CHEMTRONICS®
Technical Data Sheet

TDS # CW2400

CircuitWorks® Conductive Epoxy

PRODUCT DESCRIPTION

CircuitWorks® Conductive Epoxy is a two part, silver epoxy used in prototype, repair and general conductive bonding applications. CW2400 features strong mechanical bonds, excellent electrical conductivity, and quick room temperature curing. CircuitWorks® Conductive Epoxy bonds aggressively to a wide variety of materials.

- Two-component product
- Simple mixing ratios
- Excellent electrical conductivity
- Fast curing
- High strength bond
- Bonds dissimilar surfaces
- Operating temperature range from
- -91°C (-131°F) to 100°C (212°F)

TYPICAL APPLICATIONS

CircuitWorks® Conductive Epoxy may be used for electronics applications including:

- Conductive Bonds Between Heat Sensitive Components
- Solderless Surface Mount Connections
- Circuit Board Trace Repair
- Static Discharge and Grounding
- Solder Repair
- Conductive Structural Adhesions

TYPICAL PRODUCT DATA AND PHYSICAL PROPERTIES

Composition

Material	Part A Part B
	Epoxy Hardener
Specific Gravity (Parts A & B Mixed)	2.85

Cured Compound

Volume Resistivity	<0.001 ohm-cm
Thermal Conductivity	
Cal-cm/sec-cm^2 -°C	3.8 x 10^{-3}
BTU-in/hr-ft^2 -°F	11.0
W/m°K	1.6
Operating Temperature Range	-131 to 212°F (-91 to 100°C)
Lap Shear (ASTM D-1002)	>1200 lbs/in·
Shore Hardness	>70
Adhesion	Excellent
Cured Flexibility	Excellent
Chemical Resistance	Excellent
Moisture Resistance	Good
Typical Thickness	5 mil

Shelflife 12 months

Conditions: Store at temperatures below 120° F

COMPATIBILITY

CircuitWorks® Conductive Epoxy is generally compatible with most materials used in printed circuit board fabrication. As with any adhesive/sealant, compatibility with substrate should be determined on a non-critical area prior to use.

USAGE INSTRUCTIONS

Read MSDS carefully prior to use.

Cleaning: For best results, clean the board with one of Chemtronics® Electro-Wash® or Pow-R-Wash® cleaners in order to remove any surface contamination which may prevent adequate material contact.

Mixing: Mix equal amounts (1:1) by weight or volume of Part A and Part B. Mix thoroughly for 2 minutes and apply within 8 minutes.

Thinning: Do not attempt to thin.

Curing: Curing times and electrical conductivity depend primarily on temperature. For fastest curing times, maximum conductivity and adhesion, cure the bond between 150-250°F (65-121°C) for 5-10 minutes. CircuitWorks® Conductive Epoxy can be room temperature cured at or above 75°F (25°C), for 4 hours. Maximum conductivity and bond strength are achieved in 24 hours. *Curing at temperatures below 75°F* (25°C) *will result in a loss of conductivity and adhesion.*

Pot Life: 8-10 Minutes at 75°F (25°C) after mixing.

AVAILABILITY

CW2400	7g/ 0.25 oz. Adhesive & 7g/ 0.25 oz. Hardener

NOTE:

This information is believed to be accurate. It is intended for professional end users having the skills to evaluate and use the data properly. CHEMTRONICS® does not guarantee the accuracy of the data and assumes no liability in connection with damages incurred while using it.

SECTION 1: CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Information: 800-TECH-401

Product Identification

CIRCUITWORKS® CONDUCTIVE EPOXY - Part B (Hardener)

Product Code: CW2400, CW2400J, CW2400BLK (Part B)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Wt. % Range
Silver (Metallic)	7440-22-4	60.0-90.0
Modified Aliphatic Amine	140-31-8	10.0-25.0

SECTION 3: HAZARDOUS IDENTIFICATION

Emergency Overview: Silver/gray paste with amine odor. This product is nonflammable. Liquid may cause chemical burns in eye.
Potential Health Effects:
Eyes: This product may cause chemical burns in the eye. Damage is irreversible.
Skin: Sensitizer - may cause allergic skin reaction.
Ingestion: Harmful if swallowed. May cause chemical irritation in gastrointestinal tract and may be potentially toxic. Silver ingestion may result in generalized argyria.
Inhalation: May cause respiratory irritation if inhaled over a long period of time. Sensitizer - may cause allergic respiratory reaction.
Pre-Existing Medical Conditions Aggravated by Exposure: Heart, lung, eye, skin

SECTION 4: FIRST AID MEASURES

Eyes: Immediately flush with large amounts of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Have eyes examined by a Physician.
Skin: Remove contaminated clothing and wash skin with soap and water. Get medical attention if irritation persists. Wash clothes separately before reuse.
Ingestion: If swallowed, seek medical attention. Neutralize with milk or dilute with water.
Inhalation: In case of exposure to high concentrations of vapor or mist, remove to fresh air. If breathing is difficult, give oxygen and call a Physician. If breathing has stopped, apply artificial respiration and call a Physician.

SECTION 5: FIRE FIGHTING MEASURES

Flash Point: > 200°F (>93C) (Setaflash) LEL/UEL: NA (% by volume in air)
Extinguishing Media: Use carbon dioxide or dry chemicals for small fires, aqueous foam or water for large fires.
Fire Fighting Instructions: Remove all ignition sources. Closed containers may rupture due to build-up of pressure when exposed to extreme heat. As in any fire, wear self-contained breathing apparatus (pressure demand, OSHA/NIOSH approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Large Spills: Remove all sources of ignition (sparks, open flames, etc.). Wear self-contained breathing apparatus and appropriate personal protective equipment. Ventilate area and contain and absorb spill with inert material. Collect spill by scooping up liquids and absorbent material and place in a chemical waste container for proper disposal. Do not flush to sewer. Prevent material from entering storm sewers, ditches that lead to waterways and ground.
Small Spills: Absorb spill with absorbent material, then place in a chemical waste container for proper disposal.

SECTION 7: HANDLING AND STORAGE

Avoid prolonged or repeated contact with skin, eyes or clothing. Wash hands before eating. Use with adequate ventilation. Avoid breathing product vapor. Do not reuse this container. Store in a cool dry place, away from heat, sparks or flames.
KEEP OUT OF REACH OF CHILDREN.

SECTION 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Guidelines:

CHEMICAL NAME	ACGIH TLV	OSHA PEL	ACGIH STEL
Silver	0.1 mg/m3	0.01mg/m3	NA
Modified Aliphatic Amine	NA	NA	NA

Work/Hygienic Practices: Good general ventilation should be sufficient to control airborne levels. Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product. Wear safety glasses with side shields or goggles and rubber or other chemically resistant gloves when handling this material.

NFPA and HMIS Codes:	NFPA	HMIS
Health	1	1
Flammability	1	1
Reactivity	0	0
Personal Protection	-	B

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Silver/gray Paste
Odor: Amine
pH: NA
Vapor Pressure: <1.0 mmHg @ 20°C
Percent Volatile: < 0.5%
Vapor Density:>1
(Air = 1)

Solubility in Water: <10%
Specific Gravity: 2.5-2.8
Evaporation Rate: <1
(Butyl acetate=1)
Boiling Range: >400°F (>204C)

SECTION 10: STABILITY AND REACTIVITY

Stability: This product is stable. Conditions to Avoid: Excessive Heat.
Incompatibility: Avoid epoxy resins and isocyanates, strong acids, mineral and organic acids, strong bases, caustics and alkali contamination.
Products of Decomposition: Carbon monoxide, carbon dioxide and oxides of nitrogen.
Hazardous Polymerization: Will not occur.
Conditions to avoid: Contamination with strong acids, bases, epoxy resins or isocyanates can cause polymerization.

SECTION 11: TOXICOLOGICAL INFORMATION

Ingredients	LD50 (rat) Oral	LD50 (rbt) Dermal	LC50 (ppm) (rat) Inhalation
Silver (metallic)	NA	NA	NA
Modified Aliphatic Amine	2,140 mg/kg	880 µL/kg	NA

Cancer Information: No ingredients listed as human carcinogens by NTP or IARC
Reproductive effects: none Teratogenic effects: none Mutagenic effects: none

SECTION 12: ECOLOGICAL INFORMATION

Environmental Impact Information
Avoid runoff into storm sewers and ditches which lead to waterways. Water runoff can cause environmental damage.

REPORTING
US regulations require reporting spills of this material that could reach any surface waters. The toll free number for the US Coast Guard National Response Center is: **1-800-424-8802**

SECTION 13: DISPOSAL CONSIDERATIONS
Dispose of in accordance with all federal, state and local regulations. Water runoff can cause environmental damage.

SECTION 14: TRANSPORTATION INFORMATION

Air and Ground Shipments:
Adhesives, sealants
Not Regulated

SECTION 15: REGULATORY INFORMATION
SECTION 313 SUPPLIER NOTIFICATION
This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To- Know Act of 1986 (40 CFR 372).
Silver CAS # 7440-22-4 60.0-90.0%
This information should be included on all MSDSs copied and distributed for this material.
TOXIC SUBSTANCES CONTROL ACT (TSCA).
All ingredients of this product are listed on the TSCA Inventory.
WHMIS: Class D2B
This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

SECTION 16: OTHER INFORMATION
Normal ventilation for standard manufacturing practices is usually adequate. Local exhaust should be used when large amounts are released.

To the best of our knowledge, the information contained herein is accurate. However, all materials may present unknown hazards and should be used with caution. In particular, improper use of our products and their inappropriate combination with other products and substances may produce harmful results which cannot be anticipated. Final determination of the suitability of any material is the sole responsibility of the user. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that may exist.