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Global Metal Materials for Humanoid Robots Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Metal Materials for Humanoid Robots market size was valued at US$ 2.47 million in 2025 and is forecast to a readjusted size of US$ 60.45 million by 2032 with a CAGR of 50.8% during review period.

In 2025, global Metal Materials for Humanoid Robots capacity 800 Tons, sales reached approximately 750 Tons, with an average market price of around 3,200 USD/Ton, industrial gross margin 26%.

Metal Materials for Humanoid Robots define “light, strong, durable, and cool.” They set the stiffness-to-weight and vibration envelope of the main frame, the fatigue life and noise floor of joint transmissions, and the power density and thermal headroom of motors. As humanoid programs move from prototypes to repeatable builds, Metal Materials for Humanoid Robots are judged less by peak lab numbers and more by whether performance can be delivered consistently through scalable routes—stable die casting/forging windows, predictable heat treatment distortion, controllable machining capability, and traceable quality.

A practical bill-of-materials view breaks Metal Materials for Humanoid Robots into three layers. (1) Lightweight structures: aluminum alloys (6061/7075 families) remain the workhorse for extrusions, CNC, and high-pressure die casting; magnesium alloys are pulled in for additional mass reduction once corrosion protection and process stability are proven; titanium alloys appear selectively where high fatigue resistance and high specific strength justify the cost. Core parameters are density (Al ~2.7 g/cc; Mg ~1.7 g/cc), fatigue strength, corrosion behavior, and surface-treatment headroom. (2)

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Precision transmission: bearing steels, gear steels, and carburizing steels dominate; the value drivers are cleanliness (inclusions), heat-treat distortion control, raceway/gear contact fatigue, and grindability. (3) Drive & electromagnetic: non-oriented electrical steel, copper, and NdFeB magnets dominate; the key metrics are core loss, lamination thickness, magnet coercivity/thermal stability, and irreversible demagnetization risk under high-frequency control.

The industrial chain starts upstream (Al/Mg/Ti producers, specialty steelmakers, copper refiners, rare-earth mining/separation and magnet materials), moves through semi-finished forms (sheet/extrusion, die castings/forgings, powders and powder-metallurgy parts), and then through machining, heat treatment, and surface engineering (anodizing/MAO, nitriding, DLC/PVD, etc.) before flowing into joint modules, reducers/ball screws, servo motors, and final assembly. Representative players can be read as “materials + critical components”: Alcoa/Novelis and China Hongqiao/Chalco in aluminum; Baowu Magnesium and Yunhai Metals in magnesium; Baowu and Nippon Steel in specialty steel; SKF and NSK in bearings; Harmonic Drive and Nabtesco in high-precision reduction/actuation chains—each directly shaping alloy specs, process windows, and qualification rules.

Commercialization signals are increasingly visible through designated procurement and framework agreements that pull metal processes into real delivery cadence. On 8 Dec 2025, Lizhong Group disclosed a designated procurement agreement with Beijing Weijing Intelligence for humanoid-robot machined components: 5,000 sets over five years with an estimated contract value of about RMB 75 million, covering items such as the main skeleton, shoulder joints, and dexterous-hand structures. The strategic message is that “metal capability” is being locked in early: material selection, casting/forging routes, machining baselines, and inspection standards are being frozen into repeatable supply, which is exactly what the Metal Materials for Humanoid Robots stack needs to cross from engineering builds to scalable production.

Into late-2025, Metal Materials for Humanoid Robots are shifting from “which alloy” to “which process platform and which resilient supply chain.” Three 2025 developments illustrate the direction: on 10 Jul 2025, a U.S. defense-related agency and MP Materials advanced a public-private partnership to accelerate domestic rare-earth magnet capability; on 15 Jul 2025, MP Materials and Apple announced a US$500 million partnership centered on recycled rare-earth magnets; on 9 Oct 2025, China’s Notice No. 61 expanded export controls to specified rare-earth items and products containing rare-earth permanent magnets, while late Oct 2025 saw Lynas announce investment to expand heavy rare-earth separation capacity in Malaysia. For humanoid programs, the

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implication is clear: dual-sourcing, localization, and recycling become design constraints, not afterthoughts. Growth concentrates in (i) integrated castings and thin-wall structural design (plus a measured shift toward magnesium as corrosion and quality stability mature), (ii) cleaner steels and longer-life raceway/gear surface engineering, and (iii) thinner electrical steel for high-frequency operation and magnet recipes that reduce heavy-rare-earth reliance while improving high-temperature stability.

This report is a detailed and comprehensive analysis for global Metal Materials for Humanoid Robots market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Metal Materials for Humanoid Robots market size and forecasts, in consumption value ($ Million), sales quantity (Tons), and average selling prices (US$/Ton), 2021-2032

Global Metal Materials for Humanoid Robots market size and forecasts by region and country, in consumption value ($ Million), sales quantity (Tons), and average selling prices (US$/Ton), 2021-2032

Global Metal Materials for Humanoid Robots market size and forecasts, by Type and by Application, in consumption value ($ Million), sales quantity (Tons), and average selling prices (US$/Ton), 2021-2032

Global Metal Materials for Humanoid Robots market shares of main players, shipments in revenue ($ Million), sales quantity (Tons), and ASP (US$/Ton), 2021-2026

The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries
To assess the growth potential for Metal Materials for Humanoid Robots
To forecast future growth in each product and end-use market
To assess competitive factors affecting the marketplace

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This report profiles key players in the global Metal Materials for Humanoid Robots market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Baoji Titanium Industry, Baowu, Western Superconducting Technologies, Jiangsu Tiangong Technology, CNPC Powder, Tangshan Weihao Magnesium Powder, Shanghai Yongmaotai Automotive Technology, Lizhong Sitong Light Alloys Group, Anhui Shiny Electronic Technology, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Market Segmentation

Metal Materials for Humanoid Robots market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Type

Alloy Steel

Aluminum Alloy

Magnesium Alloy

Titanium Alloy

NdFeB Rare Earth Permanent Magnet

Others

Market segment by Industry

Industrial

Logistics

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Medical

Research

Household

Others

Market segment by Application

Biped Humanoid Robot

Wheeled Humanoid Robot

Major players covered

Baoji Titanium Industry

Baowu

Western Superconducting Technologies

Jiangsu Tiangong Technology

CNPC Powder

Tangshan Weihao Magnesium Powder

Shanghai Yongmaotai Automotive Technology

Lizhong Sitong Light Alloys Group

Anhui Shiny Electronic Technology

Market segment by region, regional analysis covers

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North America (United States, Canada, and Mexico)
Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)
Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)
South America (Brazil, Argentina, Colombia, and Rest of South America)
Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe Metal Materials for Humanoid Robots product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Metal Materials for Humanoid Robots, with price, sales quantity, revenue, and global market share of Metal Materials for Humanoid Robots from 2021 to 2026.

Chapter 3, the Metal Materials for Humanoid Robots competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Metal Materials for Humanoid Robots breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Type and by Application, with sales market share and growth rate by Type, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026.and Metal Materials for Humanoid Robots market forecast, by regions, by Type, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of Metal Materials for Humanoid Robots.

Chapter 14 and 15, to describe Metal Materials for Humanoid Robots sales channel,

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distributors, customers, research findings and conclusion.

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