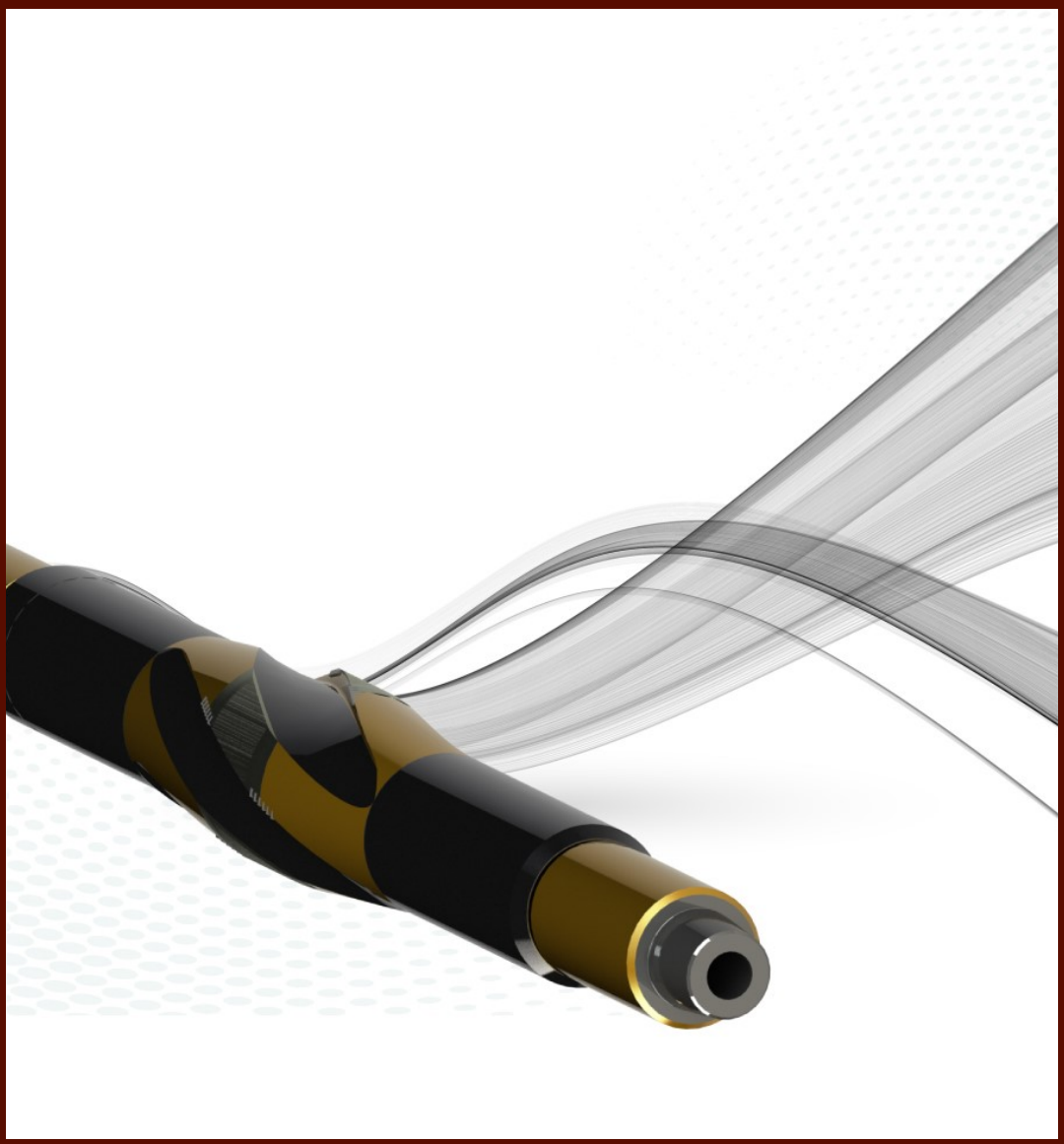
MRS™ STAR
Stabilized Accentuated Reamer



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Geoprotech International Limited

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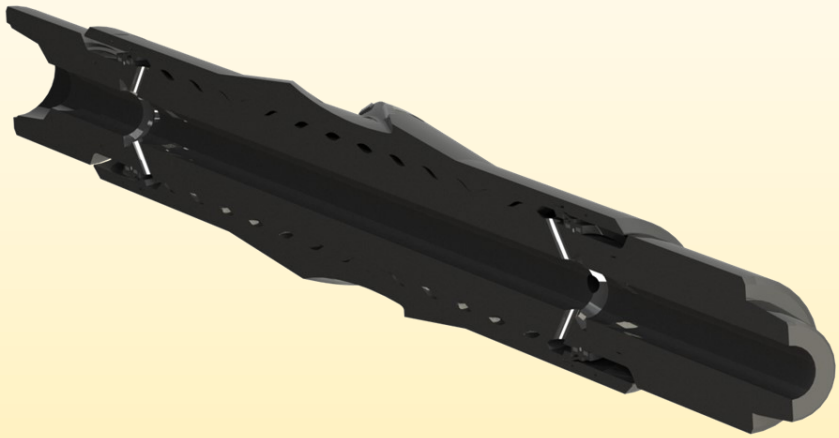
MRS™ STAR
Features & Benefits

- Fluid activated
  - Localized torque for independent reaming operation
- Drilling optimization
  - Improves hole cleaning by stirring up cuttings bed or loose formations into the fluid mid-stream
  - Agitation function ensures better weight transfer to bit
  - Reduces frictional losses (torsional and axial) when drilling due to independent rotation of stabilized reamer
  - Reduces / eliminates the need for reaming (down/up)
- Improves formation evaluation by reducing hole rugosity
- Reduces / eliminates stuck pipe occurrence and incidents and provides a response where event is localized around the MRS™ STAR
- Delivers fluid activated direct reaming action at the tool thus enabling drilling crews get out of most hole and geologically induced problems
- Eliminates stick-slip and drill string vibrations

MRS™ STAR

MRS™ Stabilized Accentuated Reamer

The MRS™ STAR is a drilling solution specifically designed to improve drilling efficiency by reducing dependency on multiple wiper trips, backreaming and dedicated reaming activity. The MRS™ STAR is a very unique tool. It comes complete with a 2.2 stage 7/8 lobe motor power section with mud-cooled sealed bearings that deliver over 6,000 ft-lbs of torque through carefully designed and chamfered stabilizer blade profile with gradual leading edges for both downward and upward reaming. The MRS™ STAR is fluid activated by circulating fluid down the drill string. Additional torque can be transferred to the tool by rotating the drill string.



The MRS™ STAR is based on the MRS™ concept and designed purely for drilling enhancement and for drilling applications only. It is specifically focuses on rigs with sufficient hydraulic power to but where torque limitations on either surface equipment or string components or both, limit string rotation to combat hole problems such as tight spots, swelling shales or wellbore collapse, where traditionally, the solution would have required backreaming.

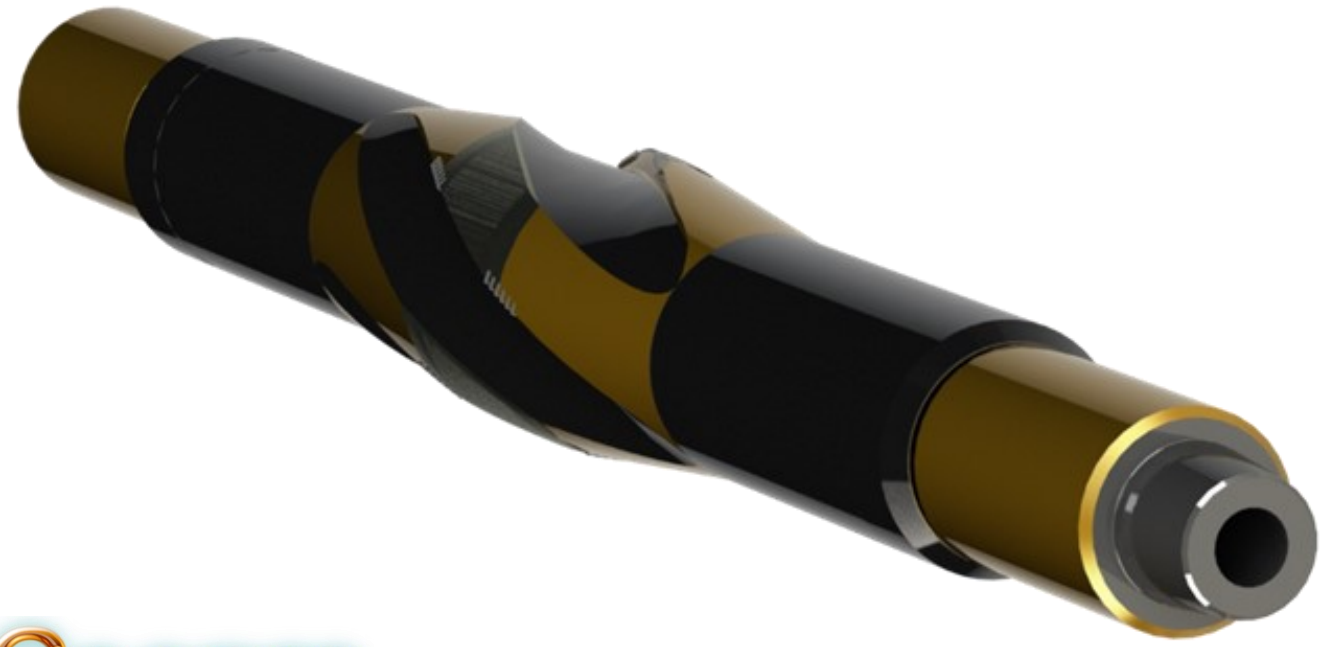
The MRS™ STAR includes a complete power section with rotor and stator (and the rotor could be lined with elastomer or may also come as rubberless). The rotor and stator are attached to the string in such a way as to cause the rotational force created to be applied only to the stator causing it to rotate.

MRS™ Stabilized Accentuated Reamer—STAR

The MRS™ STAR actuates with circulation. When fluid is circulated up to the threshold flow rate, the external sleeve starts to rotate clockwise looking downwards. This rotation is irrespective of the rotation of the drill string. The STAR is self torque-generating due to the associated power section that generates both torque and rotation.

- This family of tools should enable drilling teams to ream in and out of hole without string rotation making it the ultimate reaming solution for tight spots, hole pack-offs, swelling shales, and all manner of wellbore instability related issues.
- Due to its unique internal power generation this tool will contribute lesser torque to the string in drilling mode that regular reamers or stabilisers.
- String rotation can be used to increase the available torque at the STAR for rock destruction and deformation.
- Due to its offset dynamics and harmonics it is expected to reduce stick slip or drill string vibrations.
- It is bored in the centre to ensure better signal transfer for telemetry systems that require to communicate using the internal fluid medium in the drill string.
- It will act as a conventional stabiliser as well as a reamer.

The MRS™ STAR is available for hole sizes from 14¾" and smaller and can be used as an integral component of the drill string when drilling with motors, rotary steerable systems and rotary drilling applications. Multiple MRS™ STAR components can be run in the same drill string



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MRS™ STAR 1200

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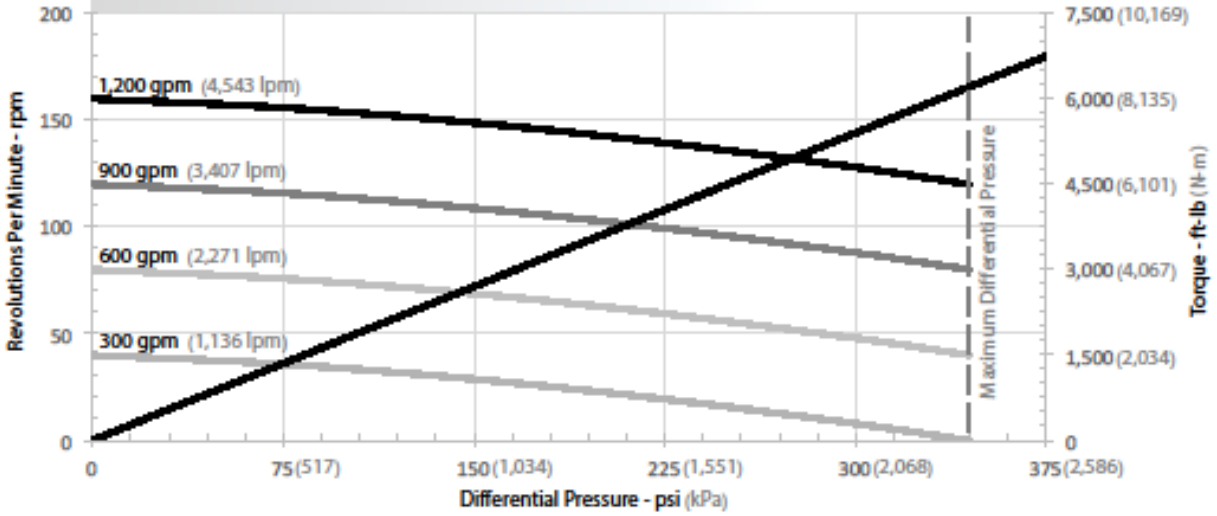
MRS STAR
7 | 8 2.3 CONFIGURATION

SPECIFICATIONS	IMPERIAL	METRIC
Maximum Differential Pressure	345 psi	(2,379 kPa)
Torque Slope	17.984 ft-lb/psi	(3.536 N-m/kPa)
Torque at Maximum Differential	6,204 ft-lb	(8,412 N-m)
Stall Torque	9,306 ft-lb	(12,617 N-m)
Maximum Horsepower	142 hp	(106 kW)
Flow Range	300 - 1,200 gpm	(1,136 - 4,543 lpm)
RPM Ratio	0.133 revolutions / g	(0.035 revolutions / l)
No Load RPM Range	40 - 160 rpm	
Recommended Hole Size	12.25 in	(311 mm)
Maximum OD	12.00 in	(305 mm)
Nominal OD	10.25 in	(260 mm)
Joint OD	8.25 in	(210 mm)
Maximum Weight on Bit	95,000 lb	(42,250 daN)
Overall Length	149.00 in	(3.78 m)
Overall Weight	2,818.78 lb	(1,278.58 kg)

LAYOUT

POWER CURVE



MRS™ STAR 0825

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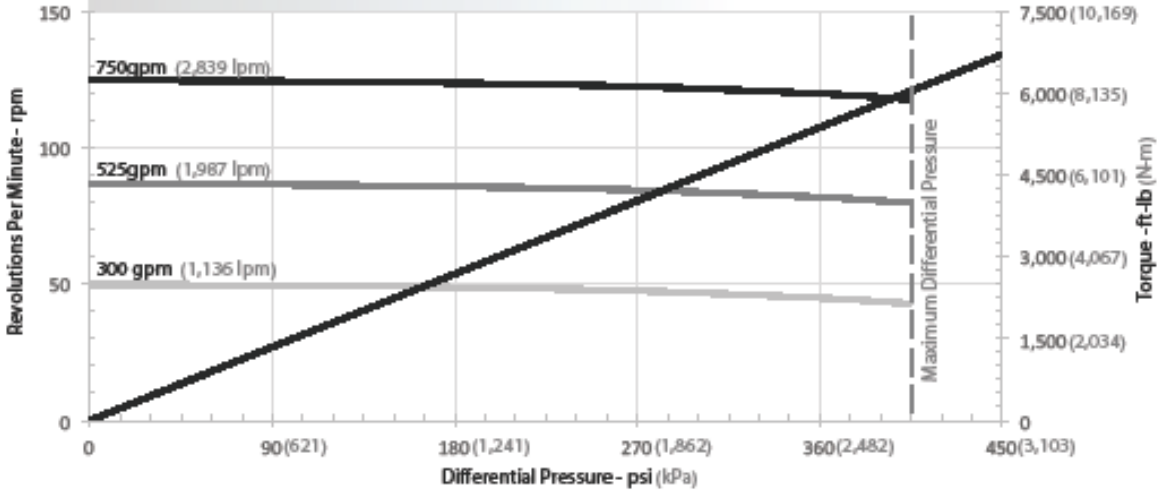
MRS STAR
7 | 8 2.7 CONFIGURATION

SPECIFICATIONS	IMPERIAL	METRIC
Maximum Differential Pressure	405 psi	(2,792 kPa)
Torque Slope	14.931 ft-lb/psi	(2.937 N-m/kPa)
Torque at Maximum Differential	6,047 ft-lb	(8,199 N-m)
Stall Torque	9,071 ft-lb	(12,299 N-m)
Maximum Horsepower	141 hp	(105 kW)
Flow Range	300 - 750 gpm	(1,136 - 2,839 lpm)
RPM Ratio	0.133 revolutions / g	(0.035 revolutions / l)
No Load RPM Range	50 - 125 rpm	
Recommended Hole Size	8.50 in	(216 mm)
Maximum OD	8.25 in	(210 mm)
Nominal OD	7.75 in	(197 mm)
Joint OD	6.50 in	(165 mm)
Maximum Weight on Bit	80,000 lb	(35,600 daN)
Overall Length	144.00 in	(3.66 m)
Overall Weight	2,094.97 lb	(950.26 kg)

LAYOUT

POWER CURVE



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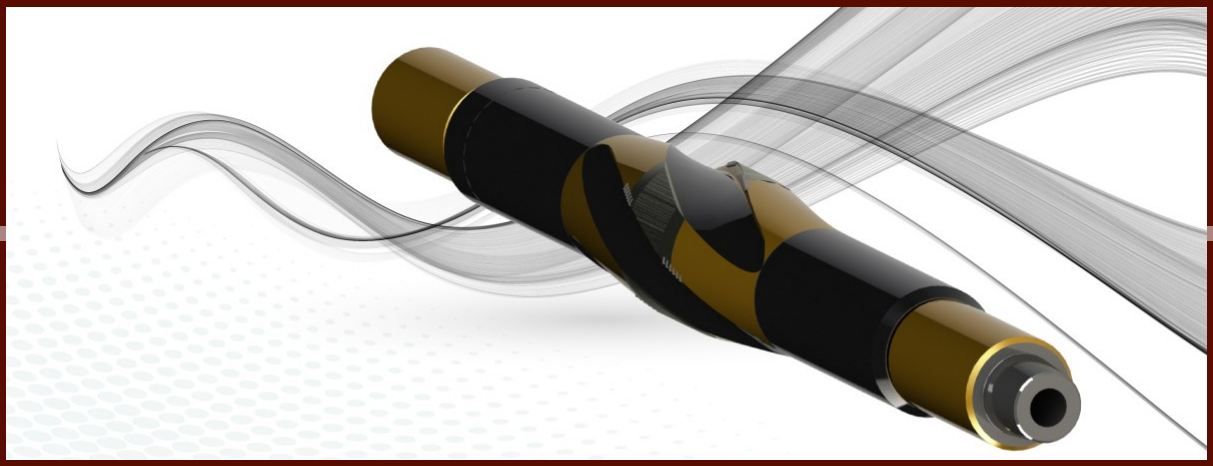

GEOPRO TECHNOLOGY

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