TECHSPRAY™

Product Information

Conductive Pen

Trace Technologies™
2505

Introduction

This pen contains a fast drying, silver filled ink designed to quickly make highly conductive silver traces.

Features / Benefits

Repairs Traces
Links Components
Makes Smooth Jumpers
Shields Electronics

Chemical Components

Silver	(7440-22-4)	45-55%
Butyl Ethanoate	(123-86-4)	35-45%
Propietary Polymer		<20%

Typical Cured Properties

Consistency	Low Viscosity Liquid
Filler	Silver
Percent Silver, Cured	85%
Crease Resistance	Good
Volume Resistivity (Ω-cm) **Cured at 25°C** **Cured at 150°C**	 0.10 0.02
Solderable	Yes
Hydrolytic Stability	Excellent
Useful Temperature Range (°C)	-55 to +150

Environmental Policy

Techspray® is committed to developing products to ensure a safer and cleaner environment. We will continue to meet and sustain the regulations of all federal, state and local government agencies.

Packaging and Availability

Conductive Pen is available in the following sizes:

2505-N 1 4.89ml Pen

MATERIAL SAFETY DATA SHEET

Finished Product

MSDS Ref. No: 2505-N

Trace Technologies Conductive Pen

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Trace Technologies Conductive Pen
PRODUCT DESCRIPTION: Conductive Silver Pen
PRODUCT CODE: 2505/CAN/EUR-N

MANUFACTURER

Techspray, L.P.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Wt.%	CAS#	EINECS#
Silver	45 - 55	7440-22-4	
n-Butyl acetate	35 - 45	123-86-4	
Polymer, Proprietary	<20		

EEC LABEL SYMBOL AND CLASSIFICATION

R11 - Highly flammable.

EEC Highly flammable - "F"

R36/37/38 - Irritating to eyes, respiratory system and skin.

EEC Irritant - "Xi"

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3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Transparent, colorless liquid.

IMMEDIATE CONCERNS: Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract. Causes skin irritation. Harmful if swallowed.

POTENTIAL HEALTH EFFECTS

EYES: Avoid contact with eyes; may cause redness, irritation and conjunctivitis.

SKIN: Prolonged or repeated skin contact may cause irritation.

INGESTION: Ingestion of large amounts may produce abdominal pain, nausea and vomiting. Swallowing small amounts is not likely to produce harmful effects.

INHALATION: Prolonged or excessive inhalation may cause respiratory tract irritation.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

EYES: Liquid splashed in the eye may cause redness, irritation and conjunctivitis.

SKIN: Prolonged or exposure may cause skin irritation.

INGESTION: For large amounts; abdominal pain, nausea and vomiting.

INHALATION: High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, paralysis and loss of consciousness).

ACUTE TOXICITY: Low hazard for usual industrial or commercial handling.

TARGET ORGAN STATEMENT: Prolonged or repeated overexposure may cause central nervous system, kidney, liver, and lung damage.

CANCER STATEMENT: NOT listed

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4. FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of water. Get medical attention, if irritation persists.

SKIN: Wash with soap and water. Get medical attention if irritation develops or persists.

INGESTION: Aspiration hazard. If swallowed, vomiting may occur spontaneously, but do not induce. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Call a physician immediately.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

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5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: > 22°C TAG CC

FLAMMABLE LIMITS: 1.7 to 7.6

AUTOIGNITION TEMPERATURE: > 425°C

GENERAL HAZARD: Vapors can travel to a source of ignition and flash back.

EXTINGUISHING MEDIA: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.

HAZARDOUS COMBUSTION PRODUCTS: Smoke, fumes and oxides of carbon.

FIRE FIGHTING PROCEDURES: Evacuate area and fight fire from a safe distance.

FIRE FIGHTING EQUIPMENT: As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

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6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Contain spill with dike to prevent entry into sewers.

LARGE SPILL: Clean up spills immediately, observing precautions in Protective Equipment section.

GENERAL PROCEDURES: Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on adsorbent, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including vapors, have been removed thoroughly wet vacuum the area. Do not flush to sewer. If area of spill is porous, remove as much contaminated earth, gravel, etc. as necessary and place in closed containers for disposal.

SPECIAL PROTECTIVE EQUIPMENT: Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. See Section 8 for details.

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7. HANDLING AND STORAGE

GENERAL PROCEDURES: Wash thoroughly after handling. Use only in a well ventilated area. Store in a cool dry place.

HANDLING: Use with sufficient ventilation to keep employee exposure below recommended limits. Provide adequate ventilation for storage, handling and use, especially for enclosed or low spaces. Avoid contact of liquid with eyes and prolonged skin exposure. Do not allow product to contact open flame or electrical heating elements because dangerous decomposition products may form.

STORAGE: Store away from heat.

STORAGE PRESSURE: Store at local atomspheric pressure.

STORAGE TEMPERATURE: Store in a cool place below (120) F (49) C.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE GUIDELINES:

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)

		EXPOSURE LIMITS					
		OSHA PEL		ACGIH TLV		Supplier OEL	
		ppm	mg/m^3	ppm	mg/m^3	ppm	mg/m^3
n-Butyl acetate	**STEL**	200		200			

ENGINEERING CONTROLS: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear splash-proof goggles.

SKIN: The glove(s) listed below may provide protection against permeation. Gloves of other chemically resistant materials may not provide adequate protection.
Viton, Solvex, Butyl, Buna, Neoprene.

Butyl Rubber
Solvex

RESPIRATORY: NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

WORK HYGIENIC PRACTICES: Wash hands before eating and wash before reuse.

OTHER USE PRECAUTIONS: Emergency shower and eyewash facility should be in close proximity.

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9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid
ODOR: Sweet ester odor.
COLOR: Silver liquid.
PERCENT VOLATILE: 30
VAPOR DENSITY: >1 (Air=1)
BOILING POINT: > 126°C
SOLUBILITY IN WATER: Insoluble
SPECIFIC GRAVITY: 1.74 (water=1)
(VOC) NOTES: Not Established

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10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Heat, flames, ignition sources, and incompatables.

STABILITY: Stable.

POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Dioxide and carbon Monoxide may form when heated to decomposition.

INCOMPATIBLE MATERIALS: Strong acids and alkalis, reactive metals and strong oxidizing agents.

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11. TOXICOLOGICAL INFORMATION

ACUTE

DERMAL LD_{50}: >5 g/kg (rabbit)

ORAL LD_{50}: 13100 mg/kg (rat)

INHALATION LC_{50}: 2000 ppm, 4-hour

Fumes/liquid -- Irritant

EYE EFFECTS: Mixture is a moderate eye irritant.

CARCINOGENICITY:

IARC: NOT listed

NTP: NOT listed

OSHA: NOT listed

MUTAGENICITY: Collective data indicate non-mutagenic.

REPRODUCTIVE EFFECTS: NOT listed

NEUROTOXICITY: Not Established

TERATOGENIC EFFECTS: Not Available

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: There is limited information available on the environmental fate and effects of this material. The primary environmental concern for release is the impact on aquatic and terrestrial species. Due care should be taken to avoid the accidental release of this material into the environment.

ECOTOXICOLOGICAL INFORMATION: Not Established

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13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Federal, State, and Local laws governing disposal of materials can differ. Ensure compliance with proper authorities before disposal.

FOR LARGE SPILLS: Contaminated sawdust, vermiculite, or porous surfaces must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility.

GENERAL COMMENTS: Dispose of in a manner consistent with federal, state, and local regulations.

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14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
PROPER SHIPPING NAME: Nonhazardous
UN/NA NUMBER: N/A
PACKING GROUP: N/A
OTHER SHIPPING INFORMATION: "THIS PACKAGE CONFORMS TO 49CFR 173.4." must be on package.

AIR (ICAO/IATA)
PROPER SHIPPING NAME: Nonhazardous
UN/NA NUMBER: NA
PACKING GROUP: N/A
IATA NOTE: Domestic shipments only. When shipping International contact TechSpray shipping department.

VESSEL (IMO/IMDG)
PROPER SHIPPING NAME: Flammable Liquid, N.O.S. (n-butyl acetate)
PRIMARY HAZARD CLASS/DIVISION: 3.2
UN/NA NUMBER: UN1993
PACKING GROUP: II
IMDG NOTE: Page 3230

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15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

311/312 HAZARD CATEGORIES: IMMEDIATE / DELAYED

FIRE: NO **PRESSURE GENERATING:** NO **REACTIVITY:** NO **ACUTE:** YES **CHRONIC:** YES

313 REPORTABLE INGREDIENTS: Not considered a SARA 313 "Toxic Chemical".

TITLE III NOTES: Not listed as an Extremely Hazardous Substance.

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

CERCLA REGULATORY: n-butyl acetate (CAS# 123-86-4)

CERCLA RQ: 5000 lbs

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS: All components of this product are either listed or exempt from listing in the TSCA inventory.

RCRA STATUS: D001

OSHA HAZARD COMM. RULE: Contents of this MSDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 CFR 1910.119---PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: None of the chemicals in this product are considered highly hazardous by OSHA.

EUROPEAN COMMUNITY

EEC LABEL SYMBOL AND CLASSIFICATION

R11 - Highly flammable.

EEC Highly flammable - "F"

R36/37/38 - Irritating to eyes, respiratory system and skin.

EEC Irritant - "Xi"

CALIFORNIA PROPOSITION 65: This product does not contain any chemicals known to the State of California to cause cancer.