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Global Battery Pack Liquid Cooling Plate Market 2025 by Manufacturers, Regions, Type and Application, Forecast to 2031

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Abstracts

According to our (Global Info Research) latest study, the global Battery Pack Liquid Cooling Plate market size was valued at US$ 2003 million in 2024 and is forecast to a readjusted size of USD 8374 million by 2031 with a CAGR of 21.1% during review period.

In this report, we will assess the current U.S. tariff framework alongside international policy adaptations, analyzing their effects on competitive market structures, regional economic dynamics, and supply chain resilience.

A battery cooling plate is a critical component in battery thermal management systems, typically constructed from high thermal conductivity materials (e.g., aluminum alloy, copper alloy, or composites). It incorporates internal flow channels to circulate cooling media (e.g., liquid or phase-change materials), enabling precise temperature control. Key functions include:

Heat Dissipation: Rapidly removing heat generated during battery charging/discharging to prevent thermal runaway;

Temperature Uniformity: Ensuring even temperature distribution across battery cells to avoid localized overheating;

Heating (in specific scenarios): Pre-warming batteries in low-temperature environments to maintain optimal operating temperatures (e.g., 20–35°C).

Widely used in new energy vehicle (NEV) batteries, energy storage systems (ESS), and

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high-density server backup power systems, it is a core technology for enhancing battery safety, efficiency, and lifespan.

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Current Applications

1. New Energy Vehicles (NEVs)

Liquid Cooling Dominance: Liquid cooling plates are widely adopted in NEVs (e.g., BEVs, PHEVs) due to their high heat dissipation efficiency, ensuring optimal battery temperature (20–35°C) and preventing thermal runaway. Aluminum-based designs (stamped, extruded) dominate the market, with key players like Valeo, MAHLE, and Modine leading innovation.

Integration with Battery Systems: Advanced designs like CTP (Cell-to-Pack) and CTC (Cell-to-Chassis) integrate cooling plates into structural components (e.g., CATL’s 'Qilin Battery'), enhancing energy density and thermal uniformity.

3. Energy Storage Systems (ESS)

Immersion Cooling Breakthrough: Immersion liquid cooling (e.g., Zhuhai KeChuang’s

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system in the Meizhou Baohu ESS project) submerges batteries in non-conductive coolant, eliminating fire risks and improving thermal consistency. This technology is now deployed in grid-scale projects in China.

Safety and Efficiency: Liquid cooling replaces air cooling in large-scale ESS due to its ability to manage high heat loads and extend battery lifespan.

3. Data Centers/Servers

High-Density Cooling: Immersion cooling systems (e.g., Narada Power's solid-state batteries, NARADA's 783 Ah cells) are used in data centers to address lithium-ion battery thermal risks during high-density operations. These systems reduce footprint by 50% and enable AI-driven predictive maintenance.

Safety Innovations: Semi-solid-state batteries and in-situ electrolyte film technologies mitigate leakage risks while maintaining high energy density (e.g., 430 Wh/L)

Future Trends

1. Lightweight & High Thermal Conductivity Materials: Adoption of aluminum composites, graphene coatings, or 3D-printed structures to optimize weight and heat dissipation.

2. Integrated Design: Deep integration with battery modules (e.g., CTP/CTC technologies) to reduce complexity and improve space efficiency.

3. Smart Thermal Management: AI-driven control systems with sensors enable dynamic zonal temperature regulation, supporting ultra-fast charging (e.g., 800V platforms) and extreme conditions.

4. Sustainability: Shift toward recyclable materials and eco-friendly coolants (e.g., propylene glycol replacing ethylene glycol).

5. Multifunctional Systems: Synergy with heat pumps to reuse energy for both battery heating (in winter) and cooling (in summer).

6. Cost Reduction via Scale: Automated and standardized manufacturing processes will lower costs as NEV adoption accelerates globally.

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Currently, the world's major manufacturers include Valeo, MAHLE, Yinlun Holdings, Sanhua Auto Parts, Nabaichuan, Dana, Boyd Corporation, Cotran, Modine Manufacturing, ESTRA Automotive, ONEGENE, Hubei Reddit Cooling System, Trumony Aluminum, Runthrough Heat Exchange, Shenzhen FRD, XD THERMAL, Anhui ARN Group, Hengchuang Thermal Management, Sogefi Group, Nippon Light Metal, etc. In 2024, the market share of major manufacturers will exceed 60%. It is expected that industry competition will become more intense in the next few years, especially in the Chinese market.

This report is a detailed and comprehensive analysis for global Battery Pack Liquid Cooling Plate 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 Battery Pack Liquid Cooling Plate market size and forecasts, in consumption value ($ Million), sales quantity (K Sets), and average selling prices (US$/Set), 2020-2031

Global Battery Pack Liquid Cooling Plate market size and forecasts by region and country, in consumption value ($ Million), sales quantity (K Sets), and average selling prices (US$/Set), 2020-2031

Global Battery Pack Liquid Cooling Plate market size and forecasts, by Type and by Application, in consumption value ($ Million), sales quantity (K Sets), and average selling prices (US$/Set), 2020-2031

Global Battery Pack Liquid Cooling Plate market shares of main players, shipments in revenue ($ Million), sales quantity (K Sets), and ASP (US$/Set), 2020-2025

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 Battery Pack Liquid Cooling Plate

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To forecast future growth in each product and end-use market

To assess competitive factors affecting the marketplace

This report profiles key players in the global Battery Pack Liquid Cooling Plate 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 Valeo, Dana, MAHLE, Modine Manufacturing, Boyd Corporation, Nippon Light Metal, ESTRA Automotive, Sogefi Group, ONEGENE, Nabaichuan Holding, etc.

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

Market Segmentation

Battery Pack Liquid Cooling Plate market is split by Type and by Application. For the period 2020-2031, 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

Harmonica Tube Type

Stamping Type

Inflatable Type

Market segment by Application

New Energy Vehicles (NEVs)

Energy Storage Systems (ESS)

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Data Centers/Servers

Major players covered

Valeo

Dana

MAHLE

Modine Manufacturing

Boyd Corporation

Nippon Light Metal

ESTRA Automotive

Sogefi Group

ONEGENE

Nabaichuan Holding

Runthrough Heat Exchange

Yinlun

Sanhua Group

Cotran

Trumony Aluminum

Hubei Reddit Cooling System

Shenzhen FRD

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Anhui ARN Group

XD THERMAL

Hengchuang Thermal Management

Market segment by region, regional analysis covers

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 Battery Pack Liquid Cooling Plate product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Battery Pack Liquid Cooling Plate, with price, sales quantity, revenue, and global market share of Battery Pack Liquid Cooling Plate from 2020 to 2025.

Chapter 3, the Battery Pack Liquid Cooling Plate competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Battery Pack Liquid Cooling Plate breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2020 to 2031.

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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 2020 to 2031.

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 2020 to 2025.and Battery Pack Liquid Cooling Plate market forecast, by regions, by Type, and by Application, with sales and revenue, from 2026 to 2031.

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 Battery Pack Liquid Cooling Plate.

Chapter 14 and 15, to describe Battery Pack Liquid Cooling Plate sales channel, distributors, customers, research findings and conclusion.

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