

## Summary

The report of the pre-graduation practice consist the results of investigation steels for rails and application ESR process for their production.

Pre-graduation practice report includes 49 pages of printed text. The report includes introduction, basic information and conclusions.

The introduction provides general information about the railway track, their shape and design.

In the main part on the subject shows the chemical composition of steel rail, shown methods of heat treatment of steels, containing information about the production of converter steel rail, described defects that can occur in the rail steel.

Given the experience of application ESR for the rails manufacturing, and experiments for the using electroslag technology for their production.

As a result, pre-graduation practice an analysis of literary sources, production methods of rails and review process for implementing ESR for their production.

The work achieved the following results:

Experiments on the application electro slag process as a mixture of metal covering mirror on the continuous casting machine showed the fundamental possibility of electroslag surface heating, which will reduce the casting speed and improve the internal quality of the ingots.

Shown that the traditional ESR furnaces with consumable electrodes may increase ingot drawing speed more than doubled (compared to the typical ESR) without changes in the structure of steel. The resulting ingots are dense homogeneous structure without any shrinkage and separating defects, which is a prerequisite for the production of these premium quality rails.

Experimental verification and preliminary study showed promising hybrid creation process ESR + CC that can produce high quality billet with satisfactory productivity.

Further research will be aimed at the development and optimization of manufacturing technology of using ESR methods for rail manufacturing, choice of

equipment and materials for the charge process, calculations of economic efficiency and safety technology.

**Keywords:**

ELECTRO-SLAG REMELTING, RAILROAD RAILS, CONTINUOUS CASTING, CRYSTALLIZER