Pigment Market Growth Expected, But Challenges Remain Ahead

Price increases, lack of availability and environmental regulations have changed the industry landscape

Anthony Locicero, Associate Editor 03.09.18

The pigment industry has been showing signs of growth in recent years. In 2017, Grand View Research projected an increase in the global dye and pigment market, which it valued at $30.42 billion the previous year.

Meanwhile, Global Market Insights, Inc. expects the pigment market to surpass $18.98 billion in sales by 2024.

While these forecasts remain positive, the industry has faced numerous challenges over the last 12 months.

“The pigment industry, like other chemical related industries, has been greatly influenced by changing consumer trends, environmental regulations, political factors and new technologies. These changes have presented both challenges and opportunities for future innovation,” said Chris Weighill, VP and GM – Ink Industry, Sun Chemical Performance Pigments.

“For the past few quarters, the global pigment market has experienced unprecedented cost increases in key raw materials. These increases have impacted all levels of the pigment supply chain, from basic chemicals to specialty raw materials,” he added.

According to Weighill, a huge factor is the general lack of raw material availability due to the stronger enforcement of environmental and safety regulations globally.

Other pigment industry officials reported similar stories.

“In an effort to reduce effluents and emissions generated by the chemical industry, the Chinese government imposed closures and production limitations limiting the availability of pigment intermediates,” Union Colours sales director Oliver Pfefferkorn said. “This scarcity challenges supply chains and results in price escalations.”

Added Tanja Guethlin, Clariant’s global communications manager: “Stricter environmental enforcement particularly in China has resulted in widespread plant closures and consolidations throughout the value chain, which in turn has led to a significant reduction of both feedstock and intermediate capacity.”

That includes the “changes in waste water discharge requirements” in China, which have “reduced the output of 4B acid and DCB factories, the raw materials for litho rubine and diarylide pigments,” Lansco Colors EVP and GM Frank Lavieri said.

“Production of these and other pigments have also been intermittently disrupted over the last six months,” Lavieri added. “The net result is a backlog of production orders, short supply and rising prices for many classical organic pigments, mainly used in printing inks but also used to a lesser extent in plastic and coatings applications.”

Falko Orlowski, VP sales and marketing, Trust Chem USA, LLC, observed that pigment pricing is unstable due to poor availability of many of the raw materials used to make conventional azo pigments.

“Regulatory restrictions and environmental restrictions in China are driving this supply problem, with many producers being restricted in capacity or closed entirely,” Orlowski said. “The fourth quarter was especially bad with costs rising rapidly, and we see this to continuing into Q1 of 2018. Pigments dependent on DCB are especially difficult at this point. All disazo yellow and orange pigments will be affected. AS-IRG, 2B acid and 4B acid are also tight, especially for the 2B acid, increasing costs on many of the reds used in the ink market as well as yellow 83.”

“In recent years, the Chinese government has implemented strict environmental restrictions on industry waste and pollution. As environmental pressure from the government continues to intensify, some intermediate producers do not have the financial strength to make the additional investment needed to meet environmental protection standards,” Toyocolor Co. Ltd.’s director VP Jeff Okaichi added. “We have been seeing many producers being forced to reduce production or exit the market altogether. This all makes for a difficult supply situation for raw materials, keeping market prices at elevated levels.”

Per Guethlin, the markets for certain key feedstocks such as CLT acid, 2B acid (PR48.xx), carbazole (PV23) and DCB (PY12, 13, 14, 83, 174, etc.) have “become very tight, leading to extreme price volatility.”

“Most organic pigment technologies are challenged: diarylide yellows; Y12; Y13; Y14; Y62; Y65; Y74; Y174; Chinese-made DCB; AAA; AAOT; AAMX’ R48s & R57:1s; Chinese-made 2B&4B acid; R53:1 with limited CLT acid; V3; V27 and R169; R146; R184 (naphthol AS series); Y83 (DCB andAsIRG); O5; O13; and O34 (PTMP/PMP),” Pfefferkorn said. “The list goes on.”

“Prices for standard azo pigments yellow and red continue to rise in large part due to supply uncertainty, specifically from Chinese producers. In particular, the supply of key ingredients DCB and acid red 2B has been very erratic with prices fluctuating sharply,” Okaichi added.

China is the major supplier of both pigments and pigment intermediates to the world, Pfefferkorn stated.

Pierre Boulangue, technical marketing manager inks EMEA for Ferro Performance Pigments Belgium, said that 2017 was a challenging year for pigment producers. He added that getting intermediates to be able to produce pigments on time was one issue, as were increasing prices, particularly in the second half of the year.

“Continuous environmental pressure of the Chinese government, and also in India, has the consequence that a lot of intermediate suppliers had to temporarily or definitively close their doors, resulting in a lot of temporary shortages and price increases,” Boulangue added.

Asia Pacific was the largest regional pigments market in 2015 and is anticipated to maintain its global share up to 2024, according to Global Market Insights.

“The specialty chemical world, including those of us making pigments, has become increasingly dependent on Chinese raw materials over the past two decades,” Darren Bianchi, Brilliant Group’s founder and CEO, said. “These include dyes and other polymer raw materials. As the rest of the world has gotten out of the business of making a number of these materials, we are now left to chase capacity regularly limited due to governmentally directed plant shutdowns. It is causing wild spikes in raw material prices that are moving through the value chain.”
All indications are that the Chinese authorities will become even more stringent in applying existing regulations in the coming months, per Clariant’s Guethlin.

“We do not foresee the regulatory environment easing nor the continued pressure to deliver cost effective, value added solutions,” Neil Hersh, head of marketing and technical services for ECKART America, said.

“This supply disruption is expected to last well into 2018 and will impact the majority of the industry, which so heavily relies on Chinese production for these raw materials,” Lavieri added.

Other regulatory areas are also becoming stricter, such as the ingredients that can be used for packaging.

“The packaging sector is increasingly controlled by regulations that limit the negative elements found naturally in organic chemistries, especially for food contact,” Pfefferkorn said. “The challenge is to manufacture the pigments in a way to minimize these elements.”

“Increased global awareness with respect to food safety and reducing the impact of packaging on the environment has been driving demand for packaging materials with lower migration or enhanced eco-friendly characteristics,” Okaichi said. “The demand continues to grow for clean, sustainable pigments, including aqueous types and compositions free of VOCs, halogens and amines.”

According to Hersh, this isn’t limited to just China.

“Increased regulatory requirements, driven primarily from Europe, have become increasingly more challenging,” he said. “Raw materials are reclassified or lower migration thresholds are implemented, making them unacceptable for use in certain applications.”

“The most notable challenges and opportunities in the regulatory sphere cover NIAS (non-intentionally added substances) as connected to AP89/1, Swiss Ordinance and upcoming German Ordinance together with new stricter labelling regulations (CLP),” Guethlin said. “Together the challenge for us as a colorant manufacturer and [part of] the digital ink industry will be to find the right balance between technical and regulatory requirements of the colorant and the cost performance of the final print (total cost of ownership).

“As seen for colorants for conventional inks in general we also see a strong pressure on costs even for digitally used ones caused by raw material cost increase and supply pressure,” she added.

New legislation for printing inks is introduced regularly, Sun Chemical’s Weighill noted.

“Controls can differ greatly across the globe. These changes can influence regional pigment selection, binder chemistry and formulation flexibility,” he said. “The challenge is keeping up with changing local regulations, designing products that meet new criteria, and delivering performance.”

“It seems there is a regulatory need to eliminate impurities, especially for primary aromatic amines,” Orlowski noted. “This will have an effect on all azo pigments. With regards to the yellows, Trust Chem has developed a PY155 that can be used to replace classical azo yellows in inks. The challenge for the ink industry is the difference in cost between the PY155 and the conventional yellows. There are alternatives for these yellows and in Europe PY155 is being adopted in critical applications where PAAs can’t be accepted. In the US this pigment has not been as widely adopted as it has in Europe.”

Meeting customer mandates

So, what are companies doing to help customers meet mandates?

“We strive to support our customers by helping them better understand the technical challenges faced, by providing a variety of cost/performance options but ultimately by always recommending intrinsically safe colorants,” Guethlin said. “Regarding digital printing, we continuously support the digital market with new, innovative products and services and a dedicated sales range for colorants and dispersions for the different digital printing technologies.”

“There’s a lot of effort being expended to identify suitable alternatives/functional equivalents within the desired cost structure to maintain desired performance requirements and continuity of supply without having any negative economic impact,” Hersh said.

Added Weighill: “We have invested considerable time and resources ensuring that our products are REACH compliant ahead of the deadline in June 2018. All our new products are developed to be globally compliant. For existing products, we work closely with our customers to obtain additional registrations where necessary. We are working closely with our intermediate manufacturers to ensure our pigment supply chain suffers minimal disruption.

“The challenge is keeping up with changing local regulations, designing products that meet new criteria, and delivering performance,” he noted.

For Orion Engineered Carbons, it’s about adapting existing products and developing new ones, according to Dr. Sanjay Monie, marketing manager – inks, batteries & special applications.

“Our strong innovation team and global production capabilities make this possible. Furthermore, we inform and educate our customers, and provide regulatory documentation to support our products,” Dr. Monie said.

Orlowski said that because of regulatory restrictions and environmental restrictions in China, intermediates’ supply and cost has become unpredictable.

“How to secure the supply of intermediates has been more important than before for the pigment industry. Trust Chem will use the advantage of capital and choosing the right time to build stockpile of both pigments and intermediates,” he added.

“Additionally, the REACH program in Europe goes into effect in the year of 2018, initiating some new laws and regulations,” Orlowski said. “Trust Chem will definitely develop new pigments to meet these new laws and regulations as well as customer’s requirements.”

Said Okaichi: “We are continuously working to ensure that our customer communications, including safety data sheet updates, are country-specific and in line with the most recent standards for all our products. Product portfolios, in particular for colorants for food and sensitive products, are regularly reviewed according to business needs and regulatory requirements.

“We are also strongly committed to product safety and eco-friendly processes and have developed regulatory knowledge in areas such as ETAD, REACH, Swiss Ordinance and AP-89-1 standards, and regulatory compliance for food packaging materials,” Okaichi added.

Pfefferkorn said Union Colours recognizes regulatory needs by “working with our clients, and we in turn work with our suppliers.”
Brilliant has developed new products to address market needs, per Bianchi.

Weighill believes Sun Chemical’s “leadership in the marketplace, world-class group of regulatory professionals, and investment in R&D has put us in an excellent position to respond to the constant changing business conditions.”

Multiple areas of growth inside graphic arts

Industry official agreed that packaging and packaging inks are at the forefront.

“For sure, liquid inks for flexible packaging has grown for us, especially into health sensitive applications. Digital inks have grown also, although in small volumes as the market is still maturing,” Pfefferkorn said.

“Packaging remains resilient in all markets with both China and India continuing to show remarkable growth,” according to Guethlin. “In the Asian markets, where gravure printing dominates, an increased emphasis on compliance and sustainability is driving interest in aqueous, UV and single solvent systems.”

“We saw growth with many of the customers we currently supply and increased the number of customers we serve. Business was more challenging in Europe and Asia,” Orlowski said, adding that packaging inks have been strong while publication ink continues to be weak.

“Packaging flexography and some gravure continue to grow. Solvent systems still dominate, especially in Latin America,” Dr. Monie said. “We see more companies growing their digital printing portfolios, especially inkjet capabilities. UV and energy curing systems are also gaining prominence throughout graphic arts, particularly in offset, flexographic and digital printing.”

Okaichi also sees growth with UV and inkjet inks.

“Digital printing markets has been driving demand for high quality pigment dispersions to help formulate inks and coatings for these applications,” he said.

“For the past several years, we have seen demand increase in solvent and water-based packaging inks along with UV and inkjet applications,” Weighill added.

- Article from <Ink World>

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