Quality analysis of castings obtained by easily melted models

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Abstract

Casting with easily melted models is a new technology for making complex castings. It provides a number of advantages over other casting methods: increased metal utilization, reduction or elimination of the use of cores for the forming of inner surfaces, reduction of cleaning and machining of castings. The quality of the casting depends on the quality of the model, so that all errors that occur during the modeling process are reproduced on the casting. The paper presents the results of experimental research in which wax models were used. After molding the wax models and melting the wax in the dryer, the mold cavity was filled with liquid metal. The first series of castings was made from the alloy composition: Cu= 90.2%, Sn= 1.5%, Zn= 3.0%, Pb= 3.3% and Fe= 2.0%, while the second series was made from alloys known as red casting, with composition: Cu= 85%, Sn= 5%, Zn= 5% and Pb= 5%. Based on the obtained results, incompleteness was noticed on the candlestick from the second series of castings. The incompleteness was caused by insufficient drying of the wax mass, as a result of which it did not fully melt. The remaining wax reacted with the metal, which caused a defect. The quality of other castings is satisfactory, which is related to the externalernal appearance. Defects in the form of porosity are present, but minimal surface machinig allows to obtain castings with relatively smooth surfaces.

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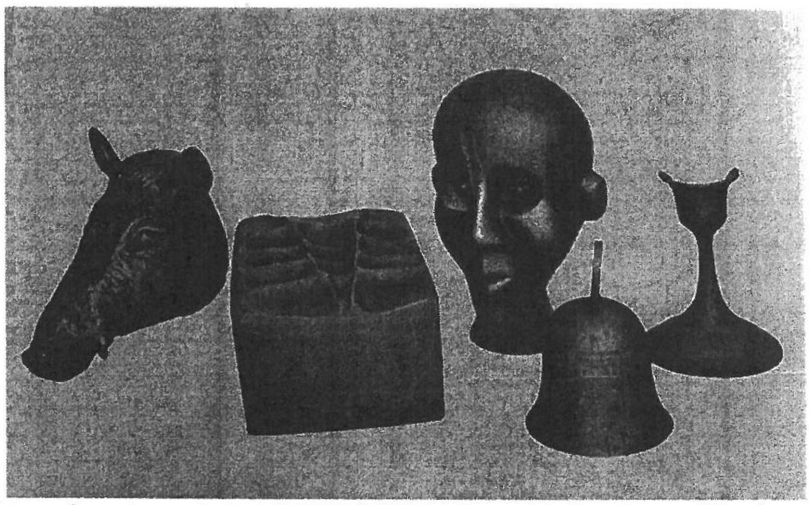
Graphical abstract:

The first series of castings obtained from copper alloy with tin, zinc, lead and iron, with the following composition: Cu= 90,2%, Sn= 1,5%, Zn= 3,0%, Pb= 3,3%, Fe= 2,0%



The second series of castings obtained from copper alloy with tin, zinc and lead with the following composition: Cu= 85,0%, Sn= 5,0%, Zn= 5,0%, Pb= 5,0%