Material Report

POLYPROPYLENE + 30% GLASS FIBERS PROCESSING REPORT

This report is a guideline for the processing of PP-GF composites.

MATERIALS USED

Base PP: Resinex RXP 2004
Glass Fibers: JM Thermoflow 636
Coupling Agent: GRAFTABOND™ PPH-MAH 70025 CA
Blend Composition: 69% PP + 30% GF + 1% Coupling Agent

PROCESSING

The processing was done in the following steps:

1. Dry the glass fibers at 100°C for at least 3 hours
2. Dry the PP at 80°C for at least 3 hours
3. Mix the PP and GF in a mixing unit
4. Extrude the material in a twin screw extruder
5. Granulate the material
6. Dry the prepared blend 80°C for at least 3 hours
7. Injection mold A1 type specimen for tensile and Charpy tests

Injection molding parameters:
Melt T – 240°C
Injection Pressure – 80 MPa
Holding Pressure – 50 MPa
Mold T – 40°C
Cooling time – 10 s
The importance of heat treatment of glass fibers

Studies have shown that heat treatment of silanated surfaces at 100°C consolidates the condensation reaction and increases their bonding strength through the elimination of water, alcohol, and other subproducts of the condensation reaction. It is expected that heat treatment of the silane coupling agent improves the mechanical properties of fiber reinforced composites.

The heat treatment accelerates the silane condensation chemical interaction between the silane monomer and the fiber surfaces. Evaporation of solvents, such as water, alcohol, and acetic acid, causes the elimination of hydrogen bonds on the fiber surfaces, thus increasing sites available for reaction with silane. The silane application is seen as a sensitive technique. Among the factors that affect their effectiveness, evaporation of the solvents plays an important role since incomplete evaporation of these solvents may compromise adhesive action.
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CONTACTS

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