

SUN CHEMICAL

expanding options for glass decorating

In this article, which is a White Paper published by Sun Chemical, we get an idea of how the possibilities involved in the decoration of glass containers is continuing to grow and expand. This does not only involve decoration, but also includes important aspects of brand protection and product security.

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INTRODUCTION

Brand owners know that the retail shelf is where the majority of purchase decisions are made. This 'moment of truth' emphasizes the importance of packaging that stands out from the competition. Packaging helps consumers identify favourite brands, however catching consumers' attention with engaging packaging also helps to drive product sales.

Another challenge brand owners face is determining the ideal packaging substrate. Stores are full of a wide variety of packaging substrates, from pouches, aluminium cans, glass containers and shrink sleeves to pressure-sensitive labels, paperboard, plastic, and heat-transfer labels.

GLASS – THE IMPORTANCE OF BEING 100 PERCENT RECYCLABLE

Glass is a unique substrate that brand owners often prefer because of its rigid barrier. Glass automatically protects food or beverages from the migration of substances across the packaging substrate. It is an ideal barrier to resist chemicals, alcohol, and water. It is also a recyclable material that can be reused over and over again. The importance of glass can be seen through concerns about the migration of chemicals into baby milk and food in Europe, which have led to a mandated switch to glass containers for those products.

During an independent research study organized by Friends of Glass, of the 8,000 consumers interviewed, two thirds admitted to worries about food contamination, and 61 per cent of those who opted for glass as their preferred packaging substrate said they chose it because it is the safest packaging for their health.

However, the greatest challenge with glass has been the

limitations in directly decorating the glass itself, which makes it difficult to represent product branding and imagery that utilize brand colours. Glass FRIT bonding screen printing limits the colours that can be used for direct decorating, and may also contain heavy metals which prohibit its use. As a result, labels are often the solution, sacrificing uniqueness in branding.

Organic inks from Sun Chemical allow brand owners to decorate their glass and ceramic packaging with bright, vibrant effects that can liven up the shelf presence. Organic inks, coatings and sprays significantly expand the colour gamut versus the FRIT printing process, allowing brand owners to not only produce standout designs directly decorated on the glass, but to do so using real brand colours that meet the current industry regulations regarding heavy metals and VOCs.

UV ink systems can significantly increase mileage, reduce energy costs by using UV lamps versus firing ovens, use less floor space, and increase production speeds. The end result is a lower cost per print.

THE SUNVETRO™ SOLUTION

Sun Chemical's SunVetro™ family of organic screen inks are specifically formulated for glass. Using Sun Chemical's SunMatch™ base colours to simulate Pantone® shades, SunVetro organic inks can print very bright, strong brand colours. Practically limitless colour options are available from simple mixing systems. Typically the entire Pantone colour range can be made from a base ink range of 12 mono-pigmented colours, and the cured colour is fully repeatable time after time.

The SunVetro VTGL series of UV screen inks are a two-component system designed for

printing onto glass, coated metals, and ceramics, as well as mirroring applications. These inks offer excellent adhesion to glass substrates, high gloss, excellent abrasion and chemical resistance, 100 per cent solids with no heavy metals or VOCs, and additives to provide numerous special effects.

Formulated to cure with both mercury vapour and LED UV sources, the SunVetro VTGL series has a colour matching system available with smart scale and ink dispensing systems.

Sunspray UVSPG is a 100 per cent solids UV spray coating specifically designed for plastic and glass. By utilizing a clear and frost base with SunSpray colour concentrates, a wide gamut of colouring is achievable.

Preparing the Substrate for a UV System

Pre-treatment of the glass is critical to achieve optimum adhesion. The reason is that glass containers commonly have anti-scuff coatings applied during manufacture.

To achieve adhesion, the surface of the glass must be altered. There are two ways to alter the glass surface tension. The first is by applying SunVetro Glasprep spray pre-treatment. This aqueous coating is applied to the glass as a fine mist and must be thoroughly flame dried prior to decorating.

A second option is utilizing Pyrosil™ technology from Applied Surface Technologies, LLC, which applies a flame and a proprietary liquid mix to the surface, leaving silicon dioxide on the glass and making it hydrophilic.

No matter the process utilized in preparing the glass, pre-treatment is highly recommended.

SunVetro VTR screen ink is a thermally cured component system for printing on glass and ceramic with excellent adhesion

and is suitable for mirroring applications.

The SunVetro family of products can be used for ceramics, glass containers such as beer/wine beverage bottles, drinkware, cosmetics, and medical vials. They can also be used on glass for cell phones, computer screens, gaming machine mirrors, and furniture.

SPECIAL EFFECTS

Sun Chemical offers a wide range of special effect inks, such as metallic, thermochromic, fluorescent, tactile, and etch effects, to name a few.

Thermochromic inks can be applied directly onto glass to indicate the ideal temperature of wines or beers, or can be used as a promotional message that appears at a specific temperature (Figure 1).



Figure 1 - Thermochromic inks were applied to these glasses. Colder temperatures change the colour of the ink from white to blue

Fluorescent and phosphorescent colours can shine brightly in black UV or glow in the dark, an effect which is great for displays and making labels stand out in a nightclub, etc.

Acid-etch or sandblasted effects can be printed onto bottles and cured in the same way coloured inks are, or alternatively, frosted bottles can have windows spot printed by using a gloss clear varnish in the desired area. Creating this effect through the use of inks and coatings can significantly reduce the cost and environmental concerns associ-



Figure 2 - Frosted bottles that were developed using Sun Chemical inks and coatings.

ated with traditional acid etching and sandblasting (Figure 2).

Other surface effects, such as tactile effects to enhance the luxurious feel and quality appeal or non-slip finishes for practicality, can also be created.

ADDING BRAND PROTECTION FEATURES TO GLASS DECORATING

It is clear that different levels of security are needed for different types of products and packaging. Brands need flexible solutions that can address the required level of sophistication while successfully countering the threat in a cost-effective way.

A multi-layered approach to security allows brand owners the flexibility to add and remove security features as required, which in turn allows them to stay one step ahead of the counterfeiter. These layers could range in sophistication without compromising the level of protection.

Most importantly, brands need to understand their options in order to make an educated decision about the best security for their products and/or packaging.

Sun Chemical offers a range

of anti-counterfeit and authentication solutions to make items more difficult to copy and enable brand owners and government officials to determine if products are genuine or fake.

Essentially all security solutions can be grouped into two segments: overt and covert technologies. Overt technologies are added for consumer verification purposes and can include thermo-chromic and colour shift inks, for example. These are visible features and do not require detection. Covert technologies need to be detected through a reading device. These include UV-readable and IR-responsive inks and coatings.

Sun Chemical has a range of both overt and covert security features that can be supplied as finished organic glass printing inks, or be incorporated covertly into glass printing inks.

The most effective security solutions for glass packaging are covert technologies, which are integrated directly into the organic glass printing inks. Covert solutions offer increased security compared to overt solutions and are viewed as the second line of defence.

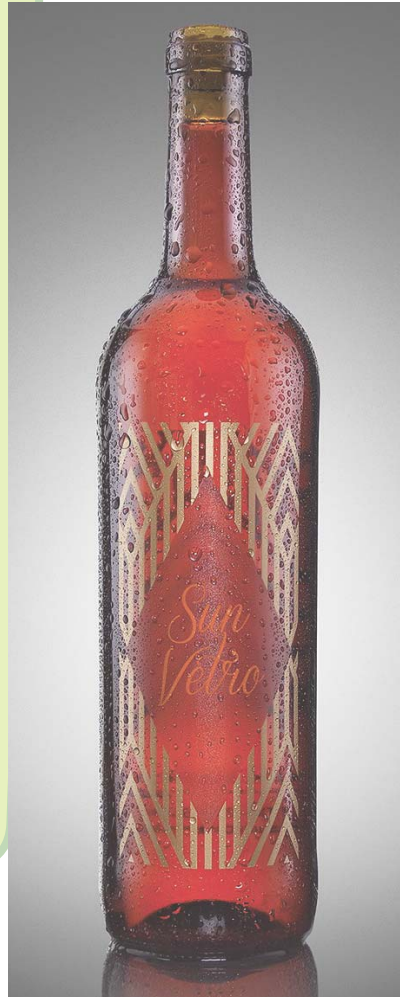
First-level covert solutions include invisible fluorescent inks, which are virtually invisible in daylight but exhibit distinct fluorescent shades on exposure to UV light. Coloured fluorescent inks are visible in normal light but have a strong fluorescence under UV light.

High-level covert solutions will contain some form of taggant that is only visible or detectable through more sophisticated devices, which range from laser pens to dedicated readers with controlled distribution.

Sun Chemical's taggant solution for glass packaging includes Verigard™ technology, which offers a lock and key approach to securing and authenticating



Figure 3 - Sun Chemical's Verigard™ security product is a proprietary machine-readable covert taggant system used to protect some of the world's most recognized consumer products from counterfeiting and diversion. Samples of glass decorating that used Sun Chemical's inks and coatings



brand packaging and documents of value. Using machine-readable taggants and readers available only from Sun Chemical, this is a highly effective system of covert marking and verification for both visible and hidden ink applications (Figure 3).

Highly flexible brand protection security solutions are made possible through technologies that are incorporated into the ink. Glass packaging printers are able to use these inks without having to adjust or replace any press equipment or process lines, as the products are supplied as standard organic inks suitable for all single-trip applications, which makes security a realistic option for all brand owners.

CONCLUSION

Sun Chemical's organic solutions offer many benefits for glass decorators. These include cost savings, production efficiencies, and enhanced colour gamut



using heavy-metal-free pigments. However, to be successful, decorators should look at their printing process as a whole, understand their print buyers' end-use requirements, and employ the technology that makes the most sense for each application.

To learn more about Sun Chemical SunVetro inks and coatings for glass decorating, visit www.sunchemical.com/glass-decorating. ■

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