FLUID ASSISTED POLYMER PROCESSING IN EXTRUSION AND INJECTION MOULDING: A COMPARATIVE OVERVIEW

L. Mulvaney-Johnson, M. Woodhead, M. Rose, A. Dawson, T. D. Gough, P. D. Coates, IRC in Polymer Science and Technology, School of Engineering Design and Technology, EDT 8, University of Bradford, BD7 1DP, UK.

G.F. Smith, V. Goodship, Rui Magalhaes, Rob Hansell, Warwick Manufacturing Group, Advanced Technology Centre, University of Warwick, CV4 7AL

ABSTRACT:
A programme of research is described to compare gas, cryogenically cooled gas, water and super-critical carbon dioxide assisted polymer processing. Results indicate apparent reductions in melt viscosity are possible by adding super critical carbon dioxide in the cases where it is used in extrusion and injection moulding. The issues associated with implementing water assisted injection moulding, including tool design, are highlighted. Reductions in residual wall thickness are possible in the gas assisted injection moulding process when cryogenically cooled gas is used over the conventional implementation.