

Market Study: Synthetic Rubber

(2nd edition)



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Yours faithfully, Oliver Kutsch

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- **Have a look at the future**
Find out if new investments and technologies are worthwhile and how to gain access to future markets. We also show possible market scenarios
- **Recognize opportunities and risks**
Identify opportunities and risks on your target markets in time

This study is useful for:

- Producers and traders of styrene butadiene rubber (SBR), polybutadiene rubber (BR), acrylonitrile butadiene rubber (NBR), butyl rubber (IIR), ethylene propylene diene rubber (EPDM), polychloroprene rubber (CR), polyisoprene rubber (IR)
- Producers of auxiliaries and additives, e.g. Carbon Black, fillers, plasticizers, antioxidants, vulcanization accelerators, pigments
- Manufacturers of tires, hoses, and rubber products for industrial sectors such as construction, machinery, vehicles, sports, leisure, textiles, and 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 in this study, for the second time now, the global market for rubbers: Styrene butadiene rubber (E-SBR and S-SBR), polybutadiene rubber (BR), ethylene propylene diene rubber (EPDM), butyl rubber (IIR), acrylonitrile butadiene rubber (NBR), as well as polychloroprene rubber (CR) and polyisoprene rubber (IR) are examined in detail. Per year, more than 12.6 million tonnes of these types of rubbers are consumed worldwide. More than one half of global demand is generated in Asia-Pacific. Due to above-average growth rates, the market share in this region will presumably rise to approx. 56% in 2022. The study deals with data for the years starting in 2006 and forecasts data until 2022. All information on demand, production, import and export for the period are indicated in tonnes - the revenues in the currencies US dollar and Euro.

Elastically deformable plastics have been necessary for several technical applications but also for various everyday objects in the past decades. Demand for synthetic rubber is split in this report by the application areas tires, automotive, industry & construction, modification of materials (that is the admixture with other materials) as well as by other applications. The most important market in 2014 was the segment tires: Almost 60% of total demand was generated by original equipment tires and replacement tires. Additionally, rubbers are used in various other products in the automotive industry. Among these

are hoses, cables, gaskets as well as profiles for windows and doors. For this segment we forecast an increase of demand by 2.4% p.a. until 2022. The second largest application area for rubbers is the manufacturing of technical products such as conveyor belts, roll coverings, hoses, profiles, gaskets, cables, moldings, and roofing films. Ranging from the chemical industry, engineering, and construction to electricians and electronics, increasing numbers of rubber are needed. For the period from 2014 to 2022 we expect global demand for rubber in the segment industry and construction to increase by 2.9% p.a. By far the most important type of products is SBR: more than 5.3 million tonnes were processed in 2014. SBR is produced by emulsion polymerization (E-SBR) or solution polymerization (S-SBR). While E-SBR accounts for 73% of total SBR demand, the market for S-SBR develops at significantly more dynamic growth rates of more than 5% p.a. The tire industry is the dominating sales market for these two products as well as for BR, IIR, and IR. The picture discernible in regard to EPDM, CR, and NBR is different: These are mainly used in industry and construction products as well as in modification of materials.

The Study in Brief:

Chapter 1 provides a description and analysis of the rubber market, including forecasts up to 2022: The development of revenues, demand volumes and production is analyzed for each region of the world.

Chapter 2 offers a detailed analysis of 20 countries: Demand, export, import, production, capacities and revenues. Additionally, demand for rubber split by applications is examined for the countries. Market data on numbers of demand are split by types of rubber for each country.

Chapter 3: The different types of application areas of rubber are analyzed in detail: Data and influential factors on application in tires, automobiles, industry and construction, modification of materials as well as other applications.

Chapter 4 analyzes demand for rubbers split by the types styrene butadiene rubber (E-SBR), styrene butadiene rubber (S-SBR), polybutadiene rubber (BR), ethylene propylene diene rubber (EPDM), butyl rubber (IIR), acrylonitrile butadiene rubber (NBR), polychloroprene rubber (CR), and polyisoprene rubber (IR).

Chapter 5 offers a useful directory of the 70 most important producers, clearly arranged according to contact details, revenues, profit, product range, production sites, profile summary, and specific information on rubbers.

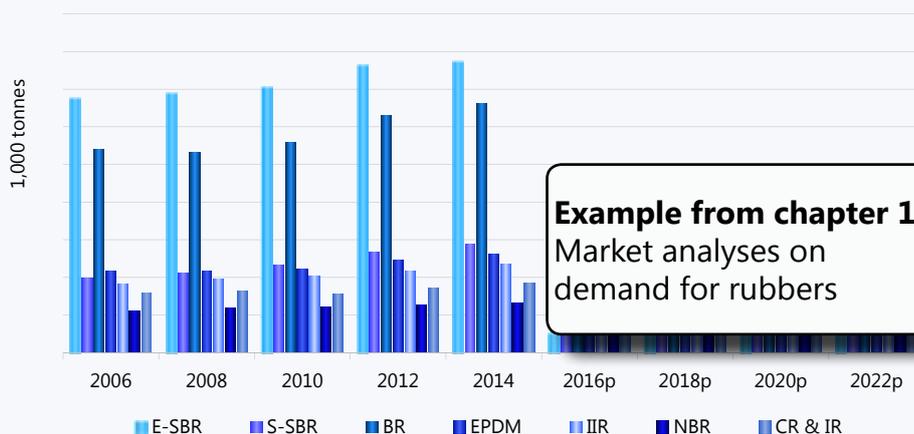
The most important manufacturers include: Bridgestone, Dow, ExxonMobil, Goodyear, Grupo Kuo, JSR, Kumho, Lanxess, LG Chem, Michelin, Nizhnekamskneftekhim, PetroChina, Reliance, TSRC, Versalis, and Zeon.

1 Market Data

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 - 1.1.1 Demand
 - 1.1.2 Revenues
 - 1.1.3 Production
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Worldwide demand for rubber from 2006 to 2022, split by products

Ceresana



Example from chapter 1
Market analyses on demand for rubbers

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- 4.5 Butyl rubber (IIR)
- ...
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- ...

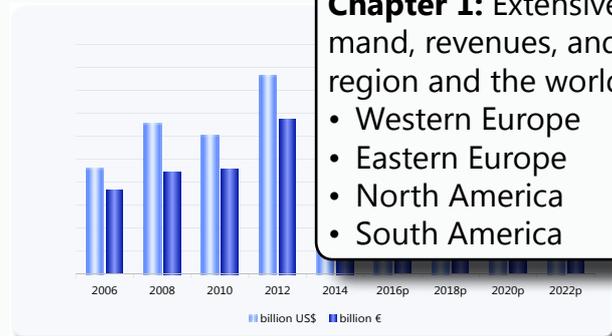
- 4.7 Polychloroprene rubber (CR) and polyisoprene rubber (IR)
- ...

5 Company Profiles

- 5.1 Western Europe
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 - Italy (1)
 - Spain (1)
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 - Poland (1)
 - Russia (5)
 - Serbia (1)
- 5.3 North America
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 - USA (9)
- 5.4 South America
 - Brazil (1)
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 - India (3)
 - Indonesia (1)
 - Japan (10)
 - South Korea (5)
 - Taiwan (3)
 - Thailand (2)
- 5.6 Middle East
 - Armenia (1)
 - Iran (1)
 - Saudi-Arabia (2)
- 5.7 Africa
 - South Africa (1)

1.3 Eastern Europe

Demand for rubber in Eastern Europe rose by, on average, X% p.a. during the past eight years and amounted to X million tonnes in 2014. We forecast the overall Eastern European demand for rubber to increase to approx. X million tonnes until 2022. Rubber revenues amounted to EUR X billion in 2014. For 2022, we forecast a market value of approx. EUR X billion.



Chapter 1: Extensive market data on demand, revenues, and production for each region and the world from 2006 to 2022:

- Western Europe
- Eastern Europe
- North America
- South America
- Asia-Pacific
- Middle East / Africa

Graph: Rubber revenues from 2006 to 2022 in billion USD and billion EUR

in 1,000 tonnes	2006	2008	2010	2012	2014	2016p	2018p	2020p	2022p	2014-2022
Poland	X	X	X	X	X	X	X	X	X	X % p.a.
Russia	X	X	X	X	X	X	X	X	X	X % p.a.
Turkey	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 % p.a.								

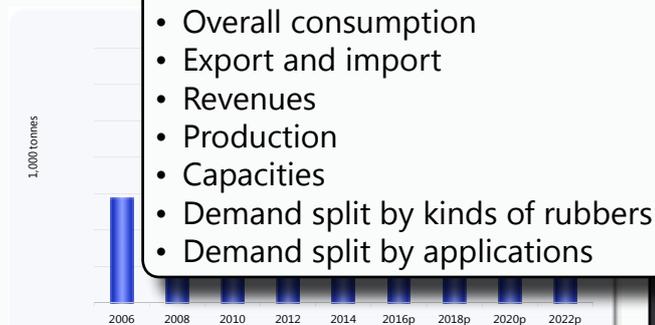
Table: Demand for rubber in Eastern Europe from 2006 to 2022 – split by major countries

2.5.5 South Korea

2.5.5.1 Demand and Revenues

Demand for rubber in South Korea amounted to around X tonnes in 2014. Consumption had thus risen by an average of X% p.a. since 2006. One third of the demand for rubber in South Korea is covered by E-SBR. Demand for rubber totaled X tonnes in 2014. Demand for the second most important product, BR, amounted to about X tonnes in the same year. For the segment of S-SBR, we predict the strongest development. Demand is forecast to increase at an annual rate of X%.

We expect demand in South Korea to increase further by X% per year to X tonnes by 2022. Rubber revenues amounted to USD X billion in 2014. For 2022, we forecast a market value of approx. USD X billion.



Graph: Demand for rubber in South Korea from 2006 to 2022

The most important sales market for rubbers in 2014 was the application area tires: Construction and industry products ranked second. Demand of other applications is projected to increase at the highest growth rate of X% p.a. during the next eight years. Automotive applications are also expected to generate above-average rates of X% p.a.

Chapter 2: Specific analyses and forecasts for 20 individual countries:

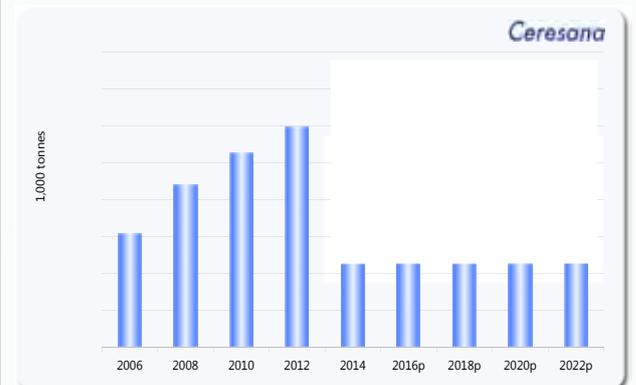
- Overall consumption
- Export and import
- Revenues
- Production
- Capacities
- Demand split by kinds of rubbers
- Demand split by applications

Even though the segment tires will record the least dynamic development, it will continue to account for the major share of rubber consumption in South Korea.

2.5.5.2 Production, Capacities and Trade

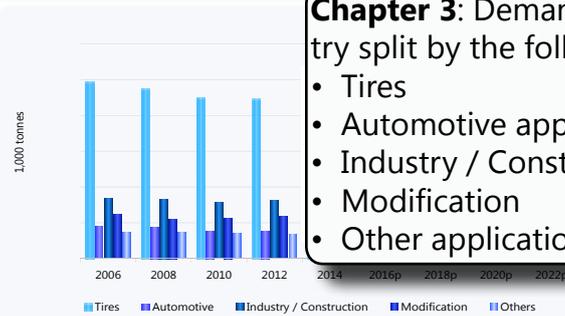
Rubber production accounted for X million tonnes in 2014. We forecast production volume to increase by X% p.a. during the upcoming eight years. In 2022, X million tonnes of rubber will be produced in South Korea.

Recently, total capacity amounts to X million tonnes. Lotte Versalis Elastomers (LVE) is a joint venture between Lotte and Versalis which plans to open up a 100,000 tonnes SSBR plant in 2017. The joint venture Kumho Polychem Co., Ltd. intends to increase its annual EPDM capacity by 60,000 tonnes starting 2016. Exports of rubbers amounted to X tonnes in 2014 while X tonnes were imported.



Graph: Rubber production in South Korea from 2006 to 2022

3.2 Applications – Western Europe



Chapter 3: Demand per region and country split by the following applications:

- Tires
- Automotive applications
- Industry / Construction
- Modification
- Other applications

Graph: Demand for rubber in Western Europe from 2006 to 2022 – split by application areas

in 1,000 tonnes	2006	2008	2010	2012	2014	2016p	2018p	2020p	2022p	2014-2022
Tires	X	X	X	X	X	X	X	X	X	x % p.a.
Automotive applications	X	X	X	X	X	X	X	X	X	x % p.a.
Industry / Construction	X	X	X	X	X	X	X	X	X	x % p.a.
Modification	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 % p.a.								

Table: Demand for rubber in Western Europe from 2006 to 2022 – split by application areas

Of the total amount of X million tonnes of rubber which were demanded for in Western Europe in 2014, about one half was used for the production of tires. Industry and

construction ranked second. Demand for rubbers in the application areas tires as well as industry and construction will develop dynamically with rates of presumably X% p.a. each in the upcoming eight years. Overall rubber consumption in Western Europe will increase by X% p.a. to approx. X million tonnes.

3.2.1 Tires

In 2014, X tonnes of rubbers were used for the production of tires in Western Europe. Germany had the highest demand for rubber. Producers in France ranked second, followed by Italy. We expect the highest relative increase of X% p.a. until 2022 for Belgium while the Spain is anticipated to experience an average decrease of X% p.a. Given an expected increase of X% p.a. in this segment, demand for rubber in Western Europe will amount to approx. X tonnes in 2022.

in 1,000 tonnes	2006	2008	2010	2012	2014	2016p	2018p	2020p	2022p	2014-2022
Belgium										
Germany										
France										
The United Kingdom										
Italy										
Netherlands										
Spain										
Others										
Total										

Chapter 4: Demand split by product types:

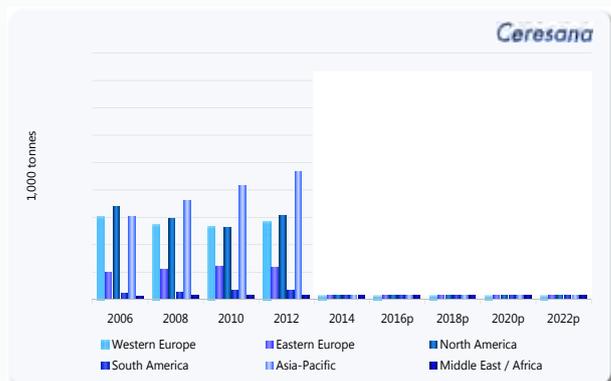
- Styrene butadiene rubber (E-SBR)
- Styrene butadiene rubber (S-SBR)
- Polybutadiene rubber (BR)
- Ethylene propylene diene rubber (EPDM)
- Butyl rubber (IIR)
- Acrylonitrile butadiene rubber (NBR)
- Polychloroprene rubber (CR) and polyisoprene rubber (IR)

Table: Demand for rubber in Western Europe from 2006 to 2022 – split by major countries

4.4 Ethylene propylene diene rubber (EPDM)

4.4.1 World

In 2014, about X million tonnes of EPDM were processed worldwide. In the past eight years, demand rose at an average rate of X% per year. Around X% of global demand in 2014 originated in the region Asia-Pacific. Western Europe ranked second, followed by North America. The highest relative increase during the next eight years is expected for Asia-Pacific. Market volume in this region is likely to increase by X% p.a. to approx. X tonnes in 2022. Eastern Europe and South America will develop more strongly than the regions North America and Western Europe. The latter will experience the least dynamic development: Until 2022, market volume will only rise by, on average, X% per year. Overall global demand for EPDM will rise by about X% p.a. to approx. X tonnes over the next eight years.



Graph: Worldwide demand for EPDM from 2006 to 2022 – split by region

Zeon Corporation				
<p>Shin Marunouchi Center Building, 1-6-2 Marunouchi Chiyoda-ku, Tokyo 100-8246 Japan</p> <p>Tel.: +81 3 3216 1772 Web: www.zeon.co.jp</p>				
Financial Key Data				
(in billion JPY)	2011/12	2012/13	2013/14	2014/15
Total Revenues	262.8	250.8	296.4	307.5
Net Income	19.1	14.8	19.7	19.1
General information about the company				
Divisions, Product Range	<p>The company operates in the business segments:</p> <ul style="list-style-type: none"> Elastomers: synthetic rubbers, synthetic latices, chemicals Specialty Materials: specialty chemicals, information materials, specialty plastics, optical materials and medical products Others: RIM formulations, RIM products, paints, butadiene extraction technology, medical products etc. 			
Production Sites	<p>The company's production sites are located in:</p> <ul style="list-style-type: none"> Japan (4) USA (3) United Kingdom Thailand (2) China (4) 			
Profile Summary	<p>Zeon was founded in 1950 and started out as a manufacturer of plastics. Beginning in the 1980s, Zeon diversified into other business areas, such as spe-</p>			

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

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

Specific information about elastomers	
Product Details	<p>Zeon offers following elastomer products:</p> <p>Synthetic Rubbers:</p> <ul style="list-style-type: none"> General-purpose Rubber: Nipol SBR, Nipol SBR NS Series, Nipol BR, Nipol IR Special Rubber: Nipol NBR, Nipol POLYBLEND, Nipol AR, Zetpol (HNBR), Zeoforte ZSC (ZEON Super Composite), Hydrin (Epiclorohydrin Polymers)
Associated Companies	<p>Subsidiary:</p> <ul style="list-style-type: none"> Zeon Chemicals Texas Inc....
Site / Plant - SBR (current)	
Tokuyama, Japan (ESBR)	Capacity (tonnes/year) xxx
...	...
Total Capacity (current) xxx	
Site / Plant - BR (current)	
...	Capacity (tonnes/year) xxx
Total Capacity (current) xxx	
Site / Plant - NBR (current)	
...	Capacity (tonnes/year) xxx
Total Capacity (current) xxx	
Site / Plant - IR (current)	
...	Capacity (tonnes/year) xxx
Total Capacity (current) xxx	
Site / Plant SBR (planned)	
...	Capacity (tonnes/year) xxx
Total Capacity (20??) xxx	

Chapter 5: In-depth profiles for the largest manufacturers, including Bridgestone, Dow Chemical, ExxonMobil, Goodyear, JSR, Kumho, KUO, Lanxess, LG Chem, Michelin, Nizhnekamskneftekhim, PetroChina, Reliance, TSRC, Versalis, and Zeon. (The profiles are assigned to the country in which the company is headquartered and include JVs and subsidiaries.)

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- Turkey
- United Kingdom

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