Weiss Bonya

Gemini®
PFPE Dry Film Lubricant

Material Safety Data Sheet

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1. Gemini® PFPE Dry Film Lubricant DF-68M

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Material	CAS-No.	Concentration
2,3-Dihydrodecafluoropentane	138495-42-8	86-93%
Polytetrafluoroethylene	9002-84-0	1-4%
Perfluoroalkylether resin		6-10%

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3. HAZARDS IDENTIFICATION

Potential Health Effects

Skin : May cause slight irritation with itching, redness or swelling. Repeated and/or prolonged exposure may cause defatting of the skin with itching, redness or rash. Based on animal data, significant skin permeation, and systemic toxicity after skin contact, appears unlikely.

Eyes : May cause eye irritation. Discomfort, tearing, Blurred vision.

Gross overexposure by inhalation to 2,3-Dihydrodecafluoropentane may cause suffocation if air is displaced by vapors and central nervous system stimulation with increased activity or sleeplessness, tremors or convulsions. These effects may be followed by central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness.

Based on data from other fluorocarbons, gross overexposure to 2,3-Dihydrodecafluoropentane may cause irregular heart.

beat with a strange sensation in the chest, "heart thumping" apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air.

The major ingestion hazard of 2,3-Dihydrodecafluoropentane 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 of fluorine containing compounds released as decomposition products from overheated or burning product may cause lung irritation and pulmonary edema which require medical treatment. Inhalation of gases and fumes from overheated or burning product may cause polymer fume fever, which is a temporary flu-like illness characterized by fever, chills, and sometimes cough, and lasting approximately 24 hours. Repeated episodes of polymer fume fever may cause persistant lung effects.

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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4. FIRST AID MEASURES

First Aid

INGESTION

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

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

In case of contact, wash with water and soap as a precaution.
Wash contaminated clothing before reuse.

EYE CONTACT

In case of contact, rinse with plenty of water. If eye irritation persists, consult a specialist.

If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration.

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.

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.

Activated charcoal mixture may be beneficial.Suspend 50 g activated charcoal in 400 mL water and mix well. Administer 5 mL/kg, or 350 mL for an average adult.

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5. FIRE FIGHTING MEASURES

Flash point
None

Extinguishing Media
Use media appropriate for surrounding material.

Fire Fighting Instructions
Wear self-contained breathing apparatus (SCBA). and full protective equipment. Cool tank/container with water spray. Fight fire from a disance, heat may rupture containers.

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6. 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.

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

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Soak up with sand, oil dry, or other noncombustible absorbent materials.

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7. HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling.

Handling (Physical Aspects)

ĸeep away from heat, sparks and flames. Keep container tightly closed.

Storage

Store in a well ventilated place.

Do not allow stored product to exceed 52 degC (125 degF) to prevent leakage or potential rupture of container from pressure and expansion. Protect from freezing temperatures. If solvent is stored below -10 degC (14 degF), mix prior to use.

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8. 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 or enclosed places.

Personal protective equipment

EYE/FACE PROTECTION:
Wear safety glasses or coverall chemical splash goggles.

RESPIRATORS:
Wear NIOSH approved respiratory protection, as appropriate. Self-contained breathing apparatus (SCBA) is required if large release occurs.

PROTECTIVE CLOTHING:
Where there is potential for skin contact have available

and wear as appropriate impervious gloves, apron, pants, and jacket.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Form : Turbid Suspension
Boiling Point : 66 degC (150.8 degF)
% Volatiles : 86-93 %
Density : 1.5g/cm3

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10. STABILITY AND REACTIVITY

Stability

Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials

Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, Na, Mg, etc. Incompatible with strong bases such as NaOH, KOH, etc.

Decomposition

Decomposes with heat. High temperatures (open flames, glowing metal surfaces, etc.) can decompose 2,3-Dihydrodeca-fluoropentane forming hydrofluoric acids and possibly carbonyl halides. 2,3-Dihydrodecafluoropentane is incompatible with strong bases and can react to form salts of hydrofluoric acid and unsaturated compounds of unknown toxicity.

Polymerization

Polymerization will not occur.

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11. TOXICOLOGICAL INFORMATION

Animal Data

2,3-Dihydrodecafluoropentane:
Oral LD50: >5,000 mg/kg in rats
Dermal ALD: >5,000 mg/kg in rabbits
Inhalation, 4 hour LC50: 11,100 ppm in rats

Perfluoroalkylether resin:
Inhalation 4 hour ALC: >19.54 mg/L in rats
Skin Absorption ALD: >17,000 mg/kg in rabbits
Oral ALD: >25,000 mg/kg in rats

Animal testing indicates that 2,3-Dihydrodecafluoropentane is a slight skin irritant and a mild eye irritant, but is not a skin sensitizer. Single exposure to 5,000 ppm by inhalation caused tremors. A different single exposure study by inhalation in rats caused incoordination, hyperactivity and prostration; pathological examination of rats from this study revealed kidney and lung changes, and external hair loss. Repeated exposures to 1,900 - 3,500 ppm caused tremors or convulsions, behavioral effects, and altered clinical chemistry. These effects were temporary. In a different repeated exposure test the No-Observed-Adverse-Effect-Level (NOAEL) for convulsions was 1000 ppm. Results indicate convulsions is an acute effect of 2,3-Dihydrodecafluoropentane. The 90-day No-Observed-Adverse-Effect-Level (NOAEL) is 500 ppm. In animal testing 2,3-Dihydrodecafluoropentane produced developmental effects only at exposure levels producing other toxic effects in the adult animal. No animal data are available to define the carcinogenic or reproductive hazards of 2,3-Dihydrodeca-fluoropentane. Tests have shown that 2,3-Dihydrodecafluoro-pentane does not cause genetic damage in bacterial or mammalian cell cultures. It has not produced genetic damage in tests on animals.

Animal testing indicates that PTFE is not a skin irritant. Repeated exposure to PTFE by ingestion caused no significant toxicological effects. Possible effects on white blood cell counts were found in rats fed 25% PTFE in the diet for 90 days, however any changes were within normal variability and were considered to be of no toxicological significance. In rats, single exposure to dusts of undegraded PTFE by inhalation caused irritation of the lungs. Exposure to thermal decomposition products of PTFE caused lung injury whose severity depends upon the temperature and exposure conditions. Birds appear to be especially susceptible to the toxic effects of fluoropolymer decomposition products. In rats, exposure to freshly formed low molecular weight polymer fragments (fume) produced by continuous heating of the polymer above 400 degrees C may produce acute pulmonary inflammation. When the concentration of fluoropolymer fragment fumes increases, deaths may occur from pulmonary edema and hemorrhage. Exposure to fume aged for several minutes, markedly reduces the toxicity. At higher temperatures involving gross thermal decomposition of the polymer, deaths occurred due to pulmonary edema from lethal concentrations of fluoropolymer fume and/or fluorinated gas decomposition products. No adequate animal data are available to define the carcinogenicity or developmental hazards of PTFE. No adequate reports of genetic testing were found. No animal data are available to define the reproductive toxicity of PTFE.

Perfluoroalkylether resin is a mild skin and eye irritant, but is not a skin sensitizer in tests on animals. A single inhalation exposure produced nonspecific effects such as respiratory irritation. Exposure to thermal decomposition

products produced irritation, irregular respiration, tremors and increased liver weight. Repeated inhalation exposures to 10, 100, or 1000 mg/m3 caused increased lung weights and microscopic particle-laden macrophages in the lungs and lymphs nodes; this was an expected pulmonary response to high aerosol concentrations of an inert material. No animal test reports are available to define carcinogenic, developmental, or reproductive hazards. Tests have shown that Perfluoroalkylether did not cause genetic damage in bacterial cell cultures.

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12. ECOLOGICAL INFORMATION

2,3-Dihydrodecafluoropentane:

96 hour LC50, Fathead minnows: 27.2 mg/L
96 hour LC50, Rainbow trout: 13.9 mg/L
48 hour LC50, Daphnia magna: 11.7 mg/L

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13. DISPOSAL CONSIDERATIONS

Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local Regulations.

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14. TRANSPORTATION INFORMATION

UNRTDG
Not regulated as a dangerous good
IATA-DGR
Not regulated as a dangerous good
IMDG-Code
Not regulated as a dangerous good

NOT classified as dangerous in the meaning of transport regulations

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15. REGULATORY INFORMATION

EPCRA: Emergency Planning and Community Right-to-Know

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does NOT contain any components with a section 304 EHS RQ
SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does NOT contain any components with a section 302 EHS TPQ
SARA 311/312 Hazards: NO SARA Hazards
SARA 313: This material does NOT contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313

CERCLA Reportable Quantity : This material does NOT contain any components with a CERCLA RQ

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16. OTHER INFORMATION

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 here in and does not relate to use in combination with any other material or in any process.

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