

**Drilling
Enhancement
Performance
where it matters**

Our products – many of them unique – are widely recognized for their ingenuity, simplicity and effectiveness in ensuring that customers reach their objectives as quickly and cost effectively as possible. We call it *practical innovation*.

Rubicon's three guiding principles are:

Making it better

From product conception through to design, manufacturing and installation, we partner, respond and adapt to our customers' requirements every step of the way. We ensure that every product is designed and manufactured to work optimally for every client in every environment - every time.

Making it simple

Straightforward yet innovative, our products are practical, often multi-functional and designed to reduce unnecessary complexity while maximizing performance. They are easy to deploy, uncomplicated to the user and fit seamlessly with existing drilling and well construction equipment.

Making it happen

Putting all our expertise at our customers' disposal, we deliver unique, innovative and practical products that meet our customers' challenges head-on, ensuring exceptional customer service at every stage of the delivery process.

That's practical innovation.

Adding value through drilling enhancements

From well trajectory to wellbore geometry, hole sizes, drill string, BHA components and formations being drilled; drilling today is a complicated business with customers looking to squeeze every last bit of value from their operations. Through its range of versatile reamers and stabilizers designed to minimize downtime and maximize value, Rubicon's pioneering products are delivering accurately gauged and high quality wellbores, reduced bit vibrations and reduced risk. The results are higher ROP and improved drilling efficiencies.

Extreme customer focus

Through continued collaboration with our customers, we will design, customize and manufacture a dedicated product to suit your specific application and ensure it is the best solution for your problem.

Our global reach and local roots provide our customers with the best of both worlds, offering dedicated service and one-on-one support throughout the project lifecycle backed up by the resources, engineering expertise and manufacturing of a larger company. In short, we are small enough to care but large enough to deliver

Innovation in product development

Rubicon combines field proven technology with an innovative collaborative approach to extend the capabilities of our products and deliver the best technology available.

Our experienced in-house design team listens to our customers' engineering challenges and use their technical skills to address these challenges head on.

Applications Engineering and Design

Innovative design and applications are crucial to drilling engineers and directional drillers as they look to drill further, faster and with increased precision.

Our applications engineering approach is all about applying our expertise to real world problems.

We combine the knowledge of our specialists with specific objectives and task-oriented software to reduce risk and produce the optimum end product. In this way we provide simple products that address complex challenges.

Applications Engineering

Performing pre-run modeling and post-run analysis on our technologies is key to providing our customers with the best solution. Analyzing actual performance against pre-run modeling allows us to identify potential areas for optimization to improve overall operating efficiencies. By performing extensive post run evaluations on the performance of the GunDRILL Reamer, for example, the customer can be confident that they will enhance borehole quality every time with increased WOB transmission, steadied torque and reduced NPT related to POOH (Pull Out of Hole).

Performance where it matters.

Design

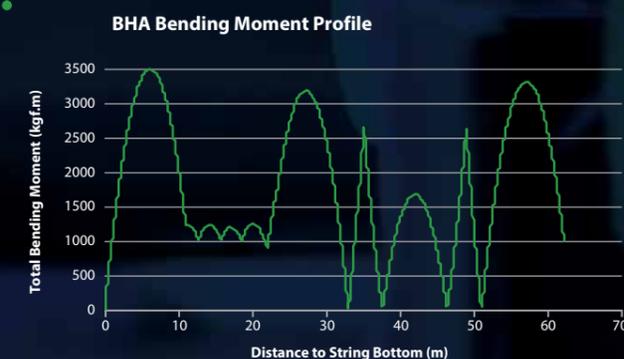
The development, design and customization of our products is exceeding industry quality standards and customer expectations at every step of the product development process. This includes the planned and systematic monitoring, testing and documenting of all practices as well as alignment with all recognized global standards, such as ISO and API.

Our focus on R&D through Rubicon's Engineering Group and our in-house manufacturing where we closely project manage our products throughout the development cycle, also ensures that customer needs and simplicity in application remain the top priority.



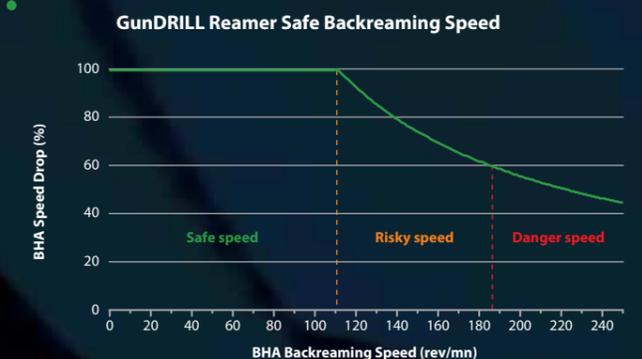
Placement Analysis Ensures BHA Integrity

Total bending moment evolution is computed all along the BHA. Comparing the maximum value to the GunDRILL Reamer bending moment limit, our applications engineering team ensures BHA integrity during the run.



GunDRILL Reamer Safe Backreaming Speed

To avoid accidental connection break out, our applications engineering team use the BHA tally to assess the maximum backreaming rotating speed of the GunDRILL Reamer while pulling out of hole.



GunDRILL Reamer

Enhanced drilling in problematic formations



GunDRILL Reamer

The GunDRILL Reamer provides reaming through a simple blade design that uses proprietary Tungsten Carbide Inserts (TCI) that provide more reaming or stabilization according to the drilling and formation conditions and maintains the gauge for extended durations. TCI distribution is optimized to provide continuous reaming in longitudinal and radial directions. The Rubicon PDC distribution works with our in-house cutter matrix design, resulting in balanced drilling and reduced vibrations. The PDC gauge is passive, allowing it to interact with the formation only when undergauge occurs.

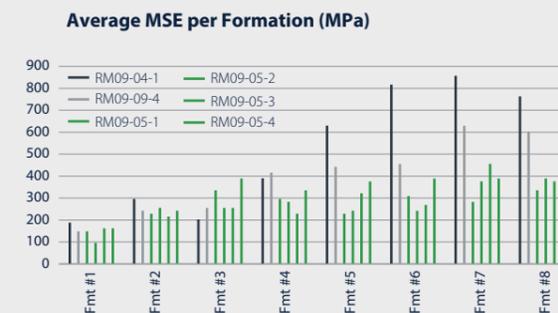
The GunDRILL Reamer is highly flexible being uni-directional for applications where only back reaming is required and bi-directional for applications where front and back reaming is required. There is also the directional variant with flat TCIs for applications where sliding is expected. The tool can be made in steel and non-magnetic configurations to extend the flexibility of tool placement anywhere along the BHA. By reducing the MSE fluctuations, improving WOB transmission, smoothing the pull out process (POOH) and increasing the casing RIH speed, the GunDRILL Reamer is contributing to enhanced drilling deployment in all formations.

By replacing a standard stabilizer with the GunDRILL Reamer the client saved up to USD8m per year by eliminating the need for dedicated wiper trips throughout the Bakken Field.

\$ 8m
SAVING ON DEDICATED WIPER TRIPS

Smoother Drilling Process In Most Formations

The presence of the GunDRILL Reamer reduced the fluctuations of specific energy, smoothing the drilling process in almost all formations.



Increased Casing Running Speed

By replacing a standard stabilizer with the GunDRILL Reamer, the casing running speed was increased by 54%.



Reamers

Superior torque and drag reduction



Roller GunDRILL Reamer

The Roller GunDRILL Reamer combines the advantages of the GunDRILL Reamer with the TorqAVENGER in one tool. With its PDC cutters and gauge-reaming roller cartridges, the tool improves drilling efficiencies, allowing the BHA to be pulled to surface, safely overcoming tight spots and difficult intervals. The Roller GunDRILL Reamer improves hole quality, and reduces casing/completion running times, while minimizing torque and smoothing out fluctuations.

TorqAVENGER

The TorqAVENGER Roller Reamer is a fully customizable reaming and torque-reducing tool that improves borehole shape, size and quality. It provides stabilization by centralizing the BHA, minimizing downhole vibrations, preventing the BHA from resting on the low side of the deviated hole, and reducing BHA fatigue. Benefits for operators include longer gauge life and a reduction in NPT through more efficient reaming and back reaming compared to conventional stabilizers.

Available in 3-Point and 6-Point configurations with multi-stage, uni-directional or bi-directional variations, they can be deployed in almost every BHA as an improved alternative to conventional fixed blade stabilizers.

Historically used for wellbore gauge maintenance, our Reamers have a variety of uses from torque reduction and vibration suppression through to smoother wall finishes for casing runs and improved wellbore integrity.

10%
INCREASE
in drilling hours before repair



GunDRILL Eccentric Reamer

The GunDRILL Eccentric Reamer is an eccentric hole opener used primarily for borehole enlargement. The cutting and gauge PDCs enlarge and maintain the hole at the desired size while the steel pads on the blade protect the casing.



EzeeREAM

EzeeREAM is a fixed blade reamer with blade coverage that is fully customizable to most well conditions. It provides drilling enhancements through hole reaming and doubles up as a fixed blade stabilizer. The EzeeREAM can be customized according to blade coverage and flow by area. Ensuring good condition of hole at the required size for improved wellbore integrity, smooth POOH (Pull Out of Hole) and subsequent well construction, the EzeeREAM also provides BHA stabilization, and reduced bit walk, whirl and vibration to meet these goals. The EzeeREAM Watermelon configuration, with its watermelon profile, is particularly suited to directional applications.

Hole Openers and Stabilizers

Improved borehole quality



EzeeBORE Multi Stage

A PDC hole opener with a lead in gauge section, the EzeeBORE Multi Stage (EzeeBORE MS) opens the hole to an intermediate OD before the second stage opens the hole to the final OD. Tungsten carbide inserts (TCIs) act as stabilizing elements in the first stage and additional TCIs ream and maintain the hole gauge in stage two. Strategically placed nozzles clean and cool the PDCs during borehole enlargement. The EzeeBORE MS enlarges and reams the hole eliminating the need for a dedicated reaming trip while maintaining a high degree of stability during drilling.

EzeeBORE

The EzeeBORE suite of products provide gauge protection to downhole components that do not perform well in undergaged boreholes or poor hole quality, in addition to mitigating any risk of expensive downhole components getting stuck while pulling out of hole. A key characteristic of the tool is its flexibility, being able to be placed anywhere in the drill string and coming in three configurations. The Upper EzeeBORE is suitable for back reaming, the Lower EzeeBORE for front reaming and the EzeeBORE Hole Opener for hole enlargement. With operators looking to maintain gauge size, reduce torque or hole enlargement, this product offers balanced drilling, reduced vibrations, and significant reductions in NPT.

Rubicon hole openers are suitable for wide variety of drilling applications, well conditions and formations – reducing torque, decreasing bit vibration and improving the quality of the hole being drilled.

**10%
INCREASE**
in ROP versus traditional BHA



EzeeSTAB

The EzeeSTAB is a fully customizable stabilizer that reduces bit walk, whirl and vibration and improves borehole quality. The tool, which can be placed in the BHA at carefully selected points evens out BHA bending thereby reducing the fatigue load experienced by BHA components and reducing BHA contact with the formation. In response to customer requirements for flexibility, the tool can be customized for almost any well condition. Variations include blade coverage, the total mud flow by area, the shape of the upset and the length of its full gauge section. The results for the customer are significant reductions in drilling vibrations and torque and drag, increased ROP, extension of bit life, improved drilling efficiencies and borehole quality.



VibraSHIELD

Placed on top of the drill bit or added to the BHA in straight hole drilling, the VibraSHIELD and its blade coverage stabilizes drill bits to sharply decrease bit vibration, protecting the bit and increasing its life. The VibraSHIELD is fully customizable according to mud flow by area, the shape of the upset, the length of its full gauge section, the blade wrap angle and the type of wear protection used. The VibraSHIELD On Bit Stabilizer with Undercut Full-Gauge Upset configuration is suitable for bit stabilization and BHA control in straight and tangent hole drilling, reducing friction without compromising stiffness added to the BHA. The VibraSHIELD Compact for use with Motor Assembly is suited to short continuous upsets and blade wrap angles suitable for directional drilling applications.

Casing and Drill Pipe Protectors



RotoTEC®

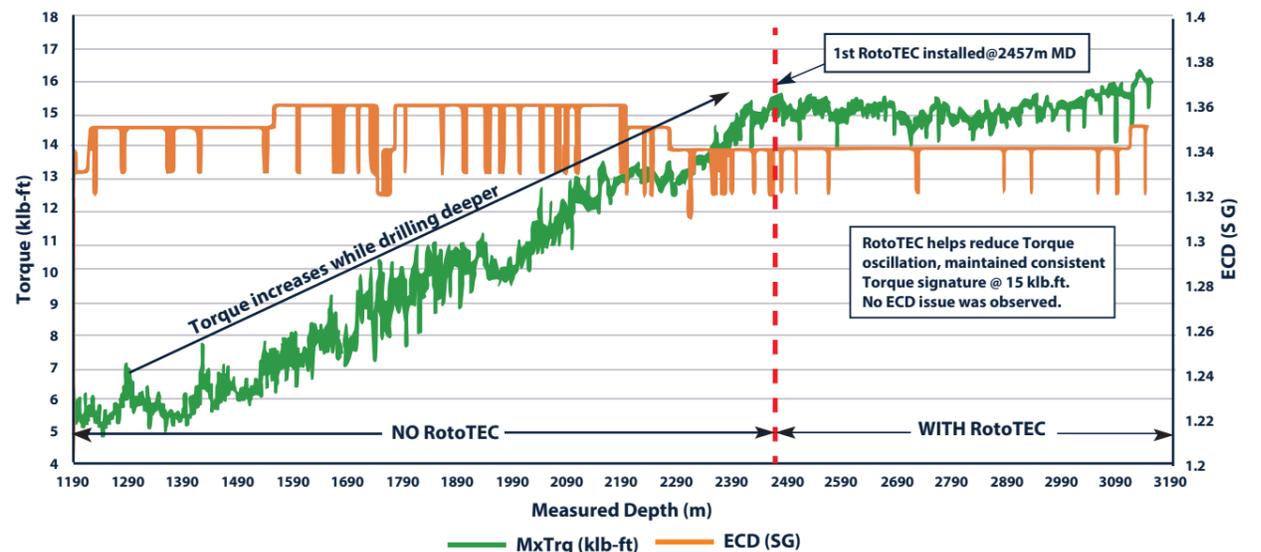
The RotoTEC is a drill pipe deployed tool designed to eliminate casing wear and reduce torque and drag in the drill string. Unwanted casing wear and torque and drag can occur when the drill pipe tool joints come into contact with the casing under side-load during any pipe movement, creating a frictional load between the surfaces. The RotoTEC has a less stiffening effect than rigid sub based tools and a modified protector can be manufactured to provide additional Total Flow Area (TFA) should Equivalent Circulating Densities (ECD) become an issue. Successful installations regularly deliver a reduction in torque of 30%.

Rubicon casing protectors guarantee casing integrity at every stage of the drilling process – **reducing rotational friction between the drillstring and casing, reducing torque and drag and preventing casing wear.**

30%
reduction in torque

Torque signature reduced using 5" RotoTEC in Thailand

Software modeling showed high side forces (>2,800lbf) when drilling 8-1/2" hole (S-type well) highlighting possible casing wear. The operator installed 5.0" RotoTEC® (RT) –1 per joint from 2,457m MD to 2,813m MD and 2 per joint from 2,813m MD to TD. Torque oscillation was observed - increasing as drilling commenced - until 2,457m MD. After the first RotoTEC was installed at 2,457m MD, the torque signature was reduced to a consistent 15,000lb ft to TD.





Putting all our experience and expertise at our customers' disposal, we deliver unique, innovative and practical products that meet our customers' challenges.

Making it happen.

\$3m saving through reduced NPT

The client's highly deviated 71.5 degree well was drilled through challenging sand shale sections with cutting bed and circulation issues. By replacing a standard stabilizer at the top of the BHA with the GunDRILL Reamer, this Malaysian client was able to pull the BHA to surface safely, overcoming high torque, multiple sticking points and difficult intervals – reducing back reaming time and saving USD 3m in non-productive time.

\$300,000 cost saving on dedicated wiper run

An E&P company in Colombia faced difficulty in reaching TD with poor borehole quality due to swelling, tight spots and ledges. The 8-3/8" Bi Directional GunDRILL Reamer was placed in the drillstring above the BHA to allow reaming while drilling. The GunDRILL Reamer successfully removed the irregularities, eliminating the need for a separate costly wiper trip and saving over 15 hours in rig time.

Record of more than 9 million cartridge revolutions of 12-1/4" Bi-directional TorqAVENGER in hard interbedded formations

The client was experiencing issues with WOB fluctuations, washing and reaming every joint, mud losses and challenging BHA dynamics due to hard interbedded formations on 6 oil production wells in the Middle East. The 12-1/4" build sections had formations of hard interbedded Limestone, shale and Marl. Two full gauge TorqAVENGERs were run on the BHA to successfully drill 6 build sections. A unique set of bi-directional cartridges was used to smooth out the torque signature ensuring longevity of the sealed bearings to reduce overall costs.

Improved borehole quality and reduced vibration in highly deviated well

The GunDRILL Reamer was integrated into a highly deviated well in the Middle East to overcome high torque fluctuations in highly interbedded formations. The client also experienced high axial and lateral vibrations leading to poor wellbore conditions. The GunDRILL Reamer reduced the fluctuations of the mechanical drilling strength and enhanced the WOB transmission, proving a better borehole quality. The tool also reduced the BHA lateral and axial vibrations amplitude and variation - mitigating the BHA failure risk.

Safe POOH while delivering improved quality Borehole through fractured chalk

The GunDRILL Reamer was integrated onto a directional BHA to improve borehole quality and safely pull out the assembly in a challenging 64 degree inclination section through swelling shale and faulted chalk, onshore Netherlands. All around the world, GunDRILL Reamer helps to reduce the NPT related to POOH and allows smoother deployment of well construction.

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