

# SUSTAINABILITY IN THE SCREEN PRINTING WORLD

Are certain screen printing ink products truly friendlier to the environment or more sustainable than others? Not necessarily, says Steve Kahane as he takes a closer look at the primary consumable for apparel decoration



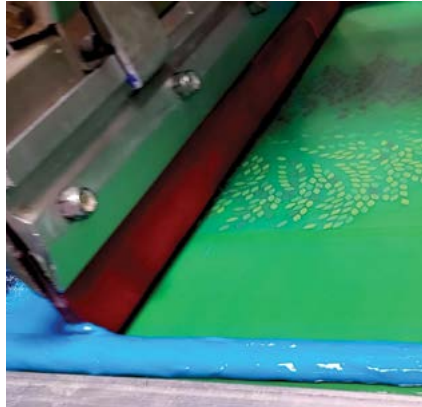
Steve Kahane is President and CEO of International Coatings

**Global apparel is a trillion dollar industry that keeps us all clothed, but in the process it casts a large footprint on our environment. Prior to the Covid-19 pandemic, the average person bought 60% more clothing than they did 20 years ago and they threw out more as a result. Less than 1% of used clothing today is recycled or reused.**

According to the World Bank, the fashion industry uses over 93 billion cubic metres of water. That's enough to meet the needs of five hundred million people. An estimated 20% of wastewater worldwide comes from fabric treatments. The fashion industry contributes 10% of annual global carbon emissions, more than all international flights and maritime shipping combined. Assuming clothing demand continues at its pre-pandemic rate, the fashion industry's greenhouse gas emissions are expected to increase by more than 50% over the next decade.

These statistics are sobering and have brought needed attention and urgency to how the industry can become more sustainable and environment-friendly. There is certainly opportunity for gain, particularly given the apparel industry's size and the scale of its impact.

We have seen a lot of solid and science-based progress in recent years, but we have also seen a rise in 'greenwashing' – bold and unsubstantiated claims suggesting that certain apparel-related products are 'greener' or 'eco-friendlier' than others. Since these claims are



Screen print using fluorescent blue plastisol ink

largely unregulated, it should come as no surprise that many are unsupported by the facts, and are misleading or flat out wrong. For example, organic cotton shirts to some may seem like the 'greener' choice over polyester. But would it change your perception if you considered that it takes hundreds of gallons of water to grow, dye and treat one cotton shirt,

***"Claims that water-based inks are more environmentally friendly than plastisols and acryols are questionable at best"***

and that many polyester shirts are now being spun from recycled plastic products?

This article takes a closer look at the environmental impact of screen printing inks – the primary consumable for apparel decoration. As a supplier to the industry, we are often asked why certain screen print ink products (such as water-based inks) are represented as environment-friendly and others (most notably, PVC plastisols) aren't. Is one truly friendlier to the environment or more sustainable than the other? Not necessarily. Certainly there are differences between PVC, acrysol and water-based ink products, but they are all plastics. Yes, water-based inks, like plastisols and acryols, are plastics.

## FACT OR FICTION?

PVC plastisols are widely used around the world and are the inks of choice in North America. They are versatile, easy to use, cost efficient and safe. Plastisols don't dry in the screen because they don't cure until they are heated. Plastisols are considered '100% solids' and consequently provide virtually a 100% yield. What you print on the garment



White plastisol ink. International Coatings manufactures a complete line of non-phthalate plastisol and acrysol screen printing inks

stays on the garment. Most water-based inks contain only 20 to 30% solids. The highest solids water-based inks contain no more than 70% solids.

Printers looking for an alternative to PVC are generally looking to acrysol or water-based inks. Like plastisols, acryols are 100% solids and provide the same high yield. They are

easy to use, and print and behave like PVC plastisols. They don't dry in the screen and most don't require a flash after every print.

The common misconception is that water-based inks are benign since they are largely water. Not so. All water-based inks contain a



Plastisols and acryols contain plasticisers that cross-link with the plastic resin. These plasticisers don't evaporate off but become part of the ink film

plastic binder (usually an acrylic or urethane) and various additives (pigments, fillers, retarders, mould inhibitors) that are suspended in water and other co-solvents. In fact, many high-solids water-based inks contain relatively little water. Water-based inks aren't as popular as plastisols in North America largely because they're not as easy to use (drying in the screen), not as efficient (lower yields, daily cleaning, more waste), require more energy and time to cure, and in the case of some 'high-solids' inks, are more expensive.

Claims that water-based inks are more environmentally friendly than plastisols and acryols are questionable at best. All three inks rely on plastic resins or binders, pigments, fillers and various chemical additives. Plastisols and acryols contain plasticisers that cross-link with the plastic resin. These plasticisers don't evaporate off but become part of the ink film. Water-based inks, on the other hand, rely on solvents that evaporate off leaving the pigmented binder compounds on the garments. These evaporative solvents may represent over 70% of the ink. While the primary solvent is water, water-based inks often contain co-solvents such as alcohols, glycols and formaldehyde. These co-solvents may be harmful and put printers at risk unless they are properly protected from the evaporative fumes.

#### FOOTPRINT

Plastisols, acryols and water-based inks have environmental footprints that are quite different. Water-based printing generally requires more energy to power more flashes, longer cure times, and ventilation to drive off the moisture; and more water, primarily for daily cleaning. At the end of a print day, plastisol and acrysol can be left on the screen or put back in the bucket for use at another time. Not necessarily so with water-based inks. Water-based printing not only consumes more water, it generates more water waste, and that waste is often poured mistakenly down the drain.

Some of the chemicals in plastisol, acrysol and water-based inks are considered hazardous and must be managed and disposed as such. Plastisol and acrysol waste that can't be reused can often be recycled for other uses, or when cured can be disposed as a regular plastic. Water-based binder in some cases may be similarly disposed of if all solvents have evaporated off.

#### PRINTERS' RESPONSIBILITY

The point here is that printers should take the time to learn which inks work best for their situations. I'm not suggesting

that plastisols and acryols are better than water-based inks. But at the same time, water-based inks aren't necessarily better or greener than plastisol or acrysol inks.

'Eco-friendliness' or sustainability is not determined solely by the chemical constituents of a product. The terms now embody the cradle to grave impact a garment and its constituents (including inks) have on the environment. For printers, it's important to remember that how you manage a print process and shop may have the greatest impact on its environmental footprint – materials, energy, water, workflow, reuse/recycle and waste.

So the next time you hear a claim about one product being green or greener than the next, take the time to understand the basis of that assertion. It just might be that someone is trying to 'greenwash' their products. ■

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