



Will the Good Times Keep COATING?

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I imagine if coatings were stored like wine—different varieties and vintages from each year corked and labeled and kept in a cool cellar to be enjoyed decades later. What would connoisseurs of the future be saying about selections from 2007? And would the same be true for coatings “bottled” in 2008?

MARKET UPDATE

The global paint and coatings market grew by 5.7% in 2006 to reach a value of \$71.7 billion, according to a recent report by Datamonitor (*Paints & Coatings: Global Industry Guide*, August 2007). Global volume increased by 3.5% in 2006 to total 29.4 million tonnes. By 2011, Datamonitor predicts that the value of the global paint and coatings market will climb to \$92.5 billion (29% increase), while the worldwide volume of sales will total 35.5 million tonnes (20.9% growth). Decorative paints generated the most income in 2006 at 15.9% of the market's value. On a regional basis, the Americas contributed the largest percentage of value (37.7%).

In the U.S., the paint and coatings market was valued at \$21 billion in 2006 by The ChemQuest Group, Inc., with architectural coatings accounting for 48% of the total value, followed by product OEM coatings at 32% and special purpose coatings at 20%. All three segments experienced strong growth during 2006 as the coatings industry increased in value by 8.4% and in volume by 2.2% versus 2005.

“2007—THAT WAS A GOOD YEAR”

For the most part, coatings producers and their suppliers enjoyed a robust market for the first six to nine months of 2007. Energy and raw material prices remained reasonably stable, allowing manufacturers throughout the

supply chain to continue to recover some of the ground lost in previous years. Improving margins led to strong cash flows and a flurry of merger and acquisition activity. Emerging markets in Asia, Central/Eastern Europe, and Central/South America continued to provide opportunities for growth, as did the "green" movement.

PRICING PRESSURES

Raw material costs continued to remain at high levels during 2007, but despite this pricing pressure, margins have remained healthy. Coatings producers were, in general, able to pass higher energy and feedstock costs on to their customers. ChemQuest had predicted an overall 1% increase for its raw material index, but now expects the numbers to more likely be neutral or even slightly favorable. "Softer demand throughout the supply chain has been the key factor," notes Dan Murad, president and CEO of ChemQuest.

Vinyl acetate monomer (VAM) has been an issue for producers of acrylics. Major VAM manufacturers have declared force majeure and supplies are tight around the world. According to Mario Pschaidt, BASF Architectural Coatings business manager, methyl methacrylate (MMA) is also tight and no relief is expected in the near future. Crude oil, propylene, and oxo alcohol pricing also remains an issue for the company. "The reality is that raw materials have gone up significantly and we need to pass on those price increases to our partners/customers in order to prevent further margin erosion," Pschaidt adds that BASF is working very closely with its partners/customers to find solutions to address the market challenges.

M&A Activity

Most of the large coatings manufacturers have been successful in passing price increases along and have thus taken in a lot of cash. "In general, larger companies are able to weather pricing pressures better than medium and small companies because they have more power to pass the increases on. As a result, they can quickly build up cash and be in a position of strength while smaller companies are still struggling," Murad says. A flurry of merger and acquisition activity often results, and that is just what happened in 2007.

The biggest transaction of the year was Akzo Nobel's acquisition of ICI, providing Akzo Nobel with a more global portfolio and stronger position in North America, particularly in the decorative sector. Akzo also moved itself to the top position in wood coatings in North America with its purchase of Chemcraft.

PPG Industries has also been active, announcing that it will purchase Europe-based Sigma Kalon. This

acquisition will give the company a strong position in the industrial maintenance market and will be complementary to the Ameron business it acquired in 2006.

Many other smaller transactions took place this year, and many were cross-continent deals to improve the global positioning of companies. The trend toward globalization continued in 2007, with companies looking to establish a presence in numerous regions of the world.

Successful coatings manufacturers have discovered, according to Murad, that they must provide local and regional service in order to provide customers with the products that meet their specific cultural preferences. Akzo Nobel has adopted the strategy of locating production close to its customers in order to be more responsive to their needs.

PPG has a similar approach. "Our customers that build production facilities around the world still want access to an international supplier like PPG that operates with one set of global standards for quality and EH&S systems," emphasizes the company's vice president of growth initiatives, Richard A. Beuke.

Emerging Markets

Emerging markets continued to provide tremendous opportunities for growth in 2007. "India is actually growing faster now than China, which remains strong, and Central and Eastern Europe are also developing quite rapidly," notes Murad. He adds that Vietnam, with access to extensive wood related natural resources, is a country to watch.

In China, as consumer wealth has increased, per capita spending has grown. Even so, it remains well below levels observed in mature economies and continues to rise. "The trickle-down effect already has been significant and will become enormous in the future," Murad asserts. Private ownership of homes is becoming more common, and with that the desire to paint, decorate, and furnish living spaces is taking off, resulting in a rapidly growing demand for paint. The automotive industry is also expected to expand dramatically in the coming years.

Leading companies continue to invest in China, opening plants throughout the country and in its many neighbors, too. "No global player, whatever the field, can afford to ignore the opportunities offered by the burgeoning economy of the People's Republic," states Derek Welch, Akzo Nobel's director of corporate strategy. China is a key part of the company's growth strategy. Akzo expects 20% of revenues to originate from



the Asia-Pacific region by 2012 and intends to become the leading coatings manufacturer in China. It is investing heavily to achieve this goal, including constructing new facilities such as the new decorative coatings plant it opened in Langtang in 2007.

Quality remains an issue, though, as was demonstrated with the recalls made in 2007 due to the presence of lead in paint used on different toys. It is too early to tell whether or not these very public demonstrations of this issue will have a positive backlash for Western manufacturers. "International companies may benefit as companies respond by looking for established suppliers to help improve their image and also replace the recalled products," Murad states.

India and Russia have begun to receive increased attention from coatings producers, according to Dr. Terry



Knowles, manager of Information Research (IRL), a division of Business Research Group. "The Indian economy is like a steam train," adds Welch. "It takes a long

time to gain momentum. But once it's rolling, you can't stop it. India has been a long time coming, but it's now catching up with China."

Russia (and Eastern Europe) is attractive to coatings producers from two perspectives. Although on a smaller scale than Asia, there is good growth potential in the region. In addition, it is economically attractive to produce products in Eastern Europe and Russia and distribute them to older EU countries.



"We are already seeing some activity now, with companies investing in plants in Russia, the Czech Republic, and Turkey," comments Murad. For example, Akzo Nobel's Powder Coatings business opened its first production plant in Russia in 2007. ChemQuest expects the investment level in these areas to become more noticeable by 2010 as infrastructure improves and companies start investigating these areas as potential connections to China.

Regulatory Landscape

Regulatory requirements continue to grow around the globe. The European Union's Registration, Evaluation and Authorization of Chemicals (REACH) legislation went into effect in July of 2007. "The full impact of these regulations has yet to be felt by the coatings industry," notes Knowles. "It won't be until 2008 that companies gain a better understanding of the true level of work and resources necessary for compliance."

The U.S., Canada, and Mexico took their own steps in 2007, signing a new agreement to test more than 9,000 chemicals produced in quantities over 25,000 pounds and coordinate management of chemicals in North America. The tiered, targeted, and risk-based aspects are important characteristics of the agreement for many, and some hope it may be more attractive than REACH as a global standard for chemicals management.

More specifically for the coatings industry, more extensive VOC restrictions are being adopted throughout Europe and North America and in a broader set of coatings sectors. These regulations have encouraged the development of higher performing water-based, high-solids, powder, and energy-cured coatings for a variety of applications. Successful coatings companies have viewed the ever changing regulatory landscape as an opportunity to develop compliant technologies that help their customers differentiate themselves from the competition. "Regulations are not a barrier. If you have the right technology and real capabilities in place, then new regulations create opportunities," asserts Beuke.

TOUGH GROWING CONDITIONS FOR 2008

Demand will remain strong in emerging regions of the world, but current economic trends in the U.S. suggest otherwise for this, and possibly other, mature markets such as Western Europe and Japan.

Crude Oil Pricing Critical

Crude oil pricing will remain a key factor for formulators in 2008. Many of the raw materials consumed in the production of paints and coatings are derived from petrochemical feedstocks. Fortunately, according to Murad, the industry has done a pretty good job of managing this issue. "Most players have budgeted for crude oil pricing in the range of \$65-\$80/barrel. As long as prices are kept in check and remain in this region, the paint and coatings industry should be well prepared." He also notes that natural gas appears to be fairly stable and no significant fluctuations in pricing are expected for 2008.

Housing Market Downturn

The news from the housing sector in the U.S. has many in the industry concerned about performance levels in 2008. Fewer new homes are being built, and the repainting of existing homes has dropped dramatically. Consumer confidence has been impacted. When homeowners feel that there is less value in their homes, they do not do as much upkeep. As a result, architectural

coatings, which account for about 50% of paint sales, are already experiencing softer demand.

PPG still has a bright outlook, however. Other factors in this segment remain positive and continue to contribute strongly to the bottom line. "The robust commercial construction market and high performance coatings where PPG is a key player is offsetting most of the weakness that we are seeing in the new housing sector," Beuke explains.

Automotive Sector Declines

A general decline in consumer spending has begun to affect durable good sales and suppliers of coatings to this market as well. The automotive refinish sector was already shrinking as automobile accident rates have decreased. The industrial maintenance segment has been doing well as manufacturing sectors have invested in capital equipment, but this growth is expected to decrease as the economy slows. "Some analysts are predicting that the bottom of the cycle won't be reached until 2010," Murad says.

Automotive sales in the U.S. have been dropping significantly as well. For global coatings producers, the loss of business in North America has not been a significant issue, but more of a shift in the location of the demand, according to Beuke. For the tier manufacturers that serve North American auto makers, it is a very real problem. "The smaller paint companies that supply tier manufacturers are hurting," Murad states. "Very few tier manufacturers are able to supply to transplanted car manufacturing sites, so when business goes 'offshore' for these producers it is gone for good."



CREATING THE RIGHT CONDITIONS FOR SUPERIOR PERFORMANCE

Given the varying market conditions in different regions around the world, how can global coatings manufacturers orchestrate another vintage year worth remembering? Proper positioning in emerging markets, staying in front of regulatory requirements and meeting customer needs with environmentally friendly products, improving process efficiencies, and focusing on R&D and development of novel technologies will be crucial.

"Forward planning is crucial for any global company. It is necessary to remain one step ahead, be that in terms of innovative product development, strategic decision-making, or employee enhancement," says

Akzo Nobel's CTO Jo Lennartz. "Identifying opportunities in mature and emerging markets and making clever investments where appropriate is crucial today. Launching groundbreaking products and services is another way in which pioneering companies can remain competitive and deliver unmet market needs."

Many companies have focused on improving production efficiencies to reduce costs. Significant effort has also been invested in the processes and equipment used to apply coatings. BASF has been developing its Integrated Process since 1996. In 2007, the company successfully trialed its newest integrated high-solids system at Ford Ohio Truck and is ready to go into full commercial supply, according to Paul Lambert, senior market development manager for BASF Coatings.

BASF received a 2007 PACE Honorable Mention Award for its Power Fill UV Primer. When used as a sealer, the product eliminates a complete step (the adhesion promoter or etching primer) due to its powerful direct adhesion to many substrates, according to the company.

For its new EcoConcept finishing system, DuPont Automotive Coatings won a 2007 PACE award. The system combines two coating steps into one waterborne basecoat, allowing elimination of an entire spray booth and drying equipment. The result is lower emissions, reduced solvent and energy consumption, and higher productivity.

PPG was named a finalist for the 2007 PACE awards for its Air Dry Waterborne Adhesion Promoter, which is being commercialized in North America on plastic fascias. The product combines the benefits of zero hazardous air pollutants, ultra-low VOCs, and superior physical properties in an adhesion promoter that does not require baking prior to topcoat application, according to the company.

Environmental Opportunities

All of these companies have looked to develop new products to meet growing regulatory requirements. "One of the most significant challenges facing the coatings segment is helping automotive OEMs meet their goal of producing world-class paint finishes, while reducing negative environmental impacts like CO₂ emissions," stresses Lambert. BASF has developed an award-winning primer and ultra-low VOC paint and film systems, and successfully launched high-solids technology in Europe at the Ford Motor Company facility in Valencia, Spain, with a second plant to follow in Belgium.

"All sectors within the coatings industry will continue intensifying their activities in water-based coatings technology where it is feasible to do so," says Knowles. "At BASF, we focus on low-VOC latexes and are continually developing and refining our product portfolio to ensure that our customers have paint formulations approved and potentially commercialized prior to the implementation of increasingly restrictive regulations," Pschaidt comments. "Even just five years ago there was resistance to waterborne coatings. Today, technology advances have made it possible to develop water-based coatings that meet strict regulations and spray well, perform better than their solvent-based counterpart, and also allow excellent color matching," Bueke adds.

Going "Green"

Most players in the paint and coatings industry view the switch to waterborne coatings as just one example of a much greater mega trend towards environmentally friendly products. Consumers are much more aware of the impacts that products they use can have on the environment. As a result, manufacturers in all industries must provide products that address those concerns.

The higher cost of petrochemical based feedstocks is another contributor to this larger trend. "High crude oil prices have driven interest in alternative energy applications and the use of biobased materials to supplement petrochemical-based compounds," notes Murad. Coatings companies are responding by investigating the potential implementation of greener technologies.

PPG is one company that has exerted an aggressive effort to develop green initiatives throughout its operations. "At this point the ingredients we have developed from biomaterials such as soybean and

sunflower oils cannot yet be used as replacements for traditional chemicals but are effective as additives," Bueke says. "We will continue developing this technology and identifying other alternative natural resources to help shift the emphasis from the ethylene cracker production train," he adds.

Alzo Nobel also is convinced that doing business in a sustainable manner is key to its economic success. Its recent ranking as the chemical industry leader on the Dow Jones Sustainability World Index (DJSI) recognizes the company's ongoing commitment to improving social responsibility performance, according to Wijers. "This is a clear message based on independent research that our strategy is paying off. As a company, we are well positioned to deliver sustainable solutions for our customers, while at the same time creating top-line growth. The top rating on the DJSI World Index represents important recognition for the company and is testament to the collective effort made by our employees around the world to embrace sustainable business practices."

Small and Smart

Many market drivers are leading coatings companies to pursue other step change technologies as well. "The properties and functionalities of coatings are now being transformed by a number of fundamental trends and developments. These include, among others, advances in science and technology (the development of nanotechnology and a better understanding of the chemistry and physics of surface boundary layers), increasing environmental pressures and concerns, and a greater capacity and willingness to mimic naturally occurring coatings," Lennartz asserts.

While much of the advantages to be gained from nanotechnology will not be realized for some time, the coatings industry is realizing some initial commercial benefits. "Coatings are an ideal carrier for nanoparticles," says Bueke. "The goal is to activate the surface with nanotechnology to create real differences that can be detected tactilely or visually." The incorporation of nanoparticles into coatings in a controlled and organized fashion is expected to impart an endless array of dramatically enhanced properties to coatings.

Both PPG and Alzo Nobel are investing heavily in nanotechnology programs. PPG's effort is a technology extension of its long history in inorganic nanoparticle research regarding management of solar energy on glass. "Developing products to meet market demand in the automotive and aerospace sectors for coatings that contribute to better energy management is a natural extension of our work with nanoparticle based coatings that PPG applies to glass surfaces," Bueke says.



Akzo's Coatings Nanotechnology Program is currently working on 15 different projects, supporting individual business unit initiatives. It also identifies future nano-based business opportunities and educates employees about the nature and potential of nanotechnology.

Smart coatings, or coatings that predictably change in an effective way in response to external stimuli such as temperature, stress, strain, or the environment, provide yet another long-term opportunity for the industry. "With these coatings, the coatings themselves, as opposed to the structures they coat, will increasingly become the source of value to both business and consumers," underscores Lennartz. Self-healing, corrosion control, hygienic, self-cleaning, and color-shifting coatings are just some examples of materials under investigation.

Most of the leading paint and coatings companies have initiated programs, usually in partnership with

university based research groups, to investigate smart coatings technologies.

DIFFICULT TIMES AHEAD, BUT THE FUTURE REMAINS BRIGHT

As the slowing economy in the U.S. begins to take its toll, paint and coatings manufacturers are bracing themselves for a less rosy year in 2008. Most remain positive, though, about the industry's ability to provide continued value. Ongoing growth in emerging markets will help counteract softer demand in mature markets. Meanwhile, investments in technology developments will lead to novel products that address key environmental and performance issues and eventually lead to coatings that provide functionality not previously considered possible. 