

FLOW BEHAVIOR OF A SHORT FIBER RUBBER COMPOSITE IN AN AXISYMMETRIC EXTRUSION DIE USING FINITE ELEMENT METHOD

M. Bagheri-Jaghargh, M.H.R. Ghoreishy, A. Mojarrad, G. Naderi, S. Soltani

Iran Polymer and Petrochemical Institute, Tehran, Iran

m.h.r.ghoreishy@ippi.ac.ir

Isothermal steady state flow of a short fiber filled rubber compound was studied in an axisymmetric die. A creeping flow was assumed to exist and the rheological behavior was considered as non-Newtonian. The stress tensor was thought to consist of three components, first the pressure, second molecular stress of polymer matrix and third the stress induced by fibers. Polymer stress component was calculated using three different constitutive models namely, Power-law, Carreau and CEF. The fiber stress component was calculated by making use of Tucker's model. A finite element code was developed to simulate this flow and its results were verified by comparison to the experimental results obtained from extrusion.