Expandable Polystyrene

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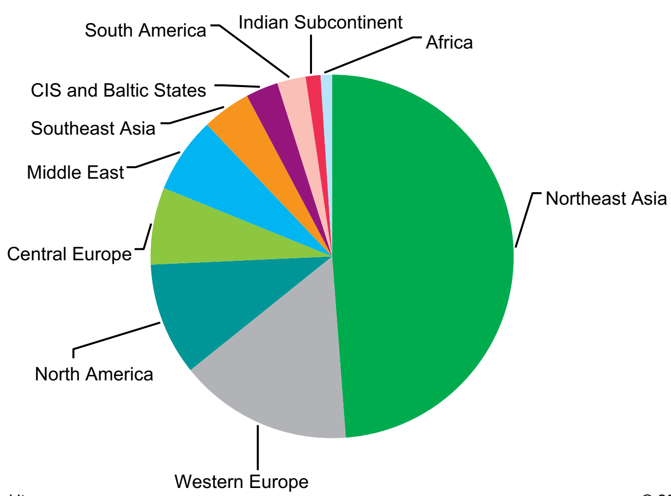
Abstract

Expanded polystyrene (EPS) is a rigid cellular plastic originally invented in Germany by BASF in 1950. EPS is 98% air and the rest is made from tiny, spherical EPS beads—themselves made only of carbon and hydrogen. EPS is among the largest commodity polymers produced in the world and is the second-largest styrene derivative, after polystyrene. It is a solid foam with a unique combination of characteristics, such as lightness, insulation properties, durability, and excellent processability. EPS is used in many applications, such as thermal insulation board in buildings, packaging, cushioning of valuable goods, and food packaging.

Expandable polystyrene is a bead that can be produced directly in a one-step process or produced indirectly via polystyrene beads in a two-step process. In the two-step process, EPS beads are produced from polystyrene beads made in the suspension process, which are impregnated under heat and pressure with a light hydrocarbon such as pentane. The light hydrocarbon will expand the polymer when reheated.

The following pie chart presents world consumption of expandable polystyrene.

World consumption of expandable polystyrene—2017



Source: IHS Markit © 2017 IHS Markit

The current global EPS market continues to face the challenge of an abundant, oversupplied market. Most of this excess capacity is coming out of China. In 2017, EPS producers were operating at low rates, mostly as a result of the massive capacity overhang in China, which has reduced the country's operating rate to a very low rate, greatly offsetting much higher rates in other regions. Global EPS production increased only slightly during 2012–17.

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The largest EPS-producing region is Northeast Asia, which represents 58% of the world's EPS supply as of 2017. China accounts for 79% of Northeast Asian regional production and 85% of regional capacity. EPS producers favor the advantages of China's low-cost investment and large capital cost and, therefore, China is now responsible for a majority of the world's EPS capacity surplus.

Western Europe is the second-largest EPS-producing region, accounting for 18% of the global EPS supply. Germany is one of the region's largest producers, with a 29% share, followed by Austria and the Netherlands. Over the next five years, global EPS production is expected to increase at an average annual rate of about 2% per year.

Northeast Asia is also the overall leader in consumption of EPS, with 49% of total consumption in 2017. Western Europe and North America follow distantly. The Indian Subcontinent remains one of the smallest consuming regions; however, it is expected to see the most growth during 2012–17. Africa and the Middle East will follow. Western and Central Europe will grow the least over the next five years.

The building/construction market is the largest end use for EPS and represents 59% of global consumption as of 2017. In this market, EPS is commonly used in molded sheets for building insulation. These are commonly packaged as rigid panels in both residential and commercial construction. In recent years, geofoam projects have also been a key contributor to EPS demand growth. Geofoam is used to provide a lightweight void fill below a highway, bridge approach, embankment, or parking lot.

EPS consumption in packaging applications is used primarily as a cushioning protectant in fragile items as well as in disposable trays, cups, plates, bowls, etc. The growth in this market is driven primarily by the electronics and appliance industries. Global EPS consumption in packaging applications is the second-largest end-use market and accounts for 35% of EPS demand as of 2017.

Contents

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