

# **Battery Structural Part Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented, By Type (Battery Housing, Cover Plates, Connecting Parts, and Others), By Application (Electric Vehicles, Energy Storage Systems, and Consumer Electronics), By Battery Type (Lithium-Ion Batteries, Lead-Acid Batteries, Nickel-Metal Hydride Batteries, Solid-State Batteries, Others), By Region, By Competition, 2020-2030F**

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## **Abstracts**

### Market Overview

The Battery Structural Part Market was valued at USD 12.97 Billion in 2024 and is expected to reach USD 21.94 Billion by 2030 with a CAGR of 8.99%. The battery structural part market refers to the industry focused on the design, production, and supply of essential components that form the physical framework and protective casing of batteries, particularly in advanced energy storage systems such as those used in electric vehicles, renewable energy storage, consumer electronics, and industrial applications. These structural parts include battery trays, housings, enclosures, end plates, frames, and cooling plates that ensure the mechanical stability, thermal management, safety, and overall performance of the battery pack.

Unlike the electrochemical elements of a battery, structural parts play a vital role in integrating cells into modules and packs while withstanding mechanical stress, vibration, and environmental challenges such as temperature fluctuations and potential impacts. The market is heavily influenced by the rapid expansion of the electric vehicle

industry, where lightweight and durable structural components made from aluminum, steel, carbon fiber composites, and advanced polymers are increasingly in demand to enhance vehicle efficiency, improve energy density, and comply with stringent safety regulations.

Beyond the automotive sector, battery structural parts are critical in stationary energy storage systems, where large-scale installations for grid stabilization and renewable energy integration require robust frameworks to house high-capacity batteries. The industry also supports applications in aerospace, marine, and industrial equipment, where reliability, weight optimization, and heat dissipation are crucial for effective performance. As global demand for sustainable energy and electrification rises, manufacturers are investing in advanced materials, precision manufacturing technologies, and innovative designs to meet evolving requirements for safety, efficiency, and sustainability.

## Key Market Drivers

### Rising Adoption of Electric Vehicles (EVs) and Energy Storage Systems

The increasing global adoption of electric vehicles (EVs) and large-scale energy storage systems represents one of the most powerful growth drivers for the battery structural part market, as the structural components play a critical role in ensuring safety, efficiency, and durability of modern battery systems. With governments across the world setting ambitious targets for zero-emission mobility and offering incentives to accelerate EV adoption, demand for high-performance batteries has grown exponentially, creating a parallel need for advanced housings, trays, frames, and covers that provide stability and protection.

Battery structural parts must not only hold multiple cells securely but also offer crash resistance, vibration absorption, and heat dissipation capabilities, making them indispensable to vehicle safety and efficiency. As EV manufacturers push for longer driving ranges and lighter vehicle bodies, there is a strong emphasis on developing battery structural components from lightweight materials such as aluminum alloys, magnesium, and high-strength composites that reduce weight without compromising strength. This transition toward lighter, more compact, and safer battery structures significantly enhances the competitiveness of structural part manufacturers.

In addition, the surge in renewable energy adoption has fueled growth in grid-scale energy storage projects, where battery structural parts are required to support large

arrays of lithium-ion cells in demanding environments. Such applications demand scalable, modular, and corrosion-resistant structures to ensure long operational life under varying climatic conditions. Beyond functionality, structural integrity also influences thermal management, ensuring consistent battery performance and reducing fire risks, which is a crucial factor as regulators tighten safety norms.

With automotive giants, battery manufacturers, and energy firms investing heavily in next-generation gigafactories and battery pack assembly plants, the demand for innovative structural solutions has intensified. Moreover, collaborations between automakers and materials science companies are accelerating the commercialization of novel structural designs that reduce manufacturing costs while improving safety standards. In this context, the battery structural part market benefits directly from the expanding EV supply chain and the rising adoption of energy storage solutions, as both industries rely on optimized structural frameworks for reliable performance.

The evolution of solid-state batteries further opens opportunities for specialized structures capable of accommodating new chemistries and configurations, requiring advanced designs beyond traditional housings. Overall, the rapid acceleration of EV and energy storage deployment ensures that battery structural parts remain a mission-critical component, with sustained demand projected as global electrification gains momentum. Global electric vehicle sales surpassed 14 million units in 2023, reflecting more than 15% of total vehicle sales worldwide. The number of EVs on the road globally has crossed 40 million units, with projections to reach over 200 million units by 2030. Energy storage system installations exceeded 100 GW of capacity in 2023, supporting both grid-scale and distributed energy applications. Lithium-ion batteries account for over 90% of global EV and energy storage deployments. Demand for EV batteries is expected to exceed 3,000 GWh annually by 2030. More than 50 countries have announced policies or targets to phase out internal combustion engine vehicles within the next two decades. Global investment in battery manufacturing facilities and gigafactories has surpassed USD 100 billion annually, reflecting the scale of EV and energy storage adoption.

## Key Market Challenges

### High Manufacturing Costs and Material Constraints

One of the most pressing challenges in the battery structural part market is the high cost of manufacturing and the constraints related to sourcing suitable materials, which directly impact scalability and profitability for producers. Battery structural parts such as

trays, housings, and frames need to provide durability, thermal stability, and lightweight properties, which often require advanced materials like aluminum alloys, carbon composites, and high-strength steels. While these materials meet performance expectations, they are costly, and their prices are subject to global supply fluctuations, making it difficult for manufacturers to control production costs consistently.

Additionally, the complex fabrication processes required—such as precision casting, stamping, extrusion, or molding—demand significant investment in advanced machinery, skilled labor, and strict quality assurance systems. The push towards lighter electric vehicle (EV) batteries amplifies these challenges, as automakers expect suppliers to deliver cost-effective yet structurally strong parts that comply with safety and performance standards. Further, geopolitical uncertainties, trade restrictions, and volatility in raw material markets create supply chain risks that hinder cost predictability.

For smaller or mid-sized component manufacturers, entering the market becomes even more difficult, as economies of scale heavily favor large established players who can absorb fluctuations in costs. Another dimension of this challenge is the growing demand for sustainable materials and eco-friendly production processes, which require manufacturers to invest in research and development, recycling technologies, and green certifications, further adding to cost pressures. The balance between achieving lightweight designs, ensuring mechanical integrity, and keeping costs under control represents a delicate trade-off.

Companies unable to manage these pressures risk losing competitiveness as automakers and energy storage providers increasingly prioritize suppliers who can guarantee quality, consistency, and cost efficiency at scale. In the long run, failure to address material constraints and high production costs may slow down the widespread adoption of EVs and renewable storage systems, since structural components form a critical part of overall battery pack performance and affordability.

## Key Market Trends

### Shift Toward Lightweight Materials and Advanced Alloys

The battery structural part market is witnessing a significant trend toward the adoption of lightweight materials and advanced alloys as manufacturers aim to enhance energy efficiency, performance, and safety in electric vehicles and energy storage systems. The push for vehicle electrification has created a pressing need to reduce overall weight without compromising durability, prompting widespread use of aluminum alloys,

magnesium composites, and high-strength carbon fiber-reinforced plastics in battery enclosures, trays, and frames.

These materials not only decrease vehicle weight but also enhance thermal stability and mechanical protection, ensuring that battery packs remain safe under extreme conditions such as collisions, vibrations, or high-temperature operations. The transition from traditional heavy steel structures to innovative lightweight alternatives is reshaping supply chains and encouraging partnerships between battery manufacturers, automakers, and material science companies.

Furthermore, advanced manufacturing technologies such as die-casting, additive manufacturing, and precision stamping are being integrated into production to achieve high dimensional accuracy and scalability, reducing costs while improving structural integrity. Environmental sustainability is also a driving factor in this trend, as recyclable and eco-friendly materials are increasingly prioritized to align with global carbon reduction goals. Governments and regulatory authorities are pressuring automotive OEMs to achieve stricter emission targets, which further accelerates the use of lighter structural components.

Additionally, aerospace and defense industries are beginning to adopt similar battery structural innovations, reinforcing the market's trajectory toward material efficiency. The ongoing research and development in nanostructured composites and hybrid alloys is expected to expand the performance capabilities of structural parts, offering benefits such as corrosion resistance, higher load-bearing capacity, and longer product lifecycle.

As the demand for electric mobility surges, especially in regions with strong EV adoption, the reliance on lightweight structural parts will continue to shape competitive differentiation in the market. Companies that can scale production of advanced lightweight solutions while maintaining cost competitiveness are poised to capture substantial market share. In the coming years, the lightweight material trend is set to transform not just the physical characteristics of battery packs but also redefine design possibilities, paving the way for more compact, energy-dense, and safer energy storage solutions across multiple industries.

### Key Market Players

Contemporary Amperex Technology Co. Limited (CATL)

Panasonic Corporation

LG Chem Ltd.

Samsung SDI Co., Ltd.

BYD Company Limited

Tesla, Inc.

A123 Systems LLC

Johnson Controls International plc

Saft Groupe S.A.

GS Yuasa Corporation

#### Report Scope:

In this report, the Global Battery Structural Part Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

#### Battery Structural Part Market, By Type:

Battery Housing

Cover Plates

Connecting Parts

Others

#### Battery Structural Part Market, By Application:

Electric Vehicles

Energy Storage Systems

## Consumer Electronics

### Battery Structural Part Market, By Battery Type:

Lithium-Ion Batteries

Lead-Acid Batteries

Nickel-Metal Hydride Batteries

Solid-State Batteries

Others

### Battery Structural Part Market, By Region:

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia-Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Kuwait

Turkey

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the Global Battery Structural Part Market.

Available Customizations:

Global Battery Structural Part Market report with the given Market data, Tech Sci

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Research offers customizations according to a company's specific needs. The following customization options are available for the report:

#### Company Information

Detailed analysis and profiling of additional Market players (up to five).

## Contents

### **1. PRODUCT OVERVIEW**

- 1.1. Market Definition
- 1.2. Scope of the Market
  - 1.2.1. Markets Covered
  - 1.2.2. Years Considered for Study
- 1.3. Key Market Segmentations

### **2. RESEARCH METHODOLOGY**

- 2.1. Objective of the Study
- 2.2. Baseline Methodology
- 2.3. Formulation of the Scope
- 2.4. Assumptions and Limitations
- 2.5. Sources of Research
  - 2.5.1. Secondary Research
  - 2.5.2. Primary Research
- 2.6. Approach for the Market Study
  - 2.6.1. The Bottom-Up Approach
  - 2.6.2. The Top-Down Approach
- 2.7. Methodology Followed for Calculation of Market Size & Market Shares
- 2.8. Forecasting Methodology
  - 2.8.1. Data Triangulation & Validation

### **3. EXECUTIVE SUMMARY**

- 3.1. Overview of the Market
- 3.2. Overview of Key Market Segmentations
- 3.3. Overview of Key Market Players
- 3.4. Overview of Key Regions/Countries
- 3.5. Overview of Market Drivers, Challenges, and Trends

### **4. VOICE OF CUSTOMER**

### **5. GLOBAL BATTERY STRUCTURAL PART MARKET OUTLOOK**

- 5.1. Market Size & Forecast

- 5.1.1. By Value
- 5.2. Market Share & Forecast
  - 5.2.1. By Type (Battery Housing, Cover Plates, Connecting Parts, and Others)
  - 5.2.2. By Application (Electric Vehicles, Energy Storage Systems, and Consumer Electronics)
  - 5.2.3. By Battery Type (Lithium-Ion Batteries, Lead-Acid Batteries, Nickel-Metal Hydride Batteries, Solid-State Batteries, Others)
  - 5.2.4. By Region
- 5.3. By Company (2024)
- 5.4. Market Map

## **6. NORTH AMERICA BATTERY STRUCTURAL PART MARKET OUTLOOK**

- 6.1. Market Size & Forecast
  - 6.1.1. By Value
- 6.2. Market Share & Forecast
  - 6.2.1. By Type
  - 6.2.2. By Application
  - 6.2.3. By Battery Type
  - 6.2.4. By Country
- 6.3. North America: Country Analysis
  - 6.3.1. United States Battery Structural Part Market Outlook
    - 6.3.1.1. Market Size & Forecast
      - 6.3.1.1.1. By Value
    - 6.3.1.2. Market Share & Forecast
      - 6.3.1.2.1. By Type
      - 6.3.1.2.2. By Application
      - 6.3.1.2.3. By Battery Type
  - 6.3.2. Canada Battery Structural Part Market Outlook
    - 6.3.2.1. Market Size & Forecast
      - 6.3.2.1.1. By Value
    - 6.3.2.2. Market Share & Forecast
      - 6.3.2.2.1. By Type
      - 6.3.2.2.2. By Application
      - 6.3.2.2.3. By Battery Type
  - 6.3.3. Mexico Battery Structural Part Market Outlook
    - 6.3.3.1. Market Size & Forecast
      - 6.3.3.1.1. By Value
    - 6.3.3.2. Market Share & Forecast

- 6.3.3.2.1. By Type
- 6.3.3.2.2. By Application
- 6.3.3.2.3. By Battery Type

## **7. EUROPE BATTERY STRUCTURAL PART MARKET OUTLOOK**

- 7.1. Market Size & Forecast
  - 7.1.1. By Value
- 7.2. Market Share & Forecast
  - 7.2.1. By Type
  - 7.2.2. By Application
  - 7.2.3. By Battery Type
  - 7.2.4. By Country
- 7.3. Europe: Country Analysis
  - 7.3.1. Germany Battery Structural Part Market Outlook
    - 7.3.1.1. Market Size & Forecast
      - 7.3.1.1.1. By Value
    - 7.3.1.2. Market Share & Forecast
      - 7.3.1.2.1. By Type
      - 7.3.1.2.2. By Application
      - 7.3.1.2.3. By Battery Type
  - 7.3.2. United Kingdom Battery Structural Part Market Outlook
    - 7.3.2.1. Market Size & Forecast
      - 7.3.2.1.1. By Value
    - 7.3.2.2. Market Share & Forecast
      - 7.3.2.2.1. By Type
      - 7.3.2.2.2. By Application
      - 7.3.2.2.3. By Battery Type
  - 7.3.3. Italy Battery Structural Part Market Outlook
    - 7.3.3.1. Market Size & Forecast
      - 7.3.3.1.1. By Value
    - 7.3.3.2. Market Share & Forecast
      - 7.3.3.2.1. By Type
      - 7.3.3.2.2. By Application
      - 7.3.3.2.3. By Battery Type
  - 7.3.4. France Battery Structural Part Market Outlook
    - 7.3.4.1. Market Size & Forecast
      - 7.3.4.1.1. By Value
    - 7.3.4.2. Market Share & Forecast

- 7.3.4.2.1. By Type
- 7.3.4.2.2. By Application
- 7.3.4.2.3. By Battery Type
- 7.3.5. Spain Battery Structural Part Market Outlook
  - 7.3.5.1. Market Size & Forecast
    - 7.3.5.1.1. By Value
  - 7.3.5.2. Market Share & Forecast
    - 7.3.5.2.1. By Type
    - 7.3.5.2.2. By Application
    - 7.3.5.2.3. By Battery Type

## **8. ASIA-PACIFIC BATTERY STRUCTURAL PART MARKET OUTLOOK**

- 8.1. Market Size & Forecast
  - 8.1.1. By Value
- 8.2. Market Share & Forecast
  - 8.2.1. By Type
  - 8.2.2. By Application
  - 8.2.3. By Battery Type
  - 8.2.4. By Country
- 8.3. Asia-Pacific: Country Analysis
  - 8.3.1. China Battery Structural Part Market Outlook
    - 8.3.1.1. Market Size & Forecast
      - 8.3.1.1.1. By Value
    - 8.3.1.2. Market Share & Forecast
      - 8.3.1.2.1. By Type
      - 8.3.1.2.2. By Application
      - 8.3.1.2.3. By Battery Type
  - 8.3.2. India Battery Structural Part Market Outlook
    - 8.3.2.1. Market Size & Forecast
      - 8.3.2.1.1. By Value
    - 8.3.2.2. Market Share & Forecast
      - 8.3.2.2.1. By Type
      - 8.3.2.2.2. By Application
      - 8.3.2.2.3. By Battery Type
  - 8.3.3. Japan Battery Structural Part Market Outlook
    - 8.3.3.1. Market Size & Forecast
      - 8.3.3.1.1. By Value
    - 8.3.3.2. Market Share & Forecast

- 8.3.3.2.1. By Type
- 8.3.3.2.2. By Application
- 8.3.3.2.3. By Battery Type
- 8.3.4. South Korea Battery Structural Part Market Outlook
  - 8.3.4.1. Market Size & Forecast
    - 8.3.4.1.1. By Value
  - 8.3.4.2. Market Share & Forecast
    - 8.3.4.2.1. By Type
    - 8.3.4.2.2. By Application
    - 8.3.4.2.3. By Battery Type
- 8.3.5. Australia Battery Structural Part Market Outlook
  - 8.3.5.1. Market Size & Forecast
    - 8.3.5.1.1. By Value
  - 8.3.5.2. Market Share & Forecast
    - 8.3.5.2.1. By Type
    - 8.3.5.2.2. By Application
    - 8.3.5.2.3. By Battery Type

## **9. SOUTH AMERICA BATTERY STRUCTURAL PART MARKET OUTLOOK**

- 9.1. Market Size & Forecast
  - 9.1.1. By Value
- 9.2. Market Share & Forecast
  - 9.2.1. By Type
  - 9.2.2. By Application
  - 9.2.3. By Battery Type
  - 9.2.4. By Country
- 9.3. South America: Country Analysis
  - 9.3.1. Brazil Battery Structural Part Market Outlook
    - 9.3.1.1. Market Size & Forecast
      - 9.3.1.1.1. By Value
    - 9.3.1.2. Market Share & Forecast
      - 9.3.1.2.1. By Type
      - 9.3.1.2.2. By Application
      - 9.3.1.2.3. By Battery Type
  - 9.3.2. Argentina Battery Structural Part Market Outlook
    - 9.3.2.1. Market Size & Forecast
      - 9.3.2.1.1. By Value
    - 9.3.2.2. Market Share & Forecast

- 9.3.2.2.1. By Type
- 9.3.2.2.2. By Application
- 9.3.2.2.3. By Battery Type
- 9.3.3. Colombia Battery Structural Part Market Outlook
  - 9.3.3.1. Market Size & Forecast
    - 9.3.3.1.1. By Value
  - 9.3.3.2. Market Share & Forecast
    - 9.3.3.2.1. By Type
    - 9.3.3.2.2. By Application
    - 9.3.3.2.3. By Battery Type

## **10. MIDDLE EAST AND AFRICA BATTERY STRUCTURAL PART MARKET OUTLOOK**

- 10.1. Market Size & Forecast
  - 10.1.1. By Value
- 10.2. Market Share & Forecast
  - 10.2.1. By Type
  - 10.2.2. By Application
  - 10.2.3. By Battery Type
  - 10.2.4. By Country
- 10.3. Middle East and Africa: Country Analysis
  - 10.3.1. South Africa Battery Structural Part Market Outlook
    - 10.3.1.1. Market Size & Forecast
      - 10.3.1.1.1. By Value
    - 10.3.1.2. Market Share & Forecast
      - 10.3.1.2.1. By Type
      - 10.3.1.2.2. By Application
      - 10.3.1.2.3. By Battery Type
  - 10.3.2. Saudi Arabia Battery Structural Part Market Outlook
    - 10.3.2.1. Market Size & Forecast
      - 10.3.2.1.1. By Value
    - 10.3.2.2. Market Share & Forecast
      - 10.3.2.2.1. By Type
      - 10.3.2.2.2. By Application
      - 10.3.2.2.3. By Battery Type
  - 10.3.3. UAE Battery Structural Part Market Outlook
    - 10.3.3.1. Market Size & Forecast
      - 10.3.3.1.1. By Value

- 10.3.3.2. Market Share & Forecast
  - 10.3.3.2.1. By Type
  - 10.3.3.2.2. By Application
  - 10.3.3.2.3. By Battery Type
- 10.3.4. Kuwait Battery Structural Part Market Outlook
  - 10.3.4.1. Market Size & Forecast
    - 10.3.4.1.1. By Value
  - 10.3.4.2. Market Share & Forecast
    - 10.3.4.2.1. By Type
    - 10.3.4.2.2. By Application
    - 10.3.4.2.3. By Battery Type
- 10.3.5. Turkey Battery Structural Part Market Outlook
  - 10.3.5.1. Market Size & Forecast
    - 10.3.5.1.1. By Value
  - 10.3.5.2. Market Share & Forecast
    - 10.3.5.2.1. By Type
    - 10.3.5.2.2. By Application
    - 10.3.5.2.3. By Battery Type

## **11. MARKET DYNAMICS**

- 11.1. Drivers
- 11.2. Challenges

## **12. MARKET TRENDS & DEVELOPMENTS**

- 12.1. Merger & Acquisition (If Any)
- 12.2. Product Launches (If Any)
- 12.3. Recent Developments

## **13. COMPANY PROFILES**

- 13.1. Contemporary Amperex Technology Co. Limited (CATL)
  - 13.1.1. Business Overview
  - 13.1.2. Key Revenue and Financials
  - 13.1.3. Recent Developments
  - 13.1.4. Key Personnel/Key Contact Person
  - 13.1.5. Key Product/Services Offered
- 13.2. Panasonic Corporation

- 13.3. LG Chem Ltd.
- 13.4. Samsung SDI Co., Ltd.
- 13.5. BYD Company Limited
- 13.6. Tesla, Inc.
- 13.7. A123 Systems LLC
- 13.8. Johnson Controls International plc
- 13.9. Saft Groupe S.A.
- 13.10. GS Yuasa Corporation

## **14. STRATEGIC RECOMMENDATIONS**

## **15. ABOUT US & DISCLAIMER**

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