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Development of ink transfer monitoring system for roll-to-plate gravure offset printing process SEUNG-HYUN LEE, Korea Institute of Machinery and Materials (Corresponding author), TAIK-MIN LEE, DONG-SOO KIM, BYOUNG JAE KIM, SEUNGWOO LEE — The gravure offset printing process is very cost-effective for printed electronics, such as printed solar cell, printed battery, printed TFT, printed RFID tag and so on. In gravure offset printing, there are two kinds of ink transfer processes – off and set processes. At the off process, an elastic blanket cylinder picks up the ink from patterned plate or patterned cylinder. At the set process, ink on the elastic blanket cylinder is transferred onto the target substrate. These two ink transfer processes determine printing quality, therefore understanding of ink transfer mechanism during off and set processes are very important to control printing quality. In this study, we developed ink transfer monitoring system for roll-to-plate gravure printing. We visualized ink transfer from pattern plate to rolling blanket cylinder (off process) and from rolling blanket cylinder to plate substrate (set process) by using high-speed camera and long range microscope. We investigated the effects of pattern size, printing speed, rotational effect of blanket cylinder, contact angle and rheological property of ink to understanding gravure offset printing mechanism.

Seung-Hyun Lee
Korea Institute of Machinery and Materials (Corresponding author)

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