

THE EFFECT OF DIE GEOMETRIES AND EXTRUSION RATES ON MELT STRENGTH OF HIGH MELT STRENGTH POLYPROPYLENE

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ABSTRACT

The effect of die geometry on the melt strength of conventional and high melt strength polypropylene (HMS PP) was studied. It was found that the melt strength of highly elastic PP is sensitive to changes in die geometry and that die diameter has greater effect on melt strength than on the length of the die. The effect of die entrance angle on melt strength was also studied. No significant difference in melt strength was observed when die with different entrance angles was used. This may be because dies with high L/D ratio used in this study helped to relax the polymer and dissipate stresses caused by different entrance angles. Higher extrusion rates enhance the melt strength of PP because higher molecular orientations are developed in the entrance region of the die.

Keywords: Melt strength; High melt strength Polypropylene; Die geometry

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