1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: HALOTRON® I

OTHER/GENERIC NAMES: HCFC Blend B, Halotron® I Pre-Sat Base

PRODUCT USE: Halotron® I is a clean fire-extinguishing agent for streaming and local applications. NFPA 2001, *"Standard on Clean Agent Fire Extinguishing Systems"* defines a "Clean Agent" to be "electrically non-conducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation." Halotron® I is a safe, effective, environmentally acceptable clean agent. It is discharged as a liquid, which rapidly evaporates (i.e. it is volatile). It is a proprietary three component chemical blend based on HCFC-123 that is approved by the U.S. EPA under its Significant New Alternatives Policy (SNAP) program (referred to as “HCFC Blend B”) for commercial/industrial, military, and maritime use in streaming applications as a substitute for halon 1211 (bromochlorodifluoromethane or "BCF").

MANUFACTURER: American Pacific Corporation, Halotron Division. 10622 West 6400 North, Cedar City, UT 84721

FOR MORE INFORMATION CALL: (435) 865-5000

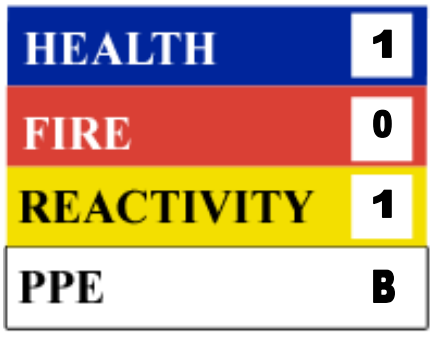
IN CASE OF EMERGENCY CALL: (435) 865-5044

2. COMPOSITION/INFORMATION ON INGREDIENTS

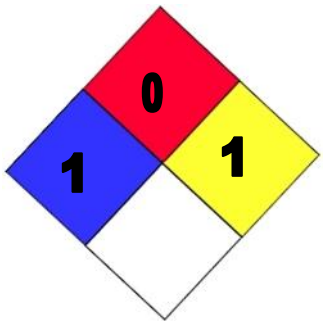
INGREDIENT NAME	CAS NUMBER	WEIGHT %
2,2-dichloro-1,1,1-trifluoroethane (HCFC-123)	306-83-2 (EC Number 206-190-3)	Greater than 93%
Proprietary Gas Mixture	Multiple, proprietary	Less than 7%

OSHA Hazard Communication Standard: This product is considered hazardous under the OSHA Hazard Communication Standard.

3. HAZARDS IDENTIFICATION



HMIS



NFPA

HMIS PERSONAL PROTECTIVE EQUIPMENT (PPE) 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

EMERGENCY OVERVIEW:

Halotron I is a colorless volatile, pressurized liquid with a slight ether-like odor. As with any chemical, dose and exposure are critically important variables to understand any potential treatment. Short-term exposure to high concentrations may result in central nervous system and cardiac effects. Long-term exposure to concentrations above those time weighted averages recommended herein may result in liver effects.

HEALTH HAZARDS:

Inhalation: Inhalation of high concentrations of vapor 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 causes increased sensitivity of the heart to adrenaline which might cause irregular heart beats and possible ventricular fibrillation or death. Long-term exposure to concentrations above those time weighted averages recommended may cause liver damage with altered enzyme levels and central nervous system depression. When used on a fire, hazardous decomposition products are formed, but typically are within safe emergency exposure limits.

Eye contact: May cause irritation, tearing, or blurring of vision, which result in part due to the cooling effect of HCFC-123 evaporation.

Skin contact: Evaporative cooling can result in chilling sensations or frostbite effects. Repeated exposure to the skin can result in dermatitis. Prolonged skin contact should be avoided, but short-term contact is not considered hazardous.

Ingestion: Not likely to occur in industrial use. HCFC-123 is a highly volatile liquid.

This material is NOT LISTED by OSHA, NTP, or IARC as a CARCINOGEN.

Additional region specific information

European Union:

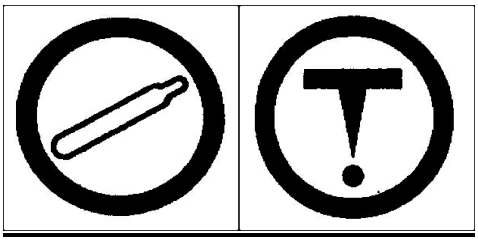
This chemical substance is not classified in the Annex I of Directive 67/548/EEC.

It is listed as a LPV

Canada:

Components are listed on the DSL

WHMIS Hazard Symbols



Halotron® I Fire Extinguishing Agent:

Caution: Contains a compressed gas. High concentrations may cause cardiac arrhythmia and central nervous system depression, and possibly asphyxiation. May produce irritating vapors during use. Use of this material in confined spaces when personnel are present is acceptable only if the volume of the space is sufficiently large, as specified on UL listed fire extinguishers containing this product and guidance contained herein.

First Aid: See other section of this MSDS. Toxicity information is located in other sections of this MSDS.

4. FIRST AID MEASURES

Routes of exposure	Signs and symptoms of exposure:	Emergency and first aid procedures:
SKIN:	Evaporative cooling can result in chilling sensations or frostbite effects. Short exposures, such as when filling equipment or in other situations, should not have a lasting effect. Repeated exposure to the skin, however, can result in dermatitis.	If significant exposure occurs, wash exposed area immediately with large amounts of water. Remove contaminated clothing and footwear. Contact a physician if irritation occurs.
INHALATION:	Significant 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 (v/v) or higher, HCFC-123 may cause increased sensitivity of the heart to adrenaline which might cause irregular heartbeats and possibly ventricular fibrillation or death.	If experiencing breathing difficulties, move to fresh air. Apply artificial respiration if necessary. Never give anything by mouth to an unconscious person. Contact a physician if breathing difficulties occur. Note to physician: This material may make the heart more susceptible to arrhythmias. Catecholamines such as adrenaline, and other compounds having similar effects, should be reserved for emergencies and then used only with special caution.
INGESTION:	Not likely to occur in industrial use. Highly volatile liquid.	Do not induce vomiting; Give two glasses of water if ingestion occurs. Contact a physician
EYES:	Irritation and tearing may result from the cooling effect of HCFC-123 evaporation. Mild to moderate reversible eye damage, including irritation and corneal opacity has been seen in testing of undiluted HCFC-123.	Flush eyes with fresh water and move exposed person to a non-contaminated area. Contact a physician for cases where irritation or effects occur

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: None.
FLASH POINT METHOD: Not applicable.
AUTOIGNITION TEMPERATURE: Not determined.

UPPER FLAMMABILITY LIMIT (volume % in air): Not applicable.
LOWER FLAMMABILITY LIMIT (volume % in air): Not applicable.

EXTINGUISHING MEDIA: The properties of this chemical make it an ideal extinguishing media its self.

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.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

- **In the event of a large 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 large volume 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.**
- **Any food items that were directly sprayed by the liquid should be thrown away, and all surfaces that are used for food service should be washed (as normal) before re-use.**
- **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).**

7. HANDLING AND STORAGE

NORMAL HANDLING: (See section 8 for recommended personal protective equipment.) Avoid prolonged contact with the skin and eyes. Avoid inhaling material and ensure that good ventilation is present when handling. Wash after handling and follow good personal hygiene and good housekeeping practices. Keep containers closed and transfer material using closed systems. Handle in a manner to minimize spills.

Additional Note: Approved DOT shipping containers are a normal safe method of storage. Containers should be maintained in good condition. Do not allow material to remain in deteriorating containers. Because this product can volatilize, special care should be taken for over pressurization hazards if the containers are overheated or near a radiant heat source. Protective shoes, such as steel toed shoes, should be worn in addition to the other specified personal protective equipment (PPE) when handling bulk containers. Eye protection with splash protective side shields should be used when any possibility of splash or spray exists

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Ventilate as necessary to minimize exposure levels. Inspect and clean ventilation systems regularly. Prolonged use should occur only in areas with adequate ventilation. Keep storage containers tightly closed. Vapors are heavier than air posing a potential hazard if large volumes are trapped in enclosed or low places.

PERSONAL PROTECTIVE EQUIPMENT:

- Wear protective clothing when handling a leak in a storage container (does not apply to fire protection equipment servicing, other than safety goggles and gloves if large volumes can be exposed to skin).
- Neoprene, PVC or PVA gloves should be worn when handling material for prolonged periods. Short exposures to skin are not likely to pose a hazard.•
  Respiratory protection is not normally needed, however, if handled in enclosed spaces where applicable exposure limits might be exceeded, a Self Contained Breathing Apparatus (SCBA) should be used.
- When performing filling or servicing operations, PERFORM THESE ACTIVITIES IN A WELL-VENTILATED AREA.
  If handling materials outside a closed, sealed system such that the possibility of splashing exists, wear safety glasses with side shields. This statement is not intended to apply to use of a fire extinguisher where the nozzle arrangement is intended to direct the discharge away from the user of the extinguisher.

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). See section 11 for more information.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless	**PHYSICAL STATE:** Pressurized liquid	**VAPOR PRESSURE OF LIQUID ALONE:** (68°F, 20°C): approx. 11.2 psig (77 kPa)	**RELATIVE DENSITY (AIR=1):** 5.14	**ODOR:** Slight ether-like odor
OCTANOL/WATER PARTITION COEFFICIENT (Log P_{ow}): 2.0-2.8	**MOLECULAR WEIGHT:** Approx. 150.7	**PRESSURE OF MIXTURE IN CONTAINER:** (70°F, 20°C): 95 psig (655 kPa)	**BOILING POINT AT 1 ATM.:** 27°C (80.6°F)	**GAS DENSITY:** Approx. 6.17 kg/m^3 (0.385 lb./ft^3) **LIQUID DENSITY:** (77°F, 25°C): 92.3 lb./ft^3 (1.48 kg/l)
EVAPORATION RATE: Faster than water, slower than ether		**FLASH POINT:** Not flammable		

10. STABILITY AND REACTIVITY

STABILITY: Normally stable (will decompose if exposed to a high radiant heat source, such as fire). The material is intended for use as a fire extinguishant.

INCOMPATIBILITIES: Incompatible with alkali or alkaline earth metals, and powdered metals Al, Zn, Be, etc.

HAZARDOUS DECOMPOSITION PRODUCTS: Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halide.

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HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

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%vol.
  Cardiotoxic NOAEL (No Observed Adverse Effect Level): 1%vol.
  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.

  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 in laboratory studies.

  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.

  Carcinogen: IARC: NO NTP: NO OSHA: NO

12. ECOLOGICAL INFORMATION

Aquatic toxicity:

Slightly toxic, 96 hour LC_{50} –Fathead minnow's > 77mg/l

13. DISPOSAL CONSIDERATIONS

Observe all federal, state, and local regulations for products of this type when accomplishing disposal.

The manufacturer assumes no liability for the use of this product in a manner that causes environmental or other harm.

14. TRANSPORT INFORMATION

DOT SHIPPING NAME: UN1956, Compressed Gases, N.O.S., 2.2 (contains tetrafluoromethane, Argon),

DOT SHIPPING LABEL: Nonflammable Gas
IMCO CLASS: 2.2

It is recommended that DOT approved transport containers and carriers be used for shipment of this product.

NOTE: The transportation information above covers the Halotron I fire extinguishing agent as shipped in bulk containers, and not when contained in fire extinguishers or fire extinguishing systems. When shipped in a stored-pressure type fire extinguisher, and pressurized with argon gas, the fire extinguisher is considered a hazardous material by the US Department of Transportation and Transport Canada. The proper shipping name shall be FIRE EXTINGUISHER and the UN designation is UN 1044. The DOT hazard class/division is 2.2 Non-Flammable Gas. Packing Group – N/A.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)
TSCA INVENTORY STATUS: All components Listed on the TSCA Inventory.
OTHER TSCA ISSUES: None

SARA TITLE III/CERCLA "Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients. Listed only for Section 313 notification

INGREDIENT NAME	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)

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).

Spills or releases resulting in the loss of any ingredient at or above its RQ (For those compounds where an RQ exists) require immediate notification to the National Response Center [(800) 424-8802], to the state where you are located, and to your Local Emergency Planning Committee or Fire Department.

SARA 313 TOXIC CHEMICALS: The following ingredients are SARA 313 "Toxic Chemicals" and may be subject to annual reporting requirements. CAS numbers and weight percents are found in Section 2

INGREDIENT NAME	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)
2,2-dichloro-1,1,1-trifluoroethane (HCFC-123)	Not listed, Section 313 only	Section 313

No ingredients listed in this section.

STATE RIGHT-TO-KNOW In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

None of the components are listed under California Proposition 65. Tetrafluoromethane is listed under some US state's right to know act or lists

INGREDIENT NAME	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)
Halotron I Pre-Sat Base	Examine local regulations to determine	Examine local regulations to determine

ADDITIONAL REGULATORY INFORMATION:

Regulations

Listed in the Toxic Substances Control Act (TSCA) Inventory.: Yes , all components are on the TSCA Inventory
Listed on EPA SARA (313) Hazard Class, **Subject to reporting requirements of EPCRA Section 313**
All components listed in Canadian DSL.
HCFC 123 is listed under EINECS EC Number 206-190-3 as a low production volume chemical. All components of the proprietary gas mixture are listed in Einecs based on ESIS lookup.

Information about limitation of use: This blend is intended solely for use as a fire extinguishing agent and should not be used for other purposes without contact and technical discussion with the manufacturer.

16. OTHER INFORMATION

CURRENT ISSUE DATE: 02 January 2013

PREVIOUS ISSUE DATE: 23 April 2010

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING: In section 14 Changed sequence order (UN Number First)
Change H1 MSDS From: Compressed Gases, N.O.S., 2.2, UN1956 (contains Tetrafluoromethane, Argon)
Change H1 MSDS to read: UN1956, Compressed Gas, N.O.S., 2.2 (contains Tetrafluoromethane, Argon)

OTHER INFORMATION: The user is responsible to evaluate the safety and environmental consequences of any intended uses. The manufacturer assumes no liability for any usages that result in adverse consequences.