THERMAL EFFECTS DURING THE FLOW OF A LOW-DENSITY POLYETHYLENE MELT ALONG CIRCULAR CROSS-SECTION DUCT

An experimental apparatus, coupled with the use of a novel temperature sensor, has been utilised to accurately measure temperature profiles in flowing polyethylene melts on an injection moulding machine. The melt temperature profiles were investigated at the inlet and outlet regions of a tapered die. It was found that melt temperature profiles at both regions were different and changed with screw position due to thermal effects such as shear heating, conduction effects and compressive effects. The temperature profiles were observed to be related to melt velocity profiles, which were also simultaneously measured using a novel technique called the cooled-Stainless Tube (CST)