# **DRILLING SERVICES**

# **Directional Drilling Technologies**

# DuraMax™

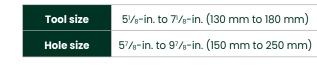
#### High-performance drilling motors

#### Applications

- Shale gas
- Onshore, offshore, and deepwater
- Conventional and unconventional
- Geothermal
- Vertical and directional drilling
- Performance drilling
- Hard/abrasive formations and high-temperature
   environments

#### Features

- DuraMax Ultra Series power section
- Titanium flex shaft
- Optimized connections
- High-temperature elastomer and high weight-on-bit (WOB)
- bearing assembly
- Adjustable kickoff sub (AKO)
- Increased flex design and flow rate



#### Lucida<sup>™</sup> Advanced rotary steerable service

#### Applications

- Wells that require high buildup rates
- Simple or complex 3D wellbore profiles
- Single-run vertical, curve, and lateral
- Extended-reach wellsPad or batch drilling
- Onshore, shelf, or deepwater

#### Features

- Integrated drill bit
- Automated wellpath trajectory control system
- Continuous proportional steering
- Near-bit directional measurements
- Near-bit and azimuthal gamma-ray measurements
- Multi-chip module (MCM) electronicsReal-time dynamics measurements

# Tool size 4¾-in. (121 mm) Hole size 5<sup>7</sup>/8-in. to 6¾-in. (149 mm to 171 mm)

#### AutoTrak<sup>™</sup> X-treme Motor-powered rotary steerable system

#### Applications

- Horizontal extended-reach wells
- Complex 3D directional profiles
- Onshore, offshore and deepwater environments
- Performance drilling applications

#### Features

- Pre-contoured X-treme
- Fully modular system, integrated BHA with
- short-spaced advanced MWD/LWD sensors

  Automated 3D continuous proportional
- steering method
- Real-time near-bit inclination and bidirectional communication
- Steering mechanism independent of hydraulic parameters such as flow rate, bit pressure drop, and mud properties
- Optional near-bit gamma (ZoneTrak G)



# AutoTrak<sup>™</sup> G3

Advanced rotary steerable system

#### Applications

- Real-time reservoir navigation, integrating multiple MWD/
  LWD measurements
- Multilateral, complex 3D designer,
- extended-reach and tight wellbore spacing wells
- Conventional, unconventional, onshore, offshore
   and deep water

• Fully modular system, integrated BHA with

• Automated 3D continuous proportional

• Optional near-bit gamma (ZoneTrak G)

Directional and gamma MWD service

• Real-time near-bit inclination and

bidirectional communication

short-spaced advanced MWD/LWD sensors

Steering mechanism independent of hydraulic parameters

9½-in. (241 mm)

12-in. to 18¼-in. (304 mm to 464 mm)

3<sup>1</sup>/<sub>8</sub>-in. (79.4 mm) 3<sup>3</sup>/<sub>8</sub>-in. (85.7 mm)

4¾-in. (121 mm)

6¾-in. (171.5 mm)

8¼-in. (209.6 mm)

9½-in. (241.3 mm)

1¾-in. (45 mm)

3<sup>7</sup>/<sub>8</sub>-in. to 17½-in. (98 mm to 445 mm)

such as flow rate, bit pressure drop, and mud properties

Features

steering method

Tool size

Hole size

NaviTrak<sup>™</sup>

Applications

Factory drilling

Downlink capability

Tool size

Probe

diameter

Hole size

**GyroTrak**<sup>™</sup>

Features

Unconventional shale plays

Onshore development drilling

Real-time directional information

• Real-time gamma ray logs

Optional flow-off logging



## ZoneTrak<sup>™</sup> R

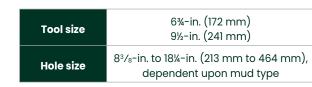
At-bit resistivity LWD service

#### Applications

- Casing and coring point selection
- Salt exit detection
- Real-time pressure management
- Geo-stoppingAll drilling environments
- High-resistivity contrast formations

#### Features

- Identifies top and bottom of reservoir
- Detects formation changes faster to adjust drilling
   fluid parameters
- Includes forward response modeling
- Real-time data transmitted through WellLink™ service



#### **ZoneTrak<sup>™</sup> G** Near-bit gamma service

- ApplicationsCasing and coring point selection
- Geo-stopping and Geosteering
- Reservoir navigation
- All drilling environments

#### Features

- True azimuthal gamma ray measures 6 feet above
- the bit
- Imaging capabilities
- Two gamma sensors
- Real-time gamma data can be displayed through WellLink™ service

Tool size	4¾-in. (121 mm) 6¾-in. (172 mm) 9½-in. (241 mm)
Hole size	5¾-in. to 18½-in. (146 mm to 464 mm)

## SureTrak<sup>™</sup> Steerable drilling liner service

#### Applications

- Onshore or offshore environments
- Interbedded formations
- Wellbore instability issues, including swelling shale
- and weak sediments
- Lost circulation
- Depleted formations

#### Features

 Changeable pilot bottomhole assembly (BHA) eliminates the need for liner retrieval

• Liner shoe with decoupled reamer bit separates BHA drilling

4%-in, with 7-in, liner

6¾-in. with 95/8-in. liner

8½-in. to 12¼-in. (216 mm to 311 mm)

- BHA design tailored to wellsite requirements
- Uses AutoTrak<sup>™</sup> system with modular MWD/LWD services
- Incorporates X-treme motor technology

dynamics from the liner

Tool size

Hole size

#### Navi-Drill<sup>™</sup> Ultra-HP<sup>™</sup> Series High-performance drilling motors

#### Applications

- Shale gas, onshore, and conventional/unconventional
- Vertical and directional drilling
- Performance drilling
- OBM environments
- Underbalanced drilling
- Hard/abrasive formations

#### Features

- High-performance elastomer technology
- Titanium flex shaft improves reliability compared to universal joint
- Optimized connections increase motor reliability
- Adjustable kickoff sub (AKO)

Tool size	6½-in. to 11¼-in. (165 mm to 286 mm)
Hole size	77/8-in. to 44-in. (200 mm to 1,118 mm)

# Navi-Drill<sup>™</sup> X-treme Series Directional drilling motors

- Applications
- Shale gas
- Onshore, offshore, and deepwaterConventional and unconventional
- Geothermal
- Vertical and directional drilling
- Performance drilling
- Re-entry and slimhole drilling
- Hard/abrasive formations and high-temperature
   environments

#### Features

- X-treme pre-contoured power section
- Titanium flex shaft
- Optimized connections and increase motor reliability
- High-temperature elastomerHigh weight on bit (WOB) bearing assembly
- Adjustable kickoff sub (AKO)

## Applications

Simple or complex 3D wellbore profiles

AutoTrak<sup>™</sup> eXact Pro

• Higher temperature wells up to 330°F (165°C)

Advanced high-build rate rotary steerable system

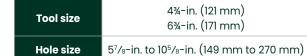
- Extended-reach wells
- Geosteering with advanced LWD servicesOnshore, offshore, and deepwater
- Features
- Wellpath trajectory control systemNear-bit directional measurements
- McM electronics
- The 4<sup>3</sup>/<sub>4</sub>-in. tool has WOB capability up to 35,000 lb (15 875 kg)
- High-resolution vibration and stick slip
- Continuous proportional steeringCompatible with Baker Hughes suite of advanced
- LWD services



- AutoTrak<sup>™</sup> eXact
- Advanced high-build rate rotary steerable system
- Applications
- Onshore, offshore, and deepwater
- Real-time reservoir navigation, integrating multiple
- measurment-while-drilling (MWD)/LWD measurements
- Multilateral, extended-reach, or complex 3D designer wells
- Conventional and unconventional development drilling

#### Features

- Reaches high buildup rates, up to 12°/100ft
- Automated steering mechanism creates a continuous steer force with continuous drillstring rotation
- Fully modular system, additional LWD measurements as required
- Integrated bottomhole assembly (BHA) with short-spaced, advanced MWD/LWD sensors
- Steering mechanism independent of hydraulic parameters
   such as flow rate, bit pressure drop, and mud properties



AutoTrak<sup>™</sup> Curve Pro

• Wells that require high build up rates

Single-run vertical, curve, and lateral

• Onshore, offshore, and deepwater

Continuous proportional steering

· Simple or complex 3D wellbore profiles

Applications

Features

• Extended-reach wells

• Pad or batch drilling

measurements

High-build rate rotary steerable system

 $5^{7}/_{8}$  - In. to  $10^{3}/_{8}$  - In. (149 mm to 270 mm

#### Applications

- Nearby well casing interference
- Kickoff below a casing shoeWhipstock orientation and milling

Gyroscopic MWD service

- Relief-well drilling
- Features
- Robust gyroscopic measurements

	OnTrak:	6¾-in. (172 mm) 8¼-in. (210 mm) 9½-in. (241 mm)
Tool size	NaviTrak:	4¾-in. (152mm) 6¾-in. (172mm) 8¼-in. (210mm) 9½-in. (241mm)
	CoilTrak:	2³⁄ଃ−in. (60 mm) 3-in (76.2 mm)
	OnTrak:	8³∕₃-in. to 26-in. (214 mm to 660 mm)

# aXcelerate<sup>™</sup> PLUS

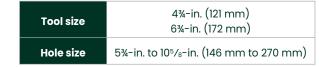
#### High-speed mud-pulse telemetry service

#### Applications

- Critical wells
- Geosteering and optimized wellbore placement
- Extended-reach and complex 3D wells
- Performance drilling
- Required for extended formation
   evaluation BHA's

#### Features

- Downhole adjustable pulser setup via downlinkReal-time formation evaluation data for
- reservoir navigation
- High-resolution downhole drilling dynamics dataBandwidth up to 40 bits per second physical and up to 256
- bits per second compressed



#### Wired-Pipe Telemetry

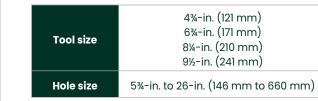
#### Applications

- Extended-reach wells
- Underbalanced drilling
- Geosteering
- Performance drillingRequired for extended formation evaluation BHA's
- Enabling technology for delivering measurements
- along the string

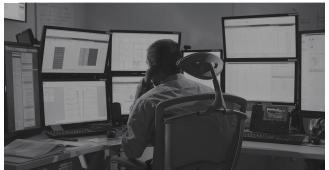
#### Features

- Real-time formation evaluation memory quality data for reservoir navigation
- Bandwidth up to 57,600 bits per secondHigh-resolution downhole drilling dynamics data of the BHA
- and optional along the string

  Drilling in environments where data transmission was not
- possible with mud pulse telemetry



#### SIGNALS<sup>™</sup> Services Wellsite and remote operations monitoring



Rotary steerable and rotary operations

Unconsolidated formations

• StayTough™ hardfacing

• Application-specific cutter blades

Blade operation, protecting the casing

Active blade retraction

Series 6

Series 6.5

Series 8

Series 9

Series 10

Series 12

Series 13

Series 14

Series 16

Series 18

Applications

GaugePro<sup>™</sup> Echo

• Deep water & on-shore projects

On-Demand unlimited activations

• Downlink via Mud Pulse or wired drill pipe

Real-time VSS and tool diagnostics

BHA Body

4¾-in.

6¾-in.

8¼-in.

9½−in.

9½−in.

9½-in.

· Confirms real-time cutter blade actuation and

• No pressure drop dependencies, no shoulder tests

Pass-Thru

6-in.

8½-in.

10<sup>5</sup>/8-in.

12¼-in.

14½-in.

16½-in.

Maximum

**Hole Size** 

8¾-in.

9<sup>7</sup>/8-in.

12¼-in.

14¾-in.

17¾-in.

22-in.

• 5 minute activation/deactivation

Real-time communication

• Up to 3 reamers in one BHA

Independent of mud flow

• Memory for post analysis

Selective under reaming

ECD management

• Hole cleaning

OD position

Series 6

Series 8

Series 10

Series 12

Series 14

Series 16

Features

• Rat-Hole elimination

On Command Digital Downhole Reamer

GaugePro<sup>™</sup> XPR/XPS

Concentric expandable hole enlargement

• StaySharp<sup>™</sup> premium polished cutter technology with

6-in. x 7-in.

6½-in. 7½-in.

8½-in. x 97/8-in.

9½-in. x 11¾-in.

105/8-in. x 12¼-in.

12¼-in. x 14¾-in.

13½-in. x 16-in.

14½-in. x 17½-in.

16½-in. x 20-in.

18<sup>1</sup>/<sub>8</sub>-in. x 22-in.

improved diamond material and interface

Deepwater projects Wellbore enlargement

Applications

Salt drilling

Features



Conventional and unconventional development drilling

· Automated wellpath trajectory control system

Internal hydraulics independent of pressure drop

Near-bit directional and azimuthal gamma-ray

Hole size 8<sup>3</sup>/<sub>8</sub>-in. to 10<sup>5</sup>/<sub>8</sub>-in. (213 mm to 270 mm)

#### AutoTrak<sup>™</sup> Curve High-build rate rotary steerable system

#### Applications

- Conventional and unconventional hydrocarbon development drilling
- Vertical, horizontal, and 3D directional drilling
- Pad drilling applications with tight wellbore spacing
  Well factory applications in high-volume drilling environments

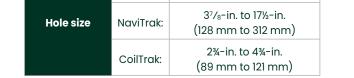
#### Features

- Reaches high buildup rates, up to 15°/100ft
- Uses automated 3D steering adjustments while drilling ahead

#### Modeuro

- Measures real-time, azimuthal gamma ray at short distance to bit
- Drills straight, smooth wellbores with automatic inclination hold function
- Optimized, rugged system design with single piece BHAOptional downhole motor

Tool size	6¾-in. (171 mm)
Hole size	8³⁄₃-in. to 10⁵⁄₅-in. (213 mm to 270 mm)



## OnTrak™

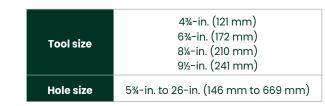
Integrated MWD and LWD service

#### Applications

- Offshore exploration and development
- Complex directional targets
- GeosteeringLeak Off and Formation Integrity Testing

#### Features

- Real-time directional information
- Azimuthal gamma ray with imaging capability
- High-frequency phase resistivity
- Low-frequency attenuation resistivity
- Fast two-way communication between the surface
   and downhole



#### AziTrak™

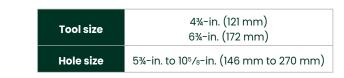
Deep azimuthal resistivity LWD tool

#### Applications

- Conventional oil and gas reservoirs
- Deep water drilling
- High-angle and horizontal wells
- Brownfield production enhancement
- Field development through infill drilling
- Leak Off and Formation Integrity Testing
- Geosteering

#### Features

- Compact, fully integrated sub featuring close-to-the-bit
  measurements
- Close-to-the-bit, deep-reading azimuthal resistivity allows
   early detection of remote conductive boundaries
- Intuitive, dynamic, real-time display of reservoir boundaries



#### SIGNALS<sup>™</sup> Surveillance Operations Monitoring Services

#### Applications All Drilling Environments

#### Features

- Collection and interpretation of real-time operational data
  Detailed record of drilling parameters
- Provides integrated data visualization
- Structured workflow and proactive
- communication protocols

#### SIGNALS<sup>™</sup> Defense Wellbore Integrity Services

#### Applications

- Exploration Wells
- Offshore drilling environments
- Narrow pressure windows
- Complex and problematic formations

#### Features

- Early kick detection with automated smart alarms
  Identification of wellbore instability issues
  Pore pressure trend analysis
  Hole cleaning analysis
- SIGNALS<sup>™</sup> Optime Drilling Optimization Services

## Applications

All Drilling Environments

#### Features

- Focused, real-time, offsite 24-hour monitoring and analysis
- of data
- Integrated drilling advice through wellsite, operator, and
- remote support teams
- Structured workflow and proactive
- communication protocols
- Pre-well and Post-well service analysis

#### Applications

- Onshore, offshore, and deepwater
- Extended reach drilling
- Challenging interbedded or complex well formations

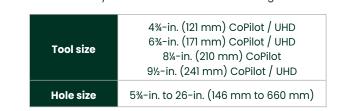
CoPilot<sup>™</sup> 2.0 / CoPilot UHD

Real-time drilling performance service

- Conventional/unconventional oil and gas
- Salt drilling
- Shale gas drilling

#### Features

- Real-time data transmission and expert interpretation
- Bending moment and bending orientation
- Accurate downhole weight and torqueDownhole dynamics measurements including whirl



### **ColiTrak<sup>™</sup> HT** Coiled tubing drilling BHA

#### Applications

- Coiled tubing drilling
- Re-entry and preset well application
- Slimhole drilling
- Underbalanced drilling

#### Features

- Performs in downhole temperatures up to 175°C
- Passes easily through existing completion for economic access to bypassed reserves
- Reaches target zone faster because of high build-up rate capability
- Handles underbalanced conditions with compressible drilling fluids and gas injections through the drill string or production while drilling
- Enables BHA deployment into pressurized/live wellheads, and allows BHA setup variations depending
- on customer need

Tool size	3-in. (76mm)
Hole size	3½-in. to 4¾-in. (89mm to 121 mm)

## bakerhughes.com

# **DRILLING SERVICES**

Formation Evaluation Technologies

# LithoTrak<sup>™</sup>

#### Density and porosity service

#### Applications

- Formation and reservoir evaluation in all well profiles
- Reservoir navigation Wellbore stability monitoring

#### Features

- Acquires data using straight hole rotary, steerable motors, or rotary steerable drilling systems
- Measurements are collected by a standoff binning process to provide accurate, compensated density and Pe values
- · Real-time borehole density images and caliper measurements in all mud types
- Accurate identification of fluid contacts and hydrocarbon typing
- Azimuthal borehole caliper and real-time, short-spaced borehole images

Tool size	4¾-in. (121 mm) 6¾-in. (171 mm) 8¼-in. (241 mm)
Hole size*	57/8-in. to 12¼-in. (149 mm to 311 mm)

#### SoundTrak<sup>\*\*</sup> Acoustic service

#### Applications

- Pore-pressure prediction
- Acoustic slowness in large holes and slow formations
- Seismic time-depth tie
- Acoustic porosity evaluation • Early detection of shallow gas
- Acoustic light hydrocarbon indicator

#### Features

- Proprietary quadrupole transmitter technology
- Multi-frequency source
- Measures compressional and shear slowness
- Salinity-independent measurements for real-time pore-pressure prediction
- Real-time geomechanical rock properties measured for
- wellbore stability • High attenuation, band-reject isolator
- Sourceless porosity

SeismicTrak<sup>™</sup>

Applications

• Deep water drilling

extended-reach wells

Reducing seismic uncertainty

check-shot time-depth pairs

drilling process

large memory

**Tool size** 

Hole size

Nominal

hole size

TesTrak<sup>™</sup>

Applications

Drilling hazard mitigation

Reservoir characterization

• SmarTest™ intelligent testing

Real-time formation mobility

**FASTrak<sup>™</sup> PRISM** 

Single-phase fluid sampling and

Highly deviated, extended reach and

formation-pressure testing

SmarTest<sup>™</sup> intelligent testing

High Accuracy Pump Control

Chemical Resistant metallurgy

· Compressibility and Drawdown Mobility

Multiple samples per pressure station

• Single Phase Sample Tank Technology

Capture of up to 16 Single Phase Samples

· Real Time Fluid Analysis

and Soundspeed

• JewelSuite Software

Tool size

Hole size

SmartPad<sup>™</sup> closed-loop sealing

• Multiple drawdowns per test station

operational safety

Onshore / Offshore

horizontal wells

• SmartPad<sup>™</sup> closed-loop sealing

· Real-time pore pressure measurements

• Real-time gradient analysis to identify fluids

types

**Features** 

and contacts

**Tool size** 

Hole size

Applications

• Deepwater

**Features** 

Seismic-while-drilling service

• Vertical, Highly deviated, horizontal, or

• Determining casing and coring points

Identify over-pressured zones below the bit

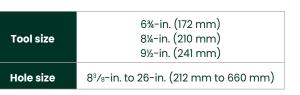
• Precise clock mechanisms for highly accurate

Immediate data-capture feedback during

Rugged design with redundant sensors and

Formation pressure while-drilling service

Onshore and offshore drilling: all well types and formation



# Integrated MWD and LWD service

#### Applications

OnTrak<sup>™</sup>

- Offshore exploration and development
- Complex directional targets
- Geosteering
- Leak Off and Formation Integrity Testing

#### Features

Real-time directional information

#### **Features**

# VisiTrak<sup>™</sup>

#### Geospatial Navigation and Analysis Service

#### Applications

- Onshore / Offshore
- Deepwater
- Conventional Oil & Gas
- Pilot hole mitigation
- Highly deviated, horizontal and extended reach wells
- Reservoir Navigation / Geosteering and reservoir mapping

#### Features

- Low frequency measurements for extra deep resistivity measurements
- Cross component antenna technology allowing azimuthal sensitivity
- · Early reservoir detection from overburden
- Multiple boundary / fluid contact detection
- Real-time reservoir architecture mapping to seismic scale



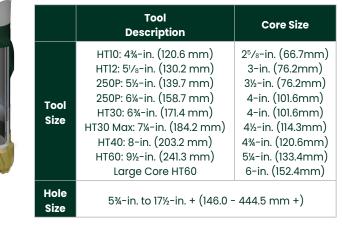
## **Conventional Coring**

#### **Applications**

- Onshore / Offshore drilling
- Conventional and Unconventional formations
- High Pressure / High Temperature formations
- Shale Gas, Deep Water & Geothermal Drilling
- Horizontal and deviated Drilling
- Consolidated and Unconsolidated formations

#### Features

- HT-Series (Heavy Duty, High Torque) Core Barrels
- Baker Hughes Core Bits
- CoreGard<sup>™</sup> Low Invasion Technology
- Disposable, vented Inner Barrels
- Non Rotating Inner Tube Stabilizers



#### JamBuster™ Jam mitigation coring system

#### **Applications**

- Onshore / Offshore drilling
- Conventional and Unconventional formations
- High Pressure / High Temperature formations
- Shale Gas, Deep Water & Geothermal Drilling
- Horizontal and deviated Drilling Consolidated and fractured formations

- Features • Telescoping Sleeves allow continuous coring after jamming inside Inner Barrel Modular Coring System
- Tool **Core Size** Description

## SOr™ Sponge liner coring system

#### **Applications**

Baker Hughes >

- Specialized Coring operations
- All Drilling Environments • Enhanced oil recovery projects
- Consolidated formations

#### Features

- · Molded, oil-absorptive sponge liner
- Foam reinforced webbing
- LaserCut aluminum liner system
- Proprietary pressure-compensating piston design



#### CoreGel<sup>™</sup> Downhole core encapsulation system

#### Applications

- Onshore / Offshore
- Conventional and Unconventional formations
- Horizontal and deviated Drilling

#### Features

• Encapsulates cores in a viscous, noninvasive,

Reduces drilling fluid contamination

protective gel Increases core integrity during cutting

FE-Vision"

Applications

Features

All Drilling Environments

HC-Vision

All Drilling Environments

compartmentalization

evaluation services

All Drilling Environments

CI-Vision<sup>™</sup>

Applications

connectivity

and their origin

TRU-Vision<sup>™</sup>

All Drilling Environments

Applications

Features

**Applications** 

Features

Methane-Pentane gasses

**Cuttings and Gas Evaluation Services** 

Gas sample collection and analysis of

Provides integrated data visualization

**Reservoir Characterization Services** 

Provides visual reservoir interpretation logs

projects independent of SLS provider

Integrates with other formation

Carbon Isotope Analysis

volumetrics, saturations, geohazards and fluid

Provides indications of hydrocarbon porosity, permeability,

Processes data from current drilling projects and legacy

Continuous C1-C3 and CO2 Carbon Isotope ratio analysis

Indicators to biogenic, thermogenic or mixed gas

• Purpose built, rack mounted lab quality equipment

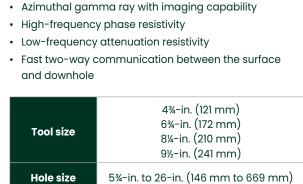
Quantitative Gas Extraction and Analysis

Provides insight of source rock, maturity, transition zones and

Cuttings sample collection and lithology analysis

Identification of potential hydrocarbon presence

Helps prevent jamming



#### AziTrak<sup>™</sup> Deep azimuthal resistivity LWD tool

#### Applications

- Conventional oil and gas reservoirs
- Deep water drilling
- High-angle and horizontal wells
- Brownfield production enhancement
- Field development through infill drilling Leak Off and Formation Integrity Testing
- Geosteering

#### Features

- Compact, fully integrated sub featuring close-to-the-bit measurements
- Close-to-the-bit, deep-reading azimuthal resistivity allows early detection of remote conductive boundaries
- Intuitive, dynamic, real-time display of reservoir boundaries

Tool size         4%-in. (121 mm)           6%-in. (172 mm)	
Hole size	5¾-in. to 10⁵⁄ଃ-in. (146 mm to 270 mm)

#### MagTrak<sup>™</sup> Magnetic resonance service

#### Applications

- Sourceless petrophysical characterization
- Accurate reserves estimates in complex lithologies
- Continuous permeability Fluid sampling optimization
- Fluid typing
- Wellbore placement
- Drilling efficiency
- Completions optimization

#### Features

- Accurate T2 magnetic resonance logs
- Minimizes motion effects on measurements induced
- by drilling vibration
- Sourceless porosity
- Real-time T2 spectrum transmitted to surface

Tool size	4¾-in. (121 mm) 6¾-in. (172 mm) 8¼-in. (211 mm)
Hole size	5¾-in. to 12¼-in. (146 mm to 314 mm)

- Measurements acquired during natural breaks in the drilling process
- Reduces overall cost of logging program • Employs precise clock mechanisms for highly accurate

6¾-in. (171 mm)

9½-in. (241 mm)

8<sup>3</sup>/<sub>8</sub>-in. to 26-in. (213 mm to 660 mm)

8½-in. to 12¼-in.

(216 mm to 311.2 mm)

4¾-in. (121 mm) 6¾-in. (171 mm)

8¼-in. (210 mm)

5¾-in. to 17½-in. (146 mm to 445 mm)

Fluid analysis, sampling and pressure testing service

Reservoir knowledge enhancement, drilling efficiency and

• Direct measurement of Density, Viscosity, Refractive Index

6¾-in. (172 mm)

8½-in. to 11¾- in. (216 mm to 298 mm)

Sampling and Pressure Testing while circulating

**Features** 

• Extended-reach and complex 3D wells

aXcelerate<sup>™</sup> PLUS

Applications

Critical wells

Performance drilling

Geoste

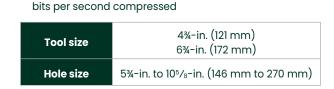
• Downhole adjustable pulser setup via downlink

Required for extended formation evaluation BHA's

High-speed mud-pulse telemetry service

ing and optimized wellbore placement

- Real-time formation evaluation data for
- reservoir navigation
- High-resolution downhole drilling dynamics data • Bandwidth up to 40 bits per second physical and up to 256



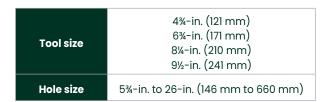
### Wired-Pipe Telemetry

#### Applications

- Extended-reach wells
- Underbalanced drilling
  - Geosteering Performance drilling
  - · Required for extended formation evaluation BHA's
  - Enabling technology for delivering
  - measurements along the string

#### **Features**

- Real-time formation evaluation memory quality data for reservoir navigation
- Bandwidth up to 57,600 bits per second
- · High-resolution downhole drilling dynamics data of the BHA and optional along the string
- Drilling in environments where data transmission was not possible with mud pulse telemetry



#### ImageTrak<sup>™</sup> High-resolution ultrasonic borehole imaging service

#### Applications

- Production optimization
- Reduce drilling risks
- Reservoir structure and dip determination
- Thin bed and lamination identification
- Secondary porosity evaluation
- Cement and borehole volume estimation Visual casing and liner running risk avoidance

#### **Features**

- Oil or water based mud compatible
- High sampling rate for drilling up to 400 ft/hr
- Three independent sensors
- 256 sector travel time and amplitude images • 1/4-in. vertical resolution

6¾-in. (172 mm) Tool size



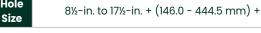
#### HydroLift<sup>™</sup> Full closure catcher coring system

- Applications
- Recovery of unconsolidated formation material HydroLift is available for the HT30 and HT60 core barrels,
- cutting 4 and 5¼-inch diameter core samples, respectively
- The System also includes a slick entry feature that prevents fractured core from catching or jamming into the catcher

#### **Features**

- Full closure catcher completely seals the inner barrel
- Slick, unobstructed core entry
- Back-up conventional core catcher





# LaserCut<sup>™</sup>

Quick access coring system

- Applications
- Onshore / Offshore drilling
- Conventional and Unconventional formations
- Shale Gas, Deep Water & Geothermal Drilling
- Horizontal and deviated Drilling

 Integral, one piece liners with LaserCut along its length Rapid access on surface

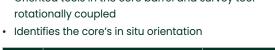


# Size



#### Onshore / Offshore Conventional and Unconventional formations Consolidated formations

- Features
- Knives in shoe assembly continuously scribe the core Oriented tools in the core barrel and survey tool





#### HT30: 6¾-in. (171.0mm) 4-in. (101.6mm) Tool HT60: 9½-in. (241.3mm) 5¼-in. (133.4mm) Size Hole 8½-in to 17½-in. (215.9 to 444.5mm) Size

Core Size

Tool

Description

#### **Vision Services** Wellsite and remote formation evaluation



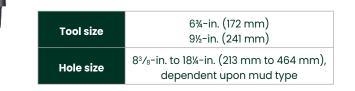
#### ZoneTrak<sup>™</sup> R At-bit resistivity LWD service

#### Applications

- Casing and coring point selection
- Salt exit detection
- Real-time pressure management
- Geo-stopping
- All drilling environments
- High-resistivity contrast formations

#### Features

- · Identifies top and bottom of reservoir
- Detects formation changes faster to adjust drilling fluid parameters
- Includes forward response modeling
- Real-time data transmitted through WellLink™ service



# ZoneTrak<sup>™</sup> G

#### Near-bit gamma service

#### Applications

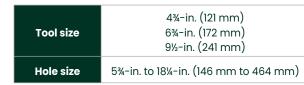
- Casing and coring point selection
- Geo-stopping and Geosteering
- Reservoir navigation
- All drilling environments

#### Features

bakerhughes.com

- True azimuthal gamma ray measures 6 feet above
- the bit
- Imaging capabilities
- Two gamma sensors
- Real-time gamma data can be displayed through

#### WellLink™ service



### StarTrak<sup>™</sup> Electrical imaging service

#### **Applications**

- Complex or thin-bedded reservoirs • Shale gas plays
- Geosteering
- Wellbore stability

#### **Features**

- Acquires high-resolution images at penetration rates up to 150 ft/hr
- Very tolerant of moderate levels of stick/slip
- Real-time images displayed through WellLink™ service
- Detailed fracture analysis



#### Hole size 8<sup>3</sup>/<sub>8</sub>-in. to 10-in. (212.7 mm to 254 mm)

Tool Size	HT10: 4 3/4-in. (120.6mm) HT12: 5 №-in. (130.2mm) HT30: 6 3/4-in. (171.0mm) HT30 Max: 7 1/4-in. (184.2mm) HT40: 8-in. (203.2mm) HT60: 9 1/2-in. (241.3mm)	2 <sup>5</sup> / <sub>8</sub> -in (66.7mm) 3 -in (76.2mm) 4 -in (101.6mm) 4 1/2-in (114.3mm) 4 3/4-in (120.6mm) 5 1/4-in (133.4mm)
Hole Size	5 ¾-in to 17 ½-in. + (146.0 ·	- 444.5mm +)

\* Baker Hughes will only provide the needed interface to the survey tools

# **Core Bits**

Applications



#### Onshore / Offshore drilling

- Conventional and Unconventional formations
- Extremely hard and abrasive formations
- Unconsolidated formations
- Highly fractured formations
- Shale Gas, Deep Water and Geothermal Drilling
- Horizontal and deviated Drilling
- Enhanced Oil Recovery Projects, specialized SOr Sponge Precision Core Bits

#### Features

- Talon Series PDC Core Bits
- IRev Impregnated Core Bits
- Natural Diamond Core Bits

Tool size	4¾-in. to 9½-in. (120.6 mm to 241.3 mm)
Hole size	5%-in. to 17½-in. + (146.0 mm to 444.5 mm +)

#### Features

- Quantitative analysis of C1-C8 organic hydrocarbons and key inorganic gasses
- Heated quantitative gas extraction
- Constant flow and constant temperature
- Continuous quantification and visualization of
- mud density
- Automated and continuous gas extraction efficiency

#### STRATA-Vision<sup>™</sup>

#### **Advanced Cuttings Evaluation**

#### Applications

- Unconventional wells
- Extended-reach and horizontal wells
- Slimhole drilling

## HPHT zones

- Features
- Formation evaluation log correlation with other
- FE datasets
- Identification of productive zones Chemostratigraphic profile and surface
- spectral gamma
- Near real-time formation and kerogen
- geochemical analysis