



MATERIAL SAFETY DATA SHEET



SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: RSO-3 / RSO-4

April 14, 2010

Vishay Measurements Group, Inc.
Post Office Box 27777
Raleigh, NC 27611

919-365-3800

CHEMTREC 1-800-424-9300 (U.S.)
703-527-3887 (Outside U.S.)

NOTE: CHEMTREC numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

SECTION 2: HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

CAS NUMBER	CHEMICAL IDENTITY	
*25068-38-6	Bisphenol A Diglycidyl Ether Polymer	% >52.9
109-99-9	Tetrahydrofuran	22.8-25.3
7429-90-5	Aluminum	11.4
108-46-3	Resorcinol	3.7-4.1
3101-60-8	P-Tertbutylphenyl Glycidyl Ether	0.6-5.8
57-11-4	Stearic Acid	0.4
106-89-8	Epichlorohydrin	2-3 ppm

*NOTE: CAS # 25068-38-6 is an epoxy resin produced by the condensation reaction of epichlorohydrin and bisphenol A. The epichlorohydrin is consumed in the process and residual levels are controlled to 2-3 ppm maximum.

SECTION 3: HEALTH HAZARD DATA

Routes of Entry:

Inhalation: Yes Skin: Yes Ingestion: Yes

Health Hazards (Acute and Chronic): Lung damage (scarring, bronchitis, emphysema) may be evidenced by shortness of breath, especially on exertion, and may be accompanied by chronic cough. Skin sensitizer (allergy) may be evidenced by rashes, especially hives.

Carcinogenicity: NTP: See Note
IARC Monographs: See Note
OSHA Regulated: NA

NOTE: International Agency for Research on Cancer (IARC) has classified epichlorohydrin as a possible human carcinogen (IARC GROUP 2A) based on the following conclusions: Human Evidence – Inadequate; Animal Evidence – Sufficient. Epichlorohydrin has also been classified by National Toxicology Program (NTP) as an anticipated carcinogen (NTP GORUP 2B) based on sufficient evidence of carcinogenicity from studies in experimental animals.

Signs and Symptoms of Exposure:

INHALATION: Overexposure to tetrahydrofuran may cause headache, nausea, vomiting, dizziness, narcosis, and respiratory failure, low blood pressure, central nervous system depression, coughing and difficult breathing.

EYE CONTACT: May cause severe irritation or burns.

SKIN CONTACT: May cause skin injury (reddening and swelling) or burns. Overexposure to this material can cause sensitization and allergic reaction.

INGESTION: Product is slightly toxic. May cause headache, nausea, vomiting, dizziness, and/or gastrointestinal irritation.

Conditions Generally Aggravated by Exposure: Pre-existing eye, skin, and respiratory disorders may be aggravated by exposure to this product. Pre-existing skin or respiratory allergies may increase the chance of developing increased allergy symptoms from exposure to this product.

SECTION 4: EMERGENCY AND FIRST AID PROCEDURES
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INHALATION: Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get medical attention.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Get medical attention.

SKIN CONTACT: Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with plenty of water. Follow by washing with soap and water. If irritation occurs, get medical attention.

INGESTION: Do NOT induce vomiting. Give large quantities of water. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs. Get medical attention.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): 6°F (-14.4°C) Closed Cup

Flammable limits: LEL: 2.0 UEL: 11.8

Extinguishing Media: Use alcohol foam, dry chemical or carbon dioxide. Water may be ineffective.

Special Firefighting Procedures: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

Unusual Fire and Explosion Hazards: Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Steps to be taken if material is released or spilled: Wear self-contained breathing apparatus and full protective clothing. Shut off ignition sources; no flares, smoking, or flames in area. Stop leak if you can do so without risk. Use water spray to reduce vapors. Take up with sand or other non-combustible absorbent material and place in container for later disposal. Flush area with water. Prevent washings from entering waterways.

SECTION 7: EXPOSURE CONTROLS -- PERSONAL PROTECTION

Respiratory Protection: Avoid prolonged or repeated breathing of vapors or mists. Wear a properly fitted NIOSH approved respirator whenever exposure to vapor/mist produce exposure that exceeds the TLV.

Ventilation:

Local Exhaust: Keep below TLV

Mechanical: Keep below TLV

Special: NA

Other: NA

Protective Gloves: Chemical resistant gloves.

Eye Protection: Chemical splash goggles.

Other Protective Clothing or Equipment: For operations where skin contact can occur, coveralls, apron, and rubber foot covering are recommended.

Work / Hygienic Practices: Avoid contact with skin. Remove and thoroughly launder contaminated clothing before reuse. Discard contaminated shoes.

SECTION 8: HANDLING AND STORAGE
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Precautions to be taken in handling and storing: Keep containers tightly closed. Store in a cool, dry, well-ventilated storage area. Keep liquid and vapor away from heat, sparks, and flame.

Other Precautions: Do not re-use contaminated clothing until it has been cleaned. Contaminated leather articles, including shoes, cannot be decontaminated and should be discarded.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES
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Boiling Point:	>150°F (66°C)
Vapor Pressure (mmHg):	>1
Vapor Density (Air = 1):	>1
Specific Gravity (H₂O = 1):	1.16
Melting Point:	NA
Evaporation Rate (BuAc = 1):	>1
Volatile Organic Compounds:	25%
Solubility in Water:	Partially soluble

Appearance and Odor: Aluminum colored liquid; ether-like odor.

SECTION 10: STABILITY AND REACTIVITY DATA
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Stability: Stable.

Conditions to Avoid: Heat, flame, other sources of ignition.

Incompatibility (Materials to Avoid): Strong oxidizing agents, strong reducing agents, strong bases, acids, aluminum and alkalis.

Hazardous Decomposition or By-products: Explosive peroxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION
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Bisphenol A Diglycidyl Ether Polymer

OSHA PEL:	Not established
ACGIH TLV:	Not established
OTHER:	ORAL (RAT) LD ₅₀ >5000 mg/kg
	SKIN (RABBIT) LD ₅₀ >6000 mg/kg
	INHALATION (RAT) LC ₅₀ >3466 mg/m ³

RSO-3 / RSO-4 MSDS (Continued)

Tetrahydrofuran

OSHA PEL: 200 ppm
ACGIH TLV: 200 ppm
OTHER: 250 ppm STEL
INTRAPERITONEAL (RAT) LD₅₀ 2900 mg/kg
INHALATION (RAT) LC₅₀ 78 g/m³ 2-Hour

Aluminum

OSHA PEL: 5 mg/m³ DUST/MIST 15 mg/m³ TOTAL DUST
ACGIH TLV: 5 mg/m³ DUST/MIST 15 mg/m³ TOTAL DUST
OTHER: Not established

Resorcinol

OSHA PEL: 10 ppm TWA
ACGIH TLV: 20 ppm STEL
OTHER: ORAL (RAT) LD₅₀ 301 mg/kg
SKIN (RABBIT) LD₅₀ 3360 mg/kg

P-Tertbutylphenol Glycidyl Ether

OSHA PEL: Not established
ACGIH TLV: Not established
OTHER: Not established

Stearic Acid

OSHA PEL: Not established
ACGIH TLV: 10 mg/m³ TOTAL DUST
OTHER: INTRAVENOUS (MUSKRAT) LD₅₀ 23 mg/kg

Epichlorohydrin

OSHA PEL: 2 ppm SKIN
ACGIH TLV: 0.5 ppm SKIN
OTHER: Potential contribution to overall exposure is possible by skin exposure.

SECTION 12: DISPOSAL CONSIDERATIONS
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Waste Disposal Method: Dispose of in accordance with local, state, and federal environmental regulations.

SECTION 13: TRANSPORTATION INFORMATION

SHIPPING NAME	CLASS	PACKING GROUP	UN NUMBER
Flammable Liquid, N.O.S. (Tetrahydrofuran/Diglycidyl Ether)	3	II	1993

SECTION 14: REGULATORY INFORMATION

SECTION 313 SUPPLIER NOTIFICATION:

This product contains a toxic chemical or chemicals (as listed below) subject to the reporting requirements of Section 313 Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

CAS NUMBER		CHEMICAL NAME % BY WEIGHT
108-46-3	Resorcinol	3.7-4.1
7429-90-5	Aluminum	11.4
106-89-8	Epichlorohydrin	2-3 ppm

TSCA NOTIFICATION:

All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA).

SECTION 15: OTHER INFORMATION

To the best of our knowledge, the information provided above meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4) for a mixture of hazardous chemicals which has not been tested as a whole. The data provided on this Material Safety Data Sheet is from manufacturers of the original components. Micro-Measurements specifically disclaims any and all form of liability and/or responsibility for the application of this product.