



BESTEBIT



PRODUCT CATALOGUE

WWW.BESTEBIT.COM

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BESTEBIT is a leading supplier of premium drilling products and services to the worldwide Oil and Gas Industry.

BESTEBIT was founded on July 05, 1999 and since then supplying quality products and services to our worldwide customers. Despite the recent downturn, BESTEBIT is expanding its footprint and continue to invest in people and infrastructure to grow in the International markets. In a short period of time, we have managed to achieve great results in the key markets of China (Offshore and Onshore), Kingdom of Saudi Arabia, Iraq, Iran, Algeria, Chad, Niger, US, Thailand, etc.

**1999
JULY**

Chengdu Best Diamond Bit Co., Ltd. established and started operations



2003

BESTEBIT Manufacturing expanded capacity to produce 8,000 units per year



2009

BESTEBIT moved into the new State of the Art manufacturing facility



**2015
APRIL**

BESTEBIT Premium Trident Series Product line is launched



**2013
AUGUST**

BESTEBIT USA Operation Facility established in Conroe, Texas

**2018
JUNE**

TridentPlus - The new generation of advanced PDC cutter was brought into market for challenging applications.

**2000
APRIL**

BESTEBIT gets the ISO 9001 certification

**2000
DECEMBER**

BESTEBIT gets the API 7-1 certification

2005

BESTEBIT set up sales and operations in Saudi Arabia, Iraq, Iran, Africa, Thailand, Indonesia, Malaysia, and other International markets



**2010
APRIL**

BESTEBIT gets the ISO 14001 and OHSAS 18001 certification

**2010
MAY**

BESTEBIT Tiger Series Product Line is launched



**2019
JULY**

BESTEBIT celebrates 20 years of successful operations



ENGINEERING, PRODUCTION CAPABILITY AND CERTIFICATIONS

BESTEBIT employs state of the art manufacturing and design process to work towards a continuous improvement process which has resulted in enhancing ROP and decreasing drilling costs for our customers. Our 3 BTM Technology, the Integrated Engineering System combined with BEansys™-Analysis Technology, BEmil™-Cutter Technology, BEcam™-Fast Manufacturing Technology and Computer Integrated Manufacturing System have proven themselves valuable in designing and providing high performance drill bits in a wide range of drilling applications.



CERTIFICATIONS & QUALITY CONTROL

BESTEBIT adopted international management and quality systems as a strategic decision. We have passed ISO9001:2015, ISO14001:2015 and OHSAS18001:2007 qualifications, and have certificates issued by Det Norske Veritas (DNV). Products comply with API Spec. Q1 and API Spec. 7-1.

QHSE is a core value of BESTEBIT. Our business success depends on the ability to continually focus on operational safety, human health, environmental protection and quality improvement. Our QHSE culture is based on the principle that Safe and Clean Energy comes from Safe and Efficient Operations.

- API Specification Q1
Specification of Quality Programs for the Petroleum, Petrochemical and Natural Gas Industry
- ISO9001:2015
- ISO14001:2015
- OHSAS18001:2007
Occupational Health and Safety Management Systems



MANAGEMENT SYSTEM CERTIFICATE

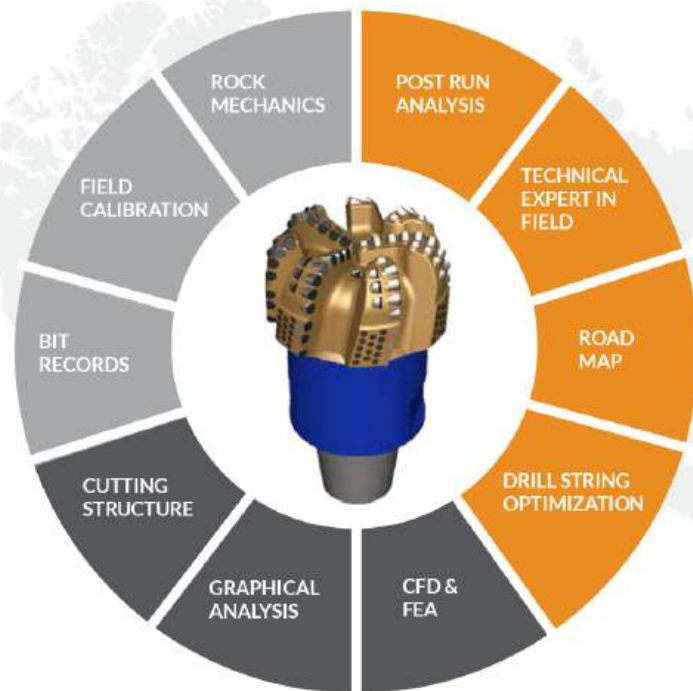
This is to certify that the management system of
Chengdu Best Diamond Bit Co., Ltd.
has been found to conform to the requirements of the standard
ISO 9001:2015 / ISO 14001:2015 / OHSAS 18001:2007
This certificate is valid for the following scope:
Design and Production of Diamond Drill Bits



TECHNICAL SERVICES

A range of technical services are available for fixed cutter product line. There are classified into 3 main categories:

PRE-DESIGN	DESIGN	RUN & POST RUN
Rock Mechanics	Cutting Structure	Drill String Optimization
Field Calibration	Graphical Analysis	Road Map
Bit Records	Parameter Optimization	Technical Expert in Field
	CFD & FEA	Post Run Analysis

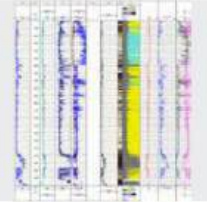


PRE-DESIGN

Fixed cutter products are customized to work for a particular given application in order to maximize performance. This requires a good understanding of the application and calibrating the real scenario in an internal proprietary analytical software. This is done in 2 stages:

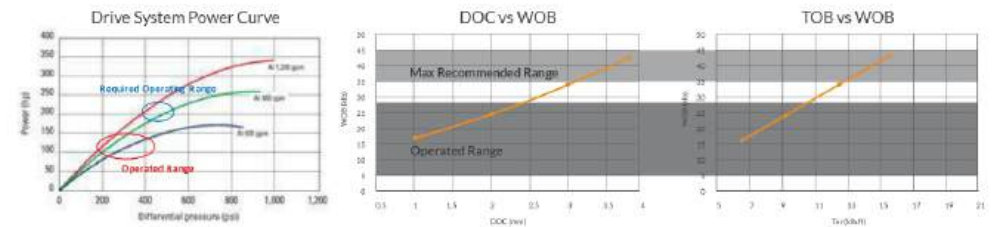
Rock Mechanics

In order to get detailed understanding of the rock to be drilled, it is important to understand its various properties. Based on the rock mechanics theory, the RMA software calculate the rock property by inputting logging data and outputs a readable graph. It plays a significant role in bit selection and optimization. This in turn is used to visualize the requirements in a customized product.



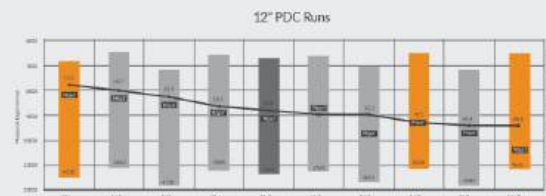
Field Calibration

It is crucial to understand the field operating conditions available for a bit. Hence a key step called field calibrations is performed. This involves understanding of drive system's operating range and the energy delivered to the bit by Kelly/top drive as well as the drive system itself. Then the performance results such as ROP, as predicted by software is compared to field results to verify and calibrate the software. Such calibration helps optimize the software to predict more accurate performance results of the proposed and/or newly designed bit.

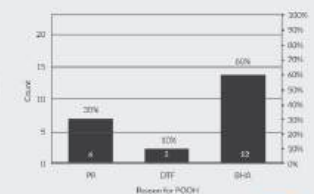


Bit Records

A database with full bit run details is maintained for statistical analysis. Lot of information such as bit, run, well, BHA information etc are captured to understand and compare the performance of a given product. The database is used in creating and understanding of performance, establishing benchmark results, generic dull observed in certain application etc. The statistical method not only helps in bit selection but also in optimizing a design for best results.



Dull Grading Statistics



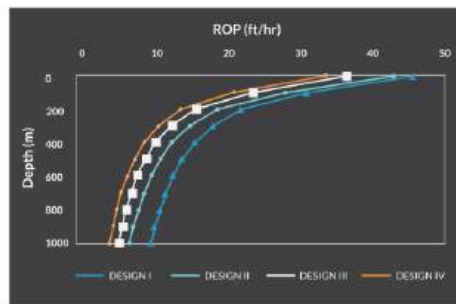
DESIGN

Cutting Structure

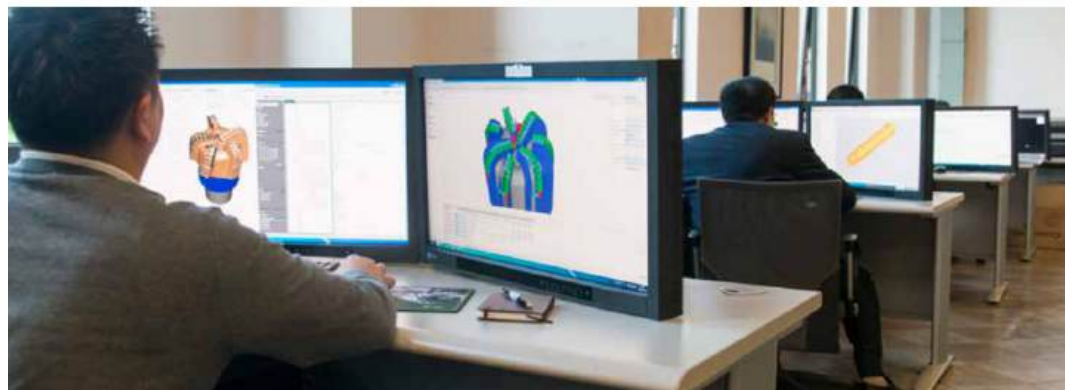
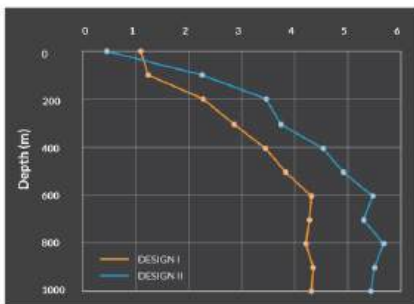
Proprietary software is used to design the cutting structure in both 2D & 3D. All variables in a design are considered and optimized in this stage since cutting structure plays a significant part in bit performance.



Aggressivity



IMBF %



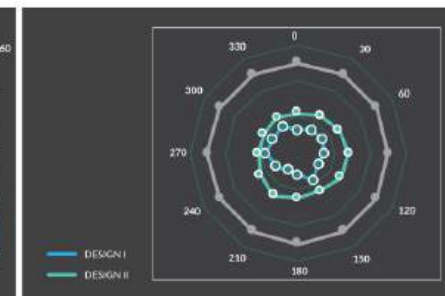
Graphical Analysis

Graphical analytical method is used to visualize and engineer various factors into a bit. Static forces optimization, reduction of imbalance forces, mass balancing, vibration control etc at various drilling scenarios are few of the analyses performed to arrive at perfect cutting structure.

Durability

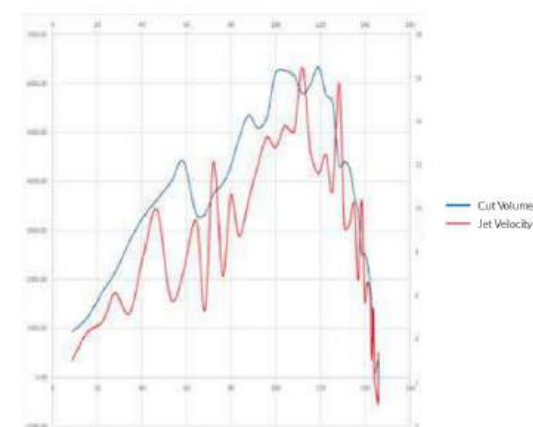
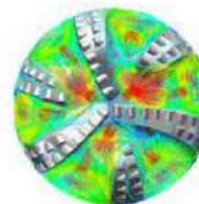
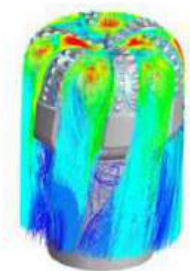


Steerability



CFD & FEA

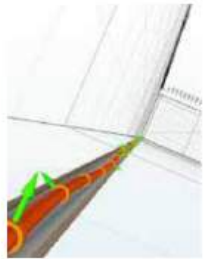
Structural strength are analyzed for integrity of the product in real drilling situations. Computational fluid dynamics combined with an analytical method is used to establish ideal hydraulics guideline for a given product. Various options as standard, thin and/or tall designs combined with standard, anti-erosion or anti-balling hydraulics are available.



RUN & POST RUN

Drill String Optimization

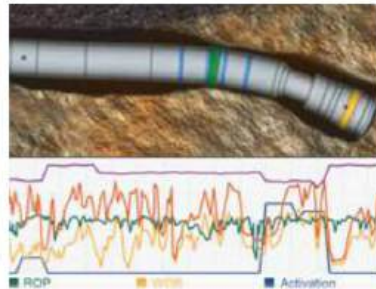
BHA Management	Drillstring Management	Wellbore Integrity	Survey Management
- Directional Pre-Engineering - Directional Post Analysis - PDC Bit Modal Dynamic Modal Analysis - Trajectory Prediction	- Torque & Drag Soft-string - Torque & Drag Stiff-string - Torque & Drag & Buckling - Hydraulics	- Casing Wear - Casing Deformation and Stand Off	- Sag Pre-analysis - Run Sag Correction - Well Sag Correction - Local Doglegs



Advanced Drilling String Mechanics & Vibration Analysis

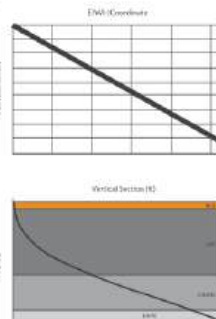
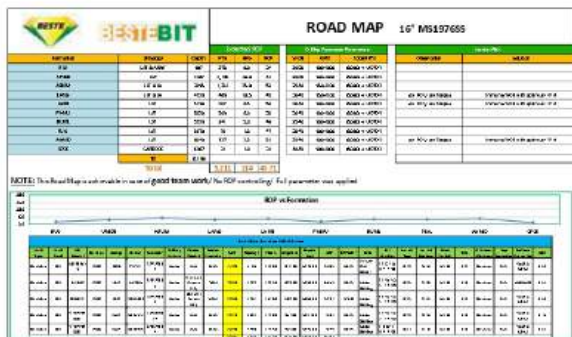


MSE: Drilling Efficiency Evaluation



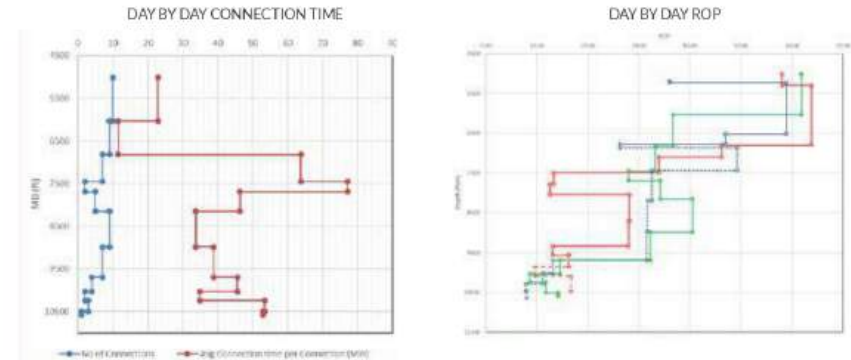
Roadmap

Roadmaps are created to run the bit at ideal operating conditions. Based on the casing, BHA design, well profile, mud system and various other factors that affect drilling, ideal operating parameter such as WOB, RPM, nozzle configuration are created and proposed to achieve maximum ROP and footage.



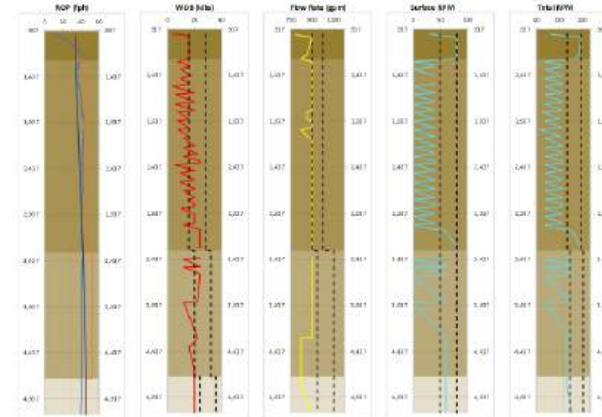
Technical Expert In The Field

Well trained professional bit field engineers are available to run the bit from start to finish. They are experts in tracking performance and changing parameters in real time to achieve desired results.



Post Run Analysis

After every run, the bit performance is analyzed to find further improvements that can be implemented in the future run. This involves checking roadmap versus applied parameters, output dull condition, fish bone analysis etc.



Cutter Wear

PRODUCTS

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NOMENCLATURE & BIT SELECTION

Bit Nomenclature

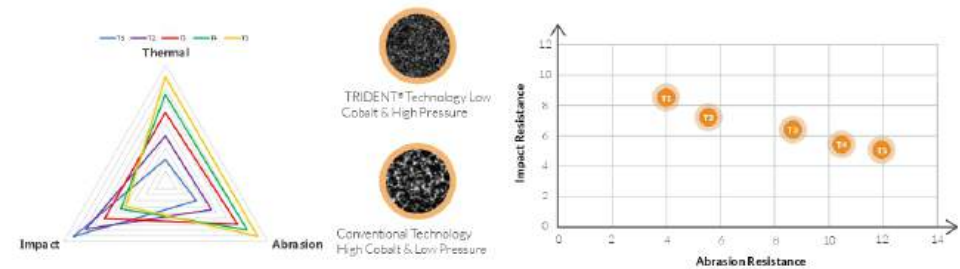
TS1665U

Product Series	Body Material	Cutter Size	Blade QTY	Cutter Density
T-TRIDENT®	S-Steel	8 - 8 mm	3 - 3 Blades	1-9 Diamond Volume
	Blank - Matrix	10 - 10 mm	4 - 4 Blades	
		11 - 11 mm	5 - 5 Blades	
		13 - 13 mm	6 - 6 Blades	
		16 - 16 mm	7 - 7 Blades	
19 - 19 mm		8 - 8 Blades		
M-MARS®			9 - 9 Blades	
			..	
E-Eco				



TRIDENT® Plus Series PDC Cutter

- Comprises five application-specific PDC cutters
- Employs proprietary diamond grits and ultra-high pressure synthesis process
- Produces low cobalt concentration without leaching
- Matches cutter to primary failure modes
- Delivers high impact/abrasion resistance
- Provides excellent thermal stability
- Drills more footage per run
- Lowers cost per foot



Cutter Type

T1	T2	T3	T4	T5
Super Impact	Impact	Balanced	Abrasion	Super Abrasion

BIT SELECTION

Achieving excellent field performance requires selecting a right bit for the right application.

Every bit proposed is justified using a variety of technical services. This involves studying the application in detail, evaluating baseline bit performance, using internal proprietary analytical software and field experience. **Every possible detail is considered and every variable in a fixed cutter product are optimized to achieve the best results in the field.**

Suffix	Suffix Characters	Suffix	Suffix Characters
U	Back Reaming Cutter	PP	PowerPick
B	Backup Cutter	PI	PowerImpact
V	DOC Limiter	PPI	PP&PI
E	Enhanced Back Reaming Gauge	RS	Rose Cutter
A	Anti-Balling	PF	PowerForce
G	Enhanced Gauge	DM	DrillMax
M	Mirror Cutter	TM	TurboMax
D	Directional bits		

Materials	Bit Size Range	No. of Blades Range	Cutter Size Range
Matrix	3" to 17 1/2"	3 to 10 Blades	8mm to 19mm
Steel	3" to 28"	3 to 12 Blades	8mm to 19mm

For Specific design and Product Information, please contact a Bestebit representative

BITS / Trident® Plus Series Premium PDC Ψ



Our PDC drill bits provide greater drilling efficiencies and lower cost per foot.

Applications & Benefits

Feature	Benefits & Advantages
 TRIDENT® Plus PDC Cutters	Longer bit life, deeper intervals, faster ROP and higher TD success rate.
 Directional Bit Profile	Bit profiles are customized to meet the BHA and application requirement.
 Directional Gauge Pad Design	Custom gauge pad designs offer flexibility to match the bit to the target Dog Leg.
 Depth of Cut Control	DOC Management smooths out downhole torque fluctuations, providing superior directional control on motor and RSS.
 Short Shank	Reduces the distance between the Bit-to-Bend or RSS steering unit, thus generating higher side cutting forces to achieve high Dog Legs.
 Anti-Balling & CFD	Eliminates the "Dead Zone" by mechanically forcing cuttings into the CFD fluid path for faster ROP in balling formations.
 ARMOR Hard Facing & Improved Matrix	Higher wear resistant body materials significantly increase operating hours for longer runs.

Directional Bit Profile

Steerable Index	Profile Height	Cone Angle
Level 1	Medium	Deep
Level 2	Medium	Shallow
Level 3	Short	Shallow

Short Shank

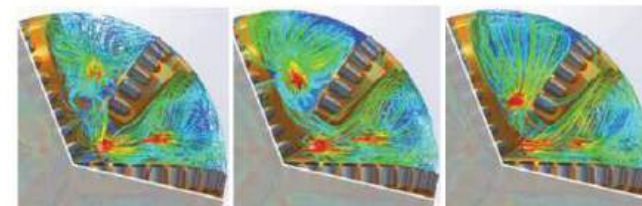


Hydraulics: CFD & Anti-Balling Feature

Location	Non Optimized	Partially Optimized	Optimized
Cone	Reverse flow	Low flow	Full coverage
Blade Front	Low flow	Low flow	Full coverage
Junk Slot	Scattered flow	Improved flow	Parallel flow paths

CFD

- Reduces Erosion
- Longer Hours
- Decreases Bit Balling
- Faster ROP



Directional: Gauge Pad Design

Gauge Pad Features



Passive

Step

Active 1

Active 2

Active 3

BESTEBIT offers a wide range of gauge configurations, depending on the requirements for: Dog leg and/or Gauge pad wear resistance.

BITS / MARS® Series

The MARS® line of PDC bits are a versatile family of proven products which meet a wide range of drilling and application requirements.



These extremely reliable bits combine advanced technology and a proprietary design process to achieve excellent performance and consistency worldwide.

All of our product lines are designed with a holistic approach, incorporating finite element analysis, computational fluid dynamics, diamond density management, torque and vibration control, and advanced force balancing. The result is longer faster runs, with greater steerability and stability than ever before.

Our Mars Series of PDC cutters comes from a long history of testing and evaluation, ensuring that the most suitable cutters for each application are utilized. This fit-for-purpose family of cutters help us ensure the reliability, durability and consistency customers have come to expect from all of our standard products and eventually giving the lowest cost-per-foot solutions.

The result is reliability, durability and consistency giving the lowest cost-per-foot solutions possible.

Applications & Benefits

- Optimized Cutting Structures
- Enhanced Gauge Protection
- Depth of Cut Control
- Anti-Balling & CFD

Our full line of PDC drill bits offer a wide range of solutions to the most common drilling problems:

- Enhanced gauge protection
- Depth-of-cut control technology
- Optimized cutting structures
- Innovative anti-balling designs

Our PDC drill bits provide greater drilling efficiencies and lower cost per foot.

BITS / Eco Series

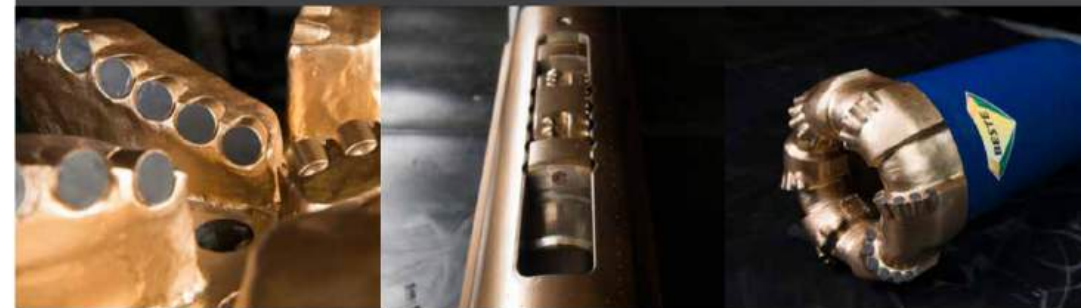


Our economy (Eco) line of PDC bits come from a family of time tested and field proven legacy design products meant for easy / soft applications.



The Eco Series Bits incorporate standard designs and standard cutters.

For any product enquiries, please visit our website www.bestebit.com or send us an email sales@bestebit.com



SPECIALTY BITS / Duo-Bore

Performance drilling in the most challenging environments. Duo-Bore bi-center bits allow for drilling up to **30%** larger diameter holes, over that of the pass through drift diameter, eliminating the need for under reaming and other conventional hole opening tools.



Their unique one piece design provides a shorter makeup length for better direction control and optimum hydraulic alignment of the pilot and reamer sections. With advanced force balanced cutting structure designs and innovative pilot-to-reamer configurations, these bits minimize cutter and casing damage during drill out, have for less vibration while drilling ahead, and produce better quality wellbores at higher ROP's. Duo-Bore bits are available in both matrix and steel body.

- Lower makeup length for better directional response
- Aggressive cutting structure design with depth of cut provide vibration control for smooth running and improved durability
- Thinner blades provide high junk slot areas for maximum hydraulic efficiency for both the pilot and reamer sections
- Force and mass balanced asymmetrical blade design
- Cutting structure designed for reliable drill out mode while protecting the casing
- Gauge design to protect casing and improved stabilization
- Optimized nozzle placement for smooth flow transitions and improved cuttings removal

Applications & Benefits

- | | | | |
|--|--|--|---|
|  One piece matrix or steel body designs |  30% hole opening ratios |  Eliminate hole openers and under reamers |  Formation specific design flexibility |
|  Protected casing during drill out |  Increased stability and durability |  Better hole quality and diameter |  Fewer trips and lower cost per foot |

Their unique one piece design provides a shorter makeup length for better direction control and optimum hydraulic alignment of the pilot and reamer sections. With advanced force balanced cutting structure designs and innovative pilot-to-reamer configurations, these bits minimize cutter and casing damage during drill out, have for less vibration while drilling ahead, and produce better quality wellbores at higher ROP's. Duo-Bore bits are available in both matrix and steel body.

SPECIALTY BITS / Core-Tek Coring



Premium core bits designed and manufactured to the tightest tolerances in the industry.



Available in both matrix and steel body, and a variety of cutting structures from natural diamond, TSP and PDC.

SPECIALTY BITS / Frac Mill Plug

A low cost, steel body PDC drill bit built to drill out composite frac plugs and drillable bridge plugs in lateral, vertical and directional wellbores.



With less torque and finer cuttings, these bits are ideal for high volume milling applications.

SPECIALTY BITS / RevC

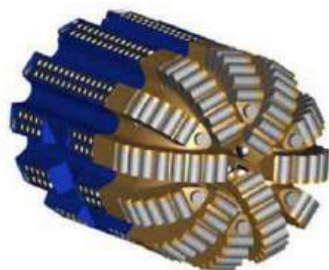


Reverse Circulation Bits designed for:

- Larger diameter shallow boreholes
- Water well drilling
- Mining & Construction
- Other specialty drilling applications

SPECIALTY BITS / TurboMax™ Impregnated

Resulting in a highly flexible platform for optimized designs, with versatility and reliability in even the most challenging formations. The result is the ability to drill longer intervals through hard and abrasive formations while drilling faster with a lower cost per foot as well.



TurboMax™ bits use flexible diamond impreg blocks, allowing optimized designs in blade profile, application specific diamond grit size and density, more efficient cooling and cleaning, and greater gauge protection. The results are more aggressive designs for greater ROP, improved durability, better performance and more footage drilled. With a more balanced workload for smoother running and longer bit life, overall drilling efficiency is greatly improved. TurboMax™ bits can greatly improve bit life, while minimizing trips and the number of bits required, when drilling extremely hard and abrasive intervals.

Applications & Benefits

- Improved Hydraulics
- Advanced Manufacturing Process
- Optimized Blade Profiles
- Application-specific diamond grits and densities
- Optional Turbine Sleeve with TSP protection
- Aggressive Cutting Structure designs
- Greater Gauge Protection

The cutting elements of MAX series bits are made from hot isostatic pressed (HIP) segments which are formed in a variety of shapes and sizes. Diamonds coated with a metal binder, densely intered within a tungsten carbide matrix powder, result in a superior cutting element. A higher diamond density, with more uniform distribution and no thermal degradation, is achieved.

Strict diamond selection of size and quality, along with uniform distribution of diamond concentrations, ensure the reliability, durability and consistency that is needed. Atmosphere controlled coated diamond processing results in improved diamond bonding, lower oxidation and less graphitization providing improved wear characteristics and durability.

SPECIALTY BITS / Geo-Max™ Natural Diamond

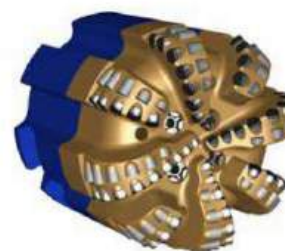


This style of drill bit utilizes a single layer of natural diamonds, set in a hard matrix which can be manufactured in many crown profiles to fit different types of the formations.

The bits are available in a wide variety of diverse specifications such as:

- Diamond size (stones per carat)
- Diamond quality
- Diamond exposure
- Matrix hardness
- Crown design
- Fluid passages
- Numerous design specifications

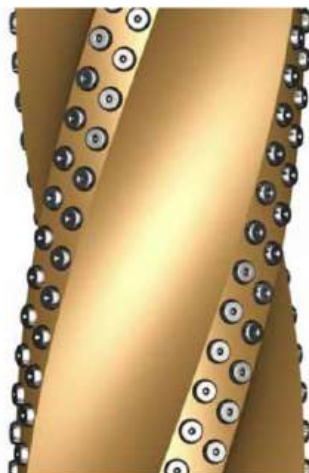
SPECIALTY BITS / DrillMax™



The DrillMax™ Series of bits combines the cutting actions of standard PDC drill bits with that of Diamond Impregnated bits. Where PDC bits are not durable enough and diamond impregnated bits are too slow, DrillMax™ bits will drill faster and last longer through harder and more abrasive formations. With the dual cutting action of these bits, the Trident® PDC cutting structure enables high cutting efficiency in the fixed cutter drillable section, while the diamond impregnated cutting structure engages the harder more abrasive formation once the PDC cutters start to wear.

TOOLS / Shuriken Reamer

Reduces drilling NPT and gives you a clean path to completion



Drilling highly reactive, unconsolidated, inter-bedded and similarly troublesome zones, especially with tortuous extended reach well paths, all-too-often induces nonproductive time (NPT) to deal with stuck pipe and other well bore instability issues. Project costs are further aggravated when post-drilling reaming runs are required to minimize tortuosity and condition the well bore for the completion and production hardware.

With the uniquely engineered Shuriken Reamer, BesteBit gives you a durable and ultra-efficient tool that minimizes NPT and costs, while delivering a smooth and unobstructed wellbore to the completion team, generally without the need for any post-drilling remediation. Featuring a proprietary forced balanced bi-directional cutting structure, the self-stabilizing reamer transfers more weight on bit than possible with any conventional BHA, which in tandem with optimized hydraulics, allows you to consistently drill ahead in the tightest well paths and at higher ROP. With its capacity to construct a clean in-gauge wellbore while drilling, the Shuriken reamer mitigates the persistent risks of stuck pipe when rotating out of otherwise tight and highly restrictive holes.

Above all, you are left with a stable and higher quality wellbore and one fully prepped for the unhindered running of casing, liners and completion tools. What's more, the Shuriken Reamer is available in non-magnetic and steel alloy materials, thus eliminating any concerns of interference with MWD/LWD tool responses.

Applications & Benefits

- Minimal NPT while drilling and tripping
- Faster drilling rates with lower torque and drag than conventional tools
- Enhanced wellbore stability
- Reduced costs & elimination of dedicated reaming trips
- Unimpaired MWD/LWD logs
- Increased durability for longer runs
- Effective reaming without need for conventional & often obstructive stabilizers
- A smooth and ready-for-completion wellbore

Clearly unlike any competitive tool the market has to offer, the truly innovative Shuriken Reamer offers a host of novel and patent-pending features in blade design, cutting elements and cutting structure design. A key differentiator of the Shuriken Reamer is in its innovative dual action cutting structure: with an active cutting structure on the O.D. of the tool which is combined with a passive bi-directional cutting structure on the tapered sections of the tool blades.

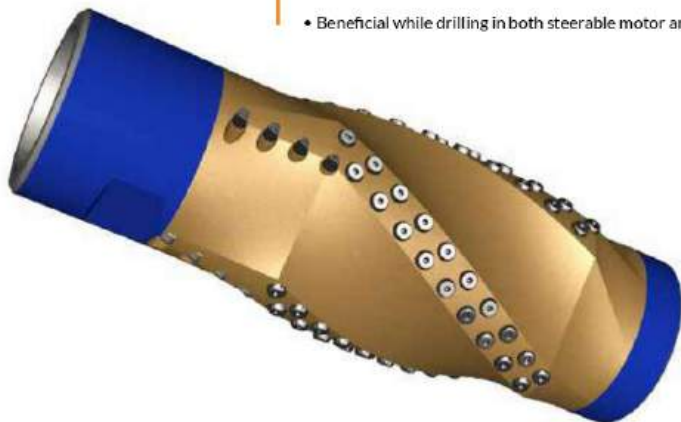
The uniquely shaped tungsten carbide inserts on the O.D. of the tool, along with their strategic positioning and placement within the blades, provide a better cutting and scraping action with less torque, less drag, more uniform wear and less insert breakage than comparable designs. The PDC cutters on the tapered blade sections of the tool are placed to provide a uniform cutting action, with varying back and side rakes to balance both the load and wear on the cutting structure.

The groundbreaking blade geometry provides complete PDC cutter exposure to the drilling fluid with much greater cleaning and cooling of the cutters when they are engaged. The unique blade geometry also improves fluid flow-by with a less restrictive flute design and reduced pressure drop across the tool. Obviously, better fluid flow translates into clean cutters, with reduced risk of bit balling and enhanced hole cleaning. The small taper angle at the ends of the blades, regardless of the tool size, greatly reduces the chances of hanging or lodging the tool. Unlike competitive tools on the market, the blades are fully spiraled on the OD of the tool providing full gauge coverage where it counts. The Shuriken Reamer is available in nearly all targeted hole diameters and effective in any formation and hole condition.



Shuriken Reamer Family / Shuriken NBR Near bit Reamer

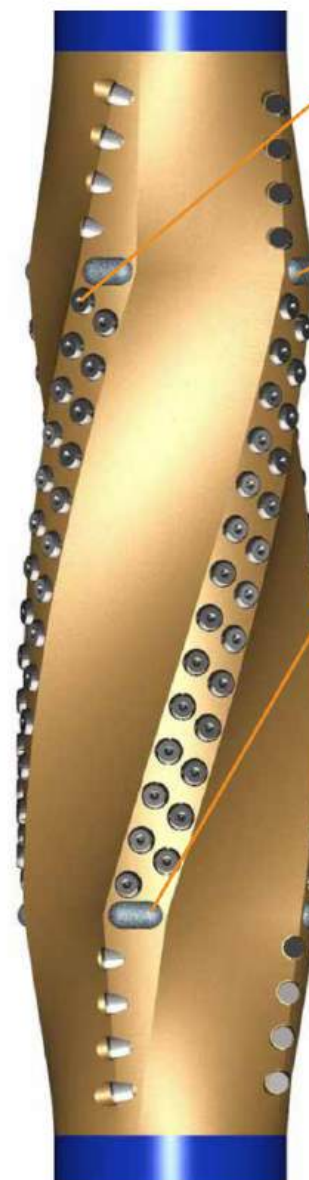
- Provides reaming-while-drilling capabilities with reduced torque, increased ROP and full 360 degree coverage.
- More durable and will hold gauge longer than standard stabilizers.
- Prevents stuck pipe due to borehole or hole cleaning problems.
- Effective in common formation problems including mobile, fractured, reactive or faulted formations, key seats, ledges, swelling shales, etc.
- Produces a much higher quality smooth borehole.
- Beneficial while drilling in both steerable motor and RSS applications.



Benefits

- Utilizes the BHA to improve well bore shape, tortuosity and smoothness.
- Replaces conventional stabilizers while adding the capability of reaming.
- May be used in a wide range of applications including multi-lateral, deep horizontal, extended reach, HPHT and deviated wells.
- Significantly reduces risks associated with borehole instability problems.
- Helps increase penetration rate by maintaining more consistent weight on bottom.
- Lower torque and drag as compared to most fixed blade stabilizers.
- Holds gauge much longer than traditional stabilizers.
- Provides security against stuck pipe tripping out of hole (when drill string can be rotated).
- Reduces non-productive time associated with heavy back reaming.
- Eliminates dedicated reaming runs in many cases saving valuable rig time and money.
- Reduces problems with running casings, liners, logs, completion and production equipment.
- Does not affect steerability with directional applications such as Autotrak, Geopilot and PowerDrive RSS systems.

Shuriken Reamer Family / LedgeBuster™



Combinations of extremely severe hole conditions, and very hard or highly abrasive formations, often result in premature breakage or excessive wear of the tungsten carbide insert cutters. This can also lead to early breakage of the trailing PDC cutter of each blade.



Cutting elements made from hot isostatic pressed (HIP) segments, which are formed in a variety of shapes and sizes, provide excellent impact resistance while maintaining unique cutting ability.



Natural diamonds coated with a metal binder, densely sintered within a tungsten carbide matrix powder, result in a superior cutting element. A higher diamond density, with more uniform distribution and no thermal degradation, is achieved.

Placement of these unique diamond impregnated elements, specifically designed to provide both impact resistance and cutting ability provides an effective transition between the primary TCI cutting elements and the secondary PDC cutters.



By providing this transition cutter between both the TCI cutters and the PDC cutters, the ability to cut through difficult ledges in hard and abrasive formations is achieved. Longer tool life and greater drilling efficiency is realized.

TOOLS / Stiletto Under Reamer

Simple and reliable hole enlargement while drilling

The Stiletto under reamer provides a simple and reliable solution to the drilling inefficiencies and out-of-gauge wellbores that can increase hole enlargement costs exponentially. Whether enlarging an existing wellbore or reaming-while-drilling new hole, the Stiletto delivers the utmost in durability regardless of the formation or operating parameters. This versatile tool comprises a single-piece body engineered with Finite Element Analysis (FEA) modeling to ensure a robust low-mass design. This concentric symmetric mass-balanced design provides optimum hole opening ratios up to 25% with increased flows around the tool for enhanced hole cleaning and reduced downhole vibration. Designed with an exceptional mechanical force advantage, the Stiletto under reamer is opened and closed by one of two hydraulic activation methods: Ball drop or by way of pre-set jet nozzles where a fully controlled pressure drop activates the tool. Either way, Stiletto opens completely and consistently, delivering simple, dependable and cost-effective hole enlargement in a single run.

Above all, a Stiletto under reamer is matched with BesteBit's pacesetter Trident PDC cutter technology, delivering an application-specific cutter block that enhances drilling efficiency and consistently produces a full-gauge hole, from soft to hard and abrasive formations and under the most aggressive drilling parameters. We even configure cutter blocks specifically to clean out cement in the casing and non-active versions that allow the tool to function as a stabilizer. The Stiletto under reamer is available in a wide range of hole diameters and is compatible with all rotary steerable systems (RSS).



Benefits

- Enlarges hole while drilling in single run
- Ensures smooth engagement for consistent full-gauge wellbore
- Provides high stress tolerance and maximum durability
- Reduces drill string vibration
- Improves drilling efficiency, BHA stabilization
- Promotes full or low flow through BHA
- Enhances hole cleaning
- Optimizes hole opening ratios of up to 25%
- Promotes operational simplicity, reliability
- Reduces non-productive time (NPT) and costs

Features

- Suitable for all formations and RSS
- Straightforward single-body, FEA-modeled tool design
- Application-specific Trident PDC cutter blocks
- Superior mechanical force advantage
- Adjustable jet nozzles with integrated flow paths
- Hydraulic activation through ball drop or controlled pressure drop
- Concentric symmetric mass-balanced design
- Track feed design for securing and deploying cutters
- Bi-directional capability
- Cutter deployment independent of BHA weight, formation strength and operating parameters

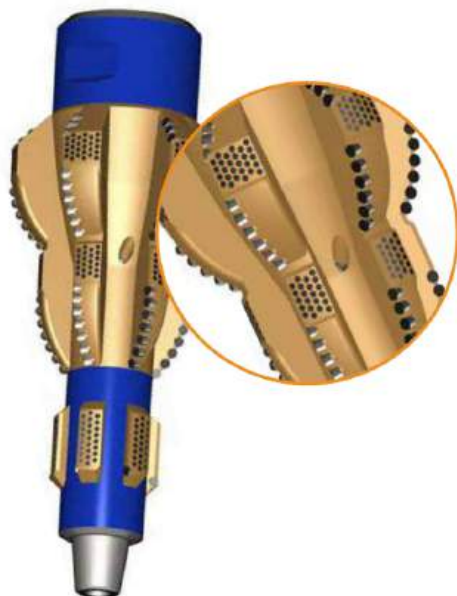
General Tool Specifications	UR051	UR056	UR082	UR100	UR115
Body Diameter	5.125"	5.75"	8.250"	10"	11.625"
Min Hole Opening Size	5.625"	6.375"	9.125"	11"	12.75"
Max Hole Opening Size	6.375"	7.125"	10.500"	12.75"	14.875"
Pass Through (Pilot) Hole Diameter	5.250"	5.875"	8.375"	10.25"	11.875"
Connection Type	3-1/2" API Reg.	3-1/2" API Reg.	6-5/8" API Reg.	6-5/8" API Reg.	6-5/8" API Reg.
Block Type	Hard Formation, Soft Formation, Stabilizer				
Primary Cutter Size	10mm	10mm	13mm	13 or 16mm	13 or 16mm
Nozzle Type	RZ	RZ	MZ(50 Series)	MZ(50 Series)	YZ(65 Series)
Nozzle Count	3	3	3	3	3
Makeup Length (mm)	1566	1773	2152	2440	2740
Fishing Neck Length (mm)	500	508	620	660	760
Neck Length (mm)	120.65	133.4	190.5	228.6	273
Lower Neck Length (mm)	480	520	600	700	700
Top Sub Length (mm)	220	220	320	360	360
Bottom Sub Length (mm)	200	220	300	300	300
Bore Diameter (mm)	26	26	40	57.2	66
Drop Ball Size - Open (mm)	28	28.6	45	60.3	70
Drop Ball Size - Close (mm)	30	24	50	66.7	75
Aprox Weight (kg)	121	172	405	886	1042

Operating Recommendations	UR051	UR056	UR082	UR100	UR115
Max Flow Rate (l/s)	26	32	48	70	70
Min Flow Rate (l/s)	6	13	18	22	28
Max Operating Pressure ΔP (Mpa)	20.7	20.5	20.5	20.5	20.5
Min Operating Pressure ΔP (Mpa)	3.4	3.5	4.5	5.5	5.5
Make Up Torque-Upper (kN.M)	9-12	9-12	41-47	41-47	41-47
Make Up Torque-Bottom (kN.M)	9-12	9-12	41-47	41-47	41-47
Max. Operating Temperature (°C)	177	177	177	177	177

TOOLS / Step-Drill FHO

Simple and reliable hole enlargement while drilling.

Step-Drill FHO is a multi-staged fixed diameter concentric PDC hole opener designed for fast, smooth and durable concentric hole opening in a wide variety of hole diameters, formations and application conditions. Each stage of this design works in conjunction with the other stages to provide smooth reliable performance on either rotary or rotary steerable assemblies, for both vertical and directional applications.



STAGE 5

The fifth and final stage of the tool consists of shorter gauge pads for directional capabilities and backream cutters to ensure smooth tripping out of the hole.

STAGE 3 & 4

The next stage provides minimal cutting and relieves the formation for a more aggressive fourth cutting stage. Both of these cutting sections of the tool feature premium Trident™ PDC cutters, strategically placed for balanced work loads, optimum durability and faster ROP.

STAGE 2

The second stage integral to the tool consists of passive gauge pads which provide initial stabilization and centering of the tool.

STAGE 1

The first stage can be either a pilot bit for drilling ahead or a bullnose for hole opening.

Benefits

- High quality hole opening at an aggressive ROP
- Improved bit stability while drilling ahead
- Operational simplicity and reliability with no moving parts
- Suitable for both conventional steerable motor and RSS systems
- Back ream through tight spots, ledges and doglegs
- Configurable with roller cone, PDC or bull nose
- Applicable in a wide range of drillstring or BHA configurations

Features

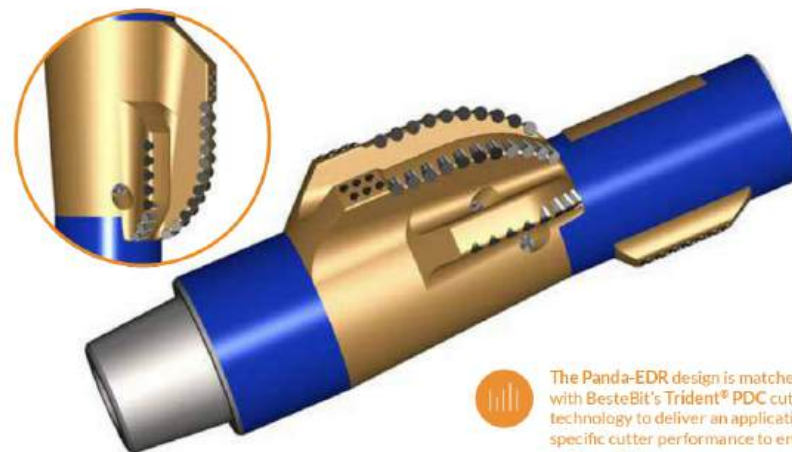
- Straightforward single-body FEA-modeled tool design
- Application-specific Trident® PDC cutters
- Increased working area for higher cutter count and density
- Optimized gauge design for directional responsiveness
- Integral stabilization, centralization and hole conditioning
- Integrated hydraulics for improved hole cleaning

TOOLS / Panda ECCENTRIC DRILL & REAM

The Panda-EDR is designed to drill an oversized hole, similar to bicenter bits, through simultaneous drilling and hole enlargement.

The ability to drill and ream in a single pass has many advantages in deeper, high pressure, high temperature wells. With longer intervals and extra casing strings, often through unstable or encroaching formations, advantages of simultaneous drilling and reaming can result in significant cost savings.

Solid one piece construction, integral blade design and no moving parts, provides for an extremely durable and stable tool. With a pilot stabilization pad offsetting the imbalance force of the reamer blades, and properly placed PDC cutter arrangements, this tool offers improved ROP and stabilization not possible with bicenter bits. With no limitations on rotary speed, lower cost and less potential hazards associated with conventional hydraulic under reamers, this tool is most effective for the application requirements.



The Panda-EDR design is matched with BesteBit's Trident® PDC cutter technology to deliver an application-specific cutter performance to enhance drilling efficiency.

Benefits

- Straightforward single-body FEA-modeled tool design
- Application-specific Trident® PDC cutters
- More working area for increased cutter count and density
- Optimized gauge design for directional responsiveness
- Integral stabilization, centralization and hole conditioning
- Drill collar connections for flexible BHA placement

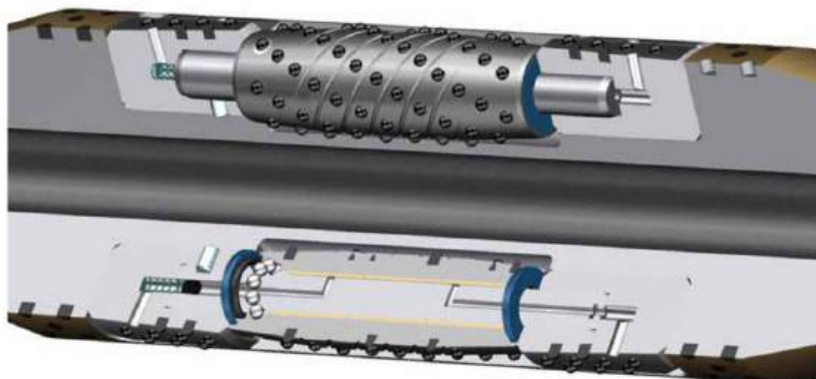
Features

- Enlarges hole, over pass through diameters, while drilling in single run
- Eliminates added trips with drillout capability
- Suitable for both conventional steerable motor and RSS systems
- Eliminates micro-doglegs, ledges and localized hole tortuosity
- Promotes operational simplicity, reliability with no moving parts
- Reduces non-productive time (NPT) and costs
- Reduces the need for dedicated reamer runs or wiper trips

TOOLS / SpinDrift Roller Reamer



The low torque solution to a smoother wellbore



The Spin-Drift family of premium quality Roller Reamers offer a low torque solution to borehole gauge maintenance, overall BHA stability and better wellbore quality. By lowering torque and drag, stick slip and BHA vibration, drilling efficiencies can be greatly improved with less NPT and greater MTB, resulting in significantly lower cost per foot drilling. Improved weight transfer and lower vibration results in both higher ROP's and extended life of the bit, motor and MLWD tools. With a rolling element cutting action there is less wear on the tool, less damage to the hole wall formation and lower torque as compared to traditional fixed blade reamers and stabilizers.

By mechanically conditioning the wellbore, removing tight spots, formations ledges, micro doglegs and spiraling, a smoother wellbore wall profile is achieved which will aid in the drilling, logging, coring and casing processes of well construction. Spin-Drift Roller Reamers are fully optimized through advanced software tools, such as FEA and CFD analysis, along with extensive field testing.

Spin-Drift roller reamers are some of the most advanced designed tools in the industry. These tools are engineered with the most innovative and unique features resulting in versatility, durability and reliability. With an advanced seal and bearing package, state of the art cutter designs and a reliable cutter retention system, these tools offer the maximum performance available on the market. As with all BesteBit product designs Spin-Drift Roller Reamers are fully optimized through advanced software tools, such as FEA and CFD analysis, along with extensive field testing.

Benefits

- Reduces BHA torque and stick slip compared to conventional stabilizers
- Efficiently eliminates ledges, hole tortuosity and micro doglegs
- Improves WOB for higher ROP and longer bit life
- Back reams more efficiently than stabilizers or drill bits
- Replaces conventional fixed blade stabilizers and reamers
- Compacts mud filter cake versus scraping

Cutter Selections



Used for low torque stabilization in both vertical and directional drilling, this "frictionless reamer" cartridge is hardened and carburized for long service life.



Standard cutting structure design for medium to medium hard formations with optimum tungsten carbide insert quantity and placement, with a tapered profile for bi-direction reaming.



For soft clay, limestone and shale applications a steel tooth cartridge with plasma hardface cutting edges is an economical yet effective solution for many applications.



Applicable for extremely hard and abrasive formations, such as hard sands, chert or granite, these cutters are fitted with an increased quantity of premium tungsten carbide inserts.

Tool Specifications

Hole Size (in)	Body OD (in)	Body ID (in)	Fishing Neck Length (in)	Fishing Neck Diameter (in)	Overall Length (in)	Dressed Body Weight (lbs)*
5 7/8 - 6 1/2	4 3/4	1 1/4 - 1 3/4	40	4 3/4	80	225 to 250
7 7/8 - 8 3/4	6 1/2	2 1/4	45	6 1/2	95	450 - 575
9 7/8	6 1/2 - 8	2 13/16	50	6 1/2 - 8	110	775
11	8	2 13/16	55	8	125	1000
12 1/8 - 12 1/4	8 or 9 1/2	2 13/16	60	8 - 9 1/2	130	1250
14 3/4 - 26	9 1/2	2 13/16	70	9 1/2	150	1800 - 4000

* Approximate

Features

- Dual Tapered Wedge Locking Mechanism
- Large Diameter Roller Bearing Cutter Retention
 - Pressure Compensated - Pressure Relieved Lubrication System

EXCITE® Circular Impact Accelerator



The solution to improve ROP and reduce stick-slip



In drilling when a PDC bit encounters harder formation, the bit needs more weight-on-bit (WOB) to keep the PDC cutters engaged into formation. However, in most cases the reactive torque of the formation cannot be overcome immediately. As a result, the bit slows or stops (stick) with torque being stored in the drill string until the torque required to fail the formation is achieved, eventually leading to a violent rotation of the bit (slip). This stick-slip can cause damage to PDC cutters and other BHA components. In severe case, the after effect is back off in drill string, causing complex accidents in borehole. Energy transfer is challenging due to presence of stick-slip, which always brings poor drilling efficiency.

Excite® Circular Impact Accelerator provides a solution to improve ROP and reduce stick-slip. It connects to the drill bit directly and can be regarded as a sub. Hence, drilling RPM from Rotary Table/Top Drive/PDM and WOB from the string above it, can be transmitted to the bit effectively. Excite® has a rotating hammer and anvil assembly on the inside that is driven by drilling fluid pumped through the tool. It creates high-frequency circular impact forces that are transferred to the PDC bit directly, which can assist PDC bit in rock-breaking and reduce or even prevent stick-slip i.e. breaking the rock more frequently and continuously leading to little changes in the torque. A longer bit life, less string failures, more footage and higher ROP will be achieved with Excite®, especially in hard and fragile formations.

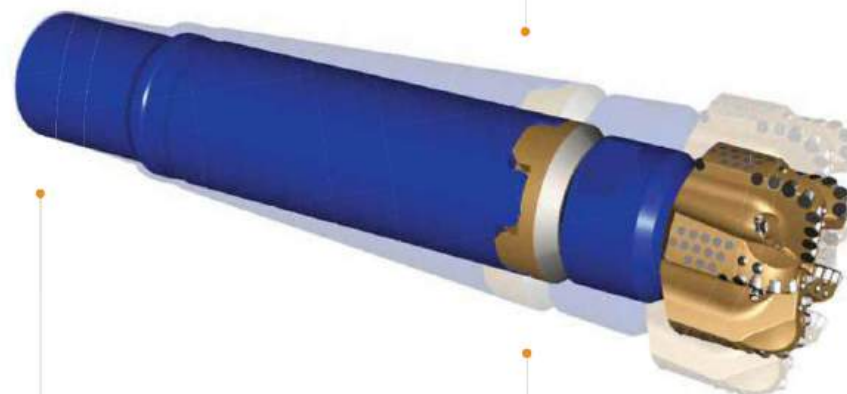
Excite® Circular Impact Accelerator delivers high-frequency and strong circular impact forces to the PDC bit by means of a special mechanical design. Combined with the latest processing and surface treatment technology, Excite® not only makes drilling easy in difficult rock formations but also has a longer life even when used with complex mud systems. Excite® has no rubber seals and no electronic components making it suitable to work at high temperature, high pressure and strong corrosive mud.

Tool Type	Hole Size mm inch	Max. Tool O.D. mm inch	Tool Length mm inch	Fishing Neck O.D. mm inch	Fishing Neck Length mm inch	Upper Connection Type API	Bottom Connection Type API
TA052	149.2~171.5 5-7/8~6-3/4"	134 5.28	615 24.2	121 4.76	130 5.12	3-1/2" Reg Box	3-1/2" Reg Box
TA071	212.7~228.6 8-3/8~9"	180 7.09	780 30.7	163 6.50	180 7.09	NC50 Box	4-1/2" Reg Box
TA076	238.13~256.7 9-3/8~10-1/2"	196 7.72	780 30.7	178 7.00	180 7.09	NC50 Box	4-1/2" Reg Box
TA102	266.7~333.38 10-1/2~13-1/8"	260 10.24	858 33.7	256 9.84	200 7.87	6-5/8" Reg Box	6-5/8" Reg Box

Tool Type	Flow Range L/s GPM	Pressure Loss MPa ksi	Max. Impact Torque N.m ft-lbs	Frequency Time/min 1/min	Max. WOB ton KLBs	Working Temperature °C °F	Tool Life h
TA052	12-20 190-317	1.7 0.247 2.6 0.373	623 460	693 1200 680 1280	10.3 22.708	≤200 ≤392	≥200
TA071	25-35 395-555	2.3 0.290 3.2 0.435	1152 850	750 1500 750 1580	13.3 29.321	≤200 ≤392	≥200
TA076	28-45 444-713	2.2 0.219 3.2 0.464	1328 980	820 1600 820 1600	14.2 31.306	≤200 ≤392	≥200
TA102	30-50 476-793	2.2 0.219 3.4 0.493	1748 1290	700 1550 700 1550	15.5 34.172	≤200 ≤392	≥200

Features and Applications

- Simple structure, advanced hydraulics
- No rubber seals, no electronic components, high reliability
- Good adaptability to different formations
- No special requirements for drilling technology and rig type
- Integrated housing design, multilevel anti-drop assembly
- Mud-propelled
- Adapts to different mud system
- Excite® is available for vertical well, directional well and horizontal well.



Features and Applications

- 01** An effective Stick-Slip solution, increases PDC bit life resulting in less trips
- 02** Generates high-frequency circular impact forces to assist PDC bit in rock-breaking
- 03** Higher ROP in hard formations
- 04** Reduced drilling cost by improving bit performance
- 05** Improved BHA life-mitigates damage associated with stick-slip
- 06** Short tool length, little influence on the BHA

REFERENCES

PDC Bit Tolerance	36
Bit Make Up Torque Table	36
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REFERENCES



PDC Bit Tolerance

Fixed Cutter Bit Diameter Range		Diameter Tolerance	
Min (in)	Max (in)	mm	in
-	<=6.75	+0.00/-0.38	+0.00/-0.015
>6.75	<=9.00	+0.00/-0.51	+0.00/-0.020
>9.00	<=13.75	+0.00/-0.76	+0.00/-0.030
>13.75	<=17.50	+0.00/-1.14	+0.00/-0.045
>17.50	-	+0.00/-1.60	+0.00/-0.063

Nozzles TFA Table

YZ Series	Nozzle Size												Open Ports	
	8	9	10	11	12	13	14	15	16	18	20	22		35.28
MZ Series	8	9	10	11	12	13	14	15	16				25.20	
1	0.049	0.062	0.077	0.093	0.110	0.130	0.150	0.173	0.196	0.249	0.307	0.371	0.487	0.954
2	0.098	0.124	0.153	0.186	0.221	0.259	0.301	0.345	0.393	0.497	0.614	0.742	0.974	1.909
3	0.147	0.186	0.230	0.278	0.331	0.389	0.451	0.518	0.589	0.746	0.920	1.114	1.461	2.863
4	0.196	0.249	0.307	0.371	0.442	0.518	0.601	0.690	0.785	0.994	1.227	1.485	1.948	3.818
5	0.245	0.311	0.383	0.464	0.552	0.648	0.752	0.863	0.982	1.243	1.534	1.856	2.435	4.772
6	0.295	0.373	0.460	0.557	0.663	0.778	0.902	1.035	1.178	1.491	1.841	2.227	2.922	5.727
7	0.344	0.435	0.537	0.650	0.773	0.907	1.052	1.208	1.374	1.740	2.148	2.599	3.409	6.681
8	0.393	0.497	0.614	0.742	0.884	1.037	1.203	1.383	1.571	1.988	2.454	2.970	3.896	7.635
9	0.442	0.559	0.690	0.835	0.994	1.167	1.353	1.553	1.767	2.261	2.761	3.341	4.383	8.590
10	0.491	0.621	0.767	0.928	1.104	1.303	1.503	1.726	1.963	2.468	3.012	3.712	4.869	9.544

Bit Make Up Torque Table

Fixed Cutter Bit Diameter Range		Connection Type	Make Up Torque (k. ft-lbs)	
Min (in)	Max (in)		Min	Max
3.750	4.500	2 3/8" API Regular	2.4	2.7
4.625	4.875	2 7/8" API Regular	4.7	5.1
5.000	7.250	3 1/2" API Regular	7.7	8.4
7.500	9.250	4 1/2" API Regular	17.8	19.5
9.500	14.500	6 5/8" API Regular	38.2	42
14.750	18.500	7 5/8" API Regular	60.9	67

Bit Dull Grading

Cutting Structure				Bearing	Gauge	Remarks		
Inner Rows - Average Cutter Wear	Outer Rows - Average Cutter Wear	Primary Dull Characteristics	Location of Primary Dull Characteristics	Bearing & Seals	Under size (16th's inch)	Other Dull Characteristics	Reason Pulled	
Average wear on inner 2/3rds of the diameter	Average wear on inner 1/3rds of the diameter	BF Bond Failure BT Broken Cutter CT Chipped Cutter ER Erosion FC Flat Crested Wear HC Heat Checking LT Lost Cutter NO No Characteristics RG Rounded Gauge WT Worn Cutters	C Cone C Nose S Shoulder T Taper G Gauge	X - Used for all fixed cutter bits	I = In-Gauge 1 = 1/16" 2 = 2/16" 3 = 3/16" " 16 = 16/16"	BU Balled Up CR Cored JD Junk Damage LN Lost Nozzle NR Not Rerunnable PN Plugged Nozzle RO Ring Out RR Rerunnable WO Wash Out	BHA Changed Bottom Hole Assembly DMF Downhole Motor Failure DSF Drill String Failure DST Drill Stem Test DTF Downhole Tool Failure LOG Run Logs RIG Rig Repair CM Condition Mud CP Core Point DP Drill Plug FM Formation Change HP Hole Problems PP Pump Pressure PR Penetration Rate TD Total Depth TQ Torque TW Twist-Off WC Weather Conditions WO Washout Drill String	





BESTE**BIT**

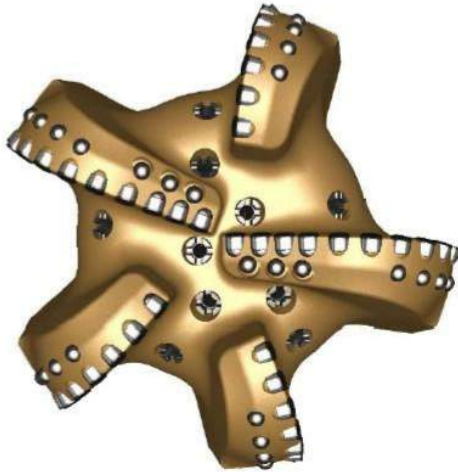
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17.5"TS519



BESTEBIT



Product Specifications

IADC	S223
Product Series	PDC
Body Material	Steel
No. of Blades	5
Face Cutters	39 (19mm)
Gage Cutters	15 (19mm), 1 (13mm)
Backup Cutters	0
Total Cutters	1 (13mm), 54 (19mm)
Nozzles	10YZ
Junk Slot Area	90.0 in ²
Gage Pad Length	6 in
Make-up Length	17.4 in
Bit Connection	7-5/8" API+REG

Recommended Operating Parameters

Make-up Torque (MUT)	60.89-67.01 kftlb
Weight On Bit (WOB)	6.75-45 klbs
Bit Speed	60-260 rpm
Flow Rate	713-1268 gpm
HSI	0

Other Features

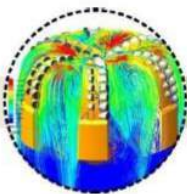
Up-Drill cutters, Optimized DOC limiters

*Contact Bestebit representative for optimal parameters for maximizing performance

Force Balanced
Cutting Structure



Optimized
Hydraulics



TSP Gauge

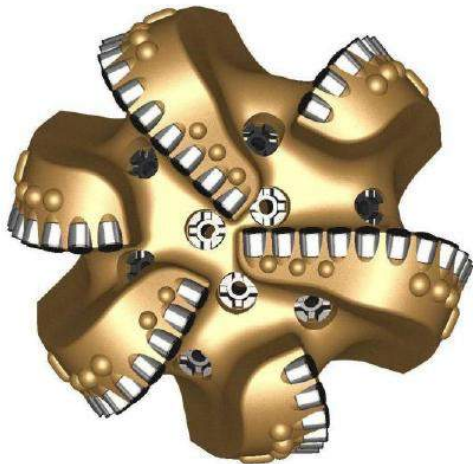


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12.25"T616



BESTEBIT



Product Specifications

IADC	M423
Product Series	Drill bit
Body Material	Matrix
No. of Blades	6
Total Cutters	9 (13mm), 48 (16mm)
Nozzles	9YZ
Junk Slot Area	31.9 ir
Gage Pad Length	3 in
Make-up Length	14.9 in
Bit Connection	6-5/8"API+REG

Recommended Operating Parameters

Make-up Torque (MUT)	38.15-41.99 kftlb
Weight On Bit (WOB)	6.75-31.5 klbs
Rotary Speed	60-260 rpm
Flow Rate	444-1110 gpm
HSI	0

Other Features

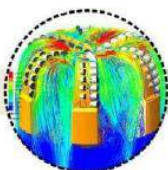
Up-Drill cutters, Optimized DOC limiters

"Contact Bestebit representative for optimal parameters for maximizing performance

Force Balanced
Cutting Structure



Optimized
Hydraulics



TSP Gauge

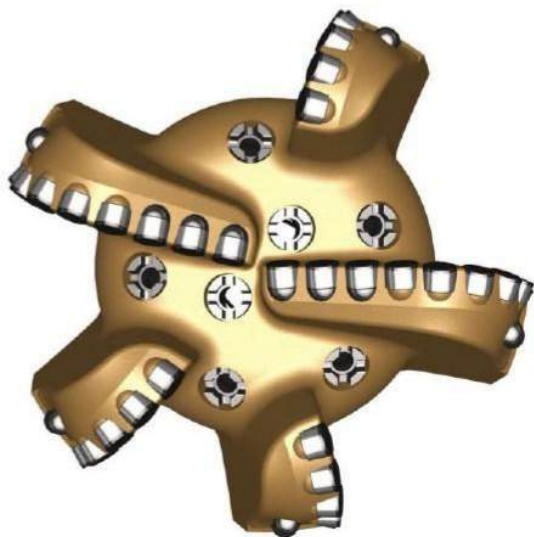


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12.25" TS519



BESTEBIT



Product Specifications

IADC	S223
Product Series	PDC
Body Material	Steel
No. of Blades	5
Face Cutters	28 (19mm)
Gage Cutters	7 (13mm), 3 (19mm)
Backup Cutters	0
Total Cutters	7 (13mm), 31 (19mm)
Nozzles	7YZ
Junk Slot Area	46.0 in ²
Gage Pad Length	2.5 in
Make-up Length	12.6 in
Bit Connection	6-5/8"API+REG

Recommended Operating Parameters

Make-up Torque (MUT)	38.15-41.99 kftlb
Weight On Bit (WOB)	6.75-31.5 klbs
Rotary Speed	60-260 rpm
Flow Rate	444-1110 gpm
HSI	0

Other Features

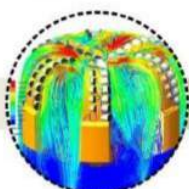
Up-Drill cutters, Optimized DOC limiters

*Contact Bestebit representative for optimal parameters for maximizing performance

Force Balanced
Cutting Structure



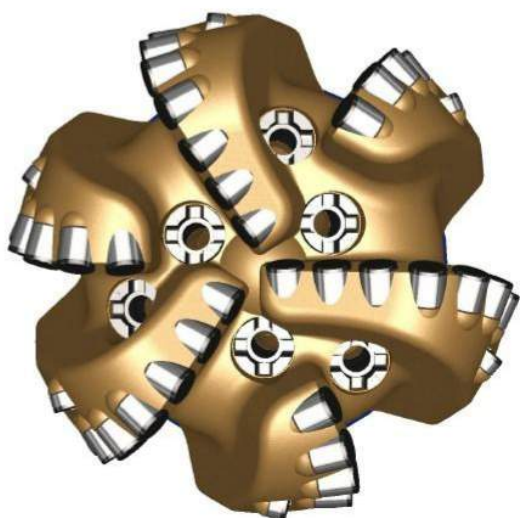
Optimized
Hydraulics



TSP Gauge



8.5" T616

**BESTEBIT**

Product Specifications

IADC	M423
Product Series	PDC
Body Material	Matrix
No. of Blades	6
Face Cutters	29 (16mm)
Gage Cutters	9 (13mm), 4 (16mm)
Backup Cutters	6 (16mm)
Total Cutters	9 (13mm), 39 (16mm)
Nozzles	6YZ
Junk Slot Area	14.7 in ²
Gage Pad Length	2 in
Make-up Length	11.3 in
Bit Connection	4-1/2" API+REG

Recommended Operating Parameters

Make-up Torque (MUT)	17.79-19.56 kftlb
Weight On Bit (WOB)	5-25 klbs
Bit Speed	60-260 rpm
Flow Rate	349-555 gpm
HSI	0

Other Features

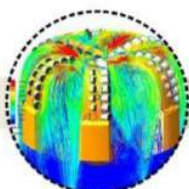
- AntiBall^(TM) Feature
- Optimized DOC Limiter
- In gage PDC cutter
- Up-Drill cutters

*Contact Bestebit representative for optimal parameters for maximizing performance

Force Balanced
Cutting Structure



Optimized
Hydraulics



TSP Gauge

