

# EnduroBlade 360

## Rolling diamond element bit

### APPLICATIONS

- Drilling conditions that cause and accelerate PDC cutter wear
- Abrasive environments

### BENEFITS

- Extends bit durability
- Increases run footage and average ROP
- Improves heat dissipation to extend cutter life

### FEATURES

- 360° revolution capability enables cutting element to stay sharper longer
- Number and placement of elements can be customized to maximize durability in bit cutting structure's high-wear areas
- Can be integrated into any PDC bit cutting structure without changing cutter size
- Available in 13-mm, 16-mm, and 19-mm sizes

The EnduroBlade 360\* rolling diamond element bit is proven to sustain run length increases of up to 57%, as compared with bits using fixed cutters. Such durability is the result of integrating customized bit manufacturing by Smith Bits, a Schlumberger company, and our cutting-element technology.

Precise positioning of Enduro 360\* rolling diamond cutting elements relative to contact with the formation, coupled with the bit's drilling force, drives efficient rotation of the Enduro 360 element. Strategically positioned in the highest wear areas of a bit's cutting structure, the rolling element's entire diamond edge is used to shear the formation.

### Revolving cutting-element edge advances durability

The part of a fixed cutter's edge that engages the formation is subjected to mechanical and thermal effects that cause wear and chipping. Using a rolling cutting element increases durability by ensuring that the part of the element edge making contact with the formation is continually refreshed to stay sharper longer. In addition, the rotating

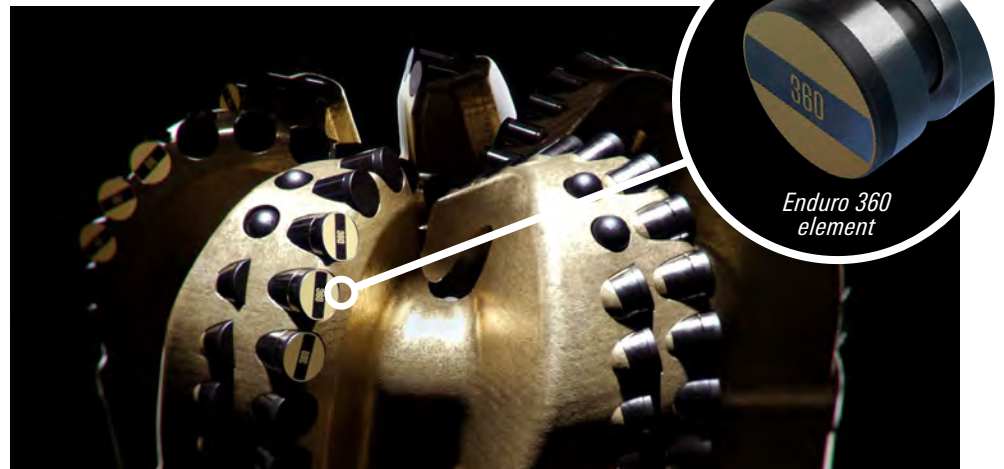
action improves thermal dissipation, preventing concentrated heat buildup.

Insights gained from the deployment of the 13-mm and 16-mm elements—combined with continuous improvement to materials and design—resulted in development of a 19-mm size to provide even more strength and durability. Field tests demonstrated additional increases in run length and penetration rate.

### Comprehensive evaluation validates rolling concept

Durability tests compared rolling elements and fixed cutters mounted on test fixtures to engage a granite test formation with an unconfined compressive strength of 30,000 psi [207 MPa]. To maintain a constant ROP, the vertical force required for premium fixed cutters had to be continually increased from 100 lbf to more than 1,200 lbf to compensate for their wear rate.

The Enduro 360 elements required substantially less force, confirming that the cutter remained sharp for the entire test interval.



Rolling diamond element cutters are positioned in the high-wear shoulder area to improve EnduroBlade 360 bit durability. As the cutting element rotates 360°, wear is evenly distributed around the perimeter of the diamond table.

### Specifications

EnduroBlade 360 Bit	Formation Type	Cutting Element Size	Classification
	Hard, abrasive	13 mm 16 mm 19 mm	Rolling cutting element

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