## 1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

**Name: ReleaSys™ DFX-L**
High Performance Dry Lubricant

**Product Use:** 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:** Gases under pressure – Liquefied Gas

**Label elements:**

**Single Word:** Warning
**Hazard Statements**
Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

**Precautionary Statements:**
Do not pierce or burn, even after use**.**
Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.
Dispose of contents/container to an approved waste disposal plant.

**Other hazards which do not result in classification or are not covered by GHS**
Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Misuse of intentional inhalation abuse may lead to death without warning symptoms, due to cardiac effects.
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

| Material (s) | CAS No. | Approximate % |
|---|---|---|
| 1,1,1,2-Tetrafluoroethane | 811-97-2 | 50 - 60 |
| 1,1,1,2,2,3,4,5,5,5-Decafluoropentane | 138495-42-8 | 40 - 50 |

## 4. FIRST AID MEASURES

**Inhalation:** Remove patient to fresh air. Get medical attention if necessary.

**Eye:** Flush with large amounts of water. Get medical attention if irritation develops and persists.

**Skin:** Wash skin with soap and water after contact. Get medical attention if symptoms occur.

**Oral:** If swallowed, Do NOT induce vomiting. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Note to physician: Treat symptomatically and supportively.

## 5. FIRE FIGHTING MEASURES

**Flammability:** This product is not flammable. **Test Method:** Ignition distance test and Enclosed space ignition test

**Fire and Explosion:** Aerosols may rupture under fire conditions. Decomposition may occur.

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

**Specific hazards during firefighting:** Exposure to combustion products may be a hazard to health. Aerosols will rupture under fire conditions due to the heat and high pressure.

**Hazardous combustion products:** Carbon oxides, Hydrogen fluoride, Carbonyl fluoride, Potentially toxic fluorinated compounds.

**Special Fire Fighting Instruction:** Evacuate area. Use water spray to cool aerosols. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Do not breathe fumes or vapors from fire. Self-contained breathing apparatus (SCBA) may be required if a large amount of aerosols rupture under fire conditions. Fight fire from a distance, heat may rupture containers.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment, and emergency procedures:** Evacuate area. Ventilate the area with fresh air. Use personal protective equipment. If a large amount of aerosols rupture and spill in confined areas, provide mechanical ventilation to disperse the vapors.

**Environmental precautions:** Avoid release to the environment. Prevent material from entering sewers, waterways, or low areas. Do not allow contact with soil, surface, or ground 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:** Use in a well-ventilated area to avoid breathing vapors. Use only with adequate ventilation. Use appropriate respiratory protection, when ventilation is inadequate. Avoid contact with skin or eyes. Wash thoroughly after handling.

**Storage Conditions**: Do not store near sources of heat, in direct sunlight or where temperatures exceed 50°C/122°F.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

| Exposure Limits: | ACGIH | OSHA |
|---|---|---|
| 1,1,1,2-Tetrafluoroethane | Not Established | Not Established |
| 1,1,1,2,2,3,4,5,5,5-Decafluoropentane | Not Established | Not Established |

**Respiratory Protection:** General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. 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:** Avoid contact with skin. Use gloves impervious when prolonged or frequently repeated contact occurs. 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 hands thoroughly after contact.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Boiling Point:** Not Applicable

**Density:** 1.25 g/cc at 77$^{O}$F/25$^{O}$C

**Vapor Density (Air=1):** >1

**pH Information:** Neutral

**Form:** Aerosol

**Color:** White

**Percent Volatile by Volume:** 99%

**Vapor Pressure:** 80 psig at 77$^{O}$F/25$^{O}$C

**Solubility in $H_2O$ :** Insoluble

**Evaporation Rate (CC14=1):** >1

**Appearance:** Milky

**Odor:** Faint Ethereal Odor

## 10. STABILITY AND REACTIVITY

**Reactivity:** Not classified as a reactivity hazard.

**Chemical Stability:** Stable under normal conditions.

**Material and Conditions to Avoid:** None known.

**Hazardous Decomposition:** This product can be decomposed by high temperatures (flame, glowing metal surfaces, etc.) forming Hydrogen fluoride, Carbonyl difluoride, Carbon monoxide and Carbon dioxide.

## 11. TOXICOLOGICAL INFORMATION

### 1,1,1,2-Tetrafluoroethane

**Acute Inhalation:**
LC50 (Rat) > 567000, 4 h. Test atmosphere: gas. Method: OECD Test Guideline 403
No observed adverse effect concentration (Dog): 40000 ppm. Test atmosphere: gas. Remarks: Cardiac sensitization
Lowest observed adverse effect concentration (Dog): 80000 ppm. Test atmosphere: gas. Symptoms: May cause cardiac arrhythmia.
Cardiac sensitization threshold limit (Dog): 334,000 mg/m³. Test atmosphere: gas. Symptoms: May cause cardiac arrhythmia.
**Skin corrosion/irritation:** No skin irritation.
**Serious eye damage/eye irritation:** No eye irritation.
**Respiratory or skin sensitization:** Not classified based on available information. Negative in Skin contact and Inhalation.
**Germ cell mutagenicity:** Weight of evidence does not support classification as a germ cell mutagen.
Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay). Species: Mouse
Application Route: inhalation (gas). Method: OECD Test Guideline. 474 Result: negative
Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo. Species: Rat
Application Route: inhalation (gas). Method: OECD Test Guideline 486. Result: negative
**Carcinogenicity:** Weight of evidence does not support classification as a carcinogen. Species: Rat. Application Route: inhalation (gas) Exposure time: 2 years. Method: OECD Test guideline 453. Result: negative.
**Reproductive toxicity:** Weight of evidence does not support classification for reproduction toxicity.
Species: Mouse. Application Route: Inhalation. Result: negative effects on fertility. Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test. Species: Rabbit. Application Route: inhalation (gas). Method: OECD Test Guideline 414. Result: negative effects on fetal development.
**STOT-single exposure:** Not classified based on available information. Routes of exposure: inhalation (gas). Assessment: No significant health effects observed in animals at concentrations of 20000 ppmV/4h or less.
**STOT-Repeated exposure:** Not classified based on available information. Routes of exposure: inhalation (gas). Assessment: No significant health effects observed in animals at concentrations of 250ppmV/6h/d or less.
**Aspiration toxicity:** Not classified based on available information.

### 1,1,1,2,2,3,4,5,5,5-Decafluoropentane

**Information on likely routes of exposure:** Inhalation, Skin contact, Ingestion, Eye contact
**Acute Oral:** LD50: > 5000 mg/kg in rats. Method: OECD Test Guideline 401
**Acute Inhalation (vapor):** 4 hour LC50: 114.428 mg/l in rats. Method: OECD Test Guideline 403
**Acute Dermal:** LD50: > 5000 mg/kg in rabbits. Method: OECD Test Guideline 402
**Skin Corrosion/Irritation:** No skin irritation in rabbits. Method: OECD Test Guideline 404
**Serious Eye Irritation/ Eye Irritation:** No eye irritation in rabbits. Method: OECD Test Guideline 405
**Skin Sensitization:** No skin sensitization in Guinea pigs. Buehler Test. Method: OECD Test Guideline 406
**Respiratory Sensitization:** Not classified based on available information.
**Germ Cell Mutagenicity:** Weight of evidence does not support classification as a germ cell mutagen.
**Carcinogenicity:** Not classified based on available information.
**Reproductive toxicity:** Weight of evidence does not support classification for reproductive toxicity.
**STOT-single exposure:** Inhalation (vapor): No significant health effects observed in animals at concentrations of 20mg/l/4h or less.
**STOT-repeated exposure:** Inhalation (vapor): No significant health effects observed in animals at concentrations of 1mg/l/6h/d or less.
**Aspiration toxicity:** No aspiration toxicity classification.

## 12. ECOLOGICAL INFORMATION

**1,1,1,2-Tetrafluoroethane**

**Toxicity to fish:** 96 hour LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l. Method: Regulation (EC) No. 440/2008, Annex, C.1
**Toxicity to daphnia and other:** 48 hour EC50 (Daphnia magna (Water flea)): 980 mg/l. Method: Regulation (EC) No. 440/2008, Annex, C.2
**Toxicity to algae:** 96 hour ErC50 (algae): 100 mg/l. Based on data from similar materials.
**Biodegradability:** Not readily biodegradable. Method: OECD Test Guideline 301D
**Bioaccumulative potential:** Bioaccumulation is unlikely. Partition coefficient n-octanol/ water (log Pow): 1.06
**Mobility in soil:** No data available
**Other adverse effects:** No data available

**1,1,1,2,2,3,4,5,5,5-Decafluoropentane:**

96 hour LC50 in Danio rerio (zebra fish): 13 mg/l. Method: OECD Test Guideline 203
48 hour EC50 in Daphnia magna (Water flea): 10.6 mg/l. Method: OECD Test Guideline 202
72 hour EC50 in Selenastrum capricornutum (Green algae): >120 mg/l. Method: OECD Test Guideline 201
21 days NOEC in Daphnia magna (Water flea): 1.72 mg/l. Method: OECD Test Guideline 211

**Biodegradability:** Not readily biodegradable. Method: OECD Test Guideline 301D
**Bioaccumulative potential:** Bioaccumulation is unlikely. Partition coefficient: n-octanol/water: log Pow: 2.4 (75°F/24°C)
**Mobility in soil:** No data available

## 13. DISPOSAL CONSIDERATIONS

Comply with federal, state and local regulations. Remove to a permitted waste disposal facility. Do not puncture or incinerate cans. Empty aerosol cans before disposal.

## 14. TRANSPORT INFORMATION

**U.S. DOT**
**Limited Quantity**

**IATA**
**Proper Shipping Name:** Aerosols, Non-Flammable
**Hazard Class:** 2.2
**Identification No.** UN1950
**Packing Group:** None

**IMDG**
**Proper Shipping Name:** Aerosols, Non-Flammable
**Hazard Class:** 2.2
**Identification No.** UN1950
Packing Group: None

## 15. REGULATORY INFORMATION

**U.S. Federal Regulations**

**TSCA:** All ingredients are listed in TSCA inventory.

1,1,1,2,2,3,4,5,5,5-Decafluoropentane (CAS# 138495-42-8) - The United States Environmental Protection Agency has established a Significant New Use Rule (SNUR; 40 CFR 721.5645) for this product. Also, this product requires an export notification under TSCA Section 12(b) and 40 CFR Part 707 Subpart D.

**CERCLA Reportable Quantity:** This material does not contain any components with a CERCLA RQ.

**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 Regulated Chemicals:** 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 it may be present as an impurity and the exact concentration may vary between lots:
3,3,4,4,5,5,6,6,7,7,8,8,8-Tridecafluorooctanesulphonic acid, CAS No.: 27619-97-2, < 0.02 ppb
Perfluorononanoic acid, CAS No.: 375-95-1, < 0.3 ppb
Perfluorododecanoic acid, CAS No.: 307-55-1, < 0.3 ppb
Perfluorodecanoic acid, CAS No.: 335-76-2, < 0.4 ppb
Perfluoropalmitic acid, CAS No.: 67905-19-5, < 0.4 ppb
Perfluorohexanoic acid, CAS No.: 307-24-4, < 0.4 ppb
Perfluorobutanoic acid, CAS No.: 375-22-4, < 0.4 ppb
Octadecanoic acid, pentatriacontafluoro-, CAS No.: 16517-11-6, < 0.4 ppb
Perfluorotetradecanoic acid, CAS No.: 376-06-7, < 0.5 ppb
Perfluorooctanoic acid, CAS No.: 335-67-1, < 1.2 ppb

**U.S. State Regulations**

**California Prop. 65**
WARNING: This product can expose you to chemicals including Pentadecafluorooctanoic acid, 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 | - 1 |
| Flammability | - 0 |
| Physical Hazard | - 3 |

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

**FOR INDUSTRIAL USE ONLY**

**REVISION DATE: November 13, 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.