



# Material Safety Data Sheet

## R-113

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** R-113  
**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. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Trichlorotrifluoroethane	76-13-1	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 Hydrochloric Acid (HCl), Hydrofluoric Acid (HF) and carbonyl halides.

#### POTENTIAL HEALTH HAZARDS

**SKIN:** Prolonged and/or repeated contact with this solvent can cause irritation of the skin (defatting of skin).

**EYES:** Irritant. Liquid contact will irritate and may cause conjunctivitis.

**INHALATION:** Overexposure to vapor may cause dizziness, loss of concentration and irritation. With high exposure levels, effects can include central nervous system (CNS) depression (intoxication) and cardiac arrhythmia. Product vapors displace air and can cause suffocation especially in a confined space.

**INGESTION:** Discomfort due to volatility would be expected. Some of the inhalation effects could be expected.

**DELAYED EFFECTS:** None identified

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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>
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No ingredients listed in this section

## 4. FIRST AID MEASURES

**SKIN:** Promptly flush skin with water until all chemical is removed. Remove clothing contaminated with liquid and wash before use.

**EYES:** Immediately flush eyes with large amounts of water for at least 15 minutes, lifting eyelids occasionally to facilitate irrigation. Get medical attention.

**INHALATION:** Immediately remove patient 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:** DO NOT induce vomiting unless instructed to do so by a physician. DO NOT give stimulants. Get medical attention immediately.

**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

<b>FLASH POINT:</b>	None
<b>FLASH POINT METHOD:</b>	ASTM D-1310-67 and ASTM D-56-82
<b>AUTOIGNITION TEMPERATURE:</b>	770°C
<b>UPPER FLAME LIMIT (volume % in air):</b>	None
<b>LOWER FLAME LIMIT (volume % in air):</b>	None
<b>FLAME PROPAGATION RATE (solids):</b>	Not applicable
<b>OSHA FLAMMABILITY CLASS:</b>	Not applicable

### **EXTINGUISHING MEDIA:**

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

### **UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Product will decompose at temperatures above 250°C. Decomposition products include hydrochloric acid, hydrofluoric acid, and carbonyl halides. Contact with certain finely divided metals may cause exothermic reaction and/or explosive combinations. Vapors, when present in the flammable range (listed above), especially in a confined or poorly ventilated space, can be ignited with a flame or high intensity source of heat.



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**SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:**

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against suffocation and possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool and to knock down vapors which may result from product decomposition.

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**6. ACCIDENTAL RELEASE MEASURES**

**IN CASE OF SPILL OR OTHER RELEASE:** (Always wear recommended personal protective equipment.)

Immediately evacuate the area and provide maximum ventilation. Try to eliminate all ignition sources. Unprotected personnel should move upwind from spill. Only personnel equipped with proper respiratory and eye/skin protection should be permitted in the area. Dike area to contain the spill. Take precautions as necessary to prevent contamination of ground and surface waters. For large spills, pump material into appropriate containers. For small spills, recover or absorb spilled material using an absorbent designed for chemical spills such as Habsorb® pillows. Place used absorbents into closed DOT approved containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush into sewer. If the area of the spill is porous, removal of contaminated earth/surface may be required.

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:** (Always wear recommended personal protective equipment.)

R-113 boils at 117.7°F, hence contents may be under pressure. Exercise caution when opening container. If containers have been stored in direct sunlight or heated above the boiling point of the solvent, the container should be cooled to below the boiling point before opening.

**STORAGE RECOMMENDATIONS:**

Keep container closed when not in use. DO NOT store in open, unlabeled or mislabeled containers. Store in a cool, well-ventilated area of low fire risk. Protect container and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty. If container temperature exceeds boiling point, cool the container before opening.

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**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**ENGINEERING CONTROLS:**

Use local exhaust at filling zones and areas where leakage is probable. Use mechanical (general) ventilation for storage areas. All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94).

**PERSONAL PROTECTIVE EQUIPMENT**

**SKIN PROTECTION:**

Use protective, impervious gloves such as PVA or neoprene. Also, use full protective clothing if there is prolonged or repeated contact of liquid with skin. Any non-impervious clothing should be promptly removed when contaminated 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 splash-proof goggles.

**RESPIRATORY PROTECTION:**

None generally required for adequately ventilated work situations. Use NIOSH approved self-contained, positive pressure respirators for emergencies and in situations where air may be displaced by vapors.

**ADDITIONAL RECOMMENDATIONS:**

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**

**INGREDIENT NAME**

Trichlorotrifluoroethane

**ACGIH TLV**

1000 ppm TWA-8  
1250 ppm STEL

**OSHA PEL**

1000 ppm TWA-8  
1250 ppm STEL

**OTHER LIMIT**

None  
None

**OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:**

Hydrogen Fluoride: ACGIH: 3 ppm ceiling

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>APPEARANCE:</b>	Colorless liquid
<b>PHYSICAL STATE:</b>	Liquid
<b>MOLECULAR WEIGHT:</b>	187.35
<b>CHEMICAL FORMULA:</b>	CCl <sub>2</sub> FCClF <sub>2</sub>
<b>ODOR:</b>	Faint ethereal and sweetish odor
<b>SPECIFIC GRAVITY (water = 1.0):</b>	1.47 @ 70°F (21.1°C)
<b>SOLUBILITY IN WATER (weight %):</b>	0.31% @ 70°F (21.1°C)
<b>pH:</b>	Neutral
<b>BOILING POINT:</b>	117.7°F (47.6°C)
<b>MELTING POINT:</b>	-35°C (-31°F)
<b>VAPOR PRESSURE:</b>	5.6 psia @ 70°F (21.1°C)
<b>VAPOR DENSITY (air = 1.0):</b>	6.5
<b>EVAPORATION RATE:</b>	>1
<b>% VOLATILES:</b>	100
<b>FLASH POINT:</b>	None

**COMPARED TO:** Ether = 1

(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):**

The product is normally stable.

Avoid sources of ignition such as sparks, hot spots, welding flames and lighted cigarettes. At all concentration ranges, exposure of the product to high-energy sources may yield toxic and/or corrosive decomposition products. After R-113 has been exposed to lubricating oils, alcohols, polyols or other hydrocarbons at temperatures in excess of 100°F, the composition should be monitored for reaction products, particularly R-133a. Reaction products may be toxic.

**INCOMPATIBILITIES:**

Strong acids and alkalis, reactive metals e.g. powdered or freshly abraded aluminum (may cause strong exothermic reaction), sodium, potassium, calcium, magnesium, zinc, molten aluminum, barium and lithium shavings. Strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Hydrochloric and hydrofluoric acids; and carbonyl halides, such as phosgene.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

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**11. TOXICOLOGICAL INFORMATION**

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**IMMEDIATE (ACUTE) EFFECTS:**

Acute Inhalation:

2 hr LC<sub>50</sub> (rat) . . . . . 110,000 ppm

Mice – 95,000 ppm

Exposure of dogs to levels of 5,000 ppm and greater resulted in increased sensitivity of the heart to adrenaline.

**DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:**

Results of a 2-year chronic inhalation study on rats exposed to 2,000, 10,000 and 20,000 ppm confirmed the low order of toxicity of this material. This, and results of other studies available in literature, have shown no evidence of carcinogenicity, mutagenicity or teratogenicity in animal studies and in human experience. (Reference: Haskell Laboratory data)

**OTHER DATA:**

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

Not a developmental toxin

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**12. ECOLOGICAL INFORMATION**

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**Daphnia and Fish** – LC<sub>50</sub> = 1,250 ppm/96 hrs. – Flat head minnow

**Degradability (BOD):** Minimal

**Octanol Water Partition Coefficient:** Log P<sub>ow</sub> = Not available



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13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded?

Virgin (unused) is not considered a RCRA Hazardous Waste. However, all unused product should be disposed of properly.

If yes, the RCRA ID number is:

Not applicable for virgin (unused) product. If used as a solvent: F002

OTHER DISPOSAL CONSIDERATIONS:

Spent (used) R-113 used as a solvent is a hazardous waste: F002

Proper DOT Shipping Name for the waste solvent is:

Hazardous Waste Liquid, n.o.s. (Trichlorotrifluoroethane), 9, NA3082, III

All spent material must be disposed of in accordance with all applicable Federal and State RCRA Regulations.

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 HAZARD CLASS: Not Regulated.

US DOT ID NUMBER: 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: 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 TPO (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 DELAYED



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**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>
Trichlorotrifluoroethane	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-113 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82. Section 611 requires the following label text on all shipments of this product.

**WARNING: DO NOT VENT TO THE ATMOSPHERE. TO COMPLY WITH PROVISIONS OF THE U.S. CLEAN AIR ACT, ANY RESIDUAL MUST BE RECOVERED. CONTAINS TRICHLOROTRIFLUOROETHANE (CFC-113), A SUBSTANCE WHICH HARMS PUBLIC HEALTH AND ENVIRONMENT BY DESTROYING OZONE IN THE UPPER ATMOSPHERE.**

**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:**

EINECS (EU) # 2009361, MITI (Japan), MOE (Korea) DSL (Canada) and AICS (Australia)

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**16. OTHER INFORMATION**

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**CURRENT ISSUE DATE:** December, 2008  
**PREVIOUS ISSUE DATE:** August, 2007

**OTHER INFORMATION:** HMIS Classification: Health – 1, Flammability – 0, Reactivity – 0  
NFPA Classification: Health – 2, Flammability – 0, Reactivity – 0

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**17. DISCLAIMER**

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