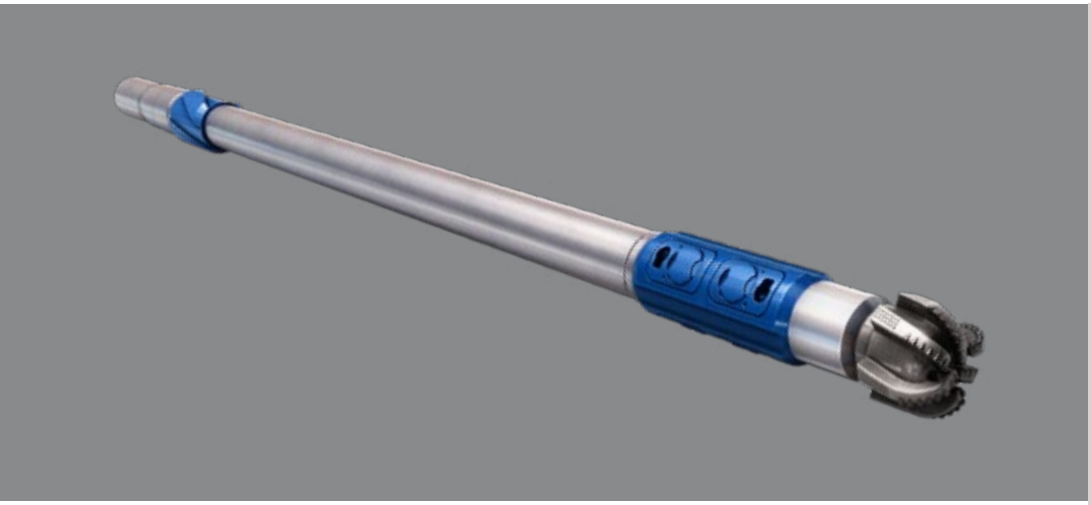
Next-Gen RST—Increased Technical Capabilities Helps Maximize Performance

Streamlined Tool Improves Reliability to Stay Downhole Longer



D-Tech's next-generation rotary steerable tool (RST) combines a fit-for-purpose design with multiple technical advancements—such as real-time telemetry, high-speed, and high-temperature capabilities—to provide a more reliable, efficient, and cost-effective drilling solution. Designed to drill at a maximum operating speed of 330 RPM, the RST can be added to motor-assisted operations to increase rates of penetration (ROP) and push drilling efficiency.

The push-the-bit tool delivers consistent, predictable build rates to drill a high-quality wellbore that can improve production over the long term. The fully contained system includes only 10 moving parts and requires no connections—even to MWD/LWD sensors—making it truly plug-and-play in virtually any bottomhole assembly (BHA).

To further reduce nonproductive time (NPT), all programming is completed by D-Tech in advance, minimizing human error at the rig. The next-gen rotary steerable, which includes upgraded hydraulics and pistons, does not have an external data port; thus, eliminating the potential for fluid invasion through the port.

Extremely robust, the next-gen tool includes a slick control unit collar, without any through holes, to reduce the risk of collar cracking under severe torsional vibration. Its patented shock mitigation technology allows it to withstand high-shock events and operate reliably in harsh drilling environments.

The RST incorporates D-Tech's proprietary software platform, increasing inclination and azimuthal control while helping decrease wellbore tortuosity, improve ROP, and provide more reliable steering results in challenging applications. An enhanced electronics and sensor package offers additional communications capabilities and data to accurately and effectively place the wellbore.

D-Tech understands that drilling high-performing wells requires more than technology. To further improve performance and avoid NPT, an experienced onsite D-Tech technician and 24/7 remote support are available when tools are downhole. A post-run report and analysis to maximize performance on future jobs can also be provided.

Applications

- Intermediate, vertical, curve, and laterals
- Harsh and remote drilling environments
- Onshore and offshore complex directional drilling

Benefits

- Expedites well delivery through higher torque and rotational speed capability and enhanced automated steering
- Increases reliability since the streamlined, robust design has minimal moving parts, experiences less damage, and stays in the hole longer
- Minimizes costs, NPT, and risks with real-time drilling capabilities and no surface programming
- Enhances wellbore placement accuracy with real-time capabilities
- Expands BHA design flexibility since the universal plug-and-play system is compatible with virtually any bit, motor, MWD/LWD sensor, fluid system, etc.

Features

- Next-gen directional control software offers full 3D directional control with build, drop, and turn capabilities
- Rugged design with patented shock mitigation technology increases reliability and decreases maintenance costs and turnaround times
- Solids-control system increases tool longevity in high-LCM and high-solids applications
- Upgraded hydraulics, pistons, and software improves communications, longevity, and performance
- Closed-loop control and power systems allow for operations at high hours without risk of power loss
- Onsite D-Tech technician, 24/7 remote support, and post-well analysis available to optimize drilling programs

Next-Generation Rotary Steerable Tool Specifications

	RST475	RST500	RST650	RST675	RST900
Hole size, in. (mm)	5 7/8 to 6 ½ (149.225 to 165.1)	6 ¾ (171.45)	7 7/8 (200.025)	8 ½ to 8 ¾ (215.9 to 222.25)	12 ¼ to 12 ½ (311.15 to 317.5)
Tool length, ft (m)	11.5 (3.50) w/o stabilizer	11.5 (3.50) w/o stabilizer	15.637 (4.766) w/ stabilizer sub	13 (3.96) w/ stabilizer	12.87 (3.92) w/o stabilizer
Nominal OD, in. (mm)	4.75 (120.65)	5.00 (127)	6.50 (165.10)	6.75 (171.45)	9 (228.6)
Max overpull, lb (N)	400,000 (1,800,000)	400,000 (1,800,000)	1,100,000 (4,900,000)	1,200,000 (5,300,000)	1,500,000 (6,700,000)
Max torque-at-bit, ft-lb (Nm)	11,000 (14,914)	11,000 (14,914)	20,000 (27,116)	20,000 (27,116)	65,000 (88,128)
Max weight-on-bit, lb (N)	Drill bit limited	Drill bit limited	Drill bit limited	Drill bit limited	Drill bit limited
Bit connection, in.	3 ½ Reg	3 ½ Reg	4 ½ Reg	4 ½ Reg	6 5/8 Reg
Max DLS passthrough - nonrotating (rotating), °/30m [1]	25 (15)	25 (15)	16 (10)	16 (10)	10 (7)
Flow range, gpm (lpm) [2]	170 to 400 (643 to 1,514)	170 to 400 (643 to 1,514)	300 to 670 (1,135 to 2,540)	300 to 670 (1,135 to 2,540)	410 to 1,200 (1,552 to 4,550)
Max mud density, lb/gal (kg/L)	20 (2.39)	20 (2.39)	20 (2.39)	20 (2.39)	20 (2.39)
Chlorides, ppm [3]	Material dependent	Material dependent	Material dependent	Material dependent	Material dependent
Max LCM concentration, lb/bbl (kg/L) [4]	30 (0.13)	30 (0.13)	50 (0.19)	50 (0.19)	50 (0.19)
pH [5]	9 to 12	9 to 12	9 to 12	9 to 12	9 to 12
Max sand content, %	1	1	1	1	1
Max pressure, PSI (MPa)	20,000 (137.9)	20,000 (137.9)	20,000 (137.9)	20,000 (137.9)	20,000 (137.9)
Max temperature, °F (°C)	320 (160)	320 (160)	320 (160)	320 (160)	320 (160)
Max operational RPM	330	330	330	330	230
Max DLS capability, °/100 ft (°/30m) [6]	8	8	8	8	5
Up-hole/top connection, in. [7]	3 ½ IF (NC38) or XT39	3 ½ IF (NC38) or XT39	4 ½ IF (NC50)	4 ½ IF (NC50)	6 5/8 API Reg

1 Contact your D-Tech rep if your DLS exceeds what is provided.
2 Dependant on mud density.
3 >50,000 ppm requires the RST to be surface flushed/externally cleaned with freshwater post-run. High chloride-resistant material options are available; contact D-Tech.
4 Subject to the type of lost circulation material (LCM), medium-sized LCM. For specific materials, contact D-Tech.
5 D-Tech should be contacted for silicate fluid systems.
6 Dependent on application, formation, bit design, run parameter, etc.
7 Alternative top connections are available on request.

The D-Tech RST has been run reliably in every shale play in North America. It has consistently delivered value by reducing risk, drilling time, and cost-per-foot while providing high directional accuracy and overall reliability to total depth. To learn how we can help you on your next drilling campaign, contact your local D-Tech representative to take control of your well.

D-TECH ROTARY STEERABLE

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