IMPROVING THE DESIGN OF ELECTRIC ARC FURNACE MECHANISMS

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An electric arc furnace is a machine that is necessary for the production of steel. The reasons for the development of steel production in electric arc furnaces: the great need for high-quality steel and the need to obtain this steel from ore.

Electric arc furnace designs are constantly changing for three reasons: changes in steel production technology, improved technological progress, and changes in electric arc furnace sizes.

The design of the electric arc furnace consists of: a steel body; Inside the steel body there is thermal insulation made of two types of refractory bricks: the main one – magnesite and the auxiliary one – dinas. The bottom of the housing is limited by a fireproof floor, and the top of the housing is limited by a vault with holes for electrodes. In the walls of the housing there are: a window for releasing slag and a window with a chute for releasing steel. There are mechanisms around the body: a

mechanism for moving the furnace, a mechanism for moving the electrodes, a mechanism for lifting and turning the arch and a tilt mechanism.

The most important mechanism of an electric arc furnace is the tilting mechanism. It is needed for draining metal and slag. The tilting mechanism must tilt the electric arc furnace smoothly and accurately at different speeds and must support the weight of the furnace and metal. To drain metal, the furnace tilts from 40 to 45 degrees forward, and to download slag, the furnace tilts from 10 to 15 degrees to the other side (Musskiy, 2023).

References:

1. Karbowniczek, M. (2021). Electric arc furnace steelmaking. CRC Press.
2. Musskiy, S. (2023). Electric arc furnace. History of invention and production. Retrieved from https://uk.diagram.com.ua/info/engineering-and-technology/engineering-and-technology002.shtml.