

Graphite Electrode - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

The Graphite Electrode Market size is estimated at 1.67 thousand kilotons in 2025, and is expected to reach 1.98 thousand kilotons by 2030, at a CAGR of 3.55% during the forecast period (2025-2030).

The COVID-19 pandemic hampered the graphite electrodes market, as nationwide lockdowns in several countries and strict social distancing measures affected the production of crude steel and crude aluminum. However, the market registered a significant growth rate after the restrictions were lifted due to the increasing demand from crude steel and aluminum manufacturing industries.

Key Highlights

- In the short term, the strong demand for EAF technology for steelmaking and the rising availability of steel scrap in China is expected to drive the market demand.
- On the other hand, high dependency on the steel industry is expected to hinder the market's growth.
- The rising usage of graphite electrodes in non-steel applications may offer various opportunities for the growth of the market studied.
- Asia-Pacific is expected to dominate the market and is anticipated to witness the highest CAGR during the forecast period.

Graphite Electrode Market Trends

The Electric Arc Furnace Segment to Dominate the Market

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- Graphite electrodes find their primary application in electric arc furnace (EAF) steelmaking, accounting for around 70% to 80% of their total consumption.
- Within the EAF, graphite electrodes serve as conduits for electrical energy. They play a crucial role in the melting and refining scrap steel, ultimately yielding high-quality steel. These electrodes, crafted from specialized grades of needle coke and other raw materials, boast exceptional thermal and electrical conductivity. This enables them to withstand the extreme temperatures and demanding conditions encountered during steelmaking.
- Graphite electrodes play a pivotal role in the contemporary steel industry, facilitating efficient and eco-conscious steelmaking in electric arc furnaces. As steel producers increasingly embrace technological advancements and prioritize sustainability, the demand for high-quality graphite electrodes is poised to remain robust. This, in turn, is expected to drive innovation and progress in EAF steelmaking in the years ahead.
- Tata Steel UK, in January 2024, announced the closure of two high-emission blast furnaces, signaling a shift toward greener steelmaking. The company plans to commence operations at its proposed electric arc furnace in Port Talbot by 2027, with a substantial investment of GBP 1.25 billion (~USD 1.59 billion).
- Japan's second-largest steelmaker, JFE Steel, broke ground on a large-scale electric arc furnace (EAF) at its Kurashiki plant in western Japan, slated for completion around 2027. This move is aimed at curbing carbon dioxide emissions and addressing climate change concerns. In June 2023, ArcelorMittal Luxembourg, as part of its decarbonization efforts, announced an investment in a new electric arc furnace (EAF) at its Belval site.
- China, the global steel giant, accounts for 55% of the world's steel production. The World Steel Association highlights China's consistent output, with 1,019.1 million tons in 2023, matching the 2022 figure. Notably, the country's production in the first 10 months of 2023 reached 874.7 million metric tons, marking a 1.4% uptick from the same period in 2022. China's crude steel capacity witnessed modest growth in 2023, driven by plans from Chinese steelmakers to introduce up to 118 million MT/year of new capacity through a capacity swap mechanism.
- Hence, owing to the above-mentioned factors, the electric arc furnace application segment is expected to dominate the graphite electrode market during the forecast period.

Asia-Pacific to Dominate the Market

- Asia-Pacific is expected to dominate the graphite electrode market during the forecast period. The demand for graphite electrodes is increasing from basic oxygen furnaces and electric arc furnaces in countries like China and India.
- The demand for graphite electrodes is increasing in China due to the rising adoption of electric arc furnaces (EAFs) in steel production. Chinese manufacturers recognize the country's commitment to higher steel production rates via EAF technology. This shift was primarily driven by environmental concerns and the push for more sustainable steelmaking methods.
- Graphite electrodes find applications not only in steelmaking but also in aluminum and silicon processing. China, being the world's largest producer of both aluminum and silicon, witnessed a significant surge in its annual aluminum output in 2023. The output climbed by 3.43% from the previous year, hitting a record high of 41.59 million tonnes, as reported by the National Bureau of Statistics of China. This growth was fueled by the addition of new capacities and the relaxation of power supply restrictions. According to the US Geological Survey, China's silicon production in 2023 was estimated at 6.6 million metric tons.
- India is witnessing a robust surge in the demand for graphite electrodes, primarily driven by the steady uptick in iron and steel production over recent years. These electrodes play a pivotal role in steel and non-ferrous metal production and are employed in both the electric arc furnace and ladle furnace processes.
- India, the world's second-largest steel producer, has a steel capacity of over 161 million tons annually, trailing only China. This capacity is distributed with 67 million tons via the blast furnace-basic oxygen furnace (BF-BoF) route, 36 million tons via electric arc furnace (EAF), and 58 million tons via the induction furnace (IF) route.
- The steel sector in South Korea holds significance, driving the nation's economic growth by catering to industries like

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automotive, construction, and shipbuilding. As reported by the Korean Iron & Steel Association, the steel industry accounts for 1.5% of the nation's GDP and 4.9% of its manufacturing sector. Notably, South Korea ranks as the sixth-largest steel producer globally.

- Owing to the factors mentioned above, the market for graphite electrodes in Asia-Pacific is projected to grow significantly during the forecast period.

Graphite Electrode Industry Overview

The graphite electrode market is partially consolidated. Some of the major players (not in any particular order) in the market include Resonac Holdings Corporation, GrafTech International, Fangda Carbon New Material Co. Ltd, Zhongze Group, and Liaoning Dantan Technology Group Co. Ltd (Dan Carbon).

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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