



There are bits that crush.

A large, metallic, cylindrical rock bit, likely made of tungsten carbide, is shown against a solid black background. The bit has a central body with several rows of circular cutting elements or teeth. These teeth are dark, possibly due to heat or wear, and are arranged in a staggered pattern around the circumference of the bit.

There are bits that shear.

A close-up, high-angle view of a large, industrial-grade PDC bit. The bit is made of a light-colored metal, likely tungsten carbide, and features a series of circular, black-tipped cutting elements (buttons) arranged in a staggered pattern around its circumference. The central body of the bit has a hexagonal cross-section. The lighting highlights the metallic texture and the sharp edges of the buttons.

Now there's a PDC bit that does both.

# AxeBlade

Ridged diamond element bit



# AxeBlade

Ridged diamond element bit

- Saves rig time and costs by delivering faster instantaneous ROP
- Achieves directional objectives in less time and maximizes production zone exposure



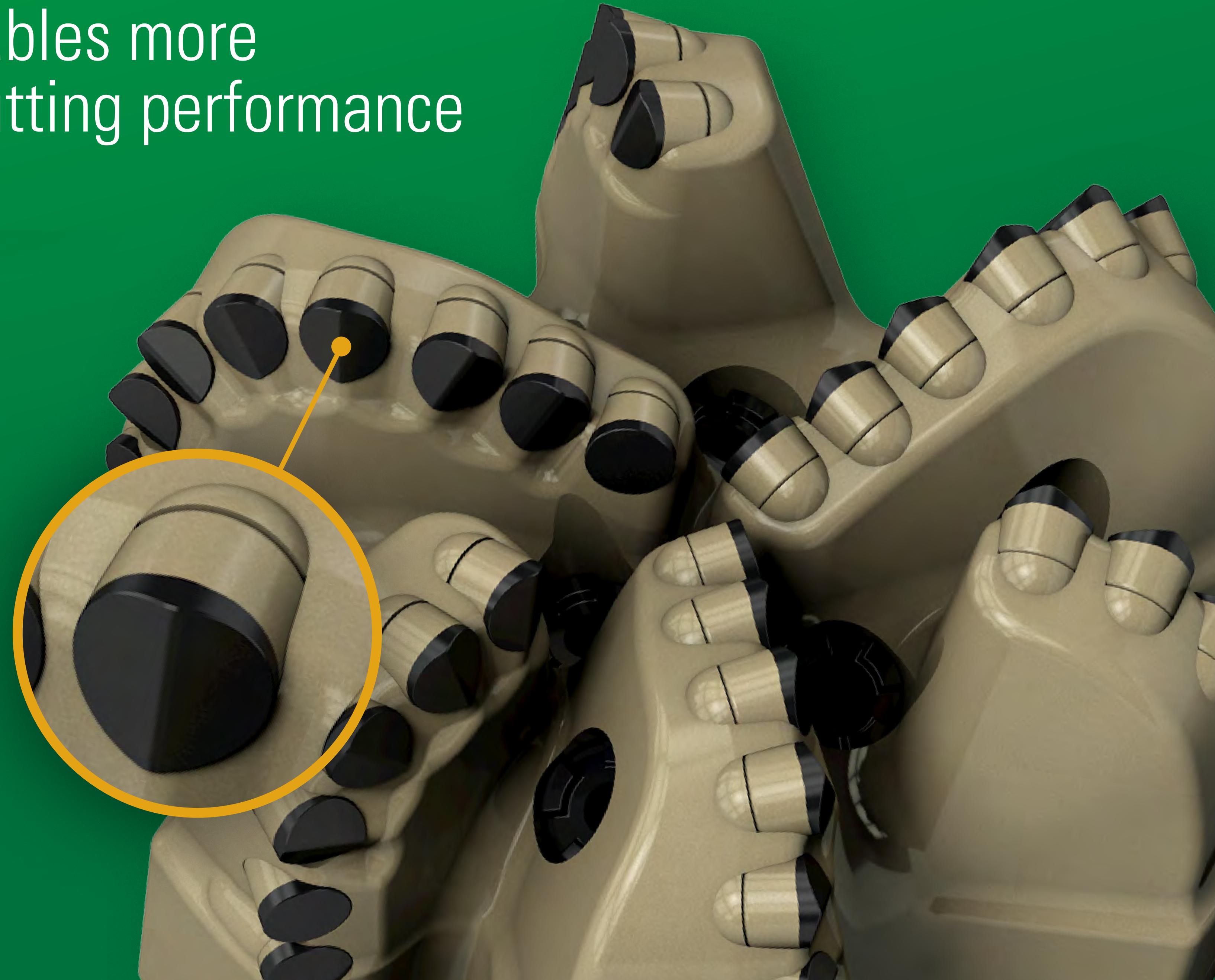
**SMITH BITS**

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# 3D element design enables more efficient, aggressive cutting performance

The new design of the Axe ridged diamond element enables more efficient cutting and heat dissipation while improving impact resistance and durability.

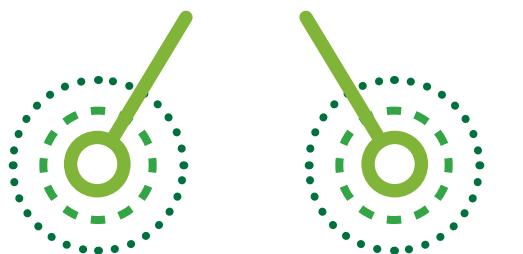
**Bits fitted with Axe elements achieve deeper penetration and better directional control for increased ROP.**



Roller cone bit



Crush



PDC bit



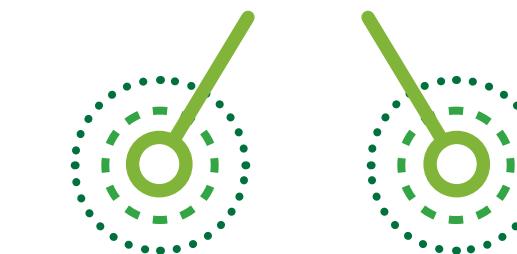
Shear



AxeBlade bit



Crush and shear



# +29% ROP Increase

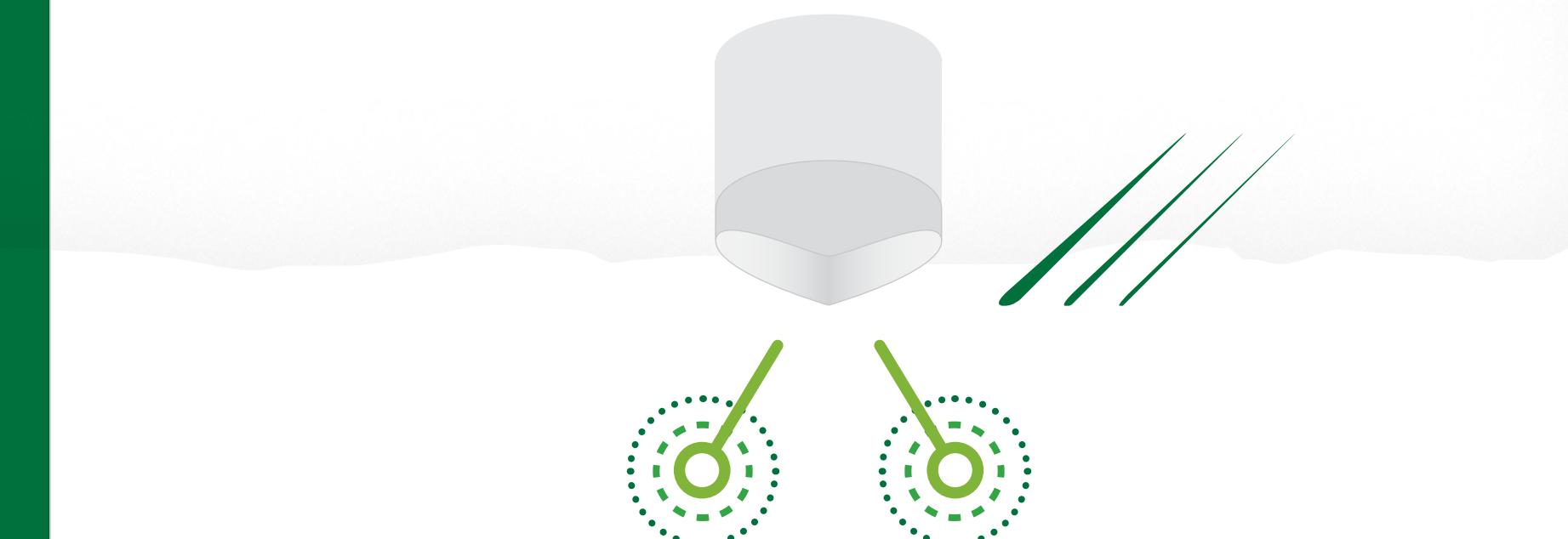
The AxeBlade bit's unique ridge-shaped element combines the crushing action of a roller cone bit and the shearing action of a conventional PDC bit.

The element's thicker diamond table improves durability and dull condition for deeper penetration and maximum ROP throughout the run.

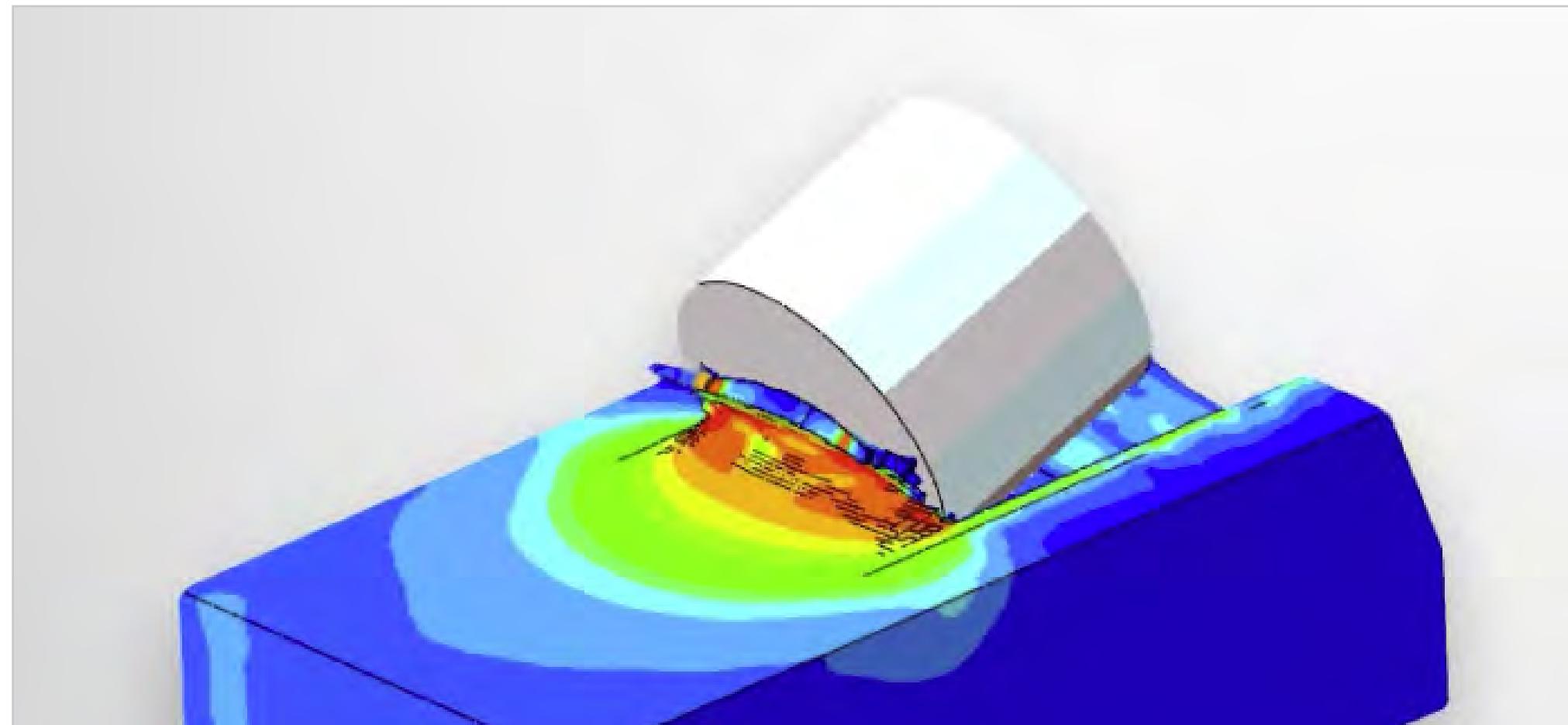
## AxeBlade bit



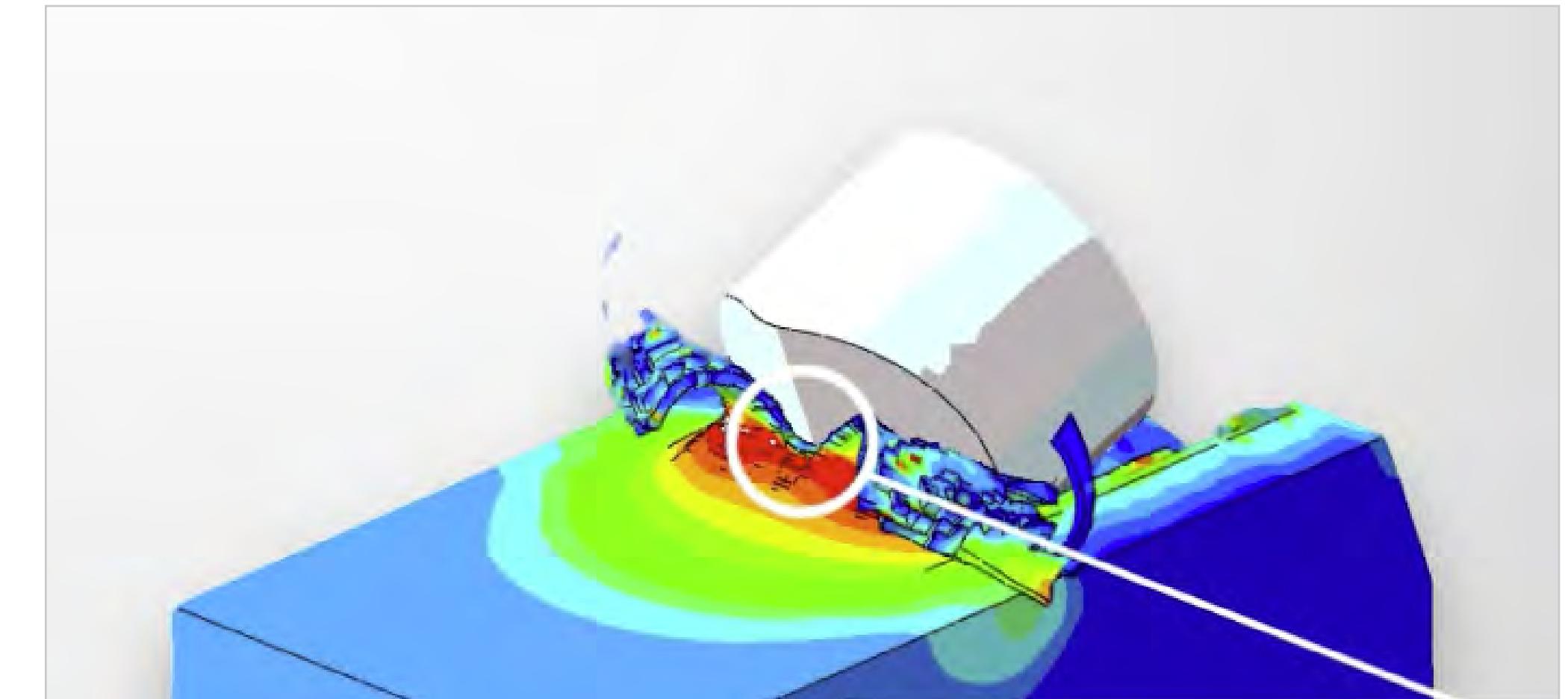
Crush and shear



# PDC cutter

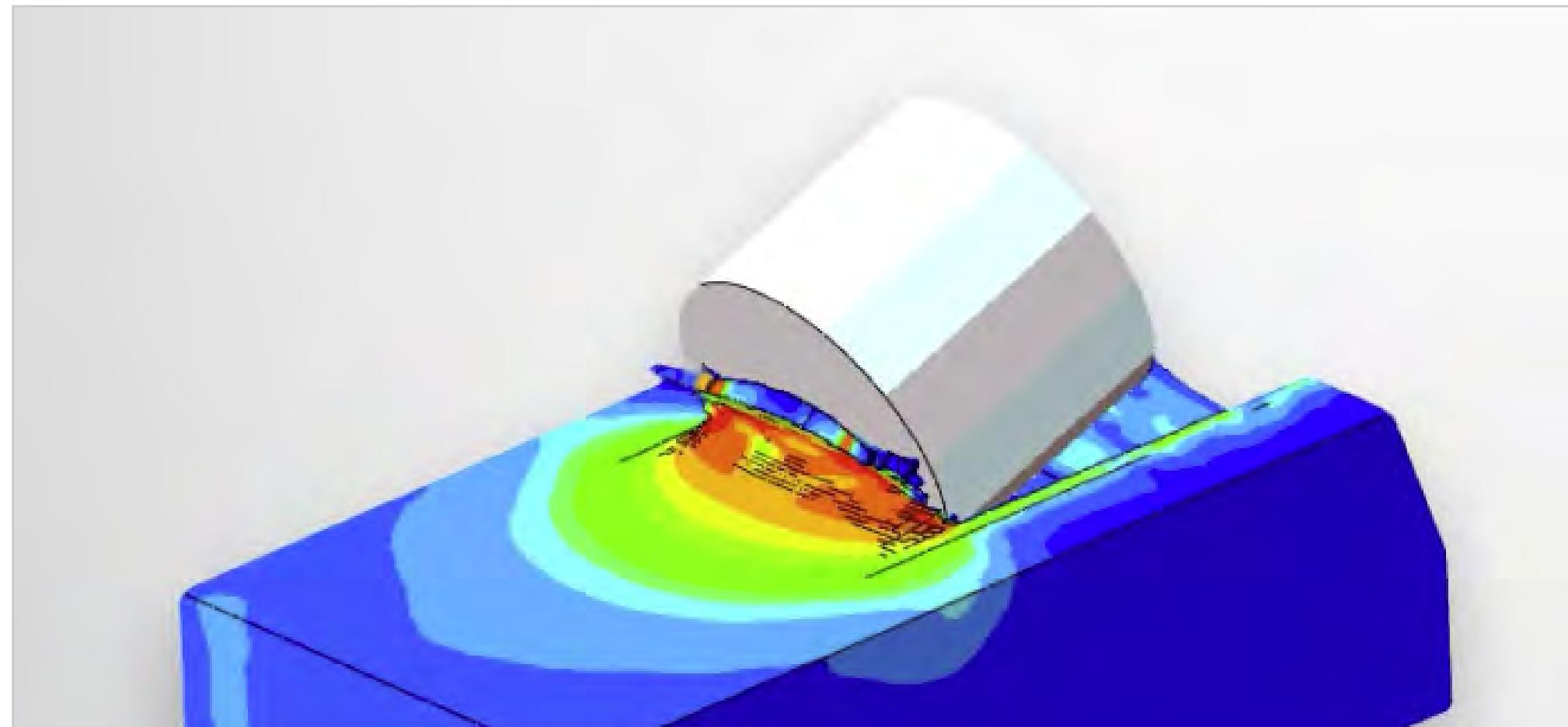


# Axe element

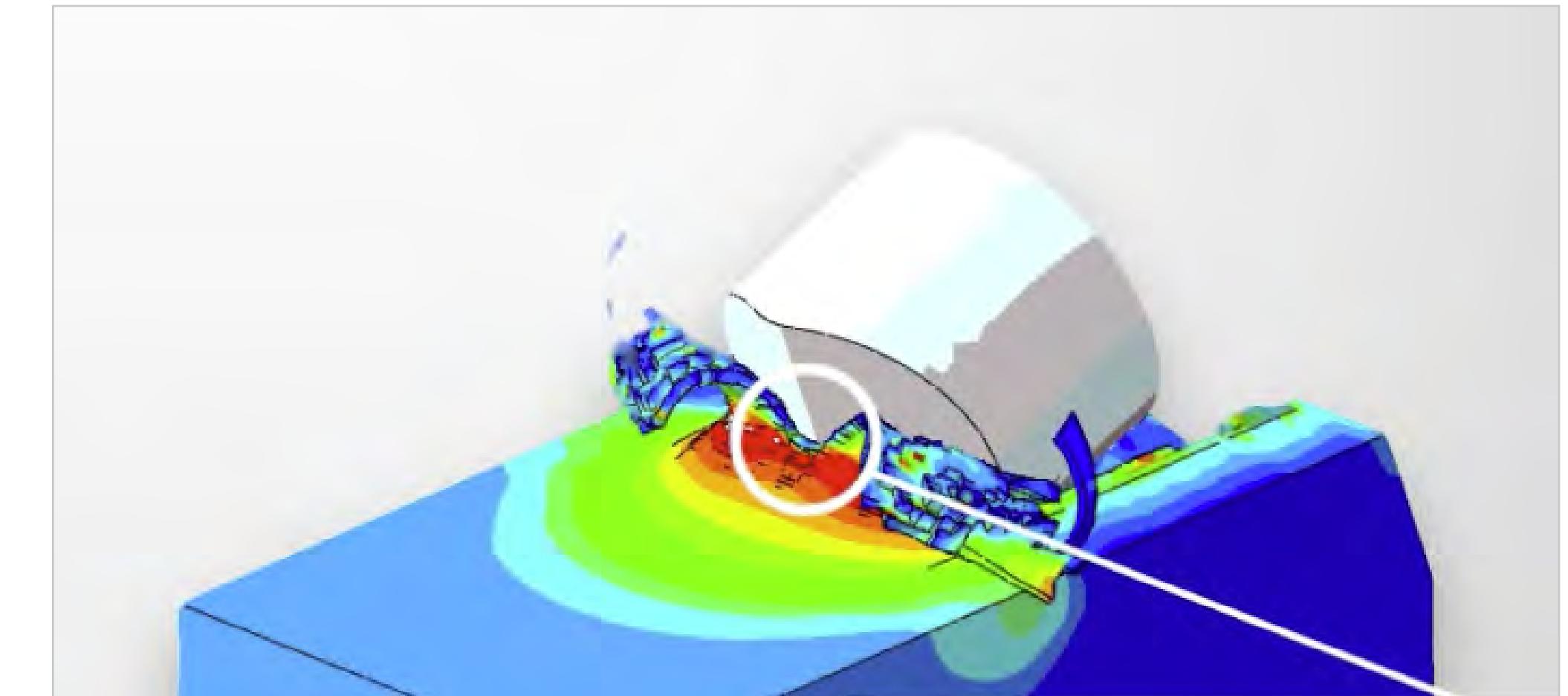


Under the same drilling conditions and operational parameters,  
the Axe element achieves deeper penetration.

# PDC cutter



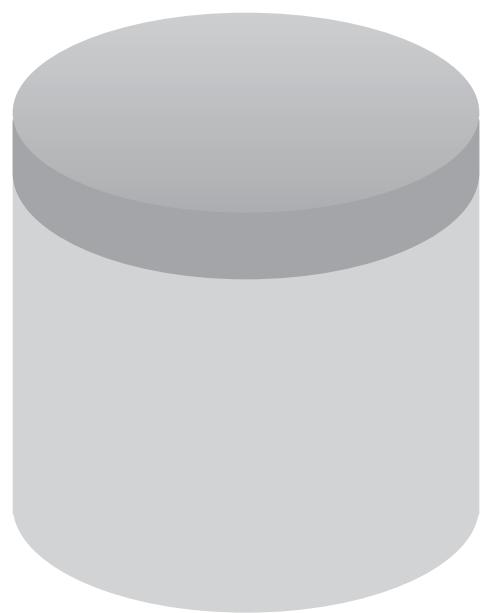
# Axe element



22% deeper penetration = improved cutting efficiency

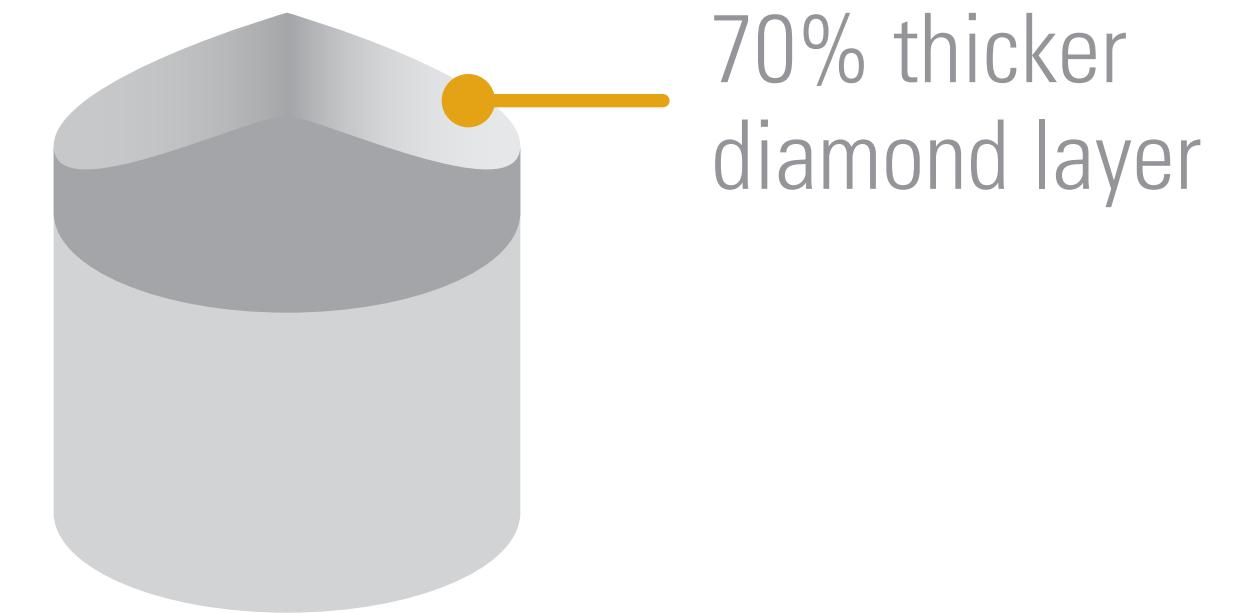
Under the same drilling conditions and operational parameters,  
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## PDC cutter



Until recently, improvements in PDC bit performance resulted primarily from changes in metallurgy and materials, not cutter shape.

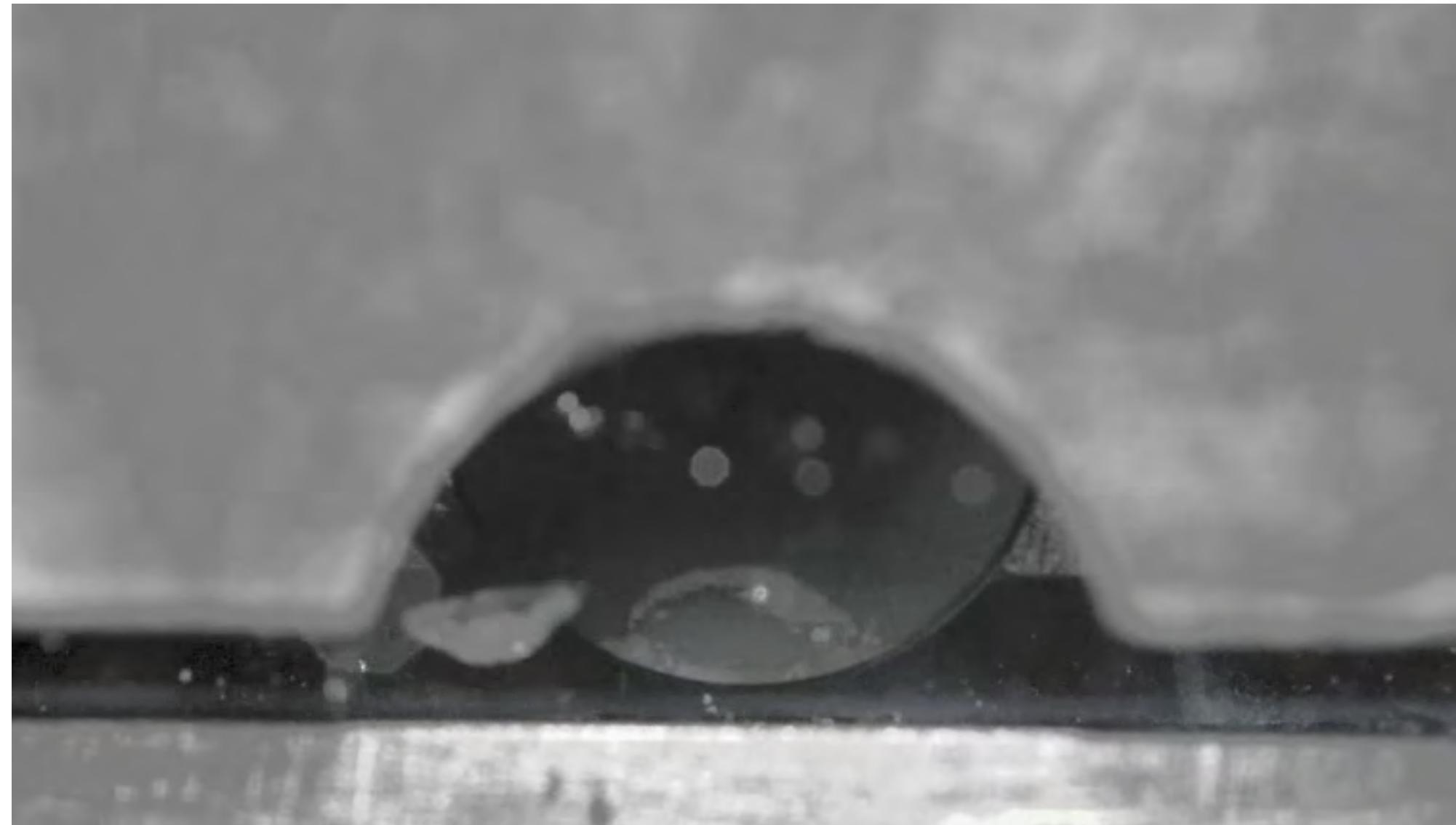
## Axe element



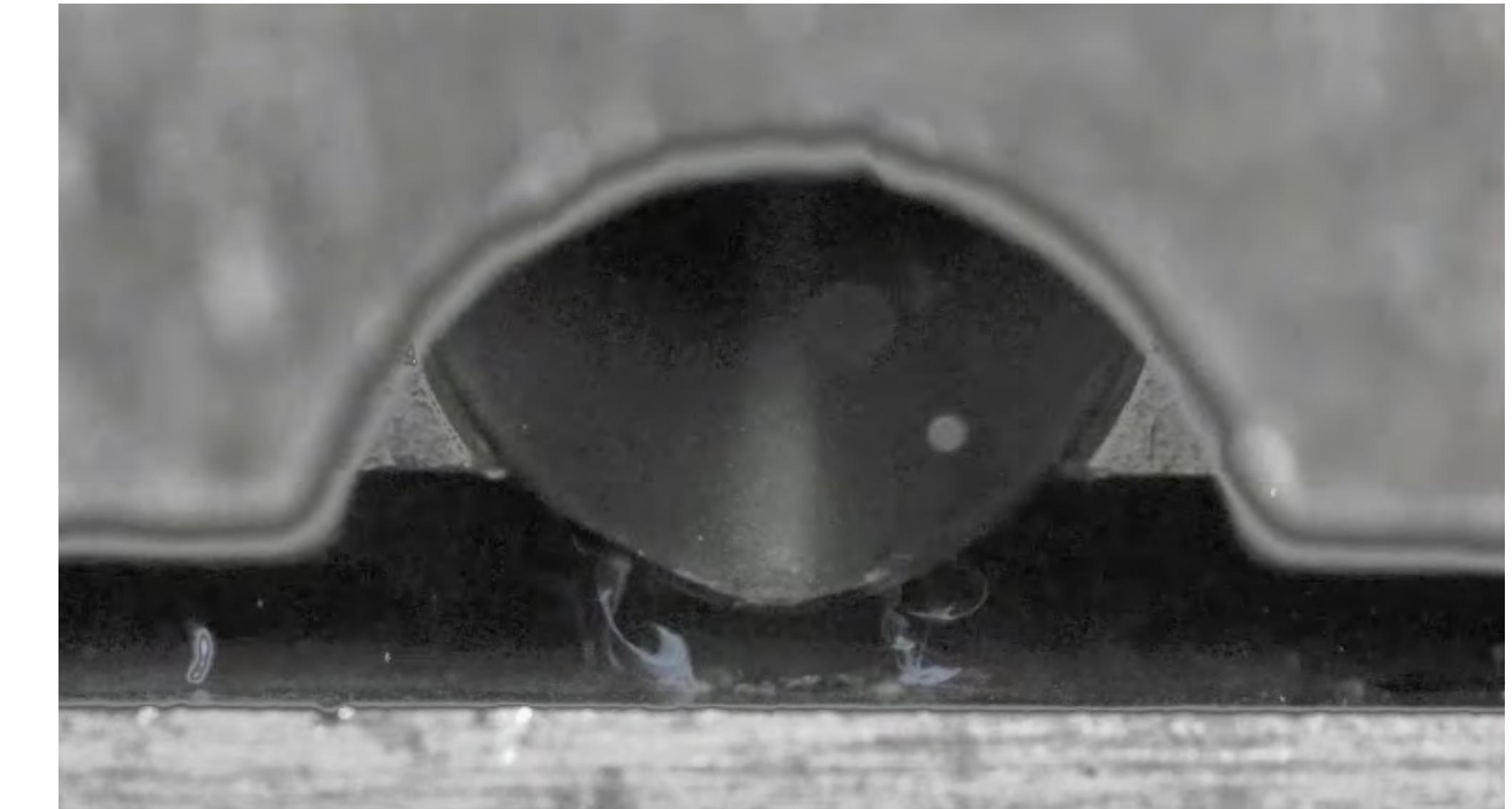
70% thicker  
diamond layer

The new ridged element design features a 70% thicker diamond layer for more efficient heat dissipation and better impact resistance.

# PDC cutter



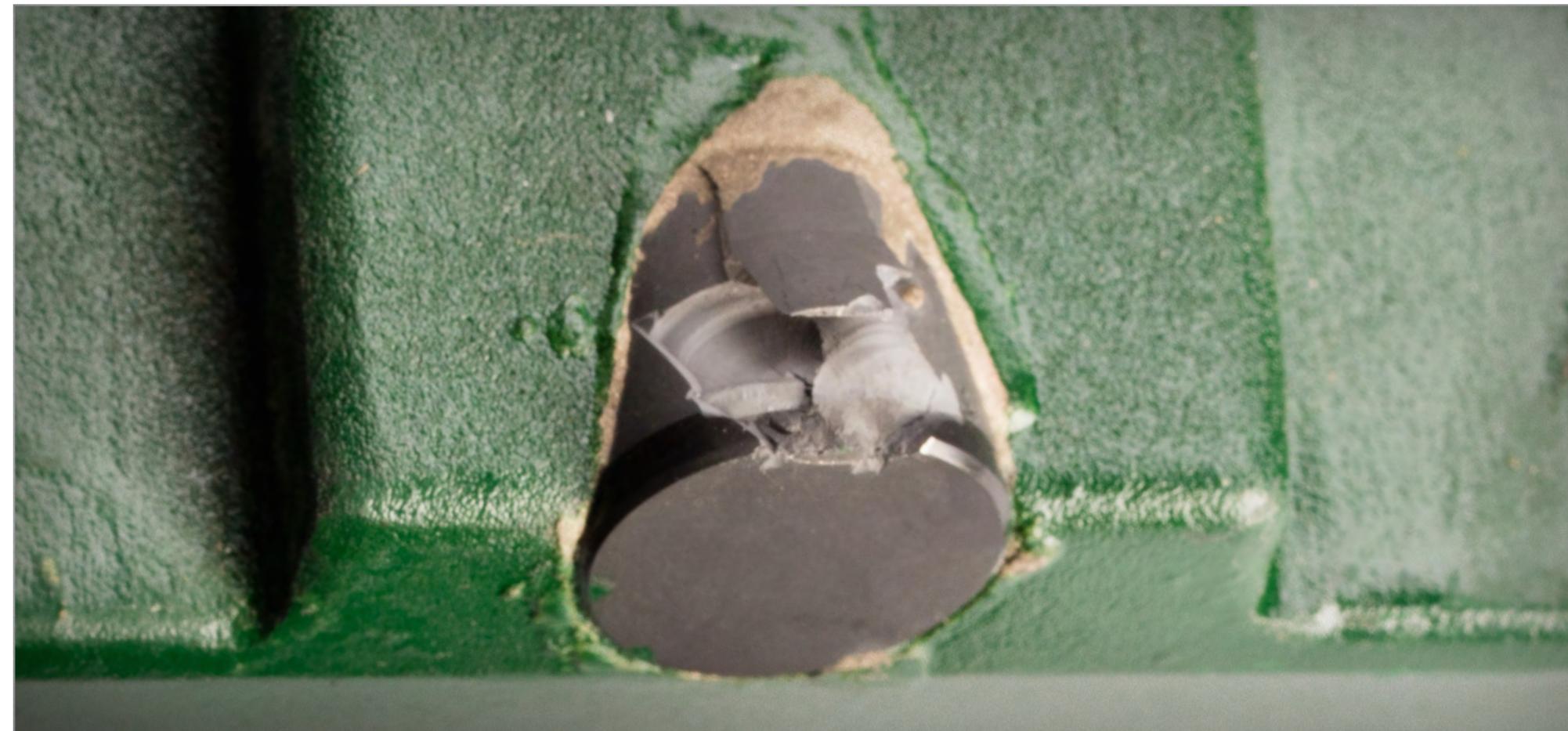
# Axe element



In laboratory testing, a conventional PDC cutter and the Axe element impacted a hardened steel block at 18,000 lbf.

These test parameters simulate drilling into a hard limestone formation at 60 ft/h.

# PDC cutter



# Axe element



Laboratory testing simulated a frontal impact of 7,000 lbf on a conventional PDC cutter and the Axe element.

Increased frontal impact resistance enables the AxeBlade bit to maximize ROP throughout the entire run through increased durability.

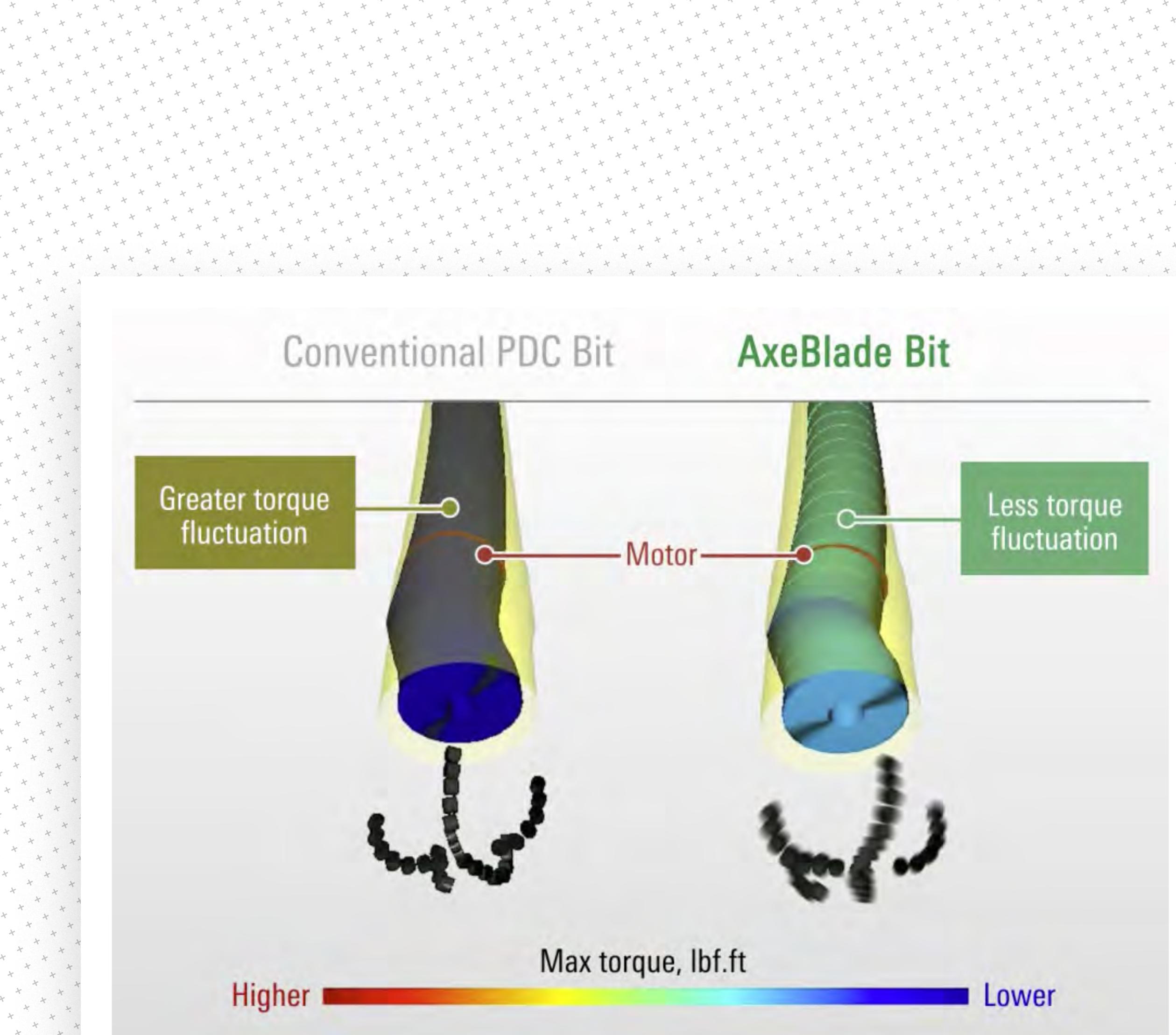
# Enhanced control in directional applications

The ridged shape of the Axe element enables the AxeBlade bit to generate less torque with better toolface control. With this, operators achieve higher build rates with fewer corrections for reduced drilling time and maximum production zone exposure.



# Improved steering and speed

Torque simulations in the IDEAS integrated drillbit design platform showed that the AxeBlade bit achieves less overall torque and generates fewer reactive torque fluctuations for improved steering and ROP.



# AxeBlade Bit Increases **ROP +29%** and Improves Directional Control in Eagle Ford Shale Interval

Ridged diamond element bit improves drilling rates while enhancing steerability with reduced reactive torque

## Challenge

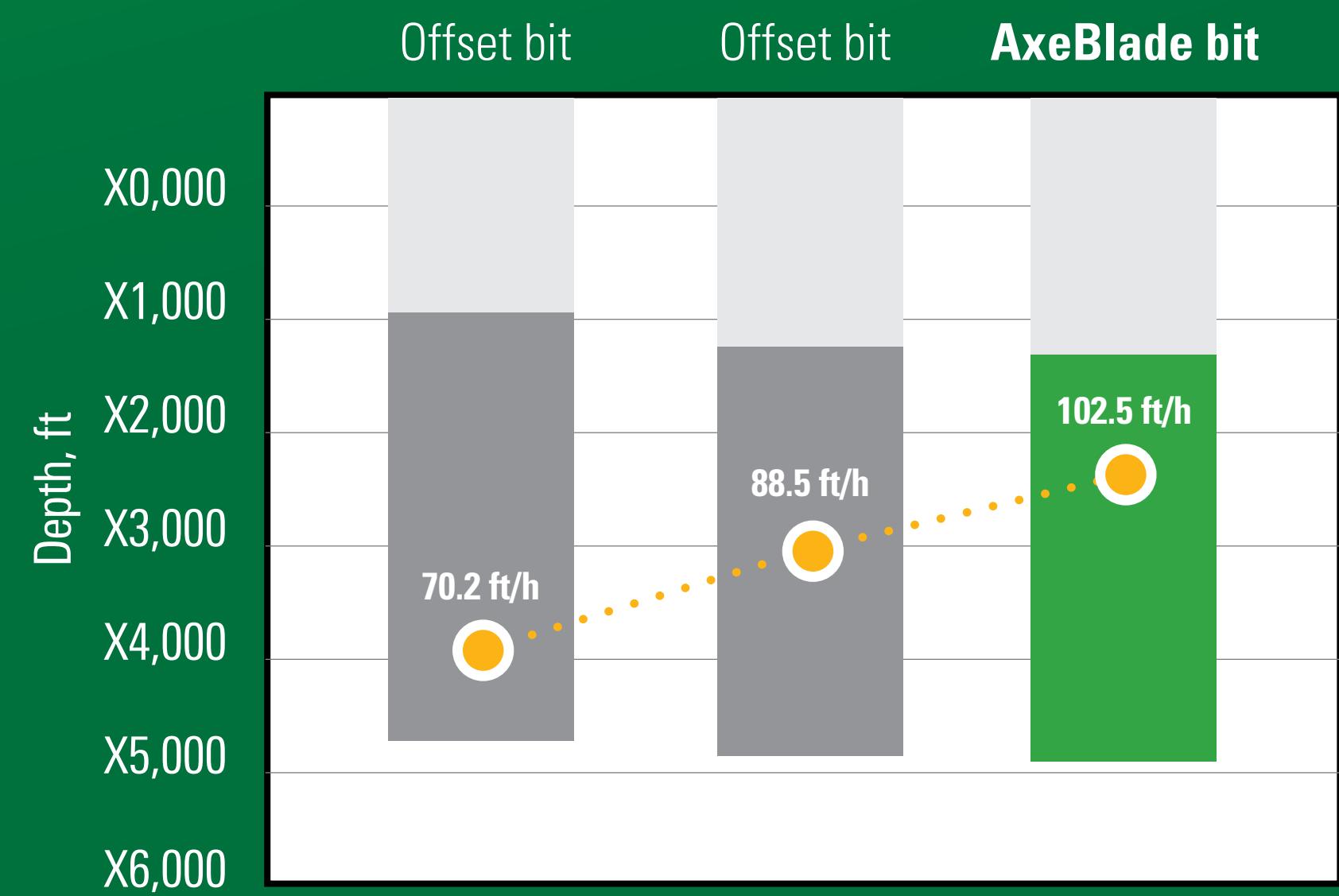
Achieve high instantaneous ROP and enhance toolface control while drilling with a high differential pressure motor in limestone and shale formations, Eagle Ford Shale.

## Solution

Deploy the AxeBlade bit to drill the curve and lateral intervals.

## Result

- Drilled 3,586-ft interval in 35 hours for an ROP of 102.5 ft/h, an improvement of 29% compared with previous wells.
- Held toolface, built angle, and reduced reactive torque compared with baseline bits.
- Showed better dull condition compared with offset runs.



# Unit Petroleum Company Boosts **ROP +27%** in Intermediate Section Targeting the Granite Wash

AxeBlade bit enabled drilling with **20% less torque** through interbedded shale, sand, and limestone formation onshore Texas.

## Challenge

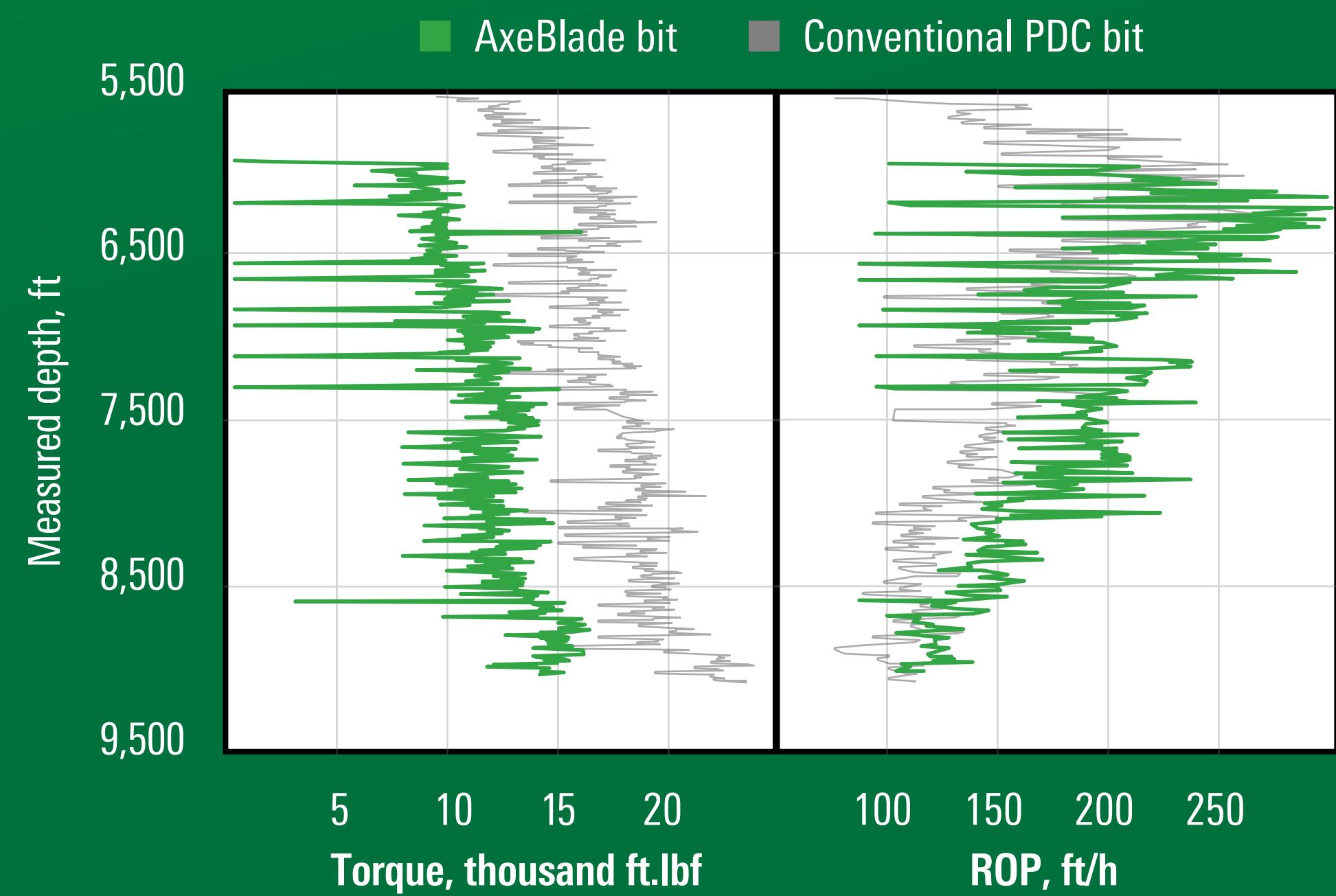
Improve ROP and reduce torque while drilling through interbedded formations of shale, sand, and limestone above the Granite Wash in the Anadarko basin.

## Solution

Deploy AxeBlade bit to drill the intermediate section.

## Result

Drilled the entire interval at 27% higher ROP and generated 20% less torque.



# AxeBlade

## Ridged diamond element bit

For both land and offshore PDC bit applications, the AxeBlade bit increases ROP and directional control through improved cutting efficiency and enhanced impact resistance.



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