

Safety Data Sheet (SDS)

www.chipquik.com

To comply with European CLP Regulation 1272/2008, US 29CFR 1910.1200 OSHA's Hazard Communication Standard, and Australian NOHSC: 1008 [2004] and ADG Code 7.4

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Chip Quik Conductive Paint Series: CP1
SYNONYMS: Conductive Coating, Conductive Trace Paint, Electrical Trace Paint
PART NUMBERS: CP1-5S, CP1-10S, CP1-30J

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REVISED BY: Chip Quik Product Safety

PRODUCT USE: Electrically bonding semiconductor chips and packages to circuit boards. Drawing circuit traces between chips and packages. This product is for industrial use only.

2. HAZARD IDENTIFICATION

Classified in accordance with European CLP Regulation 1272/2008

Acute Tox. 4
 Skins Sens. 1
 Aquatic Acute 1
 Aquatic Chronic 1

CHEMICAL NAME: NA
CHEMICAL FAMILY: Mixture
CHEMICAL FORMULA: Proprietary

ROUTES OF ENTRY: Inhalation, Ingestion, Skin/Eye Contact

TARGET ORGANS: NA

GHS/CLP:



Signal Word: Warning

GHS/CLP LABEL ELEMENTS:

Hazard statement(s)
 H302 Harmful if swallowed.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H332 Harmful if inhaled.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H335 May cause respiratory irritation.
 H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
 P102 Keep out of reach of children.
 P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P233 Keep container tightly closed.
 P260 Do not breathe dust/fume/gas/mist/vapor/spray.

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|--------------------------|---|
| P262 | Do not get in eyes, on skin, or on clothing. |
| P264 | Wash hands thoroughly after handling. |
| P270 | Do not eat, drink, or smoke when using this product. |
| P271 | Use in a well-ventilated area. |
| P272 | Contaminated work clothing should not be allowed out of the workplace. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P284 | In case of inadequate ventilation wear respiratory protection. |
| P301/P330/P331/P310 | IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Immediately call a POISON CENTER/Doctor. |
| P303/P361/P352/P333/P313 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Wash with soap & water. Get medical advice/attention if skin irritation or rash occurs or if you feel unwell. |
| P304/P340/312 | IF INHALED: Remove victim to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. |
| P305/P351/338/P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call POISON CENTER/Doctor. |
| P308/P313 | IF EXPOSED OR CONCERNED: Get medical advice/attention. |
| P342/P311 | IF EXPERIENCING RESPIRATORY SYMPTOMS: Call POISON CENTER/Doctor. |
| P362 | Take off contaminated clothing and wash it before reuse. |
| P391 | Collect spillage. |
| P402/P404 | Store in a dry place. Store in a closed container. |
| P405 | Store locked up. |
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

POTENTIAL HEALTH EFFECTS (CHRONIC and OVEREXPOSURE)

Tin: Dust or fumes may cause irritation of the skin mucous membranes and may result in a benign Pneumoconiosis (Stannosis).

Silver: May cause discoloration of eyes and skin (Argyria).

Bismuth: May cause foul breath, a blue-black line on the gums, and Stomatitis.

Nickel: Slightly hazardous in case of skin contact (sensitizer), of ingestion, of inhalation (lung sensitizer). The substance is toxic to skin. The substance may be toxic to kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Indium: May cause weight loss, pulmonary edema, blood damage and degenerative changes in liver and kidneys.

Graphite: The substance is toxic to upper respiratory tract. The substance may be toxic to cardiovascular system. Repeated or prolonged exposure to the substance can product target organ damage.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE: Diseases of the blood-forming organs, kidneys, nervous and possibly reproductive systems. Occupational Asthma.

SECTION 2 NOTES:

Chip Quik Inc. does not recommend, manufacture, market, or endorse any of its products for human consumption.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Classified in accordance with European CLP Regulation 1272/2008

| Hazardous Ingredients ⁽¹⁾ | C.A.S. Number | Weight Percent | OSHA PEL mg/m ³ | ACGIH TLV TWA mg/m ³ | LD 50 Ingested g/Kg | LD 50 Inhaled g/m ³ |
|--------------------------------------|---------------|---|-------------------------------|------------------------------------|------------------------|-----------------------------------|
| Tin | 7440-31-5 | Product contains one or more of these elements in varying percentages | 2.00 | 2.00 | NE | NE |
| Silver | 7440-22-4 | | 0.01 | 0.10 | NE | NE |
| Bismuth | 7440-69-9 | | NE | NE | NE | NE |
| Nickel | 7440-02-0 | | 1.00 | 1.00 | NE | NE |
| Indium | 7440-74-6 | | NE | 0.10 | NE | NE |
| Graphite | 7782-42-5 | | 2.50 | 3.00 | NE | NE |
| Copper | 7440-50-8 | | 1.00 | 1.00 | NE | NE |

| Non-Hazardous Ingredients | C.A.S. Number | Weight Percent | OSHA PEL mg/m ³ | ACGIH TLV TWA mg/m ³ | LD 50 Ingested g/Kg | LD 50 Inhaled g/m ³ |
|---------------------------|---------------|----------------|-------------------------------|------------------------------------|------------------------|-----------------------------------|
| Surfactants | NA | <4 | NE | NE | NE | NE |
| Rheological Modifier | NA | <5 | NE | NE | NE | NE |

SECTION 3 NOTES:

(1) Per 29 CFR 1910 the mixture has not been tested as a whole. All hazardous components, which comprise 1% of the mixture (0.1% carcinogenic), are listed. Percentages of individual components are not listed as this information is considered a trade secret.

(2) The identity of the specific chemical(s) is being withheld as a trade secret per 29 CFR 1910.1200. The hazardous properties of these ingredients are disclosed in this SDS.

4. FIRST-AID MEASURES

Signs and symptoms of exposure: Inhalation-Nose and throat irritation, headache, dizziness, difficulty breathing, coughing. Ingestion-nausea, vomiting, cramps. Skin-redness, burning, rash, dryness. Eye-redness, burning, tearing, blurred vision.

Emergency first aid procedures:

EYES: Flush with plenty of water, contact a physician. If contact lenses can be removed easily, flush eyes without contact lenses.

SKIN: Wash affected area with plenty of warm, soapy water. If irritation persists, seek medical attention.

INGESTION: Call a physician or Poison Control Center immediately. Do not induce vomiting. Drink large amounts of water. Never give anything by mouth to an unconscious person

INHALATION: Remove to fresh air. Support respiration if required. If not breathing, seek immediate medical attention.

5. FIREFIGHTING MEASURES

EXTINGUISHING MEDIA: Dry chemical, foam

SPECIAL FIRE FIGHTING PROCEDURES: Do not use water. Use NIOSH-approved self-contained Breathing Apparatus and full protective clothing if involved in a fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: May release Toxic metal and oxide fumes. High concentrations of dust may present explosion hazard. Water trapped below molten metal may explode thus spattering molten metal.

6. ACCIDENTAL RELEASE MEASURES

PRECAUTIONS AND EQUIPMENT: Material is extremely thick and will not flow out.

ACCIDENTAL RELEASE MEASURES: If material spills or leaks use a spatula to collect and place it in a plastic or glass jar. Remove traces of residue using cloth rags or paper towels moistened with Isopropyl Alcohol. Exposure to spilled material may be irritating. Follow on-site personal protective equipment recommendations.

ENVIRONMENTAL PRECAUTIONS: Avoid release to the environment. Collect spillage.

SECTION 6 NOTES:

See Sections 2, 4, and 7 for additional information.

7. HANDLING AND STORAGE

HANDLING/STORAGE: Keep containers tightly closed when not in use. Use care to avoid spills. Avoid inhalation of fumes or dust. Avoid contact with eyes, skin, and clothing. Store in a closed corrosive resistant container, with corrosive resistant liner, in cool dry place. Wear appropriate personal protective equipment when working with or handling. Always wash hands thoroughly after handling this product. Dispose of following Federal, State/Provincial, and Local regulations.

OTHER PRECAUTIONS: Empty containers may retain product residues in vapor, liquid, and/or solid form. All labeled hazard precautions should be observed.

WORK HYGIENIC PRACTICES: Cosmetics/Food/Drink/Tobacco should not be consumed or used in work areas. Always wash hands after handling material and before applying or using cosmetics/food/drink/tobacco.

SECTION 7 NOTES:

For industrial use only.

Keep out of reach of children.

Not for internal consumption.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limit Values:

See section 3.

ENGINEERING CONTROLS: Use only with production equipment designed for use with conductive paint.

VENTILATION: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLVs.

RESPIRATORY PROTECTION: A (US: NIOSH; EU: EN 140:1998, EN 14387:2004 A) approved air-purifying respirator with fume/organic chemical cartridge should be worn when airborne concentrations may be exceeded. General and local exhaust ventilation is the preferred means of protection.

EYE PROTECTION: Use with appropriate eye protection: Goggles or face shield (EU: EN 166-S 3 9).

SKIN PROTECTION: Protective gloves should be worn when the possibility of skin contact exists (EU: EN 374-1:2003).

PROTECTIVE CLOTHING OR EQUIPMENT: Work clothes should be worn and laundered in accordance with current Lead (Pb) standards (US: OSHA).

WORK HYGIENIC PRACTICES: Cosmetics/Food/Drink/Tobacco should not be consumed or used in areas where solder products may be used. Always wash hands after handling soldering products and before applying or using cosmetics/food/drink/tobacco.

OTHER: Maintain eye wash stations in work areas. Avoid the use of contact lenses in high fume areas. Clean protective equipment regularly. Clean up spills immediately.

9. PHYSICAL AND CHEMICAL PROPERTIES

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|-------------------------------|--------------|
| APPEARANCE: | Silver Paste |
| ODOR: | Odorless |
| ODOR THRESHOLD: | NE |
| pH as SUPPLIED: | NA |
| MELTING POINT: | Varies |
| FREEZING POINT: | Varies |
| INITIAL BOILING POINT: | Varies |

| | |
|---|-----------|
| BOILING RANGE: | NA |
| FLASH POINT: | NA |
| EVAPORATION RATE: | NA |
| FLAMMABILITY (solid): | NE |
| UPPER/LOWER FLAMMABILITY: | NE |
| UPPER/LOWER EXPLOSIVE LIMITS: | NE |
| VAPOR PRESSURE (mmHg): | NA |
| VAPOR DENSITY (AIR = 1): | NA |
| RELATIVE DENSITY: | NE |
| SOLUBILITY IN WATER: | Insoluble |
| PARTITION COEFFICIENT (n-octanol/water): | NE |
| AUTOIGNITION TEMPERATURE: | NE |
| DECOMPOSITION TEMPERATURE: | NE |
| VISCOSITY: | NA |

SECTION 9 NOTES:

Other physical and chemical properties depend on alloy composition.

10. STABILITY AND REACTIVITY

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| STABILITY: | Stable |
| CONDITIONS TO AVOID (STABILITY): | NE |
| INCOMPATIBILITY (MATERIAL TO AVOID): | Oxidizing materials, acids, hydrogen peroxide, bases |
| HAZARDOUS DECOMPOSITION/BY-PRODUCTS: | Harmful organic fumes and toxic oxide fumes may form at elevated temperatures. |
| POSSIBILITY OF HAZARDOUS REACTIONS: | NE |

11. TOXICOLOGICAL INFORMATION

INHALATION:

This product does not present a risk at ambient temperatures.

SKIN:

Contact with conductive paint may cause irritation and sensitization.

EYES:

Contact with conductive paint may cause irritation and sensitization.

Health Hazards (acute and chronic): Contact with dust and fumes may cause skin, eye and respiratory irritation. Ingestion and/or inhalation of material or fumes may result in flu like symptoms, insomnia, muscle weakness, nausea and abdominal pain. Gross inhalation or ingestion may be toxic and can result in death. Symptoms of toxicity may take hours or days to manifest. Chronic exposures, inhalation and ingestion, may result in kidney, red blood cell, reproductive and nervous system effects. Health effects may be cumulative over many exposures. Studies show that health risks vary by individual. Minimize exposure as a precaution. See OSHA 29CFR 1910.1025(subpart Z) for more information.

ACUTE TOXICITY:

| Product/Ingredient Name | Result | Species | Dose | Exposure |
|-------------------------|-----------|---------|-----------|----------|
| Silver | LD50 Oral | Mouse | 100 mg/kg | - |

| | |
|---|----|
| SKIN CORRISSION/IRRITATION: | NE |
| SERIOUS EYE DAMAGE/IRRITATION: | NA |
| RESPIRATORY OR SKIN SENSITIZATION: | NE |
| GERM CELL MUTAGENICITY: | NA |
| CARCINOGENICITY: | |

| | | | |
|-----------------|------------------|----------------|-----------------|
| OSHA: NA | ACGIH: NA | NTP: NA | IARC: NA |
|-----------------|------------------|----------------|-----------------|

| | |
|--------------------------------|----|
| REPRODUCTIVE TOXICITY: | NA |
| STOT-SINGLE EXPOSURE: | NA |
| STOT-REPEATED EXPOSURE: | NA |
| ASPIRATION HAZARD: | NA |

SECTION 11 NOTES:

This product has not been tested as a whole to determine its hazards. Synergistic or additive effects of the above chemicals are unknown, as are the effects of exposure to these chemicals in addition to others present in the work place. See Section 2 for additional health hazards.

12. ECOLOGICAL INFORMATION

TOXICITY:

| Product/Ingredient Name | Result | Species | Exposure |
|-------------------------|----------------------------------|--|----------|
| Silver | Acute EC50 1.4 µg/l Marine water | Algae - Chroomonas sp. | 4 days |
| | Acute EC50 0.24 µg/l Fresh water | Daphnia - Daphnia magna | 48 hours |
| | Acute LC50 11 µg/l Fresh water | Crustaceans - Ceriodaphnia reticulata | 48 hours |
| | Acute LC50 2.13 µg/l Fresh water | Fish - Pimephales promelas | 96 hours |
| | Chronic NOEC 5 mg/l Marine water | Algae - Glenodinium halli | 72 hours |
| Copper | Acute EC50 1100 µg/l Fresh water | Aquatic plants - Lemna minor | 4 days |
| | Acute EC50 2.1 µg/l Fresh water | Daphnia - Daphnia longispina - Juvenile (Fledgling, Hatchling, Weanling) | 48 hours |

| | | |
|------------------------------------|--|----------|
| Acute IC50 13 µg/l Fresh water | Algae - Pseudokirchneriella subcapitata - Exponential growth phase | 72 hours |
| Acute IC50 5.4 mg/l Marine water | Aquatic plants - Plantae - Exponential growth phase | 72 hours |
| Acute LC50 0.072 µg/l Marine water | Crustaceans - Amphipoda - Adult | 48 hours |
| Acute LC50 7.56 µg/l Marine water | Fish - Periophthalmus waltoni - Adult | 96 hours |
| Chronic NOEC 2.5 µg/l Marine water | Algae - Nitzschia closterium - Exponential growth phase | 72 hours |
| Chronic NOEC 7 mg/l Fresh water | Aquatic plants - Ceratophyllum demersum | 3 days |
| Chronic NOEC 0.02 mg/l Fresh water | Crustaceans - Cambarus bartonii - Mature | 21 days |
| Chronic NOEC 2 µg/l Fresh water | Daphnia - Daphnia magna | 21 days |
| Chronic NOEC 0.8 µg/l Fresh water | Fish - Oreochromis niloticus - Juvenile (Fledgling, Hatchling, Weanling) | 6 weeks |

PERSISTENCE AND DEGRADABILITY: NE

BIOACCUMULATIVE POTENTIAL:

| Product/Ingredient Name | LogP _{ow} | BCF | Potential |
|-------------------------|--------------------|-----|-----------|
| Silver | - | 70 | Low |

MOBILITY IN SOIL: NE

RESULT OF PBT and vPvB ASSESSMENT: Not applicable

OTHER ADVERSE EFFECTS: NE

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Scrap and waste should be recycled or stored in a dry, sealed container for later disposal. Disposal must be in accordance with Federal, State/Provincial, and Local Regulations.

OTHER PRECAUTIONS: Avoid skin & eye contact, inhalation & ingestion of fumes and material. Wash contaminated clothing before reuse. Keep away from children.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

UN Number: Not available
UN Proper Shipping Name: Not available
Packaging Group: Not applicable
Environmental Hazards: None

TRANSPORT HAZARD CLASSES:

US DOT Hazardous Material Classification: Non-Hazardous
Water Transportation: Non-Hazardous
IATA Hazardous Material Classification: Non-Hazardous
ADR Road Regulations: Not regulated
IMDG Sea Regulations: Not regulated
ADG Land Transportation: Not regulated

15. REGULATORY INFORMATION

All ingredients used to manufacture this product are listed on the EPA TSCA Inventory. Finished product is not listed on the EPA TSCA Inventory.

U.S. FEDERAL REGULATIONS: Not regulated
STATE REGULATIONS: Not regulated
INTERNATIONAL REGULATIONS: Not regulated
AUSTRALIAN REGULATIONS: Not regulated

16. OTHER INFORMATION

LEGEND:

ACGIH American Conference of Governmental Industrial Hygienists
ADG Australian Dangerous Goods Code
ADR European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS Australian Inventory of Chemical Substances
BCF Bioconcentration factor
C.A.S. Chemical Abstract Service
CLP Classification, Labeling and Packaging
DOT Department of Transportation
EC Effective Concentration
EPA Environmental Protection Agency
GHS Global Harmonized System
HMIS Hazardous Material Identification System

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|-----------------------|--|
| IARC | International Agency for Research on Cancer |
| IATA | International Air Transport Association |
| IMDG | International Maritime Dangerous Goods Code |
| LC | Lethal Concentration |
| LD | Lethal Dose |
| NA | Not available |
| NE | Not established |
| NIOSH | National Institute for Occupational Safety & Health |
| NOEC | No observed effective concentration |
| NOHSC | National Occupational Health and Safety Commission (Australia) |
| NTP | National Toxicology Program |
| OSHA | Occupational Safety and Health Administration |
| PEL | Permissible Exposure Limit |
| P_{ow} | Octanol water partition coefficient |
| SDS | Safety Data Sheet |
| STEL | Short-Term Exposure Limit |
| STOT | Specific target organ toxicity |
| TLV | Threshold Limit Value |
| TSCA | Toxic Substance Control Act |
| TWA: | Time Weighted Average |
| US DOT: | United States Department of Transportation |

PREPARATION INFORMATION:

This update supersedes all previously released documents.

DISCLAIMER:

The information and recommendations contained within this publication have been compiled from sources believed to be reliable and to represent the best information available to Chip Quik at the time of issue. No warranty, guarantee, or representation is made by Chip Quik nor does Chip Quik assume any responsibility in connection there within; nor can it be assumed that all acceptable safety measures or other safety measures may not be required under particular or exceptional conditions or circumstances. The data on this Safety Data Sheet relates only to this product and does not relate to use with any other material or in any process. All chemical products should be used only by, or under the direction of, technically qualified personnel who are aware of the hazards involved and necessity for reasonable care in handling. Hazard communication regulations require that employees must be trained on how to use a Safety Data Sheet as a source for hazard information.

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