

Conclusions: So, the analysis of scientific works in the direction of development of rocks by combine method shows that the effectiveness of softening of rocks by milling combines depends on the strength and structural characteristics, taking into account the physical and mechanical properties of rocks, as well as the features of the interaction and formation of relationships between the rock and the working body of the combine layer milling.

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STUDY OF THE DEVELOPMENT OF ROCKS BY SURFACE MINERS IN CONDITIONS OF MINING STEEPLY DIPPING IRON ORE DEPOSITS

*Graduate student O.O. Vusyk, PhD, Assoc. Prof. A.M. Pyzhyk
Kryvyi Rih National University, Kryvyi Rih, Ukraine*

Market conditions for the growth and functioning of the mining industry now require serious rethinking in the direction of rational use of all resources of mining enterprises for the purpose of integrated development of iron ore deposits. Also quite important for the development of capital-intensive mining industry is the introduction of large-scale investment programs aimed at obtaining technological and technical re-equipment of iron ore enterprises, as well as the rational choice and use of modern mining equipment.

The existing domestic iron ore quarries are characterized by parks of basic technological equipment that require updating, as they are outdated and have significant wear.

Based on perennial experience of mining and the results of scientific research, you can now maintain non-blasting the development of half-rocky rocks and rocky rocks surface miners.

In the vast majority of the development of half-rocky rocks and rocky rocks in the development of steep iron ore deposits occurs with the implementation of a complex of drilling and blasting operations.

At present, preference is given to the non-blasting method of preparation of the rock massif for excavation, which has significant advantages over the preparation of rocks for excavation by blasting.

The analysis of works in this direction testifies that on iron ore pits the traditional set of technological schemes of conducting mining operations with use of the outdated mining equipment is applied. These flow sheets were developed for use in conditions of low depth of mining career with the sustainable development of the rocks massif.

At present, there are a significant number of technological schemes of mining operations that require modernization and adaptation to complex mining and geological conditions of open mining of mineral deposits [1, 2].

Important is the fact that there is a tendency to a gradual transition to non-blasting methods of development of rock massif. This is explained by the achievement of the best technical and economic indicators of mining enterprises due to the lack of drilling and blasting. As a result of the application of the combine method of development of half-rocky rocks and rocky rocks, there is a significant reduction in the cost of working off the rocks massif, as well as improving the indicators of intensification of mining operations by increasing the actual technical and economic level of technological processes of mining.

Working out of half-rocky rocks and rocky rocks by combine layer milling in most cases is characterized by the relationship between the technological parameters of the combine and the operating parameters of the elements of the system of development of mineral deposits.

A significant number of factors, which include the assessment of the rational application of combines of layer-by-layer milling on iron ore open pits in the qualitative performance of technological processes of mining production, affect:

- provision of sufficient number of mining and transport equipment;
- organization and efficiency of technological processes interaction;
- formation of the parameters of the elements of the development system;
- economical and safe use of mining equipment;
- ensuring the necessary amount of ready-to-excavate mineral reserves, etc.

They together create conditions on which depends the efficiency and rationality of the use of mining equipment, which in turn affects the achievement of high technical and economic performance of the mining enterprise.

These high-performance machines of layer-by-layer milling of rocks during operation at open pits will reduce the width of the working area and increase the height of the ledge, in turn, will increase the angles of slopes of the sides of pits [3].

There are cases when milling combines are used as the main excavation-loading equipment or only for the preparation of rocks for excavation. In the second case, the best technical and economic indicators of their work are achieved than in the first.

In most cases, for testing of the ledge, combine layer-by-layer milling is used as the primary excavation and loading equipment running over the ledge approaches.

In the process of conducting open development of iron ore deposits, questions arise to ensure the stability and maximum completeness of mining of pits.

With the use of mountain combines of layer-by-layer milling, it is possible to adjust the angles of the slope of the sides of the pit by increasing the height of the overburden ledges and reducing the width of the working platforms.

The use of milling combines in iron ore open pits is complicated due to the need to work out the rock massif is represented by a ledge, which requires additional techniques to ensure the completeness of the development of the ledge of its entire height and the entire width of the working site. This is achieved by improving the technology of layer-by-layer milling in the development of steep-falling iron ore deposits.

Efficiency of application of combines of layer milling can be increased at the expense of coherence of their work with the mining equipment in a complex of technological processes of the mining enterprise.

Conclusions: Recently, in the conduct of open development of mineral deposits used combine method of mining rocks massif. An important issue is the assessment of the rational application of surface miners in deep iron ore open pits. Combines layer-by-layer milling perform dredging of half-rocky rocks and rocky rocks without the need for drilling and blasting. Compared with mechanical shovels, surface miners have the following advantages: lower metal consumption; mobility of movement; less specific capital costs; high speed of movement; high productivity, etc. Also, surface miners in comparison with mechanical shovels, in turn, are characterized by high operating costs and a shorter period of effective operation.

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ОСОБЕННОСТИ ТРАНСФОРМАЦИИ НЕМЕТАЛЛИЧЕСКИХ ВКЛЮЧЕНИЙ И ГРАНИЦ ВКЛЮЧЕНИЕ-МАТРИЦА ПРИ ЛАЗЕРНОМ ВОЗДЕЙСТВИИ, ВЫЯВЛЕННЫЕ В КОЛЕСНОЙ СТАЛИ, РАСКИСЛЕННОЙ КОМПЛЕКСНЫМ РАСКИСЛИТЕЛЕМ

*Докт. техн. наук, проф. С.И. Губенко,
канд. техн. наук, доц. В.Н. Беспалько, мл. науч. сотр. И.А. Никульченко
Национальная металлургическая академия Украины, г. Днепр*

Введение. Методы воздействия на неметаллические включения представляют собой одно из наиболее перспективных направлений обработки сталей. Известно, что неметаллические включения являются причиной