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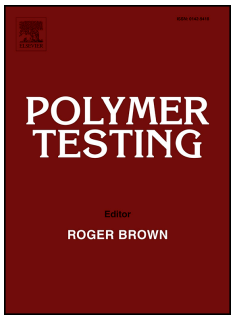

Rheological studies on gas-laden and long glass fiber reinforced polypropylene through an inline high pressure capillary rheometer in the injection molding process

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Test Equipment

Rheological studies on gas-laden and long glass fiber reinforced polypropylene through an inline high pressure capillary rheometer in the injection molding process

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ABSTRACT

A new inline high pressure capillary rheometer (IHCR) for measurements of viscosity at high shear rates and a wide range of materials such as long glass fiber reinforced and gas laden polypropylene is described. With this IHCR, simultaneous production of molded parts and viscosity measurements are enabled directly in the injection mold. Rheological measurements were carried out with polypropylene (PP), long glass fiber reinforced polypropylene (PP-LGF) with nitrogen (N_2) as blowing agent. For validating the IHCR data, an offline capillary rheometer was used for comparative measurement. In addition, a melt flow simulation with Moldflow was carried out on the IHCR system to examine the flow of neat PP melt through the hot runner system and generate further comparative data.

KEYWORDS

viscosity, inline capillary rheometer, long fiber reinforced, gas-laden polymer melt, counter pressure chamber

1. Introduction

Due to the required energy and cost efficiency in the automobile industry, for example, more and more lightweight and thin molded parts are needed to fulfill the specifications. One solution is the use of microcellular integral foams, manufactured by thermoplastic foam injection molding. By combining the advantages of long glass fiber reinforced thermoplastics and thermoplastic foams, high-strength and light parts can be built with high process productivity due to short cycle times and low costs [1]**.** To manufacture thin molded parts, high injection

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