

References

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STUDY OF TECHNOLOGY TO MINING SURFACE THE ROCK MASSIF OF MINING COMBINES

The relevance of the presented work consists in solving a research task, namely, research and improvement of the technology of surface mining of the rock massif using the mining combine harvesters. To do this, take into account the data of the analyzed experience, scientific papers and design materials of the work of mining combines in domestic and foreign pits.

A deep analysis of the conditions and factors contributing to the effective open-pits development of iron ore deposits is made and forms the following conclusion that Krivbass's iron ore mines require a switch to a non-blasting technology for preparing the rock mass in excavation and loading operations. The non-blasting technology of surface mining of the rock massif makes it possible to achieve economic, energy-saving, technological and environmental effects, in contrast to the preparation of rocks by a mass explosion in excavation loading operations.

As a result of the study of the non-blasting development of the rock massif, an improved technological scheme was proposed for conducting surface mining of the rock massif by open-pit mining combine harvesters, thanks to which the mining combines can be effectively integrated into the existing technology of open-pits iron

ore deposits. To do this, all possible options for technological schemes of conducting surface mining of rocks by mining combines are considered for maximum reliability of the final results of the study.

When comparing the technological solutions to the problem of introducing half-rocky rocks and rocky rocks development, it was found that the use of Wirtgen surface miners, which have proven themselves in the field of open-pit mining, is advisable.

Non-blasting is technology of surface mining by mining combines requires the establishment of the relationship between the technological parameters of mining combines and the parameters of the elements of the system of development of mineral deposits in existing pits.

It would be economically feasible to determine the effectiveness of surface mining of the rock massif by mountain harvesters; it will take their weighted average performance per 1 hour for the accuracy of calculations. Considering the fact that it is significantly lower than the calculated and also average values achieved during the operation of surface miners, but under the same conditions of their use. It is clear that the latter is due to one before the lack of sufficient experience of their use in domestic mining enterprises. Depending on the number of mining harvesters in the work park, the pit's productivity is ensured with their well-coordinated and smooth operation.

Regarding the technical and economic comparison of the effectiveness of rock softening by surface mining by mining combines and drilling and blasting, it is necessary to take into account the rationality of using technological schemes for the operation of mining equipment.

Under the conditions of the open-pits, three variants of technological schemes for mining rocks are considered, compared with others, they are distinguished by the best technical and economic indicators and the rationality of using mining equipment.

The first version of the softening of the rock massif is carried out when performing drilling and blasting operations, followed by loading rocks into the vehicle.

In the second variant, the rock mass is softened by surface mining when using mining combines instead of drilling and blasting.

The third option is characterized by the use of surface mining of the rock massif, extraction and loading of rocks by a mining combine in a vehicle and the use of other auxiliary equipment to ensure the smooth operation of the mining combine.

Comparing the above options based on the results of various research works, it can be concluded that the use of the technology of surface mining of the rock massif by surface miners increases the profitability of rocks mining by $2 \div 3.5$ times compared with the technology of drilling and blasting operations. Moreover, increasing the efficiency of the development of rocks depends on the thickness of the layer of milling rock massif and strength of rocks.

So, as a more effective technology for the preparation of half-rocky rocks and rocky rocks, the excavation should include surface mining of the rock massif by mining combines compared to the preparation of rocks by a mass explosion. So, as surface mining allows you to effectively switch to non-blasting technology of open-pit development.

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FEATURES OF THE NON-EXPLOSIVE EXTRACTION OF A DIMENSION STONE DURING OPENCAST MINING

In dimension stone extraction technology the basic criteria of the process efficiency is its productive capacity and survival capacity of the extracted blocks. In some scientists' investigations [1,2] splitting is viewed exclusively as the task of critical stress calculation at which the splitting occurs. Here the borehole model containing holes is considered and to the walls of which splitting force is applied to. Further, the tension intensity between adjacent blast-holes is calculated. The splitting criterion is the stress field between the boreholes, the minimum value of which should be equal to the ultimate solid's tensile strength.