

# **Lithium Solid-State Battery Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Polymer-Based Solid-State Battery, Sulfide-Based Solid-State Battery, Oxide-Based Solid-State Battery), By Capacity (Below 20 mAh, 20 mAh – 500 mAh, Above 500 mAh), By Application (Consumer Electronics, Electric Vehicles, Energy Storage Systems, Medical Devices, Aerospace), By Region & Competition, 2020-2030F**

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## **Abstracts**

### Market Overview

The Global Lithium Solid-State Battery Market was valued at USD 2.83 billion in 2024 and is projected to grow at a CAGR of 28.67%, reaching USD 12.96 billion by 2030. Lithium solid-state batteries utilize solid electrolytes in place of traditional liquid or gel-based ones, offering notable advantages such as enhanced safety, higher energy density, longer cycle life, and reduced risk of leakage or fire. These characteristics make them especially well-suited for use in electric vehicles, consumer electronics, medical devices, and large-scale energy storage systems. As industries seek more efficient and reliable energy storage solutions, the demand for lithium solid-state batteries is expected to rise significantly across key application sectors.

### Key Market Drivers

Increasing Demand for Electric Vehicles Driving Adoption of Advanced Battery Technologies

The expansion of the electric vehicle (EV) sector is a central driver propelling the growth of the lithium solid-state battery market. Automakers are increasingly turning to next-generation battery technologies that can deliver greater safety and efficiency. Solid-state batteries, with their solid electrolytes, eliminate the fire hazards associated with liquid electrolytes, enhancing the safety profile of EVs. Furthermore, these batteries offer higher energy density, which allows for extended vehicle range—an important factor influencing consumer adoption. Their capability to support faster charging also addresses a major usability concern. Global emissions regulations and EV adoption incentives are compelling automotive manufacturers to accelerate investment in these technologies, aligning with future mandates such as the European Union's phase-out of internal combustion engine vehicles by 2035.

## Key Market Challenges

### High Manufacturing Costs and Scalability Constraints

A major barrier in the commercial adoption of lithium solid-state batteries is the high cost and technical complexity associated with their production. Manufacturing requires precise environments and materials—such as sulfide-, oxide-, or polymer-based solid electrolytes—that are costly and sensitive to ambient conditions like moisture. Specialized techniques, including thin-film deposition and inert atmosphere processing, further elevate capital and operational expenses. Moreover, the integration of solid electrolytes with lithium metal anodes presents engineering challenges, particularly in achieving consistent interfacial contact and avoiding dendritic growth. These issues reduce manufacturing yields and hinder scalability, delaying the cost competitiveness of solid-state batteries compared to conventional lithium-ion technologies.

## Key Market Trends

### Integration of Lithium Solid-State Batteries in Electric Mobility Ecosystem

A key trend reshaping the lithium solid-state battery market is the increasing investment in these technologies for electric mobility applications. Solid-state batteries offer advantages that align with the evolving requirements of the automotive industry, including improved safety, extended range, and faster charging. Major vehicle manufacturers like Toyota, Volkswagen, and Hyundai are actively pursuing solid-state battery development through in-house R&D and partnerships with battery innovators. For example, Toyota is targeting commercialization of solid-state batteries for hybrid

vehicles by 2027. These batteries are projected to enhance vehicle range by up to 50% while significantly reducing charging times. As the global push for zero-emission transportation intensifies, the integration of solid-state batteries into EV platforms is expected to accelerate rapidly.

### Key Market Players

QuantumScape Corporation

Solid Power Inc.

Toyota Motor Corporation

Samsung SDI Co., Ltd.

LG Energy Solution Ltd.

Panasonic Holdings Corporation

Iluka plc

ProLogium Technology Co., Ltd.

SK Innovation Co., Ltd.

Hitachi Zosen Corporation

### Report Scope:

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

### Lithium Solid-State Battery Market, By Type:

Polymer-Based Solid-State Battery

Sulfide-Based Solid-State Battery

Oxide-Based Solid-State Battery

Lithium Solid-State Battery Market, By Capacity:

Below 20 mAh

20 mAh – 500 mAh

Above 500 mAh

Lithium Solid-State Battery Market, By Application:

Consumer Electronics

Electric Vehicles

Energy Storage Systems

Medical Devices

Aerospace

Lithium Solid-State Battery Market, By Region:

North America

United States

Canada

Mexico

Europe

Germany

France

United Kingdom

Italy

Spain

South America

Brazil

Argentina

Colombia

Asia-Pacific

China

India

Japan

South Korea

Australia

Middle East & Africa

Saudi Arabia

UAE

South Africa

## Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Lithium Solid-State Battery Market.

## Available Customizations:

Global Lithium Solid-State Battery Market report with the given market data, TechSci 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).

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