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new
bottle
look&
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IN DIALOGUE

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p 14

IN DIALOGUE

The Impact of Packaging

p 40

EVENT

PETnology AMERICAS 2018

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Never-Before-Seen PET Bottles Colored by penneffex™

PENN COLOR

A bottle that glows in the dark. A bottle that changes from red to purple when it gets cold. Color gradients that follow the distinctive shape of a bottle. At NPE 2018, Penn Color inspired Package Designers with new ideas by overcoming some critical technical challenges with special pigment compounds and leveraging partnerships with technology and design leaders in the PET industry.

"Brand Owners want their packages to be unique. We create unique effects" says Phil Riccardi, Penn Color's Marketing Manager for Packaging. At NPE 2018, penneffex™ - Penn Color's new Global Design Team - showcased Bicolor, ThermoChromic and Phosphorescent PET bottles for the beverage market.

The bottles were designed and engineered by PET Engineering, specifically for the small format CSD market, offering distinctive eye-catching shapes on the shelves. One bottle in particular used the proprietary "Nova line" design with a cap cover, a unique alternative to the conventional CSD bottle designs with a petaloid base. Penn Color and PET Engineering then worked together to choose the pigments that would add special effects, complementing and accenting the bottle's distinctive designs.

Using special effect pigments, however, usually comes with a number of challenges. Special effect pigments can degrade at the high process temperatures required for PET, causing the bottle to lose its eye-catching effect. In addition, special effect pigments are not always approved for food contact, thus limiting their applications to non-food contact applications like Homecare and Personal Care. And finally, special effect pigments are generally expensive, making the bottle potentially cost prohibitive for mass-market applications.

For each of the Bicolor, ThermoChromic and Phosphorescent PET bottles, the penneffex™ team overcame these challenges by designing a proprietary special effect compound to be used in the mid-layer of a Multi-Layer PET bottle. Penn Color partnered with HUSKY Injection Molding Systems to combine the uniquely designed compounds with the high capability Multi-Layer technology to create never-before-seen PET bottles. How did they overcome these challenges?

The Multi-Layer hot-runner was able to process the penneffex™ compound in the mid-layer at lower temperatures than the inner and outer layers. This significantly reduced the impact of thermal degradation and allowed the special effects to maintain their full effect in the finished bottle.

In the Multi-Layer structure of the bottle itself, an inner layer of food grade PET can effectively create a functional barrier between the mid-layer and the food or beverage content. The FDA requires a minimum 25 micron thick functional barrier that can allow the non-food grade pigments to be used in the mid-layer.

The penneffex™ compounds were specifically tailored to take advantage of the ability to dose high concentration of pigments in minute amounts, in the mid-layer of the preform. Even in minute amounts, the special effect pigments can reach their targeted special effect, driving a meaningful reduction of total-cost-to-produce in the finished bottle.

After a very successful NPE with the Bicolor, ThermoChromic and Phosphorescent PET bottles, the penneffex™ team continues to develop unique colors and effects. Inspired by the brilliant metals of the 2018 Winter Olympics, in June penneffex™ will introduce a "Metallic Depth" themed concept, also presented in a highly-engineered Multi-Layer PET structure.

The high cadence of innovative launches is fueled by a cross-pollination between the scientists who support the 19 markets Penn Color participates in, the most diversified market portfolio in the industry. It's also stimulated and enabled by partnerships established with Customers, Suppliers, OEM's and Package Designers.

"The goal of penneffex™ is to push the technical limits and inspire Package Designers with new ideas. We combine trend setting color design and innovative technologies to help create packages that stand out. We utilize our vast prototyping capabilities to design and create unique concepts, these concepts are presented in their finished part form and we can make fast iterations to shorten time-to-market," says Phil Riccardi, Penn Color's Marketing Manager for Packaging.



Fig. A: Special color effects accent distinctive eye-catching shape

Fig. B: Color effects complement the "Nova line" design with cap cover

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