The rock breaking principle of rotary rock drill

Analysing the influence of changing drilling parameters on the rock breaking capability of sonic drilling systems can provide theoretical guidance ...

Torsional percussive drilling tool was designed to reduce the risk of stick-slip and improve drilling efficiency, but there are few studies on the influence of torsional impact ...

Percussion drilling is a drilling method that uses impact force to break rock or soil layers. Its core component is the impactor, which delivers ...

In-depth research on impact drilling can be traced back to the 1950s. Although impact drills were already widely used in rock drilling at that time, attention to the principles of ...

Rotary drilling rigs are among the most sought-after drilling tools in the modern-day industry, thanks to their extreme efficiency and versatility, ranging from ...

Rotary drilling rigs are among the most sought-after drilling tools in the modern-day industry, thanks to their extreme efficiency and versatility, ranging from mineral exploration to digging oil ...

Considering the motion mechanism of rotary percussion drilling tools, a three-dimensional rock-breaking numerical model was established for different cutters (planar, axe ...

Abstract To expedite drilling operations in hard rock of coal mines, a new type of impact-shear drill bit was developed, and its mechanism of ...

In this study, discrete element method (DEM) is applied to simulate the rock-breaking process by pneumatic rock drill, and the drilling parameters of the surrounding rocks ...

Abstract Compound percussive drilling technology is a new method to improve the rock-breaking efficiency in deep hard formation. In order to ...

Most of the advanced thermal and high-pressure jet drills require 10 to 100 times more energy to drill rock than conventional rotary bits (Table 5.1). Low drilling ...

A rotary drill applies a constant thrust to the bit while a torsional force moves the bit parallel to the rock surface, breaking the rock ahead of it. A rotary-percussive, drill applies both a rotary force ...

The rock breaking principle of rotary rock drill

During the process of rotary drilling, the drill bit engages in a sequence of actions involving compression, cutting, and friction against the ...

Compared with traditional rotary drilling, the rotary percussive drilling technology has just been added a high-frequency impact force in the axial direction of drill bit to make the ...

Considering stick-slip vibration and the impact loads formed while drilling in strongly heterogeneous formations or soft-hard interbedded ...

Based on the principle of particle jet coupled impact rock-breaking technology in rotary drilling, the numerical model of rock-breaking is established and the laboratory ...

The downhole impact rock-breaking tools have achieved good application effects in the field, mainly including rotary impact drilling tools, ...

In order to evaluate the drilling efficiency and bit wear in ultra-deep formation, parameters of ultra-deep drilling simulator were calculated based on the similarity principle, ...

Abstract Compound percussive drilling technology is a new method to improve the rock-breaking efficiency in deep hard formation. In order to study the rock-breaking ...

Based on the rotating characteristic of rotary jet, the asymmetric inclined linear nozzle arrangement was proposed for the multinozzle drilling ...

Regarding rock breaking efficiency, the impact velocity has a relatively minor influence, while the drill rod diameter shows a positive correlation with efficiency. The drill bit ...

5 Terms and definitions related to rock drilling methods 5.1 rock drilling drilling and in any by predetermin which a borehole is produced in rock [SOURCE: ISO d direction 3.1.5, modified in ...

To achieve high-efficiency drilling in hard formations, the rotary percussive drilling tool was designed to improve rock-breaking efficiency. Currently, few studies are conducted to ...

Summary The principal drilling methods used in mines today are mechanical ones in which a drill drives cutting tools into rock by means of static or dynamic force. Percussion rock drills are the ...

This document discusses principles of surface rock drilling used for excavating rock through blasting. It describes the main drilling methods of rotary and ...

High-frequency torsional vibration percussive drilling is considered a promising approach to improve drilling

performance in deep hard formations, so studying its rock ...

This document discusses various drilling methods and equipment used in surface mining operations. It describes common drilling methods like rotary, percussion, and DTH drilling. It ...

1. ABSTRACT This report entails information on Mechanical Rock Breakage machines, their applications and merits and limitations. This report ...

High-efficiency rock-breaking is a problem that has long been studied in the oil- and gas-drilling industry. The successful use of ultrasonic ...

In this paper, we propose an ultrasonically coupled mechanical rock-breaking technology, creatively design an ultrasonically coupled ...

Abstract Aimed at the technical problems of low drilling speed and difficult rock-breaking in deep-well and hard rock-stratum, particle waterjet coupled impact rock-breaking technology in rotary ...

In this paper, the numerical simulation is used to study the rising mechanism of rotary-percussive drilling, which is under the combination of rotary cutting and axial impact.

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