

Liquid Molding of Anionic Polyamide-6 Glass Fiber Composites

Kjelt van Rijswijk
TU Delft
Ir.

ABSTRACT

Anionisch Polyamide 6 (APA6) is a thermoplastic Nylon-6, which can be processed as a thermoset resin. One-way to manufacture glass fiber reinforced APA6 is by injecting monomer in between the fibers together with a catalyst. In between the fibers polymerization will take place and Nylon-6 is formed. The fact that the viscosity of the monomer is significantly lower than the melt viscosity of the final Nylon-6 makes impregnation of the fibers much easier and does not require high pressure and temperatures as is normally required to manufacture Nylon-6 based composites.

At the Faculty of Aerospace Engineering, TU Delft, the Netherlands, manufacturing equipment for liquid molding of APA-6 based composites has been developed. The setup consists of a dosing/mixing unit with an electrically heated / water-cooled mould. A relative slow reacting system is used to impregnate a pre-placed fiber mat. Besides a description of the equipment, the following test results will be presented:

- Viscosity-time relations
- Degree of conversion-time relations
- Mechanical properties of the APA-6 matrix material
- Mechanical properties of APA-6 / GF composites