

PREPARATION OF COAL CHARGE FOR COKE BATTERY COMPLEX No. 5, 6 AT COKE PRODUCTION OF PJSC «ARCELORMITTAL KRYVYI RIH»

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The article highlights the methodological foundations and the results of research on the development of criteria and practical recommendations aimed at optimizing the composition of coal charges of coke oven batteries No. 5, 6 of the coke-chemical production of PJSC "ArcelorMittal Kryvyi Rih" to obtain coke of the required quality from the rammed charge. The defining indicator of the production of coke using the technology of compaction of coal charges is the strength of the compacted cake. The most successful way to determine this indicator is to assess the strength by an indirect method according to the value of the shear strength (σ_{ss}) of rammed batch samples in laboratory conditions. This method allows to identify changes in the strength of the coal cake and take the necessary measures to prevent or minimize the number of collapses during loading. The article gives images of installations for laboratory compaction of coal charge and determination of the shear strength of the resulting cake; the methodology for determining this indicator is given.

As a result of the above studies, it has been established that the density of the tamped cake from crushed individual coals included in the raw material base of the by-product coke production of PJSC "ArcelorMittal Kryvyi Rih" is closely related to the content in coal raw materials of classes <3 and <0.5 mm. An increase in the content of classes <3 and <0.5 mm leads to an increase in the index σ_{ss} . It is also shown that the actual values of σ_{ss} for binary coal mixtures are higher than the calculated ones.

It has been established that with an increase in the level of grinding of coal charges from 90,1 to 92,2 %, an increase in the value of the index σ_{ss} is observed from 12.5 to 15.0 kPa, that is, by 20 %. With an increase in the moisture content of the charge from 10,0 to 11,5 %, the strength of the compacted cake increases. An increase in the moisture content above 12 % is undesirable due to a decrease in the strength of the rammed coal cake, as well as an increase in heat consumption for coking due to the consumption of moisture evaporation.

Keywords: coal, preparation, shear strength of the rammed cake, moisture content, particle size distribution.

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