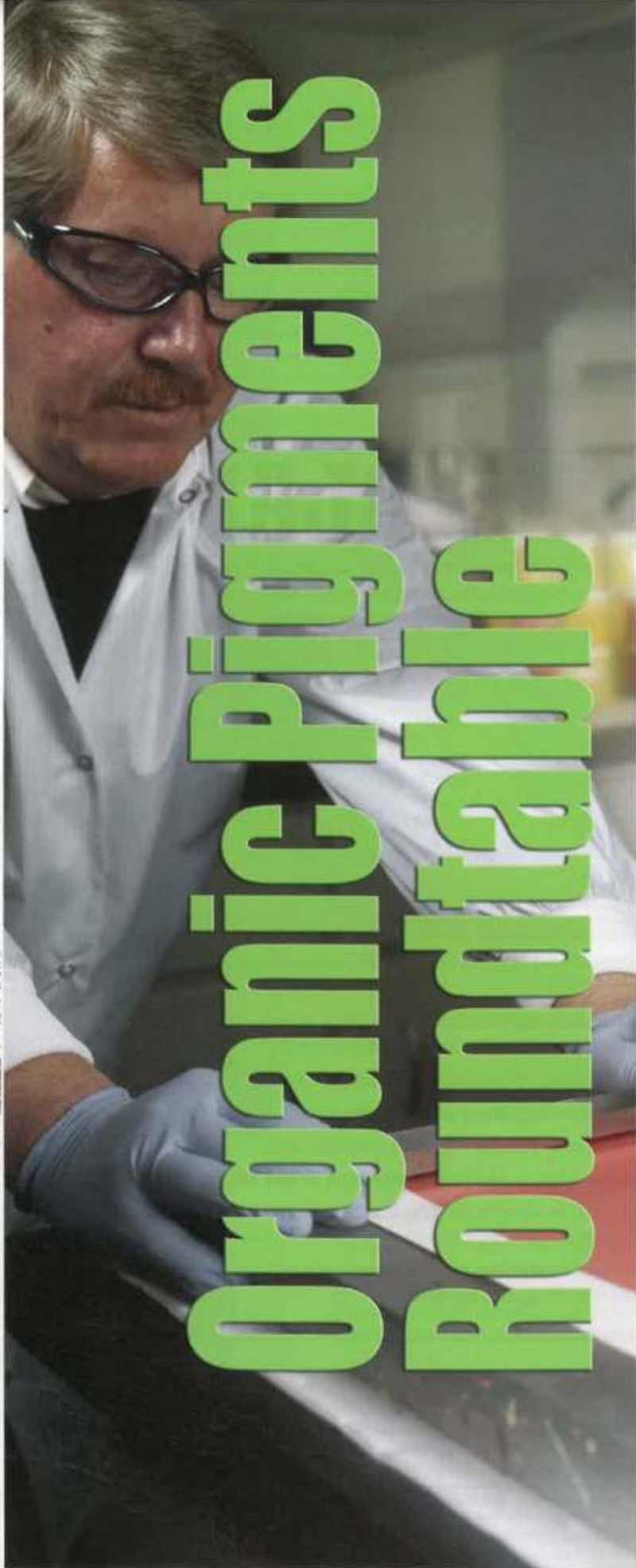




# Organic Pigments Roundtable

**W**hile paints and coatings serve many purposes—not the least of which is surface protection, enhancing the appearance of the substrates they are applied to is of significant importance to most users. Organic pigments enable formulators to offer an increasingly broad spectrum of colors for numerous applications. Growth for organic pigments typically tracks with growth of the paint and coatings market, although some shifting in demand is occurring as consumer interest in bolder colors grows. Like with many other sectors of the chemical industry, organic pigment manufacturers strive to maintain margins in the face of rising energy and raw material costs and increasing offshore competition.

Organic pigments offer brilliant colors and high saturation. Because they are highly complex organic molecules, they fall within the category of very fine chemicals and require multi-step processes for their synthesis. As a result, organic pigments tend to be much more expensive than their inorganic counterparts. Prices for organic pigments range from approximately \$7/lb to \$26/lb depending upon the color of the pigment, according to Steven Nerlfi of Kusumgar, Nerlfi & Growney, a market research firm focused on the paint and coatings industry.

In 2004, the global market for colored organic pigments was valued at approximately \$2.44 billion, which corresponds to 26% of the overall pigments market for paint and coatings, according to Michael D. Brown, vice president of The ChemQuest Group, Inc., a management consulting firm located in Cincinnati, OH. This segment of the pigments market is growing at about 3% per year. Colored inorganics in comparison account for only 9% of the total pigments market. Other categories of pigments include white and specialty effect pigments, which account for 52% and 13% of the market value, respectively.

On a regional basis, the volume of the synthetic organic pigment market is estimated to be 26 million pounds and valued at \$350 million by Kusumgar, Nerlfi & Growney. The annual growth rate is around 2% per year, which is in line with the growth rate for the overall paint and coatings industry. In the U.S., 80% of the sales are achieved by five companies—

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BASF, Ciba Specialty Chemicals, Clariant, Lanxess, and Sun Chemical.

Typical applications for organic pigments include coatings for the automotive and broader OEM markets as well as consumer goods, particularly electronic products such as cell phones and computers.

"Organic pigments are designed to give specific colors, and they offer improved brightness over inorganic coloring pigments," says Mr. Nerlfi. "They also provide homogeneous color, and can be mixed and matched to provide a broad palette of color choices. Creating different colors is part of the fine art practiced by the coatings formulator," he continues.

Increased use in interior paints for redecorating applications is a very recent trend, according to Mr. Brown. In the U.S., a number of cable stations are running television programs about home decorating. Typically assistance is provided by professional decorators, and viewers are exposed to new techniques and products. "The industry has experienced very recent growth in demand for saturated colors for interior paints as the general population has gained confidence in its ability to redecorate with bold colors," notes Mr. Brown. "These colors require a deep base and special additive packages, and suppliers of these products have experienced an unexpected increase in demand, as have some pigment producers themselves," he continues.

While much of the growth in demand for architectural coatings is driven by the overall growth of the housing market, the increasing interest in redecorating is also generating some of the demand. "Certain organic pigment suppliers are seeing a pickup in demand. In addition, this shifting of demand towards saturated colors, combined with the shortage of some raw materials, has disrupted supply in some cases," Mr. Brown adds.

Increasing competition from offshore suppliers is another changing market dynamic that organic pigment producers must contend with. "Production of organic pigments is both manufacturing and labor intensive," says Mr. Brown. Therefore, it is an ideal target for offshore producers in China and India. "The increased representation of Asian organic pigment producers at international coatings shows over the past few years is an indication of their growing interest in this segment of the coatings market. It will be interesting to see what impact this competition will have on the overall market," Mr. Nerlfi notes.

Organic pigment producers have been faced with downward pricing pressures from the offshore competition. Declining prices in the face of increasing energy and raw material costs have resulted in reduced margins. Some price increases have been achieved in the recent strengthening economy, but margins remain below desired levels. Most players in the market remain positive, though, because organic pigments are one of the highest value-added ingredients in coatings, and they provide colors that cannot be achieved with any other pigment types.

Technology is also an issue for organic pigment manufacturers. "Producers are always trying to develop organic pigments with more saturation and durability," says Mr. Brown. The complex organic molecules that provide brilliant colors tend to be sensitive to degradation. The challenge for manufacturers is to find highly stable chemical compounds that possess the desired level of color saturation. Improving production process and associated costs has also become a priority.

To gain a producer's perspective of the organic pigments market, JCT COATINGSTECH asked executives at leading manufacturers to comment on key trends and issues. Comments are presented from Werner H. Peter,

business director for BASF performance chemicals in North America; Milt Misogianes, marketing head for transportation coatings, NAFTA, with Ciba Specialty Chemicals; Bob Post, vice president—coating industries with Clariant Pigments & Additives; Dr. Elie Saad, business director, functional chemicals with Lanxess; and Bob Schweitzer, vice president and general manager of Sun Chemical Performance Pigments.

**JCT:** *What are the top three issues facing producers of organic pigments today? Why are they significant?*

**Bob Schweitzer, Sun Chemical, Performance Pigments:** Organic pigment manufacturers are facing an increasingly competitive global marketplace, in which they must produce high quality products at the lowest cost. The three most significant challenges facing pigment producers are: the increasing presence of low priced Asian imports, rising raw material costs, and sluggish demand in high volume markets, including automotive and decorative coatings.

**Werner H. Peter, BASF:** In addition to the automotive market being off for 2005, the industrial market is flat, and the architectural market is growing, but without much color. Also, with low cost Asian entrants to the market for simple versions of phthalocyanine pigments, several customer industries and segments have moved production to China. We see this tendency as ongoing.

**Elie Saad, Lanxess:** The top issues facing producers of organic pigments today include increasing raw material costs as well as the competition from Asia—both India and China. These factors are having an impact in terms of how we market and sell our products

**Milt Misogianes, Ciba:** We are facing lower margins because of rising raw material costs and reduced mar-

ket share due to the China effect. The changing applicability for solvent and waterborne systems is also producing fragmentation of the market.

*Bob Post, Clariant:* The most influencing factors are strongly rising costs for raw materials and energy and increasing competition from non-traditional suppliers (China and India). These suppliers are becoming more global with an improved and extended product portfolio. The automotive market continues to be sluggish—this leads, in combination with a lack of color, to a lower demand for organic pigments. The continuing trend for environmental friendly systems is nourishing a demand for suitable pigments and pigment preparations for these systems.

**JCT:** *How does your company plan to respond to these issues? Do they provide any opportunities?*

*Elie Saad, Lanxess:* With increased costs and low-priced competition, it is clear that we need to be more selective in our approach by offering the industry more technical and value-added products. Challenges lead to opportunities. These opportunities will come from us strengthening our intellectual property, and that will differentiate us from the competition.

*Werner H. Peter, BASF:* I think there is room for more color in our world. The trend in automotive is clearly moving away from simple silver towards tinted silver and brilliant reds and orange. Blue will gain importance as well. We see a positive trend for both organic and inorganic pigments due to this wave. With respect to Asia, international coatings manufacturers are forced to move with their market and have either established production in Asia or are in the process of doing this. Our customers expect the same products and technical service overseas that they get in their traditional markets. Since BASF has been mar-

keting pigments in Asia for a long time, we are constantly adjusting our customer support to meet the needs of this quickly changing customer base.

The phthalocyanine market has changed dramatically over the last couple of years, with many sources for the standard versions of phthalocyanine blue and green now available. Since price declines have left little room for R&D spending, innovation has stopped in this segment. As a result of our very diverse phthalocyanine range and broad know-how, however, BASF has been able to come up with product innovations even in these tough times.

*Bob Schweitzer, Sun Chemical, Performance Pigments:* Sun Chemical Performance Pigments operates as part of a global network of manufacturing facilities and maintains partnerships with suppliers and customers around the world. Through this diversification of manufacturing facilities and our partnership with Dainippon Ink and Chemicals, Performance Pigments mitigates the impact of low cost foreign imports by reducing its own domestic cost structure. Six Sigma and other productivity initiatives help the company streamline its production and provide better efficiency to serve its customers. These strategies also enable us to manage the escalation in raw material prices and minimize the effect they have on our customers.

All of the challenges mentioned above provide opportunities for Performance Pigments to reinforce our position as a market leader. We continue to improve our manufacturing capabilities through implementation of state of the art equipment and revolutionary process improvements. The company also continues to invest heavily in new chemistries and surface-modifying technologies that will provide value to our customers. We are using the changing economy and market mix as an opportunity to grow in emerg-

ing pigment markets, such as digital printing and energy curable coatings, while continuing to provide products and services to current customers.

*Bob Post, Clariant:* Just recently Clariant established a joint venture with Hangzhou Baihe Chemicals Co. Ltd., a major Chinese pigment manufacturer southwest of Shanghai. This move will expand Clariant's global production network and, in addition, will improve its competitive position in Asia and globally. To improve our business processes and cost position, Clariant has implemented CPIP (Clariant Performance Improvement Process). This program has been rolled-out worldwide and is generating positive results.

*Milt Misogianes, Ciba:* We are optimizing many plant manufacturing processes to lower our fixed costs. The goal of these activities is to maintain market share.

**JCT:** *What will be the key market drivers for organic pigments five years from now?*

*Milt Misogianes, Ciba:* We expect that the need to develop formulations for low volatile organic compound (VOC) applications and waterborne applications will be key drivers. The need to achieve advances in low cost production will also be important.

*Elie Saad, Lanxess:* In five years, the drivers for organic pigments will include improved processing technology, environmental friendliness, and overall ease of use.

*Bob Post, Clariant:* During the next five years, we expect to see more consolidation of paint makers. This will, without doubt, result in more and more globalization as customers become even more multinational. It will be extremely important as a pigment supplier that we have a robust global distribution network where our customers can

count on the same high quality products being delivered across their entire network. Strong regional technical service centers in all three big regions will also be key (NAFTA, EU, Asia). Legislation will continue to create a strong demand for VOC-free systems and waterborne applications. Another driver will be the ability to manufacture and deliver products that add value to the entire production process from pigment to paint, especially with regard to the dispersing stage.

*Werner H. Peter, BASF:* In five years, more organic pigment classes will become commoditized and new players from Asia will try to gain share in the American and European markets. Some producers might disappear. The world for high performance pigments, however, will not change overnight. The time-to-market for a new product can be as long as five years. In addition, the clock starts ticking only after a reliable production process has been established. Production consistency remains a challenge, especially for newcomers.

*Bob Schweitzer, Sun Chemical, Performance Pigments:* As the market becomes more global and products become less differentiated, the advent of new technologies, an increase in production efficiencies, and a focus on capacity increases will drive the pigment market forward. Five years from now, the organic pigment market will still be flooded with lower priced imports from Asian countries, and the domestic producers' response to this will dictate the future of the market. I anticipate that many companies will consolidate and merge in order to bolster their resources, capabilities, and capacities to compete effectively with the imports. Such companies will heavily invest capital in foreign manufacturing facilities to try to achieve the same cost structure as the importers. Simultaneously, however, I imagine that successful pigment companies

will begin to differentiate themselves from the importers by offering complete service and value propositions to their customers, rather than simply low-cost products.

**JCT:** *What would you identify as the most significant new technology for organic pigments? What is the significance?*

*Bob Post, Clariant:* I believe that the best new technology edge that we as a pigment supplier can deliver to the market will be problem resolution and value addition. The "new technology" is not predicted to be a single new molecule but rather the ability to provide multi-faceted technologies to solve problems and reduce our customers' costs. Unique bundling of services and products and new technology increments will be the answer. These bundles of solutions will likely include aspects of service like global distribution of a product, regional service centers that support global sales, bulk packaging options, or perhaps products like our "easy dispersing pigments" or low-VOC dispersions. It will be the ability to put together services and existing products and incremental technology improvements that will solve customer problems and add value.

*Werner H. Peter, BASF:* The last significant invention or new chromophore was DPP, and this happened a long time ago. In contrast to other industries, the very competitive developments occurring over the last decade have not triggered more innovation, as far as new chemistry is concerned. Necessary R&D returns can no longer be earned in many pigment chemistries and niche applications cannot finance very cost intensive and time consuming research. I believe that the market is not asking for new chromophores but rather better solutions, and more economical ways to produce paint. More economical also means very

narrow batch-to-batch variation in order to ensure smooth production flow with no corrections needed during the process. More economical also means tools for zero VOC in the paint, no grinding, less waste, and cleaning. This is why we have invested in stir-in pigments such as Xfast.

*Elie Saad, Lanxess:* The significant new technology for organic pigments is in the field of material processing. Technologies related to easy-to-disperse and non-dusting materials are now available and are becoming more popular in manufacturing facilities. Such products are expected to gain even more momentum in years to come.

*Bob Schweitzer, Sun Chemical, Performance Pigments:* Higher quality, environmentally friendly pigments represent the future of the organic pigment market. As regulations evolve and new technologies are discovered, the industry will demand products that adhere to higher regulatory standards.

**JCT:** *Will nanotechnology have any impact on the development of novel organic pigments?*

*Bob Schweitzer, Sun Chemical, Performance Pigments:* With respect to transparent organic pigments, research has traditionally been directed toward achieving smaller particle size. The average particle size for such pigments has been in the nanoparticle size range for some time so there is nothing revolutionary today about achieving nano-sized organic pigments. The technical challenge is to control some of the application properties which are associated with smaller particle size. These include rheology, stability, and durability.

One of the main changes in organic pigment technology that has been impacted by the nanotechnology revolution has been in the area of processing equipment. Today's particle size reduction equipment is

more effective and can help achieve nanosize distributions in ways that were not possible or practical a few years ago.

*Elie Saad, Lanxess:* Nanotechnology will no doubt have an impact on the development of organic pigments. The word nanotechnology itself is becoming part of our everyday vocabulary; however, it will be some time before its true impact will be seen in the area of organic pigments.

*Bob Post, Clariant:* The average particle size of a transparent organic pigment is in the nano size range. This means that nanotechnology is not really new in the pigments world. A further reduction of the average particle size of a pigment will improve the transparency, but at the same time will negatively affect properties like durability and rheology. Under this aspect, the impact of nanotechnology on the development of novel organic pigments is limited.

**JCT:** *What noteworthy organic pigment products have been introduced recently for the paint and coatings market? What makes them novel?*

*Milt Misogianes, Ciba:* Ciba has a new blue shade opaque red designed for solid shade red stylings. It has very high opacity and very high chroma, thereby providing formulators with lower pigmentation costs and/or lower film builds.

*Elie Saad, Lanxess:* Novel products include new delivery forms of standard organic pigments, whether they are granulated or easy-to-disperse types.

*Bob Post, Clariant:* Clariant innovations include new chromophores, pigments with improved dispersibility, and products focused on environmental issues (VOC-free). Hostaperm Yellow H5G and Hostaperm Yellow H7G are new additions and complete our range of

high performance pigments. Both offer excellent weathering fastness and opacity and are suitable for both water-based and solventborne systems. Hostaperm Yellow H7G is a highly chromatic pigment with a very greenish tint. It is an ideal partner to be combined with our bis-muoh vanadate product Hostaperm Oxide Yellow BV. We are continuously expanding our pigment portfolio for waterborne systems with our WD (water dispersible) range. The new Colanyl 300 range is responding to the needs of the market for VOC-free pigment preparations. Clariant is also currently introducing a line of Easy Dispersible (ED range) pigments. With Hostaperm Red D2G 70 and Hostaperm Red D3C 70, Clariant is now also offering DPP pigments, completing the range of opaque red pigments.

*Bob Schweitzer, Sun Chemical, Performance Pigments:* Performance Pigments and its Colors Technology group worked collaboratively with customers to introduce Surpass® dispersions for use in general purpose industrial coatings. By using Surpass dispersions, coatings manufacturers can achieve increased production capacities, reduced cycle times, and higher consistency because the pre-dispersed pigment particles eliminate the need for grinding and milling in the manufacture of coatings. Surpass dispersions are available in a wide variety of pigment types and represent the future of coatings technology.

**JCT:** *Have there been any major mergers, acquisitions, divestments, new plant construction, etc. that have impacted the organic pigments market?*

*Bob Schweitzer, Sun Chemical, Performance Pigments:* We continue to see various mergers or acquisitions in the coatings sector, and as there is currently an overcapacity in global pigment manufacturing, I

think we will continue to see consolidation in the coming months and years. In order for smaller companies to remain competitive in today's global market, they must be able to provide a global supply chain. For some companies, the only way to achieve an elaborate network of manufacturing and distribution facilities is to establish partnerships to maximize existing facilities.

*Milt Misogianes, Ciba:* Joint ventures between China, European, and NAFTA pigment producers are taking place. These relationships provide established producers with global networks and access to low cost manufacturing capabilities so that they can provide the best possible service to their customers.

*Bob Post, Clariant:* The decorative market is one that has seen great consolidation, leaving a few big paint manufacturing players and a few smaller regional players standing. Most of the current merger/acquisition activity is concentrated in the more fragmented industrial and powder coating markets. I fully expect consolidation to continue in these fragmented markets. Consolidation of paint makers naturally leads to the demand for robust global pigment distribution networks to support them.

As a pigment supplier who wants to stay competitive for the long haul, it is important that investments are made in Asia where the manufacturing costs are low. Our recently established joint venture in China with Hangzhou Baihe Chemicals Co. Ltd. is in line with the general market trend and the needs of our customers. Partnerships, joint ventures, and distribution agreements consummated with leading regional Chinese and Indian suppliers will be key transactions for continued success in the organic pigment market. □