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Global BN-Based Thermally Conductive Insulating 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 BN-Based Thermally Conductive Insulating 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 BN-Based Thermally Conductive Insulating Sheets sales reached approximately 103 K Sqm with an average global market price of around 945 USD per Sqm.

BN-Based Thermally Conductive Insulating Sheets are sheet-type thermal management materials in which hexagonal boron nitride powder, BN platelets, spherical or agglomerated BN, or BN-based composite fillers serve as the key thermally conductive functional phase. These fillers are compounded with silicone rubber, silicone gel, polyimide, epoxy, acrylic resin, or other polymer matrices to form electrically insulating thermal interface sheets. The product combines thermal conductivity, electrical insulation, low dielectric loss, heat resistance, and dimensional stability, and is mainly used to create stable heat-dissipation paths for power devices, battery modules, semiconductor packages, telecom equipment, servers, LEDs, automotive electronics, and high-frequency electronic components while avoiding short-circuit risks. Compared with conventional alumina-filled silicone thermal pads, BN-based materials are more suitable for applications requiring higher insulation, higher thermal conductivity, lower dielectric loss, or high-frequency performance. Compared with graphite sheets, their main advantage lies in electrical insulation and tunable anisotropic thermal design.

The typical production process of BN-based thermally conductive insulating sheets

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includes BN powder preparation or selection, surface modification, high-dispersion mixing, calendaring, coating, hot pressing or composite forming, curing, slitting or die-cutting, and reliability testing. The core barriers are BN particle size and morphology control, platelet orientation design, high-filler loading dispersion, interfacial bonding, thickness tolerance, dielectric strength, flexibility, and long-term thermal aging stability. Gross margins are generally higher than those of standard silicone thermal pads: standard BN-filled thermal insulating sheets are typically around 30%–45%; high-conductivity, low-dielectric, low-volatility, or customized die-cut products for power semiconductors, EVs, servers, and 5G high-frequency applications are usually around 40%–60%; small-volume high-end products using high-purity BN, spherical BN, oriented BN, or reinforced composite structures may achieve even higher margins, but with higher R&D costs and longer qualification cycles. The upstream chain includes boron sources, nitrogen sources, high-purity BN powders, silicone rubber or resins, release films, glass fiber or PI reinforcement films, and additives. Midstream activities include formulation, composite forming, and precision die-cutting. Downstream applications include semiconductor packaging, traction batteries, energy storage, automotive electronics, power modules, telecom equipment, servers, and industrial electronics.

Market Development Opportunities & Main Driving Factors

The market opportunity for BN-based thermally conductive insulating sheets is driven by the simultaneous demand for thermal conductivity, insulation, and reliability in high-power electronics, electrification, and high-frequency high-speed electronic systems. EV battery packs, onboard chargers, inverters, DC-DC converters, SiC/GaN power modules, AI servers, data-center power supplies, 5G telecom equipment, high-frequency PCBs, and advanced packaging are all pushing thermal insulating materials toward higher performance. The IEA's Global EV Outlook 2025 shows that global electric car sales rose by 35% year-on-year in the first quarter of 2025 and are expected to exceed 20 million units for the full year; the IEA's Energy and AI report also projects global data-center electricity consumption to reach around 945 TWh by 2030, nearly doubling. The expansion of electric vehicles and AI data centers is elevating thermal management materials from auxiliary consumables to key materials for system reliability, and BN-based sheets are gaining stronger attention in high-end thermal interface materials due to their electrical insulation, low dielectric loss, and thermal stability.

Market Challenges, Risks, & Restraints

The main challenges in this market are the high cost of performance-grade BN

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powders, relatively concentrated high-quality filler supply, processing difficulty, and long customer qualification cycles. BN has a platelet structure and anisotropic thermal conductivity, so insufficient control of orientation, filler loading, and surface modification can lead to inadequate through-plane conductivity, reduced flexibility, higher processing viscosity, or sheet brittleness. Compared with conventional fillers such as alumina and zinc oxide, BN is more expensive, which limits penetration in low-to-mid-end consumer electronics and standard power supply markets. High-end automotive electronics, servers, semiconductor packaging, and power-module customers usually require long-cycle reliability validation, including thermal cycling, dielectric withstand testing, flame retardancy, low volatility, low ionic contamination, and batch consistency. This makes rapid scaling difficult for new entrants even when sample-level capability is available. Future competition will focus on powder morphology, composite structure, low-dielectric design, thin-form-factor processing, automated placement compatibility, and joint development capability with key customers.

Downstream Demand Trends

Downstream demand is shifting from standard thermal pads toward high-performance thermally conductive insulating composites, low-dielectric thermal sheets, flexible ceramic composite sheets, and power-device-specific thermal interface materials. Consumer electronics remains the volume base, while faster-growing demand is coming from EVs, energy storage, photovoltaic inverters, server power supplies, AI accelerator cards, telecom base stations, millimeter-wave and high-frequency circuits, and advanced packaging. 3M highlights BN cooling fillers as a way to improve polymer thermal conductivity while maintaining electrical insulation, and Saint-Gobain emphasizes that BN can enhance both dielectric and thermal performance in composites, indicating that BN-based materials are evolving from single-purpose thermal fillers into integrated solutions for high-frequency electronics, thermal management, and insulation reliability. Future customers will focus more on high through-plane thermal conductivity, low compression stress, low dielectric loss, low siloxane outgassing, high dielectric breakdown voltage, heat-aging resistance, and precision die-cut capability. Product forms are expected to expand from standard sheets to large-format battery gap pads, insulating thermal sheets for power modules, low-loss 5G thermal sheets, and semiconductor packaging heat-spreading composites.

This report is a detailed and comprehensive analysis for global BN-Based Thermally Conductive Insulating 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

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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 BN-Based Thermally Conductive Insulating Sheets market size and forecasts, in consumption value ($ Million), sales quantity (K Sqm), and average selling prices (US$/Sq m), 2021-2032

Global BN-Based Thermally Conductive Insulating 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 BN-Based Thermally Conductive Insulating 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 BN-Based Thermally Conductive Insulating 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 BN-Based Thermally Conductive Insulating Sheets

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 BN-Based Thermally Conductive Insulating 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

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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

BN-Based Thermally Conductive Insulating 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

Agglomerated BN Filler

2D BN Nanosheets

Oriented BN Filler Network

Others

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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

Mitsubishi Chemical

Denka

Bando Chemical Industries

Dexerials

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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:

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

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

Chapter 3, the BN-Based Thermally Conductive Insulating Sheets competitive situation,

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sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the BN-Based Thermally Conductive Insulating 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 BN-Based Thermally Conductive Insulating 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 BN-Based Thermally Conductive Insulating Sheets.

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

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