



安全資料表

危害物料資料

1. 產品與用途							
1.1 物料名稱	R-11 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：持久接觸會引致凍傷皮膚。						
	眼睛接觸：可能引致輕微受損						
	不可燃燒。高溫分解後會放出有毒及刺激氣體。						
3. 火警和爆炸資料							
3.1 燃燒物成份比例	無資料	3.2 沸點()	23.8	3.3 溶點()	-111		
3.4 閃點()	無資料	3.5 比重	1.49@20	3.6 氣壓力	20°C @661mmHg		
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	灑水或二氧化碳,化學乾粉之滅火劑						
4. 急救處理							
4.1 眼睛接觸	立即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，一旦接觸皮膚，立刻以大量肥皂和溫水清洗。如發現水疱，立即求醫。						
4.3 食入	不要引起嘔吐，用清水清潔口腔，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立刻安排接見醫生。						
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。將洩漏源頭分隔並確保通風正常。 大量洩漏：要確保地點通風，可用沙、泥及適當物品吸乾。
7. 其他資料	
- 雪種氣體是重過空氣，如不良通風環境下，雪種會沉底，這時應提供適當之通風或呼吸裝備	



Safety Data Sheet

R-11

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-11
OTHER NAME: Trichlorofluoromethane
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: Eye and Skin Irritant
SIGNAL WORD: WARNING
HAZARD STATEMENT: Causes eye and skin irritation
SYMBOL: Exclamation Mark
PRECAUTIONARY STATEMENT(S):

PREVENTION: Avoid breathing vapors

RESPONSE: If inhaled move victim to fresh air and keep at rest in a position comfortable for breathing

STORAGE: Store in a well ventilated place. Keep container tightly closed. Store locked up.

DISPOSAL: Dispose of contents/container at an approved disposal facility.



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: R-11 has a relatively low order of acute toxicity. 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. In repeated exposure tests with animals, changes were noted in liver functions and lipid production at levels above 100 ppm. At high levels, cardiac arrhythmia may occur.

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

DELAYED EFFECTS: None known.

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

**INGREDIENT NAME**

No ingredients listed in this section

NTP STATUS**IARC STATUS****OSHA LIST**

3. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME

Trichlorofluoromethane

CAS NUMBER

75-69-4

WEIGHT %

100

COMMON NAME and SYNONYMS

R-11; CFC11

There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

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**FLASH POINT:**

None

FLASH POINT METHOD:

ASTM D-1310-67 and ASTM D-56-82

AUTOIGNITION TEMPERATURE:

Unknown

UPPER FLAME LIMIT (volume % in air):

None

LOWER FLAME LIMIT (volume % in air):

None

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 (material itself is not flammable)

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Contact with certain finely divided metals may cause exothermic reaction and/or explosive combinations under specific conditions (e.g. very high temperatures and/or appropriate pressures and in the presence of oxygen). Decomposition products include hydrochloric acid, hydrofluoric acid, and carbonyl halides.



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.

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 Hazsorb® 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.

7. HANDLING AND STORAGE

NORMAL HANDLING:

(Always wear recommended personal protective equipment.)

R-11 boils at 74.5°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.

Recommended Opening Procedure

To open container, follow these procedures to avoid loss and contamination of the product.

1. Tear off protective cap over large bung opening.
2. Carefully remove the ¾ inch plug from the center of the large bung. DO NOT puncture the inner seal.
3. Insert convenient length ¾ inch nipple fitted with a closed valve. As nipple is inserted, the inner seal is broken and container is ready to unload through valve.

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.

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.

**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**

Trichlorofluoromethane

ACGIH TLV

1000 ppm Ceiling

OSHA PEL

1000 ppm TWA-8

OTHER LIMIT

None

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

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

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colorless liquid
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	137.35
CHEMICAL FORMULA:	CCl ₃ F
ODOR:	Faint ethereal and sweetish odor
SPECIFIC GRAVITY (water = 1.0):	1.47 @ 70°F (21.1°C)
SOLUBILITY IN WATER (weight %):	0.21% @ 70°F (21.1°C)
pH:	Neutral
BOILING POINT:	23.6°C (74.5°F)
MELTING POINT:	-167.8°F (-111°C)
VAPOR PRESSURE:	12.8 psia @ 68°F
VAPOR DENSITY (air = 1.0):	4.8
EVAPORATION RATE:	>1
% VOLATILES:	100

COMPARED TO: Ether = 1**FLASH POINT:**

None

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

10. STABILITY AND REACTIVITY**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.

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.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Acute Inhalation:

4 hr LC₅₀ (rat) 26,000 ppm / Cardiac Sensitization Threshold (dog) 5,000 ppm

Anesthetic Concentration 35,000 ppm (10 min.)

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Subchronic NOEL - 10,000 ppm

OTHER DATA:

Not a teratogen

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:** R-11 has a relatively low order of acute toxicity. 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. In repeated exposure tests with animals, changes were noted in liver functions and lipid production at levels above 100 ppm. At high levels, cardiac arrhythmia may occur.**INGESTION:** Discomfort due to volatility would be expected. Some of the inhalation effects could 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

12. ECOLOGICAL INFORMATION

Degradability (BOD): Minimal**Octanol Water Partition Coefficient:** Not Determined

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?** Yes**If yes, the RCRA ID number is:** U121**OTHER DISPOSAL CONSIDERATIONS:**

Disposal must comply with federal, state, and local disposal or discharge laws. Users should review their operations, then consult with appropriate regulatory agencies before discharging or disposing of waste materials. R-11 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 HAZARD CLASS: For individual packages that contain LESS THAN the Reportable Quantity (5000 lbs.), - Not regulated.
For individual packages that contain MORE THAN the Reportable Quantity (5000 lbs.), - RQ, Environmentally Hazardous Substances, Liquid, n.o.s. (Trichlorofluoromethane) 9, PG III, UN3082

US DOT ID NUMBER: For individual packages that contain LESS THAN the Reportable Quantity (5000 lbs.), - Not Applicable.
For individual packages that contain MORE THAN the Reportable Quantity (5000 lbs.), - RQ UN3082, Environmentally Hazardous Substances, Liquid, n.o.s. (Trichlorofluoromethane) 9, PG III,

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: Subject to Section 12(b) export notification. May contain 0-10 ppm Ethane, 2-chloro-1,1,1-trifluoro, CAS # 75-88-7

SARA TITLE III / CERCLA

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

<u>INGREDIENT NAME</u>	<u>SARA / CERCLA RQ (lb.)</u>	<u>SARA EHS TPQ (lb.)</u>
Trichlorofluoromethane	5000	None

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

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>
Trichlorofluoromethane	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-11 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Sections 610, 611 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 TRICHLOROFLUOROMETHANE (CFC-11), 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 # 2008925

16. OTHER INFORMATION

CURRENT ISSUE DATE: January, 2021

PREVIOUS ISSUE DATE: May, 2018

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

DISCLAIMER:

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