



EFFECT OF PHYSICAL VAPOUR DEPOSITION COATING ON THE FLOW PROPERTIES OF THE THERMOPLASTICS AND WOOD PLASTIC COMPOSITES

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In the past few years physical vapour deposition (PVD) coating is gaining more importance in the field of polymer processing. The reduction of adhesion and contamination effects plays more and more an important role besides the wear protection of injection moulds and extrusion tools. These coatings not only improve the tool life but also the productivity. Rheological properties are one of the main parameters to increase the productivity by reducing the flow resistance in the mould cavities and respectively reduce the melt pressure during the processing. The aim of this work was to study the effect of five different hard PVD-coatings (ZrOx, ZrN, ZrCxNy, CrOx and diamond like carbon; a-C/a-C:H) on the flow properties of thermoplastic materials and wood plastics composites (WPC). The viscosity measurement were carried out on a high pressure capillary rheometer according to ISO 11443, using rectangular slit die with two different gap heights. The coating materials were deposited on the flow channel of the slit die. The materials used for the investigation were polypropylene, plasticized PVC and polypropylene based WPC with 70 wt % wood fibre. Results showed that the surface condition of the die can have a varying effect on the flow properties of the thermoplastic and WPC melts. However, little information about these effects is available in the open literature. This paper also discusses various aspects of the die surface conditions and how these can change the results of simulation in polymer processing.