FLOW BALANCING IN COMPLEX GEOMETRY PROFILES EXTRUSION DIES

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One of the most complex tasks involved in the design of profile extrusion dies, is to obtain a balanced flow, which can be simplified through the employment of numerical modelling tools [1]. This work is part of a broader project that has been developed during the last years [1,2], and comprises the development of adequate numerical modelling codes to aid the design of extrusion dies. The initial version of the numerical modelling code is able to search automatically the adequate geometry of the die, comprising routines for geometry and mesh generation and a 3D numerical flow modelling routine coupled with an optimization routine that automatically searches the space of possible solutions. Those numerical routines are limited to non-orthogonal structured meshes and, therefore, cannot be easily used with complex geometry profiles. Currently a new version of the numerical code is under development, which is intended to generalize the previously mentioned design routines, using unstructured meshes, which will allow to aid the design of complex geometry cross section profiles. In this work, the ability of the developed code to address complex geometry problems will be illustrated.

References:

[1] J. M. Nóbrega, O. S. Carneiro, F. T. Pinho, and P. J. Oliveira, "Flow Balancing in Exdtrusion Dies for Thermoplastic Profiles – Part III: Experimental Assessment", Intern. Polymer Processing, pp. 1-11 (2004).

[2] J. M. Nóbrega, O. S. Carneiro, F. T. Pinho, and P. J. Oliveira, "Flow Balancing in Extrusion Dies for Thermoplastic Profiles – Part I: Automatic Design", Intern. Polymer Processing, pp. 1-9 (2003).