

Material Safety Data Sheet

1. Product and Company Identification

245

ARCTON ® 412A (TP 5R) General Use: Refrigerant

Alternative names:

Blend of chlorodifluoromethane/1-chloro-1,1-difluoroethane/octafluoropropane;
R22/R142b/R218;HCFC22/HCFC142b/PFC218

INEOS Fluor Americas LLC
4990B ICI Rd. / P.O. Box 30 ***
St. Gabriel, LA 70776 ***

Issue Date: 12/31/01
Rev. 7
BPCS: 245

Medical Emergency (24 hr.): 800-298-9164
Transportation emergency (24 hr.): CHEMTREC 800-424-9300
Product Information: 800-275-5532

2. Composition Information on Ingredients

<u>Ingredients</u>	<u>%(Wt)</u>	<u>OSHA PEL</u>
Chlorodifluoromethane (CAS 75-45-6)	70	1000ppm
1-chloro-1,1-difluoroethane (CAS 75-68-3)	25	Not listed
Octafluoropropane (CAS 76-19-7)	5	Not listed

3. Hazards Identification

Emergency Overview:

Appearance: Colorless liquified gas with faint ethereal odor

Physical hazards : Compressed liquified gas

Health hazards : Harmful (central nervous system depression, cardiac arrhythmias)

* Hazard summary as defined by OSHA Hazard Comm. Std., 29 CFR 1910.1200.

Potential Health Effects:

General: The health hazard assessment is based on toxicity studies together with information from a search of the scientific literature.

Ingestion: Extremely unlikely to occur in use.

Eye contact: Liquid splashes or vapor spray may cause freeze burns.

Skin contact: The liquid form of this product may cause freeze burns (frostbite-like lesions).

Skin absorption: This product will probably not be absorbed through human skin.

Inhalation: Exposures to very high vapor concentrations can induce anesthetic effects progressing from dizziness, weakness, nausea, to unconsciousness. It can act as an asphyxiant by limiting available oxygen. Very high doses can cause abnormal heart rhythm which is potentially fatal.

Other effects of overexposure: None expected.

4. First Aid Measures

Skin: Thaw affected areas with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If symptoms (irritation or blistering) develop, get medical attention.

Eyes: Immediately flush with plenty of water, and continue flushing for at least 15 minutes. Have eyes examined and treated by medical personnel.

Ingestion: Not applicable.

Inhalation: Remove victim to fresh air. Keep warm and at rest. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. In the event of a cardiac arrest, apply external cardiac massage. Do not administer adrenaline or similar sympathomimetic drugs as cardiac arrhythmias may result. Get immediate medical attention.

5. Fire Fighting Measures

Flashpoint and method: Does not flash.

Autoignition temperature: Not applicable.

Flammable limits (STP): Not flammable as formulated. Flammability can result from the fractionation of this blend which may occur if allowed to evaporate or leak from the vapor phase with consequent increase in 1-chloro-1,1-difluoroethane content. The mixture becomes flammable when 1-chloro-1,1-difluoroethane reaches 60% by wt in the liquid phase.

General hazards: Compressed liquified gas.

Heavy vapors can suffocate.

Arcton 412A is not flammable in air under ambient conditions of temperature and pressure. Under conditions of high pressure, certain mixtures of Arcton 412A and air may be flammable. Mixtures of Arcton 412A and air or oxygen should not be used for leak or pressure testing.

Certain mixtures of Arcton 412A and chlorine may be flammable under some conditions.

Thermal decomposition will evolve toxic and irritant vapors.

Firefighting instructions: Not applicable. Use media suitable for surrounding fire. Use water to cool containers.

Firefighting equipment: Self-contained breathing apparatus with full facepiece and protective clothing.

Hazardous combustion products: Highly toxic decomposition products.

6. Accidental Release Measures

Precautions should take into account the severity of the leak or spill. For large releases: Use recommended personal protection and evacuate unprotected personnel. Shut off the leak if without risk. Ventilate the spill area. If possible, dike and contain spillage. Prevent liquid from entering sewers, sumps or pit areas since vapor can create a suffocating atmosphere. Capture material for recycle or destruction if suitable equipment is available.

7. Handling and Storage

Storage temperature: Keep at temperature not exceeding 120 deg. F (49 deg. C).

Storage: Store In a well ventilated cool place. Keep containers dry. Keep away from direct sunlight, heat and sources of ignition.

Handling: Avoid causing and inhaling high concentrations of vapors. Atmospheric levels should be controlled to below the occupational exposure limit and kept as low as practicable.

Do not put mixture of Arcton 412A with air or oxygen under pressure; do not use such mixtures for leak or pressure testing.

Avoid Arcton 412A contact with flame or very hot surfaces.

8. Exposure Controls/Personal Protection

Exposure guidelines: No OSHA PELs and ACGIH TLVs have been assigned to chlorodifluoromethane, 1-chloro-1,1-difluoroethene or octafluoropropane. INEOS Fluor has established an employee exposure standard of 1,000 ppm (8-hour TWA) for this material. Exposures should be kept as low as reasonably practicable below an overall concentration of 1,000ppm (8-hour TWA).

Engineering controls: Ventilate low-lying areas such as sumps or pits where dense vapors collect. Use ventilation adequate to maintain safe levels. Provide eyewash station in work area.

Respiratory protection: Not normally needed if controls are adequate. If needed, use MSHA-NIOSH approved respirator for organic vapors. For high concentrations and oxygen-deficient atmospheres, use positive pressure air-supplied respirator.

Protective clothing: Impervious gloves if any possibility of skin contact with liquid. Additional protection may be required such as apron, arm covers, or full body suit, depending upon conditions.

Eye protection: Chemical tight goggles; full faceshield in addition if splashing is possible.

9. Physical and Chemical Properties

Appearance: Colorless liquified gas with faint ether-like odor

Boiling point: -37.3 deg. F., -38.5 deg C

Vapor pressure (mmHg at 20 deg. C): 6000

Vapor density (air = 1): 3.2

Solubility in water: slight

pH: Not applicable

Specific gravity: 1.19 at 20 deg. C.

% Volatile by volume: 100

10. Stability and Reactivity

Stability: Stable under normal conditions.

Incompatibility: Reacts violently with sodium, potassium and barium metal. Reacts with finely divided aluminum, zinc and magnesium, especially at high temperatures.

Hazardous decomposition products: Halogen, halogen acids, possible trace amounts of carbonyl halide.

Hazardous polymerization: Will not occur.

11. Toxicological Information

Possible Human Health Effects:

Inhalation: High atmospheric concentrations may lead to anesthetic effects, including loss of consciousness. Very high exposures may cause an abnormal heart rhythm and prove suddenly fatal. Higher concentrations may cause asphyxiation due to reduced oxygen content of the atmosphere.

Skin contact: Liquid splashes or spray may cause freeze burns.

Eye contact: Liquid splashes or spray may cause freeze burns.

Ingestion: Highly unlikely, but should this occur, freeze burns will result.

Animal data:

Chlorodifluoromethane:

The inhalation LC50 in rats was 220,000 ppm.

Because of volatility, meaningful tests of skin or eye irritancy, or skin sensitization are not possible.

The threshold for cardiac sensitization (arrhythmias) in dogs pretreated with epinephrine was an atmosphere of 50,000ppm.

No effect of any kind was seen in 90 day inhalation studies in the rat and dog at exposure concentrations of up to and including 10,000ppm.

In the rat, a number of developmental toxicity studies have suggested a link between exposure to chlorodifluoromethane and defects of the eye (micro and anophthalmia). A large study conducted to investigate this effect showed, at atmospheres of 50,000ppm, slight maternal and fetal toxicity, as well as a statistically significant increase in the incidence of fetal eye defects. However, the incidence was very low and within the range seen in other control groups. No effects were seen in the next lower dose used (1,000ppm). In a developmental toxicity study in rabbits, no fetal effects were seen at concentrations up to and including 50,000ppm, a dose level which elicited slight maternal toxicity.

Although chlorodifluoromethane has some mutagenic activity in the Ames test, this effect appears to be specific to bacteria, as a number of other in-vitro and in-vivo studies have not demonstrated any significant genotoxic activity.

No adverse effects were found in a study in which rats were maintained to week 104 after receiving 300mg/kg bodyweight/day chlorodifluoromethane by gavage for 52 weeks. In a 2-year inhalation study, rats were exposed to concentrations up to 50,000ppm for 118 weeks (females) and 131 weeks (males), at which times survival was 80%. There were no clinical haematological or biochemical changes in treated animals. In the male group exposed to 50,000ppm, there was a statistically significant increase in numbers of malignant tumors, mainly being fibrosarcoma. This increase occurred particularly late in the study (weeks 105 to 130). No effect was seen in females or at lower exposure concentrations in males. In an analogous study in the mouse, exposures of up to 50,000ppm for 83 weeks (males) and 94 weeks (females) did not give rise to increased incidence of benign or malignant tumors.

1-chloro-1,1-difluoroethane

The 4 or 8 hour LC50 in rats was 400,000ppm.

Practically non-irritant to skin.

Cardiac sensitization threshold was 50,000ppm and NOEL was 25,000ppm in dogs.

The material displayed no significant genotoxicity, in-vitro or in-vivo.

No developmental effects have been seen in teratology studies.

The material was not carcinogenic and no toxic effects of any kind were seen in rats in a long term study with levels up to 20,000ppm.

Octafluoropropane:

The 4-hour LC50 in rats was greater than 110,000ppm. Because of volatility, meaningful tests of skin and eye irritancy, or skin sensitization are not possible.

The threshold for cardiac sensitization was 400,000ppm and the NOEL 300,000ppm in dogs.

There were no adverse effects detectable following continuous (24 hours per day) exposures of rats for 10 days to 113,000ppm.

12. Ecological Information

Persistence and degradation: Chlorodifluoromethane decomposes comparatively rapidly in the lower atmosphere (troposphere). Estimated atmospheric lifetime is 15.8 years. Products of decomposition will be highly dispersed and hence have a very low concentration. Does not influence photochemical smog (e.g. is not a VOC under UNEC convention). Ozone depletion potential (ODP) is 0.055 measured against a standard of 1 for CFC-11 (as defined by UNEP).

1-chloro-1,1-difluoroethane decomposes comparatively rapidly in the lower atmosphere with a lifetime of 19.5 years. It does not influence photochemical smog (is not a VOC under UNEC convention). Ozone depletion potential (ODP) is 0.065.

Octafluoropropane degrades very slowly in the lower atmosphere. Does not influence photochemical smog (e.g. is not a VOC under UNEC convention). The high global warming potential (GWP) and long atmospheric lifetime means that release to the atmosphere should be avoided.

Effect on effluent treatment: Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

13. Disposal Considerations

Disposal method: Material should be recycled or reclaimed whenever possible.

Stationary Refrigeration and Air-Conditioning: Subject to "no venting" regulations of Section 608 of the Clean Air Act during the service or disposal of equipment.

Container disposal: Cylinders should be returned to the supplier.

14. Transport Information

DOT Hazard Description:

Proper Shipping Name: REFRIGERANT GAS, NOS (CONTAINS CHLORODIFLUOROMETHANE, 1-CHLORO-1,1-DIFLUOROETHANE AND OCTAFLUOROPROPANE (R22/R142b/R218))

Hazard Class: CLASS 2.2

Identification Number: UN 1078

Packing Group: None

Hazardous Substance (RQ): None

Placard/Label: NON-FLAMMABLE GAS

15. Regulatory Information

TSCA (Toxic Substances Control Act) Regulations, 40 CFR 710: All ingredients are on the TSCA Chemical Substances Inventory.

CERCLA and SARA Regulations (40 CFR 355, 370, and 372): Section 313 Supplier Notification: This product contains the following toxic chemicals subject to reporting requirements of SARA Section 313:

Chlorodifluoromethane (CAS 75-45-6)
1-chloro-1,1-difluoroethane (CAS 75-68-3)

The information herein is given in good faith,
but no warranty, expressed or implied, is made.

*** Indicate changes since prior revision.