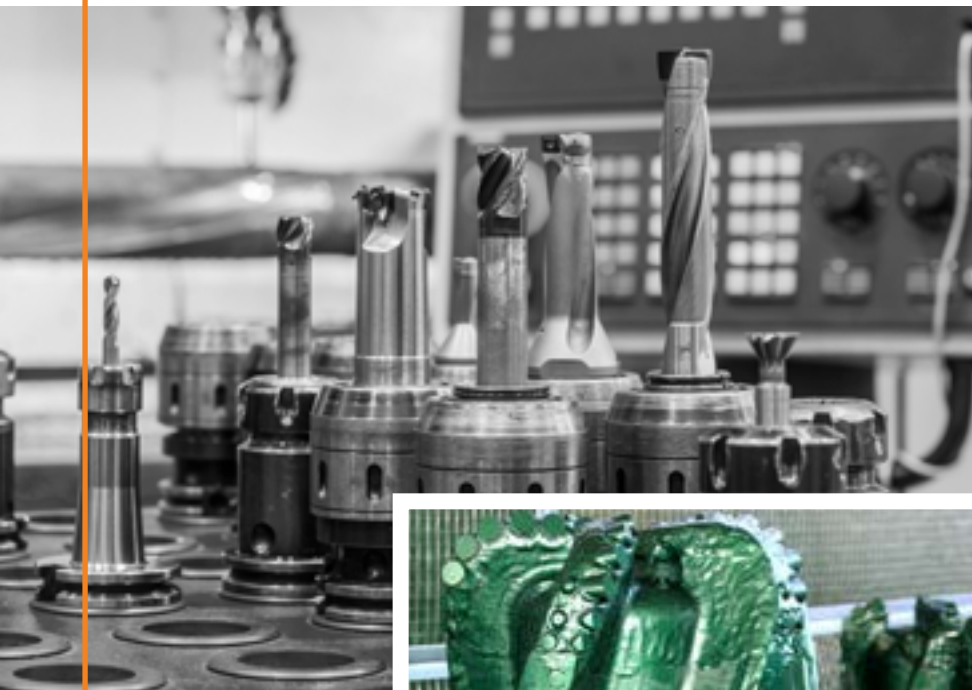


# BURSERVICE



## DRILLING TOOLS AND EQUIPMENT

SUCCESSFUL WAY TO OIL & GAS RESOURCES



# BURSERVICE

**INNOVATION LEADER.**  
**SUCCESSFUL WAY TO**  
**OIL & GAS RESOURCES**



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*Yours faithfully, General Director  
Marat N. Dautov*

**DEAR CUSTOMERS, PARTNERS  
AND COLLEAGUES!**

For more than 15 years Burservice, JSC has been designing and manufacturing equipment and tools for drilling and workover of oil & gas wells. Having started its activity in 2005 as a manufacturer of rock cutting tools, today Burservice is a multidisciplinary company capable of implementing projects of any complexity within the terms and time specified by the customer, providing the necessary services and warranties.

We are consistently expanding the scope of our activities, the scope of business and the geography of work. Our partners note the convenience and simplicity of cooperation with Burservice. This is achieved by an integrated approach to each customer, advanced production technologies and the highest level of quality of work performed.

After a ten-year journey, we are still sensitive to the demands of time. The constant process of studying the advanced technologies and their adaptation to the conditions of our currently implemented projects is one of the main principles of the Company's development. Burservice is a recognized leader in the development and application of new technologies in the field of rock cutting tools production. Due to our attention to innovations, we successfully solve the complex technical problems that are encountered at almost all major well construction sites.

Today Burservice feels confident about the future. We have created a good base for further advances. As one of the industry leaders in the industry and realizing our responsibility, we exert all our efforts, knowledge and experience so that the results of our activities become an example of high-quality fulfillment of our obligations.

By reconstructing the production site, Burservice has become a large company with a strong scientific potential, which makes a significant contribution to the modern drilling of oil & gas wells. We have interesting prospects and global plans ahead: New projects, entry into the international market, launching a new series of products, as well as solving of many issues in the social sphere of company. The company plans to expand, to start new activities, and to make our way to oil and gas resources more successful.

**BURSERVICE**



**INNOVATION · PARTNERSHIP  
SUCCESS**



**Company's background**

Established in 2005, Burservice is a manufacturer of equipment and tools for drilling and workover of oil & gas wells.

The company's head office and the production facilities are located in the city of Ufa.

Over the decade of presence in the drilling tools market, Burservice has declared itself as a dynamically developing company always offering an efficient hi-tech equipment and services to its clients.

## Integrated management system

Burservice successfully operates an integrated management system. The integrated management system in the field of quality, health, safety and environment was implemented from 2009 to 2010.

In 2010 the company successfully passed IMS certification carried out by the German certification authority TUV NORD CERT GmbH regarding compliance with the international standards:

**ISO 9001:2015** - with the scope of application in the field of development, production and supply of rock cutting and emergency tools, as well as rendering services for construction and repairs of oil and gas wells;

**ISO 14001:2015, ISO 45001:2018** - with the scope of application in the field of rendering services for construction and repairs of oil and gas wells.



CERTIFICATE OF AUTHORITY TO USE THE OFFICIAL API MONOGRAM: API Spec. 7-1



CERTIFICATE OF MEMBERSHIP IADC



## Potential and prospects of company's development

### OUR MISSION:

**«We create and implement innovative technological solutions providing new possibilities for rock cutting tools application by oil and gas companies».**

Today Burservice is a modern company with up-to-date equipping, occupying over 17 thousand m2 of administrative and production areas, carrying out the complete production cycle. Technological and engineering capacities allow our company to provide services at 50-60 wells simultaneously.

Burservice geographic activity covers all main oil and gas regions in Russia. Our regional representative offices are located in Noyabrsk, Muravlenko, Nefteyugansk, Khanty-Mansiysk, Krasnodar, Buzuluk, Nizhnevartovsk.

In today's market of rock cutting tools manufacturers there are leaders in terms of the quantity of bits produced, meters drilled and of course there are leaders regarding the price, who produce competitive drilling bits at low price. Nevertheless, there is no clear position of a leader who would offer technological solutions. The aspiration to take this position has become a strategic direction of our development in manufacturing of Russian PDC bits and provision of services for technological support of its performance.

Nowadays we produce PDC-bits for directional and horizontal drilling. We provide complex services for sidetracking as well as core sampling in exploratory wells. There are unique projects, the results of which confirm the effective work of the company. We see the positive attitude of customers and drilling companies towards us; the cooperation has reached a new level and brings very good results for all interested parties. Over a ten-years period of activity in this market, the company has gained a reputation as a high-tech and stable company.

### THE MAIN PERSPECTIVE DIRECTIONS OF THE COMPANY'S DEVELOPMENT ARE:

- Introduction of modern technologies for drilling tools manufacturing;
- Investments to production facilities and expansion of the range of drill bits, drill heads and workover tools;
- Improvement of reliability, quality and efficiency of products;
- Strengthening of the position in the domestic market and entering to the foreign markets;
- Ensuring the financial stability of the enterprise throughout the entire strategic horizon.

### COMPANY'S MAIN FOCUS:

- Qualitative growth;
- Providing the resources necessary for the quality of the processes;
- Use of the theory of constraint (TOC) methods;
- Process approach implementation;
- Improvement of culture of production and services.



## Geography of Burservice activity. Our strategic guidelines are:

Continuous improvement of the organizational structure, infrastructure and production environment based on the best work organization methods, achievements of science and technology and information technologies.

Technological improvement of tools, equipment and work production in the course of rendering services, which guarantees the company's stable position in the market. Taking measures aimed at elimination and reduction of risks for employees and other parties, identification and reduction of negative impact on the environment.

## New technological solutions

Today, the company's considerable efforts are focused on the development of Research & Development, implementation of the production cycle optimization program, increase of its own economic efficiency, and orientation to the customers' requirements. All these goals are achieved through the use of special software products developed within the company.

The BS-DrillMod™ software package has been developed in collaboration with designers and programmers to analyze the process of deepening the rotating bit into the rock.

This calculation system allows to optimize the cutting structure of the bit at the design stage and specially to increase the number of rock-crushing cutters installation on more stressed areas and minimize bit disbalance while drilling. Taking into account the positive experience of using the new design system, our specialists carry out modernization of cutting structure during bit design.

Mathematical modeling of bit hydraulics in "Hymod" program is carried out to improve drilling cuttings removal from bottomhole zone during drilling, as well as to select hydraulic nozzles.

As a result of these programs, a series of drill bits was upgraded for production casing. As a result, the mechanical penetration rate at the Priobskaya oilfield was increased.



DRILLING BIT SERVICE LIFE STAGES

1. CALCULATION



2. MODELING



6. ANALYSIS



3. DESIGN DOCUMENTATION DEVELOPMENT



5. OPERATION



4. MANUFACTURING



Technological service

DRILLING BIT SERVICE LIFE STAGES

The main objective of the integrated section is to provide oil and gas production and drilling companies with advanced, high-tech services for horizontal and directional drilling of oil and gas wells.

THE RANGE OF SERVICES INCLUDES:

- Engineering support of domestic and imported bits with drilling parameters control;
- Drill bits rental without the presence of an bit maintenance engineer, which reduces drilling costs;
- Recovery of matrix and steel PDC bits produced by both Russian and foreign companies;
- Sidetracking operations using own whipstock set;
- Engineering support of PDM motors with drilling parameters control;
- Geo-navigation support of wellbore trajectory construction using telemetry system.

The goal of the integrated service is to maximize the use of engine and bit potential and to ensure the most efficient drilling modes and necessary wellbore trajectory.

The work is supported by experienced process engineers, with strict compliance with the rules and regulations in the field of industrial, fire safety, labor and environment protection, as defined by federal laws and local regulations of the customer.



**ENGINEERING SUPPORT OF WELL DIRECTIONAL CONTROL USING TELEMETRY SYSTEM.**

**Telemetric support of the well design in the process of drilling includes:**

- Development and approval of a plan/program for the directional or horizontal well section drilling, including calculation and creation of the design profile with technical explanations;
- Use of telemetry systems with a hydraulic or electromagnetic communication channel to monitor the directional drilling process;
- Additional calculations and well profile adjustments during drilling, if the task is amended by the customer;
- Provision of daily and final reports, analysis of the drilling work results, and making recommendations for further optimization;
- Equipment and engineering staff mobilization to the customer’s production facility, and if appropriate, to the well site.



**BURSERVICE SPECIALISTS RENDER THIS SERVICE, USING TELEMETRY SYSTEMS:**

- with Ø172 mm electromagnetic communication channel (domestic and imported);
- with Ø 122.89 mm hydraulic communication channel (domestic and imported).

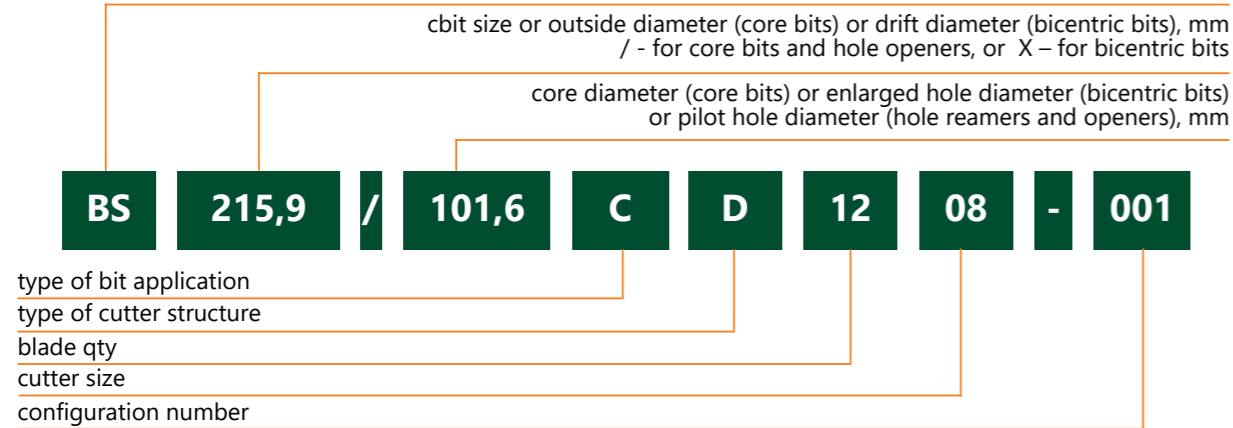
The telemetric packages are installed in mobile buildings or mounted on 4WD trucks. The staff, operating the telemetry systems, is trained by the equipment manufacturer specialists and have a vast working experience in this sphere.





# Drill bit nomenclature definition

BURSERVICE



Type of bit application		Type of cutter structure
<b>S</b> – directional (for all type of well profiles and directional systems)	<b>I</b> – sidetrack bit	<b>D</b> – PDC cutters
<b>V</b> – for vertical drilling	<b>E</b> – special reaming bit (“peak” profile)	<b>DD</b> – dual row of PDC cutters
<b>B</b> – bicentric bit	<b>F</b> – fishtail bit	<b>DC</b> – diamond composite material
<b>C</b> – core bit	<b>R</b> – bit for RSS application	<b>H</b> – tungsten carbide material
	<b>G</b> – drag bit	<b>W</b> – cone PDC cutters

## Bit nozzles

FOR DRILLING BITS WITH OUTER DIAMETER FROM 120 UP TO 190.5 MM



Type of nozzle	HP22-5	HP22-6	HP22-7	HP22-8	HP22-9	HP22-11	HP22-13
Nozzles ID, mm	5,6	6,4	7,1	7,9	9,5	11,1	12,7
Nozzles ID, in	7/32	1/4	9/32	5/16	3/8	7/16	1/2

FOR DRILLING BITS WITH OUTER DIAMETER FROM 190 UP TO 490 MM



Type of nozzle	HP 27-6	HP 27-7	HP 27-8	HP 27-9	HP 27-11	HP 27-13	HP 27-14	HP 27-16	HP 27-17
Nozzles ID, mm	6,4	7,1	7,9	9,5	11,1	12,7	14,3	15,9	17,5
Nozzles ID, in	1/4	9/32	5/16	3/8	7/16	1/2	9/16	5/8	11/16

FOR DRILLING BITS WITH OUTER DIAMETER FROM 295,3 UP TO MORE



Type of nozzle	HP 32-6	HP 32-7	HP 32-8	HP 32-9	HP 32-11	HP 32-13	HP 32-14	HP 32-16	HP 32-17	HP 32-18
Nozzles ID, mm	6,4	7,1	7,9	9,5	11,1	12,7	14,3	15,9	17,5	18,3
Nozzles ID, in	1/4	9/32	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4

# 1. Rock cutting tools

## 1.1 TYPICAL WELL DESIGN DRILL BITS PER SIZE CLASSIFICATION

New projects in Russia and CIS require extensive work on bit design providing wellbore verticality.

Drill bit design was adjusted to be run in certain conditions considering previous experience. Successful trial runs of new bits confirmed design adjustment efficiency.

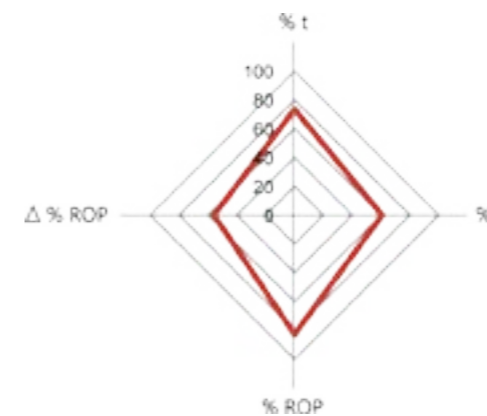
Drill bits are used to drill vertical and deviated sections thru soft to medium strength formation. 5 blades bits are most general in use. Having high ROP in soft and medium strength formations, the high impact and wear resistant PDC cutters might be used to provide good performance in hard and abrasive formations as well.

## 1.2 DRILL BITS FOR SURFACE CASING



BS-393,7 VD 519-003

### BS-393,7 VD 519-003 bit directional control diagram



Model	Diameter	
	millimeter	inch
VD419	393,7	15 1/2
VD519	393,7	15 1/2
VD616	393,7	15 1/2
VD619	393,7	15 1/2

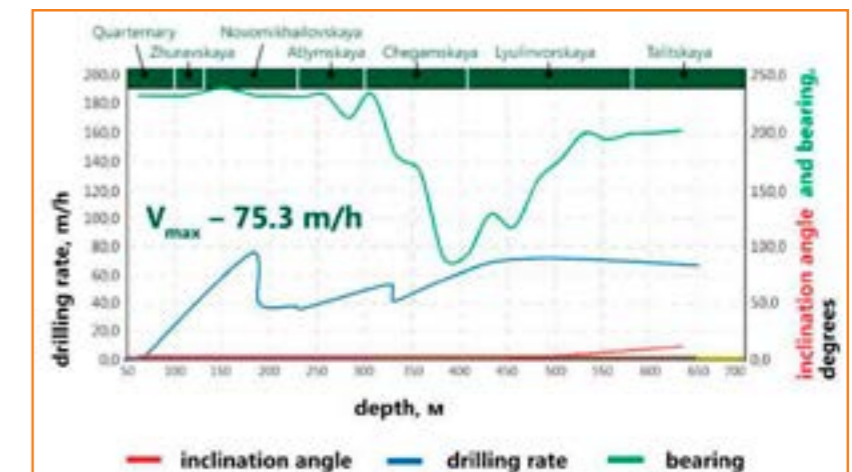
Drill bit BS-393,7 VD 519-003  
Well 2019, pad 1B, Ety-Purovskoe field  
Avg ROP = 71.6 mph, Max ROP = 165.3 mph

### Being:

**%t** – slide time to total drilling time ratio  
**%h** – slide distance to total run footage ratio

**%ROP** – slide ROP to average run ROP ratio

**Δ%ROP** – slide ROP to rotary ROP ratio



1.3 STANDART BITS

ADVANTAGES:

- Applicable for drilling of most wells
- Provides a defined trajectory of well, good steerability
- Optimal ROP, wear resistance
- Maintainability



BS - 215.9 SD 4 16 - 105

Purpose

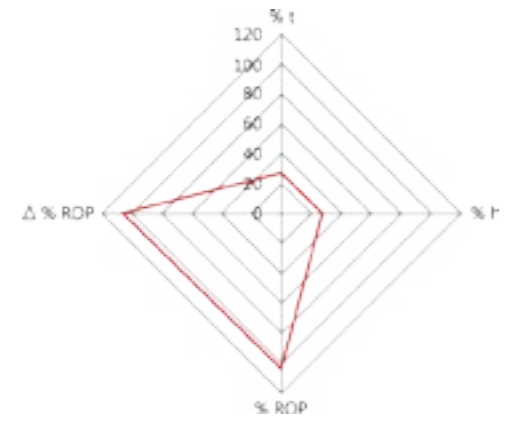
- For continuous drilling of different type of wells
- For rotary or downhole drilling

Design characteristics

- Body and threading are made of high quality alloy steel
- Two layers of wear-resistant carbide composite coating
- Exchangeable hydraulic ports (nozzles)
- Number of blades from 3 to 6
- Reverse cutters are set by default
- Calibrating surface is reinforced with a carbide braze and with PDC inserts

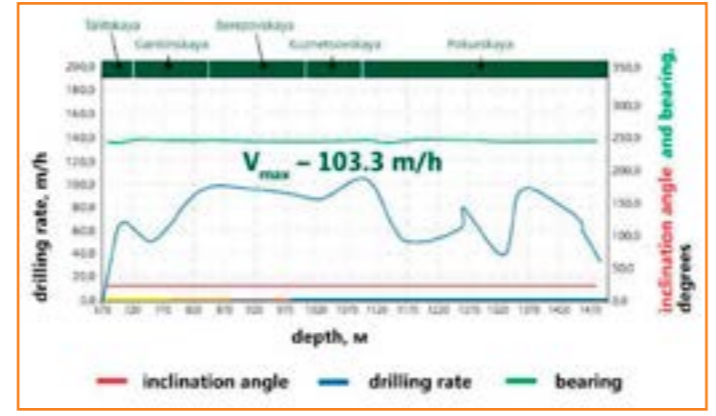
BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
SD319	S123	SD516	S223
SD316	S123	SD513	S233
SD313	S133	SD510	S233
SD419	S223	SD619	S323
SD416	S223	SD616	S323
SD413	S233	SD613	S333
SD519	S223		

BS - 215,9 SD 4 16 - 105 bit directional control diagram



Being:  
 %t – slide time to total drilling time ratio  
 %h – slide distance to total run footage ratio  
 %ROP – slide ROP to average run ROP ratio  
 Δ%ROP – slide ROP to rotary ROP ratio

Well 2018, pad 1B, Ety-Purovskoe field Effective Avg ROP = 74,8 mph



1.4 STANDART BITS

ADVANTAGES:

- Applicable for drilling of most wells
- Provides a defined trajectory of well, good steerability
- Optimal ROP, wear resistance
- Maintainability



BS - 215.9 SD 7 13 - 203

Purpose

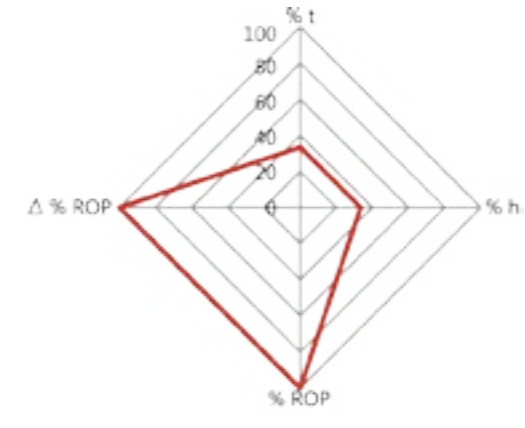
- For continuous drilling of different type of wells
- For rotary or downhole drilling

Design characteristics

- Body and threading are made of high quality alloy steel
- Two layers of wear-resistant carbide composite coating
- Exchangeable hydraulic ports (nozzles)
- Number of blades from 6 to 9
- Reverse cutters are set by default
- Calibrating surface is reinforced with a carbide braze and with PDC inserts

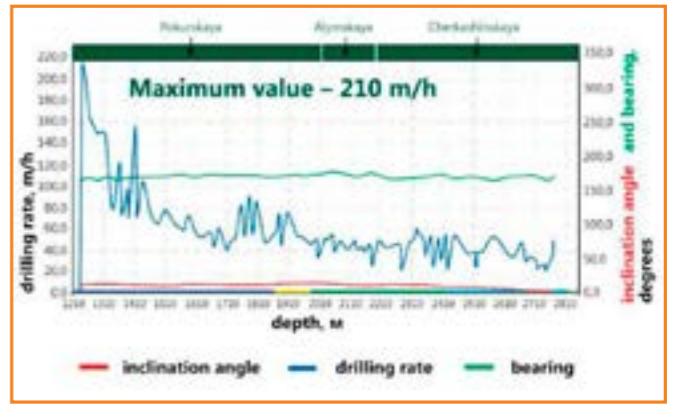
BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
SD616	S323	SD816	S423
SD613	S333	SD813	S433
SD610	S333	SD808	S443
SD608	S343	SD916	S423
SD716	S423	SD913	S433
SD713	S433	SD908	S443
SD708	S443		

BS - 215,9 SD 7 13 - 203 bit directional control diagram



Being:  
 %t – slide time to total drilling time ratio  
 %h – slide distance to total run footage ratio  
 %ROP – slide ROP to average run ROP ratio  
 Δ%ROP – slide ROP to rotary ROP ratio

BS-220,7 SD 416-115 Drill bit Well 764, pad 724, South-Priobskoe field Avg ROP = 56,8 mph



1.5 HOB-BIT BITS

ADVANTAGES:

- Optimal ROP
- Maintainability
- Premium PDC cutters for complex formations

Purpose

- For sidetracking drilling
- For rotary or downhole drilling

Design characteristics

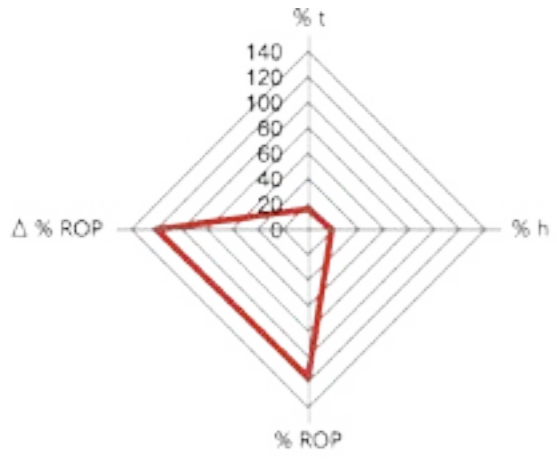
- Body and threading are made of quality alloy steel
- Two layers of wear-resistant carbide composite coating
- ROP as for four-blade bits and steerability as for six-blade bits
- Exchangeable hydraulic ports (nozzles)
- Number of blades 5
- The range of diameters from 123.8 to 165.1 mm allows you to choose the size of hob-bit bits for any project
- Calibrating surface is reinforced with a carbide braze and with PDC inserts



BS – 123,8 SD 5 13 - 101

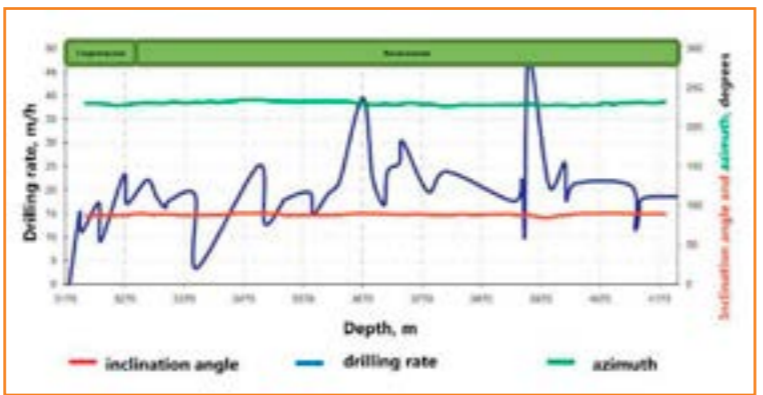
BIT OPTIONS	
BIT TYPE	IADC CODE
SD513	S333

BS – 123,8 SD 5 13 - 101 bit directional control diagram



Being:  
 %t – slide time to total drilling time ratio  
 %h – slide distance to total run footage ratio  
 %ROP – slide ROP to average run ROP ratio  
 Δ%ROP – slide ROP to rotary ROP ratio

BS-155,6 SD 613-002 Drill bit  
 Well 3751, pad 269, Ety-Purovskoe field  
 Avg ROP = 20,7 mph, Max ROP = 48,08 mph



1.6 KAIMAN BITS

ADVANTAGES:

- Provides a defined trajectory of well, good steerability
- High wear resistance
- Maintainability

Purpose

- For continuous drilling of different type of wells
- For rotary or downhole drilling

Design characteristics

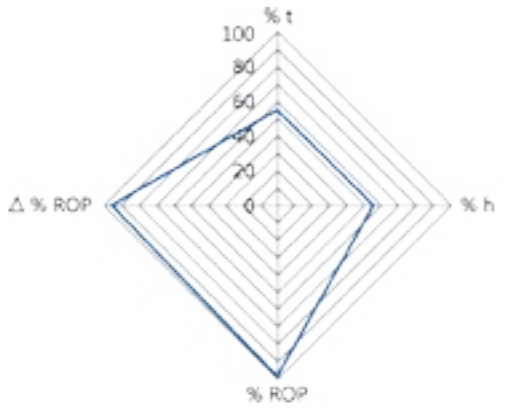
- Body and threading are made of quality alloy steel
- Two layers of wear-resistant carbide composite coating
- An additional row of cuttings behind the main one
- Exchangeable hydraulic ports (nozzles)
- Number of blades from 5 to 7
- Reverse cutters are set by default
- Calibrating surface is reinforced with a carbide braze and with PDC inserts



BS – 295,3 SDD 6 16 - 202

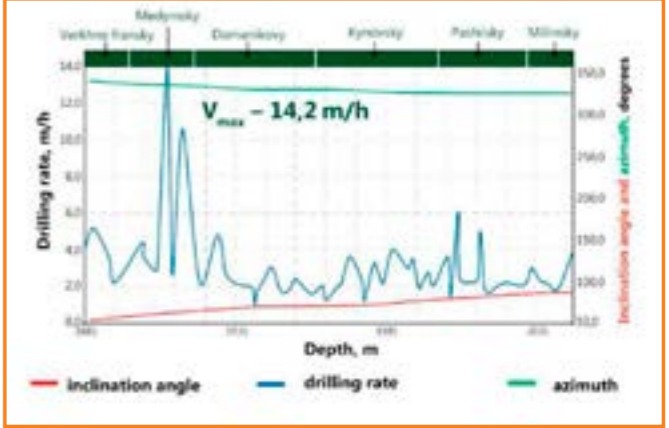
BIT OPTIONS	
BIT TYPE	IADC CODE
SDD516	S423
SDD513	S433
SDD616	S423
SDD613	S433
SDD716	S423
SDD713	S433

BS – 295,3 SDD 6 16 - 202 bit directional control diagram



Being:  
 %t – slide time to total drilling time ratio  
 %h – slide distance to total run footage ratio  
 %ROP – slide ROP to average run ROP ratio  
 Δ%ROP – slide ROP to rotary ROP ratio

Well 227, pad 65.2, Chekmagushevskoe field  
 Avg ROP = 3,86 mph



1.7 BULAVA BITS

ADVANTAGES:

- Effective in beds alternations (medium to hard)
- Provides a defined trajectory of well, good steerability
- Optimal ROP, wear resistance
- Maintainability

Purpose

- For continuous drilling of different type of wells
- For rotary or downhole drilling

Design characteristics

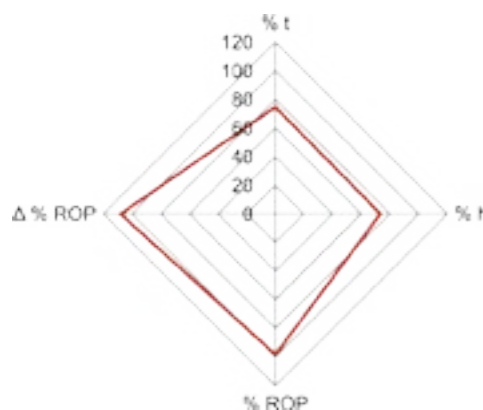
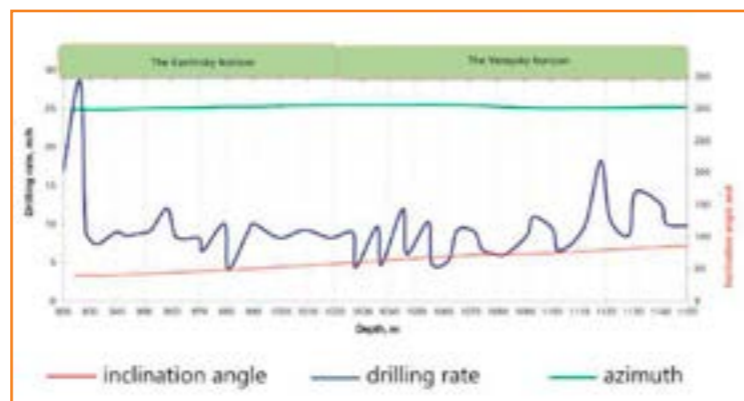
- Body and threading are made of quality alloy steel
- Two layers of wear-resistant carbide composite coating
- An additional row of cuttings behind the main one
- Exchangeable hydraulic ports (nozzles)
- Number of blades from 5 to 7
- Reverse cutters are set by default
- Calibrating surface is reinforced with a carbide braze and with PDC inserts



BS - 269,9 SW 5 13 - 201

BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
SW513	S433	SW516	S433
SW613	S433	SW616	S433
SW713	S433	SW716	S433
SW813	S433	SW816	S433
SW416	S433		

Well 927rc1, Chetyrmanskoe oilfield  
 BS-190,5 SW 513-301 bit, #01-2992,  
 Max ROP = 28,7 mph, Avg ROP = 9,5 mph



1.8 RUDDER BITS

ADVANTAGES:

- Provides a defined trajectory of well, good steerability
- Minimum of deflection force
- Load distribution and balancing
- Maintainability

Purpose

- For drilling with RSS "Point-the-bit"
- For drilling with RSS "Point-the-bit"

Design characteristics

- Body and threading are made of quality alloy steel
- Two layers of wear-resistant carbide composite coating
- Exchangeable hydraulic ports (nozzles)
- Number of blades from 4 to 6
- Bits for RSS are designed individually according to the specifications for different wells and various types of RSS



BS - 220,7 RD 5 13 - 101

BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
RD419	S223	RD513	S233
RD416	S223	RD619	S323
RD413	S233	RD616	S323
RD519	S223	RD613	S333
RD516	S223		

1.9 SIDETRACKING BITS

ADVANTAGES:

- Provides a defined trajectory of well, good steerability
- Optimal ROP, wear resistance
- Maintainability

Purpose

- Sidetracking in open hole
- Drilling of sliding down intervals with high intensity

Design characteristics

- Body and threading are made of high quality alloy steel
- Two layers of wear-resistant carbide composite coating
- Exchangeable hydraulic ports (nozzles)
- Number of blades from 4 to 12
- Calibrating surface is reinforced with a carbide braze and with PDC inserts.
- Better flushing of the peripheral part of the blades

BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
ID413	S232	ID1213	S332
ID513	S232	ID616	S322
ID613	S332	IDD616	S422
IDD613	S432	ID916	S322
ID913	S332		



BS - 219,1 ID 12 13 - 101

1.10 SPECIAL E (PEAK PROFILE) BITS

ADVANTAGES:

- Bit profile prevents sidetracking
- High ROP, wear resistance
- Maintainability

Purpose

- For reaming, opening and calibrating of well

Design characteristics

- The body is made of high quality alloy steel
- The wear-resistant carbide composite coating
- Number of blades from 3 to 6
- Calibrating surface is reinforced with a carbide braze and with PDC inserts

BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
ED310	S134	ED613	S234
ED313	S134	ED616	S224
ED413	S134	ED619	S224
ED513	S234		



BS - 120,6 ED 6 13 - 002

1.11 SPRUT BITS

ADVANTAGES:

- Suitable for drilling carbonate and terrigenous sections
- Provides a predetermined trajectory of the well, well managed
- Optimal drilling speed, increased wear resistance
- Maintainability
- Specially designed for drilling complex carbonate sections similar to the Ural-Volga region

Purpose

- For continuous drilling of different type of wells
- For rotor or downhole motor driven drilling

Design characteristics

- Deep cone shape for better stabilization of the bit on the face
- Two layers of wear-resistant carbide composite coating
- Fluid stream angle to the face to reduce swirls and erosion of the body.
- Single-row cutters model with 8 blades or a 6-blade model with a reinforced shoulder paddle with a second row of cutters
- Reverse cutters are set by default
- Calibrating surface is reinforced with a carbide braze and with PDC inserts.
- Special configuration of the central part of the bit

BIT OPTIONS	
BIT TYPE	IADC CODE
SDD616	S423
SDD613	S433
SD813	S433



BS - 215,9 SDD 6 16 - 209

1.12 CUTMIX BITS

ADVANTAGES:

- Suitable for most drilling cases
- Optimal speed, wear resistance
- Provides a predetermined trajectory of the well, well managed
- Maintainability

Purpose

- For continuous drilling of different type of wells
- For rotory or downhole drilling

Design characteristics

- Body and threading are made of quality alloy steel
- Two layers of wear-resistant carbide composite coating
- Combined with different cutter sizes
- Exchangeable hydraulic ports (nozzles)
- Number of blades 4-8
- During the drilling of soft formations, larger cutters are used. In hard formations, smaller cutters are starting work.
- Reverse cutters are set by default
- Calibrating surface is reinforced with a carbide braze and with PDC inserts



BS – 220,7 SD 6 19 - 103

BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
SD419	S223	SD616	S323
SD416	S223	SD613	S333
SD413	S233	SD719	S323
SD519	S223	SD716	S323
SD516	S223	SD713	S333
SD513	S233	SD816	S323
SD619	S323	SD813	S333

1.13 TRIDENT BIT

ADVANTAGES:

- Suitable for drilling in underload conditions
- Provides a predetermined trajectory of the well, well managed
- Optimal drilling speed
- Maintainability
- Specially designed for drilling heterogeneous sections similar to the Republic of Belarus

Purpose

- For continuous drilling of different type of wells
- For rotory or downhole drilling
- For sidetracking drilling

Design characteristics

- «Beading» behind the cutters create a supporting surface for the stability, allows to install the cutter above the body and increase the cutting ability.
- Two layers of wear-resistant carbide composite coating
- Fluid stream angle to the face to reduce swirls and erosion of the body.
- Number of blades 6
- Reverse cutters are set by default
- Calibrating surface is reinforced with a carbide braze and with PDC inserts.
- Special configuration of the additional three blades



BS - 165,1 SD 6 16 - 201

BIT OPTIONS	
BIT TYPE	IADC CODE
SD619	S323
SD616	S323
SD613	S333

1.14 BICENTRIC DRILL BITS

ADVANTAGES:

- Provides a defined trajectory of well, good steerability
- Optimal ROP, wear resistance
- Enlargement of the wellbore diameter below casing
- Increasing the casing-borehole annulus to improve the cementation operation



BS - 120,6/132 BD 5 10 - 002

Purpose

- For drilling of any type of well and enlarging the hole
- For rotor or downhole motor driven drilling

Design characteristics

- Body and threading are made of high quality alloy steel
- Two layers of wear-resistant carbide composite coating
- Number of blades from 5 to 9
- Calibrating surface is reinforced with a carbide braze and with PDC inserts

BIT OPTIONS			
BIT TYPE	IADC CODE	BIT TYPE	IADC CODE
BD708	S344	BD613	S334
BD510	S334	BD713	S334
BD610	S234	BD813	S434
BD710	S334	BD913	S334
BD513	S234	BD716	S324

1.15 CORE BITS CDD

Patented CDD core bits are used to run coring service in hard carbonate formations:

- Dual row of cutters allows to get optimum formation compression resulting to reduce of contact stress on the cutters and improve coring efficiency.
- Core bit has reinforced head section to improve core recovery and ensure proper core catching in the barrel.



BS-215.9/100 COD 810-001



BS-311.2/100 COD 813-001



BS-139.7/67 COD 808-002

CDD

CDD

CDD

Model	External diameter		Core diameter	
	milli-meter	inch	milli-meter	inch
CDD808	138,1	5 7/16	80	3 1/8
CDD808 CDD810	139,7	5 1/2	67	2 7/16
CD810	152,4	6	80	3 1/8
CDD808 CDD808	155,6	6 1/8	80	3 1/8
CDD808	190,5	7 1/2	100	3 15/16
CDD808 CDD613	212,7	8 3/8	100	3 15/16
CDD813	212,7	8 3/8	101,6	4
CDD808	214	8 27/64	100	3 15/16
CDD813	214,3	8 7/16	100	3 15/16
CDD813	214,3	8 7/16	101,6	4
CDD808 CDD613 CDD810 CDD813	215,9	8 1/2	100	3 15/16
CDD808	215,9	8 1/2	101,6	4
CDD813 CDD913 CDD1010	215,9	8 1/2	110	4 3/8
CDD808	219,1	8 5/8	110	4 3/8
CDD808 CDD810 CDD613 CDD813	295,3	11 5/8	100	3 15/16
CDD808 CDD813	311,2	12 1/4	100	3 15/16

1.16 FISHTAIL (SPUDDING) BITS

This type of bit is designed to drill vertical wells in soft formations. It designed as low cost solution vs. PDC bits and much more reliable comparing to roller cone bits because of no moveable parts.



BS-393, 7 FH3-002

Model	Diameter	
	millimeter	inch
FH3	215,9	8 1/2
FH3	219,1	8 5/8
FH3	295,3	11 3/8
FH3	393,7	15 1/2

1.17 TCI CUTTER BITS

Bit has same kind of Steel body with cutters of tungsten – carbide material. Such bits are used to drill out cement and composite plugs and casing drillable accessories, liner normalization, clean out tubing pack-off.



BS-85 VH 314-001

Model	Diameter	
	millimeter	inch
VH314	81	3 1/16
VH314	85	3 13/32
VH414	89	3 1/2
VH314, VH414	93	3 23/32
VH414	96	3 25/32
VH414	98	3 55/64
VH414	102	4 1/64
VH414	121	4 49/64
VH314, VH312	122	4 53/64
VH314, VH414, VH312	124	4 7/8
VH414	126	4 33/32
VH314, VH312	127	5
VH414	140	5 33/64
VH414	144	5 43/64
VH414	147	5 25/32
VH414	155,6	6 1/8
VH414	156	6 3/64
VH414	166	6 17/32

1.18 HOLE OPENERS

Fixed Blade Reamer is enhanced PDC hole opener to be used to enlarge the pilot hole during or after drilling run. There might be two options of hole enlargement application:  
 1. Make up reamer in drilling BHA and enlarging pilot hole by same run.  
 2. Reaming previously drilled wellbore by separate BHA.  
 Reamer blades might be changeable, so few sizes of blades can be supplied along with single tool by customer request.



P-390/555.004  
(with replaceable blades)



P-390/555.003  
(with non-replaceable blades)

Model	External diameter		Borehole diameter after enlargement	
	millimeter	inch	millimeter	inch
P-295/555.001	295	11 5/8	555	21 27/32
P-390/490.002	390	15 3/8	490	19 1/4
P-390/490.003	390	15 3/8	490	19 1/4
P-390/555.004	390	15 3/8	555	21 27/32
P-390/555.002	390	15 3/8	555	21 27/32



1.19 CORE BITS

General customer requirement for coring operations is high percentage of core recovery combining with maximum run length and rate of penetration. There is reinforced core part in design to provide stable core diameter and maximize its recovery. This helps to avoid sticking of core barrel and ensure core is secured in catching mechanism. There is shock absorbing insert to increase tool wear resistance and improve coring run performance (reduce vibration level, mitigate sticking and etc). Core cutting structure is designed to deliver increased rate of penetration while coring run.



BS-215,9/101,6 CD 813-003



BS-215,9/100 CD 1208-001



BS-212,7/100 CD 810-001



BS-215,9/100 CD 613-002



BS-215,9/100 CD 713-001



BS-215,9/100 CD 813-001

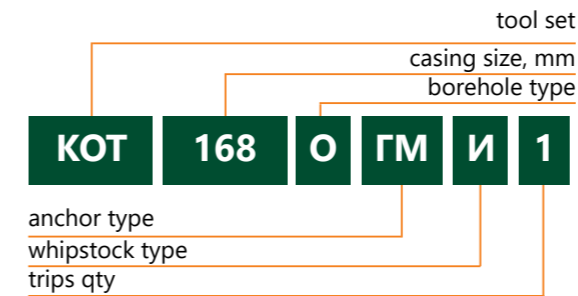
Model	External diameter		Core diameter	
	millimeter	inch	millimeter	inch
CD808	120,6	4 ¾	67	2 41/64
CD810	123,5	4 55/64	67	2 41/64
CD810	123,8	4 7/8	67	2 41/64
CD810	139,7	5 ½	67	2 41/64
CD808	142,9	5 5/8	67	2 41/64
CD810, CD613	152,4	6	66,7	2 5/8
CD813	152,4	6	67	2 41/64
CD808, CD608	152,4	6	80	3 1/8
CD810, CD813	155,6	6 1/8	80	3 1/8
CD810	165,1	6 ½	80	3 1/8
CD613, CD813	190,5	7 ½	101,6	4
CD810, CD613, CD813	212,7	8 3/8	100	3 15/16
CD613, CD813, CD908, CD913	212,7	8 3/8	101,6	4
CD1010	214	8 27/64	100	3 15/16
CD813, CD613, CD513, CD616, CD713	215,9	8 ½	80	3 1/8
CD810, CD1010, CD713, CD813, CD613, CD913, CD616, CD1208, CD416	215,9	8 ½	100	3 15/16
CD810, CD808, CD813	215,9	8 ½	101,6	4
CD613, CD1010, CD913	215,9	8 ½	110	4 3/8
CD810, CD613, CD813	219,1	8 5/8	100	3 15/16
CD810	219,1	8 5/8	110	4 3/8
CD810, CD613, CD813, CD913	220,7	8 11/16	100	3 15/16
CD613, CD813	220,7	8 11/16	101,6	4
CD813	241,3	9 ½	100	3 15/16
CD613	295,3	11 5/8	100	3 15/16
CD813	295,3	11 5/8	101,6	4

## 2. Workover and well intervention tools

### 2.1 CASING EXIT SYSTEMS



#### Designation of casing exit tools



### 2.2 WHIPSTOCK SYSTEM WITH HYDRAULIC ANCHOR, NO ABANDONMENT PLUG REQUIRED

«KOT OGN» tools set type is designed for single trip sidetrack in production casing without abandonment plug. Whipstock is non-retrievable.

Tool set includes anchor, concave, hydraulic control line, shear bolt, lead (start) and secondary (watermelon) mills. Strong design and construction provides high reliability of the tool.

Model	Casing size	
	millimeter	inch
KOT-140 OGN 1	140	5 3/8
KOT-146 OGN 1	146	5 7/8
KOT-168 OGN 1	168	6 5/8
KOT-178 OGN 1	178	7
KOT-245 OGN 1	245	9 5/8



KOT-146 OGN 1

**2.3. WHIPSTOCK SYSTEM WITH MECHANICAL ANCHOR**

«KOT-OMI» tools set is designed for single trip exit thru production casing, previously set abandonment plug is required. Whipstock might be retrieved by retrieval hook or overshot. Tool set includes anchor, concave, shear bolt, lead (start) and secondary (watermelon) mills.

«KOT-OMN» tools set is designed for single trip exit thru production casing, previously set abandonment plug is required. It includes bottom mechanical anchor, concave, shear bolt, lead (start) and secondary (watermelon) mills.

Model	Casing size	
	millimeter	inch
KOT-140 OMN 1	140	5 3/64
KOT-140 OMI 1	140	5 3/64
KOT-146 OMN 1	146	5 3/4
KOT-146 OMI 1	146	5 3/4
KOT-168 OMN 1	168	6 39/64
KOT-168 OMI 1	168	6 39/64
KOT-178 OMN 1	178	7
KOT-178 OMI 1	178	7
KOT-245 OMN 1	245	9 41/64
KOT-245 OMI 1	245	9 41/64



KOT-245 OMI 1

**2.4. WHIPSTOCK SYSTEM WITH HYDROMECH ANCHOR, NO ABANDONMENT PLUG REQUIRED**

«KOT-OGMI» tools set is designed for single trip sidetrack in production casing, without abandonment plug allowing lower zone isolation.

Whipstock system with hydromechanical anchor can be oriented by conventional mud telemetry MWD. Anchor activating includes 2 steps – preliminary and final settings. Whipstock direction might be corrected at preliminary setting stage if required.

Model	Rated string diameter	
	millimeter	inch
KOT-140 OGMI 1	140	5 3/64
KOT-146 OGMI 1	146	5 3/4
KOT-168 OGMI 1	168	6 39/64
KOT-178 OGMI 1	178	7
KOT-245 OGMI 1	245	9 41/64



KOT-140 OGMI 1

**2.5. WHIPSTOCK SYSTEM WITH HYDROMECH ANCHOR, NO ABANDONMENT PLUG REQUIRED**

«KOT-OGI» tools set is designed for single trip sidetrack in production casing, without abandonment plug allowing lower zone isolation.

Model	Casing size	
	mm	inch
KOT-140 OGI 1	140	5 3/64
KOT-146 OGI 1	146	5 3/4
KOT-168 OGI 1	168	6 39/64
KOT-178 OGI 1	178	7
KOT-245 OGI 1	245	9 41/64



KOT- 140 OGI 1

**2.6. CEMENTED ANCHOR WHIPSTOCK SYSTEM**

«KOT-OCN» tools set is designed for two trips exit thru different casing sizes with previously setting of abandonment plug. Whipstock system is non-retrievable.

Tool set includes anchor, concave, hanging pipe, xover sub, transport bolts, lead (start) and secondary (watermelon) mills. Set of mills may not be included in the kit in case of openhole run is proposed.

Model	Casing size	
	mm	inch
KOT-140 OCN 2	140	5 3/64
KOT-146 OCN 2	146	5 3/4
KOT-168 OCN 2	168	6 39/64
KOT-178 OCN 2	178	7
KOT-245 OCN 2	245	9 41/64
KOT-273 OCN 2	273	10 3/4



KOT-140 OCN 2

**2.7. PACKERED WHIPSTOCK SYSTEM**

«KOT-OMNK» tools set is designed for single trip exit thru production casing with hydraulic-set packer allowing lower zone isolation.

Retrievable system «KOT-OMIK» is designed for single trip production casing exit with hydraulic-set packer allowing lower zone isolation.

«KOT-OMNK» and «KOT-OMIK» systems include bottom mechanical anchor with packer, upper anchor, concave, shear bolt, lead (start) and secondary (watermelon) mills.

Model	Casing size	
	mm	inch
KOT-140 OMNK 1	140	5 3/64
KOT-140 OMIK 1	140	5 3/64
KOT-146 OMNK 1	146	5 3/4
KOT-146 OMIK 1	146	5 3/4
KOT-168 OMNK 1	168	6 39/64
KOT-168 OMIK 1	168	6 39/64
KOT-178 OMNK 1	178	7
KOT-178 OMIK 1	178	7
KOT-245 OMNK 1	245	9 41/64
KOT-245 OMIK 1	245	9 41/64



KOT-146 OMIK 1

**2.8. SPECIAL FORMATION MILL REINFORCED BY PDC**

Special formation mill reinforced by PDC (FSAI) is able to cut production casing and proceed drilling sidetrack wellbore thru formation in rotary mode per single trip.

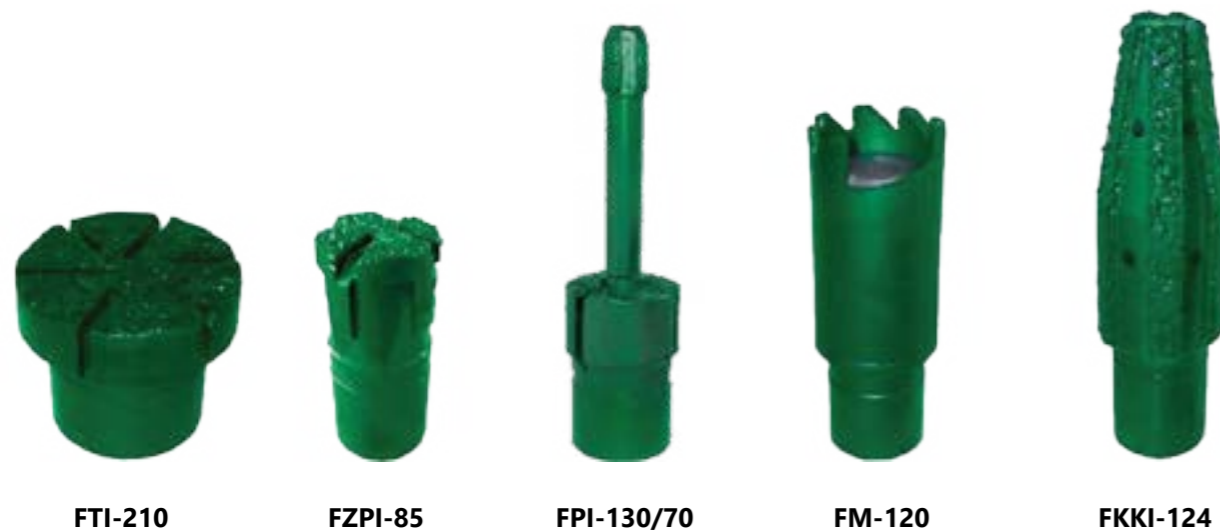


FSAI - 124.01

2.9. MILLS

Burservice manufactures mills of following types:

- **JUNK AND FLAT BOTTOM** mills are used to mill out cement and general metal junk to clean out the bottom hole. Concave shape is ideal to milling bit cones and other objects by keeping them centered under the mill. There are few types basing on milling structure – tungsten carbide tooth (FZ and FT), tungsten carbide composite material (FZI and FTI) and diamond composite material (FZA and FTA). "C" code means stabilized Mill assembly. FZPI bottom mill has combined milling structure including special chips cutters and tungsten carbide crumbs for milling sand packoffs, cement plugs, casing floats and accessories as well as common metal junk.
- **WASHOVER SHOES** are used to mill and clean downhole equipment from outside. There are 4 types basing on milling structure – tungsten carbide grains (FKZ), tungsten carbide plates (FKP), tungsten carbide composite material (FKI) and diamond composite material (FKA).
- **PILOT MILLS** are used for milling stuck tubular, such as washpipe, cemented rotary shoe, liners. FP pilot assembly maintains a centered position on the tubular while the milling blades mills product away.
- **MAGNET MILLS** are used for milling and pulling out the small metal junk from the bottom.
- **TAPER MILLS** are used to ream thru a variety of restrictions like collapsed or jammed casing. 2 types of construction depends on cutting structure: FKK – tungsten carbide plates and FKKI – composite tungsten carbide material.



FTI-210

FZPI-85

FPI-130/70

FM-120

FKKI-124

3. Expanding tools

3.1. SECTION MILL ASSEMBLY

Section mills are designed for cutting and milling a complete section of casing. Hydraulic force activates the cutter arms on the tool. Mills arms might be replaced on the rigsite if required. Float valve might be attached to section mill assembly to prevent reverse flow and pack off tool with junk once circulation is stopped. Variety of stabilizers are also available for different casing sizes.

Model	Body OD		Casing size	
	millimeter	inch	millimeter	inch
SMA-114-140	114	4 1/2	140	5 3/64
SMA-114-146	114	4 1/2	146	5 1/4
SMA-140-168	140	5 3/64	168	6 39/64
SMA-140-178	140	5 3/64	178	7
SMA-170-219	170	6 11/16	219	8 5/8
SMA-185-245	185	7 9/32	245	9 1/64



SMA-140/168

3.2. HOLE ENLARGEMENT TOOL

Typical application is open hole enlarging while drilling or by stand alone reaming run. Blades are activated by pressure drop, cutting structure is reinforced by PDC and tungsten carbide material cutters. Blades might be easily replaced on the rigsite.

Model	Body OD		Casing size	
	millimeter	inch	millimeter	inch
NET-114/152.02	114	4 1/2	152	5 63/64
NET-114/220.01	114	4 1/2	220	8 21/32
NET-132/180.01	132	5 1/8	180	7 1/32
NET-132/190,5.01	132	5 3/8	190,5	7 1/2
NET-185/240.04	185	7 9/32	240	9 29/64
NET-185/255.03	185	7 9/32	255	10 3/64
NET-185/310.01	185	7 9/32	310	12 13/64



NET-185/240

## 4. BHA components

### 4.1 STABILIZERS

Designed to minimize downhole torque, reduce damage to the hole wall, and ensure maximum fluid circulation, for reaming of the borehole according to the drilling bit diameter and for centering and improvement of the drilling bit working conditions.

Stabilizers are available with straight and spiral. It is manufactured from high-strength alloy steel as a single-piece tool with two connecting joint threads (coupling or nipple) and can be reinforced by hard-alloy and diamond-enhanced inserts.

For order the type of the thread to be specified: **M** - box, **H** - nipple.



S-212 MC4



SS-295,3 CT3

### 4.2 SLIDING TYPE CHECK VALVE

Designed to prevent possible entering of gas, oil or other solutions through the drilling and production string and to prevent sludging of PDM motors. The valves consist of a body with a conical seat with locking group.

The main advantages of this valve are high reliability and long service life period, which is achieved by:

- simple design;
- application of anti-vibration folding collar;
- absence of the traditional compression springs prone to breakage.



SCV-110

### 4.3. SLIDING TYPE CEMENTING CHECK VALVE

Designed to prevent entering of the drilling fluid or the cement slurry and possible emission of gas or oil from the annular into the casing during cementing works, and for bottom plug guard. The advantages of this valve are high reliability due to significantly larger interaction surface of the conical sealing surfaces of the core seat and application of isolation joint in comparison with the applicable poppet and ball valves.



SCCV-146 OTTM

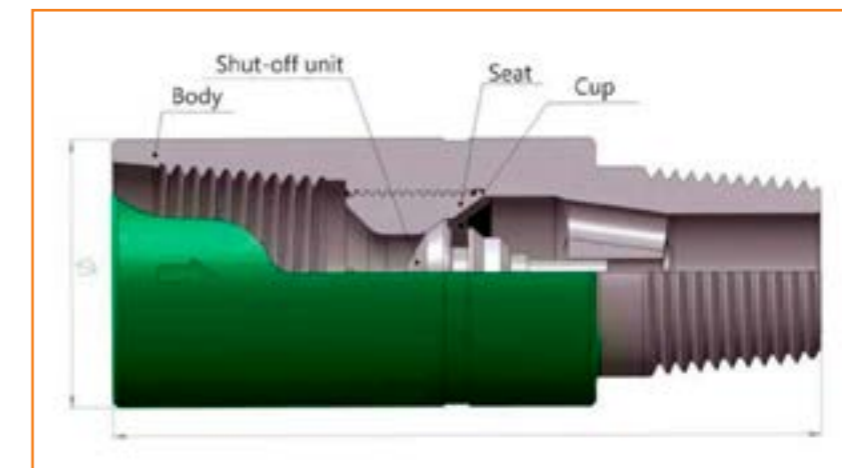
### 4.4. DRILLING SLIDE VALVE SCV-106

#### DESCRIPTION

The valve is included as a component of BHA. Designed to prevent possible gas, oil or drilling fluid entering through drilling pipes as well as to protect the PDM motors and the bit nozzles against sludging while drilling.

Technical characteristics	
Valve type	Slide-type
The body outer diameter (OD), mm (-0.38 mm)	106
Total length (L), mm (±3 mm)	280
Valve length without nipple, mm (±3 mm)	191
Cup diameter, mm	60
Seat hole diameter, mm	30
Thread connection as per GOST R 50864-96, (box/nipple)	3-86/3-86
Body material	40XH GOST 4543-71
Weight, kg	11

Recommended operation parameters	
Allowable closing pressure, MPa	35
Test pressure, MPa min.	70
Temperature limits	T=-30...+100° C



## 5. MUD LAB

A Mud Lab is a set of necessary tools for operative control of drilling mud parameters on the rig by mud engineer.

This kit is also designed for oil production and drilling companies and scientific research institutes. It is a metal box with tools attached inside it and with a carriage handle.

### MUD LAB SET CONSIST OF:

- DFA-1 areometer in the case;
- viscometer DFV-2 (sieve, funnel, cup);
- pH test paper;
- graduated cylinder, 100 ml;
- measuring cup, 1000 ml;
- gloves;
- cotton napkins;
- BM-6 device;
- OM-2 filter-press;
- stability cylinder SC-2;
- stopwatch;
- thermometer.



### CHC-2 DEVICE

**CHC-2** - designed to measure mud solutions gel strength.



### STABILITY CYLINDER

**SC-2** - designed to determine the stability of drilling muds.



### AREOMETER

**DFA-1** - designed to measure the density of drilling muds and cementing slurries.



### SPREADABILITY CONE

**SC-1** - designed to determine the flowability of the cementing slurry.



### KTK-2 DEVICE

**KTK-2** - Designed to determine the friction coefficient of the drilling mud filter cake in field laboratories and at drilling sites.



### BM-6 DEVICE

**BM-6** - designed to determine the water loss of drilling fluids.



### OM-2 FILTER-PRESS

**OM-2** - designed to determine the percent of sand in the drilling fluid sample.



### DRILLING FLUID VISCOMETER DFV-2

**DFV-2** - designed to determine the relative viscosity of drilling fluids.



### VICAT NEEDLE

**Vicat needle** - designed to determine density and setting up time of the cement in the laboratory conditions.



## 6. Burservice brand line

### From the right placement to the winning combination

A series of drilling bits with combined reinforcement, optimized for soft to medium rocks formations / a 4-blade bit is designed for drilling production intervals with high drilling rate in Western Siberia.



### CDD drilling heads - natural core recovery

The **CDD** drill bit (Core bit with Double Diamond), with double row cutters, offer new core drilling options. Cost-efficiency is ensured by the use of middle-class cutters and the original design provides high core recovery efficiency.

We can help you to find a set of drilling bits suitable for the most complex geological sections, with hard formation intervals. **CDD** heads are available in diameters from 139.7 to 311.2 mm and number of blades from 6 to 10 pieces.



### Little hero of huge projects

The high efficiency of large diameter five-blade drilling bits is represented in the line of small diameter bit called **hob-bit**. Thanks to the new technological solutions, a **hob-bit** provides drilling rate of four-blade bit and response of six-blade bit.

The range of diameters from 123.8 to 165.1 mm provides the possibility to choose the size of **hob-bit** for any project, including sidetracking. For complex formations **hob-bit** is equipped with premium class PDC-cutters.



### I know the way

Drilling bits are designed to work as a part of the Rotary Steerable System and are intended for drilling with a high penetration rate. Proved and unique blade design provides precise directional control even in extreme conditions.

**Rudder** is a steering wheel.



### Deviation from course!

Due to the rugged construction and advanced technology, the **Zet-Stock** toolkit is an effective solution for casing exits.



### BULAVA – gives power over resources!

We introduce the **BULAVA** bit line that was created for more efficient hard rock drilling. Unlike standard PDC bits, the **BULAVA** model has an original shape of cutters, which increase the efficiency of hard formations drilling.

Optimal positioning of the cutting elements ensures higher drilling speed and bit durability when working with hard rocks.



### Kaiman - perfect solution for complex project!

SDD is a series of premium bits with a double-row cutting structure. To achieve the best results, we have combined advanced technical and technological solutions with the premium PDC cutters and materials.

The **Kaiman** SDD combines high drilling speed, controllability and unrivaled durability.





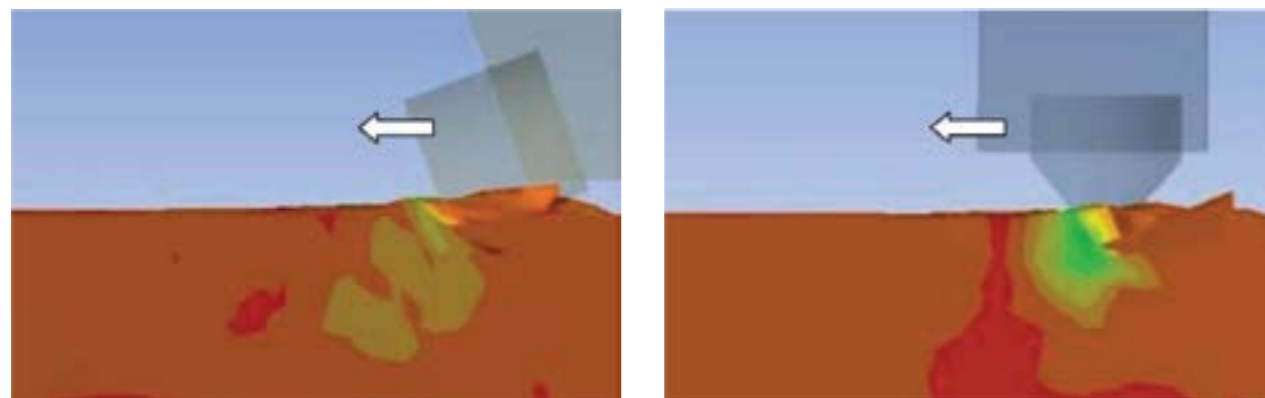
# 7. New developments of Burservice

## 7.1. THE BULAVA PROJECT

Within 10-15 years the rock cutting tools with polycrystalline diamond compact cutters (PDC) will have found an ever wider application, displacing the roller-cone bit. Currently, the share in the Russian drilling sector is about 85%. This leap was due to the high consumer properties of the PDC bit along with their simple and reliable design. But there are still goals to be achieved by PDC bits, due to their low competitiveness compared to roller-cone bits - in open pits formed by hard and solid rocks. On the one hand, the high contact stresses at the «cutter-rock» interface resulting in the cutter destruction, and on the other hand, the high forces required to run the cutter into the hard rock with the subsequent shear - all these factors restrict the use of typical PDC

bits in complex open pits. Therefore, our designers are faced with the task to create a design that would combine the advantages of both roller cone and PDC bits. So, on the one hand we have the design of the roller-cone bit, on the other hand - the PDC bit. The first is based on crushing shearing principle, the second - on the cutting-shearing one. Cutting is effective on soft and medium rocks, crushing - on hard and solid rocks. The rock cutting tools differ in the shape and the material composition.

It would be logical to create a universal bit design combining these two principles for effective drilling of soft and medium as well as hard and solid rocks, providing the bladed bit with two different cutting structure types.



## 7.2. THE CORING DEVICE UKBS-185/100

The coring device UKBS-185/ 100 is designed for sections. The basic design of the device is intended drilling boreholes of 0 212.7...311.2 mm and taking to take unsealed core samples. If it is necessary to a core of 100 mm. The device

consists of the take a sealed core sample, the device is equipped body, the core receiver, an axial bearing, and the with the proper number of fiber glass or aluminum core sampler. It may have one, two, three, and four core tubes.



UKBS-185/100

### MAIN PARAMETERS:

The housing OD, mm	185
Core diameter, mm	100
Upper thread connection	3-133
Lower thread connection	3-133

Number of sections	1	2	3	4
Length, m	10,1	18,7	27,3	35,9
Core receiving part, m	8,9	17,5	26,1	34,7

## 7.3. FLUSHING AND MUDDING DEVICE

The Flushing and Mudding Device of multiple use is a circulation valve, which is able to redirect the fluid flow from inside the drilling string into the annular space, bypassing all the BHA elements located downstream of this device.

FMD is activated through the activation ball while pumping the drilling mud. When the ball sits down on the seat, all the BHA elements located downstream of the FMD are cut from the flushing fluid flow. The list of tasks that can be solved by the FMD without tripping operations:

- Injection of all types of mud and plugging materials to the lost circulation zones.
- Improvement of the borehole cleaning by

increasing the flushing flow rate (in particular, while drilling a substantial vertical deviation and horizontal wells).

- Mud parameters recovery.
- Replacing the technical fluids in the process of borehole development, completion, and workover.

The FMD has a unique feature - the circulation ports of the activated FMD are closed when the drilling pump is stopped, thus preventing the flushing fluid backflow from the annular space into the drilling string.

The number of FMD activation/deactivation cycles depends on the volume of the ball catcher basket and can be increased by the customer's request.



FMD-120

**7.4. DRILLING DAMPER UDB-203**

**DESCRIPTION**

The device is designed to increase the drilling tools and elements life period, improving their operation resulting from:

1. Smoothing of axial shocks in the process of tools running-in, after making tools connections, and in the event of intermittent tool feed.
2. Absorption of the axial vibration energy, if it occurs from the positive displacement motor to the bit, and from the bit to the drilling string elements.

Technical characteristics	
Outer diameter, mm	203
Length without nipple, mm	3450
Number of sections	2
Stroke till full compression, mm	150
Bore diameter, mm	70
Thread connections as per GOST R 50864-96, sleeve/nipple	3-152
Weight, kg	280

Recommended operation parameters	
Rotary speed, rpm	up to 200
Flushing fluid flow rate, L/s	up to 56
Differential pressure, MPa	0,2
Axial load, tons max.	29



**UDB-203**





**BURSERVICE**

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