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DESIGN OF CASTING AND GATING SYSTEMS – PRIMARY PREDICTION OF QUALITY OF DIE CASTING COMPONENTS

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TECHNICAL UNIVERSITY OF KOŠICE

FACULTY OF MANUFACTURING TECHNOLOGIES WITH A SEAT IN PREŠOV

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Abstract

The monograph points out a current state of knowledge in the sphere of production technology of castings by die casting and in chronological order it describes die casting technology of metals as well as the die casting machines utilized within the frame of the technology. The cornerstone of the monograph is devoted to description of die casting moulds. The authors focused on structure of die casting mouldswith the stress laid on the projection of castings and gating systems. Fundamentals of hydrodynamics of molten metal flow in the mould cavity along with basic and structural parts of the moulds as well as production process and launching the moulds into production are analysed in detail. Emphasize is also put on clarification of regularities and aspects of suitability and of manufacturability of die casting component parts and of projection of gating systems. Based on the results of the selected experiments realized by the team of authors, the analysis of influence of structural modifications of the respective parts of the gating system on quality of castings was carried out with regards to elimination of gas entrapment in the molten metal volume which, as the monograph presents, directly affects the quality of casting properties. The results of the experiments realized under operating conditions as well as of those performed by means of simulation software support and move towards recommendations for industrial practice from the point of view of achieving the maximum level of effectiveness and quality of production of aluminium castings through die casting technology. The monograph is intended mainly for students, postgraduates and pedagogues at technical universities as well as to for broad scientific and expert public and technologists and foundry shop workers.

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