CounterForce™ PDC Bit Technology

When Every Run Counts™

Torque-reducing design that drills more footage—faster
CounterForce re-directs lateral forces to fail rock, not your bit.

Unrestrained lateral forces, particularly in high-speed directional wells, generate excessive vibration that, at best, puts the brakes on optimum drilling efficiency, but at worse, can prematurely destroy a premium PDC bit. With CounterForce, Ulterra has given new meaning to groundbreaking PDC bit technology with a unique cutter configuration that minimizes torque and vibration to deliver unequaled lateral stability, more footage and cost-effective drilling rates.

The patent-pending CounterForce is a true step-change advancement in PDC bit design. Unlike conventional PDC bits, CounterForce technology employs a novel cutter orientation where the cutters work together, forcing the bit to essentially grasp the bottomhole pattern, giving it the traction and stability necessary to handle otherwise destructive and efficiency-robbing lateral vibration. CounterForce reins-in lateral forces, re-directing them from the bottomhole assembly into the formation where they work to your advantage by failing rock and removing it from the hole much more efficiently. The exclusive cutter angle arrangement produces a reliable bit that slices the formation and remains sharper, longer, delivering higher penetration rates while saving you the costs of unnecessary bit trips.

Results from hundreds of wells, comprising more than one million feet of hole, document the capacity of CounterForce PDC bits to consistently reduce torque and vibration problems, improve directional control, and exhibit near-green end-of-run dull conditions. In multiple applications, CounterForce has routinely delivered exceptional drilling rates, up to 50% faster than the best available offset, saving operators tens of thousands of dollars and as much as a full day of drilling.

When every run counts, CounterForce is one more reason why you can count on Ulterra - the industry's premier PDC bit innovator.
COUNTERFORCE Advantages

- Delivers higher ROP
- Drills more footage per bit
- Directs BHA vibration to failing rock
- Reduces bit vibration
- Requires less energy to fail rock
- Enhances drilling efficiency
- Delivers a high-quality wellbore
- Smooth toolface control
- Cuts drilling time
- Lowers cost-per-foot
The patent-pending CounterForce technology is a true step-change advancement in PDC bit design. The heart of CounterForce is a novel cutter orientation that maximizes rock failure and overall drilling efficiency through a host of mechanisms.

New cutter orientation harnesses lateral vibration to help with rock failure
Unlike conventional cutter orientation where lateral vibration is wasted energy, CounterForce’s cutter orientation capitalizes on Mechanical Specific Energy by damping vibration and re-directing forces back into the rock. Accelerated cutter wear caused by bit vibration is reduced, allowing “like new” cutters to drill more hole at higher average ROP.

Proprietary cutter orientation requires less energy to drill new hole
CounterForce cutters work together and synergistically engage the formation. Individual cutter fracture mechanisms are directed into each other, optimizing crack propagation and requiring less energy to remove rock.
COUNTERFORCE Improves Drilling Efficiencies

Cutters angled to more efficiently slice formation and keep cuttings in the flow

Unlike flat conventional profiles where cutters bluntly plow through the formation, the CounterForce arrangement angles the cutting elements so they more efficiently and sharply slice through the rock. This translates into reduced reactive torque and improved stability for better tool-face control and wellbore quality. Angled cutters also remove dislodged cuttings more efficiently, forcing the drilled solids directly into the hydraulic flow path to enhance evacuation. The improved hydraulics and more efficient cutting mechanisms translate into higher ROP.

CounterForce gives you the same diamond volume but with a lower, sharper aspect ratio.

With CounterForce, cuttings are mechanically thrust into the drilling fluid, enhancing cleaning and cooling of the PDC cutters.
In a same pad South Texas offset, the CounterForce bit displays considerably lower MSE and hence less energy wasted to damaging vibration throughout the run. For the entire run, the CounterForce design drilled more efficiently and delivered significantly more ROP for the same WOB and Torque.

Mechanical Specific Energy

Mechanical specific energy (MSE) is a common measure of how efficiently energy – mainly torque – is used to drill a well. Lower MSE means that less torque is required to achieve ROP.
Eagle Ford Study
Based on a study of 1085 Eagle Ford runs and 5,081,770 drilled feet, Ulterra’s CounterForce is setting the benchmark in:

- Every county of the play
- For every customer
- On every rig

**Gonzales County** South Texas
Average ROP

- Ulterra CounterForce: 147
- Competitor Offsets: 124

**Karnes County** South Texas
Average ROP

- Ulterra CounterForce: 146
- Competitor Offsets: 115

**La Salle County** South Texas
Average ROP

- Ulterra CounterForce: 140
- Competitor Offsets: 111

**Dimmit County** South Texas
Average ROP

- Ulterra CounterForce: 123
- Competitor Offsets: 108
Ulterra is dedicated to maximizing the efficiency of oil and gas drilling operations through the use of cutting edge steel and matrix PDC bits and innovative application technologies. Throughout the world’s drilling basins we are building our reputation on proven performance. When every run counts, let us show you how we can improve your drilling efficiencies and lower your costs.