

Curing of a UV-ink



Application

Ink

Objective

Find the right condition of curing of an ink

Device

HORUS®

INTRODUCTION

UV-curable coatings have replaced solvent-based formulations in many applications such as industrial coatings, lacquers or printing inks. The reason is that they offer outstanding benefits: the primary advantage being speed, as curing can be achieved within seconds. Moreover, UV-curable coatings are environmentally friendly as they contain very low levels of VOC (Volatile Organic Compounds) and in the majority of cases no solvent at all. Finally, the UV-cured coatings show unique physical properties such as stain, abrasion and solvent resistance.

METHOD

The open configuration of the HORUS® enables to adapt any 'spot type' UV lamp and to monitor UV curing. The UV spot has to be oriented on the laser spot and the distance to the sample has to be adjusted according to the desired experimental conditions. The HORUS® is equipped with a band pass filter centred around the laser wavelength, thus the UV light neither interfere with, nor modifies the HORUS® signal.

- HORUS® wavelength : 655 nm
- HORUS® filter band : 650-660 nm
- UV lamp wavelength : 365 nm
- UV lamp filter band : 280-400 nm
- Distance to sample : 5 cm

The sample is illuminated 3 times during 1 second with a UV lamp :

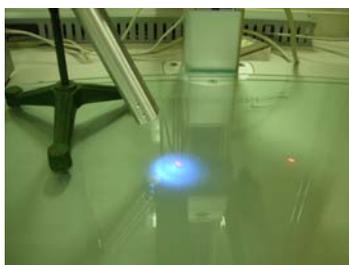
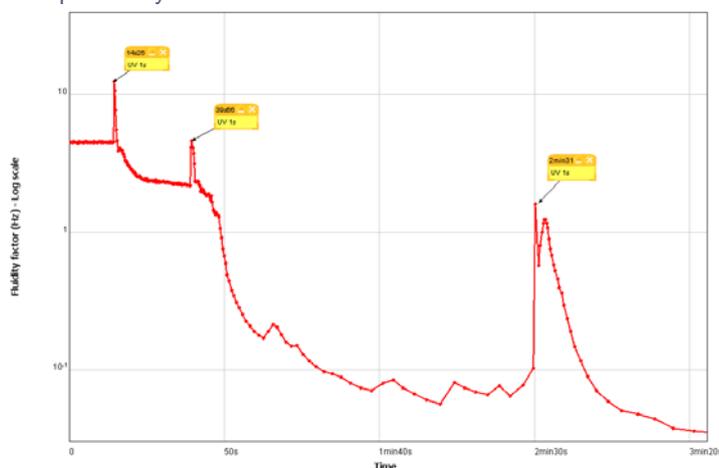
- UV light intensity : 350 mW/cm²
- ink wet thickness : 24 microns
- substrate : glass

RESULTS

Before illumination, the signal remains constant indicating no change in the sample fluidity, hence no cure.

The effect of UV light on the ink sample is then clearly visible : after each illumination period, the fluidity factor decreases sharply indicating a higher polymerisation of the sample.

The peak of fluidity factor generated during UV light exposure corresponds to an increase of the temperature of the sample under UV light, *i.e.* an increase of the sample fluidity.



CONCLUSION

By using the Horus®, the curing under UV can be monitored and the parameters of the process controlled.