

# **Properties and Selection: Nonferrous Alloys and Special-Purpose Materials**

## **1. Specific Metals and Alloys**

Introduction to Aluminum and Aluminum Alloys  
Alloy and Temper Designation Systems for Aluminum and Aluminum Alloys  
Aluminum Mill and Engineered Wrought Products  
Properties of Wrought Aluminum and Aluminum Alloys  
Aluminum Foundry Products  
Properties of Cast Aluminum Alloys  
Aluminum-Lithium Alloys  
High-Strength Aluminum Powder Metallurgy Alloys  
Introduction to Copper and Copper Alloys  
Wrought Copper and Copper Alloy Products  
Properties of Wrought Coppers and Copper Alloys  
Selection and Application of Copper Alloy Castings  
Properties of Cast Copper Alloys  
Copper Powder Metallurgy Products  
Beryllium-Copper and Other Beryllium-Containing Alloys  
Nickel and Nickel Alloys  
Cobalt and Cobalt Alloys  
Selection and Application of Magnesium and Magnesium Alloys  
Properties of Magnesium Alloys  
Tin and Tin Alloys  
Zinc and Zinc Alloys  
Lead and Lead Alloys  
Refractory Metals and Alloys  
Introduction to Titanium and Titanium Alloys  
Wrought Titanium and Titanium Alloys  
Titanium and Titanium Alloy Castings  
Titanium Powder Metallurgy Products  
Zirconium and Hafnium  
Uranium and Uranium Alloys  
Beryllium  
Precious Metals  
Properties of Precious Metals  
Rare Earth Metals  
Germanium and Germanium Compounds  
Gallium and Gallium Compounds  
Indium and Bismuth

## **2. Special-purpose material**

- Magnetically Soft Materials
- Permanent Magnet Materials
- Metallic Glasses
- Electrical Resistance Alloys
- Electrical Contact Materials
- Thermocouple Materials
- Low-Expansion Alloys
- Shape Memory Alloys
- Metal-Matrix Composites
- Ordered Intermetallics
- Dispersion-Strengthened Nickel-Base and Iron-Base Alloys
- Cemented Carbides
- Cermets
- Super abrasives and Ultra hard Tool Materials
- Structural Ceramics

## **3. Superconducting materials**

- Introduction
- Principles of Superconductivity
- Niobium-Titanium Superconductors
- A15 Superconductors
- Ternary Molybdenum Chalcogenides (Chevrel Phases)
- Thin-Film Materials
- High-Temperature Superconductors for Wires and Tapes

## **4. Pure metals**

- Preparation and Characterization of Pure Metals
- Periodic Table of the Elements
- Properties of Pure Metals

## **5. Special Engineering Topics**

- Recycling of Nonferrous Alloys
- Toxicity of Metals
- Supplementary Information