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High-Temperature Plastics

US Industry Study with Forecasts for **2017 & 2022**

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Advances will be propelled by the ongoing adoption of high-temperature plastics in place of more conventional materials such as metal, glass, and other polymers in an expanding array of applications.

US demand to grow 5.8% annually through 2017

US demand for high-temperature plastics is forecast to expand 5.8 percent per year to \$3.1 billion in 2017, with volume expected to exceed 300 million pounds on annual gains of 4.7 percent. Advances will be propelled by the ongoing adoption of high-temperature plastics in place of more conventional materials such as metal, glass, and other polymers in an expanding array of applications. Gains will be further supported by an improving economic outlook and rising consumer confidence, which will boost the output of durable goods such as electrical equipment, electronic products, machinery, and transportation equipment that increasingly utilize high-temperature plastics.

Fluoropolymers to offer best growth opportunities

Fluoropolymers are by far the largest type of high-temperature plastic, accounting for nearly half of total market value in 2012. Although advances in this large sector are expected to trail the average, fluoropolymers will continue to offer the best opportunities for growth based on their market size. The widespread use of polytetrafluoroethylene in the large industrial market will promote overall gains, particularly as opportunities in applications such as chemical processing and industrial filtration continue to arise. Additionally, a substantial rebound in nonresidential building activity, especially in the office and



commercial sector, will spur demand for fluorinated ethylene propylene, which is widely used in wire and cable applications due to its low dielectric constant, flexibility, and superior heat- and fire-resistance.

Polyketones to see most rapid demand gains

Polyketones are anticipated to see the most rapid demand gains through the forecast period, albeit from a relatively small base. Advances will be fueled by efforts to extend the use of these high-priced, high-performance materials into new applications, particularly in the medical field, where these biocompatible resins are gaining use in orthopedic

implants. Overall demand will be spurred by efforts on the part of producers to market polyketones as a lightweight alternative to metals in a variety of demanding applications, including those found in the oil and gas, and wind energy sectors. Polyphenylene sulfide and sulfone polymers are also projected to achieve above average gains, propelled by rising motor vehicle output and vehicle fuel-efficiency efforts.

Exceptional attributes to stimulate demand

The exceptional attributes of high-temperature plastics will continue to stimulate demand in a widening array of applications. For instance, high-temperature plastics are gaining use in motor vehicle applications due to their ability to provide necessary heat- and chemical-resistance, strength, durability, and weight reduction. In the electronics sector, more stringent technical and environmental specifications will promote the use of high-temperature plastics, which are inherently flame retardant and do not contain halogenated additives.

Study Coverage

This industry study, **High-Temperature Plastics**, presents historical demand data for 2002, 2007 and 2012, and forecasts for 2017 and 2022 by resin and market. The study also considers market environment factors, evaluates company market share, and profiles 24 industry players.

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Sample Text, Table & Chart

RESINS

Polysulfones

to \$... million. The... when... Strong... for po... which are suitable for use in fluid handling applications such as components, hot water fittings, and plumbing manifolds. Polysulfones are produced through the reaction of bisphenol-A with 4,4-dichlorodiphenylsulfone (DCDPS). The medical market represents the primary outlet for polysulfones, accounting for one-third of total demand. Strength in this sector stems from PSU's thermal-resistance and hydrolytic stability, which enables it to withstand repeated steam sterilization. It can also stand up to ethylene oxide and gamma radiation sterilization techniques. Polysulfones are employed in medical trays, containers, and surgical instruments. In addition, PSU resins are widely used in filtration membranes, which can be used in dialysis for blood purification. Among PSU membranes, the denser types are used primarily in electro dialysis applications, and the more porous types with higher flow rates are used in nanofiltration, ultrafiltration, and reverse osmosis systems.

Polysulfone membranes are also used in wastewater recovery, food and beverage processing, and biotechnology. The primary advantages of PSU materials are performance characteristics such as a tolerance for a wide pH range and extreme temperatures. Key water and wastewater treatment applications for PSU membranes include general wastewater treatment, as well as specific applications such as the treatment of wastewater and landfill leachate. PSU is widely used in membrane clarification of beverages such as wines and juices; concentrate whey in dairy processing; and purify dextrose and corn syrup in wine-making operations. Biotechnology applications include recovery of

58

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TABLE IV-4

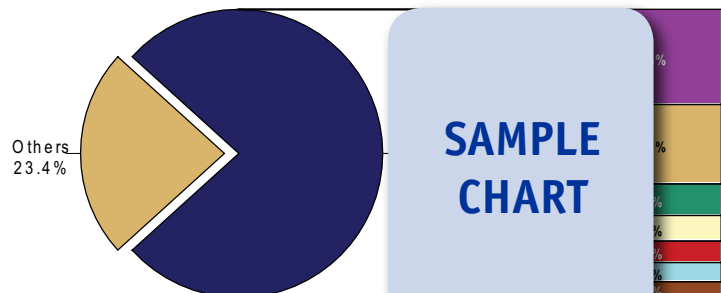
WIRE & CABLE MARKETS FOR HIGH-TEMPERATURE PLASTICS (million dollars)

Item	2002	2007	2012	2017	2022
Insulated Wire & Cable Shpfts (bil 2005\$ lb HTPs/000\$ wire & cable					
Wire/Cable High-Temp Plastics (mil lb) \$/lb					
Wire/Cable High-Temperature Plastics Fluoropolymers: Fluorinated Ethylene Propylene Polytetrafluoroethylene Other Fluoropolymers Other Resins					
% wire & cable E&E* High-Temp Plastics Demand					

*electrical & electronic

CHART V-1

US HIGH-TEMPERATURE PLASTICS MARKET SHARE (\$2.4 billion, 2012)



Sample Profile, Table & Forecast

TABLE III-4

**FLUORINATED ETHYLENE PROPYLENE DEMAND BY MARKET
(million dollars)**

Item	2002	2007	2012	2017	2022
FEP Demand (mil lb)					
\$/lb					
FEP Demand					
Wire & Cable					
Industrial					
Transportation Equipment					
Other					
% FEP Fluoropolymers Demand					



COMPANY PROFILES

Celanese Corporation

222 West Las Colinas Boulevard, Suite 900N
 Irving, TX 75039
 972-443-7000
<http://www.celanese.com>

Sales: \$1.3 billion
 Employed: 10,000
 Key Products: Polyethylene sulfide

**SAMPLE
PROFILE**

Celanese is involved in the processing of hydrocarbon products into chemical based products and value added chemicals. Celanese operates through five segments: Advanced Engineered Materials, Acetyl Intermediates, Consumer Specialties, Industrial Specialties, and Other Activities.

Celanese was the fourth largest supplier of high-temperature plastics to the US market in 2012, with nearly seven percent of sales. The Company is active in the US high-temperature industry through the Advanced Engineered Materials segment, which had sales of \$1.3 billion in 2012. Of the segment's total sales in 2012, \$478 million were to North America. The Advanced Engineered Materials segment includes Celanese's Ticona business, which has headquarters sites in the US and Germany. The US headquarters facility is in Florence, Kentucky. The business specializes in the manufacture and sale of a variety of engineering plastics. Among Ticona's products are VECTRA and ZENITE liquid crystal polymers (LCPs) and FORTRON polyphenylene sulfide (PPS). Celanese cites DuPont, BASF SE (Germany), Royal DSM NV (Netherlands), Solvay SA (Belgium), and the SABIC Innovative Plastics business of Saudi Basic Industries Corporation (Saudi Arabia) as principal competitors of the Advanced Engineered Materials segment.

OTHER STUDIES

Silicones

US demand for silicones is forecast to climb 4.7 percent annually to \$4.3 billion in 2018, with volume rising 3.2 percent per year to 900 million pounds. Silicone elastomers will grow the fastest, overtaking fluids as the leading product type. The construction and medical markets will be the fastest growing segments, while the industrial market will remain dominant. This study analyzes the \$3.4 billion US silicones industry, with forecasts for 2018 and 2023 by product, market and application. It also evaluates company market share and profiles industry players.

#3138 March 2014 \$5100

Fiber-Reinforced Plastic Composites

US demand for fiber-reinforced plastic (FRP) composites will climb 4.7 percent annually to 4.3 billion pounds in 2017, valued at \$22.9 billion. Motor vehicles will remain the largest market while construction will grow the fastest as it rebounds from the 2007-2012 period. Both thermoset and thermoplastic FRP composites will grow in line with the average. This study analyzes the 3.5 billion pound US FRP composites industry, with forecasts for 2017 and 2022 by fiber, product and market. The study also evaluates company market share and profiles industry players.

#3092 October 2013 \$5100

World Thermoplastic Elastomers

World thermoplastic elastomer (TPE) demand will rise 5.5 percent per year to 5.8 million metric tons in 2017. The Asia/Pacific region will remain the largest market and will grow the fastest. Styrene block copolymers (SBCs) will continue as the leading TPE product, while polyolefin elastomers (POEs) will grow the fastest. This study analyzes the 4.5 million metric ton world TPE industry, with forecasts for 2017 and 2022 by market, product, world region, and for 15 countries. The study also evaluates company market share and profiles industry players.

#3051 August 2013 \$6400

World Silicones

World demand for silicones will rise 5.9 percent per year to \$18.9 billion in 2017. The Asia/Pacific region will remain the largest and fastest-growing market, but the rate of growth will slow. The construction segment will grow the fastest based on a recovery in the silicone-intensive construction sectors of the US and Western Europe. This study examines the \$14.2 billion world silicones industry, with forecasts for 2017 and 2022 by market, product, world region, and for 15 countries. The study also evaluates company market share and profiles industry participants.

#3022 May 2013 \$6100

Custom Thermoplastic Compounding

US demand for custom compounded thermoplastics is forecast to rise 5.0 percent annually to 11.4 billion pounds in 2017, valued at \$14.3 billion (resin content only). Construction will offer the best market prospects, as the industry recovers from recession. PVC represents the largest and fastest growing compounded thermoplastic. This study analyzes the 8.9 billion pound US custom compounded thermoplastic industry, with forecasts for 2017 and 2022 by resin and market. The study also evaluates company market share and profiles industry players.

#2991 February 2013 \$5100

About The Freedonia Group

The Freedonia Group, Inc., is a leading international industry market research company that provides its clients with information and analysis needed to make informed strategic decisions for their businesses. Studies help clients identify business opportunities, develop strategies, make investment decisions and evaluate opportunities and threats. Freedonia research is designed to deliver unbiased views and reliable outlooks to assist clients in making the right decisions. Freedonia capitalizes on the resources of its proprietary in-house research team of experienced economists, professional analysts, industry researchers and editorial groups. Freedonia covers a diverse group of industries throughout the United States, the emerging China market, and other world markets. Industries analyzed by Freedonia include:

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