

Scribe-Ridged Element Enables Bit to Increase ROP and Durability

Customized AxeBlade bit required lower WOB to increase cutting efficiency by up to 34%

Bit with Axe SR* scribe-ridged diamond element strategically placed in the cone achieved higher ROP of 99 ft/h.

The operator's concerns

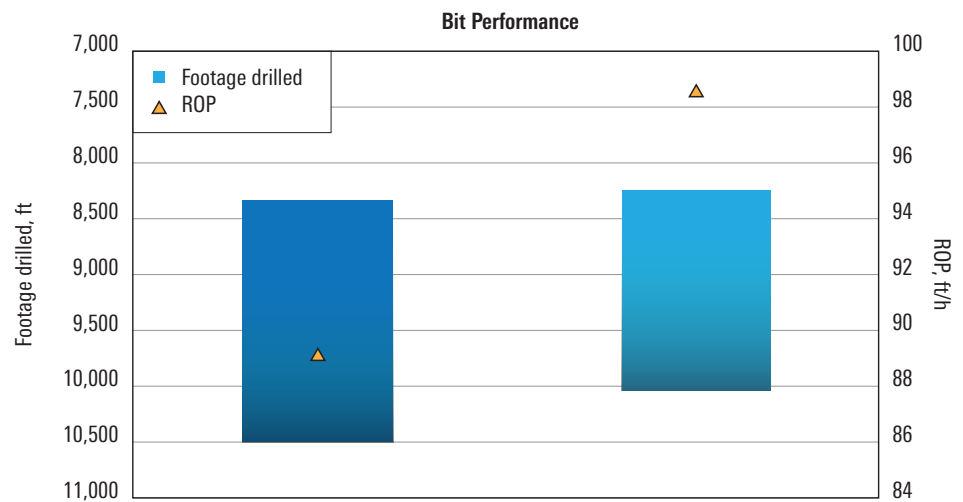
An operator in the Williston Basin needed to drill a lower 8¾-in section as fast as possible through hard limestone interbedded with anhydrites and sand. Concerns centered on selecting the right bit to achieve high ROP while maintaining durability for the entire interval.

What Schlumberger recommended

The AxeBlade* ridged diamond element bit is an innovative leap in PDC bit performance, and from its success, Smith Bits engineers continue developing effective new element geometries using the ridged shape. The Axe SR scribe-ridged element is one of the results, and it combines the classic ridge with a scribe shape. Schlumberger recommended a customized 8¾-in AxeBlade bit with Axe SR elements strategically placed in the cone to enable higher ROP than conventional PDC bits used for offset runs. An AxeBlade bit with scribe-ridged elements requires lower WOB to maximize cutting efficiency by up to 34% over conventional PDC cutters and 18% compared to the original ridged element.

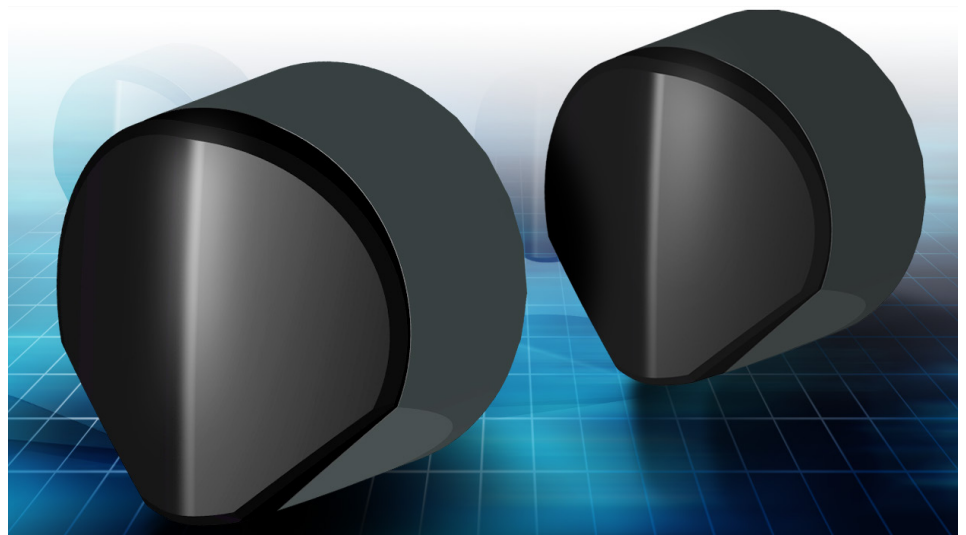
What was achieved

The Axe SR element enabled the AxeBlade bit to gain a higher depth of cut with the same drilling parameters used for a baseline bit with conventional PDC cutters. Using the point-loading shape of the scribe-ridged element in the cone, the ROP increased to 99 ft/h.



	Baseline bit	AxeBlade bit with Axe SR element
Footage drilled, ft	2,090	1,775
Depth in, ft	8,400	8,255
ROP, ft/h	89	99

Using the Axe SR element in the cone enabled the AxeBlade bit to increase ROP to 99 ft/h.



The Axe SR scribe-ridged diamond element.