

SAFETY DATA SHEET

FILE NO.: Incoming_SDS_R-113_00
SDS DATE: January 2014

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-113
SYNONYMS: Refrigerant Gas
Trichlorotrifluoroethane
1,1,2-Trichloro-1,2,2-Trifluoroethane
Refrigerant 113
CFC-113
Freon® 113
Product Use: Refrigerant, solvent

SHIPPER NAME AND ADDRESS:

HEALTH EMERGENCY PHONE: 1-800-222-1222 (Poison Control Center)
TRANSPORTATION EMERGENCY PHONE: 1-800-424-8802 (National Response Center)
GENERAL INFORMATION: 1-800-467-4922 (U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration Hazardous Materials Information Center – M-F, 9am-5pm)

SDS PREPARED BY: A-Gas RemTec

SECTION 2: HAZARD IDENTIFICATION

HAZARD CLASSIFICATION: Skin irritation, Category 3
Eye irritation, Category 2B

SIGNAL WORD: **WARNING**

HAZARD STATEMENT: Overheating and overpressurizing may cause gas release or violent container bursting.
Simple asphyxiant.



PRECAUTIONARY STATEMENTS: Keep container tightly closed in a cool/well-ventilated place.
Keep away from heat/sparks/open flame. – No smoking.
Do not allow liquid or vapors to come into contact with skin or eyes.
Wear protective gloves and eye/face protection.
Do not breathe mist/vapors.
Use only in a well-ventilated area.
Avoid release to the environment.

OTHER HAZARDS: May decompose on contact with flames or extremely hot metal surfaces to produce toxic and corrosive products.
Vapor reduces oxygen available for breathing and is heavier than air.
Harmful if inhaled and may cause heart irregularities, unconsciousness, or death.
Liquid contact with eyes or skin may cause irritation.
Harmful if swallowed.

ASHRAE STANDARD 34 SAFETY RATING: A1

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>FORMULA</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
*1,1,2-Trichloro-1,2,2-Trifluoroethane *Listed SARA Section 313	C ₂ Cl ₃ F ₃	76-13-1	>98

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of this SDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

SAFETY DATA SHEET

FILE NO.: Incoming_SDS_R-113_00
SDS DATE: January 2014

SECTION 4: FIRST AID MEASURES

SKIN: Remove contaminated clothes. Rinse skin with plenty of water. Get medical attention if irritation persists.

EYES: Immediately flush with large amounts of water for at least 15 minutes. Get medical attention if irritation persists.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Do not give adrenaline, epinephrin or similar drugs following exposure to this product.

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.

SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Use extinguishing media appropriate to surrounding fire conditions.

UNUSUAL FIRE AND EXPOSION HAZARDS: May decompose on contact with flames or extremely hot metal surfaces to produce toxic and corrosive products. Container may explode if heated due to resulting pressure rise.

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.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: If the release is caused by an open valve and it is safe for operator to close, do so. If possible to transfer the remaining material in the container in a safe manner to a separate tank, do so. Absorb liquid with commercial absorbent and shovel into a drum/waste container. Evacuate area in the event of a significant release in an enclosed area. Keep upwind. Ventilate area, especially low places. Remove open flames and heating elements. Disperse gas with floor level forced air. Gas will evaporate.

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

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: Avoid breathing fumes. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Use properly rated containers only. in a cool, well-ventilated area of low fire risk and out of direct sunlight. Storage in subsurface locations should be avoided. Close container tightly after use and when empty.

OTHER PRECAUTIONS: R-113 boils at 117.7°F, so contents may be under pressure, depending on ambient temperatures. 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. Avoid areas where salt or other corrosive materials are present. Avoid excessive inventory and storage time.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT(S)</u>
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1000 ppm TWA 1250 ppm STEL	1000 ppm TWA	*1000 ppm TWA **1000 ppm TWA

* = Recommended Exposure Limit (NIOSH)
** = Occupational Exposure Limit (ASHRAE)

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV – 3 ppm Ceiling
Hydrogen Chloride: OSHA PEL – 5 ppm Ceiling

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.

SAFETY DATA SHEET

FILE NO.: Incoming_SDS_R-113_00

SDS DATE: January 2014

PERSONAL PROTECTIVE EQUIPMENT:

- SKIN:** Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type of glove material for given application. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.
- EYES:** Where there is reasonable probability of liquid contact, wear chemical safety goggles, and have eye flushing equipment available.
- RESPIRATORY:** None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, use a self-contained, NIOSH-approved breathing apparatus or supplied air respirator.
- ADDITIONAL RECOMMENDATIONS:** Wash hands after use and before eating or drinking. Provide eyewash stations and quick-drench shower facilities at convenient locations.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	187.375 g/mol
CHEMICAL FORMULA:	C ₂ Cl ₃ F ₃
ODOR:	Faint solvent odor, nearly odorless
ODOR THRESHOLD:	Not available
RELATIVE DENSITY:	1.57 g/mL (liquid @ 25° C)
VISCOSITY (mPa*s):	0.497 mPa/s at 48.9° C (liquid) 0.0108 mPa/s at 49° C (gas)
SPECIFIC GRAVITY:	1.57 @ 25° C
SOLUBILITY IN WATER:	170 mg/L @ 25° C
pH:	Neutral
BOILING POINT:	47.7° C
MELTING POINT:	-36.22° C
VAPOR PRESSURE:	363 mm Hg @ 25° C
VAPOR DENSITY (air = 1.0):	6.5
EVAPORATION RATE (ether = 1.0):	1.3
% VOLATILES:	100%
FLASH POINT:	Not applicable
FLASH POINT METHOD:	ASTM D-1310-67 and ASTM D-56-82
AUTOIGNITION TEMPERATURE:	770° C
DECOMPOSITION TEMPERATURE:	300° C
UPPER FLAMMABLE LIMIT (volume % in air):	None*
LOWER FLAMMABLE LIMIT (volume % in air):	None*
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable
PARTITION COEFFICIENT (n-octanol/water):	3.16 log Kow

SECTION 10: STABILITY AND REACTIVITY

- REACTIVITY:** Thermal decomposition due to exposure to heat (>250° C) or fire. May cause strong exothermic reaction if exposed to strong acids and alkalis, or reactive metals such as freshly abraded aluminum, sodium, potassium, calcium, magnesium, zinc, molten aluminum, barium, and lithium shavings. 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.
- STABILITY:** This material is chemically stable under specified conditions for storage, shipment and/or use. See Section 7 Handling and Storage for specified conditions.
- CONDITIONS TO AVOID:** Avoid contact with sources of heat. Any source of high temperature, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.
- HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:** Thermal decomposition products include hydrochloric and hydrofluoric acids, and carbonyl halides, such as phosgene.

SECTION 11: TOXICOLOGICAL INFORMATION

- ROUTES OF EXPOSURE:** Inhalation, Skin contact, Eye contact, Ingestion
- ACUTE EFFECTS OF EXPOSURE:** Prolonged and/or repeated contact with this solvent can cause irritation of the skin. Liquid contact will irritate the eyes and may cause conjunctivitis.

SAFETY DATA SHEET

FILE NO.: Incoming_SDS_R-113_00

SDS DATE: January 2014

High vapor concentrations are irritating to the eyes and respiratory tract and may result in central nervous system effects such as headache, dizziness, drowsiness and, in severe exposure, loss of consciousness and death.

The dense vapor of this material may reduce the available oxygen for breathing, and prolonged exposure to an oxygen-deficient atmosphere may be fatal.

Inhalation may cause an increase in the sensitivity of the heart to adrenaline, which could result in irregular or rapid heartbeats.

Medical conditions aggravated by exposure include heart disease or compromised heart function.

CHRONIC EFFECTS OF EXPOSURE: None known

ACUTE TOXICITY: Inhalation LC₅₀ (rat – 4 hr.) = 50,000 ppm
Ingestion LD₅₀ (rat) = 43,000 mg/kg

CHRONIC TOXICITY: None known

DESCRIPTION OF SYMPTOMS: Inhalation of high concentration may lead to unconsciousness and possible death. Effects of overexposure by inhalation or ingestion may include non specific discomfort, such as nausea, headache, or weakness, or temporary central nervous system depression with effects such as dizziness, headache, confusion, loss of coordination, and loss of consciousness. Higher exposures by inhalation or ingestion may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Individuals with pre-existing diseases of the central nervous or cardiovascular system may have increased susceptibility to the toxicity of excessive exposure.

CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC, or OSHA

SECTION 12: ECOLOGICAL INFORMATION

AQUATIC TOXICITY: LC₅₀ (flat head minnow – 96 hr.) = 1,250 ppm

DEGRADABILITY: Atmospheric lifetime is about 85 years.

BIOACCUMULATION: Studies suggest bioconcentration in aquatic organisms is low to moderate.

ADSORPTION/LEACHING: Not expected to have high mobility in soil, and is expected to adsorb to suspended solids and sediment in water.

OTHER ADVERSE EFFECTS: **Ozone Depletion Potential (CFC 11 = 1.0):** 1.0
Global Warming Potential (CO₂ = 1.0): 6,130

SECTION 13: DISPOSAL CONSIDERATIONS

RCRA: Virgin (unused) R-113 is not considered to be a RCRA hazardous waste. However, all unused products should be reclaimed or disposed of properly.

R-113 as a spent halogenated solvent is considered to be a RCRA hazardous waste.

RCRA ID number is: F002 (only as a spent halogenated solvent)

DISPOSAL CONSIDERATIONS: Recover, reclaim or recycle when practical. Dispose of in accordance with federal, state and local regulations. Product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations. Contact a certified reclaimer for recovery/reclamation of this product.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION

For virgin (unused) R-113, **Not regulated**

For R-113 as a spent halogenated solvent:

UN NUMBER: UN3082

UN PROPER SHIPPING NAME: Environmentally Hazardous Substances, Liquid, n.o.s.
(Trichlorotrifluoroethane)

US DOT HAZARD CLASS: 9

PACKING GROUP: III



SAFETY DATA SHEET

FILE NO.: Incoming_SDS_R-113_00

SDS DATE: January 2014

ENVIRONMENTAL CONCERNS: Material is considered an Ozone Depleting Substance (ODS) and should not be released into the environment.

BULK TRANSPORTATION: Avoid transportation in vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the containers and what action to take in the event of an accident or an emergency.
Prior to transporting cylinders, ensure that they are firmly secured, valves are closed and not leaking, and the valve outlet cap nuts or plugs (if provided) are correctly connected.

SPECIAL TRANSPORTATION: None determined.

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT): All components of this product are listed on the TSCA Inventory list.

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT) and SARA (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):

"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>
None	None	None

Any spill or release 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 (Acute) Health
Delayed Hazard

SECTION 313 TOXIC CHEMICALS: This product contains a substance which is defined as a toxic chemical under, and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 (SARA 313) and 40 CFR part 372. See Section 3 Composition/Information on Ingredients for listed chemical.

ADDITIONAL REGULATORY INFORMATION:

R-113 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82. Section 611 of this regulation 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**, a CFC substance which can harm public health and the 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.

FOREIGN INVENTORY STATUS:

EU-EINECS: # 200-936-1

SECTION 16: OTHER INFORMATION

PREPARED BY: A-GasRemTec
DATE PREPARED: January 2014
CURRENT REVISION LEVEL: 00
CURRENT REVISION DATE: 1/29/2014

DISCLAIMER: *This document has been provided by A-Gas RemTec to the shipper indicated on Page 1 as a courtesy, to allow the shipper to comply with applicable regulations requiring the shipment of a Safety Data Sheet for the product indicated on this document. Details given in this document are for informational purposes only, and are believed to be correct. Information is provided without warranty. A-Gas RemTec is not liable for any damage which may result from the use or reliance on this information.*