

# Axe Ultra ridged diamond element

Builds on proven ridged geometry for increased element strength and more wear resistance

## Where it is used

The Axe Ultra\* ridged diamond element can be used with matrix and steel-bodied bits to drill unconventional well intervals continuously through the vertical, curve, and lateral. Ridged diamond elements are compatible with any BHA configuration. Bits using the Axe Ultra element improve ROP in medium to hard formations with unconfined compressive strengths (UCS) greater than 5,000 psi [35 MPa].

## How it improves wells

Axe Ultra element extends bit life for longer intervals and sustains the performance of the classic Axe\* ridged diamond element. The ridged shape reduces the cutting force required by AxeBlade\* ridged diamond element bits, which lessens overall torque, reduces reactive torque fluctuation, and enables better toolface control in curve applications. This advantage yields better build rates and higher overall ROPs, helping maximize production zone exposure and minimize drilling time.

## How it works

Like the classic Axe element, the Axe Ultra element combines the shearing action of a conventional PDC cutter with the crushing action of a tungsten carbide insert (TCI), achieving at least 22% deeper penetration to provide higher instantaneous ROP using the same WOB and rpm applied to conventional PDC cutters. The Axe Ultra element builds on the Axe element geometry with its 70% thicker diamond table, adding an improved interface between the diamond table and substrate. Combined, these features give the ridge even more strength and resistance to impact and wear, along with more efficient cutting and heat dissipation. This translates into improved durability and dull conditions for maintaining maximum ROP throughout the run.

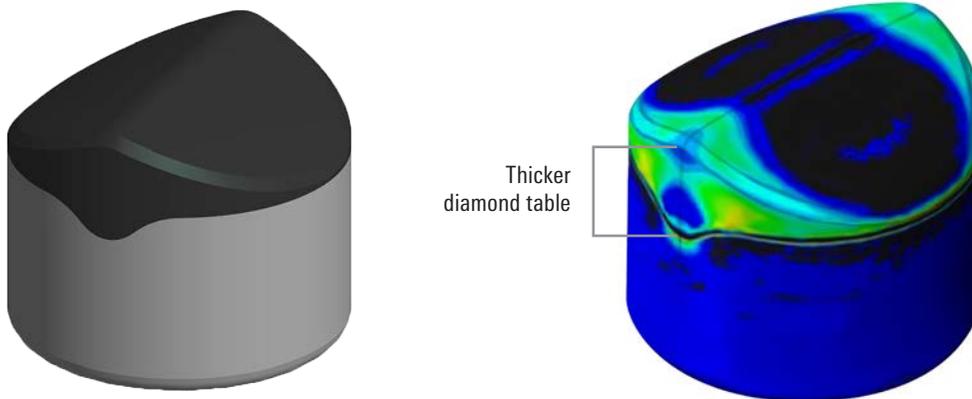
## What it replaces

Conventional flat surface cutters

## What else I should know

Smith Bits is continually recognized for advancing 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.



*The Axe Ultra element has a thicker diamond table to mitigate ridge spalling in hard-impact formations.*