

How does water jet assisted rock drilling affect tensile strength?

According to crack development conditions, the crack will extend to the free surface causing the rock mass fracture to occur when the stress at the point (r, θ) exceeds the rock tensile strength. In order to reflect the effect of the water jet assisted rock drilling, the bit force assisted with water jet was compared with that of without water jet.

Does increasing drilling speed weaken rock mechanical behavior?

The results indicate that decreasing drilling speed and increasing drilling diameter weaken rock mechanical behavior, including peak strength, Young's modulus, rockburst characteristics, and peak elastic strain energy.

Does real-time drilling weaken the strength of rock specimens?

Specifically, the RD rock specimen at a drilling speed of 100 r/min and a drilling diameter of 12 mm (67.0 MPa) shows the largest decrease of 40.93%. This highlights that real-time drilling significantly weakens the strength of rock specimens. As discussed in Sect. 4.1, real-time drilling speed and diameter affect the peak stress of the rock.

Does drilling speed affect crack evolution in multi-drilling rock specimens?

However, this study is limited to investigating the influence of real-time drilling speed and drilling diameter on the mechanical behavior of single-drilling rock specimens under one-dimensional high stress. It does not explore the impact of these factors on the mechanical behavior and crack evolution mechanisms in multi-drilling rock specimens.

How does water jet assisted rock drilling work?

The mechanism of water jet assisted rock drilling was shown in Figure 1; the process was divided into four tasks, impact, propulsion, rotation, and water jet assisted drilling. Impact was generated by the impact piston impacting the shank adapter to transfer energy into the rock causing it to become fragmented.

Can high-pressure sealing device solve the sealing problem of water jet assisted rock drilling?

In the present work, the mechanism of water jet assisted rock drilling was explored and the high-pressure sealing device was designed to solve the sealing problem of the rock drilling assisted with water jet.

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The results show that when using the optimization method of drilling source interception proposed in this paper, when the drilling jumbo is drilled to the deepest place, the selection of the source ...

Factors that affect the drilling effectiveness of hydraulic rock drills include rock drilling speed and rock

Jiujiang rock drill effect

The use of high-frequency torsional vibration for drilling in hard formations in deep and ultra-deep wells is of great innovation and practical significance.

Jiujiang, located in the northern part of Jiangxi Province, China, is a city that beautifully blends its historical significance with modern development. Known for its picturesque landscapes, ...

On July 20-21, Jiujiang, Jiangxi witnessed the stunning "Tyndall Effect" meteorological phenomenon.

The company mainly produces heavy oil drill pipe, non-magnetic bearing pressure drill pipe, drill pipe joints and casing head, oil tree, marine water and other oil and gas drilling equipment.

View the complete article here. This guide is tailored for deep foundations contractors tasked with the demanding challenge of drilling in hard ...

To address this problem, this paper proposes an optimization method for the source selection of a drilling jumbo. The optimal truth element is selected for the advanced ...

The present work-shop brings together those involved globally in the construction of tunnels in rock, underground caverns, and underground space technology using the drilling and blasting ...

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The tunnel of drift face can be roughly divided into four sections (FIGURE6.2.-1. Drilling pattern design in tunneling and drifting is based on the following factors: - Tunnel dimensions - Tunnel ...

This paper describes the technique employed in searching for concealed igneous rock (ore) bodies in metallic ore districts and the achievements gained. Drilling verification has proved ...



Jiujiang rock drill effect

The company mainly produces heavy oil drill pipe, non-magnetic bearing pressure drill pipe, drill pipe joints and casing head, oil tree, marine water and other oil ...

To analyze the effects of drilling speed and drilling diameter on the rock failure characteristics, this study employed a high-speed camera to capture the critical rockburst ...

Wuxue, the Jiujiang Maritime Bureau Wuxue Maritime Department carried out an oil spill emergency drill in the waters near the Lidingwu Wharf. In the waters of Li Dingwu Wharf, the ...

In order to guide the drill bit selection and high-efficiency drilling, the physical, mechanical, and drillability characteristics were investigated for conglomerate rock that ...

The drill-string system of the well drilling process is practically utilized in order to move torque from the rotary table to the drill bit in the borehole (Lin et al. 2020). This lengthy and skinny ...

Summary. High-voltage electric pulse rock-breaking (HVEPB) has proved to be a novel and inexpensive method of breaking rock regardless of rock composition, but the design ...

This paper evaluates the effect of rapid cooling on the rock-cutting process and incorporates this effect as a component of drilling-performance ...

From this video, you could see the effect of JZTG bullet teeth drill bits used on borehole foundation piling construction site, also the rock coring effect ...

In response to the unclear drilling resistance characteristics of rocks in the Ji'yang Depression, low drilling efficiency of PDC drill bits, and ...

Meanwhile, Donghuzhai used to be the military garrison, where caves, drilling ground, rock tables, artesian wells, rock horses and spiles for fastening horses have remained intact for ...

In this paper, different configuration modes of drilling performance assisted with water jet are explored based on the mechanism and experiment analysis of ...

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Jiujiang rock drill effect

This article makes experimental research on the drillability, abrasiveness, and drilling resistance mechanism of cropping flint and siliceous limestone core in Wujiaping Formation.

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