

**I – Identification of the Substance and of the Company**

SUPPLIER: RMO, Inc.
650 W. Colfax Ave.
Denver, CO 80204
303-592-8200

Trade Name and Synonyms –
Description: Ligatures, Separators,
Synergy Low Friction Ligatures, Radio
Opaque Separators, Elastomeric Tie
Thread, Elastomeric Modules, Rotation
Wedges

Product Grade / Name:

THERMOPLASTIC – POLYURETHANE

II – Composition / Information on Ingredients

<u>MATERIAL</u>	<u>% (CONCENTRATION)</u>	<u>CAS Number</u>
Polyurethane from 4,4' methylenediphenyl	99%	26375-23-5

Radio Opaque Separators Only

<u>MATERIAL</u>	<u>% (CONCENTRATION)</u>	<u>CAS Number</u>
Polyurethane from 4,4' methylenediphenyl	90%	26375-23-5
Barium	10%	

III – Hazards Identification

This product has non-hazardous ingredients as defined under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

No toxic effect would be expected from exposure to the solid form of thermoplastic polyurethane.

At temperatures above decomposition (482 °F), Diphenylmethan Diisocyanate (MDI) may be liberated. Potential health hazards associated with overexposure to isocyanates are as follows:

Acute Inhalation: Isocyanate vapors at concentrations above the suggested exposure limit can irritate (burning sensation) the mucous membranes in the respiratory tract causing: runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function. Persons with a preexisting nonspecific bronchial hyperactivity can respond to concentrations below the exposure limit with similar symptoms as well as asthma attack. Exposure well above the exposure limit may lead to bronchitis, bronchial spasm and pulmonary edema. These effects are usually reversible. Chemical or hypersensitive pneumonitis with flu-like symptoms has also been reported. These symptoms can be delayed up to several hours after exposure.

Chronic Inhalation: As a result of previous repeated overexposure or a single large dose; certain individuals develop isocyanate sensitization which will cause them to react to a later exposure to isocyanate at levels well below the exposure limit. These symptoms which can include shortness of breath or asthma attack could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold or other irritants. This increased lung sensitivity can persist for weeks, and in severe cases for several years. Overexposure to isocyanates has also been reported to cause lung damage (including decrease in lung function) which may be permanent. Sensitization can either be temporary or permanent.

Acute Skin Contact: Isocyanates react with skin protein and moisture and can cause

irritation which may include the following symptoms: reddening, swelling, rash, scaling or blistering.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, scaling, blistering, and in some cases skin sensitization. Individuals who have developed a skin sensitization can develop these symptoms as a result of contact with very small amounts of liquid material or as a result of exposure to vapor.

Acute Eye Contact: Isocyanate vapors are irritating and can cause tearing, reddening, and swelling. If left untreated, corneal damage can occur and injury is slow to heal.

However, damage is usually reversible.

Chronic Eye Contact: None known.

Acute Ingestion: Non known.

Chronic Ingestion: None known.

Carcinogenicity:

NTP: Not listed as a carcinogen.

IARC: Not listed as a carcinogen.

OSHA: Not listed as a carcinogen.

Medical Conditions:

Aggravated by Exposure: Asthma, other respiratory disorders including bronchitis, emphysema, bronchial hyperactivity, skin allergies, and eczema.

Exposure Limits: Although no exposure limit has been established for the product, the OSHA-PEL for nuisance dust of 15mg/m³ total dust, 5 mg/m³ respirable dust is recommended. In addition, the ACGIH-TLV for nuisance dust of 10 mg/m³ is recommended.

IV – First Aid Measures

Eye Contact	Flush eyes with plenty of water for at least 15 minutes, holding eyelids open all the time. See a physician or ophthalmologist for immediate follow-up if irritation is present and persists.
Skin Contact	Wash affected areas with soap and water. See physician if thermal burn occurs.
Inhalation	Remove to fresh air.
Ingestion	Consult a physician.

V – Fire Fighting Measures

Flash Point: Above 482 °F

Extinguisher Media: Water, dry chemical, foam

Fire & Explosion Hazard: Upper Explosive Limit (UEL) (%): N/A / Lower Explosive Limit (LEL) (%): N/A

Special Fire Fighting Procedures: Full emergency equipment with self-contained breathing apparatus should be worn by firefighters. During a fire, MDI vapors and other highly irritating and toxic gases may be generated by thermal decomposition and combustion.

Caution: Contact with hot material will cause thermal burns; toxic gases/fumes are given off during burning or decomposition and may cause allergic skin and respiratory reactions; melted product is flammable and produces intense heat and dense smoke during burning.

VI – Accidental Release Measures

Remove by mechanical means. If molten material is spilled, allow it to solidify before removal.

VII – Handling and Storage

Storage Temperature (Min/Max): Ambient

Shelf Life: 2 years

Special Sensitivity: N/A

Handling/Storage Precautions: Store in sealed containers, protect from atmospheric moisture, and direct light sources.

VIII – Exposure Controls / Personal Protection

Ventilation Requirements:

None

Personal Protective Equipment:

Respiratory Protection:

None

Eye Protection:

None

Skin Protection:

None

IX – Physical and Chemical Properties

Boiling Point: N/A

Melting – Freezing Point: 390-440 °F

Solubility in Water: Insoluble

Specific Gravity: Approximately 1.2G/CM3 (In Water = 1)

Bulk Density: Approximately 10.01 LBS/CM3

% Volatile by Volume: N/A

Vapor Pressure: N/A

Appearance and Odor: Odorless solid.

Color: Various F.D.A. allowable colors.

Flash Point: Above 482 °F

Flammable Limits: N/A

X – Stability and Reactivity

Stability:

Unstable () Stable (X)

Conditions to Avoid: N/A

Incompatibility:

Material to Avoid: None Known

Hazardous Decomposition Products:

By fire; Carbon Monoxide (CO), Carbon Dioxide (CO₂), Oxide of Nitrogen (NO_x), traces of Hydrogen Cyanide (HCN), traces of MDI, amines, Nitriles, Tetrahydrofuran, and Cyclopentanone, Aliphatic and Aromatic Hydrocarbons, Aldehydes, and Acids.

Hazardous Polymerization:

May Occur () Will Not Occur (X)

Conditions to Avoid: Overheating

Ligature HMIS Ratings: Health: 0 / Flammability: 0 / Reactivity: 0
Ligature w/Silicone Additive HMIS Ratings: Health: 0 / Flammability: 1 / Reactivity: 0

XI – Toxicological Information

Toxic gases/fumes are given off during burning or decomposition and may cause allergic skin and respiratory reactions; melted product is flammable and produces intense heat and dense smoke during burning.
No animal toxicity information is available.

XII – Ecological Information

None.

XIII – Disposal Considerations

Material may be incinerated or land filled in accordance to Federal, State, or Local Regulations.

XIV – Transportation Information

Technical Shipping Name: Not Regulated
Freight Class Bulk: N/A
Freight Class Packaged: N/A
Product Label: N/A
Hazard Class or Division: Non-Hazardous
Hazard Class or Division Number: Not Hazardous by D.O.T. Regulations.

XV – Regulatory Information

SARA TITLE III:
Section 302 Extremely hazardous Substances: None
Section 311/312 hazard Categories: None
Section 313 Toxic Chemicals: None
RERA Status: Non-Hazardous

XVI – Other Information

Note: While the information and recommendations set forth on this data sheet are believed to be accurate as received from our suppliers, RMO, Inc. makes no warranty with respect thereto and disclaims all liability from reliance thereon.