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Superhard Materials Market Forecasts to 2032 – Global Analysis By Material (Diamond, Cubic Boron Nitride (CBN), Boron Carbide and Other Materials), Form (Monocrystalline, Polycrystalline, Composite and Other Forms), Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Superhard Materials Market is accounted for $6.70 billion in 2025 and is expected to reach $10.55 billion by 2032 growing at a CAGR of 6.7% during the forecast period. Superhard materials are a class of substances characterized by their exceptional hardness, typically defined as having Vickers hardness greater than 40 gigapascals (GPa). These materials are highly prized for their resistance to wear, deformation, and extreme pressures. They include natural diamond, cubic boron nitride (c-BN), and more recent synthetic compounds like boron suboxide (B?O) and polycrystalline diamond composites. Moreover, the development of new superhard ceramics and nanostructured materials is also being fueled by ongoing advances in material science, with the goal of outperforming natural diamond in terms of price, chemical reactivity, and thermal stability.

According to the Superhard Materials Branch of the China Machine Tool and Tool Industry Association, the industrial superhard materials industry in China achieved a total output value of ?15.53 billion in 2023, an increase of 5.07 percent year-on-year, and is projected to reach ?16.32 billion in 2024 and ?17.15 billion in 2025.

Market Dynamics:

Driver:

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Growing need for applications in cutting, drilling, and grinding

Superhard materials' unparalleled hardness and wear resistance make them essential for industrial machining, cutting, drilling, and grinding processes. For great precision and efficiency while working with hard alloys, ceramics, and composites, industries including mining, construction, and heavy manufacturing depend on cubic boron nitride (c-BN) and synthetic diamond tools. These materials are essential for satisfying the rising demand for affordable, dependable, and long-lasting tooling solutions because of their capacity to increase tool life, decrease downtime, and boost overall productivity. Additionally, the use of superhard materials in industrial processes is growing more and more common as global infrastructure and manufacturing activities increase.

Restraint:

Exorbitant expenses for production and processing

The high cost of producing and processing superhard materials is one of the main factors limiting their market. Costly processes like chemical vapor deposition (CVD) and high-pressure high-temperature (HPHT) synthesis are used to manufacture synthetic diamonds and cubic boron nitride (c-BN). These processes demand a large amount of energy, sophisticated equipment, and experienced workers. Small and medium-sized businesses find it more difficult to embrace these high prices since they frequently result in pricey final products. Furthermore, the cost is further increased by the intricacy of processing and producing these materials into useful forms, such as coatings or precision tools. This prevents broad adoption, particularly in situations where cost is a concern.

Opportunity:

Expanding uses in defence and aerospace

The growing demand for lightweight, robust, and high-performance components is driving tremendous growth in the aerospace and defense industries for superhard materials. Aircraft turbine blades, engine components, and defense equipment that must endure extreme heat, stress, and corrosive conditions can all have their service lives extended by superhard coatings and composites. Superhard materials also make it possible to precisely machine sophisticated alloys and composites that are utilized in military hardware and next-generation aircraft. Moreover, the demand for these

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materials is being driven by the worldwide increase in defense spending as well as the development of high-strength, fuel-efficient aircraft.

Threat:

Price pressure and fierce competition

The fierce rivalry between well-established firms, local producers, and suppliers of alternative materials poses serious risks to the superhard materials market. Global giants make significant investments in R&D and high-end products, but smaller businesses frequently fight on price by providing less expensive alternatives, especially in emerging markets. Pricing and margins are under pressure to decline as a result, particularly for standardized goods like industrial diamond abrasives. Furthermore, this threat is heightened by the expanding availability of sophisticated yet affordable substitutes such as ceramic composites and tungsten carbide. Manufacturers run the risk of losing their competitiveness, which could result in industry consolidation and margin erosion, if they are unable to set themselves apart through technology or value-added services.

Covid-19 Impact:

The market for superhard materials saw both short-term major disruptions and long-term recovery and expansion potential as a result of the COVID-19 pandemic. The demand for superhard cutting, drilling, and machining tools temporarily decreased as a result of global lockdowns, disruptions in the supply chain, and decreased industrial activity in industries like mining, construction, automotive, and aerospace. Adoption was further hampered by postponed infrastructure projects and lower capital investment. Nonetheless, the crisis bolstered the need for superhard materials in semiconductor manufacturing and medical equipment by speeding up automation, digitization, and reliance on precision manufacturing in electronics and healthcare.

The diamond segment is expected to be the largest during the forecast period

The diamond segment is expected to account for the largest market share during the forecast period, because of its extensive industrial applications, unmatched toughness, and resilience to wear. Diamonds, both natural and synthetic, are widely employed in cutting, grinding, drilling, and polishing tools in a variety of industries, including electronics, mining, construction, automotive, and aerospace. Because HPHT (High-Pressure High-Temperature) and CVD (Chemical Vapor Deposition) technologies allow

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for customization for particular uses and lessen the need for natural sources, synthetic diamond production has further increased accessibility. Moreover, precision diamond tools' increasing application in optics, medical devices, and semiconductor fabrication further solidifies their supremacy.

The thermal management / heat spreaders segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the thermal management / heat spreaders segment is predicted to witness the highest growth rate, driven by the growing need for effective heat-dissipation solutions in semiconductors, aerospace systems, and high-performance electronics. Because of their remarkable thermal conductivity, durability, and light weight, advanced materials like cubic boron nitride and synthetic diamond are being used as heat spreaders as electronic devices, data centers, and electric vehicles produce increasing heat loads. Additionally, the adoption of superhard thermal management solutions is accelerating, making this the fastest-growing segment due to the global push for electronic component miniaturization, as well as the quick development of 5G networks, AI computing, and electric mobility.

Region with largest share:

During the forecast period, the Asia-Pacific region is expected to hold the largest market share, fueled by its robust manufacturing sector, quick industrialization, and growing end-use sectors like mining, electronics, automotive, and construction. Because of their high demand for precision machining, cutting tools, and grinding machinery in large-scale production facilities, nations like China, India, Japan, and South Korea are significant consumers of superhard materials. The production and export of synthetic diamonds worldwide are dominated by China in particular, solidifying the region's position as a leader. Furthermore, Asia-Pacific's dominant market position is maintained by the expanding electronics and semiconductor industries in East Asia as well as the expansion of South Asia's infrastructure.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, encouraged by the quick developments in the fields of electronics, renewable energy, aerospace, and defense respectively. Strong demand for superhard materials is being seen in the US in particular for precision machining, semiconductor manufacturing, and defense applications. This demand is being driven by significant

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R&D expenditures and advanced manufacturing technologies. Additionally, the demand for wear-resistant coatings, thermal management systems, and high-performance cutting tools is increasing due to the growing popularity of electric vehicles and the development of 5G infrastructure. In the upcoming years, North America is expected to grow at the fastest rate due to the growing emphasis on high-efficiency, sustainable production methods.

Key players in the market

Some of the key players in Superhard Materials Market include Saint-Gobain, Funik Ultrahard Material Co. Ltd, Henan Yalong Superhard Materials Co. Ltd, ILJIN Diamond Inc, Anhui HongJing Inc, Sandvik AB, Hyperion Materials & Technologies Inc, SF Diamond Co Ltd, Element Six Inc, Sumitomo Electric Industries, Ltd., Zhongnan Diamond Co., Ltd., Sino-Crystal Diamond Inc, Besco Superabrasives Inc, Seiko Instruments and Tomei Diamonds Inc.

Key Developments:

In July 2025, Sandvik Mining and Glencore International AG have expanded an existing partnership to include the Newtrax OEM-agnostic proximity detection and collision avoidance technology, supporting Glencore’s ambition to become a leader in safety.

In March 2025, Sumitomo Electric Industries, Ltd. (Sumitomo Electric) and 3M announce an assembler agreement enabling Sumitomo Electric to offer variety of optical fiber connectivity products featuring 3M™ Expanded Beam Optical (EBO) Interconnect technology, a high-performance solution to meet scalability needs of next-generation data centers and advanced network architectures.

In October 2024, Saint-Gobain has reached a binding agreement to acquire Kilwaughter, a leading player in fa?ade mortars in the UK and Ireland. It operates well-established and recognized brands including K Rend and K Systems. This transaction will further strengthen Saint-Gobain’s offering in the UK and Ireland in light and sustainable construction.

Materials Covered:

Diamond

Cubic Boron Nitride (CBN)

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- Boron Carbide
- Other Materials

Forms Covered:

- Monocrystalline
- Polycrystalline
- Composite
- Other Forms

Applications Covered:

- Cutting Tools
- Grinding & Polishing (Abrasives)
- Drilling
- Wear Parts / Coatings & Protective Layers
- Thermal Management / Heat Spreaders
- Other Applications

End Users Covered:

- Automotive and Transportation
- Aerospace & Defense
- Electrical & Electronics

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- Oil & Gas
- Building & Construction
- Mining & Quarrying
- Chemicals & Petrochemicals
- Other End Users

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe
- Asia Pacific
  - Japan

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- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina
- Brazil
- Chile
- Rest of South America

Middle East & Africa

- Saudi Arabia
- UAE
- Qatar
- South Africa
- Rest of Middle East & Africa

What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants

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- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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