



Du Pont
Material Safety Data Sheet

"NAFION" PFSA DISPERSIONS LISTED IN NAF034
NAF034 Revised 19-JUN-2009

Substance ID : 130000034155

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Tradenames and Synonyms

PFSA Dispersion
D2020, D2021
DE2029

Company Identification

MANUFACTURER/DISTRIBUTOR
DuPont Fluoroproducts
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS

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

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Table with 3 columns: Material, CAS Number, %

HAZARDS IDENTIFICATION

Potential Health Effects

PERFLUOROSULFONIC ACID/TFE COPOLYMER

Prolonged contact may cause skin irritation to some individuals.

Contact with eyes may cause reversible cornea opacity and mild conjunctivitis.

Inhalation of fumes from overheating or burning "Nafion", or from smoking tobacco or cigarettes contaminated with polymer, may cause polymer fume fever, a flu-like illness

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with chills and fever. Symptoms may not occur for several hours after exposure and go away in 24-48 hours even in absence of treatment.

#### 1-PROPANOL

Inhalation of n-Propyl Alcohol may cause irritation of the nose and throat with sneezing, sore throat or runny nose.

Repeated and/or prolonged skin contact with n-Propyl Alcohol may cause defatting of the skin with itching, redness or rash. There are inconclusive or unverified reports of human sensitization. Skin permeation may occur in amounts capable of producing the effects of systemic toxicity.

Eye contact with n-Propyl Alcohol may cause eye irritation with tearing, pain or blurred vision. Contact with the vapor or aerosol may cause eye irritation with tearing, pain or blurred vision.

Ingestion of n-Propyl Alcohol may cause irritation of the lower digestive tract with pain or diarrhea. A major ingestion hazard is aspiration (liquid entering the lungs during ingestion or vomiting) which may result in "chemical pneumonia". Symptoms include coughing, gasping, choking, shortness of breath, bluish discoloration of the skin, rapid breathing and heart rate, and fever. Pulmonary edema or bleeding, drowsiness, confusion, coma and seizures may occur in more serious cases. Symptoms may develop immediately or as late as 24 hours after exposure, depending on how much chemical entered the lungs.

Inhalation, ingestion or skin contact with n-Propyl Alcohol may cause non-specific effects such as headache, nausea and weakness; and central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness.

Increased susceptibility to the effects of n-Propyl Alcohol may be observed in persons with pre-existing disease of the skin.

#### ETHANOL

Short-term overexposure to Ethyl Alcohol by inhalation may cause irritation of the nose and throat with sneezing, sore throat or runny nose. Repeated or excessive over-exposure may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness and non-specific effects such as headache, nausea and weakness.

Repeated and/or prolonged skin contact with Ethyl Alcohol may cause defatting of the skin with itching, redness or rash. There are inconclusive or unverified reports of human sensitization.

Eye contact with Ethyl Alcohol may cause eye irritation with tearing, pain or blurred vision.

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Ingestion of Ethyl Alcohol may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness; irritation of the digestive tract with stomach pain, heartburn, nausea, vomiting or diarrhea; however there may be no symptoms at all; headache; and fatality from gross over-exposure.

Repeated or excessive over-exposure may cause abnormal liver function with altered enzyme levels in the blood; structural (pathological) changes in heart muscle tissue; high blood pressure; altered white blood cell counts; effects on the endocrine and reproductive systems; and reduced fertility. Repeated gross over-exposure may cause effects on the brain; pathological changes in the liver and kidneys; and severe irritation of the digestive tract with stomach pain, nausea, vomiting, diarrhea or internal bleeding.

Increased susceptibility to the effects of Ethyl Alcohol may be observed in persons with pre-existing disease of the liver, central nervous system, gastrointestinal tract, or reproductive organs.

#### 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. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

##### SKIN CONTACT

Flush skin with water after contact. Wash contaminated clothing before reuse.

##### EYE CONTACT

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

##### INGESTION

If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person.

Call a physician.

#### Notes to Physicians

Because of the danger of aspiration, emesis or gastric lavage should not be employed unless the risk is justified by the presence of additional toxic substances. Activated charcoal may be given but should be used with caution since it may induce vomiting.

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#### FIRE FIGHTING MEASURES

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##### Flammable Properties

Flash Point : 65 F (18 C) (D2021 Dispersion)  
Method : Pensky-Martens Closed Cup - PMCC, Closed Cup.  
Autoignition : 363 C (685 F) (ethanol)

Flammable liquid. Vapor forms explosive mixture with air. Vapors or gases may travel considerable distances to ignition source and flash back. Hazardous gases/vapors produced in fire are carbonyl fluoride, hydrogen fluoride (HF), and, acid fluorides.

##### Extinguishing Media

Water, Foam, Dry Chemical, CO<sub>2</sub>. Water may be ineffective because of low [ $<100$  deg F ( $37.8$  deg C)] flash point.

##### Fire Fighting Instructions

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment. Cool tank/container with water spray.

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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.

Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus.

##### Initial Containment

Remove source of heat, sparks, flame, impact, friction or electricity. Dike spill.

##### Spill Clean Up

Recover undamaged and minimally contaminated material for reuse and reclamation. Soak up with sand, oil dry, or other noncombustible absorbent materials. Dispose of in an approved container.

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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.

See FIRST AID and PERSONAL PROTECTIVE EQUIPMENT SECTIONS.

Handling (Physical Aspects)

Ground container when pouring. Use of non-sparking and explosion-proof equipment may be necessary depending on type of operation. Keep away from heat, sparks and flames.

Storage

Store in a well ventilated area away from heat and sunlight.

Store in a cool, dry place. Keep container tightly closed.

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EXPOSURE CONTROLS/PERSONAL PROTECTION  
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Engineering Controls

Use sufficient ventilation to keep employee exposure below recommended limits.

Personal Protective Equipment

EYE/FACE PROTECTION

Wear coverall chemical splash goggles and face shield. A full face mask respirator provides protection from eye irritation.

RESPIRATORS

Use a positive pressure air-supplied respirator if concentrations may exceed exposure limits. Air-purifying respirators are inadequate for this material.

PROTECTIVE CLOTHING

Wear chemical resistant clothing to prevent ANY contact with this product, such as gloves, apron, boots, or whole bodysuit as appropriate.

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## # Exposure Guidelines

## Applicable Exposure Limits

## 1-PROPANOL

PEL (OSHA) : 200 ppm, 500 mg/m<sup>3</sup>, 8 Hr. TWA  
TLV (ACGIH) : 100 ppm, 8 Hr. TWA, A4  
AEL \* (DuPont) : 200 ppm, 8 Hr. TWA

## ETHANOL

PEL (OSHA) : 1,000 ppm, 1,900 mg/m<sup>3</sup>, 8 Hr. TWA  
AEL \* (DuPont) : STEL 1000 ppm, A3, 1000 ppm, 8 & 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.

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

% Volatiles : 78-80  
Solubility in Water : Complete  
Odor : Alcoholic  
Form : Liquid  
Color : Clear colorless to yellowish  
Specific Gravity : 1.01-1.03

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STABILITY AND REACTIVITY  
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## Chemical Stability

Stable at normal temperatures and storage conditions.

## Conditions to Avoid

Avoid heat, flames or other sources of ignition.

## Incompatibility with Other Materials

Incompatible or can react with oxidizing agents, acids, acid halides, alkali metals.

## Decomposition

Decomposes with heat. Hazardous gases or vapors can be released, including alcohol fumes, carbonyl fluoride, hydrogen fluoride (HF), acid fluorides.

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TOXICOLOGICAL INFORMATION

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Animal Data

## 1-PROPANOL

## n-Propyl Alcohol

Oral LD50: 3,830 mg/kg in rats  
Dermal LD50: 5.05 mL/kg in rabbits  
Inhalation 4 hour, LC50: > 4,000 ppm in rats

Animal testing indicates n-Propyl Alcohol is a moderate eye irritant but is not a skin irritant.

Single exposure by ingestion to n-Propyl Alcohol caused increased liver weight, incoordination and hypothermia. Repeated exposure caused increased adrenals weight, and histopathological changes of the liver. Long-term exposure caused pathological changes of the bone marrow, liver, spleen, and heart.

Single exposure by inhalation to n-Propyl Alcohol caused eye irritation, upper respiratory tract irritation, shallow respiration, incoordination, narcosis, prostration, and altered righting reflexes.

No adequate animal data are available to define the carcinogenic potential of this material. Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal. Reproductive data on male rats show an effect on reproduction at a concentration that has been associated with narcotic effects in other studies. Tests have shown that n-Propyl Alcohol does not cause genetic damage in bacterial or mammalian cell cultures. It has not been tested in animals for genetic toxicity.

## ETHANOL

## Ethyl Alcohol

Oral LD50: 11,500 mg/kg in rats  
Dermal LD50: > 20 mL/kg in rabbits  
Inhalation 8 hour ALC: > 16,000 ppm in rats

Animal testing indicates Ethyl Alcohol is a moderate eye irritant but not a skin irritant.

Long-term skin contact caused temporary irritation of the skin.

Single exposure by ingestion caused prostration and altered kidney function. Repeated exposure caused liver effects; reduced weight gain; altered immune system, endocrine system, and kidney function; and altered clinical chemistry. Long-term exposure caused altered heart function.

Single exposure by inhalation caused incoordination, behavioral effects, narcosis, and altered hematology. Repeated exposure



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DOT/IMO Label : Flammable Liquid

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REGULATORY INFORMATION  
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U.S. Federal Regulations

TSCA Inventory Status : In compliance with TSCA Inventory requirements for commercial purposes.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

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

State Regulations (U.S.)

STATE RIGHT-TO-KNOW

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet, with the exceptions indicated.

SUBSTANCES ON THE PENNSYLVANIA HAZARDOUS SUBSTANCES LIST PRESENT AT A CONCENTRATION OF 1 % OR MORE (0.01% FOR SPECIAL HAZARDOUS SUBSTANCES)- Ethanol, 1-Propanol

WARNING - SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM- None known.

SUBSTANCES ON THE NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS)- Ethanol, 1-Propanol

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OTHER INFORMATION  
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NFPA, NPCA-HMIS

NFPA Rating  
Health : 2  
Flammability : 3  
Reactivity : 0

Additional Information

MEDICAL USE: CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications see DuPont CAUTION Bulletin No. H-50102.

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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.

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# Indicates updated section.

End of MSDS