CUTTING STRUCTURES: MILLS vs TRICONE vs PDC

Cutting structures have advanced significantly with modern technology, and the performance gap is narrowing: but there are operations best suited for each. TEC works to fully form the application and recommend the ideal cutting structure to maximize the probability of achieving the desired result on run one. To make this happen we consider more than just cutting size when selecting the cutting implement.

Contact us for more information:
Texas 1.432.423.1625 | Rockies / Bakken 1.701.707.3130
Canada 1.877.698.3570 info@thrusterenergy.com

EXPERIENCE MATTERS.

PDC

The TEC hybrid PDC has a strong run history in the Canadian Duvernay as a workhorse for deep operations and high plug counts. Fast mill times and minimal wear permit the bit to be utilized more than once in most circumstances, driving cost savings for multi-well pad operations.

The drawback of any PDC is the debris sized caused by the ripping-and-tearing action of the exposed buttons, which is further pronounced on naked PDC body structure This is the origination of TEC's 'hybrid' structure to include carbide backing which allows the PDC to mulch the large pieces as they travel through the water courses.

Additional consideration with any PDC is given to casing ovality, deformation, perforation burrs or other fixed impediment will stop the PDC rotation very quickly, causing sticking and stalling.

TRICONE

Many well operators are proponents of the milling action and fine debris that results from a tricone design and Thruster proudly offers the best tricone bits for small to medium OD sizes available to the market. The crushing and shearing failure mechanism of the tricone consistently generates the smallest debris possible and will stand up to usage against medium to high plug counts. However, when the tricone reaches a deformed area, ovality, overtorqued collar or similar restriction the cones and shirttail will deflect inwardly.

The tricone shirttail can flex some distance with very little weight indication on surface as the tool string passes the reduced ID section. This is useful to squeeze through small deflections in casing, but if the tricone is pinched at sufficient angle or encounters WOB at a vector angle, cones can be separated from the bearing track completely. The loose cone will remain in front of the bit, which subsequently can derail the remaining cones and necessitate a trip to surface, halting milling progress. Custom modification is also available for these to support unique applications.

MILL

Cutting edge hardbanding and gauge protection are leading the mill market and redefining the "a mill is a mill" mentality that has resulted from decades of neglected/minimalized junk mill designs. What once was utilized for simple sand cleanout and junk operations is unrecognizable stacked next to the modern mill that undergoes very little OD reduction when milling for long periods of time.

ebris will be larger than that from the tricone and generally smaller than from the PDC. When dealing with perforations, the mill will make slow progress but clean up any rough edges as it passes. Unlike the tricone it will address perforations at full OD rather than creeping past and unlike the PDC it will be less "grabby" so the process of smoothing those areas out is less delicate.

This makes a TEC Reaper mill the Goldilocks ('just right') cutter for many applications. Historically, inadequate carbide can wear significantly while milling, causing reduced milling efficiency. TEC Reaper mills have proven their effectiveness with consistent mill times maintained on over 100+ plugs.