

## Formation of Anti-Adhesive Silicone Films and Their Interaction with UV Embossing Resin

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### ABSTRACT

In this study, two anti-adhesive coatings for molds used in UV embossing were formed from functionalized silicones with different molecular weights (MW). In a subsequent step, the nickelized polyester mold surfaces covered by silicone films were UV embossed into polyethylene glycol diacrylate (PEGDA). The durability of the two silicone films was investigated. The surface chemical composition of the silicone films and the PEGDA moldings was analyzed by X-ray Photoelectron Spectroscopy (XPS) as a function of molding times using the same stamp. Silicone transfer was found to occur during the UV embossing. The silicone film formed from the release agent with the higher MW had the poorer durability. This study can provide some guidance for the selection of the most suitable release agents for the anti-adhesive layers. Two mechanisms are proposed for the material transfer.

**Keywords:** Anti-adhesion, silicone-based release agent, UV embossing and XPS