

MATERIAL SAFETY DATA SHEET

Section 1 - Product and Company Identification

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|---------------------------|--|
| Product Identification: | Leadframe |
| Product Type : | Advanced Micro NiPdAu C7025 Raw Copper Alloy Frame |
| Manufacturer Name : | Dynacraft Industries Sdn Bhd |
| Manufacturer Address : | 255-A, Block D Phase 2, Bayan Lepas Industrial Zone 11900 Penang Malaysia |
| Manufacturer Contact No : | 6-03-6439714 |
| Manufacturer Fax No: | 6-03-6436703 |

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) | |
|--------------------------|-----------|-----------------|--------------------------------|------------------------|
| Silicon | 7440-21-3 | 0.25 – 1.2 | 30.0 mg/m ³ | - |
| Nickel (Material Base) | 7440-02-0 | 2.2 – 4.2 | 1.0 mg/m ³ | 1.0 mg/m ³ |
| Magnesium | 7439-95-4 | 0.05 – 0.3 | - | - |
| Iron | 7439-89-6 | 0.2% max | - | - |
| Zinc | 7440-66-6 | 1.0% max | - | 10 mg/m ³ |
| Manganese | 7439-96-5 | 0.10% max | - | 5 mg/m ³ |
| Lead | 7439-92-1 | 0.01% max | 0.05 mg/m ³ | - |
| Copper | 7440-50-8 | Remaining | 1.0 mg/m ³ | 1.0 mg/m ³ |
| Silver | 7440-22-4 | 0.014 – 0.027 | 0.01 mg/m ³ | 0.01 mg/m ³ |
| Nickel (Plating Process) | 7440-02-0 | 0.67 - 1.25 | 1.0 mg/m ³ | 1.0 mg/m ³ |
| Palladium | 7440-05-3 | 0.0125 – 0.0375 | - | - |
| Gold | 7440-57-5 | 0.025 - 0.05 | - | - |

Section 3 - Hazards Identification, Including Emergency Overview

The leadframe products, Advanced Micro NiPdAu 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. |

Carcinogenic Effects: Nickel constitutes a possible cancer hazard & may also cause allergic rxns . epidemiological studies have shown annexes risk of cancer of nasal cavities & lungs in workers at nickel refineries.

Section 4 - First Aid Measures

Skin: Wash off contamination with soap and water, seek medical attention if signs or symptoms persist.
 Eyes: 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: Sweep up and transfer to a sealed container.

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.

Work Hygienic Practices: Not specified.

Section 9 - Physical & Chemical Properties

Appearance and Odour: Silvery White. Odourless

Melting Point: 1995 deg F

Boiling Point: No data

Decomposition Point: Not known

Vapour Pressure: Not Available

Specific Gravity: approx. 9.0 (H₂O = 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.