

1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Name: ReleaSys DF-3R
DryFilm Release Agent/Lubricant

Product Use: Release Agent or Dry Lubricant

MANUFACTURER/DISTRIBUTOR:

Miller-Stephenson Chemical
55 Backus Ave.
Danbury, Conn. 06810 USA
(203) 743-4447

Emergency Phone Number:
(800) 424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

Serious Eye Damage/Eye Irritation: Category 2A

Specific Target Organ Toxicity (single exposure): Category 3

Label elements:

Signal word

Warning

Pictograms



Hazard Statements

H319 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary Statements

Avoid breathing mist/vapors/spray.

Wash skin thoroughly after handling.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/ protective clothing/ eye protection/ face protection.

IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.

Call a POISON CENTER or doctor/physician if you feel unwell.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/ attention.

Store in a well-ventilated place. Keep container tightly closed.

Dispose of contents/ container in accordance with applicable local/regional/national/international regulations.

Other Hazards

The thermal decomposition vapors of fluorinated polymers may cause polymer fume fever with flu-like symptoms in humans, especially when smoking contaminated tobacco.

3. INGREDIENTS

<u>Material (s)</u>	<u>CAS No.</u>	<u>Approximate %</u>
Ethyl Nonafluorobutyl Ether	163702-05-4	8 – 38
Ethyl Nonafluoroisobutyl Ether	163702-06-5	45 – 75
Isopropyl Alcohol	67-63-0	10 - 18

4. FIRST AID MEASURES

Inhalation: Remove patient to fresh air. If not breathing, give artificial respiration. Give oxygen as necessary, if a qualified person is available. Get medical attention if necessary.

Eye: Flush with a large amount of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue to rinse. Get medical attention if necessary.

Skin: Wash with soap and water followed by large amounts of water for at least 15 minutes. Remove contaminated clothing. Wash contaminated clothing before reuse. Get medical attention if necessary.

Oral: DO NOT induce vomiting without medical advice. Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician.

Most important symptoms/effects, acute and delayed: The thermal decomposition vapors of fluorinated polymers may cause polymer fume fever with flu-like symptoms in humans, especially when smoking contaminated tobacco. Eye contact may provoke the following symptoms: Irritation - Causes serious eye irritation. May cause drowsiness or dizziness.

5. FIRE FIGHTING MEASURES

Flash point: None (Pensky-Martens closed cup)

Suitable Extinguishing Media: Water spray, Alcohol-resistant foam, Dry chemical, Carbon dioxide (CO₂)

Special hazards: Exposure to combustion products may be hazardous to health. Hazardous combustion products: Carbon oxides, Hydrogen fluoride, Carbonyl fluoride, potentially toxic fluorinated compounds.

Special Fire Fighting Instruction: In the event of fire, use personal protective equipment. Wear self-contained breathing apparatus, if necessary. Exposure to decomposition products may be a hazard to health.

Further information: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Evacuate personnel to safe areas. Cool containers with water spray. Remove undamaged containers from fire area if it is safe to do so.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate personnel to safe area. Use appropriate personal protection equipment.

Environmental precautions: Prevent material from entering sewers, waterways, or low areas. Should not be released into the environment. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

Methods and material for containment and cleaning up: Contain spillage, and then collect with inert absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

7. HANDLING AND STORAGE

Handling: Do not breathe thermal decomposition products. Use only with adequate ventilation. Use appropriate respiratory protection, when ventilation is inadequate. Avoid contact with skin or eyes. Wash thoroughly after handling. When using do not eat, drink, or smoke.

Storage Conditions: Store in a well-ventilated place and keep container tightly closed. Keep away from heat, sparks and flames. Store away from acids and strong bases. Store away from strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:

Ethyl Nonafluorobutyl Ether
Ethyl Nonafluoroisobutyl Ether
Isopropyl Alcohol

ACGIH

Not Established
Not Established
200 ppm

OSHA

Not Established
Not Established
400 ppm

Respiratory Protection: Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Eye Protection: Avoid eye contact. Use chemical goggles or safety glasses with side shields.

Skin Protection: Use gloves impervious to this material when prolonged or frequently repeated contact occurs. For special applications, we recommend clarifying the resistance to chemicals of the protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often.

Prevention of Swallowing: Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 168.8 °F/76 °C

Percent Volatile by Volume: 97%

Density: 1.36 g/cc at 77°F/25°C

Vapor Pressure: 97 mm Hg at 77°F/25°C F

Vapor Density (Air=1): N.A.

Solubility in H₂O : N.A.

pH Information: Neutral

Evaporation Rate (CC14=1): >1

Form: Liquid

Appearance: Suspended white solids

Color: Opaque

Odor: Slight Odor

10. STABILITY AND REACTIVITY

Reactivity: Not classified as a reactivity hazard.

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: Hazardous polymerization will not occur

Material and Conditions to Avoid: Heat, flames, sparks. Extreme temperatures and direct sunlight. Strong acids, Strong bases and Strong oxidizers.

Decomposition: This product can be decomposed by high temperatures (flame, glowing metal surfaces, etc.) forming Carbon oxides, Hydrogen fluoride, Perfluoroisobutylene (PFIB).

11. TOXICOLOGICAL INFORMATION

Ethyl Nonafluorobutyl Ether

Acute Toxicity

Dermal: LD50 estimated to be 2,000 – 5,000 mg/kg

Ingestion: LD50 > 2,000 mg/kg, Rat

Inhalation: LC50 > 989 mg/l, 4 h, Rat

Skin Corrosion/Irritation: No significant irritation in Rabbits

Serious Eye Damage/Irritation: No significant irritation in Rabbits

Skin Sensitization: Not classified in Guinea pigs

Respiratory Sensitization: Data not available or insufficient for classification.

Germ Cell Mutagenicity: In vitro and In vivo – Not Mutagenic

Carcinogenicity: Data not available or insufficient for classification.

Reproductive and/or Developmental Toxicity: Not classified for development in rats by inhalation (Test results - NOAEL 260 mg/l, during gestation).

Single Dose Toxicity: In Dogs, some positive data, but the data is not sufficient for classification by inhalation (cardiac sensitization) (Test results – NOAEL 204 mg/l, exposure 17 mins). In Rats, not classified by inhalation (respiratory irritation) (Test results - NOAEL 989 mg/l, exposure 4 hours).

Repeated Dose Toxicity: In Rats, not classified by inhalation in liver, kidney and/or bladder, respiratory system, heart, endocrine system, gastrointestinal tract, bone marrow, hematopoietic system, immune system, nervous system (Test results – NOAEL 263.4 mg/l, exposure 4 weeks). In Rats, not classified by ingestion in blood, liver, kidney, and/or bladder, heart, bone marrow, endocrine, immune, hematopoietic, nervous, and respiratory systems, (Test results – NOAEL 1,000 mg/kg/day, exposure 28 days).

Aspiration Hazard: Data not available or insufficient for classification.

Ethyl Nonafluoroisobutyl Ether

Acute Toxicity

Dermal: LD50 estimated to be 2,000 – 5,000 mg/kg

Ingestion: LD50 > 2,000 mg/kg, Rat

Inhalation: LC50 > 989 mg/l, 4 h, Rat

Skin Corrosion/Irritation: No significant irritation in Rabbits

Serious Eye Damage/Irritation: No significant irritation in Rabbits

Skin Sensitization: Not classified in Guinea pigs

Respiratory Sensitization: Data not available or insufficient for classification.

Germ Cell Mutagenicity: In vitro and In vivo – Not Mutagenic

Carcinogenicity: Data not available or insufficient for classification.

Reproductive and/or Developmental Toxicity: Not classified for development in rats by inhalation (Test results - NOAEL 260 mg/l, during gestation).

Single Dose Toxicity: In Dogs, some positive data, but the data is not sufficient for classification by inhalation (cardiac sensitization) (Test results – NOAEL 204 mg/l, exposure 17 mins). In Rats, not classified by inhalation (respiratory irritation) (Test results - NOAEL 989 mg/l, exposure 4 hours).

Repeated Dose Toxicity: In Rats, not classified by inhalation in liver, kidney and/or bladder, respiratory system, heart, endocrine system, gastrointestinal tract, bone marrow, hematopoietic system, immune system, nervous system (Test results – NOAEL 263.4 mg/l, exposure 4 weeks). In Rats, not classified by ingestion in blood, liver, kidney, and/or bladder, heart, bone marrow, endocrine, immune, hematopoietic, nervous, and respiratory systems, (Test results – NOAEL 1,000 mg/kg/day, exposure 28 days).

Aspiration Hazard: Data not available or insufficient for classification.

Isopropyl Alcohol

Acute Toxicity

Oral: LD50, Rat, > 5,000 mg/kg

Dermal: LD50, Rat, > 5,000 mg/kg

Inhalation: LC50, 6 h, Vapor, Rat, > 25 mg/l

Skin Corrosion/Irritation: No skin irritation in rabbits.

Serious Eye Damage/Irritation: Irritation to eyes in Rabbits, reversing within 21 days.

Skin Sensitization: Not classified based on available information. Test Type: Buehler Test. Routes of exposure: Skin contact.

Species: Guinea pig. Method: OECD Test Guideline 406. Result: negative

Respiratory Sensitization: Not classified based on available information.

Germ Cell Mutagenicity: In vitro and In vivo - Not Mutagenic

Carcinogenicity: Negative based in inhalation testing in rats. Species: Rat. Application Route: inhalation (vapor). Exposure time: 104 weeks. Method: OECD Test Guideline 451. Result: negative

Reproductive Toxicity: Not classified based on available information. Test Type: Two-generation reproduction toxicity study.

Species: Rat. Application Route: Ingestion. Result: negative effects on fertility. Test Type: Embryo-fetal development.

Species: Rat. Application Route: Ingestion. Result: negative effects on fetal development

STOT- single exposure: May cause drowsiness or dizziness.

STOT- repeated exposure: Not classified based on available information.

Aspiration toxicity: Not classified based on available information.

12. ECOLOGICAL INFORMATION

Isopropyl Alcohol

Toxicity to fish: 96 hour LC50, fathead minnow (*Pimephales promelas*): 9,640 mg/l

Toxicity to daphnia and other aquatic invertebrates: 24 hour EC50, water flea (*Daphnia magna*): >10,000 mg/l

Toxicity to microorganisms: 16 hour EC50, (*Pseudomonas putida*): >1,050 mg/l

Persistence and degradability: Rapidly degradable. BOD/COD: BOD: 1.19 (BOD5)COD: 2.23BOD/COD: 53 %

Bioaccumulative potential: Partition coefficient: n-octanol/water: log Pow: 0.05

Mobility in soil: No data available.

13. DISPOSAL CONSIDERATIONS

Comply with federal, state and local regulations. Remove to a permitted waste disposal facility.

14. TRANSPORT INFORMATION

U.S. DOT

Not Regulated

IATA

Not Regulated

IMDG

Not Regulated

15. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA: All ingredients are listed in TSCA inventory.

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: Serious eye damage or eye irritation. Specific target organ toxicity (single or repeated exposure).

SARA 313: This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR 372). They may not be intentionally present in the product; however, it is possible that they may be present as an impurity and the exact concentration may vary between batches:

3,3,4,4,5,5,6,6,7,7,8,8,8-Tridecafluorooctanesulphonic acid, CAS No.: 27619-97-2, < 27 ppb

Perfluorobutanoic acid, CAS No.: 375-22-4, < 1.0 ppb

Perfluorohexanoic acid, CAS No.: 307-24-4, < 1.1 ppb

Perfluorononanoic acid, CAS No.: 375-95-1, < 1.5 ppb

Perfluorododecanoic acid, CAS No.: 307-55-1, < 1.7 ppb

Perfluorodecanoic acid, CAS No.: 335-76-2, < 1.8 ppb

Perfluorooctanoic acid, CAS No.: 335-67-1, < 3 ppb

U.S. State Regulations

California Prop. 65

WARNING: This product can expose you to chemicals including 2,2'-Iminodiethanol, which is/are known to the State of California to cause cancer, and Carbon monoxide, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov. Note to User: This product is not made with PFOA nor is PFOA intentionally present in the product; however, it is possible that PFOA may be present as an impurity at background (environmental) levels.

16. OTHER INFORMATION

NPCA-HMIS Ratings:

Health - 2

Flammability - 1

Physical Hazard - 0

Personal Protective rating to be supplied by user depending on the conditions.

FOR INDUSTRIAL USE ONLY

REVISION DATE: November 17, 2025

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user.