



Du Pont Chemicals

2061FR

Revised 8-SEP-1993

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"FREON" TP Cleaning Agents

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"FREON" is a registered trademark of DuPont.

Corporate MSDS Number DU001095

Formula CC12FCC1CF2 + CH3CHOHCH3
(+CH3NO2 FOR "FREON" T-P 35)

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 %

*

76-13-1

ETHANE, 1,1,2-TRICHLORO-1,2,2,TRIFLUORO-

("FREON" 113)

ISOPROPYL ALCOHOL

67-63-0

METHANE, NITRO-

75-52-5

See Note Below for Exact Percentages

(Continued)

COMPOSITION/INFORMATION ON INGREDIENTS(Continued)

* Regulated as a Toxic Chemical under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

Components (Remarks)

Material	"Freon" TP	"Freon" T-P 5	"Freon" T-P 10	"Freon" T-P 15
Freon 113	97.0%	95.0%	90 %	85 %
Isopropyl Alcohol	3.0	5.0	10	15
Methane, Nitro	-	-	-	-

Material	"Freon" T-P 25	"Freon" T-P 35
Freon 113	75 %	64.7 %
Isopropyl Alcohol	25	35.0
Methane, Nitro	-	0.3

HAZARDS IDENTIFICATION

Potential Health Effects

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse can be fatal. Vapor reduces oxygen available for breathing and is heavier than air.

"FREON" 113

In acute toxicity testing in animals, "FREON" 113 was of very low toxicity by inhalation. However, life-threatening exposures may occur if handled carelessly. Vapors are heavier than air posing a hazard of asphyxiation if they are trapped in enclosed or low places. At flame temperatures, this fluorocarbon may decompose to hydrogen fluoride which may be lethal at low concentrations. "FREON" 113 poses a hazard of fatal heart irregularities if inhaled at high concentrations. Skin or eye contact may cause irritation. Prolonged skin contact may cause drying of the skin. Inhalation or ingestion may cause dizziness, headache, confusion, incoordination and loss of consciousness.

ANIMAL DATA:

Inhalation 4 hour LC50: 52,500 ppm in rats
Skin absorption ALD: >11,000 mg/kg in rabbits
Oral LD50: 43,000 mg/kg in rats

The liquid is a mild skin irritant and a slight eye irritant. The compound has produced a weak allergic skin reaction (sensitization) in guinea pigs.

(Continued)

HAZARDS IDENTIFICATION(Continued)

Skin: Repeated exposure to high doses of the liquid maintained in close contact with the skin caused severe local irritation in rabbits. This reaction is typically seen when defatting agents are tested under similar conditions.

Inhalation: The effects in animals from high single exposures include anaesthetic effects such as tremors, dizziness, incoordination, and loss of consciousness, and irregular heartbeat (cardiac arrhythmias) due to the heart being made more sensitive to adrenalin (cardiac sensitization). Repeated exposure at high concentrations also produced central nervous system effects during exposure but no evidence of other systemic toxicity.

Ingestion: High, single oral administration of the liquid, at or near lethal doses, produced lethargy within several minutes. Survivors have shown no apparent toxic effects.

There is no evidence of carcinogenicity or teratogenicity in animal testing. In a reproductive toxicity study in rats, no adverse effects on reproductive performance were seen at concentrations of 500 ppm, and only minimal effects (slight decrease in corpora lutea) were observed at 12,500 ppm.

This compound does not produce genetic damage in bacterial or mammalian cell cultures. It does not produce heritable genetic damage in male animals (dominant lethal test).

HUMAN HEALTH EFFECTS OF OVEREXPOSURE BY:

Skin contact may initially include: mild skin irritation, mainly due to rapid evaporation, with possible discomfort or rash. Prolonged skin contact may cause temporary tingling, numbness, coldness, or drying of skin. There are no reports of human skin sensitization. Significant skin permeation, and systemic toxicity, after contact appears unlikely.

Eye contact may initially include: mild eye irritation with discomfort, tearing, or blurring of vision.

The 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 the exposure, depending on how much chemical entered the lungs.

Inhalation or ingestion may include: temporary nervous system depression with anaesthetic effects such as

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HAZARDS IDENTIFICATION(Continued)

dizziness, headache, confusion, incoordination, and loss of consciousness. Higher exposures may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Fatality may occur from gross overexposure. One report cites two cases where workers who were repeatedly overexposed to the compound experienced liver damage; however, it was not proven that the compound actually caused the damage. Another study evaluated 50 workers exposed for an average of over 2 years to 46 - 4700 ppm. No adverse effects were found except for 1 case of dry skin.

NITROMETHANE

ANIMAL DATA

Inhalation 4 hour ALC: 6,000 ppm in rats
Oral LD50: 1,210 mg/kg in rats

Acute toxicity in animals: Inhalation of vapors: central nervous system effects, eye and respiratory irritation, anaesthetic and nonspecific preterminal effects at higher concentrations. Subchronic toxicity in animals: Inhalation: nonspecific effects such as weight loss and irritation. Ingestion: liver effects and nonspecific effects such as weight loss and irritation.

HUMAN HEALTH EFFECTS

Overexposure by skin contact with the liquid may initially include defatting of the skin with drying and irritation. Eye contact with the vapors may initially include temporary eye irritation with discomfort, tearing, or blurring of vision. Inhalation may initially include temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination and loss of consciousness or nonspecific discomfort, such as nausea, headache, or weakness. Ingestion may initially include nonspecific discomfort, such as nausea, headache, or weakness.

Chronic exposures may lead to these effects: abnormal liver or abnormal kidney function as detected by laboratory tests. There are no reports of human sensitization.

Individuals with preexisting diseases of the central nervous system, liver or kidneys may have increased susceptibility to the toxicity of excessive exposures.

ISOPROPYL ALCOHOL

ANIMAL DATA

Inhalation 4 hour LC50: 16,000 ppm in rats

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HAZARDS IDENTIFICATION(Continued)

Skin Absorption LD50: 16.37 mL/kg (c. 12,900 mg/kg) in rabbits
Oral LD50: 4,700 mg/kg in rats

The compound is not a skin irritant and is a mild eye irritant in animals. The effects in animals from exposure by inhalation include upper respiratory effects, narcosis, and liver effects. Narcotic effects and decreased body weights were seen in animals exposed by ingestion. Continued voluntary drinking of 2.5% aqueous Isopropyl Alcohol through two successive generations of rats produced no reproductive effects. Developmental toxicity was observed only at maternally toxic dose levels. The compound does not produce genetic damage in bacterial or mammalian cell cultures but has not been tested in animals.

HUMAN HEALTH EFFECTS

Overexposure by skin contact may include dryness and redness of the skin and there are rare inconclusive reports of human sensitization. Overexposure by eye contact may cause eye irritation with discomfort, tearing, or blurring of vision. Overexposure by inhalation may cause nonspecific discomfort such as headache and nausea; or irritation of the upper respiratory passages, with coughing and discomfort. Higher exposures by inhalation may cause temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Ingestion can cause nausea, vomiting, abdominal pain, and loss of consciousness.

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.

FIRST AID MEASURES**First Aid**
INHALATION

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

EYE CONTACT

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

SKIN CONTACT

Flush with water. Get medical attention if irritation is

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FIRST AID MEASURES(Continued)

present.

INGESTION

No specific intervention is indicated as the material is not likely to be hazardous by ingestion. Do not induce vomiting as the hazard of aspirating the material into the lungs is a greater hazard than allowing it to progress through the intestinal tract.

Notes to Physicians

Activated charcoal slurry may be administered. To prepare activated charcoal slurry suspend 50 g activated charcoal in 400 mL water in plastic bottle and shake well. Administer 5 mL/kg, or 350 mL for an average adult.

Because of a possible increased risk of eliciting cardiac dysrhythmias, catecholamine drugs, such as epinephrine, should be used with special caution in situations of emergency life support.

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 induce vomiting, but may be given after emesis or lavage to absorb toxic additives. Steroid therapy in mild to moderate cases does not improve outcome. Bacterial pneumonia often occurs after exposure, but prophylactic antibiotics are not indicated and should be reserved for documented bacterial pneumonia.

FIRE FIGHTING MEASURES**Flammable Properties**

Method	TOC
Flammable limits in Air, % by Volume	
LEL	Not applicable
UEL	Not applicable
Autodecomposition	Not determined

Flach Point : None to boil. "Freon" T-P 35 reduces to 90 deg. F after 45% evaporation.

Autoignition Temperature : Trichlorotrifluoromethane not determined. Isopropanol 860 deg. F.

Fire and Explosion Hazards:

Drums may rupture under fire conditions. Decomposition may occur.

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FIRE FIGHTING MEASURES(Continued)

Extinguishing Media

As appropriate for combustibles in area.

Fire Fighting Instructions

Addition of excess water will extract isopropyl alcohol and may form a flammable, supernatant layer. Self-contained breathing apparatus (SCBA) may be required if drums rupture and contents are spilled under fire conditions.

ACCIDENTAL RELEASE MEASURES

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. Self-contained breathing apparatus (SCBA) is required if a drum spill or release occurs. Do not flush into sewers. Dike spill. Collect on absorbent material and transfer to steel drums for recovery or disposal. Comply with Federal, State, and Local regulations on reporting releases.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors; avoid contact of liquid with eyes and prolonged skin exposure. Use with sufficient ventilation to keep employee exposure below recommended limits.

Storage

Clean, dry area. Do not heat above 125 deg F.

EXPOSURE CONTROLS/PERSONAL PROTECTION

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 places.

Personal Protective Equipment

Butyl gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact. Under normal manufacturing conditions no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large spill occurs.

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EXPOSURE CONTROLS/PERSONAL PROTECTION(Continued)

Exposure Guidelines

Applicable Exposure Limits

ETHANE, 1,1,2-TRICHLORO-1,2,2, TRIFLUORO-	
PEL (OSHA)	1,000 ppm, 7,600 mg/m3, 8 Hr. TWA
TLV (ACGIH)	1,000 ppm, 7,670 mg/m3, 8 Hr. TWA
	STEL 1,250 ppm, 9,590 mg/m3
AEL * (Du Pont)	None Established
ISOPROPYL ALCOHOL	
PEL (OSHA)	400 ppm, 980 mg/m3, 8 Hr. TWA
TLV (ACGIH)	400 ppm, 983 mg/m3, 8 Hr. TWA
	STEL 500 ppm, 1,230 mg/m3
AEL * (Du Pont)	400 ppm, 8 & 12 Hr. TWA
METHANE, NITRO-	
PEL (OSHA)	100 ppm, 250 mg/m3, 8 Hr. TWA
TLV (ACGIH)	100 ppm, 250 mg/m3, 8 Hr. TWA
	Notice of Intended Changes (1993-1994)
	20 ppm, 50 mg/m3, 8 Hr. TWA
AEL * (Du Pont)	None Established

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

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

% Volatiles	100 WT%
Evaporation Rate	>1 (CCl4 = 1)
pH	Neutral
Odor	Slight solvent
Form	Liquid
Color	Clear, colorless

	"Freon" TP	"Freon" T-P 5	"Freon" T-P 10	"Freon" T-P 15	"Freon" T-P 25	"Freon" T-P 35
Boiling Point (F)	119.5	120.7	123.9	127.0	133.2	139.7
Density (g/cc@77F)	1.513	1.49	1.42	1.36	1.24	1.15
Vapor Density (Air=1)	6.4	6.3	6.1	5.8	5.4	4.9
Vapor Pressure (mmHg @ 77F)	308	289	259	231	186	151
Solubility in H2O	(1)	(1)	(1)	(1)	(1)	(1)

(1) Alcohol portion is miscible with water. See special fire fighting instructions.

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STABILITY AND REACTIVITY

Chemical Stability

Materials are stable. However, avoid open flames and high temperatures.

Polymerization

Polymerization will not occur.

Other Hazards

Incompatibility : Alkali or alkaline earth metals-powdered
Al, Zn, Be, etc.

Decomposition : The components of these blends can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Aquatic Toxicity

"Freon" 113

96 hour LC50, rainbow trout: 7.4 mg/L

Nitromethane

96 hour LC50, fathead minnows: <659.2 mg/L

48 hour LC50, carp: > 40 mg/L

DISPOSAL CONSIDERATIONS

Waste Disposal

Comply with Federal State, and Local regulations. Remove to a permitted waste disposal facility. EPA Hazardous Waste Nos. F001 and F002 may apply to waste materials.

TRANSPORTATION INFORMATION

Shipping Information

DOT

Proper Shipping Name

"FREON" TP SOLVENT BLENDS ARE NOT
REGULATED AS A
HAZARDOUS MATERIAL BY DOT OR IMO

Shipping Containers

Tank Cars.
Tank Trucks.

Drums

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REGULATORY INFORMATION**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 : No

Lists:

Extremely Hazardous Substance - No
CERCLA Hazardous Substance - No
Toxic Chemicals - Yes *

* "Freon" 113 component only.

OTHER INFORMATION**NFPA, NPCA-HMIS**

NPCA-HMIS Rating
Health 1
Flammability 0
Reactivity 1

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

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 Environmental Engineer
Address Du Pont
 Electronics
 Wilmington, DE 19880-0030
Telephone 800-441-9442

Indicates updated section.

End of MSDS