



# Safety Data Sheet

## R-503

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** R-503  
**OTHER NAME:** Pentafluoroethane, Trifluoromethane  
**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** The material is untested for skin irritancy, is untested for eye irritancy, and is untested for animal sensitization.

**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:** Inhalation may include nonspecific discomfort, such as nausea, headache, or weakness; temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness; or possibly with gross overexposure (>20%, temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. There are no reports of human deaths with preexisting diseases of the cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

**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 effect of inhalation and skin exposure would be expected.



**DELAYED EFFECTS:** None Known

**CARCINOGENICITY INFORMATION:**

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

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

| <u>INGREDIENT NAME</u>                | <u>NTP STATUS</u> | <u>IARC STATUS</u> | <u>OSHA LIST</u> |
|---------------------------------------|-------------------|--------------------|------------------|
| No ingredients listed in this section |                   |                    |                  |

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

| <u>INGREDIENT NAME</u>  | <u>CAS NUMBER</u> | <u>WEIGHT %</u> |
|---|-------------------|-----------------|
| Chlorotrifluoromethane (R-13)<br>*Listed SARA Section 313<br>NFPA = 2-0-0 | 75-72-9           | 60              |
| Trifluoromethane (R-23)<br>NFPA = 2-0-0                                   | 75-46-7           | 40              |

**COMMON NAME and SYNONYMS**

R-503; CFC503

\* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

**4. FIRST AID MEASURES**

**SKIN:** Flush skin with plenty of water. Treat for frostbite if necessary.

**EYES:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

**INHALATION:** If inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**INGESTION:** Ingestion is not considered a potential route of exposure.

**ADVICE TO PHYSICIAN:** Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.

**5. FIRE FIGHTING MEASURES**

**FLAMMABLE PROPERTIES**

|   |                |
|---|----------------|
| <b>FLASH POINT:</b>                         | Will not burn  |
| <b>FLASH POINT METHOD:</b>                  | Not applicable |
| <b>AUTOIGNITION:</b>                        | Not Determined |
| <b>UPPER FLAME LIMIT (volume % in air):</b> | Not Applicable |
| <b>LOWER FLAME LIMIT (volume % in air):</b> | Not Applicable |
| <b>FLAME PROPAGATION RATE (solids):</b>     | Not applicable |



**OSHA FLAMMABILITY CLASS:**  
**AUTODECOMPOSITION:**

Not applicable  
>760 C (>1400 F)

**EXTINGUISHING MEDIA:**

As appropriate for combustibles in area.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Use water spray or fog to cool containers. Cylinders are equipped with temperature and pressure relief devices but may still rupture under fire conditions. Decomposition may occur.

**SPECIAL FIRE FIGHTING PRECAUTIONS/ INSTRUCTIONS:**

Self-contained breathing apparatus (SCBA) is required if cylinders rupture or release under fire conditions.

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**6. ACCIDENTAL RELEASE MEASURES**

**IN CASE OF SPILL OR OTHER RELEASE:**

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

Ventilate area, especially low or enclosed places where heavy vapor might collect. Remove open flames. Self-contained breathing apparatus (SCBA) is required if a large spill or release occurs.

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

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**7. HANDLING AND STORAGE**

**NORMAL HANDLING:**

Avoid breathing vapors or allowing liquid or cold vapors to contact skin and eyes. Use with sufficient ventilation to keep employee exposure below recommended limits.

**STORAGE RECOMMENDATIONS:**

Clean, dry area. Do not heat above 52 deg. C (125 deg. F).

**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.

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**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**ENGINEERING CONTROLS:**

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

**PERSONAL PROTECTIVE EQUIPMENT:**

Butyl or neoprene gloves and chemical splash goggles should be used if contact is possible. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a spill occurs.



**EXPOSURE GUIDELINES:**

Applicable Exposure Limits

Trifluoromethane,

PEL (OSHA): None Established

TLV (ACGIH): None Established

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**9. PHYSICAL AND CHEMICAL PROPERTIES**

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|  |   |
|--|---|
| <b>APPEARANCE AND ODOR:</b>              | Clear, colorless liquefied gas                |
| <b>PHYSICAL STATE:</b>                   | <b>Gas at ambient temperatures</b>            |
| <b>MOLECULAR WEIGHT:</b>                 | <b>87.25</b>                                  |
| <b>CHEMICAL FORMULA:</b>                 | <b>CClF<sub>3</sub>, CHF<sub>3</sub></b>      |
| <b>ODOR:</b>                             | Slight ethereal (ether-like)                  |
| <b>SPECIFIC GRAVITY (water = 1.0):</b>   | 1.13 @ 0/0°C                                  |
| <b>SOLUBILITY IN WATER:</b>              | 0.042 WT% @ 25 deg. C (77 deg. F)             |
| <b>pH:</b>                               | Neutral                                       |
| <b>BOILING POINT:</b>                    | -88.8° C (-127.8°F)                           |
| <b>FREEZING POINT:</b>                   | Not determined                                |
| <b>VAPOR PRESSURE (MM HG):</b>           | 566 psia @ 15.6 deg. C (60°F)                 |
| <b>VAPOR DENSITY (air = 1.0):</b>        | 3.0   |
| <b>EVAPORATION RATE:</b>                 | >1 (CC14 = 1)                                 |
| <b>% VOLATILES:</b>                      | 100   |
| <b>ODOR THRESHHOLD:</b>                  | High  |
| <b>FLAMMABILITY:</b>                     | Not applicalbe                                |
| <b>LEL/UEL:</b>                          | None/None                                     |
| <b>RELATIVE DENSITY:</b>                 | 1.233 g/cc at -30 deg. C (-22 deg F) - Liquid |
| <b>PARTITION COEFF (n-octanol/water)</b> | Not applicable                                |
| <b>AUTO IGNITION TEMP:</b>               | Not determined                                |
| <b>DECOMPOSITION TEMPERATURE:</b>        | >250°C  |
| <b>VISCOSITY:</b>                        | Not applicable                                |
| <b>FLASH POINT:</b>                      | Not applicable                                |

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

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**10. STABILITY AND REACTIVITY**

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**NORMALLY STABLE (CONDITIONS TO AVOID):**

Material is stable. However, avoid open flames and high temperatures.

**INCOMPATIBILITIES:**

Incompatible with alkali or alkaline earth metals, finely powdered metals such as AL, ZN, BE, ETC.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Refrigerant 503 can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

**HAZARDOUS POLYMERIZATION:**

Polymerization will not occur.



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**11. TOXICOLOGICAL INFORMATION**

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**ANIMAL DATA:**

Anaesthetic effects, and nonspecific effects such as weight loss were observed at concentration > 22% with refrigerant 23. No cardiac sensitization was observed in dogs after breathing 800,000 ppm of refrigerant 23 for periods of 5-10 minutes following an epinephrine challenge. Cardiac sensitization was observed in beagle dogs exposed to 800,000 ppm of refrigerant 13 for 5 minutes and challenged with adrenalin for 10 seconds.

No observed adverse effects were seen with refrigerant 13 at concentrations as high as 20% (v/v).

Tests in bacterial or mammalian cell cultures with refrigerant 23 demonstrate no mutagenic activity. Otherwise no animal test reports are available to define carcinogenic, mutagenic, embryotoxic, or reproductive hazards.

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**12. ECOLOGICAL INFORMATION**

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Degradability (BOD): R-503 is a gas at room temperature; therefore, it is unlikely to remain in water.  
Octanol Water Partition Coefficient: See Section 9

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**13. DISPOSAL CONSIDERATIONS**

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**WASTE DISPOSAL:**

Comply with Federal, State, and local regulations. Remove to permitted waste disposal facility. Reclaim by distillation.

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**14. TRANSPORT INFORMATION**

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**SHIPPING INFORMATION**

**US DOT ID NUMBER:** UN2599  
**US DOT PROPER SHIPPING NAME:** Chlorotrifluoromethane and Trifluoromethane Azeotropic Mixture or Refrigerant R-503  
**US DOT HAZARD CLASS:** 2.2 (Non-Flammable Gas)  
**US DOT PACKING GROUP NUMBER:** Not Applicable

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**15. REGULATORY INFORMATION**

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**U. S. FEDERAL REGULATIONS**

TSCA Inventory Status: Reported/Included.  
TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

|             |     |  |
|-------------|-----|--|
| Acute:      | Yes | Extremely Hazardous - No                   |
| Chronic:    | No  | CERCLA Hazardous Substance - No            |
| Fire:       | No  | Toxic Chemicals – (See Components Section) |
| Reactivity: | No  |  |
| Pressure:   | Yes |  |



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**CALIFORNIA PROPOSITION 65:**

The ingredients in this product do not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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**16. OTHER INFORMATION**

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**CURRENT ISSUE DATE:** April, 2018  
**PREVIOUS ISSUE DATE:** April, 2015

**NFPA, NPCA-HMIS**

| <b>NPCA-HMIS Rating</b> |          |
|-------------------------|----------|
| <b>HEALTH:</b>          | <b>1</b> |
| <b>FLAMMABILITY:</b>    | <b>0</b> |
| <b>REACTIVITY:</b>      | <b>1</b> |

Personal Protection rating to be supplied by user depending on use conditions.

**DISCLAIMER:**

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