AVENGER®

VAREL

MINING AND INDUSTRIAL

Avenger® Roller Cone Bits

When Varel engineers combine their decades of experience in sealed bearing drill bits with patented bearing technologies, innovative, wear-resistant features, and customized for-purpose cutting structures, you get the Avenger blashole bit series. This synergy of technologies improves ROP, lowers TDC, and extends bit life where conventional bearings struggle.

The Sealed Bearing Advantage

- The Avenger sealed roller bearing is designed for lower to medium pull-down applications where bearing life is limited with standard open bearing bits.
- Varel's patented conical seal gland geometrically constrains the seal to better handle pressure fluctuations and still maintain a preferred dynamic sealing interference.
- This bit series provides superior performance in applications including acidic groundwater, high altitude, or where bit plugging is observed.

Varel's Avenger Roller Bearing (AVL)

Varel's Avenger Journal Bearing (AV)

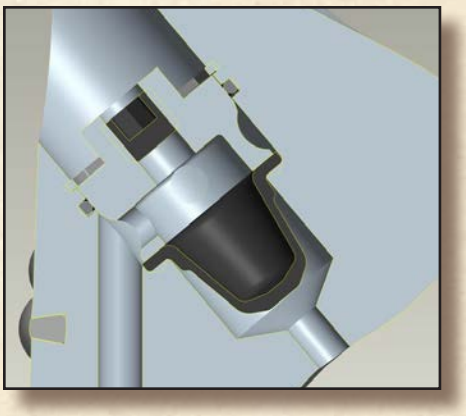
The Journal Bearing Advantage

- The Avenger journal bearing is designed for moderate to ultra-high pull-down applications where extended bearing life is required.
- In addition to Varel's patented conical seal gland, the journal design also features Varel's patented heat shield to prevent thermal degradation of the seal.
- A patented pressure attenuator mitigates pressure spikes by restricting access to the seal thereby prolonging bit life.

The Varel Advantage

Our proprietary design capabilites, efficient manufacturing, and global sales force uniquely position us to provide reliable drilling solutions faster than anyone else.

Varel's Patented EdgeGuard® is the next-generation solution for high-performance wear mitigation. Strategic placement of tungsten carbide microshields on critical areas of the bit shirttail provide a significant advantage over hardfacing and tungsten carbide inserts (TCI). The custom-fitted solid tungsten carbide microshields have higher carbide content than welded hardfacing for enhanced wear characteristics. Unlike inserts, EdgeGuard shields can be fitted to the leading and lower edges of the shirttail to protect against wear that can lead to seal and bearing failure. The microshields also conform to the shirttail contour to provide portection without compromising performance. EdgeGuard is utilized on selected bits based on application requirements.



Varel's Dome Vent Reservoir is incorporated into the bearing system and is capable of delivering bearing lubrication over high load and high RPM runs. This high volume reservoir is configured to be self-draining to avoid cuttings buildup adjacent to the reservoir. This feature improves the reliability of reservoir performance throughout the bit's life.

High Energy Tumbled (HET™) is a proprietary process for improving the attributes of tungsten carbide inserts (TCI). It overcomes the traditional trade off between wear resistance and fracture toughness of tungsten carbide components and, in fact, makes TCI components both harder and tougher.

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