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MATERIAL SAFETY DATA SHEET

PRODUCT NAME	CAS#
Nitrogen Trifluoride	7783-54-2
TRADE NAME AND SYNONYMS	**DOT I.D. NO.**
Nitrogen Trifluoride	UN 2451
CHEMICAL NAME AND SYNONYMS	**DOT HAZARD CLASS**
Nitrogen Trifluoride	Division 2.2
ISSUE DATE AND REVISIONS	**FORMULA**
Revised March 2000	NF_3

HEALTH HAZARD DATA

EMERGENCY OVERVIEW

Nitrogen Trifluoride is an toxic, nonflammable, compressed gas packaged in cylinders at high pressure (<1500 psig). It is also an oxidizer that can cause ignition or enhance combustion of metallic or non-metallic materials, particularly at temperatures exceeding 400 ^{o}F. It is odorless but may contain contaminants that can impart a musty odor. Self-Contained Breathing Apparatus is required for entry to release area when concentrations exceed exposure limits. Products of combustion are toxic.

SYMPTOMS OF OVER-EXPOSURE

Effects of over-exposure of Nitrogen Trifluoride include weakness, dizziness, confusion due to the reduction of oxygen supply in the blood.

Acute exposure can cause hemoglobin to convert to methemoglobin, which will inhibit oxygen transport in blood. This effect will immediately reverse when exposure ends. Exposure to high concentrations can lead to the destruction of red blood cells.

TOXICOLOGICAL PROPERTIES

Nitrogen Trifluoride is toxic, exposures can reduce the blood' s ability to transport oxygen.

Nitrogen Trifluoride is not listed in the IARC, NTP, FEDERAL OSHA Z LIST or CAL/OSHA.

No mutagenicity or teratogenicity effects on humans have been described for Nitrogen Trifluoride.

RECOMMENDED FIRSTAID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO NITROGEN TRIFLUORIDE. RESCUERS SHOULD BE EQUIPPED WITH ADEQUATE PERSONAL PROTECTIVE APPARATUS.

Inhalation: Victim(s) should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Further treatment should be symptomatic and supportive.

Eye Contact: Flush contaminated area with water and seek additional medical assistance.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

None

PHYSICAL DATA

BOILING POINT -200.3°F	**SPECIFIC VOLUME AT 70 °F** 5.43 ft^3/lb.
VAPOR PRESSURE @ 70 °F Permanent, non-condensable, gas	**MOLECULAR WEIGHT** 71.0
SOLUBILITY IN WATER Will not hydrolyze	**FREEZING POINT** -340.2°F
EVAPORATION RATE N/A	**SPECIFIC GRAVITY (AIR=1)** 2.46 @ 70°F
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	**AUTO IGNITION TEMPERATURE**	**FLAMMABLE LIMITS % BY VOLUME**
N/A	N/A	LEL N/A UEL N/A

EXTINGUISHING MEDIA

Water or carbon dioxide may help cool area and limit formation of reactive thermal breakdown products such as fluorine.

SPECIAL FIRE FIGHTING PROCEDURES

If possible, without risk, move cylinders away from fire area. If possible, stop the flow of gas to the fire. Cool cylinders with water spray until will after fire is out.

UNUSUAL FIRE AND EXPLOSION HAZARDS

This gas will enhance combustion of other materials. Upon exposure to intense heat or flame cylinder may vent rapidly or rupture.

REACTIVITY DATA

STABILITY		**CONDITIONS TO AVOID**
Unstable		High temperature, including temperatures produced through adiabatic compression.
Stable	X	

INCOMPATIBILITY (Materials to avoid)

Oil, grease, and other hydrocarbons.

HAZARDOUS DECOMPOSITION PRODUCTS

Hydrogen fluoride, and other toxic fluoride compounds.

HAZARDOUS POLYMERIZATION		**CONDITIONS TO AVOID**
May Occur		N/A
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Uncontrolled releases should be responded by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of an accidental release, evacuate all personnel upwind and away from affected area, protect people, and respond with trained personnel.

WASTE DISPOSAL METHOD

Waste disposal must be in accordance with appropriate Federal, State, and local regulations. For emergency disposal assistance, contact HSG for specific advice.

SPECIAL PROTECTION INFORMATION

RESPIRTORY PROTECTION (Specify type)
Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

VENTILATION	SPECIAL
See Local Exhaust	N/A
MECHANICAL (Gen.)	**OTHER**
N/A	N/A

LOCAL EXHAUST
To prevent accumulation of nitrogen trifluoride concentrations above 10 ppm.

PROTECTIVE GLOVES
Any material

EYE PROTECTION
Safety goggles or glasses

OTHER PROTECTIVE EQUIPMENT
Safety shoes

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION	
DOT Shipping Name: Nitrogen trifluoride DOT Shipping Label: Nonflammable Gas, Oxidizer	DOT Hazard Class: Division 2.2 I.D. No.: UN 2451

SPECIAL WORK AND HYGIENE RECOMMENDATIONS
As with all chemicals, avoid getting this product in you. Do not eat or drink while handling this product. Be aware of any signs of dizziness or fatigue, exposures to fatal concentrations of this product could occur without any significant warning symptoms.

SPECIAL HANDLING AND STORAGE RECOMMENDATIONS
Cylinders should be stored in dry, well-ventilated areas away from sources of heat, compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Stainless steel, carbon steel, nickel and copper are suitable materials of construction for low pressure (<70 psig) service at temperatures below 300 ^{o}F. Nickel and certain alloys of nickel and copper are the preferred materials for high pressure service.

OTHER RECOMMENDATIONS OR PRECAUTIONS
Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 125^{o}F. Use a check valve or trap in the discharge line to prevent hazardous backflow. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over.

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