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Global Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets 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 Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets market size was valued at US$ 100 million in 2025 and is forecast to a readjusted size of US$ 233 million by 2032 with a CAGR of 12.6% during review period.

In 2025, global Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets sales reached approximately 103 K Sqm with an average global market price of around 945 USD per Sqm.

Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets are sheet-form thermal management materials that use hexagonal boron nitride, platelet boron nitride, modified boron nitride, or boron-nitride-based composite fillers as the main thermally conductive phase, combined with silicone rubber, epoxy resin, polyimide, polyurethane, acrylic resin, or other polymer matrices. Their core feature is the ability to provide efficient in-plane or through-plane heat transfer while maintaining electrical insulation, dielectric strength, and dielectric stability. They are used to fill microscopic gaps between electronic components, power modules, battery assemblies, heat sinks, housings, and structural parts, thereby reducing interface thermal resistance and improving system-level thermal reliability. Compared with graphite sheets and metallic thermal sheets, boron nitride-based sheets offer stronger electrical insulation, heat resistance, chemical stability, and low dielectric loss. Compared with conventional alumina- or aluminum-hydroxide-filled thermal pads, they offer higher value in high-thermal-conductivity, lightweight, and high-frequency electronic applications. Major

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applications include EV power electronics, power semiconductors, communication base stations, AI servers, battery packs, LEDs, consumer electronics, industrial power supplies, and high-end electrically insulating thermal structures.

The gross margin of Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets can generally be estimated at 30%–60%. Standard silicone- or resin-based boron nitride thermal sheets, regular insulating pads, and mid-to-low thermal conductivity grades are usually in the 30%–45% range. High-filler-loading, highly oriented, high-dielectric-strength, low-dielectric-loss, low-volatility, low-bleeding, low-compression-set, automotive-grade, or semiconductor-grade products can reach 45%–60%, due to higher requirements for formulation design, filler dispersion, interface modification, calendaring, sheet forming, and reliability validation. The upstream value chain includes boron sources, nitrogen sources, hexagonal boron nitride powder, modified boron nitride, silicone rubber, epoxy, polyimide, coupling agents, flame retardants, release films, and precision coating or calendaring equipment. The midstream covers particle-size control, surface modification, filler orientation, compounding and dispersion, sheet forming, thickness control, die cutting, adhesive backing, dielectric strength testing, and thermal conductivity testing. Downstream applications include power semiconductors, electric vehicles, energy storage, AI servers, communication equipment, LED displays and lighting, consumer electronics, and industrial control systems. Profitability mainly depends on boron nitride powder grade, filler loading level, thermal conductivity, dielectric strength, customer qualification cycle, batch consistency, and access to high-reliability electronics supply chains.

Market Development Opportunities & Main Driving Factors

The growth of Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets is driven by the simultaneous need for heat dissipation and electrical insulation in high-power-density electronic systems. Electric vehicles, electric drive systems, charging modules, energy storage inverters, power semiconductors, communication equipment, and AI servers are all increasing power density, requiring materials that can conduct heat, isolate current, reduce breakdown risk, and withstand long-term thermal cycling. Public energy and industrial policies continue to emphasize electrification, energy efficiency, and data-center energy optimization, pushing high-reliability thermal materials from auxiliary components toward key elements of system safety and performance design. The IEA’s continued tracking of electric vehicles and battery supply chains shows that electrification remains an important foundation for power electronics and thermal management demand, while the U.S. Department of Energy has identified data-center electricity demand growth and AI workload changes as key

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energy-system issues. Against this backdrop, boron nitride-based sheets with high thermal conductivity, electrical insulation, low dielectric loss, and processability are well positioned to penetrate high-end electronics, new energy, and high-frequency communication applications.

Market Challenges, Risks, & Restraints

The main challenge in this industry lies in the trade-off between material properties. Higher boron nitride loading improves thermal conductivity, but may reduce sheet flexibility, weaken interface adhesion, increase processing difficulty, and raise material cost. When high dielectric strength is required, manufacturers must also control porosity, impurities, thickness uniformity, and long-term aging stability. High-end customers typically require materials to meet thermal conductivity, dielectric strength, flame retardancy, compression recovery, weather resistance, low volatility, low ionic contamination, and long-term reliability requirements at the same time, leading to long qualification cycles. In addition, alumina, aluminum nitride, graphite, silicone thermal pads, phase-change materials, and metal-based TIMs remain competitive alternatives in different use cases. If end customers prioritize cost over electrically insulating high-thermal performance, the penetration of boron nitride-based sheets may be constrained. Future competition will shift from simple thermal conductivity comparison to integrated capability in powder modification, composite structure design, thickness precision, reliability validation, and customer co-development.

Downstream Demand Trends

Downstream demand will evolve toward higher dielectric strength, higher thermal conductivity, thinner profiles, lower dielectric loss, and stronger customization. Electric vehicle and energy storage customers will place greater emphasis on electrical isolation and thermal safety in battery packs, BMS, power control units, onboard chargers, DC-DC converters, inverters, and power modules. AI server and communication equipment customers will focus more on heat spreading and insulation protection in high-density boards, power modules, RF devices, and high-speed computing units. LED displays, Mini/Micro LED, and consumer electronics will require thinner, lighter, easier-to-die-cut insulating thermal sheets that are more compatible with automated assembly. As data-center energy demand, vehicle electrification, and high-frequency high-speed electronics continue to develop, customer purchasing logic will shift from single-material unit price to a comprehensive assessment of thermal conductivity, insulation, reliability, assembly efficiency, and system safety. Suppliers with high-quality boron nitride powder control, orientation-based composite processing, stable mass-production capability, and

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end-customer qualification experience will be better positioned to enter high-end application chains.

This report is a detailed and comprehensive analysis for global Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets 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 Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets market size and forecasts, in consumption value ($ Million), sales quantity (K Sqm), and average selling prices (US$/Sq m), 2021-2032

Global Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets market size and forecasts by region and country, in consumption value ($ Million), sales quantity (K Sqm), and average selling prices (US$/Sq m), 2021-2032

Global Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets market size and forecasts, by Type and by Application, in consumption value ($ Million), sales quantity (K Sqm), and average selling prices (US$/Sq m), 2021-2032

Global Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets market shares of main players, shipments in revenue ($ Million), sales quantity (K Sqm), and ASP (US$/Sq m), 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 Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets

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

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To assess competitive factors affecting the marketplace

This report profiles key players in the global Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets 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 Mitsubishi Chemical, Denka, Bando Chemical Industries, Dexerials, Qnity Electronics,, Guangdong Surpons Technology, Dongguan U-Sheen, Ziitek, RISHO KOGYO, Huasee Electronic Technology, etc.

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

Market Segmentation

Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets 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

Epoxy Composite

Silicone Composite

Polyimide Composite

PDMS Composite

Others

Market segment by BN Functional Phase

h-BN Platelet Filler

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Agglomerated BN Filler

2D BN Nanosheets

Oriented BN Filler Network

Others

Market segment by Thermal Conductivity Grade

Standard Grade (12 W/mK)

Market segment by Manufacturing Process

Tape Casting

Hot-Pressing

Others

Market segment by Application

EV & Transportation

Telecommunications & ICT

Semiconductors & Microelectronics

Industrial Energy & Power

Aerospace & Defense

Others

Major players covered

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Mitsubishi Chemical

Denka

Bando Chemical Industries

Dexerials

Qnity Electronics,

Guangdong Surpons Technology

Dongguan U-Sheen

Ziitek

RISHO KOGYO

Huasee Electronic Technology

Yamamura Photonics

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:

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Chapter 1, to describe Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets, with price, sales quantity, revenue, and global market share of Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets from 2021 to 2026.

Chapter 3, the Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets 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 Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets 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 Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets.

Chapter 14 and 15, to describe Boron Nitride-Based Electrically Insulating Thermally Conductive Sheets sales channel, distributors, customers, research findings and conclusion.

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