

PPG

Inter-Office Correspondence

TO: Mike Buerkle

DATE: April 18, 1988

FROM: R. K. Lee

SUBJECT: "Freon" MSDS

Attached is the Du Pont MSDS for "FREON" SMT Cleaning Agent. This is the new product Du Pont has proposed for the electronics industry and contains "trans".



R. K. Lee

cc: File: Trans

rk1mar9/56

SL 040028

Du Pont Material Safety Data Sheet

MATERIAL IDENTIFICATION

NUMBER : 2037FR
NAME : "FREON" SMT CLEANING AGENT

CHEMICAL FAMILY : Halogenated Hydrocarbon and Alcohol
FORMULA : $\text{CCl}_2\text{F}-\text{CCl}_2\text{F}$, $\text{CCl}_2\text{H}=\text{CCl}_2\text{H}$ (trans),
 CH_3OH
TSCA INVENTORY STATUS : Reported/Included
NPCA-HMIS RATING : Health: 2 Flammability: 0 Reactivity: 1
 Personal Protection:
MANUFACTURER/DISTRIBUTOR: E.I. du Pont de Nemours & Co., Inc.
 1007 Market Street
 Wilmington, -De 19898
PRODUCT INFORMATION PHONE : 1-(800)441-7515
TRANSPORTATION EMERGENCY PHONE : 1-(800)424-9300
MEDICAL EMERGENCY PHONE : 1-(800)441-3637

COMPONENTS

Material	CAS Number	%
Ethane, 1,1,2-Trichloro-1,2,2-Trifluoro ("Freon" 113)	76-13-1	68
Trans-1,2 Dichloroethylene	00156-60-5	26
Methanol	67-56-1	6

PHYSICAL DATA

Boiling Point : 38.4 deg C (101 deg F)
Vapor Pressure : 501 mm Hg at 25 deg C (77 deg F)
Vapor Density : >1 (Air = 1.0)
% Volatiles : 100 WT %
Evaporation Rate : >1 (CCl₄ = 1.0)
Solubility in Water : 6
Odor : Slight Amine
Form : Liquid
Color : Clear, colorless
LIQUID DENSITY: 1.374 g/cc @ 25 deg. C (77 deg. F)

HAZARDOUS REACTIVITY

Instability : Material is stable. However, avoid open flames and
 high temperatures.
Polymerization : Polymerization will not occur.
INCOMPATIBILITY: Alkali or alkline earth metals - powdered
Al, Zn, Be, etc.

DECOMPOSITION: The blend can be decomposed by high
temperatures (open flames, glowing surfaces, etc) forming
hydrochloric and hydrofluoric acids - possibly carbonyl
halides.

(HAZARDOUS REACTIVITY - CONTINUED)

FIRE AND EXPLOSION DATA

Flash Point : Will not burn.

Autodecomposition Temperature : Not determined.

AUTOIGNITION TEMPERATURE

"Freon" 113 Not determined

Dichloroethylene 460 deg. C (860 deg. F)

Methanol 464 deg. C (867 deg. F)

FIRE AND EXPLOSION HAZARDS

Drums may rupture under fire conditions. Decomposition may occur.

EXTINGUISHING MEDIA

As appropriate for combustibles in area.

SPECIAL FIRE FIGHTING INSTRUCTIONS

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

HEALTH HAZARD INFORMATION

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse or swallowing can be fatal or cause blindness. Cannot be made nonpoisonous. Vapor reduces oxygen available for breathing and is heavier than air. Causes eye and skin irritation.

"Freon" 113

Inhalation 2 hour LC50: 110,000 ppm in rats

Skin absorption ALD: 11,000 mg/kg in rabbits

Oral LD50: 43,000 mg/kg in rats

The compound is a mild skin irritant, is a mild eye irritant, and is untested for animal sensitization. Toxic effects in animals occurring only with inhalation exposures are anaesthetic effects and cardiac effects. Animal testing indicates that this compound does not have carcinogenic, mutagenic, embryotoxic, or reproductive effects.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include:

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(HEALTH HAZARD INFORMATION - CONTINUED)

temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination and loss of consciousness. Higher exposures may lead to these effects: temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Gross overexposure may lead to abnormal liver function as detected by laboratory tests, or fatality. Significant skin permeation, and systemic toxicity, after contact appears unlikely. There are no reports of human sensitization. Individuals with preexisting diseases of the central nervous system or cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

Trans-1,2, Dichloroethylene

Inhalation 8 hour LC50: >3,000 ppm in rats

Oral LD50: 2,122 mg/kg in mice

The compound is a skin irritant, eye irritant and lung irritant. Toxic effects in rats with inhalation exposures of 200 ppm or more are: liver effects, anaesthetic effects and pulmonary effects. Cardiac sensitization occurred in dogs exposed to concentrations of 25-50% in air and given an epinephrine challenge. Ingestion effects in animals were: pulmonary effects, liver effects, cardiovascular effects, and other nonspecific signs of toxicity.

Human health effects of overexposure by skin contact may initially include skin irritation with discomfort. Eye contact may initially include eye irritation with discomfort and tearing. Inhalation or ingestion may initially include: temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness; temporary lung irritation effects with discomfort, or abnormal liver function as detected by laboratory tests. Prolonged exposure to very high concentrations (>25% in air) may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation.

Methanol

Inhalation 1 hour LC50: 14,500 ppm in rats

Skin absorption LD50: 15,800 mg/kg in rabbits

Oral LD50: 9,100 mg/kg in rats

The compound is a skin irritant, is an eye irritant, and is untested for animal sensitization. Toxic effects described in animals from short exposures by inhalation, ingestion, or skin contact include anaesthetic effects, liver effects, blindness, and acidosis. No animal test reports are available to define carcinogenic, or reproductive hazards. Animal testing indicates that this compound does not have mutagenic, or embryotoxic effects.

(HEALTH HAZARD INFORMATION - CONTINUED)

As little as 120 mL ingested methanol may cause blindness or fatality. Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include: nonspecific discomfort, such as nausea, headache, or weakness; temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness; or blindness. Higher exposures may lead to these effects: abnormal liver function as detected by laboratory tests; abnormal kidney function as detected by laboratory tests; or fatality from gross overexposure. Skin permeation can occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization. Individuals with preexisting diseases of the retina or liver may have increased susceptibility to the toxicity or excessive exposures.

Carcinogenicity

None of the components in this chemical is listed by IARC, NTP, or OSHA as a carcinogen.

Exposure Limits for "FREON" SMT CLEANING AGENT

TLV * (ACGIH): None established.
PEL (OSHA): None established.

* TLV is a registered trademark.

Other Applicable Exposure Limits:

"Freon" 113

TLV (ACGIH): 1000 ppm, 7600 mg/m³; STEL: 1250 ppm, 9500 mg/m³
PEL (OSHA): 1000 ppm, 7600 mg/m³

Trans-1,2 Dichloroethylene

TLV (ACGIH): 200 ppm, 790 mg/m³ (for 60, 40% cis, trans isomers, cas# 40-59-0)
PEL (OSHA): 200 ppm, 790 mg/m³ (for unspecified 1,2-isomer)

Methanol

AEL (Du Pont): 200 ppm (8 and 12 hr TWA) skin
TLV (ACGIH): 200 ppm, 260 mg/m³; STEL: 250 ppm, 310 mg/m³; skin.
PEL (OSHA): 200 ppm, 260 mg/m³

Safety Precautions

Avoid breathing vapors, ingestion, or contact of liquid with skin or eyes. Use only in well ventilated areas.

(HEALTH HAZARD INFORMATION - CONTINUED)

Wash thoroughly after handling.

FIRST AID

IF HIGH CONCENTRATIONS ARE INHALED: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.

IN CASE OF SKIN CONTACT: Immediately wash skin with soap and plenty of water. Wash contaminated clothing before reuse.

IN CASE OF EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

IF SWALLOWED: Induce vomiting to lessen chance of vision impairment. Call a physician immediately. Never give anything by mouth to an unconscious person.

PROTECTION INFORMATION

Generally Applicable Control Measures and Procedures

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

Neoprene gloves and chemical splash goggles should be used when handling liquid if contact is possible. Self-contained breathing apparatus is required if a large spill occurs or if vapors exceed airborne exposure limit.

DISPOSAL INFORMATION

Spill, Leak, or Release

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Ventilate area. 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.

AQUATIC TOXICITY

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(DISPOSAL INFORMATION - CONTINUED)

"Freon" 113 - 96-hour LC50, fathead minnows: 1250 ppm

Methanol - 96-hour LC50, fathead minnows: 29.1 g/L

Waste Disposal

Comply with Federal, State, and local regulations.
Remove to a permitted waste disposal facility.

SHIPPING INFORMATION

DOT

Proper Shipping Name :

In containers over 4000 lbs: Hazardous Substance, Liquid,
N.O.S. (Contains Trans-1,2 Dichloroethylene)

Hazard Class : ORM-E

UN/NA No. : 9183

Shipping Containers

Drums, tank trucks, tank cars.

STORAGE CONDITIONS

Store in clean, dry area. Do not heat above 125 deg. F.

ADDITIONAL INFORMATION AND REFERENCES

Not regulated by DOT, IMO, or ICAO in containers less than
4000 lbs.

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.

Date of latest Revision : 88/04/04

Person Responsible for MSDS : K. P. Brown

Du Pont Company

C&P Dept., Chestnut Run 709

Wilmington, DE 19898

302-999-3019

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