The effect of printing inks on both hardness and thickness of flexographic plates produced digitally versus flexographic plates produced by 3D printing technology "applied by Fused deposing modeling technology "

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Abstract:

One of the most important challenges facing the flexographic plate manufacturers and by extension in the field of flexographic surface prepress is the stability of the rate of change in the physical and chemical properties of the flexographic surface, whether during the photo-engraving process and the subsequent processes of developing drying, and, final exposure, then the printing process and what it faces from other challenges, which are The friction power resulting from the continuous contact between the anilox cylinder and the flexographic surface, and then transferring the inked image to the surface of the material continuously during the printing run in the presence of impression cylinder.

The characteristics of the printing ink constitute is considered one of the most important factors affecting on the hardness and thickness of the flexographic surface, whether the type of ink has a solvent based or water based, or even of the type of inks with ultraviolet dryness. Each of these types has a direct effect on the physical behavior of the thickness and hardness of the flexographic surface during Print production.

The research aims to develop a guideline for the rate of change of thickness and hardness of the printing flexographic plate with 3d-printing techniques "by applying the fused deposition modeling technique" by comparing it with the flexographic plates produced by digital methods. The study followed the descriptive, analytical and experimental method and found a convergence in the rate of change for both the hardness and thickness of the flexographic plates produced digitally and the flexographic plates produced by the technique of 3D printing "by applying the fused deposition modeling technique" Over the course of twelve hours, in the case of water-based inks and UV-treated inks, while in the case of solvent-based inks of the type of nitrocellulose inks, the rate of change was higher in both types of flexographic surfaces, whether digital or produced by 3D printing technology, in addition to the splitting of the polymer layer in the flexographic plate produced by 3D printing from the polyester backing film after eight hours of testing.

Key words:

The printing flexographic plate -Hardness-thickness- solvent based ink- water base ink – uv ink

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