MATERIAL SAFETY DATA SHEET

Section 1 - Product and Company Identification

Product Identification:	Leadframe
Product Type :	UPGRADE PPF Plating C194 Raw Copper Alloy Frame
Manufacturer Name :	Samsung Techwin Co.
Manufacturer Address :	42 Sung-ju-Dong, Changwon City Kyungsangnamdo, KOREA
Manufacturer Contact No :	82-55-260-5540

Section 2 – Composition / Information on Ingredients

Table below shows the main ingredients used in the product.

Chemical Name	CAS No	Wt %	OSHA PEL / ACGIH TLV (DUST)	
Zinc	7440-66-6	0.050~0.196	-	-
Ferrous	7439-89-6	2.083~2.551	-	-
Phosphorus	7723-14-0	0.015~0.147	-	-
Lead	7439-92-1	0.000~0.009	-	-
Nickel	7440-02-0	0.793~1.766	-	-
Gold	7440-57-5	0.010~0.045	-	-
Silver	7440-22-4	0.008~0.035	-	-
Palladium	7440-05-3	0.020~0.078	-	-
Copper	7440-50-8	95.173~97.021	-	-

Section 3 - Hazards Identification, Including Emergency Overview

The leadframe products, Pd Plating are **non hazardous** in their as-shipped form.

However, incorrect handling of the leadframe, the products made thereof, or production scrap generated may lead to injuries. Operations generating dust or fumes, such as grinding, polishing, welding or melting, may create health hazards by inhalation or by irritation of the eyes.

A reaction of a few chemical substances with this product, or its production scrap as well as dust or fumes generated during production, may produce poisonous substances or explosive gases.

Route	Effects
Inhalation	Metallic taste, dryness of the throat, sneezing, respiratory tract irritation, mixed pneumoconiosis, chills, metal fume fever, short-ness of breath, chest pain, weakness, fatigue, cough, muscle and joint pain.
Ingestion	Health hazard is normally not expected to occur. However, in case of accidental ingestion of crystallized copper salts or their solutions, symptoms of poisoning, such as nausea and vomiting, will result.
Eye contact	Mechanical irritation.

Skin contact	Material not expected to be absorbed through the skin. Health hazard is not expected to occur, however may cause allergic reactions in some individuals.

Section 4 - First Aid Measures

Skin: If irritation develops, wash off contamination with soap and water, seek medical attention if signs or symptoms persist.
Eyes: If irritation develops, irrigate thoroughly with water for at least 15 minutes, call physician if irritation persist.
Ingestion: Drink water or milk, induce vomiting, seek medical attention.
Inhalation: Remove to fresh air and call physician

Section 5 - Fire Fighting Measures

The product creates no fire or explosion hazard when used in normal atmosphere.

No information available: dust hazard, unusual fire and explosion hazards, special firefighting procedures.

Not applicable: flash point, auto ignition temperature, flammable limits

Additional remarks: avoid contact with molten or hot metal. Vapor explosion may result when water or liquid gets in contact with molten metal. Fumes of metals or metal oxides caused by fire or explosion result in health hazards.

Influence of heat results in decreasing mechanical strength of the material depending on temperature and time.

Section 6 - Accidental Release Measures

Spill Release Procedures: Not applicable.

Section 7 - Handling and Storage

Handling and Storage Precautions: Handle as normal non-hazardous material.

Section 8 - Exposure Controls & Personal Protection

Respiratory Protection: None normally needed. If exposure exceeds the PEL/TLV, use NIOSH approved respiratory protection equipment.
Skin Protection: Use rubber glove to prevent mechanical injury
Eye Protection: Not necessary under normal conditions of use (packaging).
Work Hygenic Practices: Not specified.

Section 9 - Physical & Chemical Properties

Appearance and Odour: Grey metallic. Odourless
Melting Point: 1089 deg C
Boiling Point: No data
Decomposition Point: Not known
Vapour Pressure: Not Available
Specific Gravity: approx. 8.94 (H_2O = 1)
Viscosity: No data available
Evaporation Weight and Reference: Not available
Solubility in Water: Negligible

Section 10 - Stability & Reactivity Data

Stability: Stable under normal conditions of use.
Materials to Avoid: Strong oxidiser, mercury, acetylene, chlorine, hydrogen, strong acids and bases.
Stability Condition to Avoid: Not known
Hazardous Decomposition Products: Not known
Hazardous Polymerization Indicator: No
Conditions to Avoid Polymerization: Not relevant

Section 11 - Toxicological Information

Toxicological Information: Not known to be hazardous in its as-shipped form. Please refer to Section 3 for health hazard information.

Section 12 - Ecological Information

Ecological Information: No data is available on this product. Individual constituents are as follows:
Copper: The toxicity of copper to aquatic organisms varies significantly not only with the species, but also with physical and chemical characteristics of the water, such as its temperature, hardness, turbidity and carbon dioxide content. Copper concentrations varying from 0.1 to 1.0 mg/L have been found by various investigators to be not toxic for most fish. However, concentrations of 0.015 to 3.0 mg/L have been reported as toxic, particularly in soft water to many kinds of fish, crustaceans, mollusks, insects and plankton.

Section 13 - Disposal Considerations

Waste Disposal Methods:
Maximise product recovery for reuse or recycling. Disposal must be in accordance with federal, state and local regulations.

Section 14 - Transport Information

Transport Information: Not available

Section 15 - Regulatory Information

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information

THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, STORE, TRANSPORT, OR EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING OR HANDLING THIS PRODUCT. DYNACRAFT BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKE NO WARRANTY ON IT.