Resins Roundtable:

Suppliers Share Their Thoughts on Key Trends and Issues

Key trends for resin manufacturers in 2007 include supply and demand and innovation. Forces that come to bear on the paint and coatings sector also, of course, directly influence the resins market. The slow down in the U.S. housing market, continued regulatory pressures around the globe, and tight availability for some raw materials are the leading issues this year. Innovation in resin technology will be necessary for success in the future.

Overall, 2006 was a good year for the U.S. paint and coatings industry, which experienced volume growth of 2.2% and value growth of 8.4% over 2005, according to The ChemQuest Group. "The above historical average growth was accompanied with a return of gross margins to near normal levels, as raw material prices stabilized somewhat and producers were able to pass on earlier price increases and improve production efficiency," notes company president and CEO, Dan Murad. Resin manufacturers benefited from these positive conditions.

The strong growth is not expected to be maintained in 2007, however, due to weakened economic conditions and a slowing in the housing and transportation sectors. The continued movement of wood, furniture, and metal manufacturing operations offshore will further impact the OEM sector. The rate of value growth for special purpose coatings will also decrease as few price increases are passed on. These changes will be felt by resin producers as well.

Regulation of volatile organic compounds (VOCs) will not abate in the future, and the switch to "greener" coatings formulations will require resin manufacturers to de-

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velop new technologies that provide improved performance. Shortages of some raw materials may have a significant affect on the resin market as well. Tightness in methanol could affect vinyl acetate monomer, for example, where capacities are already running at 96%, according to Murad. Acrylic resins, too, which experienced shortages in 2004/2005, are again fairly balanced in terms of supply and demand, but that balance could be tipped quickly if demand increases.

How are resin producers responding to these conditions? JCT COATINGSTECH spoke to several manufacturers to ask just this question and more. Their responses are presented below. Comments were provided by:

Air Products Polymers—Diane Terry, coatings market manager

BASF Corp.—Mario Pschaidt, business manager, Architectural Coatings Raw Materials

Cook Composites and Polymers (CCP)—Dennis Ryer, product manager, Coatings and Powder Resins in the Polymers Division

CVC Specialty Chemicals, Inc.—John Cech, general manager and president of the Thermoset Resin Formulators Association (TRFA)

Cytec—Bud Equi, global marketing manager, Liquid Coating Resins; and Terry Scoville, global marketing manager, Liquid Coating Resins

Dow Chemical's UCAR Emulsion Systems' Latex Business—Graves Clayton, North American coatings market manager

DSM NeoResins—Gail Pollano, coatings market manager

Eliokem—Steve Wilson, marketing manager, Coating Resins

EPS/CCA—Henry Bunch, business director

Estron Chemical—Nader Arang, business development manager

Nuplex Resins LLC—Sanjay Luthra, business manager, Industrial Markets—The Americas

Rhodia—Chad Waldschmidt, North American business director, isocyanates busines unit, in Rhodia's organics enterprise; and Ken Bourlier, market development specialist in the same group

Rohm and Haas Company—J.R. "Rusty" Johnson III, marketing manager, Architectural Binders, Paint, and Coatings Materials, North America; and Shruti Singhal, marketing manager for Industrial Coatings and Traffic Markings, North America

JCT: ***What are the top issues that face coatings resins producers today, and why?***

S. Luthra, Nuplex: The top three issues facing coatings resins producers today are slowing growth in a mature market, paint company consolidation, and raw material volatility. These factors have put incredible pressure on sustainability and profitability as the customer base has shrunk, raw material prices have gone up, supply shortages have become more common, and supply-exceeding-demand has put downward pressures on sale prices.

B. Equi, Cytec: There are numerous technical challenges facing resin producers and coatings companies this year against the backdrop of projected slow economic growth. This combination is creating significant turbulence. Customers in highly competitive markets are asking us to help them reduce the total coating cost, even while the chemical feedstock costs are highly volatile. Customers in growth markets are looking for support on existing products and timely new innovations. Meanwhile, regulatory pressure in all regions of the world is forcing the development of new technology, and the adoption of new products that reduce the impact on workers, end-users, and the environment.

J. Cech, CVC: Reliability of supply has been the prevailing concern for most resin manufacturers for the past three years. This challenge is occurring during a time when demand has grown significantly. Uncontrolled raw material cost increases, triggered by hikes in crude prices and tightness in supply, are further exacerbating the situation. Regulatory initiatives such as the EU's registration, evaluation, and authorization of chemicals (REACH) legislation and the high production volume (HPV) program in the U.S. also create an atmosphere of uncertainty regarding the future of many chemicals. It could certainly be the case that some important materials will be discontinued because it would not be economical to use them.

G. Pollano, DSM: Environmental regulation is the top issue. Allowable limits for VOCs are constantly decreasing. In addition, different parts of North America have different VOC requirements. Developing products that comply with these varying regulations and still meet the high performance levels demanded by our customers is the issue.

A second key concern is the workforce. The coatings industry is a mature industry and a good percentage of the workforce is represented by "baby boomers," and many of them will be retiring within the next decade. There are good universities for polymer chemists, but are there enough young people to go around? I think we can still expect people to wear many different hats in the future.

S. Wilson, Eliokem: Non-uniformity between legislative environmental groups is a key issue for resin manufacturers. Resins developed to serve one regional group may not meet the requirements in another group. As a result, it can be necessary to develop numerous products in order to comply with varying regulations. This can add significant cost.

M. Pschaidt, BASF: BASF sees VOC regulations and industry consolidation as the two largest challenges. With different regulations in effect across the U.S., paint companies may have to produce multiple products for sale across the nation. Add to that effect, those companies that have worldwide sales and are trying to formulate coatings for all regions of the world.

Further, the North American coatings industry has experienced considerable consolidation over the past 20 years, with large national manufacturers taking over medium-sized regional accounts. This results in fewer companies to form a unified voice to argue against the tightening regulations or push innovative products forward to market.

H. Bunch, EPS/CCA: Coatings industry consolidation is another key issue in addition to regulatory compliance and raw material cost escalations. The change forces are creating opportunities and risks at the same time. Status quo is not an option. On the consolidation front, national coatings companies continue to acquire regional producers. World energy markets will also continue to fluctuate, with supply and demand imbalances, geo-political forces, capacity constraints, and, ultimately, cost increases in the downstream chemical and coatings markets. We have seen this trend for several years now and it continues to be a major factor in our industry.

D. Ryer, CCP: Consolidation has also resulted in fewer medium-sized, technically competent customers to help drive technology and differentiation. Coatings resin producers are thus forced to align themselves with the larger manufacturers, which in many cases, have their own resin capabilities. This situation then presents new challenges to innovation and profitability.

Separately, the shift of technology to environmentally friendly products can be viewed as both an opportunity and a threat. The marketplace, particularly for industrial coatings, will remain fractionated. There is no clear technology trend nor is there a willingness in the industry to pay for new technology. Increased foreign competition in markets that have been traditionally U.S. based also remains a factor, as a number of industrial applications continue to move overseas, resulting in shifts away from OEM business.

D. Terry, Air Products: In the last few years, we have faced rising and more volatile raw material costs, value chain compression, and, in the U.S., a downturn in growth in architectural coatings. Historically, when raw materials went up there would be a period of stability following the rise, allowing prices through the value chain to "catchup." Frequently, a drop in price followed, so even if prices didn't "catchup" completely, it was a short term issue. What we have experienced in the last few years is rising and more volatile prices which are hard to recover in the market because the end consumer will not accept increases, leading to value chain compression for those of us in the middle. With the housing market downturn, the architectural coatings sector declined at the end of 2006, and further declined at the beginning of 2007. The only silver lining to this cloud is that the downturn has probably helped stabilize or even reduce some raw material costs.

C. Clayton, Dow: For architectural coatings, the challenge today involves the development of low-VOC resins without sacrificing product performance. To achieve lower VOC formulations in architectural paints and coatings, formulators often have to sacrifice product performance. Resin and latex emulsion developers are being called upon to develop and market new technologies that allow low- or no-VOC formulations without making these sacrifices. Developing new products to meet customer and industry demand for low- or no-VOC formulations is driving a large percentage of industry R&D efforts.

J.R. Johnson, Rohm and Haas: Given these various challenging conditions, a critical issue becomes how to balance growth, margins, health of the business, formulated costs, etc. Growing profitably in other regions such as China and Eastern Europe is also now important, and requires careful planning with regard to establishing appropriate plants, the supply chain, and sales, marketing, and technical organizations. And underlying all of this is how to address these issues in a sustainable way, respecting the environment and our impact on it.

JCT: ***What are the main drivers for coating resins growth in the short term? What about over the next five years?***

J. Cech, CVC: There is no question that growth in Asia dominates both U.S. and European demand. It is not so much that producers here are shipping to Asia and shorting their domestic customers, but rather imports from Asia that were a small but important part of the supply chain here have dropped off. This puts pressure on domestic producers to expand their production. In some cases, this goal is not feasible in the short term as many plants are running flat out already. Announced expansions over the next three years will help ease the tightness, but it is difficult to gauge the impact that Asia will have going forward, so there is some level of uncertainty about how much and how soon these expansions need to be.

T. Scoville, Cytec: We will see more attention paid to environmental protection in the emerging markets with global companies driving stewardship. The emerging markets in China and India are quickly adopting compliant technologies and using state-of-the-art processes.

Multinational producers are transferring their technologies and know-how to locations in Southeast Asia. Emerging suppliers are now leapfrogging from conventional technologies to state-of-the-art technologies, bypassing the two or three evolutionary steps the rest of the world took in the last two decades.

H. Bunch, EPS/CCA: With minimal industry growth projected in the U.S., generating significant growth will require expanding share or pursuing faster growing international markets. Technology advantages will be the differentiator for those wishing to increase market share in the U.S., and that will be true in the short term and over the next five years.

J.R. Johnson, Rohm and Haas: Growth will be achieved by moving technology to the next level of performance at a reasonable selling price/formulated cost to the paint company. Over the next five years, development of alternate feedstocks to oil and natural gas as the building blocks for acrylic and vinyl acrylic binders will be critical. Overall, the key will be to maintain profitability in an ever-increasing competitive climate.

D. Ryer, CCP: Obviously, VOC regulations can be viewed as both a threat and an opportunity. Companies who dedicate the resources and commit to meeting the VOC challenges ahead will be successful in achieving good growth in the coming years. This trend will continue as regulatory bodies continue to drive VOCs to lower and lower levels. As VOC regulations drive the marketplace, technical efforts will need to focus on maintaining performance at reasonable cost levels, particularly when threatened by overseas competition.

G. Pollano, DSM: From the perspective of a waterborne resin company, the regulations are drivers for new growth. As VOCs go lower, more solvent-based products will be replaced by waterborne resins, providing of course that these alternative products perform. Economic growth must also continue. We as a coatings industry can provide input into the regulatory debates. However, economic growth involves much more than our industry.

D. Terry, Air Products: The key drivers for growth in the architectural coatings market are housing starts, existing home sales, residential improvements, and commercial building. In the short term, growth in this market in the U.S., which declined at the end of 2006 and beginning of 2007, is expected to start to recover in the latter half of 2007, but is not expected to reach the peak level seen in Q1 2006 until after 2008. Changes in environmental regulations, while not creating additional growth, will cause technology shifts and opportunities for some in the market.

G. Clayton, Dow: Another North American construction trend we are following closely is a continuing change in home building materials, primarily to masonry. In the past 15 years, builders have moved from wood to vinyl siding and aluminum to, most recently, masonry substrates. These different substrates sometimes require different paint formulations. Not all latex chemistries are developed for every possible substrate. The industry will become much more diverse as formulators who previously relied on a single chemistry will have to expand their capabilities.

JCT: ***What can coatings companies do to manage these issues and drivers successfully?***

M. Pschaidt, BASF: We think it is important that paint companies have a unified voice and message, such as through the National Paint and Coatings Association (NPCA), to the different regulating bodies prior to the passage of stricter VOC regulations. From a recent ruling of the California District Court, it is clear that trying to overturn implanted regulations is an expensive act of futility.

It would also be helpful if paint companies act proactively to develop lower solvent-containing paints so that when the tighter regulations take effect, they have products ready to launch. To achieve this, they should pressure their raw material suppliers to continually improve/upgrade their product lines to meet or exceed current product performance at the VOC level of the pending regulations.

D. Ryer, CCP: The key to managing these threats and drivers is to maintain a strong technical effort in a number of low-VOC technologies. Emphasis in both waterborne and high-solids products will be required. Alternate curing mechanisms need to be explored. Raw material suppliers need to be pushed for new molecules and building blocks that are suitable for use in coatings applications. It will be important for coatings resin companies to align themselves with the major manufacturers to develop partnerships in key market areas. Close working relationships will be required to move products from the laboratory to commercialization in the shortest possible time. There will be a shift from industrial/OEM applications toward specialty architectural, industrial maintenance, and refinish technologies in which foreign competition will have difficulty participating.

G. Clayton, Dow: Latex developers like Dow UCAR Emulsion Systems will support paint and coatings formulators' efforts by offering a wider range of latex chemistries. This diversity allows formulators to develop different solutions based on their customers' precise needs.

D. Terry, Air Products: The keys to success are delivering products with good performance/cost balance and productivity improvement. Improving productivity offsets some of the impact of value chain compression and delivering performance/cost

The great success stories of today's well-known companies are based on innovation and the willingness to spend the time looking for new and better solutions to old problems. Over 40% of our sales today are from products we were not producing 10 years ago.

balance allows participation in a higher share of the market.

H. Bunch, EPS/CCA: Companies need to invest in the development of new technologies that advance the performance capabilities of architectural and industrial coatings. It is also imperative to operate efficient manufacturing facilities that are geographically positioned to effectively supply on a national or international basis in order to deliver low cost and superior service.

J. Cech, CVC: Resin manufacturers must develop close partnerships with customers and suppliers in order to provide enough information to plan for short AND long term requirements. They must also stay active and informed about new regulations and supply issues through participation in trade associations. Better decisions can only be made by staying ahead of the curve rather than reacting after change has already taken place.

S. Luthra, Nuplex: Coatings companies are finding new markets globally for existing products, and are following their current customers around the world. They are also leveraging their operational, marketing, raw material sourcing, and technical expertise to develop competitive advantage in focus segments. The successful coatings companies are also focused on organic growth as well as mergers and acquisitions to create a larger market share, realizing operational efficiencies and inheriting successful technologies and brand names. Successful resin manufacturers will work closely with coatings producers to implement these strategies.

JCT: ***What specifically is your company strategy in the short and longer term?***

N. Arang, Estron: Innovation is our key to success, and innovation along "green" lines will be the theme. It is time consuming, but rewarding. We also plan to expand through organic growth. We have to continually analyze our know-how, and attempt to find new markets based on core strengths. The UV market is one example. We have developed UV resins (macromers) that are applied via conventional application equipment, allowing the customer to upgrade to a UV technology platform without major changes in capital equipment.

K. Bourlier, Rhodia: Companies need to develop focused R&D objectives, with R&D work closely aligned with specific market needs. By incorporating efficient project management techniques, companies can reduce the time-to-market for new product introductions while increasing the probability of success. Both of these factors maximize R&D investment returns, which eventually carry through to the bottom line.

S. Wilson, Elotkem: Basically, our corporate strategy is continual development in specialty niche latex technologies. Regarding VOC legislation, we are working hard to develop new resins to assist paint manufacturers. We see regulations as an opportunity to develop new resins for various applications, such as for porch and floor coatings, low-VOC horizontal concrete coatings, and swimming pool paints. The more we improve our knowledge and understanding of the properties and behaviors of low-VOC coatings, the better prepared we will be to develop new resins.

G. Pollano, DSM: Our short-term strategy is to continue to develop new environmentally friendly, high performance resins for the coatings market. Our long-term strategy is obviously to be a leading supplier to the industry.

B. Lqui, Cytec: Our strategy is to deliver innovative technologies, timed to our customers' market needs, which will enable them to respond to both economic and regulatory growth opportunities. We will continue to work closely with our customers to understand their needs and maintain a balance of short-term and long-term R&D investments. Our resin platforms of liquid, UV/EB-curable, powder, and specialty additives provide us the tools to deliver a wide array of new solutions for the regulatory challenges facing our customers and end users.

J. Cech, CVC: CVC has taken the position for many years that to continue to grow and prosper, new products and new applications for existing products are critical. Technology changes, regulatory pressures, and simple obsolescence continually cut into older product sales. New products and applications keep companies growing. The great success stories of today's well-known companies are based on innovation and the willingness to spend the time looking for new and better solutions to old problems. Over 40% of our sales today are from products we were not producing 10 years ago.

H. Bunch, EPS/CCA: We are investing in the development of new

technology, building efficient operating facilities geographically positioned to provide excellent service to the North American and international markets.

G. Clayton, Dow: Dow UCAR Emulsion Systems will continue to focus on developing new technologies and products based on what our customers tell us they need and on significant industry trends, such as demand for low to no-VOC formulations. We will continue to expand our very diverse product line and offer formulators many different chemistries and new technologies—enabling them to better meet the specific needs of their customers. New chemistries and technology platforms include those that focus on application-specific areas such as dirt pick up resistance.

M. Pschaidt, BASF: BASF strategy remains unchanged: We will continue to develop and commercialize latexes that meet the VOC requirements of the pending regulations while maintaining the desired performance. Since BASF is a global company, we review the changing global regulations and ensure that our products can be used everywhere.

J.R. Johnson, Rohm and Haas: We will utilize new technology to drive the cost performance bar of paints and coatings to a new higher level that meets the end users' expressed needs, and continue our influence programs via the Paint Quality Institute (PQI) to drive the quality message as well as further pursue the development of strong relationships with our key customers. Longer term, we will look for new technologies that will differentiate Rohm and Haas from other suppliers, develop alternate lower cost feedstocks to replace those based on oil and natural gas, and seek bolt-on acquisitions to augment the current Rohm and Haas business model.

Rohm and Haas sees a deeper need to understand and broadly embrace green chemistry. VOC regulations are important and we are working very hard to bring the most innovative high performance products to market that meet or exceed all regulations, but we are also concerned about the total impact of all we do on the environment. Examples include improving air quality, reducing fuel costs, and having manufacturing plants closer to our customers. We are focused on bringing environmentally advanced, economical, and sustainable products to market for our customers.

D. Terry, Air Products: The strategy of Air Products Polymers is to provide customers with quality products at a competitive price. We launched a new high performance, low-VOC emulsion for interior applications from flat through gloss, Airflex EF833, at the end of 2006. EF833 expands the amenable market for our vinyl acetate-ethylene (VAE) technology by giving customers an acrylate-free option which can be used in a wide range of high quality interior formulations. With our continuing R&D efforts and over 30 years of VAE expertise, we deliver higher performance and are broadening the areas where Airflex technology can be utilized.

D. Ryer, CCP: CCP's strategy is to maintain a strong technical focus on alkyd dispersion technology for specialty architectural applications and high-solids polyester, alkyd, and acrylic polymers for industrial markets. Efforts in polyester powder coating resins will continue as well. CCP, in conjunction with its Cray Valley sister company, will focus its technical efforts on environmentally friendly products worldwide in their efforts to support the large paint manufacturers with an international presence. It is CCP and Cray Valley's goal to provide the same product anywhere on the globe. Keys to success will include a focused business plan, a strong development program, utilization of international resources, strong customer relationships and strategic alliances, and a dedication toward innovation.

S. Luthra, Nuplex: Nuplex Resins is committed to growth in the resins industry, and to being a supplier of solventborne and waterborne acrylic, alkyd, and polyester resins. We are focused on providing resin solutions that address the short-term and long-term needs of coatings companies, and ultimately the customers and end-users they serve. A strong focus on market segmentation, along with building collaborative relationships with key customers is the basic foundation of the business strategy. Being a global company with diverse solventborne and waterborne resin technologies, presence in several other markets besides coatings resins, as well as in various geographical regions (Europe, North America, South America, Asia, Australia, and New Zealand), allows Nuplex Resins to be a value-added coatings resins supplier.

C. Waldschmidt, Rhodia: Our strategy is to maintain reasonable growth that is inline with movement in the industrial coatings market. We can accomplish that by providing the necessary capital improvements and attention to our traditional product lines in order to service and expand our existing customer base. Our existing global network combined with raw material integration has given us a fundamentally strong position for strategic development. We plan to maintain and improve our traditional position as a supplier of high quality, value-added products for the producers of industrial coatings while ensuring that we are at the forefront in terms of new product development. This will allow Rhodia to nurture its current strong market position while taking advantage of sustainable, high value growth opportunities.

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• In 2005, **Air Products** expanded capacity for its VAE emulsions in the United States by 65 million wet pounds per year. The additional capacity, equivalent to adding a new reactor, was created using the company's technical expertise and advances in operational innovation and at a fraction of the total cost of adding a reactor, according to Diane Terry. The company has developed plans for further expansion using the same technology and operational changes at additional sites, and is executing a staged implementation.

The latest VAE product from Air Products is Airflex EF833 Emulsion, a high performance, low-VOC product for interior applications from flat through gloss. "This product combines excellent scrub resistance with low-VOC formulating capability, and also provides good block resistance, wet and dry adhesion to glossy alkyd substrates, good early blister resistance, and it can be formulated through high gloss applications," Terry explains. "The performance of conventional higher T_g acrylic and vinyl acrylic polymers is compromised when formulating to <50g/l, but Airflex EF833 provides a higher level of performance with low-VOC formulating capability, which allows customers to formulate high performance paint to meet even the strictest foreseeable regulations," she adds.

• **BASF** has been very active in developing acrylic latexes to meet the ever-tightening VOC regulations and has numerous products in its portfolio that have been commercialized over the last five years that meet the current and pending SCAQMD regulations through 2008, according to Pschaidt. Acronal Optive 230 was developed for less than 50 g/l exterior flat house paints while maintaining in-can freeze-thaw resistance and offers improved titanium dioxide utilization (potential reduction of 5% TiO_2 while maintaining wet and dry hide and tint strength) and outstanding weathering characteristics.

Acronal Optive 130 is the second generation multiphase acrylic latex for semi-gloss (non-flat) paints ranging from zero g/l to 50 g/l VOC. Due to its unique particle morphology, this product delivers outstanding block resistance with a low minimum film formation temperature as well as improved titanium dioxide utilization (potential reduction of 10–15% TiO_2 while maintaining wet and dry hide and tint strength). BASF's third generation multiphase acrylic latex, Acronal Optive 350, was developed for high-gloss paints at less than 50 g/l VOC and offers superior 20-degree gloss compared to other similar products, and also is freeze-thaw stable and provides excellent block resistance.

Acronal Optive 410 was developed for tannin stain blocking at less then 100 g/l VOC. According to Pschaidt, the formulator can formulate without reactive pigments, if necessary. With reactive pigments, primers made with Acronal Optive 410 can be made at higher PVC, allowing for more economical primers that are also easier to topcoat. Acronal Optive 510 was developed for vertical elastomeric paints with less than 50 g/l VOC and gives freeze-thaw resistance. Due to its low T_g, Acronal Optive 510 can be used in most climates.

• Most of the capital improvement projects at **Cook Composites and Polymers (CCP)** over the last several years have been in the area of expanding capacity in alkyd dispersion production. CCP currently produces large volumes of alkyd dispersions at two manufacturing sites and has developed a product portfolio that includes several unique technologies and patented compositions, according to Dennis Ryer.

The company has introduced several new alkyd dispersion products over the past two years. Chempol 821-2241 is an essentially "0" VOC and surfactant-free medium oil alkyd dispersion designed for porch and deck and sash and trim applications and wood stains. Chempol 821-1391 is a low-VOC, surfactant free short oil acrylic alkyd dispersion designed for high gloss topcoats and features fast dry, good film integrity, and toughness. Chempol 821-2220 is a surfactant-free, patented, internally crosslinked acrylic alkyd dispersion designed for porch and deck applications that features early water resistance, dirt pickup resistance, and color retention. The company also has several additional products reaching the pilot stage that could be introduced later in 2007.

• **CVC Specialty Chemicals, Inc.** made several debottlenecking investments at its Maple Shade, NJ, plant in 2006. The company is currently looking into a significant expansion targeted for 2009, according to John Cech.

During 2006, CVC's EPALLOY 7200 resin demonstrated great success in high solids primers. "The traditional approach of using liquid epoxy resins to modify the solids of conventional solid epoxy resins in primers results universally in a significant loss of dry time," notes Cech. "While changes in the hardeners can help, the solutions to date are not adequate." EPALLOY 7200 is a chemically modified Bisphenol A epoxy resin with a bound catalyst on the ring that dramatically speeds up the epoxy reaction. The result in coatings is the ability to replace most or even all of the solid resin without loss in dry time. "EPALLOY 7200 makes it possible to formulate coatings that will far exceed the VOC reductions required and produce high gloss blush-free primers with even the slowest of hardeners," he adds.

• Cytec has made plant investments in North America to enable the local manufacture of its RESYDROL® water-based alkyds, and MACRYNAL® and VIACRYL® water-based and high-solids acrylics. "This investment will enable us to improve our service to North American customers for both current products and new product launches," Bud Equi notes.

New products from Cytec include RESYDROL® AY 588w/42WA, a water-based alkyd hybrid designed for use in high performance, low-VOC architectural high-gloss and semi-gloss trim paints. The new resins will help formulators meet California's South Coast Air Quality Management District (SCAQMD) 50 g/l rules for non-flat paints while maintaining desired performance characteristics.

RESYDROL® AY 6150w/45WA is a waterborne alkyd dispersion, also launched in 2007, that offers exceptional gloss, low VOC (<100 g/L), and excellent corrosion protection for light-duty maintenance, decorative, and industrial applications, according to Terry Scoville. "Formulated coatings have very good low temperature coalescence, along with superior weathering and stability for both processing and applications," he says.

• In February 2006, **Dow UCAR Emulsion Systems** started up a next-generation latex facility at its St. Charles Operations (Hahnville, LA) site. The facility is the first new world-scale latex facility built in North America in 30 years, according to Craves Clayton. He notes that it offers state-of-the-art automated process control systems. "The new plant gives customers in North America access to new technology platforms and products as well as stable supply and consistent product quality," he states.

Dow also introduced EVOCAR™ DA 280 and EVOCAR DA 281, the first products in its new line of ethylene-modified polymers designed to aid in the formulation of low- or zero-VOC products while maintaining performance. Other new products from Dow include UCAR™ Latex DA 633, a new all-acrylic binder with significantly enhanced scrub resistance, especially in low-VOC formulations, and UCARTIDE™ 400I, a new opacifying technology that allows paint formulators to replace some titanium dioxide while maintaining hiding and performance.

• **DSM NeoResins** purchased a resin company in China in 2006 and hopes to continue to expand its efforts throughout the globe, according to Gail Pollano. With regard to new products, the company has introduced new urethane alkyd hybrid technology for the wood market. These low-VOC products are unique because they allow customers to meet regulatory requirements in these markets but dry fast and develop high gloss and black heel mark resistance quickly. "They are as close to oil-modified urethanes for performance without the VOCs," she asserts. DSM NeoResins also offers matte urethanes used to lower the gloss of coatings. They can be easily incorporated into liquid coatings, do not hard settle so they give a consistent uniform gloss in application, and are not milky in appearance after the coating is dried.

• **Eliokem** is expanding the processing and packaging capability at its Akron, OH, plant for Pliolite, Plioway, and Pliotec resins as part of an effort to continuously grow the North American market segment in specialty niche applications. On the processing side, the expansion includes doubling capacity to produce Pliotec resins. On the finishing and packaging side, automation investments have been made to the dry finishing lines.

A New Ventures Department has also been created to fuel profit growth and extend the market scope of the company, according to Steve Wilson. A mergers and acquisition team will support this new department in the search for acquisitions in Europe, Asia, and the Americas that will strengthen the company's operations and enable the company to meet its strategic and financial goals. "This expansion strategy is the driving force identified in the secondary leverage buy-out of the chemical company led by Axa Private Equity," Wilson adds. Axa became the new majority shareholder in October of 2006.

New products from Eliokem include an all-acrylic latex specifically designed for low-VOC porch and floor applications (Pliotec PA91) that provides excellent UV resistance, is a room temperature film former with a low coalescent requirement, can achieve flat and high gloss finishes, and can be formulated under 50 g/l VOCs. Designed specifically for elastomeric coatings, Pliotec EL25 offers excellent tensile/elongation properties, dirt pickup resistance, low temperature flexibility, adhesion to concrete and masonry, and crack bridging. Pliotec PA05I1, another all-acrylic latex, provides high performance horizontal concrete sealers and stains with water blush resistance, early moisture resistance, early block resistance, adhesion, and hot tire pickup resistance.

• Incremental investments in EPS/CCA's operating facilities include an expansion of the company's primary research laboratory near Chicago in order to broaden its technology development capabilities, according to Henry Bunch.

New products from EPS/CCA include EPS 2291, an acrylic resin that acts as a clear sealer for stone, exposed aggregate, stamped concrete, stained concrete, and other decorative masonry deck surfaces. "This product is essentially blush proof, thereby eliminating the primary complaint of contractors who seal a deck, and then get a call back the next day when overnight moisture turned the sealer milky." Bunch

notes. Its exceptional adhesion and good chemical resistance also make it ideal for garage floors. The water-based acrylic polymer EPS 2257 is designed for concrete stain formulations and provides the appearance of acid-based stains. EPS 2507 and EPS 2548 are two additional new acrylic polymers for use in industrial maintenance primers and coatings, offering exceptional adhesion, corrosion resistance, and gloss retention.

• **Nuplex Resins LLC** was formed in 2004 by the global divestiture of Akzo Nobel Resins to Nuplex Resins, a New Zealand-based, publicly traded company. "Initial business activity was focused on successful integration and creation of a new company that has a global face with local presence, without disrupting the supply of products and services to its core customers," says Sanjay Luthra. "Subsequently, the focus has been on increased investments in global technology development, transfer of technology and human resources within the regions, and supporting customers in entering new geographical markets." Currently, the company has several capacity upgrade and expansion plans underway to focus on growth in waterborne technologies and operational efficiency for solventborne resins.

Nuplex Resins has recently introduced several solventborne and waterborne acrylic resins for use in one- component and two-component coatings for automotive and industrial applications. Setalux 37-6802 is an acrylic emulsion that can be used for basecoats for automotive refinish and plastic coatings that assists with aluminum flake orientation for metallic basecoats. Setalux 37-6770 is a one-component, self crosslinking, acrylic emulsion with gradient morphology that provides the traditional fast drying properties of thermoplastic acrylic emulsions, but with crosslinking functionality that allows for lower amounts of coalescing solvents while increasing film properties such as flexibility, hardness, humidity, chemical, and solvent resistance. Several next-generation products of this family are also being introduced for various applications.

Nuplex has also launched several high-solids and waterborne acrylic co-reactants that are being used in two-component polyurethane coatings. Setalux 27-1597 is an 80% solids hydroxyl functional co-reactant that provides low color, excellent gloss and "wet-look," superior exterior weathering resistance, chemical resistance, and long term durability. Setalux 27-9677 is a 90% solids hydroxyl functional acrylic resin that can be used as a reactive diluent and also has excellent pigment-dispersing properties. Setalux 37-6511 is a waterborne hydroxyl functional resin that allows formulation of coatings with VOC content of 100 g/l or lower and possess excellent film properties with outstanding gloss retention and yellowing resistance in exterior weathering.

• Investments in all aspects of its businesses to meet the global supply/demand balance of its products continue at **Rhodia**. Recent activities include refining processes to optimize yields in line with global growth demands, according to Chad Waldschmidt. "The discipline which we use to identify and execute plant expansions and capital investment has allowed us to address the challenge of rising costs while providing the necessary service to our customers in a cost effective and manageable way."

Recently, Rhodia introduced several new waterborne aliphatic isocyanates for use in low-VOC coatings and adhesives applications. Providing user-friendly two-component waterborne urethane products has been a challenging effort, according to Ken Bourlier. "Typically, isocyanates will react with water, so developing an isocyanate that can be dispersed in water but still retain its reactivity presents a significant technical hurdle to overcome." The company's EZD 401, EZM 501, and EZM 502 products are easily incorporated into water without high shear mixing and provide excellent pot life, appearance, and performance properties. These products will provide coatings formulators with a valuable tool to develop low-VOC urethane coatings to meet the stricter demands being placed on industrial coatings.

• Several new acrylic emulsion products have been brought to the market by **Rohm and Haas Company**. Avanse MV-100 resin is based on the new Avanse technology platform. It is a high performance waterborne acrylic binder designed for use in low-VOC industrial maintenance coatings for metal and concrete surfaces and can be formulated for primers, topcoats, and direct-to-metal applications.

Rhoplex VSR-50 (Versatile Sheen Resin) 100% acrylic emulsion is designed for premium performance, interior and exterior, flat to gloss architectural coatings and is particularly for use in formulating paints to 50 g/l VOC. In addition, it provides outstanding performance in semiflexible coatings for cementitious and masonry substrates. Rhoplex VSR-1050 acrylic emulsion provides early block and film hardness, household stain removal, abrasive scrub resistance, and excellent alkyd adhesion.

Rhoplex HG-706 100% acrylic emulsion features crosslinking technology for the formulation of interior and exterior VOC-compliant aqueous gloss and semigloss enamels. Paints based on Rhoplex HG-706 emulsion have excellent gloss potential, early and ultimate block resistance, alkyd adhesion, and stain removal.

Rohm and Haas has also introduced two new solvent-free, associative thickeners—Acrysol RM-5000 and Acrysol RM-6000. CT