHA LIST****12. ECOLOGICAL INFORMATION****Degradability (BOD):**

R-502 is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient: (see section 9)**13. DISPOSAL 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-502 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. TRANSPORT INFORMATION**US DOT ID NUMBER:**

UN1973

US DOT PROPER SHIPPING NAME: Chlorodifluoromethane and Chloropentafluoroethane Mixture or Refrigerant Gas R-502**US DOT HAZARD CLASS:**

2.2

US DOT PACKING GROUP:

Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION**TOXIC SUBSTANCES CONTROL ACT (TSCA)**

TSCA INVENTORY STATUS: Components listed on the TSCA inventory

OTHER TSCA ISSUES: None

SARA TITLE III / CERCLA

“Reportable Quantities” (RQs) and/or “Threshold Planning Quantities” (TPQs) exist for the following ingredients.

INGREDIENT NAME**SARA / CERCLA RQ (lb.)****SARA EHS TPQ (lb.)**

No ingredients listed in this section



Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: IMMEDIATE
PRESSURE

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 “Toxic Chemicals”. CAS numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Chlorodifluoromethane (HCFC-22)	None
Chloropentafluoroethane (CFC-115)	None

STATE RIGHT-TO-KNOW

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

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
No ingredients listed in this section		

ADDITIONAL REGULATORY INFORMATION:

R-502 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 Chloropentafluoroethane**, a CFC substance which harms public health and environment by destroying ozone in the upper atmosphere. Destruction of the ozone layer can lead to increased ultraviolet 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 (HCFC-22)
EINECS # 2009382 (CFC-115)

16. OTHER INFORMATION

CURRENT ISSUE DATE: January, 2024
PREVIOUS ISSUE DATE: April, 2018

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0
ANSI/ASHRAE 34 Safety Group – A1

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 I Substance

DISCLAIMER:



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