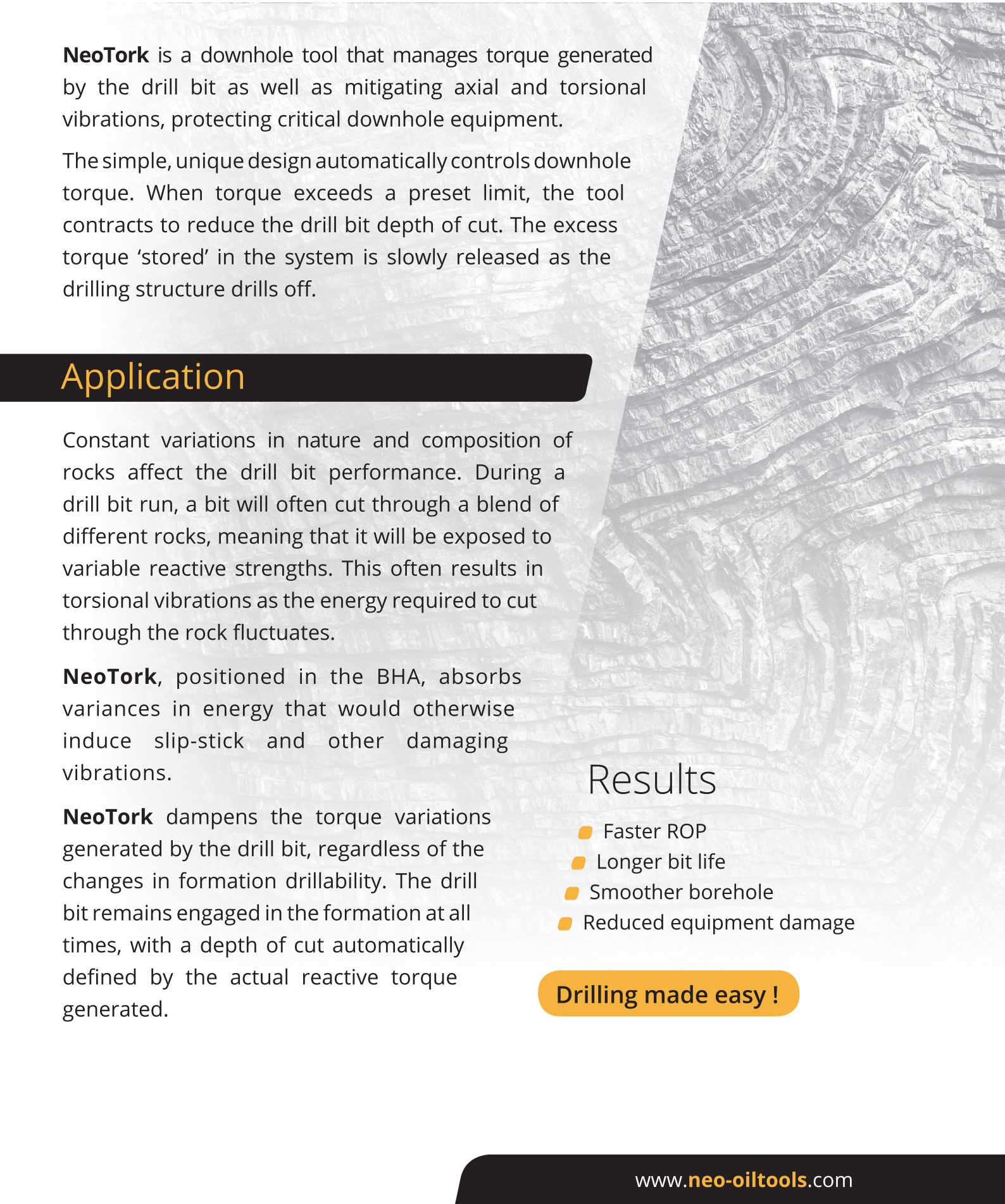
MITIGATING VIBRATIONS & SLIP-STICK IN CHALLENGING FORMATIONS

NeoTork is a downhole tool that manages torque generated by the drill bit as well as mitigating axial and torsional vibrations, protecting critical downhole equipment.

The simple, unique design automatically controls downhole torque. When torque exceeds a preset limit, the tool contracts to reduce the drill bit depth of cut. The excess torque 'stored' in the system is slowly released as the drilling structure drills off.



Application

Constant variations in nature and composition of rocks affect the drill bit performance. During a drill bit run, a bit will often cut through a blend of different rocks, meaning that it will be exposed to variable reactive strengths. This often results in torsional vibrations as the energy required to cut through the rock fluctuates.

NeoTork, positioned in the BHA, absorbs variances in energy that would otherwise induce slip-stick and other damaging vibrations.

NeoTork dampens the torque variations generated by the drill bit, regardless of the changes in formation drillability. The drill bit remains engaged in the formation at all times, with a depth of cut automatically defined by the actual reactive torque generated.

Results

- Faster ROP
- Longer bit life
- Smoother borehole
- Reduced equipment damage

Drilling made easy !

Tool Description

NeoTork is made up of two sections, assembled as a sole body.

There is a boxed connection in the top section of the tool. A shaft in the lower section of the tool supports the pin connection. The tool is supplied to site ready to use.

Top Assembly

Includes a barrel, with a stack of disc springs inside.

These springs are compressed during assembly. The springs push on an axis, forcing NeoTork to extend up to its full length. The number of springs depends on the preset threshold for WOB and torque.

The disc springs are packed in a calibrated quantity and also absorb the tool's axial movement.

Top Assembly :
The disc springs are packed in a calibrated quantity and force the tool open. At both ends of the stack a low friction bearing ensures smooth rotation.

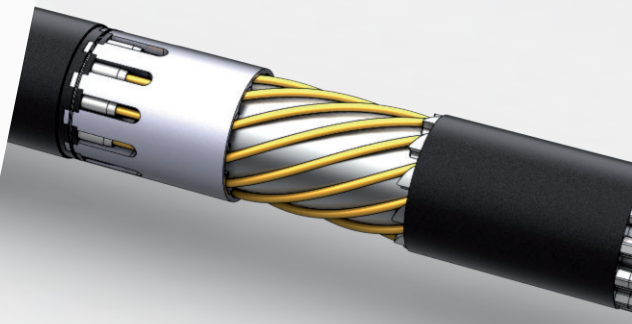
Bottom Assembly

The bottom assembly manages the extension or contraction of the tool. The rotating body, which includes the bottom shaft, is attached by steel cables to the upper section. In the extended position, the cables are set at a pre-defined angle.

When torque levels on the bottom shaft exceed the resistance exerted by the disc springs, the shaft will rotate clockwise. This forces the cables to 'swivel' around the sleeve at an increasing angle, lifting the bottom shaft until torque returns to the set level.

As the bit drills off and torque decreases, the opposite action occurs, letting the tool naturally return to its full length.

Shoulders limit the maximum upward and downward amplitude of the shaft stroke. It is these shoulders, not the cables, that stop the extension or contraction of the tool.



Bottom Assembly :
In the extended position, the cables are set at a pre-defined angle and are all bolted on with the exact same tension at both ends of the bottom section.

OUTER DIAMETER	2-1/8	2-7/8	3-1/2	4-3/4	6-3/4	8-1/2	9-1/2
Overall Length (ft)	4.8	5.5	7.1	14.2	16	17.6	17.6
Minimum ID (in)	0.70	0.79	0.98	1.38	2.05	2.75	2.84
Stroke	1.46	2	2.50	3.25	4.33	4.33	4.33
Ultimate Tensile Load (lbs)	59,000	111,500	215,000	396,000	920,000	1,270,000	2,000,000
Pulling Capacity (lbs)	45,000	90,000	172,000	316,000	730,000	850,000	1,700,000
Ultimate Torque (ft-lbs)	882	2,100	3,100	16,000	45,000	65,000	80,000
Maximum Torque (ft-lbs)	700	1,475	2,200	12,500	33,700	50,000	64,000
Operating Temperature (°F)	425	425	425	425	425	425	425
Connection	1-1/2 AMMT	2-3/8 PAC	2-7/8 REG	NC 38	NC 50	6-5/8 REG	7-5/8 REG

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