ABSTRACT

The influence of slag compositions on the structure and properties of steel ingots produced by electroslag remelting

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Graduate work: 99 p., 21 fig., 20 tables, 22 references

The object of research is steel ingots obtained by electroslag remelting.

The subject of research is the influence of slag composition on the microstructure and mechanical properties of steel ingots obtained by electroslag remelting.

The purpose of the work is to study the influence of different slag compositions on the formation of the structure, the level of purification, and the mechanical properties of steel ingots produced by electroslag remelting.

Research methods: metallographic analysis, microstructural studies, mechanical tests, statistical processing of results.

Research results: the optimal compositions of slag compositions have been established, which ensure a high level of steel purification, improvement of the structure of ingots, reduction of non-metallic inclusions, and improvement of mechanical properties.

Degree of implementation: laboratory tests with further recommendations for implementation in production.

Area of application: electroslag remelting in the production of critical structures in mechanical engineering, aviation, energy, and defense industries.

Predictive assumptions regarding the development of the research object – further optimization of slag compositions for specific steel grades and remelting conditions in order to improve product quality, reduce energy costs, and expand the range of products manufactured by the ESLP method.

Keywords: ELECTROSLAG REMELTING, SLAG COMPOSITION, STEEL STRUCTURE, MECHANICAL PROPERTIES, NON-METALLIC INCLUSIONS.