



**SKIN CONTACT** : Wash the affected areas under tepid running water using a mild soap. If irritation persists, arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

**INHALATION**: Remove the victim from the contamination immediately to fresh air. If breathing is weak, irregular or has stopped, open his airway, loosen his collar and belt and administer artificial respiration. And refer for medical attention.

**INGESTION**: Rinse mouth with water, arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

**V FIRE-FIGHTING MEASURES**

**FLAMMABLE PROPERTIES** : Flash point: above 101°C

**EXTINGUISHING MEDIA** : Dry chemical powder, carbon dioxide, foam, dry sand.

**SPECIFIC HAZARDS WITH REGARD TO FIRE-FIGHTING MEASURE:**

- Dry chemical powder, carbon dioxide or dry sand should be used for small fires.
- Apply water from a safe distance to cool and protect surrounding area. Move container from fire areas if it can be done without risk.
- Firefighters should wear proper protective equipment and self-breathing apparatus.
- Evacuate non-essential personnel into surrounding area of fires.

**V ACCIDENTAL RELEASE MEASURES**

- Ventilate area after material pick up is complete and shut off all sources of ignition.
- Wear proper protective equipment.
- Place spill in a chemical waste containers using nonsparkling tools.
- Wipe off residual spill using paper absorbed with methanol or acetone.
- Consult an expert on the disposal of recovered material.

**V HANDLING AND STORAGE**

**HANDLING:**

- Shut off all gas pilot, electrical (spark or hot wire) ignites and electrical charges during use.
- Wear proper protective equipment to avoid contact and inhalation.
- Use with local exhaust ventilation.

**STORAGE:**

- Keep containers tightly closed at temperature not exceeding 5 °C.

**V EXPOSURE CONTROL/PERSONAL PROTECTION**

**CONTROL PARAMETERS:** OSHA PEL: TWA 0.01mg/m<sup>3</sup> (Silver metal)  
ACGIH TLV(2000): TWA 0.1mg/m<sup>3</sup> (Silver metal)

**ENGINEERING MEASURE** : Do not use in areas without adequate ventilation and local exhaust ventilation.

**PERSONAL PROTECTIVE EQUIPMENTS:**

**RESPIRATORY PROTECTION** : Industrial canister gas mask

**EYE PROTECTION** : Safety goggles or face shield

**HAND, SKIN AND BODY PROTECTION** : Chemical-resistant gloves and apron

EPINAL EN-4900F-1 YMT-5618-011

**X PHYSICAL AND CHEMICAL PROPERTIES**

**APPEARANCE, PHYSICAL STATE, FORM, COLOR, ODOR:**

Silver color paste with faint irritating odor.

DENSITY: approx. 3.0 BOILING POINT: No data

VAPOUR PRESSURE : No data

RELATIVE VAPOUR DENSITY : No data

SOLUBILITY IN WATER : Slightly soluble (Polybutadiene derivative <sup>2</sup>)

SOLUBILITY IN ORGANIC SOLVENT Soluble

**X PHYSICAL HAZARD (STABILITY AND REACTIVITY)**

This product is considered a stable material under normal and anticipated storage and handling condition.

MATERIALS TO AVOID Strong oxidizing agents, strong alkalies, etc.

HAZARDUS DECOMPOSITION PRODUCTS: CO, CO<sub>2</sub>, Oxides nitrogen, etc.

PHYSICAL HAZARD	Product	Acrylic resin	Polybutadiene derivative <sup>2</sup>	Butadiene copolymer <sup>2</sup>
FLASH POINT (°C)	101	No data	310(open)	250
AUTOIGNITION TENP. (°C)	No data	No data	No data	No data
EXPLOSION LIMIT (IN AIR)	UPPER (%)	No data	No data	No data
	LOWER (%)	No data	No data	No data

PHYSICAL HAZARD	Epoxy resin <sup>4</sup>	Acrylate <sup>1</sup>	Peroxide <sup>5</sup>	Additive <sup>7</sup>
FLASH POINT (°C)	240	166	101(open)	149(open)
AUTOIGNITION TENP. (°C)	No data	No data	>360	>200
EXPLOSION LIMIT (IN AIR)	UPPER (%)	No data	No data	No data
	LOWER (%)	No data	No data	No data

**XI TOXICOLOGICAL INFORMATION**

ROUTES OF EXPOSURE: eye/skin contact, ingestion, inhalation.

**SAFETY PROFILE:**

Polybutadiene derivative: Contact in Liquid and Vaporous form with the eyes may cause irritation, may cause corrosion of the mucous membrane. Prolonged contact with the skin may cause dermatitis. <sup>2</sup>

Butadiene copolymer: Liquid contact with the eyes or skin may cause irritation. Processing Vapors may cause lung irritation if inhaled. Repeated/prolonged contact may cause dermatitis. <sup>3</sup>

Peroxide: Contact with the skin may cause dermatitis. In the case of misleading emergency treatment, Contact with the eyes may cause the loss of vision. May cause an allergy. <sup>5</sup>

**ACUTE TOXICITY**

Silver <sup>8,7</sup>	Peroxide <sup>5</sup>	Additive <sup>7</sup>
Inhalation TCL <sub>0</sub> : 1mg/m <sup>3</sup> (human)	Oral LD <sub>50</sub> : >5000mg/kg (rat, 65% diluted solution)	Oral LD <sub>50</sub> : 23g/kg (rat)
Intraperitoneal TCL <sub>0</sub> : 2400mg/kg (rat)	Inhalation LC <sub>50</sub> : >200.7mg/l (rat, 65% diluted solution)	
Oral LD: >10g/kg (mouse)		

CARCINOGENIC EFFECTS : Acrylic resin, Polybutadiene derivative,

Butadiene copolymer, Epoxy resin, Acrylate, Peroxide, Additive and Silver are not classified in IARC and NTP.

MUTAGENIC EFFECTS: Epoxy resin is positive in Ames test and chromosomal aberration test (Japan). <sup>9</sup> May cause damage to health by prolonged exposure.

EPINAL EN-4900F-1 YMT-5618-011

XI ECOLOGICAL INFORMATION

No data available

XII DISPOSAL CONSIDERATION

- The collected materials (silver paste) may be handed over to a special merchant for recovery of silver.
- Do not dump into sewers on the ground or into any body of water.
- Please be advised that your country and your region requirements for waste disposal may be more restrictive or otherwise difficult from regulation.

XIII TRANSPORT INFORMATION

- Keep this material with enough dry ice.
- Follow all regulations in your country.

XIV REGULATORY INFORMATION

- According to the OSHA HCS, this product is considered a hazardous chemical (Silver metal).
- Regulatory information with regard to this product in your country or in your region should be examined by your own responsibility.

XV OTHER INFORMATION

REFERENCES:

1. Acrylate's Material Safety Data Sheet (1997).
2. Polybutadiene derivative's Material Safety Data Sheet (1997).
3. Butadiene copolymer's Material Safety Data Sheet (1999).
4. Epoxy resin's Material Safety Data Sheet (1996).
5. Additive's Material Safety Data Sheet (1994).
6. Peroxide's Material Safety Data Sheet (1996).
7. "Documentation of Threshold Limit Values for Substances in Workroom Air" Cincinnati, Ohio, American Conference of Government Industrial Hygienists (1980).
8. Registry of Toxic Effects of Chemical Substance (2000, CD-ROM DB).
9. Ministry of Labor, Chief of Labor Standard Office (Japan). Notice (Kihatsu No. 2 of 312(1993), No2 of 341(1994)).

INQUIRY OF THE INFORMATION CONTAINED HEREIN:

Hitachi Chemical Company Ltd., Yamazaki Works  
Semiconductor Materials Div. R&D Group Mr. Yamazaki  
Tel. No. +81-294-23-8917 (Japan)

The information herein is given in good faith, but no warranty, express or implied, is made. Please consult the Hitachi Chemical Co., Ltd., for further information.

The information contained herein are, to the best of Hitachi Chemical Company's knowledge and belief, accurate and reliable as of the data issued. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. We reserve the right to revise MSDS periodically as new information becomes available.