Maintain your edge to drill faster and farther

CryoCut shaped-cutter technology

CryoCut™ shaped-cutter technology from Baker Hughes, helps beat the drilling day curve and reduce drilling costs by minimizing friction on the cutter face, improving rates of penetration (ROP), and drilling more efficiently. Run on the Baker Hughes PermaFORCE™ elite PDC drill bit platform, CryoCut shaped cutters use unique non-planar diamond table geometry and polished cutter base technology to enhance performance in key applications.

In more challenging environments, like interbedded sandstones and carbonates, bit performance is directly related to cutters and their ability to withstand heat. CryoCut technology reduces heat generation at the cutter/rock interface. This lengthens the life of the cutter, which leads to extended runs, fewer bit trips, and reduced overall time to reach total depth (TD).

STAYS COOLER, RUNS MORE EFFICIENTLY

Overheated cutters experience abrasive wear faster, which can lead to lower ROP and higher mechanical specific energy (MSE) or wasted energy that isn't directly transferred into removing rock. Lab testing has shown that CryoCut technology generates 25% less heat on the cutter face than conventional planar cutters. This reduction allows the cutter to maintain a sharper edge for longer durations during a bit run (Figure 1). Reducing the heat generation on the cutter face also minimizes cracking and spalling tendencies that can lead to failures and shorten run life.

IMPROVED TOUGHNESS AND DURABILITY

The innovative non-planar geometry on the face of the CryoCut cutter was engineered to reduce the temperature at the working edge of the bit and decrease stresses in the diamond table that can lead to premature fracture due to impact loading compared to the legacy StayCool™ 2.0 design. Using Baker Hughes' specialized Finite Element Analyses (Figure 2), the CryoCut face geometry was designed to reduce stresses by 15% compared to StayCool 2.0. An improved stress state delays crack initiation and propagation under loading conditions experienced during drilling. This translates to improved durability, especially when drilling in applications where abrasive formations are mixed with other types of rock that introduce impact loading. The net result is a longer lasting, more efficient cutting edge.

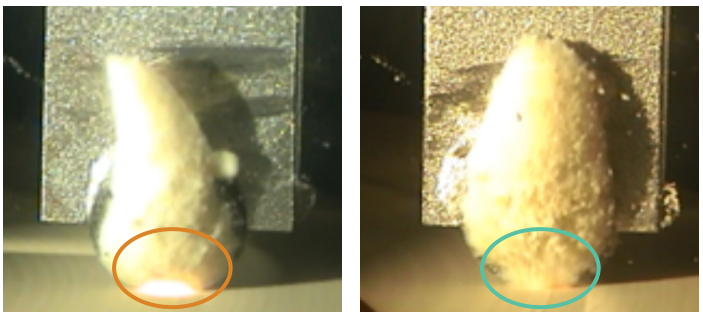
Applications

- Intervals with abrasive formations combined with other types of rock that could introduce impact loading
- Conventional BHA's and RSS with high-speed motor

Benefits

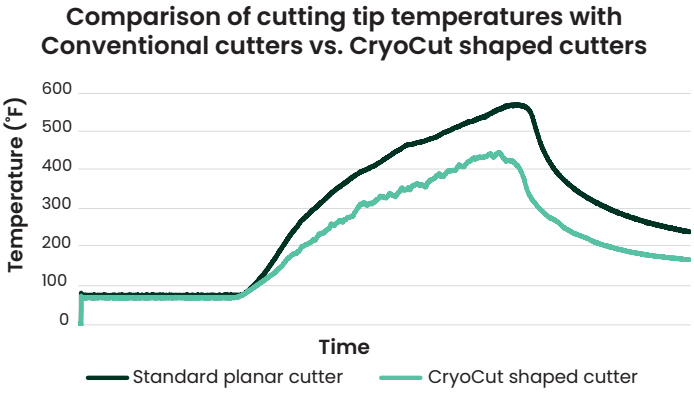
- Proven to lower torque in lab tests and field applications
- Non-planar diamond table
  - Reduces friction between formation and cutter
  - Lowers heat generation at cutter/rock interface
  - Maintains sharper edge for more efficient drilling over life of run
  - Improved face geometry reduces stresses and improves durability to reduce breakage and chipping
- Improved diamond materials
  - Increase durability and consistency
  - Reduce cracking
  - Enable faster and longer drilling
- Superior manufacturing process
  - Maximizes thermal stability

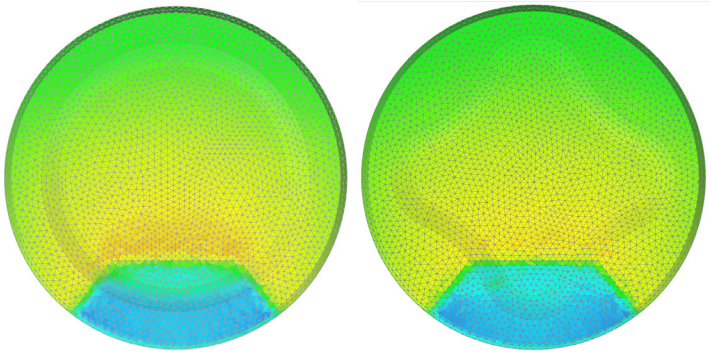
Contact your Baker Hughes Drill Bit representative today to discover how CryoCut shaped-cutter technology can help lower MSE, improve ROP, increase distance drilled, and ultimately lower your drilling costs.



Conventional planar cutter | CryoCut multidimensional cutter

Figure 1: the images above compare the heat generated from a conventional planar cutter (left) and the CryoCut shaped cutter (right)





StayCool 2.0 | CryoCut

Figure 2: Baker Hughes' proprietary Finite Element Analysis shows a 15% reduction in stresses at the working edge of the cutter under loading conditions.

Baker Hughes

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