

US industry forecasts to 2009 & 2014

Specialty Plastic Additives

Study # 1961

July 2005

\$4100

Demand to reach 5.2 billion pounds in 2009

Demand for specialty plastic additives is projected to advance 2.6 percent per year to 5.2 billion pounds in 2009. In value terms, consumption will increase 4.6 percent annually to \$6.8 billion. Gains will result from increasing plastics demand, especially polyvinyl chloride (PVC), and an improved outlook in key markets such as nonresidential construction, electrical and electronics, and packaging.

Flame retardant, plasticizer additives to rebound

Demand for plasticizers and flame retardants, the two largest additive categories, will experience a considerable rebound after declining over the 1999-2004 period. Plasticizers are by far the largest specialty plastic additive, accounting for half of total demand by volume in 2004. Growth of plasticizers is tied closely to the market for flexible PVC products, which comprise the vast majority of demand. Phthalates will remain the dominant plasticizer type, although the product mix will shift away from controversial compounds such as diethylhexyl phthalate to phthalates with

better safety profiles.

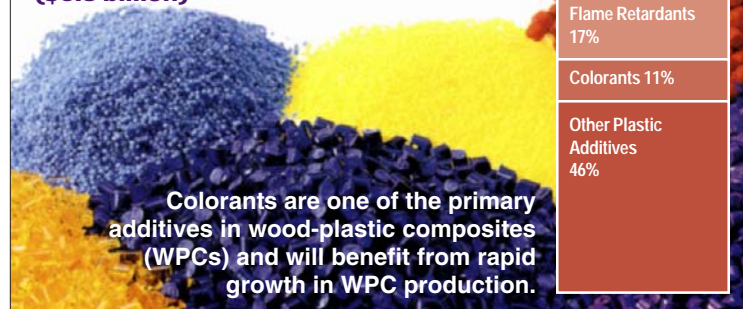
Flame retardants, the second largest additive type, will experience solid growth through 2009 as a result of a resurgent electrical and electronics market. Brominated compounds, though under environmental pressure in Europe, will see increased use in the US plastics market.

Blowing agents have been in steep decline for the past ten years, a result of the phase-out of ozone-depleting fluorocarbon products. Although the phase-out process is nearing its end, no replacement has come to the forefront, and overall blowing agent demand will continue to decline slightly as foam producers turn to not-in-kind alternatives such as air and water. Polyurethane and polystyrene are the resins most impacted by blowing agent decline, since they are often used in plastic foam applications.

PVC to remain dominant resin for plastic additives

Polyvinyl chloride is the primary resin for plastic additives, consuming over 60 percent of all additives by volume in 2004. Prospects for PVC additives will greatly improve due to an increase in nonresidential construction activity and beneficial design

US Specialty Plastic Additive Demand, 2009 (\$6.8 billion)



trends in new housing construction. However, rigid PVC products are growing more quickly than flexible PVC, which will result in better advances for additives such as lubricants and impact modifiers than for plasticizers and antimicrobial agents.

The fastest growing use for plastic additives will be in polypropylene, which will continue to gain market share in applications such as packaging, motor vehicles, and electrical and electronics. Polypropylene will see robust gains in its use of a variety of additives such as light stabilizers, antistatic agents, antioxidants and flame retardants.

Wood-plastic composites offer good opportunities

The production of wood-

plastic composites (WPCs), a market growing at around 15 percent per year, presents significant opportunities for plastic additives. While lubricants and colorants are the primary additives used in this application, WPCs also consume stabilizers, blowing agents and antimicrobial additives. Polyethylene is the predominant resin used in WPC products.

Study coverage

Details on these and other findings are available in the 261-page Freedonia industry study, *Specialty Plastic Additives*. Priced at \$4100, this study presents historical US demand data through 2004 and forecasts to 2009 and 2014 by specialty plastic additive type and resin. The study also considers market environment indicators, evaluates company market share and profiles 39 manufacturers competing in the US plastic additive industry.

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Freedonia's methods involve:

- Establishing consistent economic and market forecasts
- Using input/output ratios, flow charts and other economic methods to quantify data
- Employing in-house analysts who meet stringent quality standards
- Interviewing key industry participants, experts and end-users
- Researching a proprietary database that includes trade publications, government reports and corporate literature

DEMAND BY TYPE

Antioxidants

US demand for antioxidant plastic additives is projected to advance by 4.0% through 2014. In value terms, consumption is projected to reach \$1.1 billion. Growth will be driven by polypropylene, which is the second largest plastic resin. Phenols will remain the dominant resin type, but phenol-free systems will expand significantly. Antioxidants protect plastic products from damage done to plastic products either during processing or end-use. There are two basic types of antioxidants — primary antioxidants and secondary antioxidants. The former are hindered phenols or amines, which neutralize the free radicals which cause degradation. Secondary antioxidants, primarily phosphites, thioethers and thioesters, function by decomposing peroxides to prevent the formation of free radicals. Primary and secondary antioxidants are usually combined to provide synergistic oxidative resistance, and most of the major suppliers offer antioxidant blends containing primary and secondary compounds. Unlike some of the other plastic additives, which are primarily used in PVC, polyolefins are the principal consumers of antioxidants, representing about 65 percent of total demand by volume.

Hindered phenols dominate the primary antioxidants class, due to their excellent performance, low volatility and staining, and nontoxicity. Major applications are polyethylene (especially carbon-black filled insulation), polypropylene (hot-water applications), polystyrene, ABS and PVC. Phenol-free antioxidants, such as Ciba's HP-136 lactone antioxidant, are increasingly being used in applications such as polypropylene fibers that require low discoloration. Tertiary amines are also used as primary antioxidants, but applications are limited by problems with discoloration and toxicity.

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TABLE IV-3

POLYVINYL CHLORIDE DEMAND FOR PLASTIC ADDITIVES

Item	1994	1999	2004	2009	2014
Polyvinyl Chloride Demand (mil lb additives/000 lb PVC)					
Plastic Additives in PVC (mil lb)					
Property Modifiers					
Property Extenders					
Processing Aids					
\$/lb					
Plastic Additives in PVC (mil \$)					
Property Modifiers					
Property Extenders					
Processing Aids					
% PVC					
Plastic Additives Demand (mil \$)					

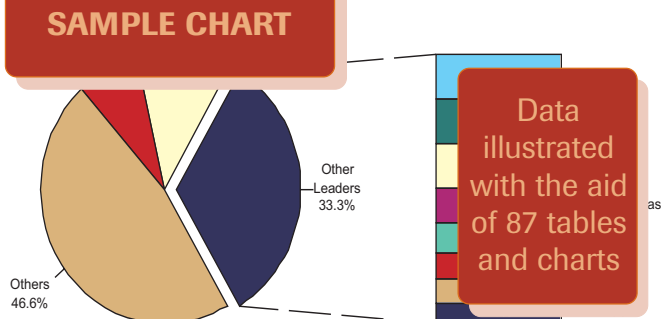
SAMPLE TABLE
Historical data for 1994, 1999 and 2004, as well as Freedonia forecasts through the years 2009 and 2014

This study can help you:

- Determine your market & sales potential
- Learn more about industry competitors
- Assess new products & technologies
- Identify firms to merge with or acquire
- Complement your research & planning
- Gather data for presentations
- Make better business decisions
- Confirm your own internal data

CHART V-1

SPECIALTY PLASTIC ADDITIVES MARKET SHARE, 2004 (billion)



SAMPLE CHART
Data illustrated with the aid of 87 tables and charts

*includes 2004 sales of Great Lakes Chemical

Source: The Freedonia Group, Inc.

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