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Conductive Polymers

Industry Study with Forecasts to **2010 & 2015**

Study #2071 | June 2006 | $4200 | 224 pages

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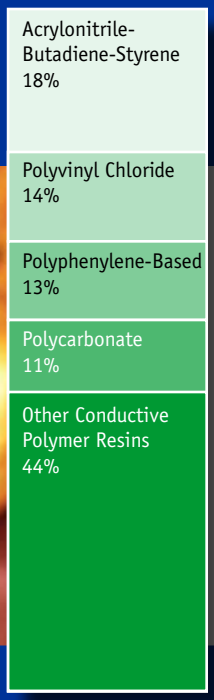
The proliferation of sensitive electronics that require ESD and EMI/RFI shielding, along with ongoing component miniaturization that require more protection, will benefit US conductive polymer demand.

US demand to grow 5.8% annually through 2010

Conductive polymer demand in the US is projected to grow 5.8 percent annually to 465 million pounds (including both resins and additives) in 2010, valued at $1.4 billion. Conductive polymers will provide a 370 million pound market for base resins, driven by their unique combination of processability, dimensional stability and conductivity, as well as optical and mechanical properties. Advances will reflect a resurgence in electrical and electronic equipment shipments, as well as the proliferation of sensitive electronic devices and needs to shield them from electrostatic discharge (ESD) and electromagnetic and radio frequency interference (EMI/RFI). Other stimulants include ongoing miniaturization trends, as smaller, more densely packed components require greater levels of protection. Rapid growth is expected for new technologies such as carbon nanotubes and inherently conductive polymers (ICPs), although volumes will remain low. Further conductive polymer growth will be moderated by continued offshore electronics production.

US Conductive Polymer Demand

(280 million pounds of resin content, 2005)



ABS to remain dominant, PVC to grow the fastest

The six leading resins -- acrylonitrile-butadiene-styrene (ABS), polyvinyl chloride (PVC), polyphenylene-based resins, polycarbonate, polyethylene and polypropylene -- together accounted for more than three-fourths of all conductive polymers used in 2005. ABS will remain the leading resin as a result of the material's high impact strength. PVC will expand at a faster pace based on its lower cost, performance enhancements, and design and processing ease. Polyphenylene-based resins such as polyphenylene sulfide will increasingly be used in high temperature and chemical resistant applications, such as under-the-hood motor vehicle components. Conductive polycarbonate demand will be fueled by the resin's high impact strength, toughness, dimensional stability, and good mechanical and electrical properties. Polypropylene will expand to 37 million pounds in 2010, reflecting the resin's excellent performance parameters and cost advantages over other resins.

Potentially large markets exist for inherently conductive polymers (ICPs)

ICPs are still in their nascent stage with uses including ESD protected material handling products such as tote bins, boxes and circuit board racks. Potentially large applications include organic light emitting diodes (OLEDs) used in flat screens and other flexible displays, and bipolar plates for fuel cells. Carbon nanotubes impart high strength and light weight to polymeric matrixes, and can be used at lower loadings than fibers or other materials. However, their high cost will continue to relegate them to specialized uses.

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Sample Text, Table & Chart

TABLE V-2

CONDUCTIVE POLYMER DEMAND BY APPLICATION
(million pounds -- resin content)

Item	1995	2000	2005	2010	2015
Electrical/Electronic Eqp Shpt (bil $)	555				
lbs conductive/mil $ shpts	407				
Conductive Polymer Demand	226				
Product Components	128				
Antistatic Packaging	36				
Material Handling	28				
Worksurface & Flooring	12				
Other Applications	22				

SAMPLE TABLE

FUNCTIONS, APPLICATIONS & MARKETS

ESD Protection & Other Functions

Nearly all plastics are electrical insulators in their natura without any modifiers or additives). As with any insulating m electrical charges deposited on a polymer surface are long-liv likely to cause damage to electronics that come into contact w sequently, a variety of conductive polymers have been develo are either electrically conductive or static dissipative.

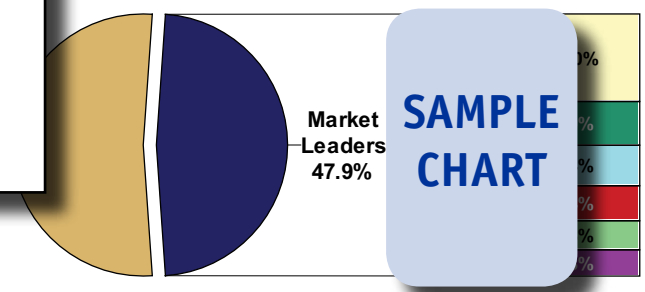
Demand for conductive polymers in electrostatic discharge protection ar annual increases through 2010 (resin only). The greater sensit devices will broaden use of static ns in worksurface, packaging and pr rotected plastics are very cost e nage to electronic components lars for a single sophisticated circuit everely damaged by random electros studies have shown that 25 percent to 75 percent of all electronic component failures are related to problems arising from electrostatic discharge damage.

SAMPLE TEXT

Static electricity is defined as a surface excess or deficiency of electrons which is produced when two nonconductive surfaces rub together or separate from one another. Human bodies, plastics, synthetic fibers and fiberglass are leading sources of electrostatic voltages. Electrical charges, accumulated during the handling, processing and shipping of plastics, may be dissipated by compounding carbon black or amine-based additives into the polymer matrix. Amine-based and other antistatic agents also provide secondary and tertiary functions by serving as lubricants and mold release agents, which enhance processability. The choice of conductive technology used must include factors such as longevity and performance under use. Improvements have been made in

CHART VI-2

NDUCTIVE POLYMER MARKET SHARE, 2005
($940 million)



SAMPLE CHART

* market share figures include resins, additives & processing

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Sample Profile, Table & Forecast

TABLE IV-3

CONDUCTIVE POLYVINYL CHLORIDE DEMAND BY APPLICATION (million pounds -- resin content)

Item	1995	2000	2005	2010	2015
Electrical/Electronic Eqp Shpt (bil $)	5				47
lbs PVC/mil $ shpts					8
Conductive PVC Demand					4
Product Components					9
Antistatic Packaging					0
Worksurface & Flooring					0
Other Products					5
% PVC	1				6
Conductive Polymers Demand	220	322	280	370	470

SAMPLE TABLE

COMPANY PROFILES

Chevron Phillips Chemical Company LLC
10001 Six Pines Drive
The Woodlands, TX 77380
832-813-4100
http://ww

Sales: $
US Sales
Employr

Key Proc compounds

SAMPLE PROFILE

Chevron Phillips Chemical Company, or CPChem, is a 50/50 joint venture between Chevron Corporation (San Ramon, California), which changed its name from ChevronTexaco Corporation in May 2005; and ConocoPhillips (Houston, Texas). CPChem operates in three segments: Olefins and Polyolefins, Aromatics and Styrenics, and Specialty Products.

The Company is involved in the US conductive polymers industry via the Olefins and Polyolefins segment, which recorded sales of $7 billion in 2005. CPChem is primarily involved in this market through a joint venture with Sumika Polymers America Corporation (Houston, Texas), which is an indirectly owned subsidiary of Sumitomo Chemical Company Limited (Japan). The venture company, Phillips Sumika Polypropylene Company (Houston, Texas), is 60-percent owned by CPChem and 40-percent owned by Sumika Polymers America. Phillips Sumika Polypropylene manufactures and markets standard and engineered polypropylene resins under the MARLEX tradename. The MARLEX product range includes several grades of antistatic polypropylene polymers, among them HGL-200, HLN-120-01 and HGL-050-

164

"Product component applications for conductive PVC are predicted to grow 6.6 percent yearly to 22 million pounds in 2010 based on cost advantages over other materials. Uses include electromagnetic and radio frequency protected housings for business machines, computers and other electronic products. Good growth is also expected for smaller applications such as worksurface and flooring protection products such as floor and table mats. Antistatic packaging film and sheet products will..."

--Section IV, pg. 68

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Other Studies

Silicones

Silicone demand in the US will grow 4.7% annually through 2010, driven by performance and environmental advantages over acrylic, polyurethane and rubber. Silicone fluids will remain the largest type while silicone gels will grow faster based on renewed growth in the electronics sector. This study analyzes the $3 billion US silicone industry to 2010 and 2015 by product and market. It also considers market environment factors, details industry structure, evaluates market share and profiles major manufacturers.

#2054 ..... 05/2006..... $4200

Nanocomposites

US nanocomposites demand will reach 1.4 billion pounds by 2015 as nanomaterial and composite prices decline and technical issues are overcome. Initial growth will be in higher-priced resins such as engineered plastics and thermoplastic elastomers, but eventually nanocomposites based on commodity plastics will dominate. This study analyzes the $311 million US nanocomposites industry to 2010, 2015 and 2020 by resin, market and nanomaterial. It also profiles major producers and evaluates market share.

#2042 ..... 03/2006..... $4200

Polyurethane

US polyurethane resin demand will reach 7.6 billion pounds in 2009, driven by opportunities in building insulation, coatings and adhesives. Flexible and rigid polyurethane foams will remain dominant while thermoplastic polyurethane will present the best growth prospects in industrial and motor vehicles uses. This study analyzes the $6 billion US polyurethane industry to 2009 and 2014 by type, raw material and market. It also examines the market environment, profiles leading producers and evaluates market share.

#2008 ..... 02/2006..... $4200

World Nanotubes

Global demand for nanotubes will expand rapidly from a small base to over $200 million in 2009. Flat panel displays for both computers and televisions will be the first widely commercialized application. The US will remain the largest national market, with Japan expected to emerge as number two. This study analyzes the global nanotube industry to 2009, 2014 and 2020 by type and market, and for two world regional and 13 national markets. The study also reviews R&D activities and profiles industry players.

#2019 ..... 01/2006..... $4800

World Thermoplastic Elastomers

Global demand for thermoplastic elastomers (TPEs) will grow 6.2% annually through 2009 driven by direct displacement of competitive materials and by overmolds onto rigid plastic and metal. Growth will be the strongest in China and India while sales will remain concentrated in the developed markets of the US, Western Europe and Japan. This study analyzes the $8 billion world TPE industry to 2009 and 2014 by market, world region and for 14 countries. It also evaluates market share and profiles major producers.

#2013 ..... 11/2005..... $5200

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