

Investigation of the interaction of a liquid metal jet with a layer of slag during the electroslag process with liquid metal

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This master's thesis is made on 78 pages of printed text. Contains 9 tables, 20 figures. 48 sources were used for the implementation.

Relevance: Today, electroslag remelting is used worldwide to produce ingots of alloy steels (including high strength and heat resistance) and various alloys (including high temperature) for the manufacture of products that work in difficult conditions in the energy sector, petrochemicals, mechanical engineering, metallurgy, etc. Analysis of the current state and trends in the production of particularly high-quality metal shows that ESR is one of the important methods today. In the future, the requirements for responsible metal products will not decrease. Accordingly, the improvement of electroslag remelting technology is an important task. The technology of ESR process with liquid metal (ESR LM), the concept of which was developed under the guidance of Academician B.I. Medovara, opens the possibility of producing high quality ingots by ESR without the use of consumable electrodes.

Purpose: Investigation of the interaction of a liquid metal jet with a layer of slag during the ESR process with liquid metal

Object of research: The jet of liquid metal in the slag layer during the electroslag process with liquid metal

Subject of research: Analysis of the actual patterns of the influence of the diameter and velocity of the jet at ESR LM on the depth of penetration of liquid metal into the slag.

Result: With increasing distance between the nozzle and the slag surface, the velocity of the jet at the time of contact with the slag surface increases, as does

the depth of its penetration. The dependences describing this phenomenon are received.

Key words: ESR LM, penetration depth, slag, liquid metal jet, mathematical model.