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Metallocene & Single-Site Polymers

US Industry Study with Forecasts for **2011 & 2016**

Study #2218 | July 2007 | \$4400 | 191 pages



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Enhanced puncture resistance, improved sealing abilities, higher clarity and other advantages make mLLDPE well suited for use in stretch film, trash bags, heavy-duty sacks and flexible food packaging.

US demand to grow 17.7% annually through 2010

US demand for metallocene and single-site polymers is forecast to grow nearly 18 percent yearly to 5.2 billion pounds in 2011, valued at \$5.8 billion. Advances will be stimulated by continued cost and performance optimization of metallocene catalysts and materials, and growing economies of scale. Further increases will be threatened by higher costs compared to conventional materials, and competition from improved Ziegler-Natta catalyst systems. Film and sheet is the leading application due to the importance of mLLDPE in packaging uses. Prices will moderate following the rapid increases in crude petroleum and natural gas feedstock costs from 2004 to 2006.

mLLDPE to stay dominant, mHDPE & polypropylene to see fastest gains

Metallocene linear low density polyethylene (mLLDPE) will remain the dominant type, and is projected to expand more than 15 percent annually to three billion pounds in 2011. Stimulants include processing and performance advantages over conventional thermoplastics, such as enhanced puncture and impact resistance, improved sealing capabilities, higher clarity and gloss, and easy blending with other polyolefins. These capabilities make mLLDPE ideally suited for the production of stretch film, trash bags, heavy-duty sacks and flexible food



packaging. Metallocene HDPE (mHDPE) demand will increase at a more rapid pace, reflecting an expanded range of product offerings, as well as performance advantages over other materials, such as flexibility, high gloss, and impact and stress crack resistance. Applications are heavily concentrated in the packaging industry, particularly for food and cosmetic/toiletry bottles. Polypropylene will also experience more rapid advances, stimulated by metallocene's ability to control polypropylene's tacticity and comonomer distribution, with particular opportunities anticipated in areas such as injection molding, and fibers and nonwovens.

Demand for metallocene elastomers and plastomers will increase 18 percent per annum to 800 million pounds in 2011. Elastomers include ethylene-propylene-diene-monomer (EPDM) and thermoplastic elastomers (TPEs). These materials perform like thermoset rubber but have the processing ease of thermoplastics. Motor vehicles are a leading market due to processing advantages and recyclability. Demand for mEPDM, widely used in roofing and membranes, will be fueled by new grades that offer improved processing, cleanliness and lot-to-lot consistency. Rapid growth is also anticipated for plastomers, which are used neat or as polymer modifiers to enhance the toughness, clarity and sealing performance of flexible packaging.

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Sample Text, Table & Chart

METALLOCENE/SINGLE-SITE ELASTOMERS & PLASTOMERS

Markets & Suppliers

Motor vehicles and packaging accounted for two-thirds of metallocene and single-site polymer markets in 2006. The vehicle market is expected to grow at a 1.5 percent per annum rate from 2006 to 2011, with increased use in areas such as bumpers, interior trim, and dimensionally stable components. Good low-cost solutions include thermoplastic elastomers (TPEs) and thermoplastic polyolefins (TPOs) are tough, recyclable. They also offer good weatherability. Typical applications include steering wheels, instrument panels, door covers, and seating. Metallocene plastic can be used as bumpers based on their impact resistance.

US metallocene and single-site plastomers in packaging markets is expected to reach 1.5 billion pounds, driven mainly by opportunities in the packaging arena. In packaging uses, plastomers can offer strength, high gloss, low melting points, enhanced cleanliness and unique barrier properties, particularly when used in blends with thermoplastics such as polypropylene. Uses include packaging for personal care products such as shampoos and detergents, as well as food packaging sealants for items such as produce, milk, fresh and processed meat, and bulk cheeses. Other uses include packaging films for products such as baby diapers, incontinence products, and other hygiene products.

Demand for metallocene TPEs and plastomers in the goods and durable equipment market is forecast to reach 1.5 billion pounds in 2011 due to increased use in products such as housewares, sporting goods and office machinery, including parts, handles and hoses. Attributes of mTPEs in these uses include colorability, durability, flexibility and lower density (resulting in weight end-products).

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SAMPLE TEXT

TABLE V-1

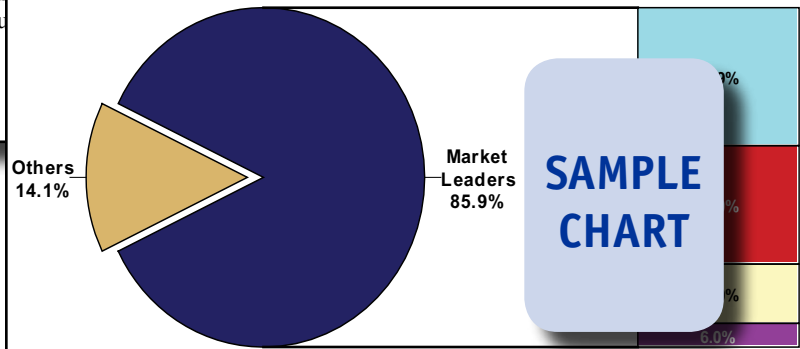
METALLOCENE & SINGLE-SITE THERMOPLASTIC DEMAND BY TYPE (million pounds)

Item	1996	2001	2006	2011	2016
Gross Domestic Product (bil 2000\$)	50	50	50	50	50
lbs polyolefins/000\$ GDP	1	1	1	1	1
Thermoplastic Polyolefin Demand % metallocene & single-site	3	3	3	3	3
M/SS Thermoplastic Demand					
mLLPDE					
mHDPE					
mPP					
\$/lb					
M/SS Thermoplastic Demand (mil \$)					

SAMPLE TABLE

CHART VII-1

METALLOCENE & SINGLE-SITE POLYMER MARKET SHARE, 2006 (\$2.4 billion)



SAMPLE CHART

Sample Profile, Table & Forecast

TABLE IV-3
FILM & SHEET APPLICATIONS FOR METALLOCENE & OTHER SINGLE-SITE POLYMERS (million pounds)

Item	1996	2001	2006	2011	2016
Packaging Shipments (bil 2000\$)	95.4	101.1	105.5	111.7	118.2
lbs polymers/000\$ packaging					3
Film & Sheet Applications					30
Polyethylene:					20
LLDPE					20
HDPE					00
Polypropylene					00
Elastomers & Plastomers					50
% film & sheet	8				8
Met/Single-Site Polymers Demand	145	140	228	315	1000

SAMPLE TABLE

COMPANY PROFILES

Schulman (A.) Incorporated

3550 West Market Street
 Akron, OH
 330-666-
<http://www>

Sales: \$
 US Sales
 Employe

Key Proc

SAMPLE PROFILE

A. Schulman is a leading international producer and supplier of high-performance plastic resins and compounds. The Company operates in two geographic segments: North America and Europe.

The Company participates in the US metallocene and single-site polymer industry through the North America segment, which had FY 2006 sales of \$494 million. Schulman also conducts business through five primary product groups, of which the Polyolefins group manufactures polyethylene and polypropylene resins and compounds, including metallocene-based products. The Polyolefins group, which generated sales of \$495 million in FY 2006, formulates SUPERLINEAR metallocene-based polyethylene, among other products.

SUPERLINEAR resins are engineered for rotational molding applications and include the XL 0370 grade, which is marketed as a next-generation product that exhibits higher stiffness and heat-deflection qualities than previous versions. SUPERLINEAR XL 0370 features enhanced impact resistance and stiffness, as well as less heat distortion than conventionally formulated polyethylene resins. SUPERLINEAR resins are produced in a range of colors for applications that include watercraft, refuse containers, pressure tanks and display cases.

“Metallocene LLDPE demand will expand over 15 percent annually to 2.4 billion pounds in 2011, accounting for 84 percent of all metallocene film and sheet uses. LLDPE’s dominance reflects the resin’s excellent clarity, strength and flexibility. Improved grades of mLLDPE have better shock resistance; low welding and sealing temperatures; good optical properties; a low extractables content; and good converting and organoleptic properties ...”

--Section IV, pg. 58

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OTHER STUDIES

Flexible Bulk Packaging

US demand for flexible bulk packaging will grow 3.4% yearly through 2011. Film wrap, plastic strapping and plastic shipping sacks will lead gains. Plastic such as polyethylene will remain the dominant material, with the limiting effect of downgauging softened by new applications and further inroads on paper sacks. This study analyzes the \$6.1 billion US flexible bulk packaging industry, with forecasts for 2011 and 2016 by material, product and market. It also details market share and profiles major players.

#2238 08/2007..... \$4500

Fluoropolymers

US fluoropolymers demand will rise 5.7% yearly through 2011. PVDF resins will lead gains among major types based on strength in architectural coatings. Fluoroelastomers will also do well, benefiting from improved motor vehicle and aerospace markets. Electrical and electronic products will be the fastest growing market. This study analyzes the \$1.4 billion US fluoropolymer industry, with forecasts for 2011 and 2016 by product, application and market. It also details market share and profiles major firms.

#2206 06/2007..... \$4400

Specialty Films

US specialty film demand will grow 4.8% annually through 2010. Gains will be driven by higher value materials, the rapid adoption of modified atmosphere packaging and improved film coating and metallization. Barrier films will remain dominant while biodegradable and water soluble films will grow the fastest from a small base. The study analyzes the \$5.8 billion US specialty film industry to 2010 and 2015 by product, function and market. It also evaluates company market share and profiles leading competitors.

#2158 02/2007..... \$4400

Natural Polymers

US natural polymer demand will grow 5.9% annually through 2010 based on increased food production and opportunities in packaging and medical uses. Starch and fermentation products will grow the fastest and surpass cellulose ethers as the dominant type by 2015. The food and beverage market will remain dominant while medical uses will lead gains. The study analyzes the \$2.7 billion US natural polymer industry to 2010 and 2015 by product and market. It also details market share and profiles major players.

#2156 01/2007..... \$4300

Plastic Film

US plastic film demand will grow 4.5% annually through 2010, driven by cost/performance and source reduction advantages over rigid packaging. Low density polyethylene film will remain dominant while polypropylene will grow the fastest. Secondary packaging will lead market gains based on strength in stretch and shrink wrap and retail bags. This study analyzes the \$23 billion US plastic film industry to 2010 and 2015 by type, application and market. It also details market share and profiles major players.

#2086 08/2006..... \$4400

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