The fundamental causes of die swell have been investigated using two novel techniques, one involving the use of a coextrusion process and the other using the coloured layers of a polymer melt. The coextrusion system consisted of an extrusion rheometer coupled with a high shear viscometer, dies and experimental assembly being designed and manufactured as appropriate. The experimental results suggested that the die swell was mainly associated with the development of velocity profiles along the die and in the extrudate. The swelling ratio was observed to high around the centre and low towards the die wall.