

UV Technology

Shaping the Future of Digital Printing

Ultra violet curing of coatings is a widely used process that we encounter in everyday life. UV coatings are used in diverse applications ranging from the manufacture of furniture, to fibre optic cables and optical lenses. It is a technology that is in everyday use and it continues to find new applications.

The Origin of UV

The technology that underpins UV inks used in display graphics was pioneered during the 1940's and 1950's (the first patent for 'UV' curable ink was granted in 1946). However, it was not until the late 1960's that UV was considered as a serious alternative to more traditional production methods. The rapid growth and interest in UV-inkjet printing over the past 2-3 years has been prompted by the desire for increased productivity and print quality together with the need to reduce the emission of volatile organic compounds (VOCs) into the atmosphere.

The first commercially viable UV curable inkjet system launched by Sericol Imaging in 1999 was Uvijet. As a pioneer in the development of UV curable inkjet inks Sericol regards the continued development of these products as a priority for the future. To assist with the understanding of this technology, we have listed the main questions and concerns that digital printers may ask when evaluating UV technology.

What are UV curing Inkjet inks?

UV curing inkjet inks contain a mixture of reactive monomers, oligomers, photoinitiators, pigments and other additives. When exposed to UV light the photoinitiators react and cross link (polymerise) to form a dry film.

Are there hazards associated with the cured ink?

Once the ink has been cured with the correct dose of UV the ingredients are 'locked together' and there are no hazards associated with handling the prints thereafter. However, materials printed with these inks cannot be recommended for direct food contact, nor should they be used to decorate items that may be sucked or chewed by children.

Are these inks safe to use?

Uvijet inks, developed by Sericol for flatbed digital applications, have a low hazard rating and can be handled with the minimum of precautions. The selected compounds have low irritancy. Although like any other chemical it is recommended to wear gloves and safety glasses when handling Uvijet inks.

For specific hazard and handling details please refer to Sericol's material safety data sheet.

Why do UV curing inks have a different odour?

UV curing inks have a distinct odour, this is a result of the compounds used and the different drying method involved.

The drying (curing) process for inkjet inks uses medium-pressure mercury vapour lamps, which produce ozone. Ozone is produced when short wave UV reacts with oxygen but only when the printer is first switched on and the lamp is warming up to operating temperature. Once the ozone is ventilated to the atmosphere it immediately reverts to oxygen.

The colours for UV inks are not as 'bright' as other ink systems will this change?

UV curing inkjet is still an emerging technology and at this time the R&D focus is developing inks with the widest possible adhesion range to maximise the productivity enhancements UV curing provides. One of the limiting factors is finding pigments that have the required exterior durability with the stability and particle size required.

Does the substrate require any special coatings to enable them to be printed with Uvijet UV curing inks?

Uvijet inks have been designed to print on a wide variety of media without the need for any special primers and coatings. Using UV curing inks such as Uvijet also eliminates the need for secondary processing such as mounting and laminating by allowing printing direct onto the media with the desired level of chemical and abrasion resistance.

Adhesion to specialist materials such as glass & acrylics require the use of a primer which is easily applied to the material prior to decorating.

Why are UV curing inks becoming more popular for inkjet printing?

The main benefit when using a UV curable ink is increased efficiency.

Uvijet inks once jetted set instantly, which improves not only the print quality but also production speeds. Also, as Uvijet inks do not dry until exposed to UV light there is no risk of the ink drying during printing increasing the life of the print head and greatly reducing downtime.

Are there any special considerations required for installing a UV digital printer in my company?

UV inkjet allows you to directly decorate substrates which can be prone to static, such as Correx, Forrex etc. If your environment is too dry, jetting problems are likely when decorating these substrates. Prior to installing any printer, Fujifilm Sericol will ensure a site survey is completed so any potential site issues can be rectified.