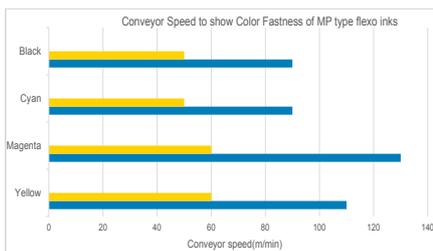




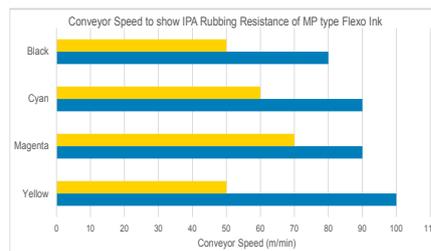
High power UV LEDs to cure inks and varnishes in flexo printing efficiently

The UV printing market is undergoing a rapid transformation from conventional UV medium pressure to UV LED systems. The use of UV LED ink is becoming more widespread in many printing applications - reducing the energy costs, enabling the use of more heat sensitive substrates and driving printing machines at a higher speed. These are the targets to improve efficiency and increase revenue. Furthermore there is a substantial pressure to ensure and improve the curing quality by using UV LEDs. UV LED curing has opened up a completely new horizon and Heraeus is driving this positive change in the printing industry in close cooperation with TOYO INK Co., LTD., a leading manufacturer of UV curing inks and varnishes. TOYO INK invests in renewable raw materials as much as possible in the formulation of the UV inks and varnishes. To use UV LEDs for curing effectively the formulation of inks needs to be optimized for the UV LED wavelength output. Both partners investigated the effect of the UV energy and intensity delivered by the UV LED on the cure performance of flexo inks:

Toyo Ink evaluated the color fastness of flexo inks by utilizing Semray UV4003 and a competitor's LED. The data shown below is from tests carried out using CMYK flexo inks. The UV LED inks were cured at various speeds with a constant distance of 10mm between the substrate surface and the UV LED lamp. After each speed setting, the ink was tested for color fastness with a either dry cotton wool rubs or with 5x IPA double rubs. The graphs below show the maximum speed that produced good color fastness when curing the inks with either Semray UV4003 or a competitor's water-cooled UV LED. A faster line speed means that less UV energy is delivered to the ink. A faster line speed also means increased productivity for the end user. These results show that Semray can enable faster production speeds whilst delivering high quality products in the full range of colors. Think UV. Think Heraeus.



graph 1



graph 2

Test results show color fastness (graph 1) and IPA rubbing resistance (graph 2) of MP type flexo inks cured with

- Competitor's water cooling type (385nm) and
- Heraeus Semray® UV4003 (385nm)

Technical data and benefits at a glance:

- UV LED system, Semray® UV4003 - for high peak intensity and UV energy
- Air cooled solution for final curing which is easier to integrate into the machine
- Proprietary optical concept to increase intensity and reduce stray light for even more focused intensity
- Simple to change to different wavelength modules, which opens benefits for different printing jobs
- Global service and application know-how available

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