

# Proxima advanced logging services

Safe. Fast. Accurate. **NO COMPROMISE.**

[bakerhughes.com](http://bakerhughes.com)

**Baker Hughes** 

## Proxima service advantages

Baker Hughes has developed **Proxima™ advanced logging services** to provide comprehensive solutions to meet any formation evaluation logging challenge. On land or offshore, Proxima advanced logging services safely and quickly gets your critical logging data in complex drilling environments, challenging wellbore conditions, and slimhole production sections enabling you to make insightful operational decisions and meet or exceed your targets. Proxima logging services can be performed remotely at any location, significantly reducing the operations footprint at the wellsite.



SAFETY



## Safety

Proxima advanced logging services provide the confidence to log in conventional or unconventional drilling environments and any hole condition with a full range of deployment capabilities.

For through-pipe logging services, Proxima provides two barriers for well control. When conducting through drill pipe memory logging operations, there are two downhole safety valves in the BHA near the bit. One valve is primary and the second one is a backup. These safety valves will isolate the drill pipe in the event of any influx from downhole. The second barrier is the surface pressure control equipment that is used for tool deployment that in combination provides complete control of the well to insure safe logging operations.

Whatever hazard you encounter with through-pipe logging, you are in complete control with the ability to reciprocate, circulate, and rotate with Proxima.



SPEED



# Speed

CLICK OR TAP THE CHARTS TO ENLARGE

There are no wasted runs with Proxima services. The robust bottom hole logging assembly with the application specific Baker Hughes drill bit gets you to total depth (TD) quickly. At total depth the logging string is verified in real-time after deployment so that you can be sure that every run is getting you the critical data you need.

You can log up to 60 feet per minute while getting full resolution, high quality log data. The Proxima hardware platform uses on-the-fly data processing so that your data is complete and ready immediately after the logging run. This allows you to make critical operational and production decisions quickly.

Proxima advanced logging services logged and helped secure the well 20 hours faster with less risk and NPT.

ACCURACY



## Accuracy

With Proxima logging services, your data is accurate, regardless of the holes size, wellbore environment, or conveyance method, with no compromises for tool size.

The Proxima 2.25-in. (57 mm) logging tools maintain the depth of investigation and vertical resolution of larger diameter logging systems along with and 350°F (175°C) temperature and 20k psi (137.9 MPa) pressure ratings, making it the premier logging system in its class.

Extensive testing was conducted at our Austin, Texas test well to validate that the measurement performance would be on par with standard size open hole logging tools. The environmental correction algorithms were verified as well as the performance at 60 ft/min (18.3 m/min) logging speed.

The Austin test well is drilled vertically, through cretaceous limestone formations. The well is 2000 ft (609.6 m) deep with specific logging challenges due to variable hole size, from 13¼-in. (349.25 mm) at the top to 7⅞-in (200 mm) at the bottom. There is additional borehole deterioration introduced through years of utilization.

The Proxima open hole quad-combo logging string was comprised of Array Induction Resistivity, Cross-Dipole Acoustic, Bulk Density, Compensated Neutron and Gamma Ray. Multiple passes were recorded at the standard logging speed of 30 ft/min (9.1 m/min) and at a

high speed of 60 fpm (18.2 m/min). The data was acquired in both real-time surface read-out mode, and downhole recording directly to memory. The measurements were compared with the established standard-size Baker Hughes quad-combo recorded at 30 ft/min (9.1 m/hr) to assess the quality of measurements and environmental corrections of the Proxima service.

The results showed an excellent correlation between all measurements. Despite the hole rugosity, the hardware design and string configuration were able to maintain good contact with the formation. There is no deterioration in data quality even at the elevated logging speed of 60 fpm. The test confirmed the ability to optimally position the sensors in this borehole and confirmed the accuracy of both measurement modeling and the resulting environmental corrections needed to translate the raw data into reliable measurements. The centralized acoustic instrument has the signal strength and gain control to achieve good signal and strong semblance over the entire receiver array, even across washed-out sections and slow formations.

The advantage you get with a Proxima logging solution is safe, fast and efficient operations, with accurate data, every time.

[CLICK OR TAP THE LOGS TO ENLARGE](#)

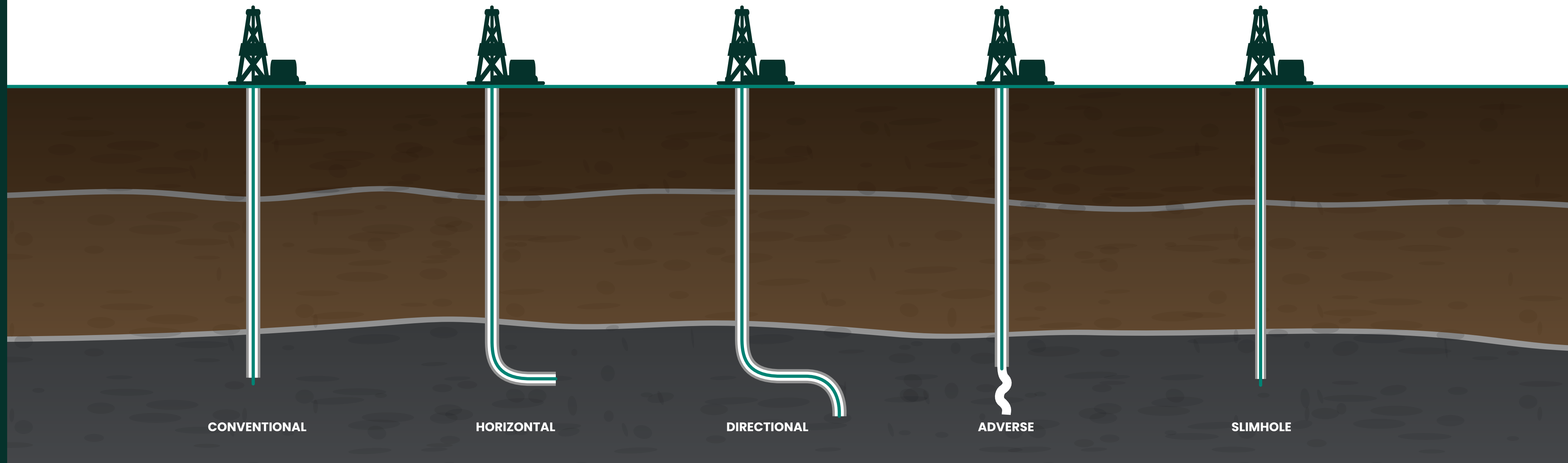
CONVEYANCE VERSATILITY



# Conveyance versatility

You have the advantage of complete flexibility in deployment configurations that allows conveyance with electric wireline, tractor, slickline, coiled tubing, or drill pipe. This conveyance flexibility provides the ability to perform real-time or memory through-pipe operations, access ultra-slim boreholes, navigate through highly tortuous well trajectories and reach long horizontals keeping the logging tools fully protected during the entire run.

The comprehensive capabilities of Proxima advanced logging services provide you with the confidence to plan your logging program at the earliest stage of your drilling program knowing that you get safe, fast and efficient operations, with accurate data, every time.



# Applications

## Open hole and cased hole

Proxima advanced logging services provide fast and accurate data in the most challenging wellbores. Applications range from hole sizes 3-in. (76.2 mm) to 12.25-in. (311.15 mm)

## Real-time and memory logging

Proxima advanced logging services provide depth control and logging data accurately in real-time or memory mode, regardless of the hole size, wellbore environment, or conveyance method. The redundant memory capacity is 56 GB for up to 35,000 ft. (10,668 m) of logging capacity. There are up to four battery modules that enable 128 hours of operating time. Multiple memory and battery subs can be used within the string as a backup.

## Conventional and unconventional wells

Proxima advanced logging services provide the ability to log in conventional or unconventional drilling environments. Deploying the services in long horizontal wells, with high dogleg severities, fluid losses, and differential pressures are no longer a problem.

## Challenging borehole conditions

Proxima advanced logging services can be deployed in horizontal, highly deviated, high temperature, high pressure, hole collapse, fluid losses, and high doglegs severity, while well control can be managed with the Proxima bottom hole logging assembly (BHA).

## Complex drilling methods

Proxima advanced logging services work with managed pressure drilling (MPD) and can safely be deployed while controlling the risks of managing the wellbore pressures when different drilling techniques and procedures are required to log the well such as underbalanced, near-balance, or mud cap.

## High temperature and high pressure

The Baker Hughes manufacturing standard verification ensures that all tools are tested and ready to perform in environments rated to 350°F (175°C) and 20,000 psi (137.9 MPa).

GAMMA RAY LOG  
SERVICES

# Gamma ray log services

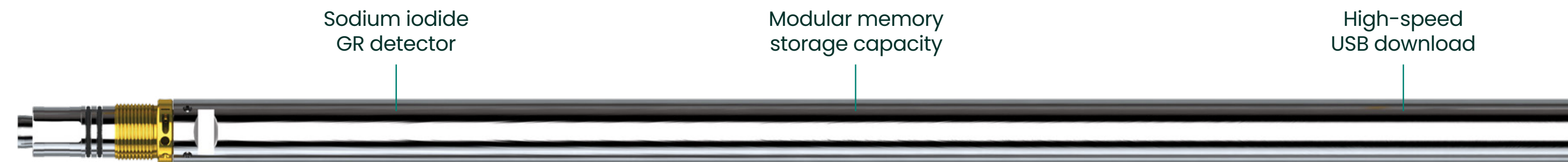
The Proxima gamma ray and memory storage service is an advanced multifunctional tool providing gamma ray measurements in real time when logged with wireline and has a centralized storage capacity for memory operations. For memory operations, recorded data is merged with the time depth log from the depth tracker to produce the log in a standard format.

**Logging applications**

- Depth determination
- Depth correlation
- Calculation of shale volume
- Lithology Identification

Specifications	
Length	4.1 ft (1.2 m)
Diameter	2.25 in. (57 mm)
Weight	32 lbs (14.3 kg)
Pressure rating	20,000 psi (140 MPa)
Gamma ray temperature rating	350°F (175°C)
Maximum hole size	No limit
Tensile strength	42,900 lbs. (190,828 N)

Measurement	
Output	GR, data storage
Range	0 to 2,000 API
Vertical resolution	12-in. (30 cm)
Accuracy	5%
Depth of investigation	9-in. (23 cm)





COMPENSATED  
NEUTRON LOG SERVICE



# Compensated neutron log service

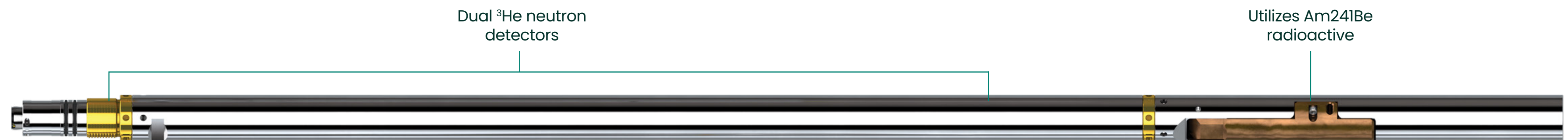
The Proxima compensated neutron service utilizes an Americium-241/Beryllium (Am/Be) neutron source and dual Helium-3 detectors to measure the ratio of thermal neutrons at each detector. The ratio is environmentally corrected and porosity is calculated for the desired lithology. When run in combination with the compensated density, indications of lithology and gas zones can be interpreted.

### Logging applications

- Determination of porosity
- Lithology identification
- Identification of gas zones

Specifications	
Length	5.3 ft (1.6 m)
Diameter	2.25-in. (57 mm)
Weight	43 lbs. (19.5 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Maximum hole size	14-in. (355.6 mm)
Tensile strength	42,900 lbs. (190,828 N)

Measurement	
Output	Thermal Neutron Porosity
Range	-3 to 60 pu
Vertical resolution	12-in. (30 cm)
Accuracy	+/- 1 pu or 6%
Depth of investigation	9-in. (23 cm)



COMPENSATED DENSITY  
LOG SERVICE



# Compensated density log service

The Proxima compensated density service utilizes a Cesium (Cs137) gamma ray source to bombard the formation. Dual detectors measure the energy spectrum and count rates of the returned gamma rays whereby both the bulk density and the photoelectric absorption index are calculated. A motorized caliper arm ensures pad contact with the borehole wall to reduce environmental effects and provide borehole caliper measurement.

Specifications	
Length	10.9 ft (3.3 m)
Diameter	2.25-in. (57 mm)
Weight	128 lbs. (58.2 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Maximum hole size	14-in. (355.6 mm)
Tensile strength	42,900 lbs. (190,828 N)

### Logging applications

- Determination of bulk density
- Formation porosity
- Lithology identification
- Identification of gas zones
- Identification of washouts
- Borehole volume

Measurement	
Output	Bulk Density, PE, Caliper
Range	1.2-3.0 g/cc, 0-10 b/eI, 3-20 in
Vertical resolution	12 in (30 cm)
Accuracy	+/-0.015 g/cc, +/-0.15 b/e, +/-0.15-in.
Depth of investigation	9-in. (23 cm)



# Inline monopole

The monopole acoustic tool is designed for acquiring high-resolution, full-wave acoustic data. The tool features a monopole transmitter and a five-receiver array, which records waveforms at each receiver, while obtaining formation interval compressional travel time ( $\Delta t_c$ ) and shear ( $\Delta t_s$ ) in fast formations. The monopole acoustic tool requires a fluid-filled borehole and can be used in fresh, salt or oil-based mud systems. In cased holes, a traditional cement bond log can be produced.

Specifications	
Length	11.9 ft (3.6 m)
Diameter	2.25-in. (57 mm)
Weight	77 lbs (35 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Maximum hole size	12-in. (304.8 mm)
Tensile strength	9,000 lbs. (40,034 N)

## Logging applications

- Compressional and shear velocity measurement
- Determine mechanical characteristics of formation
- Correlate seismic data
- Secondary porosity measurements (vugs, fractures)
- Determination of lithology
- Casing cement evaluation

Measurement	
Output	Delta-T CBL
Range	40 to 160 us/ft
Vertical resolution	2 ft (0.61 m)
Accuracy	+/- 2 us/ft (+/-6.6 us/m)
Depth of investigation	3-in. (7.62 cm)



# Cross dipole

The cross dipole acoustic tool, combining monopole and cross dipole acoustic technology, provides a detailed acoustic representation of the formations surrounding the borehole including horizontal and challenging well profiles. The information acquired is vital for geo-mechanical analysis, wellbore stability, and production enhancement-treatment design. Acoustic anisotropy and the orientation of the anisotropy can be used to determine the orientation of natural fractures.

Specifications	
Length	22.53 ft (5.73 m)
Diameter	2.25-in. (57 mm)
Weight	208 lbs (79 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Maximum hole size	14-in. (355.6 mm)
Tensile strength	28,000 lbs (124,550 N)

## Logging applications

- Porosity estimation
- Anisotropy and stress evaluation
- Natural and hydraulic fracture evaluation
- Field development optimization
- Formation and reservoir characterization
- Stratigraphic correlation

Measurement	
Output	Monopole compressional, dipole shear, stoneley fracture evaluation, anisotropy characterization, full waveform
P-range	40 to 200 $\mu$ S /FT (130 to 656 $\mu$ S/M)
S-range	70 to 400 $\mu$ S /ft (230 to 1312 $\mu$ S/m)
Vertical resolution	3.5 ft (1.07 m) 6-in. (127 mm) enhanced resolution
Accuracy	2 $\mu$ S OR +/- 2%
Depth of investigation	9-in. (228.6 cm)





# Array induction

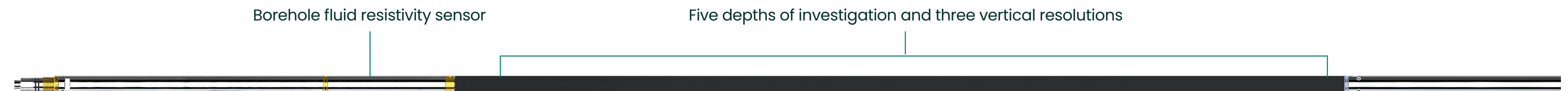
The array induction tool produces accurate measurements of open hole formation conductivity as a function of radial distance and depth. The tool uses one transmitter coil providing excitation signals at multiple frequencies into the formation, while an array of receiving coils senses the return signal from the formation. The multi-channel signal-processing technology provides a robust and stable tool response with enhanced radial and vertical resolution despite borehole conditions and formation environments.

Specifications	
Length	16.2 ft (4.9 m)
Diameter	2.25-in. (57 mm)
Weight	105 lbs (47 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Maximum hole size	14-in. (355.6 mm)
Tensile strength	20,000 lbs (88,964 N)

## Logging applications

- Determination of true formation resistivity  $R_t$
- Determination of Water Saturation  $S_w$
- Movable fluids identification
- Invasion profiling
- Thin-bed analysis
- Well-to-well correlation
- Borehole fluid resistivity measurement

Measurement	
Output	Induction resistivity, mud resistivity, optional SP
Range	0.2 to 2000 OHM-M
Vertical resolution	1 ft, 2 ft, 4 ft
Accuracy	+/-1.0 MS/M OR +/-2%
Depth of investigation	10-in., 20-in., 30-in., 60-in., 90-in.





## Geospatial positioning service

The Proxima geospatial positioning service utilizes a high-resolution directional sensor package to determine the wellbore trajectory and the position of the logging tool with respect to the wellbore. The high-resolution directional sensor consists of a three-axis accelerometer and a three-axis magnetometer; these measurements are used to determine the gravitational force and magnetic field acting on each axis from which the navigation and borehole orientation information are derived. The measurements from the tool aid in analyzing data from other

tools in deviated wellbores and can be used in the answer products from other sensors (e.g. cross-dipole azimuthal anisotropy analysis). The navigation tool is fully compatible with the rest of the Baker Hughes micro slim tool suite and its advanced range of conveyance options.

### Logging applications

- Determining borehole trajectory (azimuth and inclination)
- Applying speed correction to formation evaluation data
- Direction and orientation measurements for other sensors (Relative earing and tool azimuth)

Specifications	
Length	7.2 ft (2.2 m)
Diameter	2.25-in. (57 mm)
Weight	54 lbs (24.5 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Maximum hole size	No limit
Tensile strength	65,000 lbs (289,134 N)

Measurement	
Output	Borehole azimuth, inclination, relative bearing and tool azimuth
Range	0 to 360°
Vertical resolution	3-in. (7.6 cm)
Accuracy	Azimuth ±1.5°, Inclination: ±1°

Three-axis accelerometers and three-axis magnetometers





Spontaneous potential >

## Spontaneous potential

The spontaneous potential tool allows lithology identification and can be used as a means of log correlation. Use the spontaneous potential tool to determine bed boundaries, indicate porosity and permeability, and measure the difference in potential between the downhole electrode and a surface electrode.

Mechanical	
Length	2.96 ft (.09 m)
Diameter	2.25-in. (57 mm)
Weight	10.2 lbs. (4.62 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Tensile strength	65,000 lbs. (289,134 N)





# Casing collar locator

Used as a means of depth control, the casing collar locator responds to variances in metal volume, such as pipe collars and perforations.

Specifications	
Length	1.56 ft (.48 m)
Diameter	2.25-in. (57 mm)
Weight	17.4 lbs (7.89 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Tensile strength	65,000 lbs. (289,134 N)

Casing collar locator



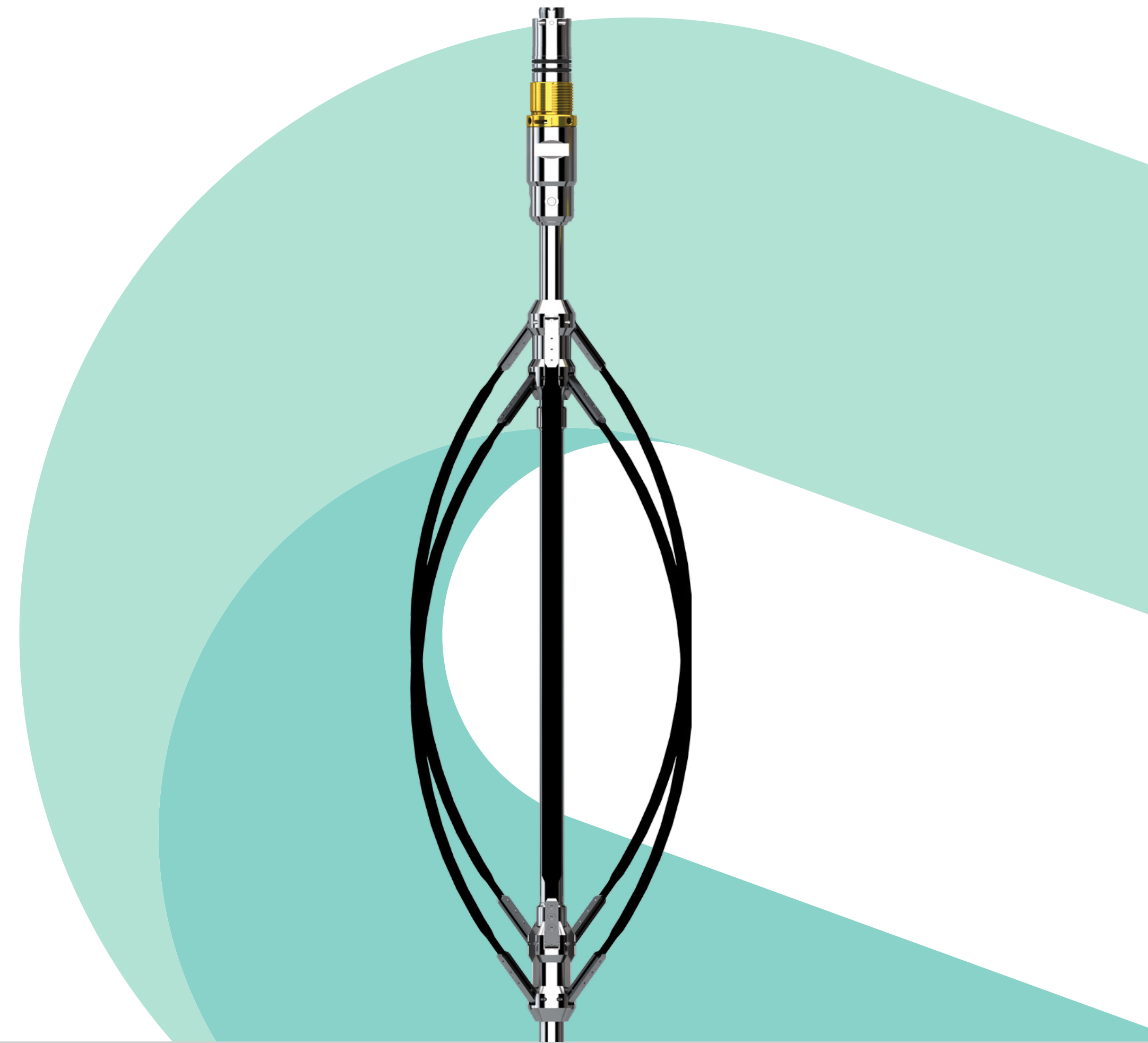




# Centralizer

Centralizers optimize tool position while minimizing environmental effects. With the ability to fully collapse to a 2 ¼-in. diameter, Proxima centralizers offer a through-tubing-capable solution for conventional, directional and horizontal wellbore applications.

Specifications	
Length	1.56 ft (.48 m)
Diameter	2.25-in. (57 mm)
Weight	17.4 lbs (7.89 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Tensile strength	65,000 lbs. (289,134 N)



Centralizer





## Decentralizer

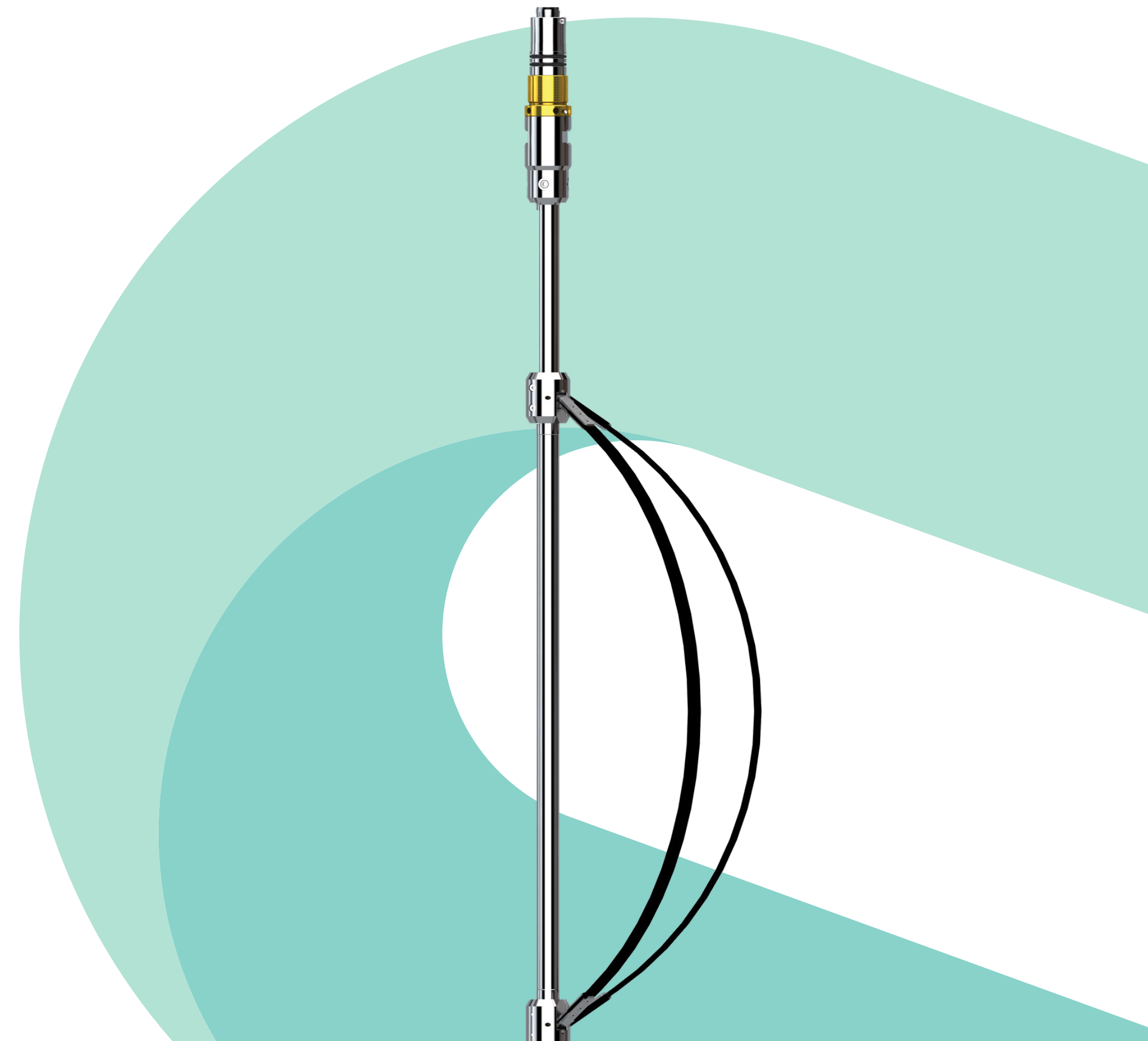
Decentralizers ensure that tools are properly posited against the borehole wall. This minimizes the effects of borehole fluids and enables the acquisition of high-quality data. Electrical feedthroughs enable the tool to be used at any point in the string, while fully collapsible springs enable easy passage through drill pipe or into the casing shoe.

### Logging applications

- Conventional
- Directional
- Horizontal

### Specifications

Length	5.19 ft (1.58 m)
Diameter	2.25-in. (57 mm)
Weight	29.8 lbs (13.51 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Tensile strength	65,000 lbs. (289,134 N)

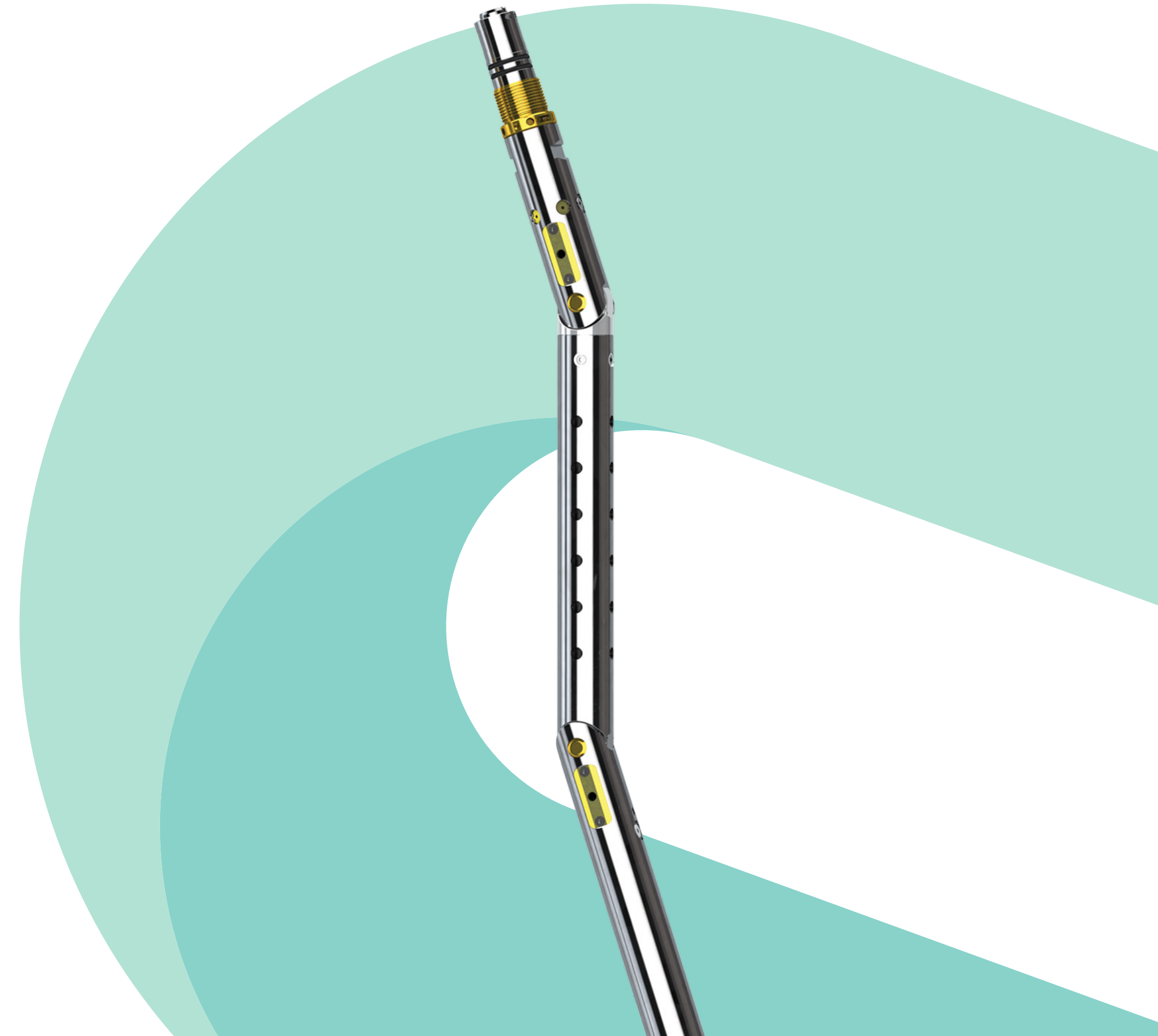




# Knuckle joint

Knuckle joints enable ideal tool positioning, reduce the rigidity of the tool string, and optimize weight distribution for easier maneuverability in highly deviated or horizontal wells.

Specifications	
Length	3.33 ft (1.02 m)
Diameter	2.25-in. (57 mm)
Weight	30.8 lbs (13.97 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Tensile strength	65,000 lbs. (289,134 N)



Knuckle joint

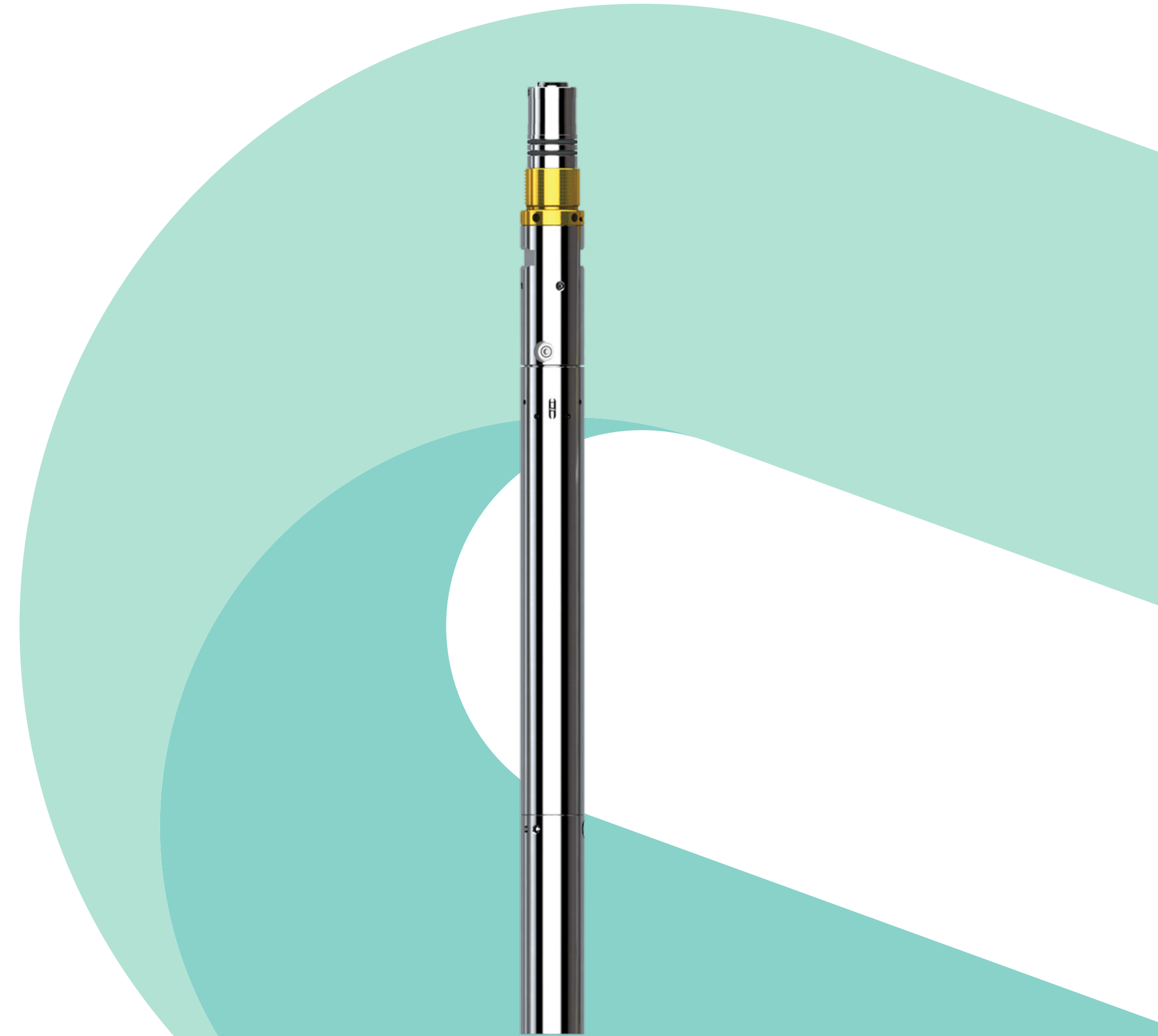




# Swivel

The swivel enables free rotation between two sections of the tool string. Decouples the tool string from the wireline or drill pipe during memory operations. This ensures minimal tool rotation, producing more consistent data.

Specifications	
Length	2.42 ft (.74 m)
Diameter	2.25-in. (57 mm)
Weight	25.4 lbs (11.52 kg)
Pressure rating	20,000 psi (140 MPa)
Temperature rating	350°F (175°C)
Tensile strength	60,000 lbs. (266,893 N)



## Subsurface interpretation

Baker Hughes Reservoir Technical Services (RTS) provide a wide array of log analysis and interpretation services to help you understand your field and reservoir. Our RTS team can use data from Proxima advanced logging services to increase your understanding of reservoir complexity and heterogeneity, optimize well placement, and improve completion designs. The rugged and versatile Proxima logging service collects data in complex drilling environments, challenging wellbore conditions, and slimhole production sections providing valuable insight that enables you to improve well placement, completion, production, and reservoir development decisions with accurate subsurface interpretation.

For the full suite of RTS subsurface interpretation services, contact your Baker Hughes representative.

**Some selected subsurface interpretation services performed using Proxima advanced logging services:**

- Volumetric analysis
- Acoustic analysis
- Geomechanics analysis
- RiskGuard™ analysis and risk management solution
- FracFit™ fracturing optimization solution



## Volumetric analysis

Stochastic Volumetric Modeling is an advanced, multi-mineral formation evaluation service. The service utilizes a non-linear weighted least-squares method to minimize the difference between theoretical and measured logs to yield most accurate estimate of formation properties. Shaliness, porosity, mineral composition of the matrix and fluid saturations can be evaluated. Shale gas evaluation includes estimates of total organic carbon (TOC) and gas-in-place, and free and adsorbed gas. This service enables better completion decisions, reserves estimate, geologic modeling, and reservoir simulation.



## Acoustic analysis

Acoustic logging measurements are used in a wide variety of geophysical, geological, and engineering applications and play an important role in reservoir evaluation, reducing exploration and production risks, well placement, completion design and maximizing hydrocarbon recovery. Full-wave, cross-dipole measurements can be acquired in open or cased hole.

**Acoustic analysis can provide:**

- Compressional, shear and Stoneley slowness, azimuthal and transverse anisotropy, Stoneley permeability
- Inputs for seismic tie-in, seismic anisotropy correction, pore pressure, rock mechanical properties, borehole stability, fracture prediction and orientation, sand production, hydraulic fracture and completion design, permeability profile





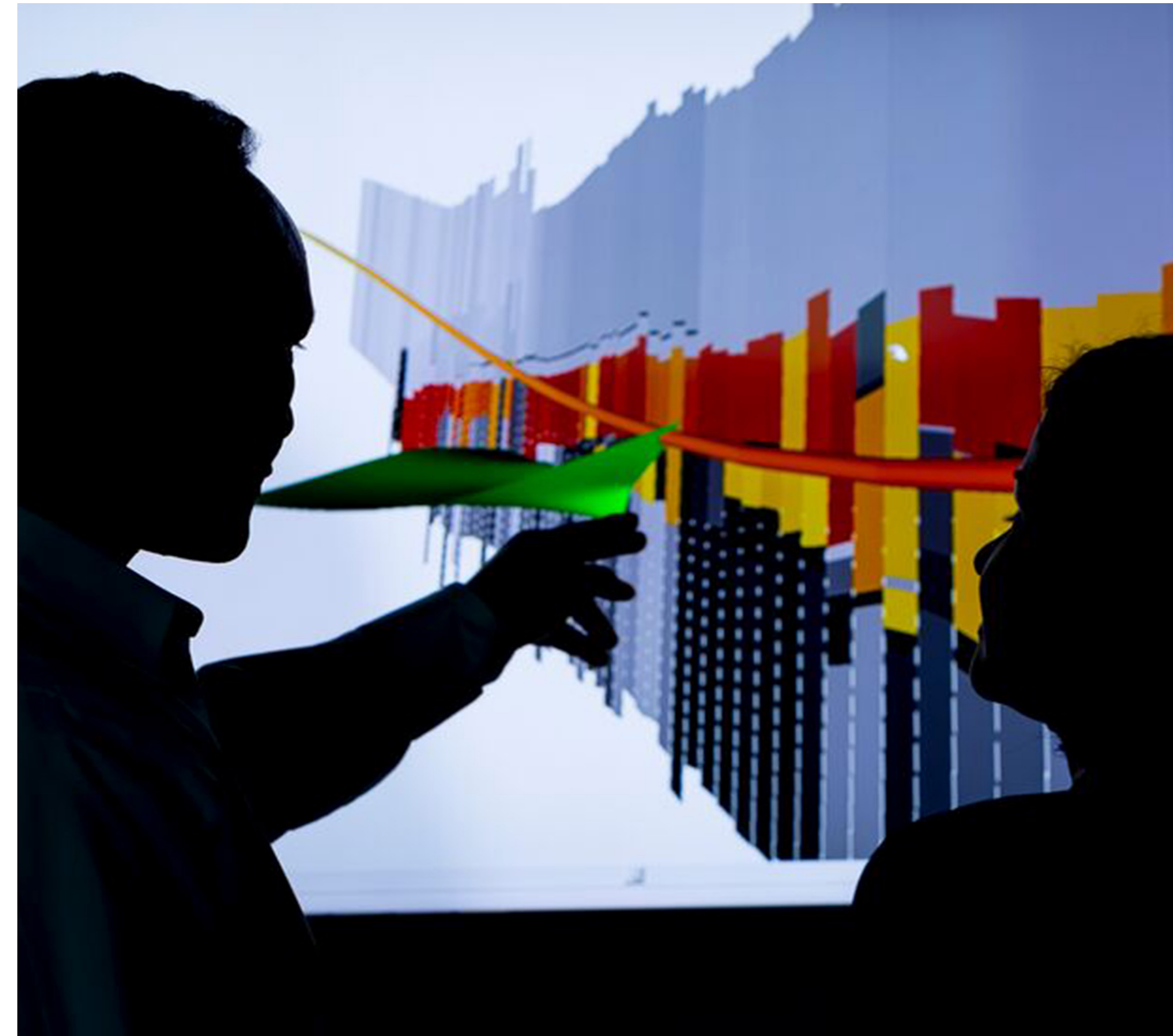
## Geomechanics analysis

A complete understanding of the stresses and pressures acting in the earth is necessary to address a wide range of challenges faced throughout the lifecycle of hydrocarbon reservoirs. The geomechanical model is a representation of these stresses and pressures and their effects on the rock.

- Open hole and cased hole solutions
- Dynamic and static rock mechanical properties, overburden stress, pore pressure, isotropic fracture migration, anisotropic fracture migration

### Geomechanical studies and well operations design including:

- In-situ stress analysis
- Borehole stability analysis
- Sand production prediction
- Hydraulic fracturing design and optimization
- Reservoir compaction and subsidence
- Drill bit analysis
- Mud weight design
- Casing depth selection
- Selection of micro-frac depth
- Integrated shale evaluation





## RiskGuard

The **RiskGuard™ analysis and risk management solution** combines subsurface services with engineering technologies and products to mitigate risks associated with abnormal pressure, wellbore instability, and other drilling-related hazards that can impact project success. RiskGuard is an integrated solution-focused service that delivers superior, predictable, safe wells while minimizing costs by alleviating risks and preventing well control and wellbore instability incidents that often compromise well delivery. Reduce uncertainty and significantly drive down NPT using well-specific technologies to de-risk the pre-well Geomechanical model, followed by real-time SME monitoring and advice during well construction.

RiskGuard



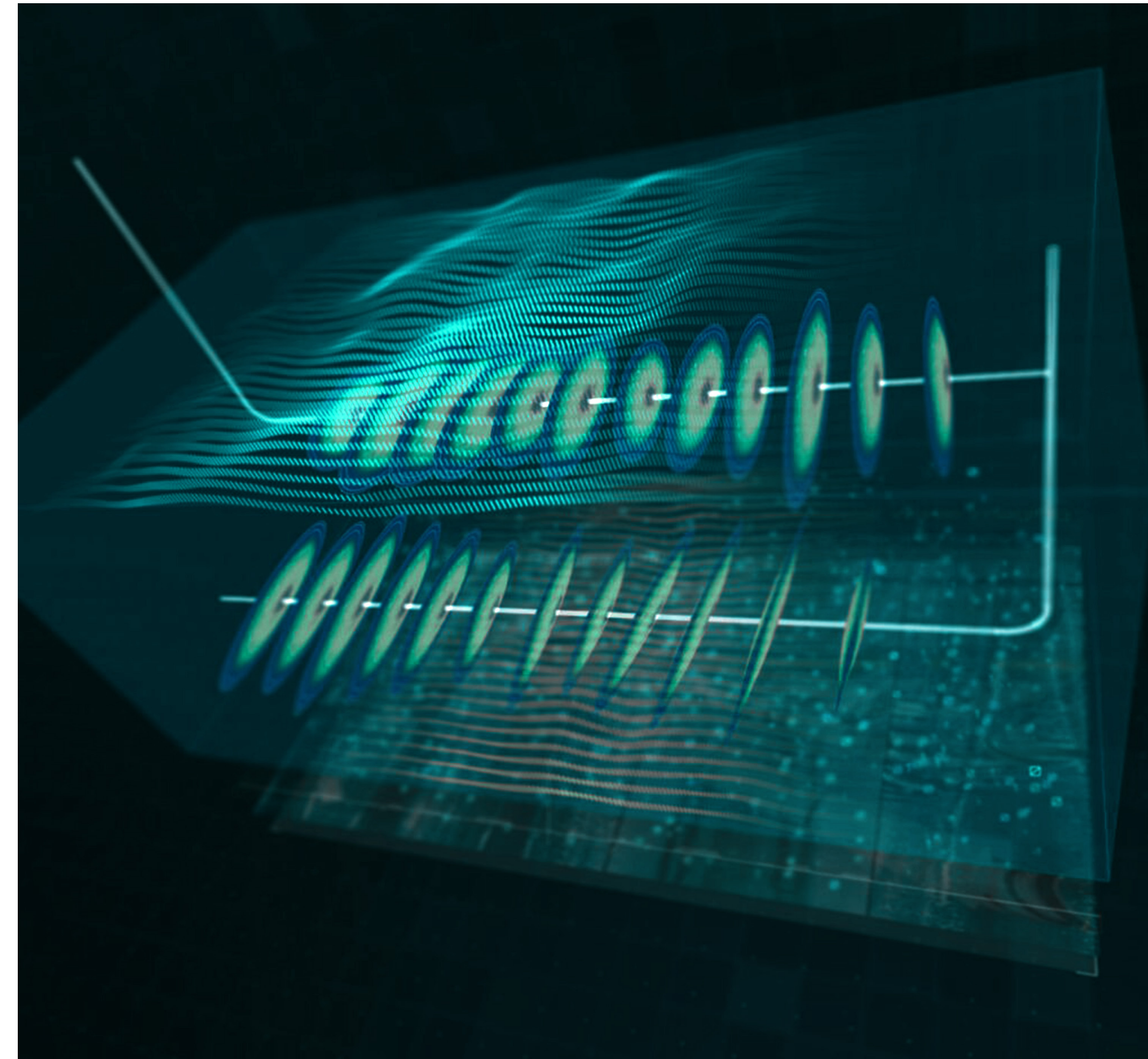


## FracFit

The **FracFit™ fracturing optimization solution** provides proven expertise and efficient data capture methods and technologies to achieve better results with engineered designs to improve ultimate recovery and maximize efficiency. The key is gathering the right data quickly and efficiently so you can make truly informed, actionable decisions to target and stimulate the most productive zones, identify and avoid potential geohazards, reduce uncertainty and operational risks, and right-size completion spend and stimulation programs.

- Optimization of completion and hydraulic fracture design, integrating formation evaluation from sub-surface logs, mud-gas, drill cuttings and core data
- Continuous depth-based profile of fracability, geohazards, producibility, recommendation on hydraulic fracture stage placement
- Avoidance of screen-outs and water breakthrough, increased hydrocarbon recovery

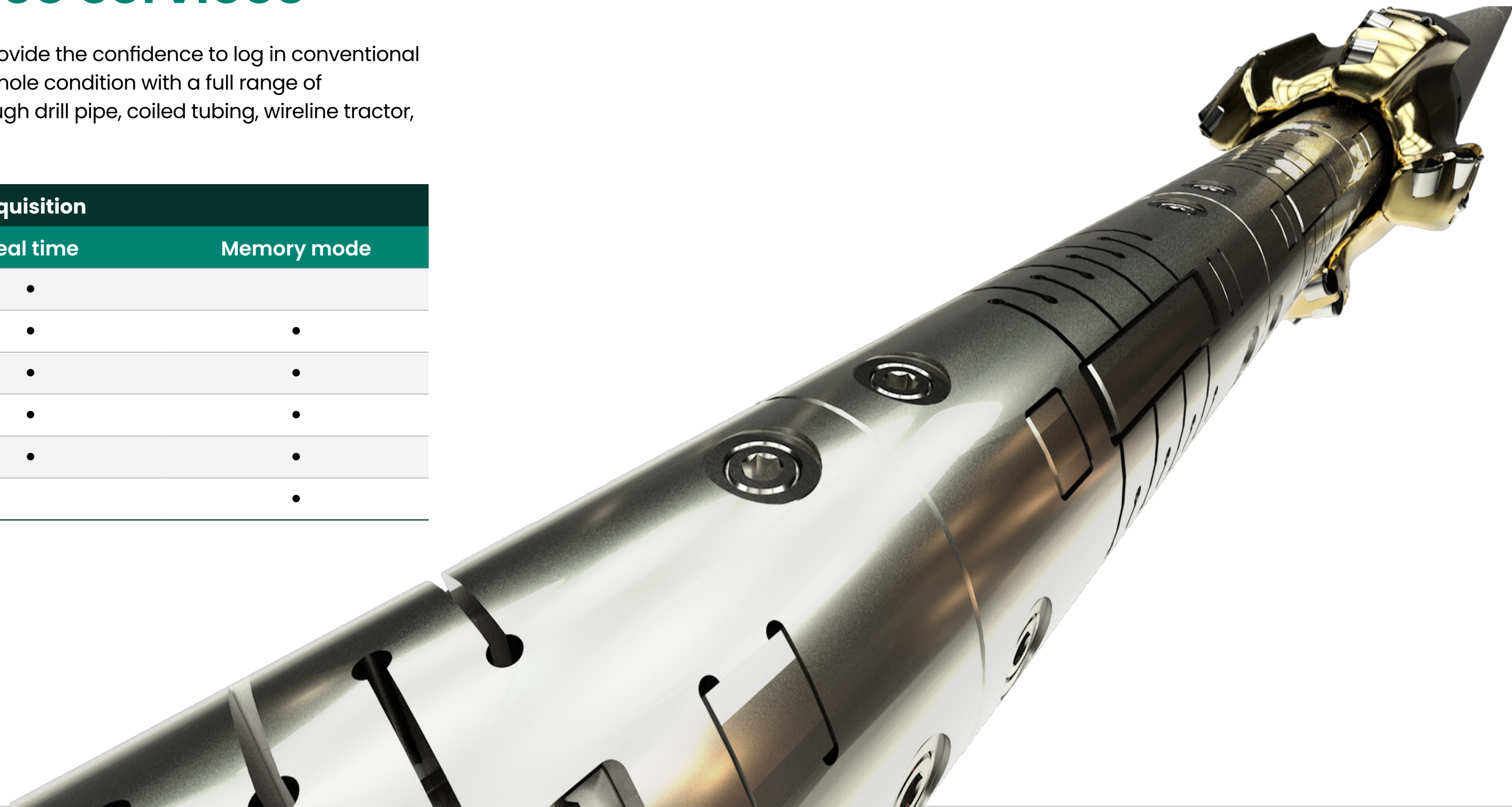
FracFit



## Log conveyance services

Proxima advanced logging services provide the confidence to log in conventional or managed pressure drilling and any hole condition with a full range of deployment capabilities: wireline, through drill pipe, coiled tubing, wireline tractor, and slickline memory logging.

Conveyance methods and data acquisition		
	Real time	Memory mode
Wireline	•	
Through drill pipe	•	•
Pump down	•	•
Tractor	•	•
Coil tubing	•	•
Slickline		•



WIRELINE

# Wireline

The wireline conveyance method allows real-time measurements and tool verification while deploying the tools either in conventional open holes or through drill pipe operations.

The Proxima service tool string has a 2.25-in. (57.15 mm) outside diameter (O.D.). It will comprise the upper and lower deployment release tool mechanism, main battery sub with backup, gamma-ray sub with memory, additional open hole formation evaluation tools, and ancillary tools for centralization, decentralization, borehole corrections, and orientation. Each tool string is designed based on formation evaluation requirements and hole conditions.

**Applications**

- Slim holes
- Directional
- Conventional reservoirs
- Exploratory

**Benefits**

- Real time
- Memory logging
- Quality data
- Fast logging speed
- Multiple conveyance methods
- Real time tool verification after deployment
- Deploy through drill pipe

Open hole and cased hole services		
	Real time	Memory mode
Proxima gamma ray log service	•	•
Proxima spectral gamma ray log service	•	•
Proxima compensated neutron log service	•	•
Proxima compensated density log service	•	•
Proxima acoustic log service	•	•
Proxima resistivity log service	•	•
Proxima geospatial positioning service	•	•



THROUGH DRILL PIPE



# Through drill pipe

During through drill pipe operations, Proxima logging tools gain access to the open hole by passing through the bottom hole assembly (BHA). Comprised of the optional float-valve sub, deployment sub, and access bit or mule shoe, the BHA makes it possible to bypass trouble zones, drill through bridges, complete reamer runs, and maintain well control - all while maintaining access to the borehole. The Proxima services conveyance system eliminates the problem of not getting logs to the bottom.

**Applications**

- Directional
- Horizontal
- Unconventional
- Adverse wellbore conditions
- Complex drilling methods

**Benefits**

- Maintains well control
- Allows tool access to borehole
- Allows BHA circulation, reciprocation, and rotation capabilities
- Bypasses trouble zones
- Eliminates additional conditioning trips
- Full downhole tool verification

Open hole services		
	Real time	Memory mode
Proxima gamma ray log service	•	•
Proxima spectral gamma ray log service	•	•
Proxima compensated neutron log service	•	•
Proxima compensated density log service	•	•
Proxima acoustic log service	•	•
Proxima resistivity log service	•	•
Proxima geospatial positioning service	•	•



THROUGH DRILL PIPE



Operating parameters >

# Operating parameters

	Run-in-hole	Tools deployed
Rotation	No limits	5-40 rpm * limited rotation per hour
Reciprocation	No limits	Not advised but limited movement is possible
Circulation	No limits	5 – 10 bbl/min (0.8 – 1.6 m³/min)
Weight-on-bit	20,000 to 40,000 lbs. (8896 to 17793 daN)	Not applicable
Torque	5,000 to 15,000 lb. ft. (6779 to 20337 Nm)	Not applicable
BHA tripping speed	No limits	150 to 300 ft/min (45.72 to 91.44 m/min)
Logging speed	Not applicable	30 to 60 ft/min (9.1 to 18.3 m/min)

THROUGH DRILL PIPE



# BHA specifications: 6.75-in. (171 mm)

BHA specifications:  
6.75-in. (171 mm)



	Length	OD	ID	Upper Connection	Lower Connection	Tool joint		
						Recommended M/U	Maximum safe torsion yield	Maximum safe tensile yield
<b>Landing sub</b>	3.3 ft (1.01 m)	6.75-in. (171.5 mm)	2.38-in. (60.5 mm)	NC-50 4.5-in. (114.3 mm) IF Box	NC-50 4.5-in. (114.3 mm) IF Box	41,000 ft. lbs (55,588 Nm)	65,000 ft. lbs (88,128 Nm)	450,000 lbs (2,001,699 N)
<b>Access bit PDC</b>	1.5 ft (0.45 m)	8.5-in. (215.9 mm)	2.76-in. (70.1 mm)	4.5-in. (114.3 mm) IF Box	-	22,000 to 24,000 ft. lbs (29,828 to 32,540 Nm)	44,000 ft. lbs (59,655 Nm)	1,091,000 lbs (4,853,009 N)
<b>Total length</b>	<b>4.8 ft (1.46 m)</b>							

THROUGH DRILL PIPE



# BHA specifications: 5-in. (127 mm)

BHA specifications:  
5-in. (127 mm)



	Length	OD	ID	Upper Connection	Lower Connection	Tool joint		
						Recommended M/U	Maximum safe torsion yield	Maximum safe tensile yield
<b>Downhole flapper valve (DFV)</b>	4.5 ft (1.38 m)	5-in. (127 mm)	2.5-in. (63.5 mm)	NC-38 3.5-in. (88.9 mm) BOX	NC-38 3.5-in. (88.9 mm) PIN	12,500 ft. lbs (16,947 Nm)	20,700 ft. lbs (34,856 Nm)	442,827 lbs (1,969,790 N)
<b>Landing sub</b>	3.3 ft (1.01 m)	5-in. (127 mm)	2.38-in. (60.5 mm)	NC-38 3.5-in. (88.9 mm) IF Box	NC-38 3.5-in. (88.9 mm) IF Box	15,600 ft. lbs (21,150 Nm)	25,800 ft. lbs (34,980 Nm)	450,000 lbs (2,001,699 N)
<b>Access bit PDC</b>	1.5 ft (0.45 m)	6-in. (152.4 mm)	2.76-in. (70.1 mm)	3.5-in. (88.9 mm) IF Box	-	9,000 to 9,900 ft.lbs (12,202 to 13,422 Nm)	18,000 ft-lbs (24,404 Nm)	573,000 lbs (2,548,830 N)
<b>Total length</b>	<b>9.3 ft (2.84 m)</b>							



DRILL BITS



# Drill bits for through drill pipe applications

For through-drill pipe applications, the Baker Hughes Drill Bits team designed the best drill bit technology. **Talon™ Strike drill bits** build upon the strength of the Talon Strike high-performance PDC drill bits. Talon Strike combines application engineering expertise, proven bit technology and a comprehensive feature set. Each bit is application-specific and uses the latest design and cutter technology to deliver maximum performance and durability.

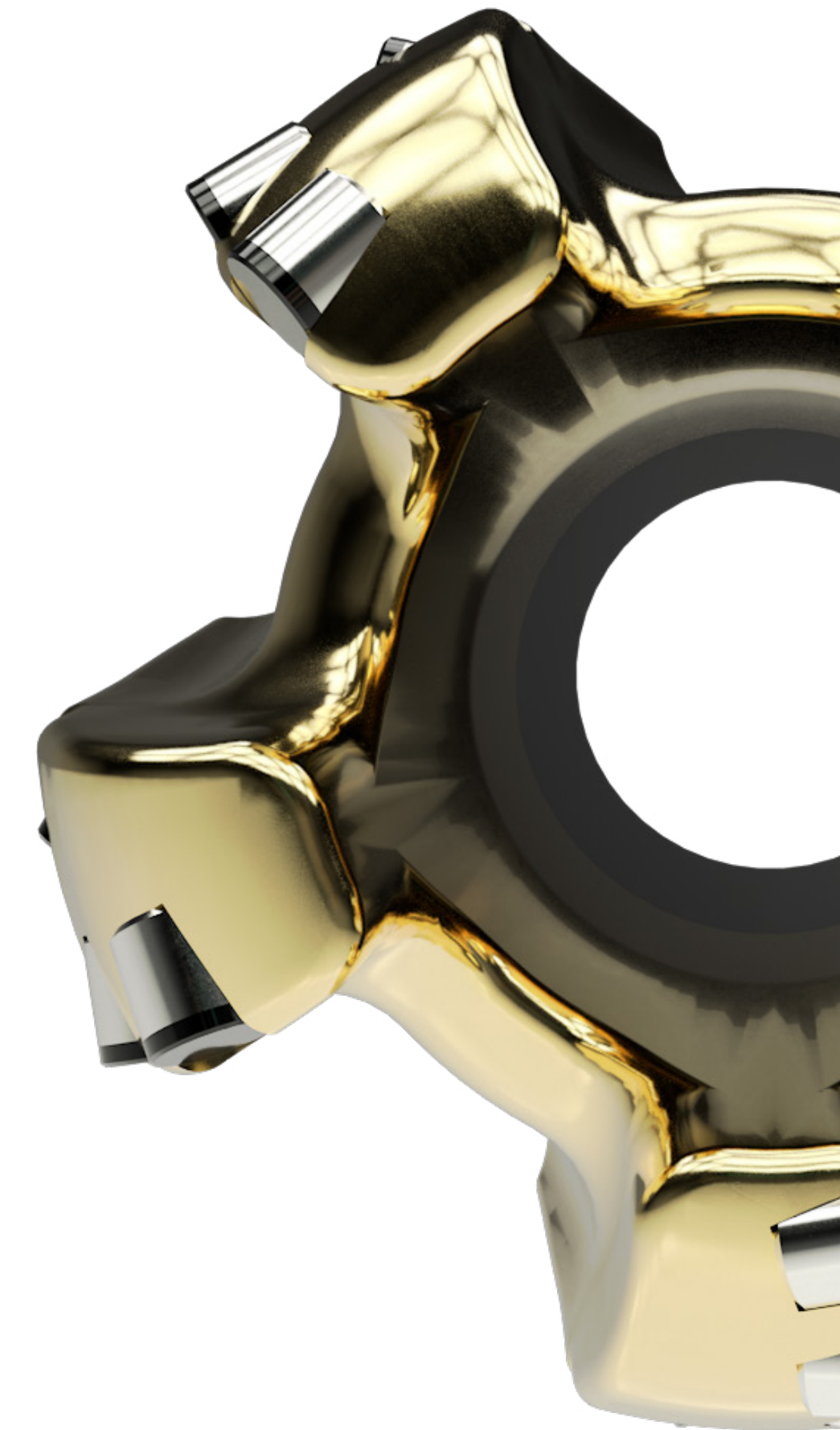
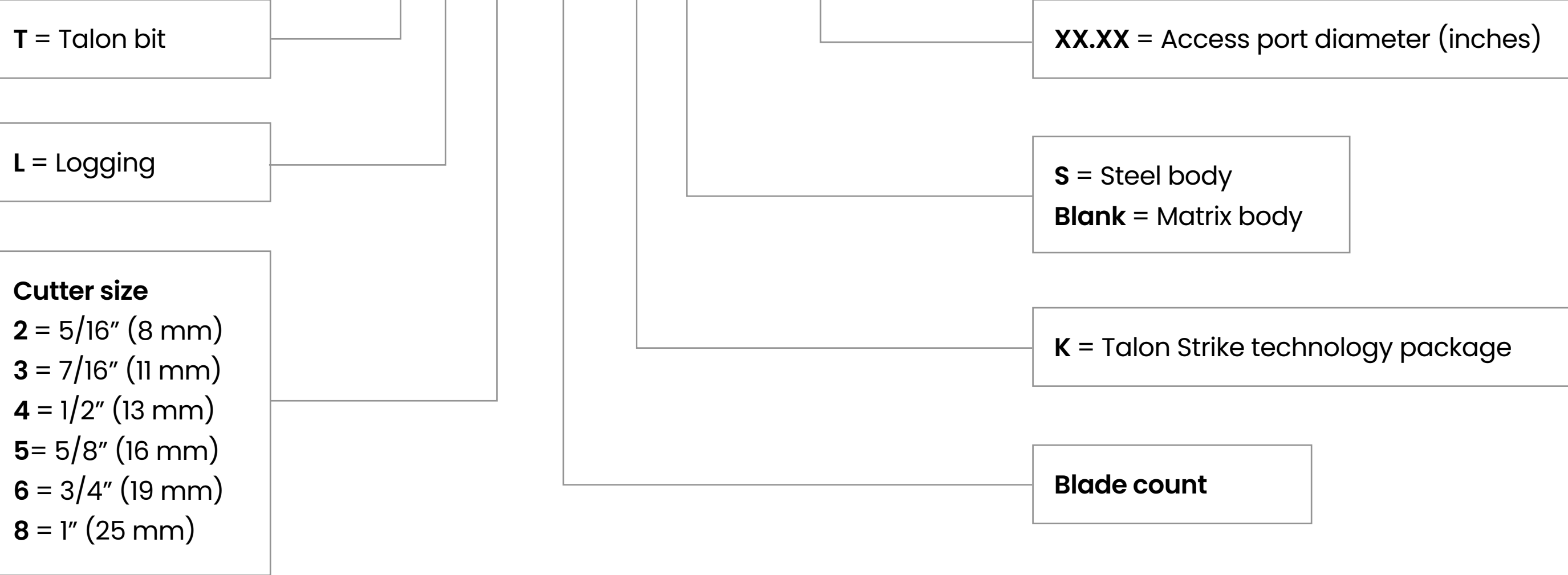
	Length	OD	ID	Upper Connection	Lower Connection	Tool joint		
						Recommended M/U	Maximum safe torsion yield	Maximum safe tensile yield
TL405KS	1.5 ft (38.1 mm)	8.5-in. (215.9 mm)	3.5-in. (88.9 mm)	4.5-in. (114.3 mm) NC50	-	22,000 to 24,000 ft. lbs (29,828 to 32,540 Nm)	44,000 ft. lbs (59,655 Nm)	1,091,000 lbs (4,853,009 N)
TL405KS	1.5 ft (38.1 mm)	7.625-in.	3.5-in. (88.9 mm)	4.5-in. (114.3 mm) NC50	-	22,000 to 24,000 ft. lbs (29,828 to 32,540 Nm)	44,000 ft. lbs (59,655 Nm)	1,091,000 lbs (4,853,009 N)
TL405KS	1.5 ft (38.1 mm)	6-in. (152.4 mm)	2.688-in. (68.28 mm)	3.5-in. (88.9 mm) NC38	-	9,000 to 9,900 ft. lbs (12,202 to 13,422 Nm)	18,000 ft-lbs (24,404 Nm)	573,000 lbs (2,548,830 N)
TL405KS	1.5 ft (38.1 mm)	5.875-in.	2.688-in. (68.28 mm)	3.5-in. (88.9 mm) NC38	-	9,000 to 9,900 ft. lbs (12,202 to 13,422 Nm)	18,000 ft-lbs (24,404 Nm)	573,000 lbs (2,548,830 N)

DRILL BITS

Access bit  
nomenclature

# Access bit nomenclature

T L 4 05 K S (XX.XX)





## Tractor

Proxima services can also be deployed using downhole tractors allowing fast and cost-effective well interventions to be carried out in high-angle and horizontal wells where traditional conveyance methods require significantly more rig time, rig space, crews, or highly complex operations.

Downhole tractors are electrically powered devices that are inserted between the wireline and the Proxima service tool string. Under the control of the operator, they can be activated to push logging tools while pulling the wireline to the desired depth in highly deviated or horizontal wells.

### Highlights

- Tools can record data in real time or memory mode
- Does not require a rig in place
- The leading tractor models have long and successful track records in cased-hole applications

### Benefits

Reduce the cost of well interventions significantly, and, in some cases, offer unique conveyance solutions by extending the operating range of conventional wireline into high-angle and horizontal wells





## Coiled tubing

In cased hole or open hole operations, Proxima services can be deployed with Coiled Tubing (CT) in real time or memory mode, this conveyance method is an effective alternative in well interventions targeting high-angle and horizontal wells. Coiled tubing is used to push the tool string to the desired depth in highly deviated or horizontal wells, while the wireline embedded in the CT provides the electrical path for downhole power and data transmission.

### Highlights

- These operations are optimized using dedicated Baker Hughes CT simulation software
- Requires large/heavy CT units and a specialized crew
- Large-diameter CT is not suitable for completions with small inside diameters (IDs)
- Needs specialized CT to wireline interface equipment:
  - CT-wireline head and non-rotating logging adapter
  - Depth encoder CT mounting kit
  - CT-wireline collector bulkhead and slip ring collector

### Benefits

- Does not require a drilling rig
- Suitable for high-angle or horizontal wells
- Provides extra protection to the wireline
- Well suited for operations in live wells





# Slickline

Slickline logging provides a solution to deploy the Proxima advanced logging services in memory mode within challenging slim production wells. The Baker Hughes portable depth system records and monitors the logging data in real time.

**Benefits**

- Does not require a drilling rig
- Memory logging
- Fast operation setup
- Well suited for operations in live wells



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