



NATIONAL METALLURGICAL ACADEMY OF UKRAINE

RESOURCE AND ENERGY EFFICIENT TECHNOLOGY OF CAST IRON DESULPHURIZATION BY MAGNESIUM REDUCED FROM EXOTHERMIC BURDEN IN DEEP MELT IN LADLE FURNACE

Purposes and implication

The technology of refining liquid cast iron from sulphur by means of magnesium that is reduced from the oxide in the volume of liquid cast iron due to the heat of parallel chemical transformations allows to introduce the technology of cast iron desulphurization in ladle furnace in foundries and metallurgical plants without significant changes in manufacturing process and installation of add-on equipment

Key characteristics of the developed technology

The main advantages of cast iron desulphurization by magnesium that is reduced from oxide in the volume of melt due to the heat of parallel chemical transformations in ladle furnace include low resource and power consumption as well as the possibility of introducing it in industry without installation of add-on equipment.

Intellectual property rights protection

Two patents for the utility model registered in Ukraine.

Specifications

Maximum degree of cast iron desulphurization is 70 % (in laboratory) with initial sulphur content 0,032 % and briquetted exothermic mixture consumption 15 – 20 kg per ton of cast iron; high chromium cast iron (in industry) 40% with initial sulphur content 0,14 % and exothermic powder mixture consumption 10 kg per ton of cast iron.

Market demand

The developed technology can be introduced in national foundry works and metallurgical plants where there is a need for iron desulphurization in ladle furnace and does not require significant capital investment.

Availability of the technology

There has been developed the design procedure to analyze energy and economic feasibility of the mixture content for reducing magnesium from its oxide with equal volume of the melt due to the heat of parallel chemical transformations. There has been employed the technology of refining liquid cast iron by means of magnesium that is reduced from the oxide due to the heat of parallel chemical transformations both in laboratory and industry.



The process of cast iron desulphurization by means of magnesium that is reduced from the oxide in the volume of melt due to the heat of parallel chemical transformations in ladle furnace

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