Material Safety Data Sheet

Trichlorofluoromethane (R-11)

Section 1. Chemical product and company identification

Product name : Trichlorofluoromethane (R-11)

Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Synonym : Aspen R-11; methane, trichlorofluoro-; monofluorotrichloromethane; trichlorofluoromethane; trichlorofluoro methane; freon 11; refrigerant 11; f-11; genetron 11; freon mf; nci-c04637; trichloromonofluoromethane; cfc-11; cfc 11; propellent 11; frigen 11; halon 11; fc 11; khaladon 11; kaltron 11; isotron 11; eskimon 11

Material uses : Other non-specified industry: SOLVENT; FIRE EXTINGUISHERS; CHEMICAL INTERMEDIATE; BLOWING AGENT.

MSDS # : 001052

Date of Preparation/Revision : **12/1/2011.**

In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Liquid. [COLORLESS LIQUID OR GAS WITH A CHLORINATED SOLVENT ODOR WHICH IS DETECTABLE >20 % BY VOLUME]

Emergency overview : CAUTION!

MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

May cause target organ damage, based on animal data.

Target organs : May cause damage to the following organs: peripheral nervous system, cardiovascular system, upper respiratory tract, skin, eyes.

Potential acute health effects

Eyes : Irritating to eyes.

Skin : Irritating to skin.

Inhalation : Irritating to respiratory system.

Ingestion : No known significant effects or critical hazards.

Potential chronic health effects

Target organs : May cause damage to the following organs: peripheral nervous system, cardiovascular system, upper respiratory tract, skin, eyes.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

Section 3. Composition, Information on Ingredients

United States

Name	CAS number	% Volume	Exposure limits
trichlorofluoromethane	75-69-4	100	**ACGIH TLV (United States, 1/2009).** C: 5620 mg/m³ C: 1000 ppm **NIOSH REL (United States, 6/2009).** CEIL: 5600 mg/m³ CEIL: 1000 ppm **OSHA PEL (United States, 11/2006).** TWA: 5600 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s). **OSHA PEL 1989 (United States, 3/1989).**

CEIL: 5600 mg/m³
CEIL: 1000 ppm

Section 4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire-fighting measures

Flammability of the product : Non-flammable.

Products of combustion : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds
carbonyl halides

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

In a fire or if heated, a pressure increase will occur and the container may burst.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protection in case of a large spill : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

Product name	Exposure limits
United States	
trichlorofluoromethane	**ACGIH TLV (United States, 1/2009).** C: 5620 mg/m³ C: 1000 ppm **NIOSH REL (United States, 6/2009).** CEIL: 5600 mg/m³ CEIL: 1000 ppm **OSHA PEL (United States, 11/2006).** TWA: 5600 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s). **OSHA PEL 1989 (United States, 3/1989).** CEIL: 5600 mg/m³ CEIL: 1000 ppm

Section 9. Physical and chemical properties

Physical state : Liquid. [COLORLESS LIQUID OR GAS WITH A CHLORINATED SOLVENT ODOR WHICH IS DETECTABLE >20 % BY VOLUME]

Odor : ODORLESS; WEAK CHLORINATED SOLVENT

Molecular weight : 137.36 g/mole

Molecular formula : C-Cl3-F

Boiling/condensation point : 24.1°C (75.4°F)

Melting/freezing point : -111.1°C (-168°F)

Critical temperature : 198°C (388.4°F)

Specific gravity : 1.484 (Water = 1)

Vapor density : 4.7 (Air = 1)

Evaporation rate : 19.4 compared with butyl acetate

VOC : 0 % (w/w)

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Conditions of instability : Under normal conditions of storage and use, hazardous polymerization will not occur.

Incompatibility with various substances : Highly reactive or incompatible with the following materials: organic materials and acids.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Toxicity data

Product/ingredient name	Result	Species	Dose	Exposure
trichlorofluoromethane	LD Oral	Rat	>352 mg/kg	-
	LC50 Inhalation Gas.	Rat	13 pph	15 minutes
	LC50 Inhalation Gas.	Rat	104800 ppm	1 hours

IDLH : 2000 ppm

Chronic effects on humans : **CARCINOGENIC EFFECTS**: A4 (Not classifiable for humans or animals.) by ACGIH. May cause damage to the following organs: peripheral nervous system, cardiovascular system, upper respiratory tract, skin, eyes.

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Not available.

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN3082	RQ ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID, N.O.S. (TRICHLOROFLUOROMETHANE) (trichlorofluoromethane)	9	III		**Reportable quantity** 5000 lbs. (2270 kg)
TDG Classification	UN3082	RQ ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID, N.O.S. (TRICHLOROFLUOROMETHANE) (trichlorofluoromethane)	9	III		**Explosive Limit and Limited Quantity Index** 5
Mexico Classification	UN3082	RQ ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID, N.O.S. (TRICHLOROFLUOROMETHANE) (trichlorofluoromethane)	9	III		**Reportable quantity** 5000 lbs. (2270 kg)

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Section 15. Regulatory information

United States

HCS Classification : Target organ effects

U.S. Federal regulations : TSCA 6 final risk management: trichlorofluoromethane
United States inventory (TSCA 8b): This material is listed or exempted.
TSCA 12(b) annual export notification: trichlorofluoromethane

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: trichlorofluoromethane
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: trichlorofluoromethane: Immediate (acute) health hazard

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

Product name	CAS number	Concentration

Trichlorofluoromethane (R-11)

Form R - Reporting requirements	:	trichlorofluoromethane	75-69-4	100
Supplier notification	:	trichlorofluoromethane	75-69-4	100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations :

Connecticut Carcinogen Reporting: This material is not listed.
Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is listed.
Michigan Critical Material: This material is not listed.
Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is not listed.
New York Acutely Hazardous Substances: This material is listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is listed.
Rhode Island Hazardous Substances: This material is not listed.

Canada

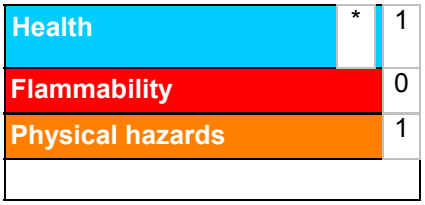
WHMIS (Canada) : Not controlled under WHMIS (Canada).

CEPA Toxic substances: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

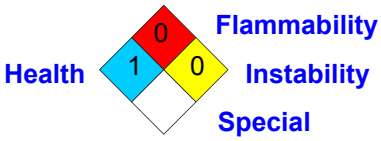
Section 16. Other information

Label requirements : MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :



National Fire Protection Association (U.S.A.) :



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.