

Drilling, in the field of rock excavation by drilling and blasting, even for excavation by non-blasting method, is the first and essential operation. The ...

In this paper, the dynamic process of drilling and breaking rock is analyzed using ABAQUS software. The rock-breaking mechanism of drilling is ...

Download scientific diagram | Drilling mechanisms of two types of percussive drilling system: (a) top-hammer drilling and (b) down-the-hole drilling (modified ...

Pneumatic down-the-hole hammer, serving as rock-breaking tool, possesses appeal for directional drilling due to its high rate of penetration. However, corresponding experimental ...

This paper investigates the failure modes firstly, then analyzes the failure mechanism of the large-diameter DTH bit, and finally proposes a novel ...

Abstract Rock drilling is widely used in various types of rock engineering. Rock boring is often used in tunneling, underground mining, and nuclear waste depository. This ...

The cluster down-the-hole hammer reverse-circulation drilling technology is an attractive approach for achieving a high rate of penetration (ROP) through the "small hole ...

Low rock breaking efficiency of drilling bit is one of the key factors restricting the large-scale development of oil gas in deep formations and geothermal energy resources in hot ...

Pneumatic down-the-hole (DTH) hammer is a pneumatic drilling tool using compressed air as a power source. It is suitable for drilling in pebble, gravel, and hard rock ...

Percussion drilling is an essential technology for improving the ROP in deep hard formations. Previous researchers conducted various theoretical analyses, experimental ...

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 speed-up and efficiency increase ...

Through experiments, theoretical modeling, and numerical simulations, the rock fragmentation mechanism and breaking performance during rotary-percussive drilling with a ...

This study proposes a novel structure of self-rotating pneumatic hammer (NSH) with a built-in rotational mechanism, which converts partial impact energy of the piston to rotate the ...

The commonly used rock drilling equipment is pneumatic drill (Fig. 4), down-hole drill and cone drill. (1) Pneumatic drill. It is suitable for drilling in the rock with medium or higher ...

The cluster down-the-hole hammer reverse-circulation drilling technology is an attractive approach for achieving a high rate of penetration ...

In order to address the issue of limited excavation footage in the drilling and blasting of a water diversion tunnel with a cross-section of ...

Regarding the rock-breaking mechanism for conventional drilling, the axial static load (drilling pressure) causes the drill teeth to come into close contact with the rock at the well ...

Down the hole hammers and bits are essential components of DTH drilling tools, as they deliver powerful percussion to break through rock formations. The ...

To explore the mechanism of rock breaking by an impact hammer and to reveal the interaction between the hammer's drill rod and rock during the rock breaking process, this ...

1. Rock breaking mechanism of down-the-hole drill bits To design a high-quality down-the-hole drill bit structure, it is necessary to first clarify its rock breaking mechanism.

Down the hole drilling demonstrates exceptional capabilities when encountering hard rock formations, setting it apart from conventional drilling methods. The system's unique design, ...

From drill bits to rods and shanks, we will cover what's needed for successful and efficient rock penetration. What is Top Hammer Drilling? top ...

This paper presents a novel pneumatic Down-The-Hole (DTH) hammer with self-rotation bit used for rock drilling, and the mechanical ...

In this investigation, the crater dimensions and volume, debris particle size, and micro-strain curves of granite with different ratio (k) of enlarged-hole to pilot-hole diameter ...

This paper presents a novel pneumatic Down-The-Hole (DTH) hammer with self-rotation bit used for rock drilling, and the mechanical structure and working principle are mainly ...

Rock drilling is the use of tools to break or drill rock and plays a critical role in various sectors, including



Rock breaking mechanism of down-the-hole rock drill

mining, where it's used for resource ...

Finally, combining existing literature, the mechanism of laser-assisted cutter rock breaking was revealed. The results show that the inner focused beam of DL efficiently pre ...

Rock breaking mechanism of down-the-hole drill bits. To design a high-quality down-the-hole drill bit structure, it is necessary to first clarify its rock breaking mechanism.

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 ...

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 ...

Discover the impact of Down the Hole Hammers (DTH hammers) in urban redevelopment projects. Learn how these specialized tools enable ...

With the increasing depth of mining operations and the emergence of complex geological conditions, pneumatic down-the-hole (DTH) hammers ...

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