

Case study: Permian Basin

Dynamus bit with Optimus Prism cutters delivered 37% ROP increase in one-run 12¼-in intermediate section

A customer drilling the Permian Basin had reached a performance ceiling in their 12¼-in. hole section. The customer contacted Baker Hughes because of past collaboration and recognition of Baker Hughes’ deep understanding of the application. The Baker Hughes team diagnosed that cutter technology would be the key to extending the performance envelope in the 12¼-in. intermediate hole section. Computer simulations and lab testing were conducted to determine the optimal cutter geometry and placement of the cutters across the bit face.

Baker Hughes recommended the **Optimus™ Prism shaped cutter technology** strategically placed in the D506WS **Dynamus™ extended life drill bit** to deliver the performance required in this application. The Optimus Prism cutters provide the point loading required for efficient drilling in tough carbonate-rich or pressurized shale formations. The Prism shaped cutter has the proven toughness of Dynamus cutter technology combined with the optimized chip flow and cooling advantages of the

StayCool™ multidimensional cutter technology.

Dynamus extended life drill bits combine the latest cutter technology and geometries, enhanced body materials and designs to dramatically increase performance and durability. The advanced computer modeling determined the specific locations of the Optimus Prism cutters in the Dynamus D506WS that would increase the bit efficiency and deliver the maximum penetration rate in this tough interbedded application.

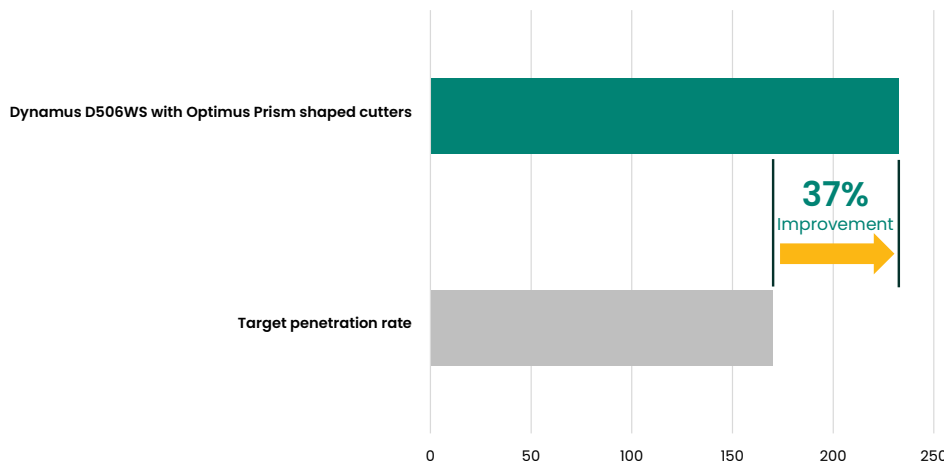
The 12¼-in D506WS with Optimus Prism cutters drilled the entire intermediate section from 1,405 ft (428 m) to 5,200 ft (1585 m) in 16.3 hours. This resulted in an average penetration rate of 232.8 ft/hr (70.8 m/hr), a 37% improvement, and saved 6.3 hours and \$15,750 USD versus the target average penetration rate. With continuous collaboration between Baker Hughes and the customer, a new performance record was set for this hole section.

Challenges

- Interbedded formations
- High drilling parameters
- Drill 12¼-in section in one run
- Drill at least 170 ft/hr (51.8 m/hr)

Results

- Completed 12.25-in section in one run
- Achieved an average ROP of 232.4 ft/hr (70.8 ft/hr)
- Set customer penetration rate record
- Excellent dull condition



Significant penetration rate improvement with the 12¼-in. Dynamus D506WS with Optimus Prism shaped cutters.