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Material Safety Data Sheet

1. Material Identification

POLYRAD FM12-15 Trifunctional Polyurethane Oligomer

2. Composition Information

| COMPONENT | CAS# | CONCENTRATION |
|-----------|------|---------------|
|-----------|------|---------------|

No hazardous materials present.

3. Hazards Identification

EMERGENCY OVERVIEW: Caution!

Harmful or fatal if swallowed.
May cause eye or skin irritation.
May cause an allergic skin reaction.
May cause eye damage or blindness if ingested.
May cause dizziness and drowsiness if inhaled.
May cause heart muscle, liver, and/or kidney damage.

4. First Aid Measures

SWALLOWING: If patient is fully conscious, give two full glasses of water. Induce vomiting. Seek medical attention immediately.

SKIN CONTACT: Remove contaminated clothing. Wash skin with soap and lukewarm water. If irritation persists, seek medical attention. Was contaminated clothing before re-use.

INHALATION: Remove patient to fresh air. If symptoms persist, seek medical attention.

EYE CONTACT: Immediately flush eyes with water and continue rinsing for a minimum of 15 minutes. Seek medical attention, preferably from an ophthalmologist, as quickly as possible.

NOTES TO PHYSICIAN:

This material is not caustic. It is an organic material that resists breakdown by gastric acids. It may be an eye and skin irritant because it possesses acrylic functional groups.

5. Fire and Explosion Hazard Data

FLASH POINT (method): > 250°C (> 482°F), estimated
LEL: N/A **UEL:** N/A
EXTINGUISHER METHOD: Dry chemical foam, or carbon dioxide.
SPECIAL FIRE-FIGHTING PROCEDURES:
Wear self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS:
None.

6. Accidental Release Measures

PERSONAL PRECAUTIONS: Wear suitable NIOSH-approved protective equipment.
ENVIRONMENTAL PRECAUTIONS: Contain and dike spill. Prevent run-off.
METHODS FOR CLEANING UP: Cover with suitable absorbent an/or collect for disposal.
Follow applicable local, state, and Federal regulations.

7. Precautions for Safe Handling and Use/Leak Procedures

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:
For small amounts, wipe off with damp sponge. For large amounts, absorb on sand or vermiculite. Wipe off and dispose of into proper waste disposal containers.
WASTE DISPOSAL METHODS:
Dissolve or mix material with proper solvent and incinerate.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Material is generally stable. Keep away from open flames. Store in cool dry place
OTHER PRECAUTIONS AND/OR SPECIAL HAZARDS:
Material will polymerize when heated to high temperatures, or when it comes in contact with strong bases, or free radical sources.

8. Exposure Controls and Personal Protection Measures

PERSONAL PROTECTION:
Respiratory: The EPA requirement for workers, who may be exposed to this chemical during manufacturing and other processing activities, is to wear a NIOSH-approved respirator.
Hands: Protective gloves are recommended (4H, butyl, neoprene, nitrile, or PVC-coated).
Eyes: Safety glasses, goggles, or face shields are required.
Skin: Chemical-resistant clothing.
OTHER PROTECTIVE EQUIPMENT:
Eye bath.
Safety shower.
ENGINEERING CONTROLS:
Ventilation: This product should be stored in a closed environment to prevent vapors from escaping storage containers, and to prevent moisture contamination. General mechanical room ventilation is satisfactory. Local ventilation is required at points where vapors are likely to be released into workplace air.

EXPOSURE LIMITS:

| <u>Component</u> | <u>Type</u> | <u>Value</u> | <u>Remarks</u> |
|--------------------------|-------------------|--------------|------------------|
| Proprietary Polyurethane | TWA (skin) OSHA | -0- ppm | None established |
| Oligomer | STEL (skin) ACGIH | -0- ppm | None established |
| | TWA (skin) ACGIH | -0- ppm | None established |

9. Physical / Chemical Characteristics**APPEARANCE:**

| | |
|-----------------|----------------|
| Physical State: | Viscous liquid |
| Color: | Water white |
| Odor: | None |

OTHER PROPERTIES:

| | |
|--|--|
| Boiling Point: | >300° C (at std. temperature & pressure, unless noted below) |
| Melting Point: | < 0° C (at std. temperature & pressure, unless noted below) |
| pH: | Not applicable |
| Specific Gravity (H ₂ O=1): | 1.1610 @ 25° C |
| Vapor Pressure: | <0.000 hPa (1.00 mmHg) @ 20° C |
| Vapor Density (Air-1): | Heavier than air. |
| Solubility in water: | Insoluble |
| Evaporation rate (BuAc=1): | >1 |
| Avg. Molecular Weight: | 900 g/mol |
| Percent volatile (weight): | <0.01% |
| Percent volatile (volume): | <0.01% |
| Volatile organic content: | <0.1 g/L |

10. Reactivity Hazard Data

| | |
|--|--|
| STABILITY: | Stable |
| CONDITIONS TO AVOID: | Open flames, high temperatures |
| INCOMPATIBLE MATERIALS: | Strong acids or bases; strong oxidizing agents. |
| HAZARDOUS DECOMPOSITION PRODUCTS: | Carbon Dioxide (CO ₂), carbon monoxide (CO), nitrogen dioxide (NO ₂), and nitric oxide (NO). |
| HAZARDOUS POLYMERIZATION: | May occur |
| CONDITIONS TO AVOID: | Open flames; strong bases. |

11. Toxicological Information

SWALLOWING:

- Acute effects:** May cause nausea, abdominal pain, vomiting, headache, dizziness, shortness of breath, weakness, leg cramps, restlessness, confusion, drunken behavior, visual disturbances, drowsiness, coma, and death. Visual effects may include blurred vision, diplopia, changed color perception, restriction of visual fields, or complete blindness. There may be a delay of up to forty-eight hours before the onset of symptoms.
- Test results:** Acute Toxicity: Toxicological testing has not been performed with this material.
Chronic Toxicity: Toxicological testing has not been performed with this material.

SKIN ABSORPTION:

- Acute effects:** No evidence of harmful effects.
- Test results:** Acute Toxicity: Toxicological testing has not been performed with this material.
Chronic Toxicity: Toxicological testing has not been performed with this material.

INHALATION:

- Acute effects:** Short-term harmful health effects are not expected from vapor generated at ambient temperature.
- Test results:** Acute Toxicity: Toxicological testing has not been performed with this material.
Chronic Toxicity: Toxicological testing has not been performed with this material.

SKIN CONTACT:

- Acute effects:** Causes moderate irritation. Causes local discomfort, redness, possibly slight swelling, and scaling. The effects of repeated exposure may cause sensitization and allergic skin reaction.
- Test results:** Acute Toxicity: Toxicological testing has not been performed with this material.
Chronic Toxicity: Toxicological testing has not been performed with this material.

EYE CONTACT:

- Acute effects:** Causes severe irritation. Causes discomfort, pain, excessive blinking, tear production and, marked excessive redness and swelling of the conjunctivae. Corneal injury may occur. Corneal injury may be severe, extensive and, if not treated promptly, could result in permanent impairment. Medical conditions that may be aggravated by overexposure include existing kidney disease, existing liver disease, or an existing heart problem.
- Test results:** Acute Toxicity: Toxicological testing has not been performed with this material.
Chronic Toxicity: Toxicological testing has not been performed with this material.

SENSITIZATION:

Test results: Acute Toxicity: Toxicological testing has not been performed with this material.
Chronic Toxicity: Toxicological testing has not been performed with this material.

MUTAGENICITY:

Genetic toxicity (in vitro): Acute Toxicity: Toxicological testing has not been performed with this material.
Chronic Toxicity: Toxicological testing has not been performed with this material.

12. Ecological Information

ELIMINATION (persistence and degradability):

Biodegradability: Biologically not degradable. Elimination by adsorption in activated sludge.

AQUATIC TOXICITY:

Acute toxicity to fish: Harmful to aquatic organisms. May have long-term damaging effects on in-shore waters.

Acute toxicity to plants: Harmful to aquatic organisms. May have long-term damaging effects on in-shore waters.

Microorganisms: Harmful to aquatic organisms. May have long-term damaging effects on in-shore waters.

13. Disposal Considerations

RCRA WASTE

CLASSIFICATION: N/A

GENERAL: Incinerate in a furnace, where permitted, following appropriate local, state, and federal regulations.

PACKAGING: Completely discharge containers. Containers may be recycled or re-used. Observe local, state, and federal regulations.

14. Transport Information

US DOT CLASSIFICATION: Not regulated

CANADIAN TDG SURFACE: Not regulated

IMDG CLASSIFICATION:

ICAO CLASSIFICATION:

IATA CLASSIFICATION:

15. Regulatory Information

CALIFORNIA PROPOSITION 65: This material does not contain any chemicals, known to the State of California, to cause cancer or reproductive defects.

TSCA INVENTORY STATUS: This material, or its components, are listed on, or are in compliance with, the requirements of TSCA.

TSCA 12(b) EXPORT NOTIFICATION: This material does not contain 12(b) regulated chemicals.

CERCLA REGULATED CHEMICALS: This material does not contain any CERCLA regulated chemicals.
RQ's: None

SARA 302 EHS CHEMICALS: No extremely hazardous chemicals present.

SARA 313 CHEMICALS: This material contains no reportable chemicals above de minimus levels.

SARA 311/312 HAZARD CLASS: There are no known hazards associated with this material.

HAPS: There are no known hazardous air pollutants associated with this material.

MASSACHUSETTS (MSA) LIST: This material contains no components, which require reporting.

NEW JERSEY RIGHT-TO-KNOW HAZARDOUS SUBSTANCES LIST: This material contains no listed components.

PENNSYLVANIA RIGHT-TO-KNOW HAZARDOUS SUBSTANCES LIST: This material contains no listed components.

CANADIAN WHMIS CLASS: Not regulated.

CANADIAN DSL LIST: This material contains no listed components.

CANADIAN INGREDIENT DISCLOSURE LIST: This material contains no listed components.

EU/UK RISK PHRASES: R 21/22, 38

EU/UK SAFETY PHRASES: S (1/2), 24/25

EU/UK HAZARD SYMBOL(S): Irritant



EINECS IDENTIFICATION: This material, or its components, are listed on, or are in compliance with, the requirements of EINECS.

HMIS RATINGS:

| | |
|----------------------|---|
| Health: | <u>2</u> |
| Flammability: | <u>0</u> |
| Reactivity: | <u>1</u> |
| Personal Protection: | <u>B</u> (For explanation, see legend in §16) |

16. Other Information

GLOSSARY OF TERMS:

| | |
|--------|--|
| ACGIH: | American Conference of Governmental industrial hygienists |
| DOT: | Department of Transportation |
| hPa: | Hectopascals |
| mPa*s: | Millipascal-seconds |
| OSHA | Occupational Safety and Health Administration |
| PEL: | Permissible Exposure Limit |
| ppm: | Parts per Million |
| SARA: | Superfund Ammendments and Reauthorization Act |
| STEL: | Short-term Exposure Limit |
| TSCA: | Toxic Substance Control Act |
| TWA: | Time-weighted Average |
| WHMIS: | Workplace Hazardous Materials Identification System (Canadian) |

EU/UK HAZARD SYMBOLS:



HMIS PERSONAL PROTECTION LEGEND:

| | |
|--------|---|
| A: | safety glasses |
| B: | safety glasses and gloves |
| C: | safety glasses, gloves and an apron |
| D: | face shield, gloves and an apron |
| E: | safety glasses, gloves and a dust respirator |
| F: | safety glasses, gloves, apron and a dust respirator |
| G: | safety glasses, a vapor respirator |
| H: | splash goggles, gloves, apron and a vapor respirator |
| I: | safety glasses, gloves and a dust/vapor respirator |
| J: | splash goggles, gloves, apron and a dust/vapor respirator |
| K: | airline hood or mask, gloves, full suit and boots |
| L – Z: | custom PPE specified by employer |
| X: | none |

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