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Polychlorotrifluoroethylene Market Assessment, By Grade [Industrial Grade, Pharma Grade], By Application [Cryogenic, Wires and Cables, Films and Sheets, Others], By End-user [Semiconductors, Aerospace, Pharmaceuticals, Others], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

The global polychlorotrifluoroethylene market size was 5248.35 tons in 2022, which is expected to reach 6394.6 tons in 2030, with a CAGR of 2.5% for the forecast period between 2023 and 2030.

Polychlorotrifluoroethylenes is one of the hardest polymers with enhanced mechanical properties and can be successively utilized in cryogenic engineering applications for handling liquid nitrogen and oxygen. For instance, according to the recent data published by the European Medical Technology, in 2022, the average global research and development investment rate was around 8% in the medical sector.

Polychlorotrifluoroethylene (PCTFE) is a melt-processable chlorofluoropolymer that has a relatively low melting point among fluoropolymers. As a result, medical-grade PCTFE is successfully utilized for cryogenic application and handling of severe gases. Furthermore, the rise in the adoption of PCTFE is due to the excellent chemical and temperature resistance that is extensively used in various medical devices and equipment. The semiconductors industry is extremely benefited by polychlorotrifluoroethylene as it has unique properties like low dielectric constant and electrical insulating properties and is frequently used in electronic devices, and gadgets. As a result, advances in the electrical, electronics and medical industry advances are fostering market growth. Moreover, government initiatives for developing advanced

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semiconductors for electronic gadgets, gaming system, and defense sector is assisting in propelling the polychlorotrifluoroethylene market.

The advancement of electronic devices and gadgets is supported by superior semiconductors that are made of polychlorotrifluoroethylenes, which in turn, is driving the market growth. For instance, according to Japan Electronics and Information Technology Industries Association (JEITA), the global production by Japanese electronics and IT companies in 2022 increased by 8% as opposed to 2021.

Rising Adoption of Polychlorotrifluoroethylene in Semiconductors Industry

Semiconductors have revolutionized the modernizing world, which is important for advanced telecommunication devices and entertainment gadgets. Polychlorotrifluoroethylene compound is an imperative solution to semiconductors as they potentially drive numerous benefits during the working of semiconductors. A high-performance PCTFE has excellent water vapor barrier properties which are non-inflammable along with excellent heat and chemical resistance properties. Thus, polychlorotrifluoroethylene (PCTFE) in semiconductors delivers low outgassing and low moisture absorption characteristics in vacuums.

For instance, according to recent statistics published by the Japan Electronics and Information Technology Industries Association (JEITA), in 2022, the total global production of electronics and IT industry is estimated to register a growth rate of around 1%, reaching USD 3,436.8 billion. Hence, the phenomenal rise in semiconductor industry significantly drives the global polychlorotrifluoroethylene market growth.

Advancement in Aerospace Parts are Accomplished using Polychlorotrifluoroethylene

Polychlorotrifluoroethylene successively combines essential mechanical and physical properties along with possessing chemical resistance, non-flammability, and excellent electrical properties. Hence, polychlorotrifluoroethylene is deployed as a high-performance material for various aerospace applications that shows stringent resistance to varied temperatures and offers retention properties to aggressive specialty fuels. Polychlorotrifluoroethylene is successively used in regulators, valves, and devices related to essential gases like oxygen, nitrogen, and helium as PCTFE offers low deformation, high compressive strength, low moisture absorption, and extremely low gas permeability.

For instance, the defense ministry of the Indian government has commissioned to

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increase defense production from USD 12 billion to USD 22 billion by 2025. In 2020, the annual revenue of Saudi Arabian Military Industries (SAMI) was USD 20 million which exponentially increased to USD 690 million in 2021. The rise in defense budget is boosting the demand for aerospace parts, which is driving the growth of the polychlorotrifluoroethylene market.

Rising Demand for Medical Grade Polychlorotrifluoroethylene

Polychlorotrifluoroethylene in medical grades offers an excellent combination of mechanical, electrical, and physical properties and good chemical resistance. The retention of mechanical properties at extremely low temperatures is the reason for the extensive application of PCTFE medical grade as cryogenic and significant handling of gases. Likewise, medical grade PCTFE is potentially active to resist attack by several chemicals due to high fluorine content. PCTFE medical grades are successively used in coating surgical instruments, producing tubes, and catheters along with creating implants and prosthetics.

For instance, MCP Engineering is a leading manufacturer and supplier of polychlorotrifluoroethylene. Their medical-grade PCTFE is machined from sheet, rod and tube, extruded from 5mm diameters to 45mm diameters, according to the provided specifications. Furthermore, Intuitive Surgical, Inc. has invested over USD 350 million across China, Japan, and Germany in 2022, for the expansion of polychlorotrifluoroethylene, including medical grade PCTFE, registering a revenue of over USD 150 million from these countries. Consequently, the market potential for polychlorotrifluoroethylene (PCTFE) is progressive, propelling industry of medical equipment.

Asia-Pacific is Dominating the Polychlorotrifluoroethylene (PCTFE) Market

Asia-Pacific has been the main contributor to the growth of the polychlorotrifluoroethylene (PCTFE) market due to several prominent factors. China is a strong competitor for electronic products as the country supports flexible policies. In addition, the remarkable progress in Japan in building advanced infrastructure for the semiconductor industry has encouraged investors, which is boosting the adoption of PCTFE. The rising production of cellular phones, advanced gaming systems, and portable electronic devices will further drive market growth in the coming years. For instance, according to the National Bureau of Statistics of China, China is a leader in the pharmaceutical industry and has generated revenue of more than USD 0.51 trillion in 2021. Hence, these factors contribute to the growth of the polychlorotrifluoroethylene

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market in Asia-Pacific.

Impact of COVID-19

The outbreak of COVID-19 led to the shutdown of the electrical and electronic industry in 2020. The reduced demand for electronic devices and gadgets significantly affected the polychlorotrifluoroethylene market. The strict lockdowns imposed by the government entities had significantly deteriorated the production industry, directly reducing the polychlorotrifluoroethylene market. The supply chain of electronic devices was disrupted due to the closure of logistic operations. After the pandemic, the manufacturing units adopted effective measures to counteract the bridge between the supply chains and increase the production capacity of polychlorotrifluoroethylene.

Key Players Landscape and Outlook

The leading global companies in polychlorotrifluoroethylene market are Honeywell International Inc., Welch Fluorocarbon Inc., Solvay, and DAIKIN INDUSTRIES, Ltd. For instance, Welch Fluorocarbon Inc. has developed a wide range of polychlorotrifluoroethylene materials with different brand names. Their registered Aclar PCTFE is available in different thickness ranges and possesses excellent moisture barrier characteristics and are commonly used as thermoformed components. Another trademark product HydroBlock 7500 is a 191-micron PCTFE homopolymer which is used as clear barrier film for industrial markets. It can easily be thermoformed, forming vacuum and excellent lamination to a variety of materials.

For instance, in March 2021, Meridian Adhesives Group, a global player in the chemicals industry, acquired GENTEC, a manufacturer of polychlorotrifluoroethylene in Canada. The acquisition's prime focus was to increase Meridian Adhesives Group's market share in the polychlorotrifluoroethylene industry.

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