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KEY WORD: FIBER GLASS/REINFORCEMENT/POLYPROPYLENE/FIBER SURFACE TREATMENT

SUPHATTRAR THANCHAIYING: COMPRESSION MOLDING OF GLASS FIBER REINFORCED POLYPROPYLENE. THESIS ADVISOR :

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Optimum condition for compression molding of glass fiber reinforced polypropylene was investigated in the present study. It was observed that the optimum condition should be 30-40 weight percent of glass content, melted at 200°C without any applied pressure and immediately cooled under 200 psi pressure. However, in order to achieve a good composite, not only an optimum condition but also appropriate surface treating agents or surface coupling agents should be used. Polyvinylalcohol, carboxymethyl cellulose, Epolene-43-P, A-174 silane and Fogger were used as surface treating agents in the present study. Compatibility enhancement of each surface treating agent between glass fiber surface and polypropylene matrix was comparatively investigated. The results show that in case of surface treating agent coated on heat-cleaned glass fiber, all of the five surface treating agents exhibit compatibility enhancement, but A-174 silane and PVA seem to be the most appropriate. In case of surface treating agent coated together with coupling agents available on commercial general purpose AGI glass fiber, no compatibility enhancement was observed for each surface treating agent. Inversely, compatibility enhancement was observed when the surface treating agent was coated together with coupling agents available on commercial NEG glass fiber which was special for thermoset, not for polypropylene thermoplastic. Compatibility enhancement by the surface treating agent was also confirmed by microstructural analysis with optical microscope; however, no significant difference could be observed. In order to achieve more reliable data, the polynomial regression equation method was also used to calculate the flexural strength and modulus of the composites.

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