1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Name: MS-122AD                          Product Use: Release Agent or Dry Lubricant
DPMS-Z0918A
PTFE Release Agent/Dry Lubricant

MANUFACTURER/DISTRIBUTOR:

Miller-Stephenson Chemical
George Washington Highway
Danbury, Conn. 06810 USA
(203) 743-4447

Date Revised: May 2011

Emergency Phone Number:
(800) 424-9300

2. INGREDIENTS

<table>
<thead>
<tr>
<th>Material (s)</th>
<th>CAS No.</th>
<th>Approximate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>811-97-2</td>
<td>86 - 94</td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>67-63-0</td>
<td>5 - 15</td>
</tr>
<tr>
<td>Poly-TFE, Omega-Hydro-Alpha-(Methylcyclohexyl)-</td>
<td>65530-85-0</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Poly-Tetrafluoroethylene</td>
<td>9002-84-0</td>
<td>&lt; 1</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Milky, white, liquid with a faint ethereal odor, packaged in an aerosol container.

Potential Health Effects

1,1,1,2-Tetrafluoroethane

**Inhalation:** Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects. Other symptoms may include anaesthetic effects, light-headedness, dizziness, confusion, incoordination, drowsiness, or unconsciousness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

**Skin:** Contact with liquid or refrigerated gas can cause cold burns and frostbite. May cause skin irritation, discomfort, itching, redness or swelling.
Eye: Contact with liquid or refrigerated gas can cause cold burns and frostbite. May cause eye irritation with tearing, redness, discomfort.

Additional Health Effects: Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the: Central Nervous System, Cardiovascular System.

Poly-Tetrafluoroethylene

Inhalation of PTFE dust may cause generalized irritation of the nose, throat, and lungs with cough, difficulty in breathing or shortness of breath. Inhalation of fluorine compounds released as decomposition products above 290°C (554°F) may cause lung irritation and pulmonary edema, which require medical treatment. Inhalation of fumes or smoke from overheated or burning Poly-TFE may cause polymer fume fever, a temporary flu-like illness accompanied by fever, chills, and sometimes cough, of approximately 24 hour in duration. Repeated episodes of polymer fume fever may cause lung damage.

Isopropyl Alcohol

Short-term overexposure of Isopropyl Alcohol by inhalation may cause irritation of the nose and throat with sneezing, sore throat or runny nose. Repeated and/or prolonged skin contact with Isopropyl Alcohol may cause defatting of the skin with itching, redness or rash. There are inconclusive or unverified reports of human sensitization. Contact with the vapor or aerosol may cause eye irritation with tearing, pain or blurred vision. Ingestion of Isopropyl Alcohol may cause irritation of the digestive tract with stomach pain, heartburn, nausea, vomiting or diarrhea; however there may be no symptoms at all. Immediate effects of inhalation, ingestion or skin contact with Isopropyl Alcohol may include non-specific effects such as headache, nausea and weakness; flushing of the face; and low blood pressure. Repeated and/or prolonged exposure may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Gross overexposure may cause fatality.

4. FIRST AID MEASURES

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

Eye: Flush with large amounts of water for at least 15 minutes, lifting eyelids until no evidence of the chemical remains. Get medical attention if necessary.

Skin: Wash skin with water after contact. Wash contaminated clothing before use. Get medical attention if necessary.

Oral: If swallowed, do not induce vomiting, because the hazard of aspirating the material into the lungs is considered greater than swallowing it. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

Notes to Physician: Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.
5. **FIRE FIGHTING MEASURES**

**Flash Point:** Non-flammable as described in 16CFR 1500.45.  
**Method:** N.A.

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

**Extinguishing Media:** As appropriate for combustibles in area.

**Special Fire Fighting Instruction:** Use water spray to cool containers. Self-contained breathing apparatus (SCBA) maybe required if a large amount of material is spilled under fire conditions. Fight fire from a distance, heat may rupture containers.

6. **ACCIDENTAL RELEASE MEASURES**

Ventilate area with fresh air and remove all ignition sources, if a large amount is accidental released. No need for additional release information, since it is an aerosol.

7. **HANDLING AND STORAGE**

**Handling:** Use in a well-ventilated area to avoid breathing vapors. Vapors are heavier than air and accumulate in low areas. Use only with adequate ventilation. Where ventilation is inadequate, use appropriate respiratory protection. Avoid contact with skin or eyes. Wash thoroughly after handling. Polytetrafluoroethylene should not be handled around tobacco products because smoking contaminated tobacco products may cause polymer fume fever.

**Storage Conditions:** Do not store near sources of heat, in direct sunlight or where temperatures exceed 120°F/49°C. Rotate stock to shelf life of one year.

8. **EXPOSURE CONTROLS/PERSONAL PROTECTION**

<table>
<thead>
<tr>
<th>Exposure Limits</th>
<th>TLV (ACGIH)</th>
<th>PEL (OSHA)</th>
<th>AEL* (DuPont)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>Not Established</td>
<td>Not Established</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>400 ppm, STEL</td>
<td>400 ppm, 8 Hr. TWA</td>
<td></td>
</tr>
<tr>
<td>Poly-Tetrafluoroethylene</td>
<td>Not Established</td>
<td>Not Established</td>
<td>10 mg/m³, 8 Hr. TWA, total dust</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 mg/m³, 8 Hr. TWA, respirable dust</td>
</tr>
</tbody>
</table>

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

**Respiratory Protection:** Avoid breathing vapors, mists or spray. Use with mechanical ventilation especially for enclosed or low places. Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. If necessary to keep exposure limits below permissible limits, use NIOSH approved respirators. In poorly ventilated areas, use an approved self-contained breathing apparatus.
Eye Protection: Avoid eye contact. Use chemical goggles or safety glasses with side shields.

Skin Protection: Avoid contact with skin. Use gloves impervious to this material when prolonged or frequently repeated contact occurs.

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: Not Applicable

Density: 1.2 g/cc at 77°F/25°C

Vapor Density (Air=1): >1

pH Information: Neutral

Form: Aerosol

Color: White

Percent Volatile by Volume: 99%

Vapor Pressure: 80 psig at 70°F/21°C

Solubility in H₂O: Insoluble

Evaporation Rate (CC14=1): >1

Appearance: Milky

Odor: Faint Ethereal Odor

10. STABILITY AND REACTIVITY

Stability: Stable at recommended storage conditions.

Material and Conditions to Avoid: Avoid heat, sparks and flame. Strong acids and alkalis. Finely powdered metals such as Al, Be, Mg, Zn, etc. Strong oxidizing agents, aldehydes, halogens, halogen compounds, amines and ammonia.

Decomposition: This product can be decomposed by high temperatures (flame, glowing metal surfaces, etc.) forming hydrofluoric acid, possibly carbonyl fluoride, hazardous gases including carbon monoxide and carbon dioxide.

Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity: None of the components in this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
1,1,1,2-Tetrafluoroethane (HFC134a)

Animal Data:

**Eye:** A short duration spray of vapor produced very slight eye irritation.

**Skin:** Animal testing indicates this material is a slight skin irritant, but not a skin sensitizer.

**Inhalation:** 4 hour, LC50, rat: >359,300 ppm

**Inhalation:** Cardiac sensitization, dog
No-observed-effect level: 50,000 ppm.
Lowest – Observed – Adverse – Effect – Level for cardiac sensitization: 75,000 ppm.
Repeated dose toxicity: rat NOEL – 40,000 ppm

**Carcinogenicity:** Overall weight of evidence indicates that the substance is not carcinogenic. An increase incidence of benign tumors was observed in laboratory animals.

**Mutagenicity:** Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

**Reproductive toxicity:** Animal testing showed no reproductive toxicity.
Teratogenicity: Animal testing show effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

**Further information:** Cardiac sensitization threshold limit: 312,975 mg/m3. Anaesthetic effects threshold limit: 834,600 mg/m3
Did not show carcinogenic or teratogenic effects in animal experiments. Concentrations substantially above the TLV value may cause narcotic effects. Inhalation of decomposition products in high concentration may cause shortness of breath (lung oedema). Rapid evaporation of liquid may cause frostbite.

Isopropyl Alcohol

**Oral:**
LD50: 4,700 mg/kg in rats, Gastrointestinal effects, Kidney effects

**Dermal:**
LD50: 12,900 mg/kg in rabbits

**Inhalation:**
4 hour LC50: 16,000 ppm in rats, Respiratory tract damage, Central nervous system depression.

Isopropyl Alcohol is a mild skin irritant, a moderate eye irritant, and is untested for skin sensitization in animals. Repeated exposure caused dry skin, decreased body weight, and increased lung weight. Repeated dose toxicity by inhalation, can cause effects on the Central nervous system, Liver, Kidney, Lung, Spleen, and Testes. Repeated dose toxicity by ingestion, can cause Liver enlargement, Kidney enlargement, and Adrenal effects. Repeated dose toxicity by skin contact, can cause drying of the skin, weight loss, and organ weight changes. No adequate animal data are available to define the carcinogenic potential of this material. Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal. Reproductive data on rats show no change in reproductive performance. Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures or in animals.
Poly-Tetrafluoroethylene

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°C may produce acute pulmonary inflammation. When the concentration of fluoropolymer fragment fumes increases, death 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.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity:

Isopropyl Alcohol

96 hour LC50: Pimephales promelas (fathead minnow) 3,200 mg/l
72 hour EC50: Algae > 1,000 mg/l
24 hour EC50: Daphnia 9.714 mg/l

1,1,2-Tetrafluoroethane:

48 hour EC50 – Daphnia magna (Water flea): 980 mg/L
96 hour LC50 – Rainbow trout: 450 mg/L

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
Proper Shipping Name: Consumer Commodity
Hazard Class: ORM-D
Identification No. None
Packing Group: None
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.

SARA/TITLE III HAZARD CATEGORIES:
Product Hazard Categories:
Acute Health - Yes
Chronic Health - Yes
Fire Hazard - No
Reactivity Hazard - No
Pressure Hazard - Yes

16. OTHER INFORMATION

NPCA-HMIS Ratings:

Health - 2
Flammability - 2
Reactivity - 0

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

FOR INDUSTRIAL USE ONLY