



About Dye-Sublimation

Introduction

Wide format textile printing has seen significant growth over the past year and is estimated to more than double within a year. It's increased popularity, is primarily due to innovation in textiles, inks and better printers which have made textile printing among the fastest growing segments in digital printing today. Most of the printing is done through dye sublimation (DyeSub), from advertising banners to display and exhibition printing sector.

What is Dye Sublimation Printing?

So what is dye sublimation? Dye sublimation is a method of transferring dye (color) onto a substrate using a heat press. The method is unique because it involves sublimation, a process in which a solid is transferred to gas bypassing the liquid stage. In the process, the molecules of the dye bind to the substrate through vapor to form a color image, infused into the fibers of the substrate as opposed to a pigmented ink which adheres to the surface of the substrate. Subsequently dyesub results in a fabric that is durable and can be washed over and over. The dyes bond effectively to polyesters, so the higher the polyester content in the substrates, the better the results. Printing using dye sublimation can be done directly to the fabric or in a 2 stage transfer process in which the image is printed onto a transfer paper and then pressed by heat to the targeted substrate or application. No matter how the print is created, dye sublimation printing yield long lasting images.

Dye Sublimation in Action

As trivial as it may sound, the key to dye sublimation printing is heat which enables the transfer of the ink to the fabrics or to the transfer paper. The heat source comes from heat presses which are purchased separately or installed on the inkjet printer as add on. Separate heat presses can be either cylinder calenders for sheet-to-roll suitable for soft materials or flat-bed presses which are compatible with dye sublimation for rigid surfaces such as boards, aluminum or wooden sheets and others. However, many dedicated inkjet printers for dye sublimation are already sold with heat press simplifying the workflow. Dye sublimation printing opens up many possibilities for printing on a wide range of textiles. The strong washing resistance and durability compared with pigment inks as well as the ease of rolling and handling fabrics make it a natural choice for printers. However, there are also disadvantages especially in the choice of fabrics which can be used. In order to withstand dye sublimation, the fabrics must be at least 50% polyester. This process cannot be achieved with natural fabrics such as cotton, linen, viscose or wool.

Dye Sublimation Printing Applications

There are many applications that can benefit from dye sublimation. The most well-known industry to use sublimation is the display and exhibition sector that benefits from lower costs of shipping and handling since fabrics are less sensitive to folding and bending compared to more common substrates like paper or vinyl. Another popular application is the personalization industry like mugs, ceramic tiles, key chains, tote bags and other popular advertising items. Other dye sublimation applications that take up a substantial share in the graphic arts markets are soft signage used in banners, pop-ups, flags, gaming table covers and even sports and swimming apparel. Most recently dye sublimation is being used for wall and floor covering and it is easy to understand the immense potential of new applications for dye sublimation.

Dye Sublimation Inks

An important aspect in achieving high quality dye sublimation printing is the inks. There are three primary types of inks: water, solvent and oil-based. Environmentally friendly water based inks are most widely used to produce sublimation graphics. These inks are different from other inkjet inks in their composition, but they still must comply with inkjet prerequisite such as compatibility with the printhead, jettability and nano particle size on top of their unique composition. Currently there are a few companies manufacturing high quality dye sublimation inks which are not associated with specific printer manufacturers. Bordeaux, an accredited independent inkjet ink manufacturer, recently announced its entry into the dye sublimation printing market with the introduction of Water-based dye sublimation inks for sublimation and direct printing on a wide range of wide-format digital printers. The inks are produced using cutting edge technology for optimal ink fluidity and printability through piezo printheads, good color and relatively high resistance to ultra violet light.

Conclusion

The dye sublimation printing process opens up many new possibilities in the digital printing market. Advancements in the market greatly increase the number of applications in the market and improve printing performance and durability. Bordeaux's dye sublimation ink line for direct to transfer and sublimation printing for use on a wide range of wide format printing provides high quality printing, flexibility and ease of use.