

## Does the use copy media in dye-sub printing pay off?

# False economy

Copy media has become a serious issue in event photography and retail photo printing. In the inkjet segment, countless third-party manufacturers offer inks and cartridges, while OEMs fight for their business with patent lawsuits and marketing activities. Nevertheless, some third-party inks and cartridges may work more or less properly in inkjet printers. Due to the technical complexity of the media, this is not the case in dye-sublimation printing. In a recent statement, Citizen Photo considers the reasons why using copy media offers little to the user but false economy.

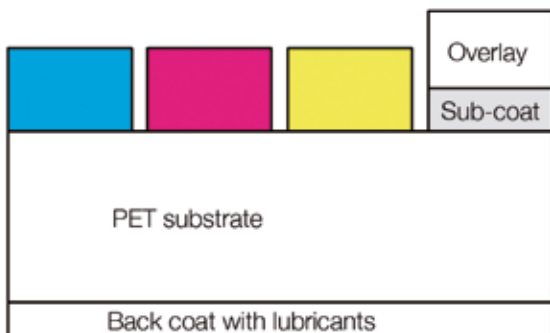
Talking about the complexity of the technology, we should remember it takes between 12–18 months to develop dye-sub media. Both the ribbon and the receiving media must be harmonized with the running gear of the printer. The mechanical elements of the hardware are extremely sensitive to copy media as additional strain can be placed on the thermal head, rollers and motors. Regular users of copy media may find that the life of their machine is shortened and by using copy media, and the printer warranty is invalidated. In photo finishing, dye-sub media comprises a ribbon and a paper based receiver. A thermal head sublimates (transfers) the ribbon dye into the receiver. The ribbon consists of a thin base of polyethylene terephthalate (PET) coated on one side with repeating panels of CMY dyes, mixed in a solvent, plus a laminate (overlay). The solvent is dispelled during the coating process, leaving



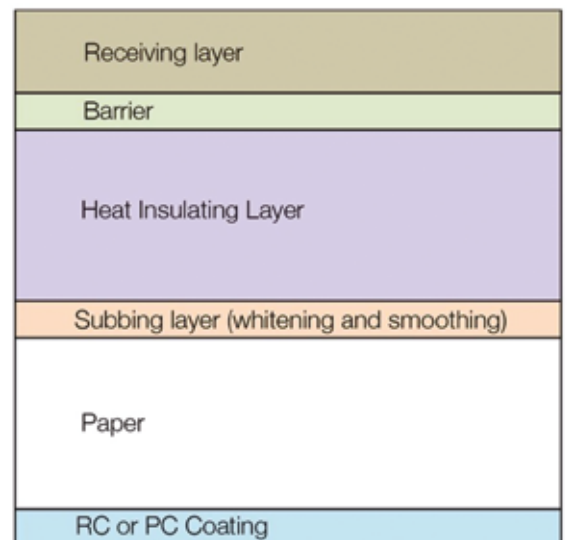
*The use of copy media in dye-sub printing may result in significantly inferior picture quality.*

a kinetically stable, yet thermodynamically unstable coating of dye in a polymer binder.

This polymer binder transition temperature is in the region of 80-120° C for accurate color delivery during printing and good storage stability. On the



*Cross sections of a dye-sub ribbon (left) and the receiving paper illustrate the technical complexity of the process.*



underside of the ribbon is another polymer coating, the back-coat. The back-coat aids the transfer of the ribbon across the thermal print head during the printing process.

There are many commercially available diffusion dyes, but for OEM photographic media, they are designed to have a high melting point and a high optical strength to give good colour intensity at low concentrations. They are also light stable to reduce fading.

### **Quality in Manufacturing**

The coating machines used in making dye-sub media are huge and cost many millions of dollars to commission and operate. It can take days to set them up for production and a high volume of initial (costly) wastage is necessary to achieve the required quality for a production run, measured in millions of metres. It is due to this timely and expensive process that third party suppliers will prefer to adapt a single type of media to suit various printer models. The issue here is the inevitable tradeoff with regards to quality and stability of the media. Due to the

inconsistency in raw material and manufacturing quality, users of copy media may experience variable print quality. One known problem is a lower Dmax (black density), which reduces the color quality and contrast of prints. Another problem is noticeable color casts, particularly in neutral greys.

Often, new batches of copy media are supplied with ICC profiles in an attempt to improve the print quality. In contrast, printer manufacturer ilke Citizen supply an ICC profile with the printer that lasts for the lifetime of any printer in their range. To make matters worse, suppliers of third party media present their inferior products in such a way that many end users will not be aware that the products are not manufactured by the OEM. Citizen recognized that a problem existed when numerous end users complained directly about printer issues and poor quality print output. Many



*At leading manufacturers like Citizen, printers and media are carefully harmonized.*

users were shocked to learn that they were using copy media and, ultimately, putting their printers at risk of damage and jeopardising their warranties.

In the end, Citizen's message is a simple one. Why would a user take the risk of negating the printer warranty, achieving substandard output and shortening the life of the machine for sake of a few percent on upfront cost? At the end, the manufacturer concludes, it's a classic case of false economy.