

Model of optimization of mining complex for the planning of flow of quarry production of limestone in multiple products and with elements for the analysis of the capacity

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Abstract

Activities in mining complexes contain multiple decisions that affect the operations of the system for the extraction, transformation, transport and storage of various subsoil components. The purpose of this research is the planning of continuous flow production systems for mixed products, in non-metallic mining extraction processes, considering bottlenecks and capacity planning. This paper presents a model for production, based on mathematical optimization, that facilitates the planning and management of operations in the area of extraction, crushing and transformation of a quarry of aggregates for construction, considering the resources and the constraints that allow to define effective strategies in the increase of the productivity of the lines of low production environment by scenarios. This research develops an analysis of bottlenecks and contrasts the nature of the production system by means of a mathematical model of optimization, which considers the capacities and balances in the flows of the Limestone production line. The mathematical model that maximizes profits can be adapted to systems of continuous flow production in mining complexes where their products are part of a reverse logistics process, analysis of alternatives of extraction, transformation and transport.

Keywords

Bottleneck, Flow shop, Mining complex, Production scheduling, Sensitivity analysis