

**INFLUENCE OF STRUCTURE  
ADJUSTMENT OF GATING SYSTEM  
OF CASTING MOULD UPON THE  
QUALITY OF DIE CAST**

by

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## **Abstract**

The monograph is devoted to study of influence of structure adjustment of gating system of casting mould upon the quality of diecast parts. The monograph offers characterization of die casting technology, methodology of designing of mould and of its individual parts. At the same time mutual relation between the errors occurring in diecast parts and structural as well as technological mistakes which induced these errors. Performed were the experiments with series of diecast parts made of AlSi alloy focused on analysis of influence of the diecast part moulding, of the sprue width and of the ingate height upon the qualitative properties of diecast parts. Those were represented by the selected mechanical properties – i.e. by permanent deformation and by surface hardness – by properties representing diecast part homogeneity – by porosity and percentage proportion of contractions. The measurements detected mutual relations among selected structure adjustments of the gating system and qualitative properties of diecast part and among those properties as such.

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.

**Key words:** *die casting, mould, adjustment of gating system, quality of cast*

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## **INTRODUCTION**

Die casting technology is relatively modern line of foundry industry and metallurgy. It dates back to the second half of the 19th century. Initially, die casting with hot chamber machines was used. Massive utilization of cold chamber machines occurred in the 1920s. In the course of one hundred years of practise the technology progressed incredibly among foundry technologies. Diecast parts are applied almost in all sectors of the industry. The most widespread materials used in die casting technology are aluminium alloys owing to their low specific weight, good machinability, and castability.

Although the technology is rather modern, the elaboration of its theoretical basis reaches a good level. However, majority of authors focus on technology and technological parameters of die casting and on their influence upon the quality of diecast parts. Unjustly, yet quite often both the structure of the die casting machine and design of its individual components are neglected so is the impact of the structure on the diecast quality.

The submitted monograph deals with the structure of a gating system of a die casting mould and with its influence upon the quality of diecast part. The introductory chapters describe die casting technology. Analysed is a principle of technology and description of the individual groups of die casting machines and their function. The following chapter is devoted to the mould, to its structure, to methodology of design and of draft of the gating system as well as to influence of the individual elements of the gating system upon the quality of diecast parts. The separate chapter describes the most frequently occurring errors of diecast parts, reasons of their occurrence and methods of prevention. The conclusion of theoretical chapter contains the most commonly applied simulation programs facilitating design of structure of moulds and gating systems.

The experimental chapter focuses on a solution of the selected issue, describes methodology of the individual tests, summarizes the conclusions, and determines possibilities of application of further knowledge gained through preparation of the thesis.