



## STUDY ON INJECTION MOLDING OF GLASS FIBER REINFORCED POLYPROPYLENE WITH FIBER LENGTH AND DISPERSION

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Recent years, conventional products from metal is replaced to Glass fiber reinforced plastic (GFRP) used glass fiber because changing to hybrid, lighter, and combine many parts in the car industry.

Injection molding machine make composite with mixing reinforced fiber and thermoplastic resin, and shot out mold tool. It is reported that Fiber length of the composite is longer, mechanical properties progress. And, the dispersion is bad, it becomes the fault one. When mixing thermoplastic resin and fiber, the fiber snap and shorten. Up to now we attend to act low shear stress on fiber not to fracture it. However molding of materials are not enough that there are many bunch of fiber.

Therefore, we tried to make longer fiber length and improve the dispersion of the reinforced composite used glass fiber by changing the shape of screw in the injection molding machine in the study.

The pellet used in the experiment is Polypropylene that content 20wt% of the glass fiber. This length of the glass fiber was 10[mm], the diameter was 25[ $\mu$ m]. This pellet is injecton molded with five screws. (standard screw, low shear screw, screw attached dulmage, Variable pitch screw, and V&D screw). First, we analyzed four screws except V&D screw as to shear stress, and analysis result of screw attached dulmage and Variable pitch screw shows characteristics. So we made V&D screw that has the shape of these two screws. We evaluated the glass length and dispersion of the GFRPP from the five screws. As a result, it has been understood that the residual fiber length of the molding depends on the depth of the screw at compression part. In addition, the dispersion depending on the shape of dalmage in the screw point.