

Axe TR triple-ridged diamond element

Better absorbs impact loading to reduce the effects of impact damage

Where it is used

Axe TR* triple-ridged diamond elements are used with matrix- and steel-bodied bits to drill unconventional well intervals, including the vertical, curve, and lateral. Ridged diamond elements are compatible with any BHA configuration. And bits using the Axe TR element improve ROP in hard formations with unconfined compressive strength (UCS) greater than 5,000 psi [35 MPa].

How it improves wells

The Axe TR triple-ridged diamond element extends bit life for drilling longer intervals because the triple-ridged shape not only better absorbs impact loading to reduce the effects of impact damage but also reduces cutting force. This 3D cutting element lessens overall torque, reduces reactive torque fluctuation, and improves toolface control in curve applications. These advantages yield better build rates and higher overall ROPs, helping maximize production zone exposure and minimize drilling time.

How it works

Like the original Axe* ridged diamond element, the Axe TR element combines the shearing action of a conventional PDC cutter with the crushing action of a tungsten carbide insert (TCI). This combination achieves at least 22% deeper penetration to deliver higher instantaneous ROP while using less WOB and reducing the rpm from that applied to conventional PDC cutters. The Axe TR element was developed specifically to endure high-impact drilling conditions without sacrificing cutting efficiency. The triple-ridged shape increases impact strength by 15% while improving cutting efficiency by 29% in carbonate formations and by 4% in sandstone formations.

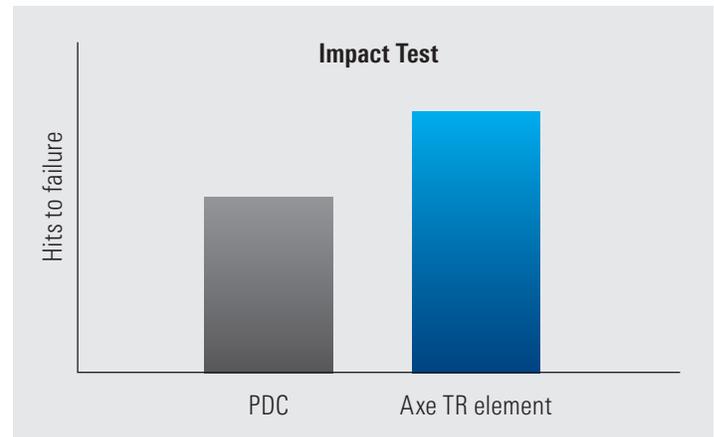
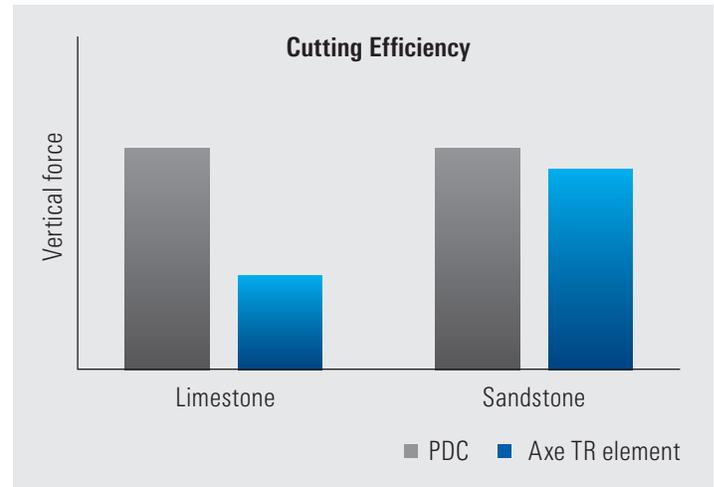
What it replaces

Conventional flat cutters.

What else should you know

Smith Bits is continually recognized for advancement in bit technology, having earned the Hart Energy Special Meritorious Awards for Engineering Innovation (MEA) for cutting element technology in 2014, 2015, 2017, and the World Oil Award for drill bits in 2014.

Additionally, Smith Bits has a 20-year record for achieving more world records than any other drillbit company. Since 1999, Hart Energy E&P documents drillbit records data for different types and sizes of bits in three categories—single-run footage, cumulative footage, and ROP. Data is verified by bit run sheets from drilling contractors and operators. In a recent review, Smith Bits set 53% of the global records in the drillbit industry—more than all other bit companies combined—with 595 of the 1,123 world records.



Axe TR element requires less force to achieve same depth of cut while showing increased resistance to impact compared with conventional PDC cutter.

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