

Flexible Polyurethane Foam (FPF) Market Assessment, By Type [Viscoelastic Foam, High Resilience Foam], By Application [Automotive, Furniture & Bedding, Medical, Packaging, Footwear, and Others], By Size (Density) [Cellular, Microcellular, Non-Cellular], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

Global Flexible Polyurethane Foam (FPF) Market size was valued at USD 25.73 billion in 2022 which is expected to reach USD 45.92 billion in 2030 with a CAGR of 7.51% for the forecast period between 2023 and 2030. Flexible polyurethane foam is widely used for its cushioning ability in various end-use industries like Automotives, Furniture, medical and packaging. Over the forecast period, growth of FPF market is anticipated to be driven mainly by rising demand from the bedding and furniture market due to an increase in urban population in Asia Pacific's emerging economies, including China, India, and Indonesia. On the other hand, Polyurethane Foam Association (PFA), North America is significant region for producing flexible PU foam, where more than 1.5 billion pounds of it is produced in this region alone.

Additionally, FPF has high levels of recycling and clean incineration for pollutant filtration, decreased waste, and increased sustainability, helping the product to gain popularity in the current buying climate globally. However, several governments have been raising concerns about the isocyanates used in the manufacturing of FPF.

Moreover, due to qualities like superior insulation that make it ideal for walls and roofs in new homes, polyurethane foams are expected to experience increased market penetration. Their use in buildings aids in regulating temperature and lowering noise



levels strengthening their demand on a global scale. Lastly, the promotion of biobased PU to replace conventional polymers is likely to be aided by government support in the form of tax incentives and subsidy programs to support the manufacturing sector, further contributes to the growth of FPF market.

Eco-friendly Solution

PU foam is recyclable and sustainable; therefore, several businesses adopt PU foam as it aligns with the sustainability goals and regulations of industries and consumers globally. The isocyanates and polyols like MDI, TDI used in the manufacturing of PU Foam do not meet the eco-friendly standard in several countries. However, the major market players in the US are forging alliances and joint ventures to manufacture biobased PU foams. For example, for use in water-based PU dispersions (synthetic leather applications) and thermoplastic polyurethane (TPU), Covestro uses polyester polyols based on succinic acid feedstock. By recycling mattresses to recover raw materials with a calibre equal to virgin resin, BASF is aiming towards circularity. Its method disintegrates flexible polyurethane in order to collect polyols. Additionally, Dow's Renuva mattress recycling programme uses chemical recycling to turn used mattress foam back into unprocessed polyols . Major players' capacity growth in the nations is anticipated to have a beneficial effect on the demand for bio-based polyurethane in the upcoming years.

Expanding Electric Automobiles

The growing emphasis on fuel efficiency in vehicles is bolstering the demand for lightweight PU foam seating. Notably, the sales of electric vehicles have witnessed a remarkable increase of 15% in Europe and 55% in the United States over the past year. This surge in electric vehicle sales is a key driver for the rising demand for flexible PU foam. Additionally, the durability of batteries in electric vehicles is enhanced by isolating shock and vibration using polyurethane-based foam, further augmenting the utilization of PU foam in the electric automobile sector.

Furthermore, the automotive industry, particularly the downstream sector, is the largest consumer of Flexible Polyurethane foam. The global market has experienced substantial growth in demand for PU foam due to the escalating sales and expanding activities in the automotive aftermarket. The increasing prosperity of the middle-class population in Asia-Pacific countries like China and India has resulted in a heightened need for lightweight and comfortable seating, thereby driving the demand for PU foam in these regions.



Tight Upstream Supply

Global demand for diphenylmethane diisocyanate MDI, the most widely used polyol in the manufacture of PU foam, is high due to poor supply. The MDI supply and demand imbalance and upward price trend are expected to further constrain the cost of producing PU foam in global markets. To close the supply-demand gap, several nations and companies, including China, India, and the United States are building MDI plants.

In July 2022, Huntsman announced the beginning of commercial operations for a new methylene diphenyl diisocyanate (MDI) separator at its Gammas Polyurethanes facility in Louisiana. This state-of-the-art separator, indicating an investment of USD 180 million, enables Huntsman to enhance the production of various high-value and specialized grades of crude MDI.

The biggest challenge being faced by the Flexible PU foam market is the rising upstream crude prices, which has a significant impact on the cost structure of PU foam. Additionally, the ongoing conflict in East European region increases the level of unpredictability of crude oil and polyurethane.

Energy Efficiency

Enhancing energy efficiency is a crucial priority for industries worldwide, including construction, transportation, and appliances. Flexible Polyurethane Foam is renowned for its exceptional insulating properties, which play a significant role in conserving energy in heating and cooling applications. By reducing energy consumption, polyurethane contributes to preserving the environment and valuable natural resources. As the importance of energy efficiency grows and global markets impose stricter energy usage regulations, there is a predicted rise in demand for Polyurethane Foams to enhance energy efficiency. For instance,

Latest developments by Covestro on PU foams can boost production efficiency without sacrificing quality or energy efficiency. Additionally, it facilitates the low-cost production of refrigerators that are energy efficient by making use of established technologies for PU foam, further contributing to its rising demand.

Impact of COVID-19

The global automotive industry, which is a key downstream sector for PU foams, faced,



significant challenges due to the outbreak of Covid-19. The pandemic resulted in a decrease in demand for PU foam worldwide, primarily caused by reduced production levels in major automotive manufacturing nations such as China, the US, and Germany. Moreover, the overall decrease in consumer footfall in stores, labour shortages, and scarcity of raw materials like silicon chips further compounded the difficulties faced by the automotive industry, leading to a reduced demand for PU foam. The workforce restrictions imposed as a response to the Covid-19 outbreak, coupled with the subsequent slowdown in the electronics and bedding sectors, also contributed to a dampened consumer requirement for PU foam. These factors collectively created an unfavourable environment for the PU foam market, with reduced demand from the automotive industry and diminished consumer needs in sectors affected by the pandemic.

Impact of Russia-Ukraine War

The Russia-Ukraine conflict had a significant impact on the PU (polyurethane) market, particularly in the manufacturing sector, due to Russia's role as a major supplier of upstream crude to European countries. The imposition of sanctions on Russian crude imports by several European nations resulted in a surge in demand and supply for crude oil. Consequently, the production rates of PU foam increased in these countries, leading to a weakened demand for PU foam in these markets. Additionally, the Middle East played a crucial role in influencing the price of producing PU foam. European nations had to import crude oil from the Middle East at higher prices, further impacting the PU foam market. Moreover, the conflict in Eastern Europe had adverse effects on the downstream automotive industry, which further contributed to the challenges faced by the PU foam market.

Key Players Landscape and Outlook

As a result of concerns over the use of isocyanates like MDI and TDI in the conventional manufacturing method used globally, key major PU foam manufacturers are investing in new manufacturing techniques like the usage of natural oil-based polyols. Companies are also finding innovative ways for recycling mattresses.

In February 2022, BASF announced the development of a wet chemical recycling method for flexible polyurethane mattresses, in partnership with Neveon. Small-scale initial tests have shown great promise. The original polyols from the worn-out mattress foams can be recovered and used once more to create premium flexible foam blocks. These flexible foam blocks have the same quality as those made from conventional



materials using fossil raw materials because they are made from recycled polyurethane.

The outlook for Flexible Polyurethane Foam looks positive as the demand from endusers such as automotives and bedding is anticipated to increase. The incline towards eco-friendly and sustainable solutions from the industries and the users are likely to drive up the FPF market even further.



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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work

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