Drillbits portfolio

2026

Transcend conventional drilling for seamless, end-to-end well construction solutions that catapult superefficiency

—Well Construction

Contents

SnapScan 3D

Rapid dull grading and drilling record system

Features

- Available with iOS® and Android ®
- Cloud-based solution
- Powered by artificial intelligence and machine learning

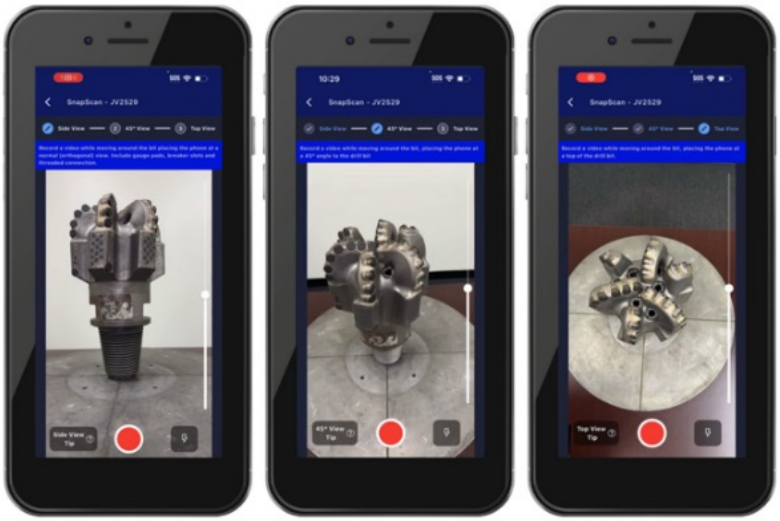
How it works

SnapScan™ application is trained on more than 20,000 images, which classify cutter primary characteristics into worn cutter, chipped cutter, broken cutter, spalled cutter, delaminated, bond failure, lost cutter, and others.

The photographic digital dull information is incorporated into workflows, enabling rapid improvement in cutting structure and cutter development life cycles with corresponding rapid improvements in drilling performance.

How it improves performance

SnapScan application delivers high-quality IADC dull grading through an AI mobile application and creates a personalized library of bit scans with a searchable database that is available for export. The application collects accurate cutter-by-cutter dull grade information and is connected to drilling metadata from a drilling records database, enabling drillers to make more accurate, more efficient business decisions. The application enhances bit selection when considering forensics data for objective PDC drillbit damage characterization and drives drilling performance.



Synapse

Performance insights and optimization service

Features

- Memory tortional vibration, three-axis acceleration, and rpm measurements at the bit
- Postrun data analysis for improved downhole understanding and drilling optimization
- Nonmagnetic assembly to prevent BHA interference
- Synthesized data delivery within 24 to 48 h
- Customizable burst mode

How it works

The Synapse™ performance insights and optimization service is a self-contained sensor module housed within the bit for true at-bit measurements. Its nonmagnetic assembly prevents interference within the BHA. And the memory-mode logging with optional preset sleep mode enables efficient acquisition of rotational speed, shock and vibration, and temperature data.

How it improves performance

Synapse performance insights and optimization service uses a memory-mode shock and vibration tool located inside PDC and roller cone bits. It provides postrun data to evaluate drilling system performance by measuring three-axis acceleration, torsional vibration, and rpm at the bit. This data is quickly processed and customized, per the customer's requirements to provide an improved understanding of downhole events and identify performance limiters. SLB experts can assess BHA drilling efficiency and deliver synthesized data within 24 to 48 h.

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Measurement	Range	Processing	Sampling Frequency
3-axial shock	-200 to 200 g_n	Rms, peak, and mean	800 Hz
3-axial vibration	-16 to 16 g_n	Rms, peak, and mean	800 Hz
Rpm	-666 to 666	Min., max., mean, and stick/slip	1,125 Hz
Torsional acceleration	-6,400,000°/s² to 6,400,000°/s²	Peak, mean	1,125 Hz
Temperature	-40 to 125 degC	Mean	1 Hz
Recording time	Up to 200 h		
Burst mode	10-min internal and 10-s duration		
3-axial shock			800 Hz
Torsional acceleration			1,125 Hz

AccuStrike

Short-makeup drill bit

Features

- Includes the shortest makeup length possible
- Patent-pending matrix-capable offering
- Facilitates efficient turning of steering energy into buildup rates
- Creates stiffness at the bit level to direct the BHA in the desired direction
- Enables lowers steering ratio where dogleg severity (DLS) achievement is possible
- Accommodates all drillbit technologies

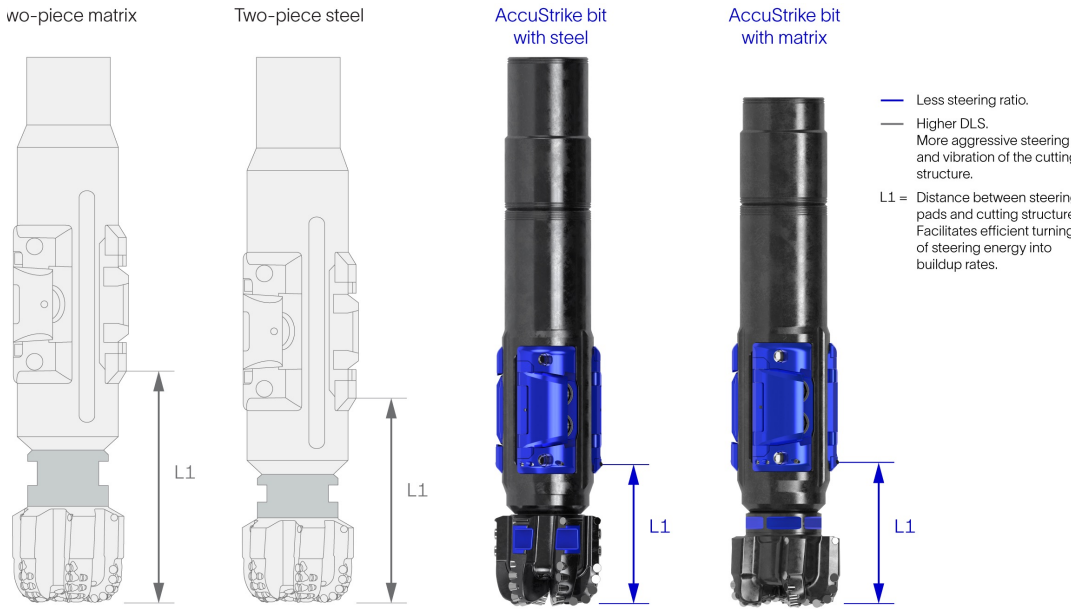
How it works

AccuStrike™ short-makeup drill bits reduce the distance between cutting structure and steering pads to efficiently direct the BHA in the desired direction and achieve high dogleg severity.

How it improves performance

AccuStrike bits help overcome challenges in curve sections of directional applications and achieve desired dogleg output to build planned well profiles. The drill bit delivers higher doglegs by reducing the distance between the cutting structure and steering pads on a rotary steerable system. AccuStrike short-makeup drill bits promote a more efficient drilling energy utilization delivering challenging directional objectives with accuracy and reliability.

In other sections of the well including vertical, build, tangent, and lateral, AccuStrike bits efficiently deliver the desired angle with less steering ratio.



DualHelix

Multiformation performance bit

Features

- Fixed-cutter uses geometry of cutter placement to change how cutters engage according to depth of cut
- Bit uses variable curvature of the cutters to optimize cutting efficiencies
- Bit body shape and blades improves bit cleaning and cutter cooling based on cutter loading
- No limitation on bit size
- No limitation on number of blades
- Compatible with all cutting element technologies

How it works

The DualHelix™ multiformation performance bit leverages cutter placement geometry to adapt cutter engagement based on the depth of cut in soft and hard formations. The design improves cutting efficiency in different rock strengths, resulting in faster ROP in soft rock and greater durability in hard rock.

How it improves performance

By strategically positioning cutters with variable curvature along the bottomhole pattern, the wake created by the leading cutters optimizes cutting efficiency. This passive engagement method operates without any moving parts, relying solely on the three-dimensional sweep resulting from shearing rock removal. Additionally, the bit's body and blade shape offer hydraulic advantages that enhance bit cleaning and cutter cooling in response to cutter loading.

DualHelix is much more than just connected blades with opposite helix directions. Its patented design includes the geometry-derived depth of cut difference between primary and secondary blades. The bit, by being independent of WOB, makes it unique and delivers the ultimate performance in soft and hard formations. It is the ideal mix of blade architecture, placement, and cutter technology.

CenterFlow

Hydraulically enhanced bit

Features

- More efficient PDC bit core with centralized hydraulic port structure and Stinger element provides suitability for a range of formations
- The center flow design enables improved hydraulic flow through the center of the bit, which helps in cuttings removal for better cutting structure engagement with the rock and reduces the risk of bit balling
- Design enhances hydraulics through optimized fluid dynamics that cool and clean the bit, leading to improved bit life and drilling efficiency

How it works

As modern drilling aims to go deeper and faster, advanced drill bits are needed to handle the long distances, different rock types, and various challenges while staying durable. Drill bit design should ensure efficient cleaning, cooling, and quick removal of cuttings. The CenterFlow™ hydraulically enhanced bit features a more efficient PDC bit core with a centralized hydraulic port structure and a Stinger element. This design ensures suitability for a range of formations—from soft to hard rock—making it a versatile choice for various drilling applications.

How it improves performance

The new cutting structure of the CenterFlow bit integrates established technology with an innovative center hydraulic feature in PDC bits. PDC core efficiency is enhanced by removing the center cutters and adding a robust Stinger element, while leveraging a unique port architecture. The CenterFlow bit's design enhances hydraulic flow through its center, which aids in removing cuttings, improves the engagement of the cutting structure with the rock, and reduces the likelihood of bit balling. The technology increases cutting velocity from the face of the bit by 27% on average.

Blade Family

PDC drill bits

Features

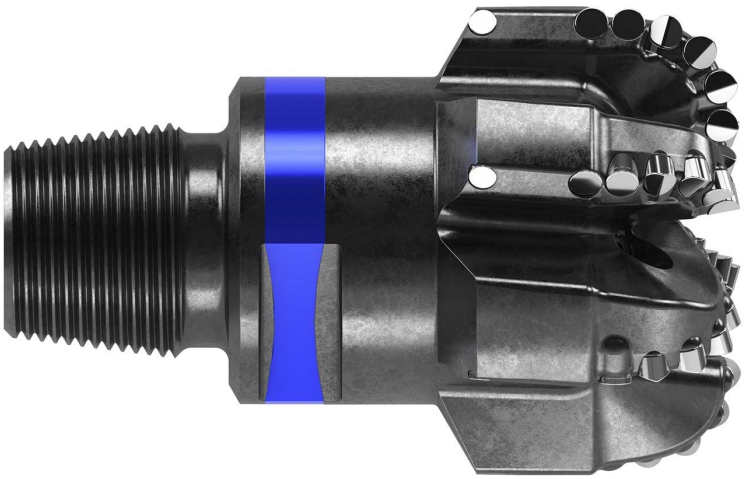
- Premium performance with superior durability
- Customized cutting structures
- Optimized hydraulics
- Application-specific enhancements
- Designed using IDEAS™ integrated dynamic design and analysis platform

How it works

The Blade family of PDC bits features continuous work and customer interaction to deliver better bit performance to customers' drilling challenges. By using sophisticated modeling tools and accounting for a multitude of dynamic variables in a virtual environment, the IDEAS platform moves bits through the design process much quicker while ensuring better reliability and performance than ever before.

How it improves performance

The customer-centric methodology for the Blade family PDC bits delivers application- specific solutions to drilling challenges. Whether it's two row of cutters on certain blades for bit durability and maximum ROP in abrasive formations or directional bits that produce less torque and stick/slip in transitional drilling, the Blade family of PDC bits is compatible with the extensive SLB cutting element portfolio. These cutting elements have extraordinary durability in all kinds of environments and enable runs that drill farther, faster, more responsively, with less bit runs.



ThermoBlade

Thermal-resistant diamond element bit

Features

- Thicker diamond table
- Proprietary diamond table interface
- Improved thermal stability
- Increased durability

How it works

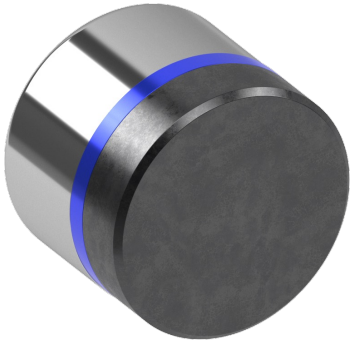
SLB developed the thermal-resistant diamond element, a proprietary cutting technology with a thicker diamond table and an engineered diamond table interface. The interface provides this cutting element with mechanical strength and durability. The cutting element also has a novel thermal stability against the tremendous heat that can approach 1,000 degC [1,832 degF] and shearing forces concentrated on the tip. This combination gives bits with thermal-resistant diamond cutting elements better resistance to thermal degradation that causes cutter damage on other drill bits.

These features improve drillbit rate of penetration (ROP) and its ability to drill to interval total depth (TD) in fewer or single bit runs.

How it improves performance

The thermal-resistant cutting elements are engineered to withstand high thermal loads and preserve diamond integrity under demanding drilling conditions. The ultra thermal-resistant diamond cutting element increases durability with up to 17% more diamond volume, a bi-layer high-conductivity carbide substrate, and an enhanced deep-leach process for improved heat management. The scribed thermal-resistant diamond cutting element boosts cutting efficiency by up to 19%, increasing penetration rates in abrasive or interbedded formations. Together, these thermal-resistant variants reduce thermal degradation, maintain sharper cutting edges, and extend bit life while minimizing the risk of premature trips.

Thermal-resistant diamond cutting element



Ultra thermal-resistant diamond cutting element

Scribed thermal-resistant diamond cutting element

EnduroBlade 360

Rolling diamond element bit

Features

- 360° revolution capability enables cutting element to stay sharper longer
- Number and placement of elements can be customized to maximize durability in bit cutting structure's high-wear areas
- No change in cutter size is required to integrate the element into any PDC bit cutting structure
- Element is available in 13-mm, 16-mm, and 19-mm sizes

How it works

The part of a fixed cutter's edge that engages the formation is subjected to mechanical and thermal effects that cause wear and chipping. Using a rolling cutting element increases durability by ensuring that the part of the element edge making contact with the formation is continually refreshed to stay sharper longer.

Precise positioning of Enduro 360™ rolling diamond elements relative to contact with the formation, coupled with the bit's drilling force, drives efficient rotation of the Enduro 360 rolling diamond cutting element. Strategically positioned in the highest wear areas of a bit's cutting structure, the rolling cutting element's entire diamond edge is used to shear the formation.

How it improves performance

PDC bits with the Enduro 360 rolling diamond cutting element are proved to sustain run length increases of up to 57%, as compared with bits using fixed cutters. Ideal for abrasive environments and other drilling conditions that cause and accelerate PDC cutter wear, Enduro 360 element extends bit durability to deliver increased run footage and average ROP. In addition, the rotating action improves thermal dissipation, preventing concentrated heat buildup.

Enduro360
Rolling diamond cutting element

StingBlade

Conical diamond element bit

Features

- Delivers high point loading onto the formation, fracturing hard-to-drill rock more efficiently
- Features a diamond layer that is twice as thick as that of a conventional PDC cutter, enhancing impact strength and improving overall bit durability

How it works

The Stinger™ conical diamond element's 3D geometry is optimized using finite-element analysis to model the precise point at which the element's tip contacts the formation. This ultrahigh concentration force, coupled with the element's thicker diamond table and state-of-the-art polycrystalline diamond blend, enables fracturing high-compressive-strength rock more efficiently for extended runs and faster ROP.

How it improves performance

PDC bits with the Stinger conical diamond element improve footage and ROP while maintaining greater toolface control and minimizing shock in challenging drilling applications that can cause impact damage to conventional bits. Bits with the Stinger element average a 55% increase in footage with a 30% increase in ROP compared with offset runs. Ideal for challenging drilling applications, including hard, interbedded, conglomerate, and chert and pyrite-inclusive formations, bits with Stinger elements significantly improve run footage and ROP, increase build rates with better toolface control, and enhance bit stability for BHA shock and vibration mitigation.

Stinger
Conical diamond element

AxeBlade

Ridged diamond element bit

Features

- Combined shearing and crushing actions to cut rock more effectively
- Thicker diamond table
- Ridge-shaped cutting geometry

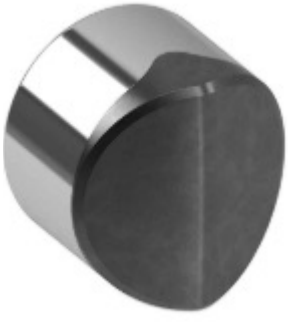
How it works

Axe™ ridged diamond elements feature a thicker diamond table on the cutter that increase cutting element durability and maintain desired ROP throughout the run. The ridge-shaped cutting element geometry reduces the cutting force requirement for less overall torque, less reactive torque fluctuation, and better toolface control.

How it improves performance

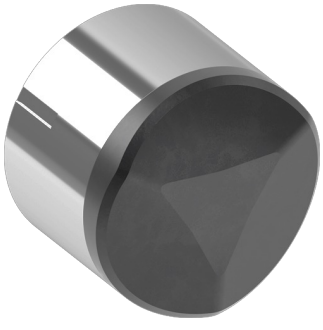
The crushing and shearing action of the Axe ridged diamond element achieves at least 22% deeper penetration to provide higher instantaneous ROP using the same weight on bit and rpm applied to conventional PDC cutters. The key is in the ridge-shaped geometry, which yields a diamond table that is 70% thicker than a conventional cutter while providing higher frontal impact resistance. This feature translates into improved durability and dull conditions for maintaining maximum ROP throughout the run.

Axe SR and Axe TR cutters enhance drilling performance in hard and interbedded formations by combining aggressive scribed geometries with the proven Axe profile. Axe SR reduces cutting and vertical forces for higher ROP potential, while Axe TR delivers ~15% greater impact strength and improved stability, maintaining sharper cutting edges under high-load conditions. Together, they increase efficiency, durability, and footage drilled in demanding applications



Axe Ultra™
Ridged diamond element

Axe SR™
Scribe-ridged diamond element



Axe TR™
Triple-ridged diamond element

SerraBlade

Serrated diamond element bit

Features

- Serrated edges for enhanced cutting efficiency
- Thick diamond table for better thermal stability
- Multiple ridges at the cutting tip to provide better toughness against impact
- Concave surface to increase aggressiveness

How it works

Its uniquely engineered serrated cutting profile initiates continuous rock crushing and shearing action, significantly enhancing cutting efficiency. This advanced geometry, combined with the multiridge cutting tip and concave surface of the cutters, reduces the attack angle and the force required to penetrate medium-to-hard rock by up to 12% compared with conventional at-surface PDC cutters. The thick diamond table improves thermal stability in high-temperature rock-cutting conditions, while the cutter's robust structure increases toughness against impact by 22%.

How it improves performance

A revolutionary development in PDC cutter technology, the serrated diamond cutting element enables higher ROP and improved drilling efficiency in the interbedded medium-to-hard strength formations. The serrated cutting elements are engineered to optimize drilling performance and bit life. The cutting elements are integrated into the drill bits, enabling them to achieve higher ROPs and drill longer distances, hence reducing overall drilling time and costs.

Serrated
diamond cutting element

StrataBlade

Concave diamond element bit

Features

- Precision-molded diamond table with armored cutting edge
- Chip-breaking profile and hyperbolic shape

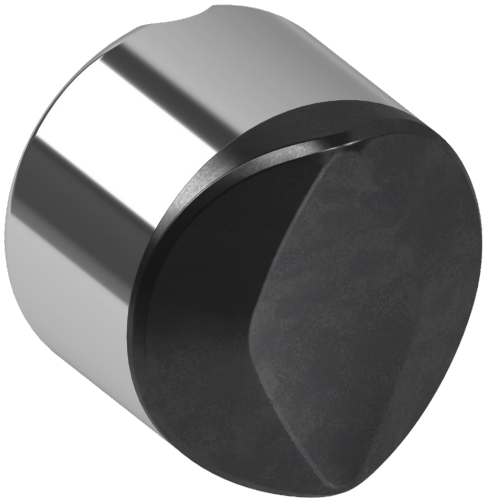
How it works

Strata™ concave diamond element feature a distinctive concave shape that decreases the cutter back-rake angle to cut deeper into rock. It also forms into a tapered geometry with a thicker diamond table that significantly improves cutting efficiency and sustains a higher instantaneous ROP with the same input energy. For deep lateral wells where weight transfer to the bit is a challenge, the bits with Strata elements deliver better torque response at the bit for superior steerability and conformance to directional plans.

The thick diamond layer at the cutting tip and tapered profile toughen the cutting elements against chipping and breaking for increased durability.

How it improves performance

Bits with Strata elements increase ROP by up to 35% in the soft-to-medium strength formations as compared with flat PDC bits. The concave diamond element bit saves rig time and costs by delivering faster instantaneous ROP. It withstands impact damage in drilling through interbedded formations with unconfined compressive strength (UCS) ranging up to 15,000 psi.



Strata
concave diamond cutting element

HyperBlade

Hyperbolic diamond element bit

Features

- Precision-molded diamond table with armored cutting edge
- Chip-breaking profile and hyperbolic shape

How it works

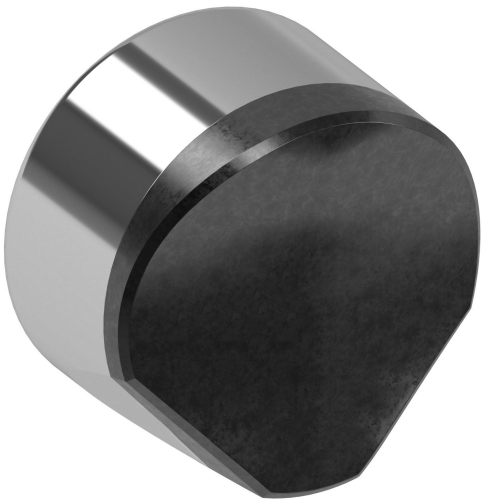
With hydrostatic pressures typically greater than 7,500 psi, plastic formations can be difficult to shear with a cutting element. The Hyper™ Hyperbolic diamond element features an increased rake angle at the cutting edge, thus cutting up to 20% deeper into rock and increasing ROP.

Fixed cutters create long cuttings ribbons that lead to severe bit balling in soft and plastic formations. The hyperbolic shape and chip-breaking profile at the center of the Hyper element create small cuttings chips to mitigate balling and improve cuttings removal.

How it improves performance

Hyper and Hyper Scribe cutters use a thick, precision-shaped hyperbolic diamond table to deliver high durability, stable steering response, and efficient rock penetration in soft and plastic formations. Their unique geometry reduces the vertical and circumferential forces required to cut, improving drilling efficiency and maintaining control. Hyper Scribe's engineered scribe tip further boosts aggressiveness, generating 35% lower vertical force than flat-round PDC cutters for superior cutting efficiency. Together, they enable faster drilling and can increase ROP by up to ~21% in soft and plastic formations.

Hyper
hyperbolic diamond cutting element



Hyper Scribe
Scribed hyperbolic diamond cutting element

Retina

At-bit imaging system

Features

- Patented technique for generating at-bit borehole images
- High-resolution imaging in any fluid composition
- Using a recording mode system, the PDC drill bit is tailored to accommodate sensors for at-bit force measurement
- Alignment with traditional workflows used by geologists, geophysicists, and completion teams for formation analysis

How it works

Retina™ at-bit imaging system is a groundbreaking technology that converts measurements taken at the drill bit into high-quality borehole images. For the first time, high-frequency cutter force data can be translated into detailed borehole images.

The only tool that offers imaging while drilling holes larger than 9 in [228.6 mm], the Retina system surpasses the limitations of other technologies, improving decision-making and operational efficiency. It collects vital data during the drilling process without requiring changes to drilling operations, extra runs, or additional tools in the BHA. It is easy to deploy and simple to operate and works with any drilling fluid composition.

How it improves performance

Using a recording mode system, a PDC drill bit is tailored to accommodate sensors for forces measure capture at-bit level. Retina system captures formation details—including dips, fractures, facies, and textures—without interference from any type of drilling fluid. The raw data is processed to create a borehole image for formation characterization and rock properties qualification.

Spyder

Hybrid drill bit

Features

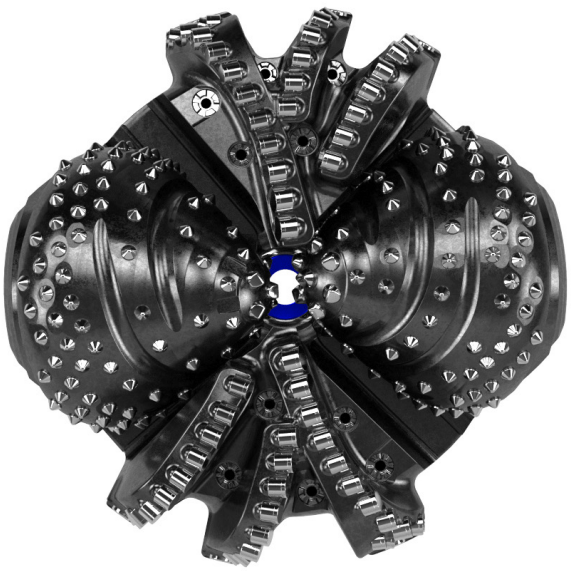
- Bit architecture is built on SLB proven two-cone technology structure
- Roller cone and fixed cutter structure operate in tandem to maximize cutting efficiency
- Cones use proprietary conical and Axe™ ridged diamond element shapes developed specifically for hybrid cutting structures
- Blades use SLB premium cylindrical cutters and 3D shaped cutters

How it works

The roller cone cutting action prefractures formations, enabling the fixed cutter structure to shear and remove rock more efficiently. Additionally, the strategic placement of cutting elements on the roller cones reduces torque and enhances bit dynamics. The combined cutting structures can be customized to efficiently drill a wide range of lithologies from very soft to hard.

How it improves performance

The Spyder™ hybrid drill bit combines the advantages of fixed cutter and roller cone bit designs, improving drilling performance, lowering torque, and expanding its versatility for a wide range of applications. With a fixed cutting structure made from a blend of SLB proprietary premium cutting elements, the Spyder bit is available in standard sizes ranging from 7⅞ to 26 in [200 to 558.8 mm], making it ideal for oil, gas, and geothermal drilling projects.



NeoSteer Max

Unconventional high-performance at-bit steerable system

Features

- Extended life in hole
- High-endurance-strength drillbit connection
- Resilient and wider operating window in high-mud-weight and high-solids environments
- Enhanced real-time communication
- Improved steering control
- Boltless collar for harsh drilling

How it works

The NeoSteer Max™ unconventional high-performance at-bit steerable system (ABSS) empowers operators to tackle the toughest challenges of unconventional reservoirs. This innovative system is designed for enhanced drilling efficiency and sustainability.

By eliminating the need for BHA reconfiguration, the system reduces energy consumption and emissions. Operators can drill the vertical, curve, and lateral sections in a single run, achieving sustainability goals without compromising performance.

With improved real-time communication, extended durability, and superior steering control, the system excels in the toughest unconventional drilling environments. The NeoSteer Max system speeds up drilling and ensures precise wellbore placement, all with a lower environmental impact.

How it improves performance

The NeoSteer Max system extends tool life, reducing trips and NPT. The system works well in harsh conditions, handling heavy mud weights and high solids without interruptions. It improves steering and well placement by providing better real-time communication and control. The boltless collar and improved piston retention make it durable in extreme drilling, while wider ow kits adapt to different formations, optimizing hydraulic performance.

The system has a new ruggedized design of the roll-stabilized control unit, enhancing efficiency and control. Additionally, the system incorporates a proprietary high-endurance-strength drillbit connection. The mechanical integrity and longevity of the box connection threads are significantly enhanced through the use of high-grade steel, resulting in superior resistance to wear and deformation under extreme drilling conditions.

PDC bits

Nomenclature

PDC Bit Architecture	PDC Cutter Technology	Blade Count	Cutter Size	Features
B	W	6	16	S

Architecture	
N	NeoSteer™ At-bit steerable system
H	AccuStrike™ Short-makeup drill bit
F	CenterFlow™ Hydraulically enhanced bit
D	DualHelix™ Multiformation performance bit
B	Blade Family

Cutter Tech	
W	Serra™ Serrated diamond element
X	Axe™ Ridged diamond element
T	Thermo™ Thermal-resistant diamond element
V	Strata™ Concave diamond cutting element
Y	Hyper™ Hyperbolic diamond cutting element
R	Enduro 360™ Rolling diamond cutting element
Z	Stinger™ Conical diamond element

Blade Count
3
4
5
—
10
11
12

Cutter Size	
09	9 mm
11	11 mm
13	13 mm
14	14 mm
16	16 mm
19	19 mm
22	22 mm

Features	
S	SHARC™ High-abrasion-resistance PDC drill bit
M	MDOC™ Depth-of-cut inserts
Z	Central Stinger
T	Integral sleeve
C	Nonstandard API connection
X	NeoSteer CLx™ Extreme curve and lateral at-bit steerable system

Xplorer

Premium roller cone drill bit

Features

- Tungsten carbide insert, milled tooth, and two cone drillbit options
- Dynamic twin-seal technology available
- Carbonate-optimized inserts available
- High-temperature seals available

How it works

Xplorer Gemini™ dynamic twin-seal technology features a primary seal that protects the bearings with a wear-resistant, dynamic face elastomer and a softer energizing material that exerts consistent pressure. A secondary seal protects the primary seal and guards against abrasive particles in the wellbore fluids that contact the bearing seal. A proprietary thermoplastic fabric is positioned on the seal's dynamic face to resist wearing, tearing, and heat damage.

The Xplorer Shamal™ carbonate-optimized insert delivers maximum toughness for carbonate-based drilling operations around the world.

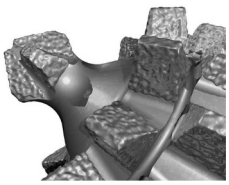
The Xplorer Kaldera™ high-temperature seals feature specialized fabric compounds and a proprietary high-temperature grease formula to incrase seal life, lubricity, and load capacity for high-temperature applications.

TCT two-cone technology roller cone bits are designed with higher point loading, resulting in improved rock destruction.

How it improves performance

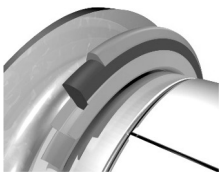
Xplorer premium roller cone drill bits deliver consistently superior performance in applications ranging from soft to ultrahard formations. These premium roller cone drill bits are armed with optimal cutting structures layouts bringing aggressiveness and robustness to enable higher rate of penetration at a lower cost per foot. Premium cutting structures, materials, and hydraulic options customize your application-specific bits for maximizing performance and durability in any environment.

Tungsten carbide insert drill bit

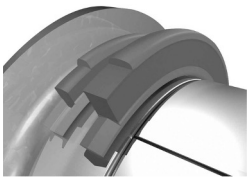


Milled tooth drill bit

TCT drill bit



Xplorer Kaldera high-temperature seals



Xplorer Gemini dynamic twin-seal

Size range from 3 ½″ to 42″

Roller cone bits

Nomenclature

Product Line	Bearing and Seal	IADC Code	Features
XR	G	417	S

Product Line		Bearing and Seal		IADC Code	Features	
XR	Xplorer	none	Open or O-ring	111	S	Xplorer Shamal™ Carbonate-optimized inserts
TCT	Two cone	G	Dual seal	115	+	Premium hardfacing
MC	Monocone	F	Single premium seal	135	A	Air applications
		K	Geothermal	—	B, BD	Binary gage
				415	OD, OD1	Diamond heel
				437	D	Diamond gauge
				—	DD	Full diamond cutting structure
					R	Leg back protection with semi-round top (SRT) tungsten carbide inserts (TCI) on upper leg section and extending near full gauge
					RD	Leg back protection with semi-round top (SRT) diamond enhanced inserts (DEI) on upper leg section and extending near full-gauge
					PS	Leg back protection with SRT TCI on leg back region
					PD	Leg back protection with DEI on leg back region

Specialty applications

Allegro XCD casing-while-drilling alloy bit

Features

- Unique bit body that can be drilled out by any standard PDC bit
- Large face waterways and junk slot areas
- Optional tungsten carbide coating

How it works

The Allegro XCD™ casing-while-drilling alloy bit is designed for drilling vertical or tangential wells to TD in one run. This PDC bit drills on standard casing that is rotated at the surface. The bit's sub is composed of durable oilfield-grade steel, while its body is made of a copper bronze alloy. This unique alloy allows it to be drilled out by any standard PDC bit after the Allegro XCD bit has drilled to TD, and the casing has been cemented in place. The need for a dedicated drillout run is eliminated as the drillout PDC bit can continue drilling the next intervals.

How it improves performance

The SLB casing-while-drilling service improves well construction efficiency and coordination to better deliver your well. This approach not only provides a way to reduce the risks associated with wellbore instability, but it also greatly increases performance through time savings—both on the drilling and flat-time portions of the time-depth curve.

Casing while drilling minimizes annulus size as the casing rotates while cuttings are smeared into the borehole wall, sealing pores in the formation to reduce fluid losses and producing a stronger borehole for improved cementing.

Available Sizes

Application	Bit	Casing x Bit Size, in
Soft formations (<8,000-psi UCS)	XCD319	13⅜ × 17½
	XCD413	10¾ × 13½
	XCD416	9⅝ × 12¼
	XCD419	9⅝ × 12¼, 13⅜ × 17½, 18⅝ × 23, 20×23, 20×24
Medium formations (8,000- to 14,000-psi UCS)	XCD316	12¾ × 15½
	XCD416	9⅝ × 12¼
	XCD419	9⅝ × 12¼, 13⅜ × 17½
	XCD516	7 × 8½, 10¾ × 13½
	XCD519	16 × 18¼
	XCD616	13⅜ × 16, 13⅜ × 17½
Hard formations (>14,000-psi UCS)	XCD516	9⅝ × 11⅝, 9⅝ × 12¼
	XCD613	9⅝ × 12¼
	XCD716	9⅝ × 12

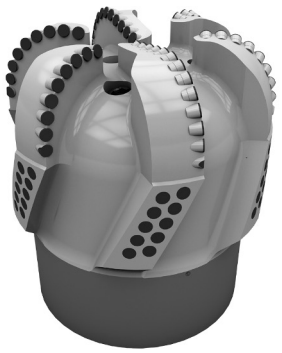
Nomenclature

Casing Size × Bit Size	Product Line	Blade Count	Cutter Size
9⅝ × 12¼	XCD	5	16

Product Line	
XCD	Allegro XCD casing-while-drilling alloy bit

Blade Count
3
4
5
6
7
7

Cutter Size
13 13 mm
16 16 mm
19 19 mm



Specialty applications

Concentric staged hole openers

Features

- Applications with high work rates
- Minimal stick-slip
- Maximum concentricity

How it works

The staged hole opener (SHO) is divided into four distinct sections.

Stage one: The pilot bit, either fixed cutter or roller cone, drills the initial hole diameter.

Stage two: The SHO pilot section consists of one or two rows of cutting structures to recondition the pilot hole and remove any swelling clays or moving halites. Gauge pads provide initial stabilization to reduce stick/slip, whirling, or off-center tendencies as the SHO begins the staged reaming process.

Stage three: The SHO pilot conditioning section includes a cutting structure designed to minimize work rates on each cutter position for maximum durability. By stress-relieving the formation with this intermediate stage, larger hole drilling can be done at a more aggressive ROP. The gauge pads and trimmers recentralizes the SHO.

Stage four: With the formation already stress relieved, the reaming section remains aggressive even in more competent formations. Gauge trimmers and spiraled gauge pads ensure good hole quality. Gauge pads in this section are kept short for directional responsiveness.

How it improves performance

The SHO cutting structures are engineered to ensure fast, smoothly drilled, high-quality, concentric hole opening under a wide range of application conditions. SHO tools are run successfully on rotary and rotary steerable assemblies in both straight and deviated holes.

Type	Size, in	Pilot, in
SHO719	26	22
SHOS516	24	20
SHO516	24	20
SHOS616	22	19½
SHO519	17½	12¼
SHOS616	17½	12¼
SHOS519	17	12¼
SHO716	16	12¼
SHO519	16	12¼
SHO519	14¾	12¼
SHO616	14½	10⅝
SHO519	14	11
SHO516	13½	8½
SHO519	12¼	8½
SHOS616	12¼	8½
SHO516	10⅝	8½
SHO616	9⅞	8½
SHOS516	8½	6⅛
SHOS516	7½	6⅛

Nomenclature

Product Line	Cutting Structure	Blade Count	Cutter Size
SHO	S	5	16

Product Line	Cutting Structure	Blade Count	Cutter Size
SHO Staged hole opener	S Backup cutters	5	16 16 mm
		6	19 19 mm
		7	

Specialty applications

Quad-D dual-diameter drift and drill reamer

Features

- Directional and BHA flexibility
- Drillout capability for eliminating trips
- Diameter control for full-gauge wellbore
- Compatibility in vertical and directional applications and variety of formations

How it works

Quad-D™ dual-diameter drift and drill reamer fulfills the two requirements of borehole enlargement—drift and drill—and provides hole opening below installed casing or liner sections. The drillout capability eliminates the need for a trip after drilling out the cement and casing shoe.

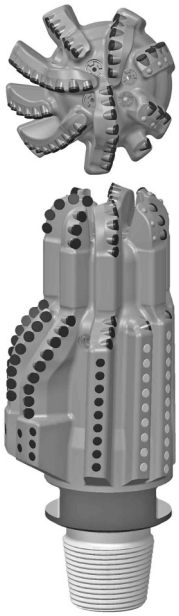
When a Quad-D reamer trips through casing, no part of the cutting structure comes in contact with the casing wall. This is achieved through the creation of a second gauge surface, the drift gauge. All cutters are strategically located inside the drift gauge surface, which is protected by tungsten carbide and diamond-enhanced inserts (DEIs). The placement of the reamer's drift axis is engineered to maximize drilling efficiency in both drillout and drill-ahead modes.

DEIs and carbide hardfacing provide maximum durability for maintaining pilot hole diameter and ensuring stability and hole integrity.

How it improves performance

Quad-D reamers are designed to provide durability, reduce torque response, maintain tangents, and reduce sliding time without compromising efficiency when drilling float equipment or formation.

The compact size of Quad-D reamers, along with spiral blades, a unique profile, and optimal gauge design, enables quick directional response, enhancing steerability.



Quad-D Reamer Specifications

Type	Size, in	Pilot, in
QDRS5216	20	16½
QDR5319	19	16½
QDRS5313	17½	14½
QDR5313	17	14½
QDR5316	16	14¾
QDR5313	14¾	12¼
QDR5213	14½	12¼
QDR5316	13¼	12¼
QDR5313	12¼	10⅝
QDR5313	10¾	9½
QDR5313	9⅞	8½
QDRS6313	7⅞	6⅝

Nomenclature

Product Line	Material	Pilot Blade Count	Reamer blades to full diameter	Cutter Size
QD	S	7	3	13

Product Line	Material	Blade Count	Cutter Size	Cutter Size
QD Quad-D Quad-D dual-diameter drift and drill reamer	M Matrix	3	3	13 13 mm
	S Steel	4	4	16 16 mm
		5	5	19 19 mm
		6	6	
		7	7	

Specialty applications

Impax diamond-enhanced insert hammer bit

Features

- Hardened-steel guide sleeve
- Patented staggered adjacent-to-gauge (ATG) row cutting structure
- Dual retention system
- Available in 8-, 10-, and 12-in sizes

How it works

The Impax™ diamond-enhanced insert (DEI) hammer bit features a hardened-steel guide sleeve design that optimizes energy transfer between the hammer's piston and bit. The guide sleeve design also improves deephole drilling reliability by eliminating the plastic blow tube, which often causes conventional hammers to fail when they are subjected to shock, vibration, abrasive wear, high temperature, erosion, and misting.

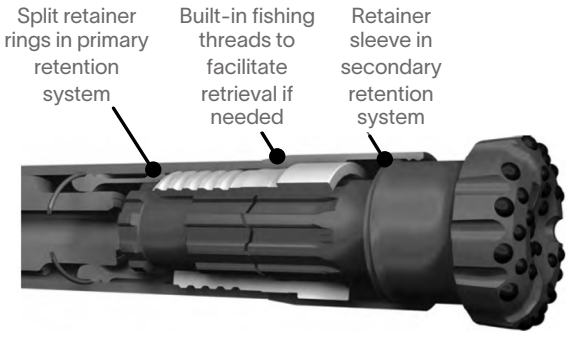
Impax bits also have an improved air delivery system that features a patented floating feed tube designed to reduce wear and downtime issues related to wear on the piston and air delivery components. Because high back pressure, circulation volume, and water produced from misting and influx are major causes of hammer failure, the Impax bit's lower chamber has been designed to handle 10% to 20% more water compared with conventional hammers.

How it improves performance

The ATG row on a bit assists in cutting a portion of the outer hole, helping to reduce the load on the primary gauge row inserts. The unique bottomhole fracture pattern uses energy more efficiently and subjects the cutting structure to less stress. This increases gauge integrity compared with a conventional hammer bit. The reduced exposure to competent formation significantly improves overall bit durability while enhancing ROP potential.

Impax bits have tough and durable DEIs that increase the footage drilled and lower the cost per foot. These bits eliminate the need for reaming, extending the life of the subsequent bit and providing a high-quality borehole for running casing. In addition, three exhaust ports improve bit-face cleaning for longer life and better ROP.

When possible, a secondary air course is used to provide additional flow channels that enhance cuttings removal by providing greater flow area across the bottom of the hole. The efficient use of circulating air improves hole cleaning capabilities and reduces the regrinding of cuttings to maximize ROP.



Nomenclature

Product Line	Gauge Insert Count	ATG Insert Count	Features
H	12	09	D+

Product Line
H Hammer

Gauge Insert Count
08
10
12
14
15
18

ATG Insert Count
04
06
08
09
11
12

Features
C Carbide insert
D DEI
F Flat profile
G Diamond on gauge
M Modified profile
N Nonretainable
PD DEI gauge protection
R Retainable
V Concave profile
X Convex profile
+ ATG feature

Specialty applications

Kinetic diamond-impregnated bits

Features

- Optimized mix of inserts, cutters, and diamond-impregnated matrix
- Center-flow fluid distribution and precisely placed ports
- Ideal for higher rotational velocities

How it works

To optimize durability and ROP, these bits are built with grit hot pressured inserts (GHIs), PDC cutters, thermally stable polycrystalline diamonds, and diamond-impregnated matrix materials.

Kinetic™ diamond-impregnated bits use optimized materials to increase durability and performance in tough formations. Critical to achieving this performance are the GHIs. These inserts comprise a proprietary combination of diamond crystals and tungsten carbide matrix powder tailored to the material properties of the drilling application. Kinetic diamond-impregnated bits GHIs use a granulation process that ensure a uniform diamond distribution unattainable with conventional inserts. This process makes Kinetic diamond-impregnated bits GHIs more durable and able to drill faster for a longer period of time.

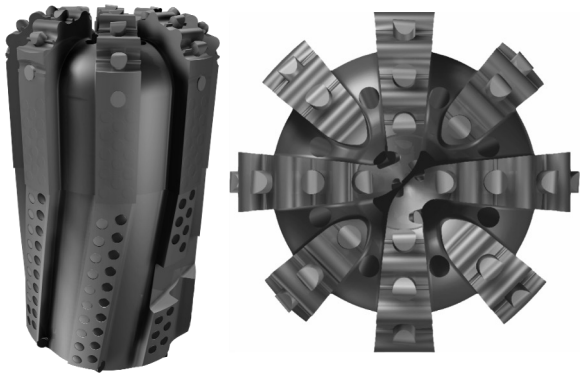
Kinetic bits use a combination of central flow fluid distribution and strategically placed ports to enhance bit cooling and cleaning. This feature is especially important when bits are used in softer formations.

Bit hydraulics enable effective drilling in a mix of lithologies at high ROPs and reduce the need to trip to change bit type.

How it improves performance

For tough, abrasive formations, Kinetic diamond-impregnated bits improve durability and ROP in the most rigorous drilling conditions. These bits can drill out float equipment and are also effective where softer formation is encountered or in overbalanced formations where drilling with conventional bits yields low ROP and footage.

The unique profile design of Kinetic bits is specific to the application and the drive system being used. The profile is tailored to optimize performance whether the Kinetic bit is run with a motor or on turbodrill.



Nomenclature

Product Line	Blade Count	Cutter Size
KH	7	13

Product Line	
K	Kinetic
H	Hybrid

Blade Count
5
6
7
—
12

Cutter Size	
13	13 mm
16	16 mm
19	19 mm

25-WCDR-2400037