Analysis of the reasons for low rock drill efficiency

Do rock properties affect drill efficiency?
ratory, with the goal of determining the effect of rock properties on the drill efficiency of the drilling machine. Kahraman et al., 2003) , Buyuksagis, B., and Goktan (2007) and Li et al. (2000) works predicted the tensile strength and

Why do drilling operators need a new index based on rock properties?
However,drilling operators always change drilling parameters to achieve higher drilling efficiency. Hence,a new index that is only related to rock properties and can be successfully applied under different drilling conditions should be developed to define rock properties.

Does rotary non-percussive drilling cause rock failure?
According to the analysis on the SE values at different drilling conditions in rotary non-percussive drilling,the rock failure before the bit is more related to rotary shear than the axial force. Table 2. Calculation of SE based on different drilling parameters in the field test.

Does the res method improve DRI estimation accuracy for rock drilling?
This study highlights the efec-tiveness of the RES method in enhancing DRI estimation accuracy for rock drilling,providing valuable insights for engineering applications in the field of rock and mining mechanics. The drillability of rocks significantly impacts the drilling rate and tool wear during drilling operations .

How does rock quality affect drillability?
Drilling is commonly described as the progress achieved by a drill as it penetrates through rock resistance [2, 3]. To improve drillability design, it is crucial to understand the specific efects of rock qualities on drillability. Factors afecting rock drilling can be classified into two groups: control parameters and uncon-trollable parameters.

How nical properties affect drilling operations?
nical properties play an important role in drilling operations such as fracture zone prediction and well stability. According to Kahraman et al.,the significant rock properties that influence the penetration rate of drill bits during drilling operations are specific energy (SE),unconfined compressive strength (UCS),

In this study, a field-drilling test is performed using a rotary non-percussive drilling machine equipped with a new drilling-monitoring system to investigate the effects of drilling ...

Rock-breaking specific energy model of bit is the key foundation of evaluation and optimization of downhole drilling condition, while some necessary parameters for the existing ...

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Overall equipment effectiveness (OEE) is a key performance indicator used to measure equipment productivity. The purpose of this study is to review and analyze the ...

Formation damage is a condition most commonly caused by wellbore fluids used during drilling, completion and workover operations. It impairs the permeability of reservoir ...

Based on the relations between rock breaking specific energy model and drilling parameters and rate of penetration (ROP), appropriate optimizing measures were proposed by ...

PDF | Rate of Penetration (ROP) is one of the important factors influencing the drilling efficiency. Since cost recovery is an important bottom ...

Reason is that we caused it and we cannot restore the in-situ rock conditions bined analysis (integrated approach) of wellbore stresses, mud chemistry, and excellent drilling practices is ...

This blog explores the key factors affecting the efficiency of rock drilling tools, including the shape of the drill head, rock hardness, compressed air pressure, powder discharge methods, ...

With the discovery of pre-salt hydrocarbons reservoirs, new challenges appeared. One of the main challenges is the necessity to optimize ...

PDF | On Apr 22, 2018, Zeyad Hassan published Common Drilling well problems (Reasons, indications, mitigation and prevention) | Find, read and cite all the ...

After optimization, drilling efficiency increased by 25%. Li et al. 9 conduct comprehensive investigations on compressive strength, Brazilian splitting, and orthogonal rock ...

This chapter presents a review of the literature on energy efficiency of drilling operations in mineral industries. It introduces the drilling systems, factors affecting drilling ...

The prediction of the drilling rate of penetration (ROP) is one of the key aspects of drilling optimization due to its significant role in reducing ...

Fundamental rock-drilling studies are aimed at optimizing the drilling efficiency by identifying the optimal drilling conditions and rock drillability. In this study, a field-drilling test is ...

Article Open access Published: 25 April 2025 Simulation and experimental research on drilling and rock breaking mechanisms of anchor drill rigs with analysis of drilling ...

Wellbore instability is a significant problem faced during drilling operations and causes loss of circulation,

caving, stuck pipe, and well kick or blowout. These problems take ...

In rotary percussion drilling, it is necessary, due to the effective geometry of the cutter, to ensure a clear burial of the cutter into the rock during impact and cutting off the rock shavings without ...

After optimization, drilling efficiency increased by 25%. Li et al. 9 conduct comprehensive investigations on compressive strength, Brazilian ...

Understanding rock drillability is essential for optimizing drilling techniques, reducing costs, and enhancing overall project outcomes. In this article, we will explore the key ...

When looking at specific factors like fracture density, what minerals are present, and how porous the rock is, these all play into how fast drills can penetrate through different ...

Efficiency of preparation of mine workings is inextricably connected with productivity of used drilling machines, which provide required rate of carrying out of mine workings, and this ...

The annular-groove PDC bits achieve large-scale cuttings when breaking the ridge created by the bit, and the rock breaking efficiency is greatly improved. At the same time, the ...

This paper discusses how drilling efficiency is measured, the difficulties and ambiguities associated with productivity measures, and the technologies that have improved ...

The geological condition of surrounding rock is essential for supporting design and disaster prevention of roadways in the underground coal mines. The main point of this ...

enetration Rate (PR) is a major factor that influences the efficiency and productivity of rock drilling operations. It is also influenced by many d rect and indirect parameters such as rock ...

An analysis of the holes produced by a multi-spindle head on aluminum alloys Al2024, Al6061, and Al5083 is presented in comparison to ...

The friction between the drill bit and workpiece will result in tool wear and chipping due to excess of drilling force. Sometimes, the difficulty of chip removal causes chip clogging ...

This study sheds light on the state of art of drilling problems, affiliated issues and causes along with their best possible prediction, ...

Discover how advanced rock drills increase mining efficiency by 25% with real-time data, AI optimization, and reduced energy waste. Learn the key factors driving productivity and ...

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In this paper, reliability analysis of drilling machines and drill bits was performed and the relationship between reliability and machine ...

In response to the issue of increased bottom-hole stress leading to higher rock strength and reduced rate of penetration, a novel drilling technology ...

Conducted scientific studies show that the influence of the drilling zone (DZ) and a new drilling analysis model was created that takes into account the drilling-based measurement method ...

1. Introduction The search for techniques of enhancing rock damage to increase rock-breaking efficiency is a key issue in geotechnical engineering activities, ...

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