Penn Color Case Study

Manufacturers in the packaging and blow molding industries that use PET resin are seeing a growth boom even in the down economy, thanks to the versatility of the plastic and its relative ease at being recycled.

To give these manufacturers a means of controlling color precisely and reducing downtime on the shop floor, Penn Color Inc. has developed a resin-based family of colorants for PET (polyethylene terephthalate) that improves on wax-based and liquid colorants that may cause color variations, jam feeding mechanisms, or cause screws to slip in molding machines.

But even with the best selection of colorants, Penn Color recognized that it needed a system that could define and identify color exactly for its customers. For assistance in the language of color, the Doylestown, PA.-based company chose X-Rite Inc. as its partner in this critical function.

"We are a leader in the manufacture of pigment dispersions and color concentrates, " says Jim Walsh, Technical Director-Thermoplastics in the Hatfield, PA. facility of Penn Color. "It was only natural that that we would select the company that we felt was a leader in color measurement technology. "

With about 600 employees in facilities in the United States, the Netherlands, and its Asha Penn Color Pvt. Ltd. joint venture in Valsad, India, Penn Color believed it to be equally important to find a partner that has a presence worldwide. The company sells full lines of inks and coatings to companies in the Americas, Europe and Asia, and it is looking to further expand its presence in those markets with its plastic colorants and additives.

Founded in 1964, Penn Color has built a strong reputation in providing additives and color concentrates at the right particle size suspended in an appropriate carrier to companies that manufacture film and sheet, packaging, housewares, compounds, building materials, and synthetic fibers.

Customers of color concentrates may range from huge multinational companies to modest sized manufacturers, Walsh says, but regardless of their size, the companies are interested in providing consistent color in packages and bottles.

Due to the wide range of companies that it serves, Penn Color provides additives and colorants for a variety of resins including, styrenics, nylon, polyolefins, acrylic, polycarbonate and a host of specialty engineering thermoplastics. But the company has launched a special

initiative to use X-Rite instruments and software to build a proprietary database and measurement methods based on PET resins.

PET is a popular resin in the packaging industry because it is naturally colorless with a high degree of transparency, but it can be made translucent and opaque with the addition of colorants and additives. In addition to its versatility, PET also is the most widely recycled plastic because virtually all carbonated soft drink and water bottles are made from the material, which allows it to be easily identified in waste stream for recycling.

" We are developing a database using X-Rite instruments and software that marries very well with our abilities to match translucent, transparent and opaque colors in PET resin " Walsh says. "Some of that will come through data conversion from our old system, as well as building new database information from scratch. While we are going to start with PET, we intend to apply this same system to all of the other polymers that we support. "

With regard to the PET market, Penn Color has developed the Pennacle® family of colorants where pigments are dispersed in a carrier that has a melting point close to the base PET resin, an improvement over wax-based or liquid colorants. The Pennacle® colorants are formed into small, uniform dust-free pellets that don't require drying before loading into resin feeders. Those innovations eliminate the processing issues that can plague both single and two-stage blow molding operations, such as color variations, premature melting in the feeders, or screw slippage that requires the screws to be cleaned excessively.

With more than 60 people dedicated to research and development and an additional 60 people devoted specifically to quality control in the laboratory, Penn Color is in a very real sense an R&D company on behalf of its customers.

"Our customers are very specific about the type of testing that needs to be done in their particular product," Walsh says. "We provide FDA and EU food contact letters -- even EU member state letters if required -- and we meet all the parameters that are required by our customers. So if we formulate a color for packaging to be sold in France, we know what colors and additives are suitable for food applications in that country. "

With a staff of 16 who are dedicated to plastic color matching in packaging, Penn Color uses X-Rite spectrophotometers and other equipment in a 24-hour, five- day week operation in Hatfield.

Penn Color employs an additional 14 people at a lab that matches the color of plastic-based building products, so "we essentially are matching colors around the clock," Walsh says. "We match a color and provide a sample back to them typically in 3 to 5 days -- sometimes in one day depending on the urgency of the program.'

To be able to meet demands of customers, Penn Color will create a color formulation, then run tests and samples often using the same type of equipment that one would find on the shop floor. Walsh says that the Hatfield facility has the capabilities of blow molding PET and PP bottles, extrude sheet and injection mold plaques of any thickness.

"We have a huge database of previously matched formulas that we can search, and then can do custom formulation using the computer color matching system," Walsh says. For a submission, Penn Color typically presents a color match folder that contains the specification that the customer has ordered, color custom molded plaques, pertinent materials safety data sheets, and a 3-pound sample of color concentrate.

"We are developing a database using X-Rite instruments and software for PET to handle translucent, transparent and opaque colors that marries very well with our abilities," Walsh says. "Quite frankly, we think that they are a strong company to partner with because they have integrated a number of companies such as Macbeth, Munsell Color Services, and Pantone under one roof."

"We are looking for leaders in the industry to be sure that they provide us with the most current technologies and software upgrades," Walsh says. Penn Color also was attracted to X-Rite due to its technologies that can be used to integrate operations anywhere around the world, such as its web-based calibration program called NetProfiler.

Using identical instrumentation and software, Penn Color plans to share its database developed in Hatfield facility seamlessly with the Netherlands operation to serve European customers that use PET for packaging and other applications.

"In the global marketplace, it is a huge advantage that the X-Rite instruments can all communicate with each other and can automatically be calibrated to standards, " Walsh says, "as well as having the state-of-the-art color matching QC software. We even use X-Rite color matching booths for standard illumination on our samples."

The Hatfield facility of Penn Color will first implement its X-Rite instrumentation and software, then share similar systems with its Netherlands facility, its building products laboratory or perhaps its Ringgold, Ga. facility that primarily focuses on fibers for applications such as carpeting.

The advantages of a shared database in color formulations can be significant, Walsh says. In addition to one laboratory acting as an extension of another to offer more services, the entire company can control its inventory of pigments and carriers more efficiently because all of the color palettes are identical -- even though each facility will be offering a much wider range of colors.

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