

# Study on the In-Mold Punching of the Thermoplastic in injection molding

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## ABSTRACT

The purpose of this study was to reduce the surface defects of thermoplastic by using in-mold punching process. In the thermoplastic blanking experiment, the punch velocity and the material temperature were selected as the experimental parameters, and their effects on the blanked surface and punched hole dimension were investigated. The experiment results were then incorporated with the injection molding process to form an in-mold punching experiment. The punching device was mounted on the injection mold, several pieces of the plastic plate with holes were injected, the punched surface and hole shrinkage were investigated. The results showed that the in-mold punching could eliminate weld line in ABS and PMMA. However, for PC, the in-mold punching failed to produce a satisfactory hole because of PC's superior toughness. The in-molding punching process was better than conventional injection molding in reducing hole shrinkage. With the help of the optical magnification, the faster punch velocity and the lower temperature help to produce the better quality of blanked surface.