

Jatupong Krongthanin 2011: An Investigation into Bond Strength of Injection Overmolded Polypropylene. Master of Engineering (Materials Engineering), Major Field: Materials Engineering, Department of Materials Engineering. Thesis Advisor: Mr. Somjate Patcharaphun, Dr.-Ing. 81 pages.

The aim of this study was to investigate the influence of injection overmolding parameters on the bond strength between substrate and overmolded polypropylene. The injection overmolded temperature, substrate temperature, and holding pressure on the tensile and impact strengths of injection overmolded part were studied in details. In addition the effects of contact distance and surface pattern on the shear strength were also main interest. The experimental results indicated that the bond strength particularly increased with increasing substrate temperature, while less significant effect was found with increasing overmolded temperature. It can be seen that the shear strength tended to decrease with the increase of contact distance. This was associated with the decrease of intermolecular diffusion at the interface as increase in flow distance. Furthermore, the significant improvement of shear strength was found by using the perpendicular and parallel groove patterns on the substrate surface. In this work, the mathematical model was developed in order to predict the shear strength of overmolded part and the analytical results were in well agreement with corresponding experiments. However, the model needs to be further developed in order to accurately predict the shear strength of overmolded part with various surface pattern.

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Student's signature

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Thesis Advisor's signature