

**MATERIAL SAFETY DATA SHEET****TRIFLUOROACETIC ACID**

PRODUCT CODE NUMBER(S): 8960-1

**PRODUCT IDENTIFICATION**

**Chemical Name and Synonyms:** *Trifluoroacetic acid; Perfluoroacetic acid; Trifluoroethanoic acid*  
**Chemical Family:** *Aliphatic halogen compounds*  
**Chemical Formula:**  $C_2HF_3O_2$   
**Product Use:** *Laboratory reagent*  
**Manufacturer's Name and Address:**  
*Caledon Laboratories Ltd.  
40 Armstrong Avenue  
Georgetown, Ontario L7G 4R9*  
**Telephone No:** (905) 877-0101  
**Fax No:** (905) 877-6666  
**Emergency Telephone No:** CANUTEC (613) 996-6666

**HAZARDOUS INGREDIENTS OF MATERIALS**

<i>Ingredients</i>	<i>%</i>	<i>TLV Units</i>	<i>CAS No.</i>
<i>Trifluoroacetic acid</i>	<i>&gt;99</i>	<i>Not established</i>	<i>76-05-1</i>

*No occupational exposure limits have been established by OSHA, ACGIH, or NIOSH*

**PHYSICAL DATA**

**Physical State:** *Liquid*  
**Odour and Appearance:** *Colourless, fuming, hygroscopic liquid with a pungent, vinegar-like odour*  
**Odour Threshold (ppm):** *Not available*  
**Vapour Pressure (mm Hg):** *107 mm Hg @ 25°C*  
**Vapour Density (Air = 1):** *4.0*  
**Evaporation Rate:** *Not available*  
**Boiling Point (degrees C):** *72°C*  
**Freezing Point (degrees C):** *-15°C*  
**pH:** *Strongly acid*  
**Specific Gravity:** *1.53 @ 20°C*  
**Coefficient of Water/Oil distribution:** *Not available*

**SHIPPING DESCRIPTION**

**UN:** 2699  
**T.D.G. Class:** 8  
**Pkg. Group:** I

**REACTIVITY DATA**

**Chemical Stability:** *Stable under normal temperatures and pressures.*  
**Incompatibility with other substances:** *Reacts with acids giving off toxic and corrosive fumes; reacts violently or explosively with bases; may react explosively with aromatic hydrocarbons, hydrogen peroxide; may react violently or explosively with lithium tetrahydroaluminate; attacks metals.*  
**Reactivity:** *Avoid excessive heat, all incompatible materials, generation of mist or fumes. Concentrated trifluoroacetic acid reacts with water evolving heat.*  
**Hazardous Decomposition Products:**  $CO_x$ , HF

**FIRE AND EXPLOSION DATA**

**Flammability:** *Not combustible, but may release toxic and corrosive fumes under fire conditions*  
**Extinguishing Media:** *Dry chemical; carbon dioxide; halon, water spray or standard foam. Move containers from fire area if possible. Use water in flooding quantities to cool containers, flush material away from fire, and disperse toxic fumes. Firefighters must wear NIOSH approved positive-pressure, full face-piece self-contained breathing apparatus, and encapsulating chemical splash suit (Bunker gear will not be adequate). Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.*  
**Flash Point (Method Used):** *Not combustible*  
**Autoignition Temperature:** *Not combustible*  
**Upper Flammable Limit (% by volume):** *Not combustible*  
**Lower Flammable Limit (% by volume):** *Not combustible*  
**Hazardous Combustion Products:** *Toxic fumes of hydrogen fluoride and acetic acid (combustible)*  
**Sensitivity to Impact:** *None identified*  
**Sensitivity to Static discharge:** *None identified*

**TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:**

**LD<sub>50</sub>:** (oral, rat) 200 mg/kg; (ivn, mouse) 1,200 mg/kg  
**LC<sub>50</sub>:** (rat) 10 gm/m<sup>3</sup>

**Effects of Acute Exposure to Product:**

**Trifluoroacetic acid is toxic and very corrosive. Poisoning may affect the cardiovascular and nervous systems.**

**Inhaled:** *Corrosive. Causes severe burns, coughing, laboured breathing. May be fatal as a result of spasm, inflammation, chemical pneumonitis and pulmonary edema. Causes cardiac irregularities, such as ventricular fibrillation and sudden cardiac arrest. These symptoms are usually preceded by an initial latent period of up to 6 hours and may be characterized by nausea, vomiting, excessive salivation, numbness, tingling sensations, epigastric pain and mental apprehension. Muscular twitching, hypotension and blurred vision are also possible.*

**In contact with skin:** *Corrosive. Causes severe burns. Readily absorbed through intact skin, destroying tissue as it penetrates and causing systemic effects as in "Inhaled".*

**In contact with eyes:** *Corrosive. Contact with solution or mist causes severe irritation or burns to the eyes with possible permanent damage and blindness. The degree of injury depends on the concentration and duration of contact. The full extent of the injury may not be immediately apparent.*

**Ingested:** *Causes burns to mouth, throat, esophagus and stomach. Exposure to fluoroacetates may cause severe epileptiform convulsions alternating with coma and depression. Death may result from asphyxia during a convulsion or from respiratory failure. It may also cause cardiac irregularities, see "Inhaled".*

**Effects of Chronic Exposure to Product:**

*Repeated or prolonged inhalation of corrosive substances may cause inflammatory and ulcerative changes in the*

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mouth and possibly bronchial and gastrointestinal disturbances. Repeated or prolonged skin exposure can cause dermatitis.

**Carcinogenicity:** Not listed as carcinogenic by IARC, ACGIH or OSHA

**Teratogenicity:** No information available

**Reproductive Effects:** No information available

**Mutagenicity:** No information available

**Synergistic Products:** None known

## PREVENTIVE MEASURES

**Engineering Controls:** Local corrosion-resistant exhaust ventilation required.

**Respiratory Protection:** Dust/mist mask. Use only in a fumehood. Up to 10x TLV, or the maximum use specified by the respirator supplier, whichever is lowest, NIOSH approved half-face high-efficiency dust/mist filter respirator. Up to 50x TLV, or the maximum use specified by the respirator supplier, whichever is lowest, NIOSH approved full face-piece high-efficiency dust/mist filter respirator. Higher or unknown concentrations, or for fire or spill conditions, self-contained breathing apparatus, or full face-piece, positive-pressure supplied-air respirator.

**Eye Protection:** Chemical safety goggles and/or full face shield.

**Skin Protection:** Nitrile or butyl rubber, neoprene or Viton gloves. Other protective equipment, apron, coveralls, boots, sufficient to prevent any skin contact.

**Other Personal Protective Equipment:** Safety shower and eye wash facilities in work area.

**Leak and Spill Procedure:** DO NOT TOUCH SPILLED MATERIAL. Evacuate area. Cleanup personnel must be thoroughly trained in the handling of hazardous materials, and in the specific hazards of this substance, and must wear protective equipment and clothing sufficient to prevent any inhalation of fumes and contact with skin, eyes, or clothing. Shut off all sources of ignition. Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent non-combustible material and place into containers for later disposal. Prevent from entering sewers or waterways. Material may be neutralized, carefully, with a basic material such as caustic soda. Move containers from spill area. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away; isolate hazard area and deny entry.

**Waste Disposal:** Follow all federal, provincial and local regulations for disposal.

**Handling Procedures and Equipment:** CORROSIVE, TOXIC MATERIAL. Personnel working with this material must be thoroughly trained in chemical handling and must be familiar with the particular hazards of this chemical. (S)he should recognize that the product can cause severe injury or death if improperly handled. The user is responsible for wearing appropriate protective equipment and clothing depending on the application. Avoid **all contact** with skin and eyes and **any inhalation** of vapours. When diluting, always add acid to water, stirring constantly. Use the smallest amount possible for the purpose in a designated area with sufficient ventilation. Treat empty containers with caution as they contain hazardous residues.

**Storage Requirements:** Store in a cool, dry, well-ventilated and corrosion-proof area, in suitable, labelled containers out of direct sunlight, and away from incompatible materials. Keep tightly closed. Storage area should be constructed of corrosion-resistant materials and have raised sills, with trenching to safe area. Protect from damage. Check fre-

quently for leaks; spillage onto combustible materials (wood; paper; etc.) could result in fire.

## FIRST AID MEASURES

### Specific Measures:

**Eyes:** Flush eyes immediately with large amounts of gently running water, lifting upper and lower lids, until no evidence of chemical remains (at least 20-30 minutes). Take care not to rinse contaminated water into the unaffected eye. Wear protective gloves to avoid contact during first aid procedures. Continue irrigating with normal saline until the pH has returned to normal (30-60 minutes). Cover with sterile bandages. GET MEDICAL ATTENTION IMMEDIATELY.

**Skin:** Under running water, remove contaminated clothing (including shoes, belts, watches and rings). Drench skin with gently running water for at least thirty (30) minutes, or until no trace of chemical remains. Wear protective gloves to avoid contact during first aid procedures. Cover area with sterile, dry dressing; bandage securely, but not too tightly. Get medical attention immediately. Decontaminate clothing before reuse, or discard.

**Inhalation:** Remove from exposure area to fresh air immediately (caution must be used by rescuers to avoid exposure to mist or fumes). Give oxygen for breathing difficulty. Get medical attention immediately. If breathing has stopped, give artificial respiration. Maintain airway and blood pressure. Keep affected person warm and at rest. Treat symptomatically and supportively.

**Ingestion:** GET MEDICAL ATTENTION IMMEDIATELY. If victim is alert and NOT convulsing, wash out mouth thoroughly with water and give 2 to 4 glasses of water to drink to dilute (chemical must be diluted approximately 100 times to render it harmless to tissues). Do not use gastric lavage or emetics. Do not give stimulants. Maintain blood pressure and respiration. If spontaneous vomiting occurs have victim lean forward to reduce risk of aspiration of emesis, Rinse mouth and wash lips and skin thoroughly to avoid further burning of tissue. Avoid contact with emesis.

## REFERENCES USED

CCINFO disc: Cheminfo

Budavari: The Merck Index, 12th ed., 1997

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 3, 1990

Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979

Suppliers' Material Safety Data Sheets

## ADDITIONAL INFORMATION

**Date Issued:** March 10, 1989

**Revision:** December 2010

**MSDS:** 8960-1

**Proposed WHIMS Designation:** D1A; E

Prepared by: Caledon Laboratories Ltd. (905) 877-0101  
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