TIRUPATI METALS

Precision in Every Alloy

Leading Manufacturer of
High-Performance Alloys

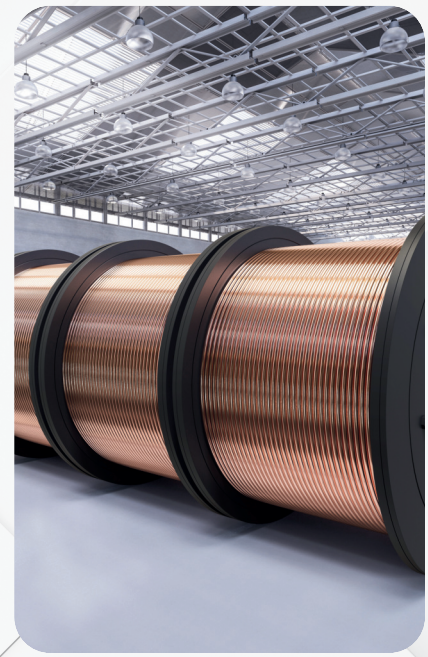
TIRUPATI METALS

Who We Are

Tirupati Metals is a professionally managed organization with over five decades of experience in Ferrous & Non-Ferrous metals. We supply all types of Copper Alloys such as Gunmetal, Phosphorous Bronze, Aluminium Bronze, Brass, Copper, Cast Iron along with Pipes, Tubes, Sheets, Plates, Round Bars and Fittings.

We specialize in **Non-Ferrous Casting, Forging, Engineering Goods, Marine Jobs, and customized machinery drawing jobs.** Supported by a dedicated and experienced team, we have built strong trust and industry reputation.

Under the leadership of skilled individuals, Tirupati Metals is today one of the largest Suppliers, Stockists, Importers & Exporters in the region and also provides products with mill test certificates.



Customers are our top priority, and our service continues even after product delivery-ensuring quality, reliability, and long-term value for every client.

TIRUPATI METALS

A professionally managed Supplier, Stockist, Importer & Exporter of a wide range of Ferrous & Non-Ferrous metals. We specialize in Non-Ferrous Casting, Forging, Engineering Goods, Marine applications, and manufacturing parts as per customer drawings. Our inventory includes Bush, Pipes, Tubes, Sheets, Plates, Round Bars, Circles, Rings and Fittings in various alloys.

Vision

To become a significant regional player and achieve progress across all operations, creating enhanced and sustainable value for our customers.

Mission

To supply a diverse range of high-quality metal products with prompt and efficient service at competitive costs, ensuring our price, quality, and service never let our customers down.

Core Values

- Customer First
- Integrity and Dedication
- Honour Commitments
- Focus on Quality

Quality

We ensure top-quality materials, including certified products with original mill test certificates, guaranteeing authenticity and compliance with industry standards.

50+
Years Experience

200+
Products Range

3000+
Customer

TIRUPATI METALS

Application Industries


Engineering


Cement Industry


Sugar Industries


Refinery Plants


Chemical Plants


Oil & Gas


Petrochemical


Pulp & Paper


Food Industries


Pharmaeutical


Water Piping System


Fertilizer

TIRUPATI METALS

Made-to-Order

Custom Manufacturing

Overview

Tirupati Metals provides made-to-order non-ferrous and selected ferrous metal solutions, delivering prototypes, precision castings, and production batches tailored to exact technical and performance requirements.

Capabilities at a Glance

Design Support: Assistance in optimizing drawings for manufacturability

Casting: Gun Metal, Phosphor Bronze, Brass, Aluminium Bronze, Aluminium, Stainless Steel, Cast Iron, and other non-ferrous alloys

Fabrication: Cutting, bending, forming, and welding (alloy-specific techniques)

Pattern & Tooling: In-house or partner tooling for sand, gravity, or investment casting

Machining: Conventional and CNC turning, milling, boring, drilling, threading, and surface grinding

Surface Finishing: Polishing, plating, anodizing, painting, passivation

Testing & Certification: Chemical, mechanical, and dimensional testing with material test certificates (MTC) as required

PROCESS WORKFLOW

Requirement Analysis
Review customer drawings, specifications, and performance needs

Design & Feasibility
Evaluate manufacturability, suggest improvements where needed

Quotation & Timeline
Provide transparent cost and delivery schedule

Tooling & Sample Approval
Develop patterns, provide samples for validation

Production & Quality Control
Batch manufacture with strict in-process and final inspection

Packing & Dispatch
Safe packaging for local or global shipment

TIRUPATI METALS

Our Manufacturing Process

Overview

At **Tirupati Metals**, every product is built with precision and consistency. We combine metallurgical expertise with advanced technology and strict quality protocols to deliver reliable non-ferrous and selected ferrous metal components. Our manufacturing process is designed to be flexible - suitable for both standard and made-to-order parts.

Advantages of Our Manufacturing Process

- Consistent alloy quality and mechanical properties
- Flexibility from prototype to bulk production
- Reduced lead time through integrated casting and machining
- Traceability and documentation at every stage

Compliance with international standards

Weighing & Cost Estimation

Weight and costing are based on:

- Material density (per selected alloy)
- Component volume (from 2D/3D drawing)
- Machining complexity (CNC/manual, tolerances, finishes)
- Batch quantity (economy of scale available for repeat production

Step-by-Step Process

1 

Raw Material Selection

- We source certified raw metals and alloys (copper, tin, zinc, lead, aluminium, nickel, iron etc.)
- Each batch is inspected for chemical composition and cleanliness

2 

Melting

- Induction, crucible, or gas-fired furnaces are used depending on alloy type and batch size
- Controlled temperatures prevent contamination and ensure correct metallurgical properties

3 

Alloying

- Required alloying elements (e.g., tin for bronze, zinc for brass, aluminium for aluminium bronze) are added in precise ratios
- Continuous sampling ensures chemical accuracy

4 

Molding

- Sand Casting: Versatile for complex shapes and low-volume orders.

5 

Cooling & Shakeout

- Controlled cooling prevents internal stresses
- Sand, shells, or molds are removed after solidification

6 

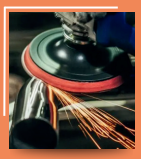
Heat Treatment (if required)

- Normalizing, stress relieving, or solution treatment is applied for specific mechanical properties

7 

Rough & Finish Machining

- Lathes, milling, drilling, boring, grinding, and CNC machines produce tight tolerances
- Threads, grooves, and other features are machined per drawing

8 

Surface Finishing

- Polishing, buffing, plating, anodizing, painting, or passivation for corrosion resistance and appearance

9 

Quality Inspection

- Dimensional checks, chemical and mechanical tests, pressure tests, and visual inspections
- Material Test Certificates (MTC) issued when required

10 

Packing & Dispatch

- Rust-preventive treatments and secure packing for safe transport
- Flexible logistics for local and global shipment

TIRUPATI METALS

Gun Metal (Bronze Alloy)

Phosphor Bronze (Tin Bronze Alloy)

Overview

Gun Metal (Red Brass/Bronze Alloy) is a corrosion-resistant Copper-Tin-Zinc alloy known for excellent casting properties, high wear resistance, and long service life, ideal for engineering applications.

Phosphor Bronze is a high-performance copper alloy with tin and phosphorus, offering excellent wear resistance, high fatigue strength, and corrosion resistance for precision engineering and electrical applications.

Chemical Composition (Typical)

- **Copper (Cu):** 78-82%
- **Tin (Sn):** 6-8%
- **Zinc (Zn):** 3-5%
- **Lead (Pb):** 6-8% (in some grades for machinability)

- **Copper (Cu):** 88-94%
- **Tin (Sn):** 5-11%
- **Phosphorus (P):** 0.01-0.4%
- **Zinc (Zn):** 0-2% (in some grades)
- **Lead (Pb):** 0-0.5% (for improved machinability in some variants)

Key Properties

- High strength, durability, and excellent wear resistance
- Superior corrosion resistance, especially in seawater
- Pressure-tight with good machinability, ideal for hydraulic and steam applications

- High tensile and fatigue strength with excellent wear resistance and low friction
- Superior corrosion and chemical resistance with good spring (elastic) properties
- High conductivity with excellent machinability and solderability

Available Casting Shapes / Forms

We manufacture Gun Metal and Phosphor Bronze in various shapes and forms to meet diverse industrial requirements.

- **Rods / Bars** (round, square, hexagonal)
- **Bushes / Bearings / Sleeves**
- **Flats / Plates**
- **Circles / Blanks**
- **Rings**
- **Sheets / Strips**
- **Custom Components** (as per drawing / special requirements)

Grades

Common designations (as per IS/BS/DIN standards):

- **LG2** - General engineering castings, valves, bushes
- **LG4** - Marine & hydraulic applications
- **RG5** - Pump & valve components
- **RG10** - High-strength bearing applications
- **CAC406 / SAE660** (equivalent grades in some standards)

Common industry designations (as per IS/BS/DIN/ASTM standards):

- **PB1** - High-strength bushings, gears, bearings
- **PB2** - Marine and heavy-load bearings
- **PB102** - Electrical & aerospace applications
- **C51000 / C52100 / C54400** - Various American standards for phosphor bronze
- **CuSn8 / CuSn10** - European standard alloys

TIRUPATI METALS

Brass (Copper–Zinc Alloy)

Copper

Overview

Brass is a versatile copper–zinc alloy known for high machinability, good strength, attractive finish, and corrosion resistance, widely used in engineering, electrical, decorative, and plumbing applications.

Copper is a widely used metal known for excellent electrical and thermal conductivity, corrosion resistance, and workability, making it essential for engineering, electrical, and architectural applications.

Chemical Composition (Typical)

- **Copper (Cu):** 55-70 %
- **Zinc (Zn):** Balance (usually 30-45 %)
- **Lead (Pb):** 0-3 % (in free-cutting brasses for machinability)
- **Tin (Sn):** 0-2 % (in naval brasses for improved corrosion resistance)
- **Other Elements:** Trace amounts of aluminium, nickel, manganese, or iron in special

Copper is a chemical element, not a composition.
It exists as a pure metal made of only one type of atom.
Correct Scientific Details:

- **Element name:** Copper
- **Chemical symbol:** Cu
- **Atomic number:** 29
- **Atomic weight:** 63.546 u
- **Nature:** Pure element (metal)

Key Properties

- Good tensile strength and toughness with excellent corrosion resistance
- Very good machinability and easy formability (rolling, drawing, forging, casting)
- Attractive golden finish with good electrical and thermal conductivity
- High electrical and thermal conductivity, ideal for power transmission and heat transfer
- Excellent corrosion resistance with non-magnetic properties for sensitive applications
- Good ductility and malleability with natural antimicrobial benefits

Available Casting Shapes / Forms

We supply Brass in a wide range of shapes to meet diverse requirements:

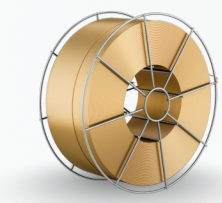
- **Rods / Bars** (round, square, hexagonal)
- **Bushes / Sleeves**
- **Flats / Plates**
- **Circles / Blanks**
- **Rings**
- **Sheets / Strips / Foils**
- **Custom Machined & Cast Components** (to customer drawing/specification)

Common Grades / Compositions

Common international designations:

- **IS 319 / IS 4413** - Free-cutting and forging brasses (India)
- **C26000 (Cartridge Brass)** - Deep-drawing, radiator cores
- **C36000 (Free-Cutting Brass)** - High machinability, fittings
- **C46400 (Naval Brass)** - Marine & corrosion-resistant uses
- **CW614N / CW617N** - European forging and machining brasses
- Lead-free brasses (for ROHS/REACH compliance) also available on request

- **ETP Copper (Electrolytic Tough Pitch)** - High conductivity (99.9% Cu)
- **Oxygen-Free Copper (OFHC)** - For high-vacuum and high-conductivity applications
- **Phosphorus-Deoxidized Copper** - Good weldability, used in plumbing and heat exchangers
- **Chrome Copper, Beryllium Copper** (specialty alloys for high strength and wear resistance)



TIRUPATI METALS

Aluminium Bronze (Copper–Aluminium Alloy)

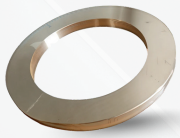
Cast Iron (Ferrous Casting Alloy)

Overview

Aluminium Bronze is a high-strength copper alloy with aluminium, offering excellent corrosion and wear resistance, widely used in marine, aerospace, oil & gas, and heavy engineering applications.

Copper is a widely used metal known for excellent electrical and thermal conductivity, corrosion resistance, and workability, making it essential for engineering, electrical, and architectural applications.

Chemical Composition (Typical)



- **Copper (Cu):** 75–85 %
- **Aluminium (Al):** 5–12 %
- **Iron (Fe):** 0–5 % (for added strength)
- **Nickel (Ni):** 0–5 % (improves corrosion and heat resistance in nickel aluminium bronzes)
- **Manganese (Mn):** Trace amounts (grain refinement)

- **Iron (Fe):** Balance
- **Carbon (C):** 2.0 – 4.0 %
- **Silicon (Si):** 1.0 – 3.0 %
- **Manganese (Mn):** 0.2 – 1.0 %
- **Sulphur (S):** ≤ 0.1 %
- **Phosphorus (P):** ≤ 1.0 %

(Exact limits depend on grade: Grey, Ductile, Malleable, or Alloyed cast irons.)

Key Properties

- High tensile and yield strength with excellent fatigue resistance and toughness
- Superior corrosion, wear, and abrasion resistance, even in seawater and chemicals
- Non-sparking, non-magnetic, with good machinability and weldability (selected grades)
- Excellent castability and machinability with economical production of complex shapes
- High compressive strength with good wear and abrasion resistance
- Effective vibration damping with good heat resistance

Available Casting / Manufacturing Shapes

We manufacture Aluminium Bronze and Cast Iron in various standard and custom forms to meet diverse industrial needs.

- **Rods / Bars** (round, square, hexagonal)
- **Bushes / Bearings / Sleeves**
- **Flats / Plates**
- **Circles / Blanks**
- **Rings** (solid or hollow)
- **Sheets**
- **Custom Precision Castings / Machined Components** (per customer drawing)

Grades

Common international standards include:

- **AB1 / AB2** - General engineering and marine castings
- **CA104 / NES 833** - Defence and aerospace grade aluminium bronze
- **C95400** - General-purpose aluminium bronze
- **C95500** - High-strength aluminium bronze
- **C95800** - Nickel aluminium bronze for superior corrosion resistance
- **CuAl10Fe5Ni5 / CuAl11Fe6Ni6** - European standards for nickel aluminium bronzes

- **Grey Cast Iron (FG150, FG200, FG260)** - Good damping, used in machine bases and housings
- **Ductile (SG) Iron (SG400, SG500, SG600)** - High tensile strength and impact resistance
- **Malleable Iron** - Good toughness, used in fittings and automotive parts
- **Alloyed Cast Irons** - Heat-resistant or wear-resistant for special applications

TIRUPATI METALS

Stainless Steel (Corrosion-Resistant Alloy Steel)

Aluminium (Lightweight Non-Ferrous Metal)

Overview

Stainless steel is a chromium-rich iron alloy known for corrosion resistance, strength, hygiene, and attractive finish, suitable for industrial, architectural, chemical, and food-processing applications.

Aluminium is a lightweight, corrosion-resistant metal with excellent conductivity, high strength-to-weight ratio, and easy formability, widely used across industrial applications.

Chemical Composition (Typical)

- **Iron (Fe):** Balance
- **Chromium (Cr):** 10.5 – 26 %
- **Nickel (Ni):** 0 – 35 % (austenitic grades)
- **Molybdenum (Mo):** 0 – 4.5 % (improves pitting resistance)
- **Carbon (C):** ≤ 0.08 % (lower in L grades)
- **Manganese (Mn), Silicon (Si), Nitrogen (N):** Trace additions depending on grade

(Exact composition depends on the grade - austenitic, ferritic, martensitic, duplex, precipitation-hardening, etc.)

- **Aluminium (Al):** Balance (≥ 90 %)
- **Silicon (Si):** 0.2 – 13 % (improves castability in some alloys)
- **Magnesium (Mg):** 0.2 – 6 % (improves strength and corrosion resistance)
- **Copper (Cu):** 0 – 6 % (improves strength but can reduce corrosion resistance)
- **Manganese (Mn), Zinc (Zn), Iron (Fe):** Trace additions depending on grade

(Exact limits depend on grade: Grey, Ductile, Malleable, or Alloyed cast irons.)

Key Properties

- Excellent corrosion resistance and high strength
- Good formability with wide temperature resistance
- Hygienic, with grade-specific magnetic properties

- Very lightweight with a high strength-to-weight ratio
- Excellent corrosion resistance with good electrical and thermal conductivity
- Non-magnetic, non-sparking, and easy to machine, weld, and form

Available Casting / Manufacturing Shapes

We supply Stainless Steel and Aluminium in a wide variety of shapes, forms, and custom configurations to suit diverse application needs.

- **Rods / Bars** (round, square, hexagonal)
- **Bushes / Sleeves**
- **Flats / Plates / Sheets**
- **Circles / Blanks / Discs**
- **Rings (solid and hollow)**
- **Pipes / Tubes** (seamless and welded)
- **Custom Precision Castings / Machined Parts** (per drawing/specification)

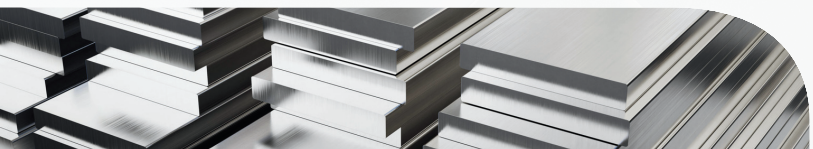
Grades

Common international standards include:

- **Austenitic:** 304, 304L, 316, 316L, 321 - excellent corrosion resistance and formability
- **Ferritic:** 409, 430 - moderate corrosion resistance, good for automotive/exhaust systems
- **Martensitic:** 410, 420, 431 - higher hardness and wear resistance, used for shafts, knives
- **Duplex / Super Duplex:** 2205, 2507 - high strength and superior chloride stress corrosion resistance
- **Precipitation-Hardening:** 17-4PH, 15-5PH - high strength and good corrosion resistance

Common international designations:

- **1xxx Series (Pure Aluminium):** Excellent corrosion resistance, electrical conductivity
- **2xxx Series (Al-Cu Alloys):** High strength, aerospace applications
- **5xxx Series (Al-Mg Alloys):** Marine environments, welded structures
- **6xxx Series (Al-Mg-Si Alloys):** General engineering, automotive, architectural
- **7xxx Series (Al-Zn-Mg Alloys):** Very high strength, aerospace and defence
- **Casting Alloys (LM Series / A3xx):** High castability, automotive and machinery components



TIRUPATI METALS

Specialty Copper & Nickel Alloys

Overview

Along with standard grades, **Tirupati Metals** supplies specialty high-performance copper and nickel alloys with elements like beryllium, zinc, and tin for enhanced strength, thermal performance, and corrosion resistance.

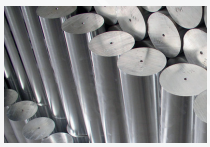
Key Alloys & Properties

1. Beryllium Copper (BeCu)

- **High Strength & Hardness** - Comparable to steels, but with excellent conductivity
- **Non-Sparking & Non-Magnetic** - Safe for aerospace, oil & gas, and electronics
- **Good Fatigue & Wear Resistance** - Ideal for springs, contacts, and precision instruments

2. Monel (Nickel-Copper Alloy)

- Especially in seawater and acidic environments - **Outstanding Corrosion Resistance**
- Retains mechanical properties at subzero and elevated temperatures - **High Strength & Toughness**
- Marine components, pump shafts, valves, heat exchangers, chemical industry parts :**Applications**



3. Nickel Alloys (High-Performance)

- **High-Temperature Stability** - For furnace parts, gas turbines, power plants
- **Excellent Corrosion & Oxidation Resistance** - Chemical and petrochemical industries
- **Applications**: Aerospace, energy, marine, and specialized engineering equipment

4. Zinc-Based Alloys (e.g., Zamak)

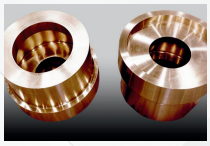
- Complex shapes with fine details - **Excellent Casting Properties**
- Used in automotive, hardware, and decorative components - **Good Strength & Surface Finish**
- **Economical & Versatile**

5. Tin-Based Alloys (e.g., High-Tin Bronze)

- **Superior Bearing Properties** - Low friction and wear
- **Good Load Capacity** - Heavy machinery, railway components, gear wheels, pump parts
- **Corrosion Resistant in Marine & Industrial Environments**

6. Leaded Tin Bronze

- High load capacity with good wear resistance - **Excellent Bearing Properties**
- Lead acts as a solid lubricant reducing friction - **Self-Lubricating**
- Easier to produce complex components - **Superior Machinability**
- Bushes, bearings, pump components, heavy-duty sliding parts :**Applications**

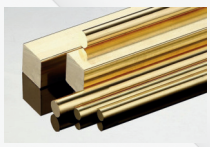


7. Manganese Bronze

- **High Strength & Toughness** - Comparable to steels with better corrosion resistance
- **Good Wear & Impact Resistance** - Suitable for heavy-load conditions
- **Excellent Corrosion Resistance** - Especially in seawater and marine atmospheres
- **Applications**: Ship propellers, gear blanks, pump parts, fasteners, heavy-duty bushings

8. Silicon Bronze

- Especially in chemicals, brine, and seawater Superior Corrosion Resistance - **Superior Corrosion Resistance**
- Suitable for structural and mechanical components - **High Strength with Good Ductility**
- Sometimes used in electrical connectors - **Excellent Electrical Conductivity (for a bronze)**
- Marine hardware, architectural panels, valve bodies, welding rods, chemical plant components :**Applications**



TIRUPATI METALS

Why Choose Tirupati Metals

- One-stop partner for castings, forgings, and machined components
- Flexible order sizes: prototype to mass production
- Quick turnaround with reliable lead times
- Adherence to international standards and tolerances
- Dedicated technical support and responsive communication Custom packing and global shipping support

Contact Us!

022 -66394705
+91 90045 54477 - Dilip Choudhary
+91 9987588230 - Ramesh Choudhary

dilip.tirupatimetal@gmail.com
tirupatimetal2013@gmail.com

Tirupati Metals, 119, Durgadevi Street,
5th Kumbharwada (Corner),
Mumbai -400004.