



# MATERIAL SAFETY DATA SHEET



## SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT:** M-Line 1240 FPA Silver Solder Paste

April 13, 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	%
7440-22-4	Silver	26.0
7440-02-0	Nickel	1.3
7440-50-8	Copper	19.5
7440-66-6	Zinc	18.2
Not Established	Flux Binder	35.0

## SECTION 3: HEALTH HAZARD DATA

### Routes of Entry:

**Inhalation:** YES    **Skin:** YES    **Ingestion:** Accidental

**Health Hazards (Acute and Chronic):** Acute over exposure to zinc oxide fume evolved from heating this product may cause metal fume fever, characterized by flu-like symptoms such as chills, fever, nausea and vomiting. Hypersensitivity to nickel is common and can cause allergic contact dermatitis, pulmonary asthma or conjunctivitis. The most common effect resulting from exposure is the development of nickel itch. It occurs primarily in persons doing nickel plating and is most frequent under conditions of high temperature and humidity.

<b>Carcinogenicity:</b>	NTP:	See Note
	IARC Monographs:	See Note
	OSHA Regulated:	Not listed

NOTE: Nickel is listed by NTP as reasonably anticipated to be a human carcinogen and by IARC as carcinogenic to humans.

### Signs and Symptoms of Exposure:

**INHALATION:** Fluoride fumes from heated flux can cause respiratory irritation and pulmonary edema. Excessive vapor inhalation from the solder will lead to central nervous system depression. Prolonged inhalation of silver compounds may cause a permanent bluish discoloration of the skin, eyes and mucous membranes. Inhalation may cause sneezing, nausea, weakness, fever. Fumes from heating may cause metal fume fever, characterized by flu-like symptoms such as chills, fever, nausea and vomiting. Inhalation may also cause headache, coughing, dizziness, difficult breathing.

**EYE CONTACT:** Can cause severe irritation and abrasion (contains metal powder and fluoride salts).

**SKIN CONTACT:** May cause severe irritation and burns. Prolonged contact may lead to symptoms similar to those for ingestion. Skin contact may produce localized irritation and permanent blue-gray discoloration of the skin. May cause nickel sensitivity resulting in an allergic reaction such as skin rash. Hot molten metal may cause burns to the skin.

**INGESTION:** Ingestion of flux binder can severely irritate and burn the mouth, throat, and stomach. Ingestion may cause systemic poisoning. Symptoms include salivation, nausea, vomiting, abdominal pain, diarrhea and coma. Prolonged ingestion of silver compounds may cause a permanent bluish discoloration of the skin, eyes and mucous membrane.

**Conditions Generally Aggravated by Exposure:** Persons with pre-existing disorders of the liver, kidney, ligaments, skeletal system, pulmonary function or having Wilson's disease may be more susceptible to the effects of this material.

## SECTION 4: EMERGENCY AND FIRST AID PROCEDURES

**INHALATION:** If affected, move victim to fresh air and call physician. If breathing is difficult administer oxygen. If breathing has stopped give artificial respiration. Keep person warm and quiet.

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists.

**SKIN CONTACT:** Immediately remove contaminated clothing. Do not attempt to remove any material bonded to the skin. Flush area of skin contact immediately with large amounts of water for at least 15 minutes. If irritation persists after flushing, get medical attention promptly. Launder contaminated clothing before reuse.

**INGESTION:** Aspiration hazard. If material is swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

## SECTION 5: FIRE AND EXPLOSION HAZARD DATA

**Flash Point (Method Used):** Not applicable

**Flammable limits:** LEL: Not known UEL: Not known

**Extinguishing Media:** For fires involving this product, use carbon dioxide, dry chemical, foam or water spray. Do not use water if metal is molten.

**Special Firefighting Procedures:** Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turnout gear and chemical resistant personal protective equipment.

**Unusual Fire and Explosion Hazards:** Emits toxic and corrosive fumes under fire conditions.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**Steps to be taken if material is released or spilled:** Scoop up excess material for proper disposal and wash affected area with soap and water. Avoid inhaling vapor and/or mists. Do not get spilled material on skin, clothing or in eyes.

## SECTION 7: EXPOSURE CONTROLS -- PERSONAL PROTECTION

**Respiratory Protection:** When exposure limits are exceeded or ventilation is inadequate, wear a NIOSH approved respirator.

**Ventilation:** The use of local ventilation is required to maintain the concentration of fumes evolved from the soldering/brazing process to well below to occupational exposure limits, within the operator's breathing zone and the general vicinity. Use of process enclosures, exhaust systems and other engineering and/or administrative controls should be designed in accordance with local conditions.

**Protective Gloves:** Wear chemical resistant gloves. When material is heated, wear thermal insulated gloves to protect against burns.

**Eye Protection:** Wear safety glasses with side shields as a minimum level of protection.

**Other Protective Clothing or Equipment:** Clothing to prevent skin contact and protect from heat rays (IR radiation).

**Work / Hygienic Practices:** Wash thoroughly after handling and before eating, drinking, or smoking.

## SECTION 8: HANDLING AND STORAGE

**Precautions to be taken in handling and storing:** Keep away from sources of ignition. Keep lid tightly closed except when removing product. Store at ambient temperatures of 41-77°F (5-25°C) to maximize shelf life of product.

**Other Precautions:** Avoid contact with eyes or skin. Use only with adequate ventilation. Do not reuse empty containers.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<b>Boiling Point:</b>	Not determined
<b>Vapor Pressure (mmHg):</b>	<50 @ 100°F (38°C) (for volatile solvent)
<b>Vapor Density (Air = 1):</b>	>5 (for volatile solvent)
<b>Specific Gravity (H<sub>2</sub>O = 1):</b>	>2
<b>Melting Point:</b>	≈1435°F
<b>Evaporation Rate (BuAc = 1):</b>	<1 (volatile solvent)
<b>Volatile Organic Compounds:</b>	<3%
<b>Solubility in Water:</b>	Partial

**Appearance and Odor:** Gold viscous paste; characteristic odor.

## SECTION 10: STABILITY AND REACTIVITY DATA

**Stability:** Stable under normal conditions of use.

**Conditions to Avoid:** Avoid extreme heat. Avoid prolonged exposure to air and moisture.

**Incompatibility (Materials to Avoid):** Reaction with strong reducing agents such as metal hydrides or alkali metals, will generate hydrogen gas, which could create an explosion hazard. Avoid contact with acids, alkalis, oxidizing agents, acetylene, ammonia, hydrogen peroxide, magnesium metals, halogens, chlorinated rubber, sulfur.

**Hazardous Decomposition or By-products:** Fluorides, carbon monoxide, carbon dioxide, smoke, nitrogen oxides, sulfur oxides, metal oxide fumes, copper fume toxic zinc and zinc oxide fume, various hydrocarbons, particulate matter. When heated to decomposition temperatures 437°F (225°C) highly corrosive and toxic hydrofluoric acid fumes may be generated.

**Hazardous Polymerization:** Will not occur.

## SECTION 11: TOXICOLOGICAL INFORMATION

Silver

OSHA PEL:	0.01 mg/m <sup>3</sup> (dust)
ACGIH TLV:	0.01 mg/m <sup>3</sup> (dust)
OTHER:	N/E

Nickel

OSHA PEL:	1 mg/m <sup>3</sup>
ACGIH TLV:	1 mg/m <sup>3</sup>
OTHER:	N/E

M-Line 1240 FPA Silver Solder Paste MSDS (Continued)

Copper

OSHA PEL: 1.0 mg/m<sup>3</sup> (dust)  
ACGIH TLV: 1.0 mg/m<sup>3</sup> (dust)  
OTHER: N/E

Zinc

OSHA PEL: 10 mg/m<sup>3</sup> (fume)  
ACGIH TLV: 5 mg/m<sup>3</sup> (fume)  
OTHER: N/E

Flux Binder

OSHA PEL: 2.5 mg/m<sup>3</sup> (as fluoride)  
ACGIH TLV: 2.5 mg/m<sup>3</sup> (as fluoride)  
OTHER: N/E

**SECTION 12: DISPOSAL CONSIDERATIONS**

**Waste Disposal Method:** Dispose of in accordance with local, state and federal regulations. Reclamation for metal value is recommended (contains silver).

**SECTION 13: TRANSPORTATION INFORMATION**

SHIPPING NAME	CLASS	UN NUMBER
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Not required -- Shipped as non-hazardous article.

**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
7440-22-4	Silver	26.0
7440-02-0	Nickel	1.3
7440-66-6	Zinc	18.2
7440-50-8	Copper	19.5

**TSCA NOTIFICATION:**

All components of this product, for which CAS numbers have been established, are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA).

<b>SECTION 15: OTHER INFORMATION</b>
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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.