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ABSTRACT

**The influence of batch weights on the microstructure
and selected properties of spheroidal cast iron
at a given superheat temperature.**

The paper presents issues related to the smelting of spheroidal cast iron at high temperature overheating above 1605°C and variable mixture charge. The main attention was paid to the possibility of shaping mechanical properties through the use of batch leads consisting of the appropriate proportions of: pig iron, steel scrap and circulation scrap.

The paper includes a review of literature which discusses the impact on selected mechanical properties of such factors as melting technology, chemical compositions, secondary metallurgy, casting cooling rate.

The research part describes the course of castings made in accordance with the assumed plan of the foundry experiment using different mixture charge, in conditions of overheating liquid iron above 1605°C. The results of metallographic examinations carried out on light microscopy and scanning electron microscopy, results of stereological tests, mechanical properties results and X-ray chase analysis were described. Computer simulation of the casting cooling and solidification process was also carried out. The results of this simulation were described, the main purpose of which was to determine the minimum time from flooding to breaking (discussed casts), after which there are no structural changes that may affect mechanical properties. An economic analysis of the rendered casts was also carried out.

Based on the conducted tests, calculations and analyzes of the obtained results, it is possible to obtain graphite separation of high-aspect graphite in the cast iron in overheated conditions above 1605°C. It was found that along with the increase in the weight of the steel scrap, the strength properties increase, while the plastic properties decrease. Due to the difference in the costs of the batch lead used and their impact on mechanical properties, the described test results may be of application nature.

The entire work is completed by a list of the referenced literature covering 95 items.