# **CHIPQUIK®**

## **Lead Free Solder Paste**

## Safety Data Sheet (SDS)

www.chipquik.com

To comply with European CLP Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2020/878

#### 1. PRODUCT AND COMPANY IDENTIFICATION

1.1 PRODUCT NAME: Chip Quik Lead Free Solder Paste Series: SMD291SNL, SMD4300SNL, TS391SNL

**SYNONYMS:** Paste, Solder Cream

PART NUMBERS: SMD291SNL, SMD291SNL10, SMD291SNL10T4, SMD291SNL10T5, SMD291SNL50T3, SMD291SNL250T3,

SMD291SNL250T4, SMD291SNL250T5, SMD291SNL500T3, SMD291SNL500T5, SMD291SNL15T4, SMD291SNL160T4, SMD4300SNL10, SMD4300SNL10T4, SMD4300SNL10T5, SMD4300SNL250T3, SMD4300SNL250T4, SMD4300SNL250T5,

SMD291SNL500T3C, SMD291SNL500T4C, SMD291SNL500T5C, SMD4300SNL500T3C, SMD4300SNL500T4C, SMD4300SNL500T5C, TS391SNL, TS391SNL10, TS391SNL50, TS391SNL250, TS391SNL500C, SMD291SNLT4, SMD291SNLT5, SMD291SNL500T4, SMD291SNLT6, SMD291SNL50T6, NC191SNL15, NC191SNL35, NC191SNL50, NC191SNL250, NC191SNL15T5, NC191SNL35T5, NC191SNL50T5, NC191SNL250T5, SMD291SNLT7, SMD291SNL40T7,

NC191SNL500C, NC191SNL500T5C, TS991SNL500T3, TS991SNL500T4, WS991SNL500T4, TS991SNL35T3,

TS991SNL35T4, WS991SNL35T4, SMD291SNL10T6, RMA591SNL, RMA591SNL10, RMA591SNL250, RMA591SNL500C, RMA591SNL50, NI3300SNL15T3, NI3300SNL60T3, RMA591L0SNL, RMA591L0SNL10, RMA591L0SNL250,

RMA591L0SNL500C, RMA591L0SNL50, NI3300SNL250T3, SMD291SNL250T4-2MIX

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against

PRODUCT USE: Soldering components for bonding semiconductor chips and packages to circuit boards.

1.3 MANUFACTURER: Chip Quik Inc.

ADDRESS: 3rd Floor, 207 Regent Street, London W1B 3HH (UK)

13 Adelaide Road, Dublin, Ireland, D02 P950 (EU)

**PHONE**: (508) 477-2264

1.4 EMERGENCY PHONE: +44 20 3868 7152 (UK and EU 24/7)

**REVISION DATE**: 2024/01/09 **REVISION NUMBER**: EU4.6

REVISED BY: Chip Quik Product Safety

#### 2. HAZARD IDENTIFICATION

#### 2.1 Classified in accordance with European CLP Regulation 1272/2008

Acute Toxicity (oral) H302 Acute Toxicity (dermal) 4 H312 Acute Toxicity (inhalation) 4 H332 Eye Irritant 2 H319 Skin Irritant H315 Skin Sensitization H317 Aquatic Acute H400 Aduatic Chronic H410

Specific Target Organ Toxicity (STOT) – Single Exposure (SE) Respiratory Tract Irritation 3 H335

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

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

TARGET ORGANS: NA

#### 2.2 Label Elements:

#### **GHS/CLP LABEL ELEMENTS:**



Signal Word: Warning

Hazard statement(s)

H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H315 Causes skin irritation.

H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.

H332 Harmful 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.

Do not breathe dust/fume/gas/mist/vapor/spray. P260 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. Avoid release to the environment. P273

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.

IF INHALED: Remove victim to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if P304/P340/312

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.

IF EXPOSED OR CONCERNED: Get medical advice/attention. P308/P313

P342/P311 IF EXPERIENCING RESPIRATORY SYMPTOMS: Call POISON CENTER/Doctor.

Take off contaminated clothing and wash it before reuse. P362

Collect spillage. P391

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.

#### 2.3 Other Hazards:

#### 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 (Argyia).

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

#### 3.2 Classified in accordance with European CLP Regulation 1272/2008

Hazardous Ingredients	C.A.S. Number	EC Number	Weight Percent	Classification
Modified Rosins (Rosin)	8050-09-7	232-475-7	<4.5	Skin Sens. 1; H317
Pine Oil Derivatives	8000-41-7	232-268-1	<0.5	Skin Irrit. 2; Eye Irrit. 2; H315, H319
(Terpineol)				
Mixed Carboxylic Acids	110-16-7	203-742-5	<0.4	Acute Tox. 4; Eye Irrit. 2; STOT SE 3; Skin Irrit. 2; H302,
(Maleic Acid)				H315, H319, H335
Tin	7440-31-5	231-141-8	<96.5	Eye Irrit. 2; STOT SE 3; H319, H335
Silver	7440-22-4	231-131-3	<3.0	Aqua. Acute 1; Aqua. Chron. 1; H400, H410
Copper	7440-50-8	231-159-6	<0.5	Aqua. Acute 1; Aqua. Chron. 1; H400, H410

Non-Hazardous Ingredients	C.A.S. Number	EC Number	Weight Percent	Classification
Surfactants	NA	NA	<0.4	NA
Rheological Modifier	NA	NA	<0.5	NA

#### 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.

#### 4.1 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.

#### 4.2 Not available

4.3 Not available

#### 5. FIREFIGHTING MEASURES

**5.1 EXTINGUISHING MEDIA:** Dry chemical, foam

**5.2 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.

5.3 SPECIAL FIRE FIGHTING PROCEDURES: Do not use water. Use (EU: EN 137:2006) self-contained Breathing Apparatus and full protective clothing

if involved in a fire.

#### **SECTION 5 NOTES:**

Molten solder alloys consisting of Antimony, Bismuth, Copper, Indium, Silver, and/or Tin do not produce significant quantities of fumes below 900° F.

#### **6. ACCIDENTAL RELEASE MEASURES**

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

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

**6.3 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.

#### **6.4 SECTION 6 NOTES:**

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

#### 7. HANDLING AND STORAGE

**7.1/7.2 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.

7.3 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:**

Keep out of reach of children. Not for internal consumption.

#### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### 8.1 Occupational Exposure Limit Values:

Rosin flux fumes (as total resin acids) MEL: 0.05 mg/m<sup>3</sup> 8h TWA. MEL: 0.15 mg/m<sup>3</sup> 15 min.

Extraction is necessary to remove fumes evolved during reflow.

Also see section 3.

8.2 ENGINEERING CONTROLS: Use only with production equipment designed for use with solder paste.

VENTILATION: Provide sufficient mechanical (general and/or local exhaust) ventilation.

**RESPIRATORY PROTECTION:** A (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.

**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

9.1

APPEARANCE: Grey paste ODOR: Odorless **ODOR THRESHOLD:** NF 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): ΝE **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): NF **AUTOIGNITION TEMPERATURE:** ΝE **DECOMPOSITION TEMPERATURE:** ΝE VISCOSITY: NA

#### 9.2 Other Information

#### 9.2.1 Information with regard to physical hazard classes

No additional information available. 9.2.2 Other safety characteristics

No additional information available.

#### **SECTION 9 NOTES:**

Other physical and chemical properties depend on alloy composition.

#### 10. STABILITY AND REACTIVITY

10.1 Reactivity:NE10.2 STABILITY:Stable10.3 POSSIBILITY OF HAZARDOUS REACTIONS:NE10.4 CONDITIONS TO AVOID (STABILITY):NE

10.5 INCOMPATIBILITY (MATERIAL TO AVOID): Oxidizing materials, acids, hydrogen peroxide, bases

10.6 HAZARDOUS DECOMPOSITION/BY-PRODUCTS: Harmful organic fumes and toxic oxide fumes may form at elevated temperatures.

#### 11. TOXICOLOGICAL INFORMATION

#### INHALATION:

This product does not present a risk at ambient temperatures. The flux fumes evolved during soldering will irritate the nose, throat and lungs. Repeated or prolonged exposure to flux fumes may cause an allergic affect which may lead to occupational asthma.

#### SKIN

Contact with flux fumes and flux residues may cause irritation and sensitization.

#### EYES

Flux fumes may cause irritation.

**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.

#### 11.1 ACUTE TOXICITY:

Product/Ingredient Name	Result	Species	Dose	Exposure
Rosin	LD50 Oral	Rat	7600 mg/kg	-
Terpineol	LD50 Oral	Rat	2000 mg/kg	-
·	LD50 Inhalation	Rat	4.76 mg/l	4 hours
	LD50 Dermal	Rat	2000 mg/kg	-
Maleic acid	LD50 Oral	Rat	708 mg/kg	Remarks: Behavioral: Convulsions or effect on seizure threshold. Behavioral: Muscle weakness. Gastrointestinal: Ulceration or bleeding from stomach.
	LD50 Inhalation LD 50 Dermal	Rat Rabbit	720 mg/m³ 1560 mg//kg	1 hour Remarks: Behavioral: Tremor

SKIN CORRISION/IRRITATION: NE SERIOUS EYE DAMAGE/IRRITATION: NA RESPIRATORY OR SKIN SENSITIZATION: NE GERM CELL MUTAGENICITY: NA

CARCINOGENICITY:

ACGIH: NA NTP: NA IARC: NA

REPRODUCTIVE TOXICITY: NA

STOT-SINGLE EXPOSURE:

 Product/Ingredient Name
 Category
 Route of exposure
 Target organs

 Maleic acid
 Category 3
 Not applicable
 Respiratory tract irritation

STOT-REPEATED EXPOSURE: NA ASPIRATION HAZARD: NA

#### 11.2 Information on other hazards:

#### 11.2.1 Endocrine disrupting properties:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

#### 11.2.2 Other information:

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named manufacturer, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

#### **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

### 12.1 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	48 hours
		reticulata	
	Acute LC50 2.13 μg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 5 mg/l Marine	Algae - Glenodinium halli	72 hours
	water		
Rosin	Acute LC50 60.3 mg/l Fresh water	Brachydanio rerio (zebra fish)	96 hours
Terpineol	Acute LC50 62.80 mg/l Fresh	Danio rerio (zebra fish)	96 hours
	water		
	Acute LC50 68 mg/l Marine water	Algae – Pseudokirchneriella	72 hours
		subcapitata (green algae)	
Maleic acid	Acute EC50 316200 µg/l Fresh	Daphnia - Daphnia magna -	48 hours
	water	Larvae	
	Acute LC50 5000 μg/l Fresh water	Fish - Pimephales promelas	96 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 -	48 hours
		Juvenile (Fledgling, Hatchling,	
		Weanling)	
	Acute IC50 13 µg/l Fresh water	Algae - Pseudokirchneriella	72 hours
		subcapitata - Exponential	
		growth phase	
	Acute IC50 5.4 mg/l Marine water	Aquatic plants - Plantae -	72 hours
		Exponential growth phase	
	Acute LC50 0.072 μg/l Marine	Crustaceans - Amphipoda -	48 hours
	water	Adult	
	Acute LC50 7.56 μg/l Marine water	Fish - Periophthalmus waltoni -	96 hours
		Adult	
	Chronic NOEC 2.5 µg/l Marine	Algae - Nitzschia closterium -	72 hours
	water	Exponential growth phase	
	Chronic NOEC 7 mg/l Fresh water	Aquatic plants - Ceratophyllum	3 days
		demersum	
	Chronic NOEC 0.02 mg/l Fresh	Crustaceans - Cambarus	21 days
	water	bartonii - Mature	
	Chronic NOEC 2 µg/l Fresh water	Daphnia - Daphnia magna	21 days
	Chronic NOEC 0.8 µg/l Fresh	Fish - Oreochromis niloticus -	6 weeks
	water	Juvenile (Fledgling, Hatchling,	
		Weanling)	

## PERSISTENCE AND DEGRADIBILITY: BIOACCUMULATIVE POTENTIAL:

NE

Product/Ingredient Name	LogP <sub>ow</sub>	BCF	Potential	
Silver	-	70	Low	
Rosin	1.9 to 7.7	-	High	
Terpineol			NE	
Maleic acid	-1.3	_	Low	

MOBILITY IN SOIL: NE

12.5 RESULT OF PBT and vPvB ASSESSMENT: Not applicable

**12.6 Endocrine Disrupting Properties:**The substance/mixture does not contain components considered to have endocrine disrupting

properties according to REACH Article 57(f) or Commission Delegated regulation (EU)

2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

No known significant effects or critical hazards.

## 12.7 OTHER ADVERSE EFFECTS:

#### 13. DISPOSAL CONSIDERATIONS

**13.1 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.

**14.1 UN Number:**Not available **14.2 UN Proper Shipping Name:**Not available

#### 14.3 TRANSPORT HAZARD CLASSES:

EU 2008/68/EC:
Water Transportation:
IATA Hazardous Material Classification:
ADR Road Regulations
IMDG Sea Regulations
ADG Land Transportation

Non-Hazardous
Not regulated
Not regulated
Not regulated
Not regulated

14.4 Packaging Group: Not applicable

14.5 Environmental Hazards: None

14.6 Not applicable14.7 Not applicable

#### 15. REGULATORY INFORMATION

15.1

EU REGULATIONS:Not regulatedU.S. FEDERAL REGULATIONS:Not regulatedSTATE REGULATIONS:Not regulatedINTERNATIONAL REGULATIONS:Not regulatedAUSTRALIAN REGULATIONS:Not regulated

**15.2** NA

#### 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 EC Number European Community Number
EPA Environmental Protection Agency
GHS Global Harmonized System

HMIS
IARC
International Agency for Research on Cancer
IATA
International Air Transport Association
IMDG
International Maritime Dangerous Goods Code

LC Lethal Concentration

**LD** Lethal Dose

MEL Maximum Exposure Limit
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
Pow 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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