

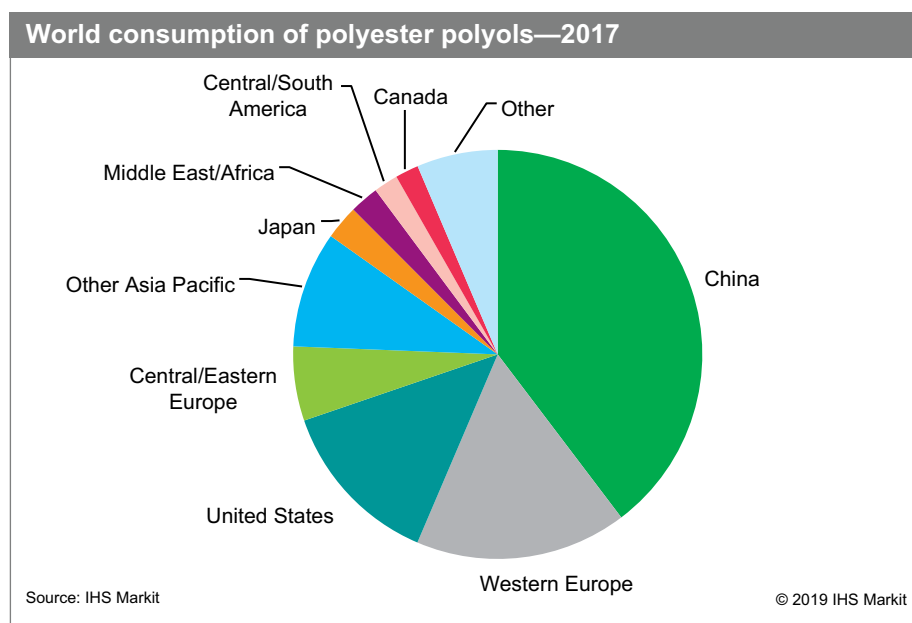
Polyester Polyols

31 May 2019

Abstract

Of the polyurethane raw material products industries, the polyester polyol industry is the least concentrated; the others, polyether polyols and isocyanates, are much more concentrated. The polyester polyol industry also tends to have the least sophisticated manufacturing processes and the lowest capital costs. Polyester polyols are manufactured from aliphatic diacids (or esters), aromatic diacids (or esters or anhydrides), or caprolactone. The simplest polyester polyols are prepared by the reaction of a diacid, diester, or caprolactone with a glycol or a polyhydric alcohol; however, occasionally a mixture of aliphatic and aromatic acids is used. The desired reaction is the production of high percentages of hydroxyl-terminated polyesters. The range of molecular weights depends on the relative amounts of the glycol and acids, the reaction conditions, and the desired end use (flexible/rigid foam or CASE).

The following chart presents world consumption of polyester polyols:



The most dynamic markets for polyester polyols continue to be China, India, and other Asia Pacific countries; North America and Europe have also shown improved growth. In terms of end uses, increasing global demand for nonfoam applications, especially for polyurethane elastomers (often for shoes in China and Other Asia) and artificial leather, are major growth drivers. Other important markets are polyurethanes/polyisocyanurates (PUR or PU/PIR) insulation foam, spurring demand for aromatic polyester polyols in the most developed industrial countries of North America and northwestern Europe, as well as in China because of its move to build more energy-efficient buildings.

Contacts

Koon-Ling Ring • Koon-Ling.ring@ihsmarkit.com
Maria deGuzman • Maria.deguzman@ihsmarkit.com

The largest market for polyester polyols is in a variety of nonfoam applications, accounting for more than 60% of global consumption. The largest nonfoam sector is in polyurethane elastomers, including shoe sole materials (the largest market in China). China is the largest polyester polyols player and consumer in the world, but only for aliphatic polyester polyols; the Chinese market for aromatic polyester polyols is still small.

Before the economic crisis impacted the chemical industry in the fourth quarter of 2008, the market for polyester polyols expanded rapidly between 2005 and 2008. In 2010, essentially all polyester polyol markets had a strong recovery. Since 2011, the global growth for polyester polyols has been uneven, with only mild-to-low growth in Western Europe, the United States, and Japan, and the greatest growth in China (5–6%), India, and Other Asia (highest growth rates but on smaller volumes).

The seven largest producers account for nearly half of the total polyester polyols production capacity (in comparison, the four largest polyether polyols producers own 33% of global capacity). Currently, many large global producers operate in China—Huafeng Group, Stepan, Huada Chemical Group, BASF, and Xuchuan Chemical (Suzhou) Company; these companies produce polyurethane systems for shoe soles and artificial leather. Other major producers include COIM, INVISTA, and Covestro, with major operations in Europe and the Americas.

In the last several years, the industry has offered a wider range of sustainable options for polyurethane manufacturers. Sustainable polyester polyols are the most viable option of all the polyurethane raw materials. Sustainable polyester polyols include products produced from bio-based raw materials and from recycled sources.

Recycled polyethylene terephthalate (PET) plastics (including PET bottles) may be converted into polyester polyols with recycled content (varies but generally 18% and higher). Huntsman (aromatic), INVISTA (aliphatic, minimum of 50% recycled content), Resinate Materials Group (aromatic; recycled PET and polycarbonate, recycled content 50–74% plus renewable content up to a combined 100%), and Petopur are producers that incorporate recycled content into its polyester polyols. The Huntsman process includes the transesterification of PET from preconsumer and postconsumer sources.

Special risk factors for further market development include the following:

- Geopolitical risks, such as unrest in the Middle East and Africa.
- The possible decline in oil prices caused by the slowdown in the world economy will hurt oil-exporting countries, including the Middle East, Libya, Venezuela, and Russia.
- The debt crisis of several European countries as well as the effects of Brexit.
- The slowing of China's economy and a slowdown in many of its industrial and construction sectors; China represents the largest share of the global market.

Contents

Executive summary	5
Summary	6
Macroeconomic environment	9
Structure of the industry	10
Environmental issues	12
Manufacturing processes	13
Aliphatic polyester polyols	13
– Specialty aliphatic polyester polyols	13
– Polycaprolactone diols	13
– Polycarbonate diols	14
Aromatic polyester polyols	14
Sustainable products	15
Supply and demand by region	17
United States	17
– Producing companies	17
– Production	18
– Consumption	19
– Aromatic polyester polyols	20
– Aliphatic polyester polyols	21
– Price	23
– Trade	25
Canada	26
– Producing companies	26
– Salient statistics	26
– Consumption	27
– Trade	28
Mexico	29
– Producing companies	29
– Salient statistics	30
– Consumption	30
– Trade	31
Central and South America	32
– Producing companies	32
– Salient statistics	33
– Consumption	34
Western Europe	35
– Producing companies	35
– Production	38
– Consumption	39
– Rigid foam	40

– Elastomers	41
– Coatings	41
– Adhesives and sealants	41
– Price	42
– Trade	43
Central and Eastern Europe	43
– Producing companies	43
– Salient statistics	45
– Production	45
– Consumption	46
– Trade	47
Middle East and Africa	48
– Producing companies	48
– Salient statistics	49
– Production and consumption	49
Japan	51
– Producing companies	51
– Production	53
– Consumption	54
– Price	56
– Trade	56
China	57
– Producing companies	57
– Production	60
– Consumption	60
– Price	63
– Trade	63
Other Asia	64
– Producing companies	64
– Salient statistics	66
– Production	67
– Consumption	68
Oceania	69
Additional resources	70
Revisions	72

IHS Markit Customer Care

CustomerCare@ihsmarkit.com

Americas: +1 800 IHS CARE (+1 800 447 2273)

Europe, Middle East, and Africa: +44 (0) 1344 328 300

Asia and the Pacific Rim: +604 291 3600

Disclaimer

The information contained in this report is confidential. Any unauthorized use, disclosure, reproduction, or dissemination, in full or in part, in any media or by any means, without the prior written permission of IHS Markit or any of its affiliates ("IHS Markit") is strictly prohibited. IHS Markit owns all IHS Markit logos and trade names contained in this report that are subject to license. Opinions, statements, estimates, and projections in this report (including other media) are solely those of the individual author(s) at the time of writing and do not necessarily reflect the opinions of IHS Markit. Neither IHS Markit nor the author(s) has any obligation to update this report in the event that any content, opinion, statement, estimate, or projection (collectively, "information") changes or subsequently becomes inaccurate. IHS Markit makes no warranty, expressed or implied, as to the accuracy, completeness, or timeliness of any information in this report, and shall not in any way be liable to any recipient for any inaccuracies or omissions. Without limiting the foregoing, IHS Markit shall have no liability whatsoever to any recipient, whether in contract, in tort (including negligence), under warranty, under statute or otherwise, in respect of any loss or damage suffered by any recipient as a result of or in connection with any information provided, or any course of action determined, by it or any third party, whether or not based on any information provided. The inclusion of a link to an external website by IHS Markit should not be understood to be an endorsement of that website or the site's owners (or their products/services). IHS Markit is not responsible for either the content or output of external websites. Copyright © 2019, IHS Markit®. All rights reserved and all intellectual property rights are retained by IHS Markit.

