Butadiene

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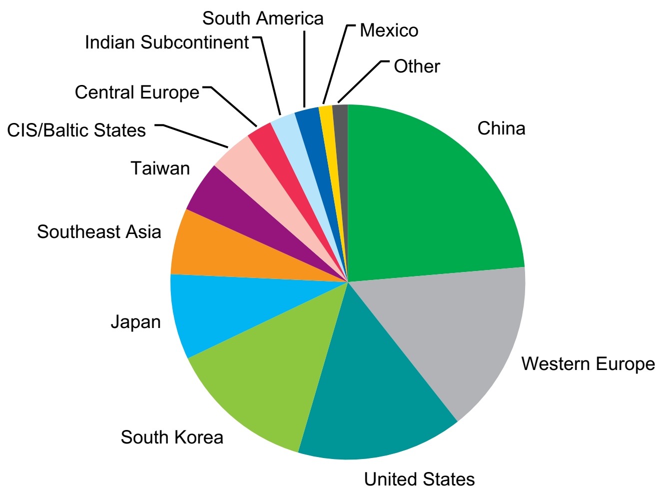
Abstract

The single largest use for butadiene is in the production of synthetic elastomers including styrene-butadiene rubber (SBR) and polybutadiene rubber, both of which are consumed in the manufacture of tires. Other elastomer applications include nitrile rubber hoses, mechanical belts, carpet backing, footwear, and neoprene products. Butadiene is also copolymerized into plastics, the largest-volume being acrylonitrile-butadiene-styrene (ABS) resins, which are used in various applications.

Because of the global nature of butadiene production and its diverse applications, it is impacted by various dynamics including changes in the production of ethylene, fluctuations in energy markets, and general economic cycles.

The following pie chart shows world consumption of butadiene:

World consumption of butadiene—2017



Source: IHS Markit © 2018 IHS Markit

Since the late 1990s, growing demand for elastomers and other polymers in Asia has led to an increase in butadiene demand; however, the demand for natural rubber is still strong and maintains some downward pressure on commodity synthetic rubbers.

In regions where downstream markets are still developing, such as the Middle East and Asia, demand growth will be robust. Continued economic and demand growth in China will secure the country's position as the world's largest producer and consumer of butadiene. In the more mature markets of North America, Western Europe, and Japan, growth will be much slower or even declining over the forecast period. With the rapid development in China, Asia has emerged as

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the world's most active butadiene market, with new capacity being built close to naphtha-fed steam crackers and downstream derivatives production expanding rapidly. Analysts anticipate that automobile sales in emerging markets will double or possibly triple over the next 10–15 years, driven by the expanding middle and upper classes. Given the current economic conditions, however, companies will continue to exercise caution in planning and executing new capacity buildup, particularly with instability in both naphtha and butadiene pricing.

Elastomer production represents 60–65% of world butadiene demand, with a majority consumed in tires. Butadiene demand in tires depends on a variety of factors including new vehicle production, tire design (tread wear, performance, operating conditions, etc.), replacement tire demand/consumer spending, and the price of competitive elastomers, including natural rubber. Additional factors that have impacted tire markets in recent years include the development of renewable materials for use in tire manufacture and a focus on improved energy efficiency, as required by labeling laws enacted in Europe. The other butadiene-based elastomers, nitrile and polychloroprene, are not used in tires, but both are used extensively in various other automotive applications such as hoses, belts, seals, and gaskets, and as impact modifiers for resins used for automotive parts.

ABS resin production is the largest nonrubber market and the third-largest individual end use for butadiene, accounting for nearly 14% of total global consumption in 2017. Used in various home and office appliances, personal electronics, and automotive components, global demand will likely improve at a rate of 4–5% annually on end-market growth. Demand in SB copolymer latexes (used in paper products and carpet backing) and adiponitrile (which is predominantly converted into hexamethylenediamine [HMDA] and used to produce nylon 66 fibers and resins) will experience 1–2% growth annually. Consumption for other applications, particularly styrenic block copolymer elastomers, which are consumed in footwear, asphalt, and adhesives/sealants, is likely to increase as a result of both improved demand in developing regions and producers and investors looking to improve their return on investment through greater diversification of product offerings.

Global butadiene demand is expected to grow at an average annual rate of about 2% during 2017–22. ABS resin manufacture is the fastest growing application for butadiene at just over 4% per year and accounts for about 27% of the total volume growth. Elastomer manufacture is forecast to grow at a slower rate of about 2% per year, but to account for 61% of the butadiene volume growth in the next five years.

Contents

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