Numerical study of polymer coating by UV photopolymerization.

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Abstract : Polymer-based coatings are used to protect a structure or device against mechanical attacks such as scratches, abrasion and erosion or against chemical attacks such as humidity, temperature, UV rays. This work concerns the development by photopolymerization UV of new coating materials based on a polymer as (Polyurethane Acrylate, oligomers) deposited on heat-sensitive materials such as thermoplastics (PC; PMMA,). Now, the polymers, which are already used in thermal powder coating. They generally show very high melting temperatures (around 200 °C). They will not be suitable for depositing on supports sensitive to high temperatures without risk of damaging them. In this work, we proposed a numerical study of the effect of different synthesis parameters (energy and applied UV rays, exposure time, temperature, external medium, etc.) on the conversion rate to a 3D mesh (crosslinking rate) and model optimization of coating parameters on heat-sensitive substrates.

Keywords : polymers, coatings polymer, photopolymerization UV