

MATERIAL SAFETY DATA SHEET

MANUFACTURER:

AMERICAN PACIFIC CORP – HALOTRON DIV.
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ISSUED: MAY 19, 1992
REVISED: APRIL 6, 2004
SUPERSEDES: JANUARY 3, 2001
REF. NO.: H1-10006c

PRODUCT NAME	PRODUCT TYPE:	CAS NUMBER
HALOTRON I PRE-SAT BASE	MIXTURE OF (by Weight): Greater than 93%: 2,2-dichloro-1,1,1-trifluoroethane (HCFC-123)	306-83-2
	Less than 7%: Proprietary Gas Mixture	Not available

1. PHYSICAL DATA

BOILING POINT AT 1 ATM.: 27° C (80.6°F)
GAS DENSITY: Approx. 6.17 Kg/m³ (0.385 lb./ft³)
LIQUID DENSITY: 1.48 Kg/l (92.3 lb./ft³) at 77°F (25°C)
RELATIVE DENSITY (AIR=1): 5.14
MOLECULAR WEIGHT: Approx. 150.7
PHYSICAL STATE: Pressurized Liquid
APPEARANCE AND ODOR: Colorless volatile liquid with slight ether-like odor
VAPOR PRESSURE OF LIQUID ALONE (68°F, 20°C): approx. 11.2 psig (77 kPa)
PRESSURE OF MIXTURE IN CONTAINER: 95 psig @ 70°F (655 kPa @ 20°C)
OCTANOL/WATER PARTITION COEFFICIENT (Log P_{ow}): 2.0-2.8

2. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: None
FLAMMABILITY LIMITS (LEL,UEL): Not applicable
AUTOIGNITION TEMPERATURE: Not Determined
EXTINGUISHING MEDIA: Non-Flammable
SPECIAL FIRE FIGHTING PROCEDURES: Ensure that the area where the fire occurred is well ventilated before re-entering. Wear protective clothing. Use water spray or fog to cool storage containers to help prevent an uncontrolled pressure release.
UNUSUAL FIRE AND EXPLOSION HAZARDS: The concentrated agent when applied to fire can produce toxic by-products specifically hydrogen halides, which can cause damage. Avoid inhalation of these materials by evacuating and ventilating the area.

3. REACTIVITY DATA

STABILITY: Stable under normal conditions. Decomposes under fire conditions.
INCOMPATIBILITY (MATERIALS TO AVOID): Reactive with alkali and alkaline earth metals and powdered metals such as aluminum and zinc. Avoid contact with oxidizers.
HAZARDOUS POLYMERIZATION: () will occur (X) will not occur
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Thermal decomposition may produce hydrogen fluoride, hydrogen chloride, and carbonyl halide.

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4. HEALTH HAZARD DATA

GENERAL INFORMATION:

- When using the material for prolonged periods in filling or servicing operations, **PERFORM THESE ACTIVITIES IN A WELL-VENTILATED AREA.**
- Fire extinguishers filled with this material should be used in enclosed areas with a net room volume of at least 140 cubic feet per pound of Halotron I in the extinguisher.

SYMPTOMS OF EXPOSURE:

- By inhalation: Exposure may cause central nervous system effects such as dizziness, drowsiness, anesthesia, or unconsciousness. Anesthetic effects may occur at concentrations of 5000 ppm (v/v) or above. At concentrations of 20,000 ppm or higher, HCFC-123 may cause increased sensitivity of the heart to adrenaline which might cause irregular heartbeats and possibly ventricular fibrillation or death.
- To the Eyes: Irritation and tearing may result from the cooling effect of HCFC-123 evaporation. Due to the ability to of HCFC-123 to dissolve fats, contact should be avoided.
- To the Skin: Evaporative cooling can result in chilling sensations or frostbite effects. Repeated exposure to the skin can result in dermatitis. Due to the ability to of HCFC-123 to dissolve fats, contact should be avoided.
- By Ingestion: Not likely to occur in industrial use. Highly volatile liquid.
- LISTED AS A CARCINOGEN: () YES (X) NO

TIME WEIGHTED EXPOSURE LIMITS (For persons regularly exposed to material)

- Workplace Environmental Exposure Level, WEEL (AIHA) (8 hrs.): 50 ppm (v/v), based on the primary component (HCFC-123).

TOXIC PROPERTIES OF COMPONENTS: Acute toxicity is low.

- For 2,2-dichloro-1,1,1-trifluoroethane (CAS # 306-83-2):
 - LC₅₀ (4 hr.): 3.2% (32,000 ppm), (Inhalation)
 - Oral Approximate Lethal Dose (ALD): 9 g/kg (body weight)
 - Cardiotoxic LOAEL (Lowest Observed Adverse Effect Level): 2%
 - Cardiotoxic NOAEL (No Observed Adverse Effect Level): 1%
 - Toxicological testing was performed on HCFC-123 by the Program for Alternative Fluorocarbon Testing (PAFT). Data from acute toxicity studies in this program demonstrated that HCFC-123 has very low toxicity by skin application or inhalation.
- For the proprietary gas mixture:
 - The toxic effects of the proprietary gas mixture in the absence of extreme temperature are primarily its ability to function as a simple asphyxiant (i.e. displace oxygen).

OTHER TOXICITY INFORMATION:

Animal Studies: For 2,2-dichloro-1,1,1-trifluoroethane (CAS #306-83-2):

Long-term exposure in a two year study (6 hours/day, 5 days/week) at concentrations of 300, 1000 and 5000 ppm decreased body weight, serum cholesterol, triglycerides and glucose, and increased urinary fluoride concentrations in rats. However, survival was significantly improved in all exposed groups compared to control animals. Inhalation of 300, 1000 and 5000 ppm caused an increase in benign tumors of the liver, pancreas, and testis. Tumors occurred late in life and none were assessed to be life threatening. Tumor formation is thought to occur through non-genotoxic mechanisms associated with a peroxisome proliferating potential or with hormonal disturbances in older rats.

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Exposure to dogs, guinea pigs or monkeys at 1000 ppm or greater for 6 hrs./day, 7 days per week, for a total of 3 weeks induced slight or mild liver damage with altered enzyme levels.

Rodent studies indicate HCFC-123 is easily absorbed via inhalation. It distributes in all organs, more so in the liver. About 90% of inhaled HCFC-123 is eliminated via the lungs unchanged. The remaining amount is metabolized to trifluoroacetic acid and excreted in the urine. Small amounts of trifluoroacetylated proteins were detected in rats.

HCFC-123 did not affect reproductive performance in rats or harm the unborn animals in rats or rabbits at 5000 and 10,000 ppm.

HCFC-123 was inactive in several test-tube genetic damage studies except the human lymphocyte chromosome aberration assay. HCFC-123 is also inactive in live animal genetic damage studies. Therefore, it is not considered genotoxic.

RECOMMENDED FIRST AID FOR OVEREXPOSURE:

(Use breathing apparatus if rescuing in an area with high concentration)

Inhalation: Remove person to area with fresh air. Apply artificial respiration if necessary. Contact a physician.
Skin Contact: Apply large amounts of water, contact a physician if irritation occurs.
Eye Contact: Apply large amounts of water, contact a physician.
Ingestion: Induction of vomiting may pose a hazard. Contact a physician.
Note to Physician: Do not administer adrenaline or similar drugs.

5. PROTECTION INFORMATION

- Wear protective clothing when handling a leak.
- Neoprene, PVC or PVA gloves should be worn when handling.
- Protective eyeglasses and protective shoes should be worn when handling.
- Respiratory protection is not normally needed, however, if handled in enclosed spaces where applicable exposure limits will be exceeded, a Self Contained Breathing Apparatus (SCBA) should be used.
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6. SPILL, LEAKAGE, DISPOSAL, AND SPECIAL PRECAUTIONS

- In the event of a spill, allow for adequate ventilation, and do not re-enter an area without an SCBA until adequate ventilation is accomplished.
- For spills that might result in overexposure, evacuate the area and use protective gear and SCBA's.
- Avoid leakage into waterways because HCFC-123 is damaging to vegetation.
- Do not expose storage containers to fire, as uncontrolled pressure releases may result.
- The HCFC-123 vapors are heavier than air, therefore use caution when releases occur in low lying areas where concentrated vapors may accumulate.
- Recommended 1 Hr. Emergency Exposure Limit: 1000 ppm (v/v) on the same basis as above.
- Recommended 1 Min. Emergency Exposure Limit: 2500 ppm (v/v) on the same basis as above.
- **WASTE DISPOSAL:** Observe all federal, state, and local regulations for products of this type when accomplishing disposal.
- **SECTION 313 SUPPLIER NOTIFICATION:** This product contains more than 93% by weight 2,2-dichloro-1,1,1-trifluoroethane (CAS #306-83-2) which is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40CFR372).

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM (HMIS):

RATINGS:

HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 1
PERSONNEL PROTECTION: B

HMIS HAZARD INDEX:

MINIMAL: 0 SEVERE: 4
SLIGHT: 1
MODERATE: 2
SERIOUS: 3

PERSONAL PROTECTIVE EQUIPMENT DESIGNATIONS:

A: SAFETY GLASSES
B: SAFETY GLASSES, GLOVES
C: SAFETY GLASSES, GLOVES, SYNTHETIC APRON
D: FACE SHIELD, GLOVES, SYNTHETIC APRON
E: SAFETY GLASSES, GLOVES, DUST RESPIRATOR
F: SAFETY GLASSES, GLOVES, SYNTHETIC APRON, DUST RESPIRATOR
G: SAFETY GLASSES, GLOVES, VAPOR RESPIRATOR
H: SPLASH GOGGLES, GLOVES, SYNTHETIC APRON, VAPOR RESPIRATOR
I: SAFETY GLASSES, GLOVES, COMBINATION DUST AND VAPOR RESPIRATOR
J: SPLASH GOGGLES, GLOVES, SYNTHETIC APRON COMBINATION, DUST AND VAPOR RESPIRATOR
K: AIRLINE HOOD OR MASK, GLOVES, FULL PROTECTIVE SUIT, BOOTS
X: SITUATIONS REQUIRING SPECIALIZED HANDLING

7. TRANSPORTATION

DOT SHIPPING NAME: Compressed Gases, N.O.S., (contains Tetrafluoromethane, argon),
2.2, UN1956
DOT SHIPPING LABEL: Nonflammable Gas
IMCO CLASS: 2.2

The information and recommendations in this publication represent our current data and best opinion as to the proper use and handling of this material under normal conditions. Any use of the described material which is not in conformance with this publication or which involves using the described material in combination with any other material or any other process is the responsibility of the user.