



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont  
Material Safety Data Sheet

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6167FR "Zyron" 8020  
Revised 4-NOV-2002

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"ZYRON" is a registered trademark of DuPont.

Corporate MSDS Number : DU009020  
Formula : C4F8 CYCLIC

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont  
1007 Market Street  
Wilmington, DE 19898

PHONE NUMBERS

Product Information : 1-800-441-7515  
Transport Emergency : CHEMTREC: 1-800-424-9300  
Medical Emergency : 1-800-441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
OCTAFLUOROCYCLOBUTANE (FC-C318)	115-25-3	100

HAZARDS IDENTIFICATION

Potential Health Effects

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor acts as simple asphyxiant, reducing oxygen available for breathing and is heavier than air. Liquid contact can cause frostbite. At flame temperatures, this fluorocarbon may decompose to hydrogen fluoride which may be lethal at low concentrations.

HUMAN HEALTH EFFECTS:

Frostbite may occur on contact with the liquid.

Based on data from animal studies, high inhalation exposures may lead to irregular heartbeat with a strange sensation in the chest, "heart thumping", apprehension, inadequate

## (HAZARDS IDENTIFICATION - Continued)

circulation, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death.

Individuals with preexisting diseases of the cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

## Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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FIRST AID MEASURES  
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## First Aid

## INHALATION

If inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

## SKIN CONTACT

Treat for frostbite if necessary by gently warming affected area.

## EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

## INGESTION

Ingestion is not considered a potential route of exposure.

## Notes to Physicians

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.

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FIRE FIGHTING MEASURES  
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## Flammable Properties

Flash Point : Will not burn  
Method : TOC  
Flammable limits in Air, % by Volume  
LEL : Not applicable  
UEL : Not applicable  
Autoignition : Not determined  
Autodecomposition : Not determined

## Fire and Explosion Hazards:

Cylinders may rupture under fire conditions. Decomposition may occur.

## Extinguishing Media

As appropriate for combustibles in area.

## Fire Fighting Instructions

Use water spray or fog to cool containers. Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are spilled under fire conditions.

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ACCIDENTAL RELEASE MEASURES  
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## Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

## Accidental Release Measures

Ventilate area, especially low or enclosed places where heavy vapors can collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills. Comply with Federal, State, and local regulations on reporting releases.

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HANDLING AND STORAGE  
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## Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin or clothing.

Use only with sufficient ventilation.

## (HANDLING AND STORAGE - Continued)

## # Storage

Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do NOT drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Never attempt to lift cylinder by its cap. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do NOT heat cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Storage area temperatures should not exceed 125 deg F (52 deg C) and should be free of combustible materials. Avoid area where salt or other corrosive materials are present. Avoid excessive inventory and storage time. Use a first-in first-out system. Keep accurate inventory records.

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EXPOSURE CONTROLS/PERSONAL PROTECTION  
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## Engineering Controls

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

## Personal Protective Equipment

## EYE/FACE PROTECTION

Wear coverall chemical splash goggles.

## RESPIRATOR

If there is potential for exposure to large amounts, use NIOSH approved air supplied respirator.

## SKIN PROTECTION

Wear impervious gloves and other protective clothing as appropriate where contact is possible.

## Exposure Guidelines

## Applicable Exposure Limits

## OCTAFLUOROCYCLOBUTANE

AEL \* (DuPont) : 1000 ppm, 8 &amp; 12 Hr. TWA

\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

## Exposure Guideline Comments

AEL\* (DUPONT) : None Established

\*AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

Boiling Point : -6.04 C (21.13 F)  
Melting Point : -41.4 C (-42.5 F)  
Vapor Pressure : 46.0 psig at 25 deg C (77 deg F)  
Vapor Density : (Air = 1.0)  
7.88 at 25 deg C (77 deg F)  
% Volatiles : 100 WT%  
Solubility in Water : 0.0025 WT% @ 25 C (77 F) (Slight)  
pH : Neutral  
Odor : None  
Form : Gas  
Color : Clear, colorless  
Density : 1.48 g/cc at 25 deg C (77 deg F) - Liquid  
Liquid Density : 94.42 lb/cu ft @ 21 C (70 F)

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STABILITY AND REACTIVITY  
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## Chemical Stability

Stable.

However, avoid open flames and high temperatures.

## Incompatibility with Other Materials

Incompatible with alkali or alkaline earth metals- powdered  
Al, Zn, Be, etc.

## Polymerization

Polymerization will not occur.

## (STABILITY AND REACTIVITY - Continued)

## Other Hazards

Decomposition : "Zyron" C318 fluorocarbon can rapidly decompose at high temperatures (open flames, glowing metal surfaces, etc.) forming toxic olefins as the molecule breaks apart.

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TOXICOLOGICAL INFORMATION  
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## Animal Data

Inhalation 4-hour ALC: >800,000 ppm in rats

Toxicity described in animals from single exposure by inhalation include nonspecific effects such as weight loss and irregular respiration. Cardiac sensitization occurred in dogs exposed to concentrations of 10-25% in air and given an epinephrine challenge. Repeated exposures to concentrations of 1-20% produced no adverse changes. The compound is not an eye irritant.

No animal test reports are available to define carcinogenic, developmental, or reproductive hazards. Tests for heritable genetic damage in insects were inconclusive. No other test reports are available to define mutagenic hazards.

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DISPOSAL CONSIDERATIONS  
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## Waste Disposal

Reclaim by distillation or remove to a permitted waste disposal facility. Comply with Federal, State, and local regulations.

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TRANSPORTATION INFORMATION  
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## Shipping Information

DOT/IMO  
Proper Shipping Name : OCTAFLUOROCYCLOBUTANE  
Hazard Class : 2.2  
UN No. : 1976  
DOT/IMO Label : NONFLAMMABLE GAS

## Shipping Containers

Tank Cars.  
Tank Trucks.

Cylinders

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REGULATORY INFORMATION  
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## U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes  
Chronic : No  
Fire : No  
Reactivity : No  
Pressure : Yes

## LISTS:

Extremely Hazardous Substance -No  
CERCLA Hazardous Substance -No  
Toxic Chemicals -No-----  
OTHER INFORMATION  
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## NFPA, NPCA-HMIS

NPCA-HMIS Rating  
Health : 1  
Flammability : 0  
Reactivity : 1

Personal Protection rating to be supplied by user depending on use conditions.

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The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.Responsibility for MSDS : MSDS Coordinator  
> : DuPont Fluoroproducts  
Address : Wilmington, DE 19898  
Telephone : (800) 441-7515

# Indicates updated section.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS