

Drill Bits

Magma™ geothermal drill bits

Engineered for heat and optimized for performance

FEATURES

- Juggernaut® X polished cutters
- Crush & Shear® hybrid bits
- High-strength body materials
- Durable gauge design

BENEFITS

- Increase in ROP to reduce drilling costs
- Extend run lengths to minimize trips
- Provide extreme temperature tolerance
- Achieve superior wellbore quality to reduce invisible lost time



Magma™ geothermal drill bits for geothermal environments

Overview

Geothermal drilling pushes tools to their limits, exposing equipment to high temperatures, abrasive formations, and hard volcanic and granitic rock. These conditions create severe mechanical loading, rapid bit wear, and thermal stress that reduce drilling efficiency and increase operational costs. To achieve reliable performance under these conditions, drill bits must deliver durability, maintain cutting effectiveness at high temperatures, and withstand sustained contact with abrasive, interbedded layers. Superior performance depends on efficient energy transfer, stable drilling behavior, effective cuttings evacuation, and maintaining gauge and hole quality over long intervals. Geothermal bits must deliver strength, thermal resistance, and a consistent rate of penetration (ROP) to minimize trips, extend run lengths, and ensure dependable drilling in some of the world's most challenging environments.

Halliburton addresses these challenges with Magma™ geothermal drill bits engineered for extreme conditions. The Magma™ drill bit portfolio includes:

- Magma™ PDC bits
- Magma™ hybrid bits

Engineered for performance

Magma™ PDC drill bits combine core engineering advancements for harsh geothermal conditions:

- Juggernaut® X cutters: engineered for abrasion resistance, durability, and thermal stability.
 - > Polished cutters reduce friction and heat buildup, maintain cutter sharpness, enable longer intervals, and improve ROP efficiency in high-temperature rock.
 - > Shaped cutters combine optimized geometry with advanced diamond technology to deliver superior drilling performance in the toughest geothermal environments.
- High-strength body materials: maximize bit durability in geothermal formations by resisting abrasion, erosion, and impact. Reduce bit runs and optimize energy transfer for reliable performance under heavy loads.
- Advanced design: Engineering analytics optimize cutter layout, diamond grade selection, and hydraulic efficiency. This results in improved bit cleaning and cuttings evacuation to deliver longer runs with higher ROP. Durable gauge design improves hole quality and directional stability while reducing vibration, ensuring consistent performance in demanding conditions.

Crush & Shear® hybrid drill bits combine a rolling mechanism with a fixed cutting structure. These hybrid bits provide greater steering response, extreme temperature tolerance, and torque-smoothing behavior that reduces damaging vibrations. Hybrid bits expand drilling solutions for complex geothermal intervals.

- Non-sealed carbide bearing exceeds traditional elastomer temperature limits.
- Rolling elements deliver smooth torque and precise directional responsiveness for superior control and efficiency.

Operational impact

Together, these technologies provide operators with a comprehensive, application-specific suite of geothermal drilling tools that improve reliability and reduce well construction time. This integrated approach delivers consistent performance in extreme geothermal environments, helping operators to achieve well construction goals with greater confidence and efficiency.

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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