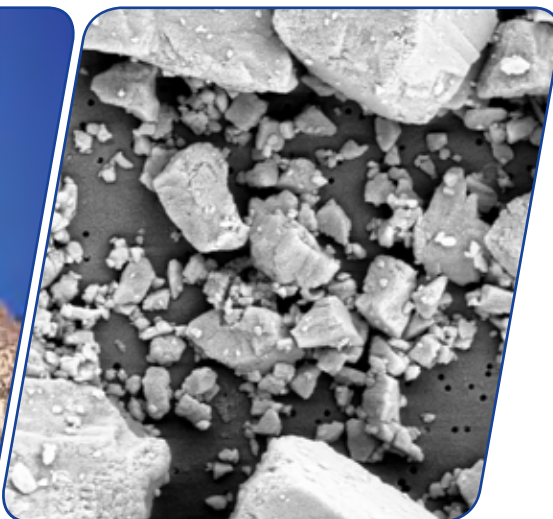
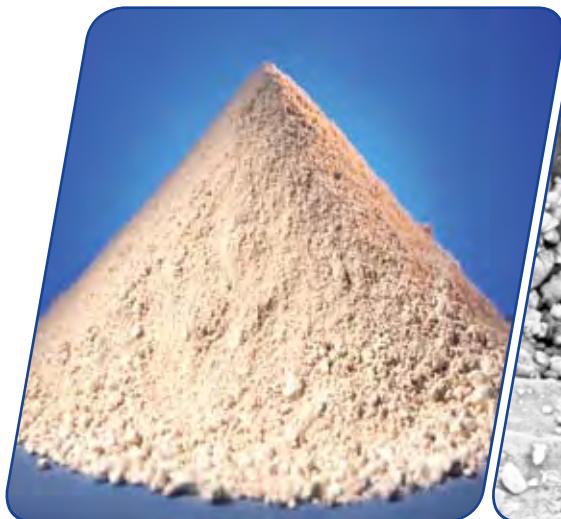


Market Study: Fillers

(4th edition)



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This study is useful for:

- Manufacturers and distributors of calcium carbonate (GCC & PCC), carbon black, kaolin, talc, and other fillers
- Manufacturers of paper, plastics, paints and varnishes, elastomers, adhesives and sealants, and many others
- Associations and Institutes
- Executive board, technology and production, strategic planning, R&D, market research, marketing, sales and distribution, procurement

In this brochure you will find the following information:

- An introduction on page 3
- A summary of the table of contents on page 4
- Following this, there are example pages from the study
- Please use the form on the last page to easily order your copy or a free reading sample!

Ceresana analyzes the market for fillers again: From ground calcium carbonate (GCC), precipitated calcium carbonate (PCC), kaolin, talc, and carbon black to other fillers such as feldspar, mica, quartz, wollastonite, dolomite, and barium sulfate. Fillers contribute a great deal to improving the properties of the carrier material. We expect an increase of revenues generated with fillers to 31.76 billion USD in 2023.

Growth Market Plastics

The most important applications are the production and processing of paper, plastics, paints and varnishes, elastomers as well as adhesives and sealants. There are significant differences between the sales markets for fillers in regard to the particular regions. While application in the paper industry accounts for a market share of 33% in Western Europe, the share is below 20% in Asia. Vice versa, manufacturers of elastomer products in Asia hold a share of over 32% on the filler market - in Western Europe the share amounts to 21%. To emphasize these regional and country-specific differences, demand for the particular filler types is split by application areas. The filler industry in Asia-Pacific accounted for about 48% of global demand in 2015. Due to above-average growth rates, demand in this region will rise to 38,9 million tonnes.

Positive Trend in Case of GCC and Carbon Black

With a market share of 34%, the most commonly used filler on the global market is GCC, fol-

lowed by PCC and carbon black. We expect demand for GCC to rise by 2.7% p.a. between 2015 and 2023. Worldwide, the largest application area for GCC is the segment plastics which is also characterized by above-average growth rates. The segment paints and varnishes ranked second, followed by paper. Calcium carbonates offer high chemical purity, a high degree of whiteness, and low abrasiveness which makes them useful in the plastics industry. Possibilities of application range from PVC to polypropylene and polyethylene up to polyurethane foams.

Many properties of PCC are identical with those of GCC. The most important difference is the greater purity of PCC. PCC is most frequently used in the segment paper around the world - approx. 47% of global demand originate in this segment. Carbon black is the third largest filler market worldwide, accounting for a demand of 11.4 million tonnes. The elastomer and natural rubber industry is the most important application area for carbon black. This segment uses it as a reinforcing filler, as carbon black significantly increases the abrasion resistance of rubber used in the production of tires. Highly reinforcing carbon blacks are mainly used in tire treads and conveyor belts, semi-active carbon blacks are primarily used in side parts of tires or air tubes. In 2015, the application in tires dominated the demand for carbon black. The second largest application area as a filler are elastomer products for the sector indus-

try & construction. Demand in this segment amounted to around 1.3 million tonnes.

The Study in Brief:

Chapter 1 provides a presentation and analysis of the global market for fillers – including forecasts up to 2023: Demand for and revenues generated with fillers are provided for the world and each region.

Chapter 2 analyzes the 16 most important countries and their filler revenues and demand. Demand is split by individual applications and product types; furthermore, demand of the particular product type is split by applications. Additionally, all important manufactures are listed according to countries.

Chapter 3 offers a substantiated analysis of the application areas for fillers: paper, plastics, paints & varnishes, elastomers, adhesives & sealants.

Chapter 4 examines demand for individual types of fillers: GCC, PCC, carbon black, kaolin, talc, and other fillers. Demand is clearly arranged for each of the 16 analyzed countries and all world regions.

Chapter 5 provides profiles of the largest manufacturers, clearly arranged according to contact details, turnover, profit, product range, production sites, profile summary, and products. Detailed profiles are provided of 109 manufacturers such as 3M, Acron, Aditya Birla, Alcoa, BASF, Bridgestone, Huber, Imerys, Merck, Omya, PPG, Rio Tinto, SCR-Sibelco, and Showa Denko.

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- 1.4 North America
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5 Company Profiles

- 5.1 Western Europe
 - Austria (1 Producer)

Example from chapter 1
Market analysis of demand for fillers



- Belgium (4)
- Finland (1)
- France (3)
- Germany (15)
- Italy (2)
- Sweden (2)
- Switzerland (1)
- The Netherlands (3)
- United Kingdom (3)

5.2 Eastern Europe

- Croatia (1)
- Czechia (1)
- Russia (3)
- Slovenia (1)
- Turkey (2)
- Ukraine (1)

5.3 North America

- Canada (1)
- Mexico (1)
- USA (19)

5.4 South America

- Brazil (2)

5.5 Asia-Pacific

- Australia (1)
- China (7)
- India (8)
- Japan (22)
- South Korea (1)
- Taiwan (1)

5.6 Middle East

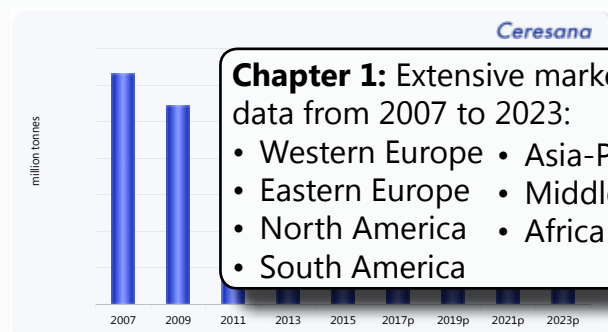
- Israel (1)

5.7 Africa

- Algeria (1)

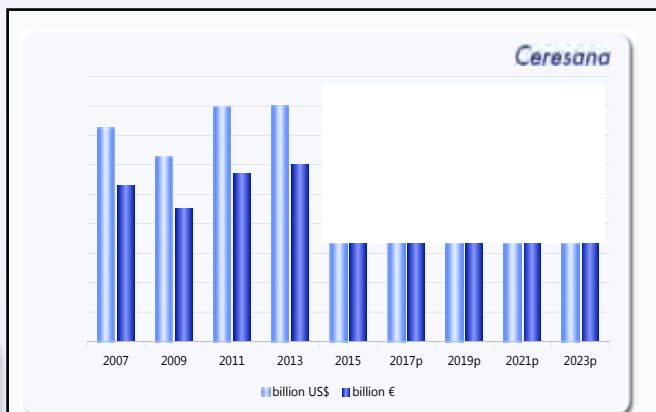
1.2 Western Europe

Demand for fillers in Western Europe totaled approximately X million tonnes in 2015. Thus, demand fell by an average of X% p.a. since 2007. We forecast total demand for fillers in Western Europe to increase again by presumably X% p.a. until 2023. Given this weak growth rate, Western Europe's share of global fillers demand is likely to fall from X% in 2015 to roughly X% in 2023. In 2015, the revenues generated with fillers in Western Europe totaled roughly EUR X billion. We forecast market value to increase by X% p.a. in the next eight years.



Graph: Demand for fillers in Western Europe from 2007 to 2023

About X% of West European demand originated in Germany, followed by France and Italy. Demand in the United Kingdom and Spain is relatively low. The remaining West European countries (the Netherlands, Sweden, Austria, Portugal, Belgium, Denmark, Switzerland, Finland, Norway, and Ireland) reached an aggregated market share of X%. We forecast Germany to continue to increase its share on the West European market until 2023. The most dynamic growth rate of X% p.a. in the upcoming eight years is projected for this country. Demand for fillers in Spain will presumably stagnate until 2023.



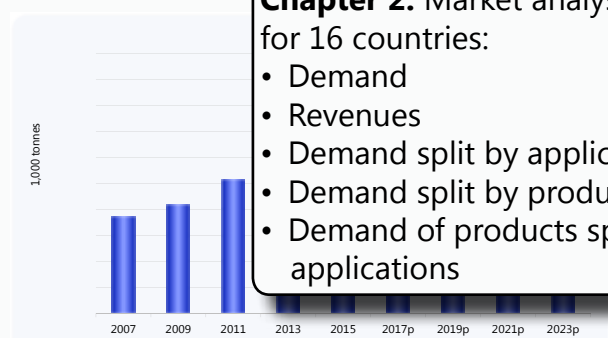
Graph: Filler revenues in Western Europe from 2007 to 2023, in billion USD and billion EUR

in million tonnes	2007	2009	2011	2013	2015	2017p	2019p	2021p	2023p	2015 - 2023
Germany	X	X	X	X	X	X	X	X	X	X% p.a.
France	X	X	X	X	X	X	X	X	X	X% p.a.
United Kingdom	X	X	X	X	X	X	X	X	X	X% p.a.
Italy	X	X	X	X	X	X	X	X	X	X% p.a.
Spain	X	X	X	X	X	X	X	X	X	X% p.a.
Others	X	X	X	X	X	X	X	X	X	X% p.a.
Total	X	X	X	X	X	X	X	X	X	X% p.a.

Table: Filler demand in Western Europe from 2007 to 2023 – split by major countries

2.5.2 India

India processed X million tonnes of fillers in 2015. Compared to 2007, this corresponds to an average increase of X% per year. We expect demand to increase by, on average, X% p.a. to approx. X million tonnes in 2023. In 2015, X million tonnes of GCC were utilized in India. Demand for the second most important product, carbon black, amounted to X million tonnes and was thus much lower. The highest relative increase at rates of X% p.a. is expected for the group of other fillers. The filler type GCC will rise significantly as well, at rates of X% p.a.



Graph: Demand for fillers in India from 2007 to 2023

The economic growth of the current financial year 2015/16 accounts for 7.4% according to the Indian central bank and is thus increasing further after growth in 2014/15 totaled 7.0%. To promote this increase, the key interest rate was lowered in 2015. The low interest is supposed to offer companies the possibility of taking out a credit loan and of making new investments. Furthermore, the lowering of the key interest rate supports the weakened Indian Rupee and has positive effects on activities on the stock exchange.

in 1,000 tonnes	2007	2009	2011	2013	2015	2017p	2019p	2021p	2023p	2015 - 2023
GCC	X	X	X	X	X	X	X	X	X	X% p.a.
PCC	X	X	X	X	X	X	X	X	X	X% p.a.
Carbon black	X	X	X	X	X	X	X	X	X	X% p.a.
Kaolin	X	X	X	X	X	X	X	X	X	X% p.a.
Talc	X	X	X	X	X	X	X	X	X	X% p.a.
Others	X	X	X	X	X	X	X	X	X	X% p.a.
Total	X	X	X	X	X	X	X	X	X	X% p.a.

Table: Fillers demand in India from 2007 to 2023 – split by products

The most important application area for fillers in 2015 was the processing of elastomers. Demand for the production of paints and varnishes ranked second. For the upcoming eight years, we forecast highly dynamic growth rates for the segment adhesives and sealants in particular. They are likely to amount to an average of X% p.a. The largest application area elastomers will experience a below-average growth rate of, on average, X% p.a.

India is one of the major producers of commercial vehicles worldwide and has continuously increasing production volumes. Reasons for the growth expected in the long term are, for example, the rising income, a young population and the fact that many inhabitants of India still do not own a car. Additionally, measures of the government to expand the infrastructure in the future also lead to an increase in demand for vehicles. The high demand for rubber in the production of tires also results in an increased consumption of fillers for rubber products. Manufacturers of paints and varnishes, plastics, and adhesives also profit from the strong development of the automotive industry.

in 1.000 tonnes	2007	2009	2011	2013	2015	2017p	2019p	2021p	2023p	2015 - 2023
Paper	X	X	X	X	X	X	X	X	X	X% p.a.
Plastics	X	X	X	X	X	X	X	X	X	X% p.a.
Paints and Varnishes	X	X	X	X	X	X	X	X	X	X% p.a.
Elastomers	X	X	X	X	X	X	X	X	X	X% p.a.
Adhesives and Sealants	X	X	X	X	X	X	X	X	X	X% p.a.
Total	X	X	X	X	X	X	X	X	X	X% p.a.

Table: Filler demand in India from 2007 to 2023 – split by application

in 1.000 tonnes	2007	2009	2011	2013	2015	2017p	2019p	2021p	2023p	2015 - 2023
Paper	X	X	X	X	X	X	X	X	X	X% p.a.
Plastics	X	X	X	X	X	X	X	X	X	X% p.a.
Paints and Varnishes	X	X	X	X	X	X	X	X	X	X% p.a.
Elastomers	X	X	X	X	X	X	X	X	X	X% p.a.
Adhesives and Sealants	X	X	X	X	X	X	X	X	X	X% p.a.
Total	X	X	X	X	X	X	X	X	X	X% p.a.

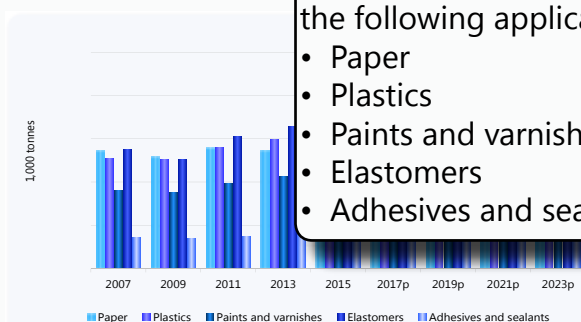
Table: GCC demand in India from 2007 to 2023 - split by application

3 Applications – World

Around X million tonnes of fillers were consumed worldwide in 2015. The most important applications for fillers are the production and processing of paper, plastics, paints and varnishes, elastomers as well as adhesives and sealants. The most important sales market in 2015 was the elastomer industry that consumed X million tonnes. This corresponds to about X% of total global consumption. Processing of plastics ranked second, accounting for a demand of X million tonnes. Application of fillers in the paper industry followed closely. The segments paints and varnishes ranked fourth, followed at a considerable distance by the manufacture of adhesives and sealants.

Chapter 3: Demand split by the following applications:

- Paper
- Plastics
- Paints and varnishes
- Elastomers
- Adhesives and sealants



Graph: Worldwide filler demand from 2007 to 2023 – split by applications

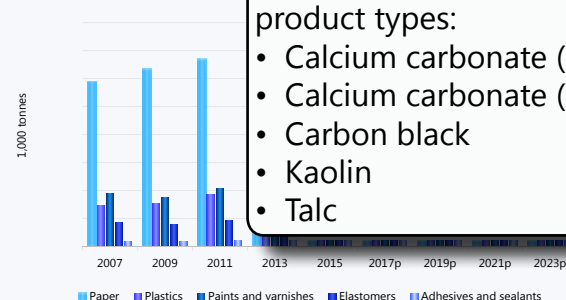
Until 2023, we expect global demand to rise to about X million tonnes. The highest growth rate between 2015 and 2023 is forecast for the segment plastics that is likely to see market volume increase by X% p.a. during the next eight years. The segments paints and varnishes as well as elastomers will also account for above-average growth rates. Overall, we expect total demand to increase at average rates of X% p.a. in the upcoming eight years.

4.2.5 Precipitated Calcium Carbonate (PCC) - South America

With X tonnes, Brazil accounted for the largest share of total South American demand for PCC in 2015. Overall demand amounted to X tonnes. Compared to 2007, this constitutes an increase of an average of X% p.a. Demand for PCC in Brazil will increase at lower rates in the upcoming eight years than it had between 2007 and 2015. Due to the highest regional growth rate of X% per year, Brazil is still likely to continue to consolidate its leading position. Until 2023, total demand in South America will increase by X% p.a. to approx. X tonnes.

Chapter 4: Demand split by product types:

- Calcium carbonate (GCC)
- Calcium carbonate (PCC)
- Carbon black
- Kaolin
- Talc



Graph: PCC demand in South America from 2007 to 2023 – split by application

in 1.000 tonnes	2007	2009	2011	2013	2015	2017p	2019p	2021p	2023p	2015 - 2023
Brazil	X	X	X	X	X	X	X	X	X	X% p.a.
Others	X	X	X	X	X	X	X	X	X	X% p.a.
Total	X	X	X	X	X	X	X	X	X	X% p.a.

Table: Demand for PCC in South America from 2007 to 2023 – split by major countries

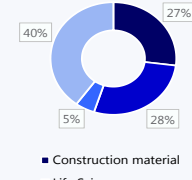
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4665 Oftringen
Switzerland
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 Web: www.omya.com

General Information About the Company

Divisions, Product Range

The company produces industrial minerals, fillers, and pigments based on calcium carbonate and dolomite. Omya is active in the production and distribution of special chemicals throughout Switzerland.

Revenues in Core Markets (Worldwide)



■ Construction material
 ■ Life Science
 ■ Forest Products Industry
 ■ Plastics

Production Sites

The company operates more than 150 production facilities and offices in 50 countries worldwide.

Profile Summary

Omya Group was established in 1884 as Plüss-Stauffer and is headquartered in Oftringen, Switzerland. In 2000, the group assumed its current name. According to own statements, about 8.000 people are employed. Revenues in 2014 amounted to approx. CHF 1 billion. Fillers based on silicon dioxide are produced from various parts of the structure.

Chapter 5: Data and facts on major producers, clearly arranged by:

- Contact details
- Turnover and profit
- Production sites
- Profile summary
- Product details

pharmaceutical industry. The company operates more than 40 sales offices and over 70 storage facilities.

Along with the Japanese Shiraishi Group, the company runs a joint venture. The joint venture Shiraishi-Omya GmbH produces precipitated calcium carbonate (PCC). The head office is located in Gummern, Austria.

Another joint venture with the family-owned company Bleck Management is Columbia River Carbonates (CRC) in Woodland, WA, USA. This joint venture manufactures ground calcium carbonate (GCC) which is extracted from the company stone quarry.

The quality and environmental management systems of the company are ISO 9001 and ISO 14001 certified.

Specific Information about Fillers

Omya produces calcium carbonate particles, under the brand names Omyacarb, Omyalite, Omyapearl, Millicarb, Inducarb, Carolith, Ulmer Weiss, and Nordkrone, dolomite (Microdol), and gray and white talc.

Furthermore, the company offers aluminum hydroxide (ATH) (Martinal), mica (Micro Mica), natural, calcined, and surface-treated kaolin (Burgess), and modified calcium carbonate (Omyabrite). GCC is used in plastics, elastomers, coatings, paper, and rubber, while the paper production is an application for PCC as a filler.

Additionally, in the category lightweight fillers, micro hollow balls made of aluminum silicate (Fillite) and virgin borosilicate (3M-Glass Bubbles) are available.

Chapter 5: In-depth profiles for the largest manufacturers, including 3M, Acron, Aditya Birla, Alcoa, BASF, Bridgestone, Huber, Imerys, Merck, Omya, PPG, Rio Tinto, SCR-Sibelco, and Showa Denko.

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