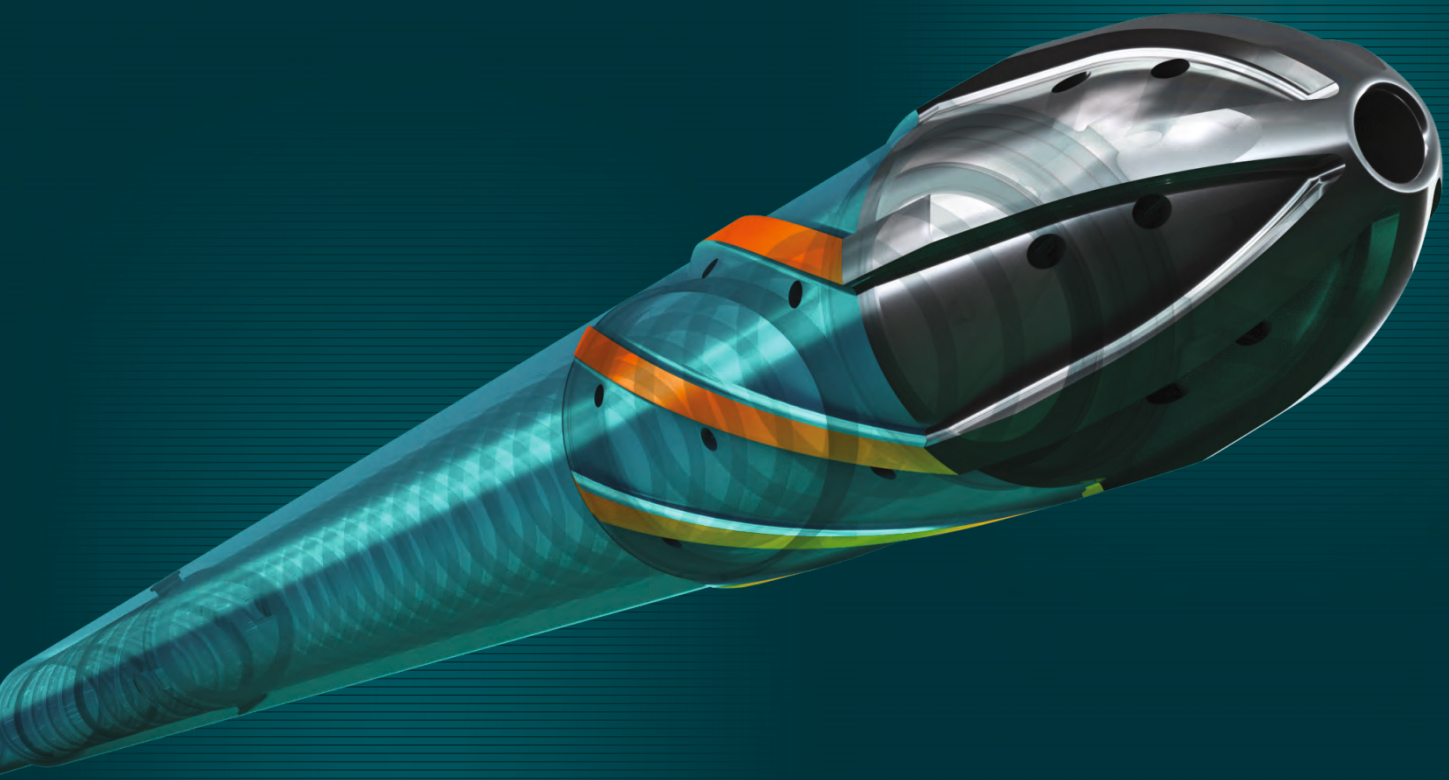
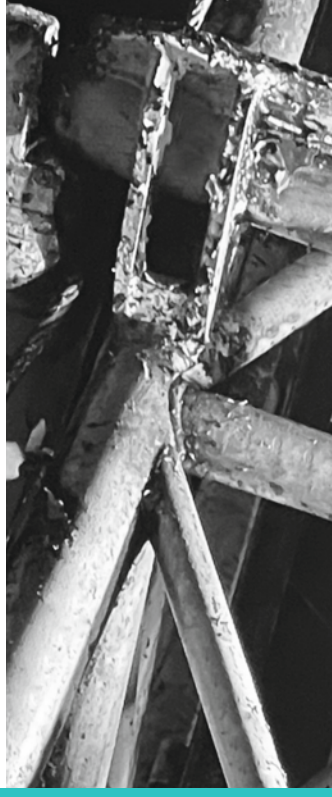
BURAN

# LOWER COMPLETION EQUIPMENT



# EQUIPMENT CATALOGUE

BURAN



BURAN COMPANY GROUP IS THE MANUFACTURER OF LOWER COMPLETION EQUIPMENT

# HISTORY OF THE COMPANY

## 2007

Incorporation
of KSP Steel, LLP

First Kazakh manufacturer
of steel seamless pipes
for oil and gas industry.

**Operational assets –
Pavlodar, Republic of Kazakhstan.**

## 2014

**Incorporation of
KSP Steel Trading House, LLC**

Exclusive representative
of KSP Steel, LLP in Russia.

*Best foreign company in segment
"Oil and Gas Gage Pipes" in Russia.
According to TEK-Rating agency.*

WE HAVE DELIVERED OVER

**1 000 000 tons**

OF PIPES TO THE MOST HARD-TO-REACH
FIELDS

+ Urengoiskoe field
+ Kharasaveiskoe field
+ Kovyktinskoe field
+ Bovanenkovskoe field
+ Chayandinskoe field
+ Samotlorskoe field
+ Priobskoe field
+ Mamontovskoe field
+ Yurubchenko-Tokhomskoe field
+ Tevlinsko-Russkinskoe field
+ Vatiyoganskoe field
+ Povkhovskoe field
+ Pokachyovskoe field
+ South Yagunskoe field
+ Yurkharovskoe field
+ East Tarkosalinskoe field
+ Khancheiskoe field
+ North Russian field
+ Salymskaya group
+ Kharyaginskoye field
+ Central Khoreyver Uplift


## 2023

### Full cycle production

Buran Company Group is the only lower completion equipment manufacturer in Russia using its own stock materials.

*From preparation of charge for pipe to finished product and lowering at the field.*

## 2022

### Incorporation of Buran Company Group

Lower completion equipment assembly production

Service support.

**Operational assets – Chelyabinsk.**

## 2017

### The holding includes Polimerstroy, LLC

Production of pipes and fittings with anticorrosive coatings and polyurethane foam heat insulation.

**Operational assets – Orenburg.**

# STRONG PARTNERS UNION

BURAN

Lower completion equipment

TRADING HOUSE KSP Steel

Seamless steel pipes

POLYMERSTROI

Heat insulation and anticorrosive coating

Metalwork

+ Shoes
+ Collars
+ Packers
+ Liner hangers

+ Stingers
+ Downhole filters
+ Bow-spring centralizer
+ Hydraulic anchors

+ Pumping and compression pipes
+ Casing pipes
+ Oil and gas supply pipes
+ Gas lift pipes

+ Boiler tubes
+ Corrosion-resistant pipes
+ General purpose pipes

+ Polyurethane foam heat insulation with fire-resistant spacer and skin effect system

+ Inner and outer coating made of epoxy materials

+ Outer anticorrosive coating made of extruded polyethylene

+ Outer polyurethane anticorrosive coating

+ Anticorrosive paint-and-lacquer coating with zinc-containing compound for pipeline supports

+ Manufacturing of metalwork for buildings and structures framework, process pipe racks, pipeline supports, piles, pipe piles

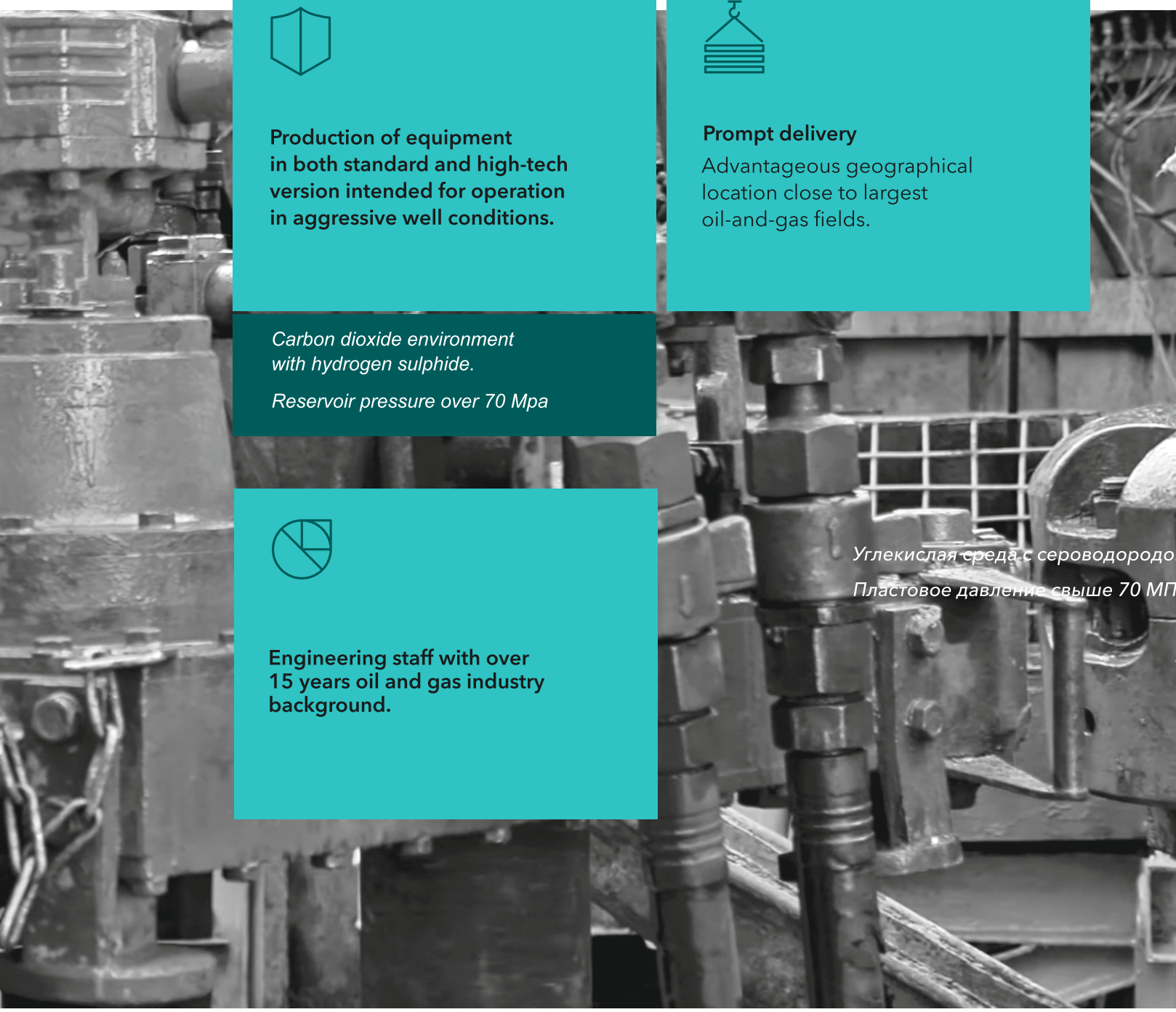
# ADVANTAGES

**Full cycle company**

From raw materials to finished products with service support.

**Conformity to the requirements of GOST ISO 14310-2014 for validation class V0.**

Test bench was installed for validation class V0.



**Production of equipment in both standard and high-tech version intended for operation in aggressive well conditions.**

**Prompt delivery**

Advantageous geographical location close to largest oil-and-gas fields.

*Carbon dioxide environment with hydrogen sulphide.*

*Reservoir pressure over 70 Mpa*

**Engineering staff with over 15 years oil and gas industry background.**

*Углекислая среда с сероводородо*

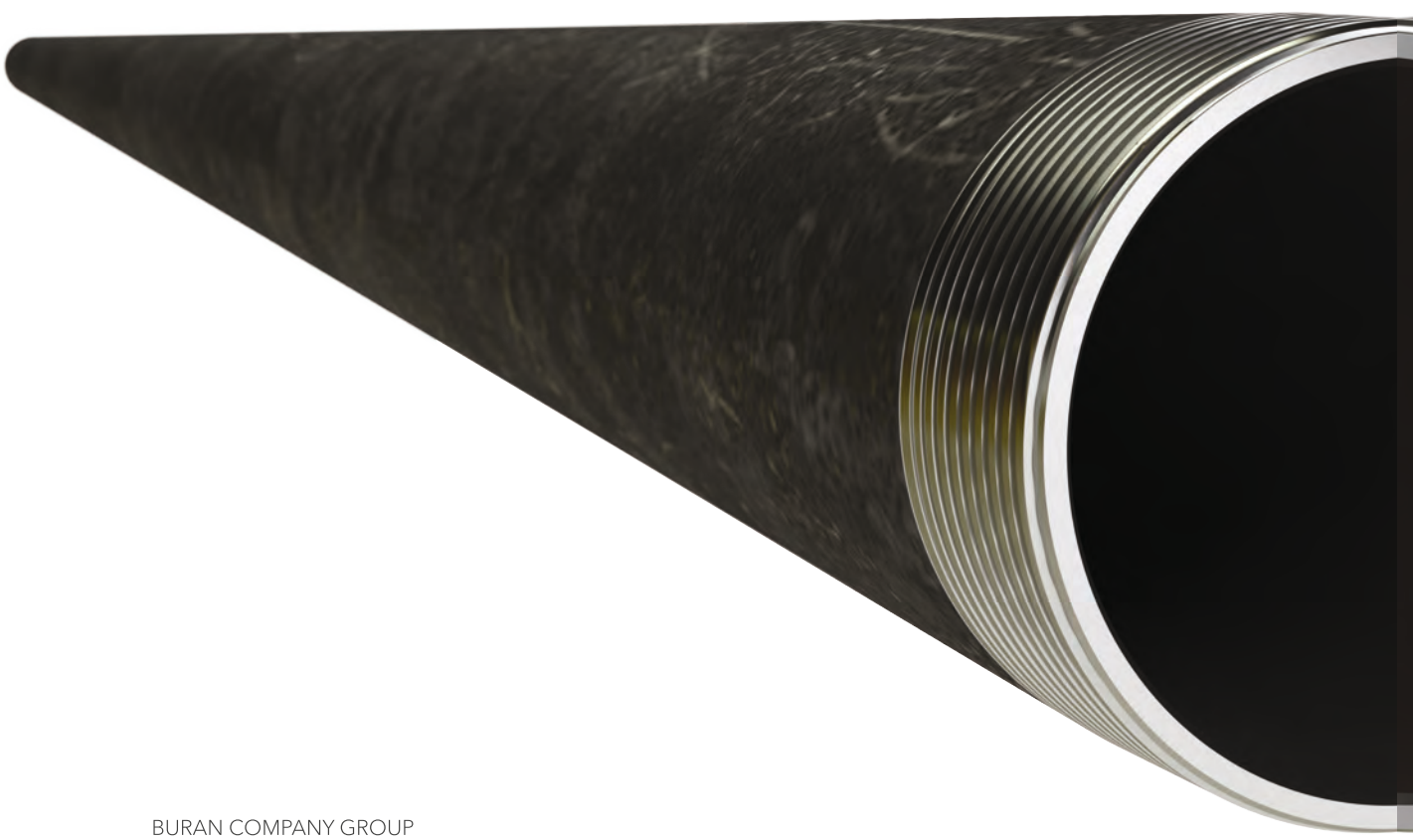
*Пластовое давление свыше 70 МП*

# OWN STOCK MATERIALS – GUARANTEE OF QUALITY AND TIMELY DELIVERY, INDEPENDENCE FROM SUPPLIERS BY PRICE PARAMETERS

High purity steel without non-metal inclusions due to degassing

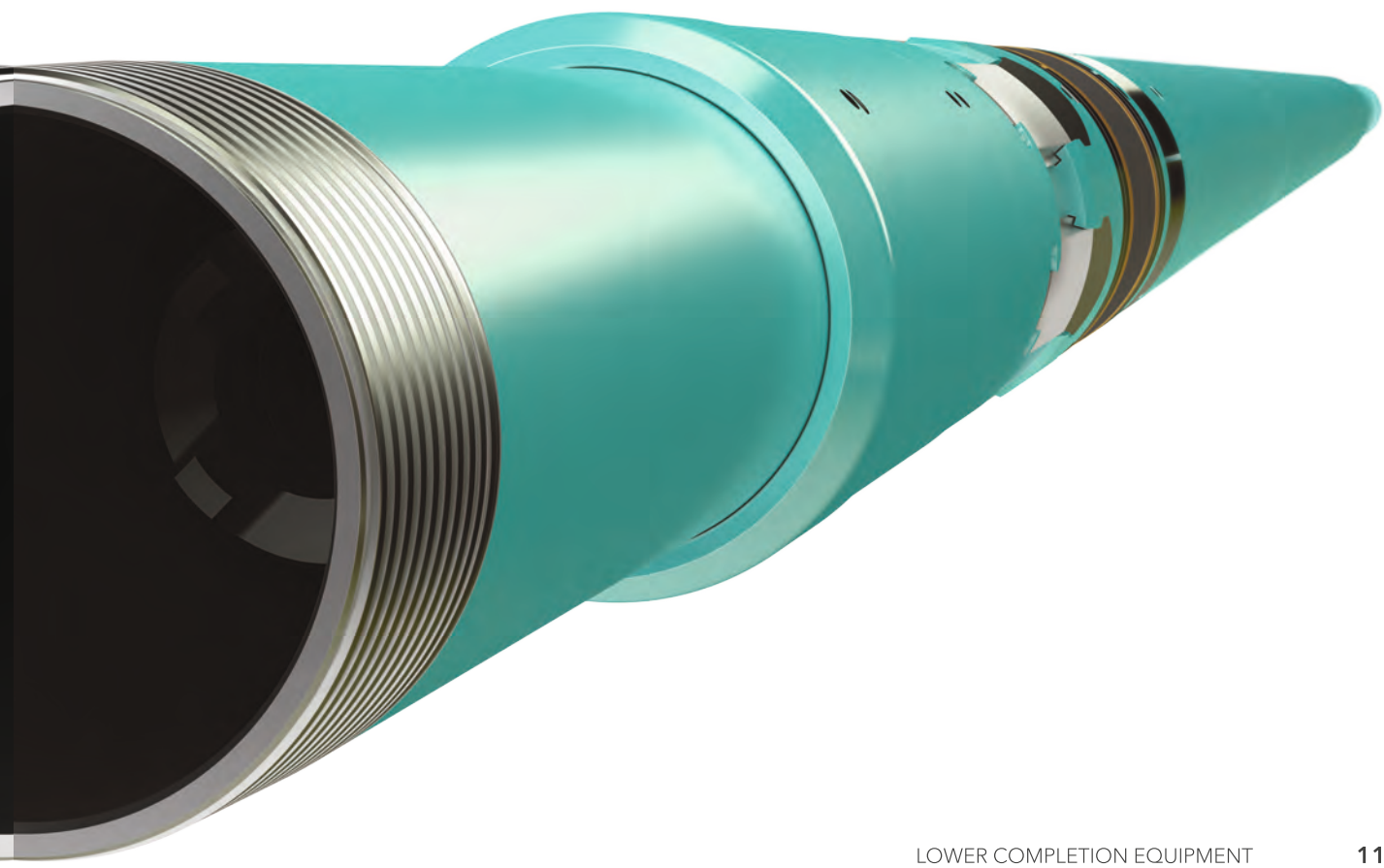
Workpiece can be made of corrosion-resistant grade steels

High operational performance due to microalloying with vanadium



# IMPROVED EQUIPMENT RELIABILITY

Long service life



STRING SHOE

# BUR-BK

For guiding of casing string when lowering in open hole, flushing of bottomhole and casing annulus in the course of oil and gas wells casing.

+ Spherical shape of shoe provides guiding and facilitates passing of ledges and key seats in open hole.

+ Circulation is provided through central and side holes.

+ Shoe nose piece is made of easy-to-drill-out alloy, which allows taking high axial loads when lowering and quick drilling out during normalization.

| | | BUR-BK-102 | BUR-BK-114 | BUR-BK-127 | BUR-BK-140 | BUR-BK-146 | BUR-BK-168 | BUR-BK-178 | BUR-BK-245 |
|---|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 | 244,5 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 | 269,9 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 | 226,6 |
| Max axial compression load | kN | 500 | 600 | 600 | 700 | 700 | 900 | 900 | 1500 |
| | ts | 51,0 | 61,2 | 61,2 | 71,4 | 71,4 | 91,8 | 91,8 | 153,0 |
| Central hole diameter | mm | 40,0 | 50,0 | 50,0 | 60,0 | 60,0 | 70,0 | 70,0 | 120,0 |
| Total circulation holes area | $mm^2$ | 2060,0 | 2766,5 | 2766,5 | 4032,0 | 4032,0 | 5454,5 | 5454,5 | 13 716,0 |
| Length | mm | 220 | 220 | 230 | 240 | 240 | 260 | 280 | 310 |
| Weight | kg | 5,7 | 6,0 | 6,8 | 9,5 | 10,2 | 16,4 | 18,0 | 38,7 |

STRING SHOE WITH VALVE

# BUR-BKK

For guiding of casing string when lowering in open hole, flushing of bottomhole and casing annulus in the course of oil and gas wells casing.

+ Shoe is equipped with check valve to prevent self-filling of string and exclude overflow after cementing.

+ Circulation is provided through central and side holes.

+ Shoe nose piece is made of easy-to-drill-out alloy, which allows taking high axial loads when lowering and quick drilling out during normalization.

| | | BUR-BKK-102 | BUR-BKK-114 | BUR-BKK-127 | BUR-BKK-140 | BUR-BKK-146 | BUR-BKK-168 | BUR-BKK-178 | BUR-BKK-245 |
|---|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 | 244,5 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 | 269,9 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 | 226,6 |
| Max compression load | kN | 500 | 600 | 600 | 700 | 700 | 900 | 900 | 1500 |
| | ts | 51,0 | 61,2 | 61,2 | 71,4 | 71,4 | 91,8 | 91,8 | 153,0 |
| Central hole diameter | mm | 40,0 | 50,0 | 50,0 | 60,0 | 60,0 | 70,0 | 70,0 | 120,0 |
| Valve hole area | $mm^2$ | 1256,0 | 1256,0 | 1256,0 | 1256,0 | 3316,6 | 3316,6 | 3316,6 | 3316,6 |
| Max pressure difference per valve | Mpa | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 30 |
| Length | mm | 370 | 370 | 380 | 390 | 390 | 430 | 450 | 480 |
| Weight | kg | 5,7 | 6,0 | 6,8 | 9,5 | 10,2 | 16,4 | 18,0 | 38,7 |

STRING SHOE CONCRETE

# BUR-BKB

For arrangement of casing string bottom, guiding thereof in well hole and protection against damage when lowering in the course of oil and gas wells casing.

+ Spherical shape of shoe provides guiding and facilitates string lowering.
+ Circulation is provided through central and side holes.
+ Shoe guide is made of concrete which allows quick drilling out.

| | | BUR-BKB-146 | BUR-BKB-168 | BUR-BKB-178 | BUR-BKB-245 |
|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 146,1 | 168,3 | 177,8 | 244,5 |
| Maximum shoe outer diameter | mm | 166,0 | 187,7 | 194,5 | 269,9 |
| Inner diameter after drilling-out | mm | 129,1 | 150,4 | 159,4 | 226,6 |
| Max compression load | kNts | 250 | 350 | 350 | 500 |
| | | 25,5 | 35,7 | 35,7 | 51,0 |
| Diameter of holein float plug | mm | 90,0 | 90,0 | 90,0 | 120,0 |
| Total circulation holes area | $mm^2$ | 7564,5 | 7966,5 | 7966,5 | 13 716,0 |
| Length | mm | 240 | 260 | 280 | 310 |
| Weight | kg | 10,9 | 17,2 | 18,6 | 44,3 |

STRING SHOE
CONCRETE WITH VALVE

# BUR-BKBK

For arrangement of casing string bottom, guiding thereof in vertical, directional and horizontal well holes, protection against damage as well as for prevention of string self-filling when lowering in the course of oil and gas wells casing.

+ Spherical shape of shoe provides guiding and facilitates string lowering.
+ Shoe is equipped with check valve to prevent self-filling of string and hold pressure after cementing.
+ Shoe guide is made of concrete which allows quick drilling out.

| | | BUR-BKBK-146 | BUR-BKBK-168 | BUR-BKBK-178 | BUR-BKBK-245 |
|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 146,1 | 168,3 | 177,8 | 244,5 |
| Maximum outer diameter | mm | 166,0 | 187,7 | 194,5 | 269,9 |
| Inner diameter after drilling-out | mm | 129,1 | 150,4 | 159,4 | 226,6 |
| Max compression load | kN ts | 250 | 350 | 350 | 500 |
| | | 25,5 | 35,7 | 35,7 | 51,0 |
| Diameter of hole in float plug | mm | 110,0 | 110,0 | 110,0 | 110,0 |
| Valve hole area | $mm^2$ | 3316,6 | 3316,6 | 3316,6 | 3316,6 |
| Max pressure difference per valve | Mpa | 35 | 35 | 35 | 30 |
| Length | mm | 240 | 260 | 280 | 310 |
| Weight | kg | 10,9 | 17,2 | 18,6 | 44,3 |

ECCENTRIC SHOE ROTATING

# BUR-BEV

For arrangement of casing string bottom, guiding thereof in well hole and protection against damage when lowering in the course of oil and gas wells casing.

+ Eccentric shaped nose piece rotates freely, provides guiding and facilitates string lowering.
+ Circulation is provided through central and side holes.

+ Shoe nose piece is made of easy-to-drill-out alloy, which allows taking high axial loads when lowering and quick drilling out during normalization.

| | | BUR-BEV-102 | BUR-BEV-114 | BUR-BEV-127 | BUR-BEV-140 | BUR-BEV-146 | BUR-BEV-168 | BUR-BEV-178 | BUR-BEV-245 |
|---|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 | 244,5 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 | 269,9 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 | 226,6 |
| Max compression load | kN | 500 | 600 | 600 | 700 | 700 | 900 | 900 | 1500 |
| | ts | 51,0 | 61,2 | 61,2 | 71,4 | 71,4 | 91,8 | 91,8 | 153,0 |
| Central hole diameter | mm | 26,0 | 26,0 | 26,0 | 26,0 | 26,0 | 35,0 | 35,0 | 50,0 |
| Total circulation holes area | $mm^2$ | 2276,7 | 2276,7 | 2276,7 | 2678,7 | 2678,7 | 3511,6 | 3511,6 | 5967,5 |
| Length | mm | 285 | 285 | 295 | 310 | 310 | 330 | 340 | 400 |
| Weight | kg | 6,8 | 7,3 | 7,8 | 10,9 | 11,7 | 18,8 | 20,7 | 44,5 |

ECCENTRIC SHOE
ROTATING WITH VALVE

# BUR-BEVK

For arrangement of casing string bottom, guiding thereof in vertical, directional and horizontal well holes, protection against damage as well as for prevention of string self-filling when lowering in the course of oil and gas wells casing.

+ Eccentric shape provides guiding and facilitates string lowering.

+ Shoe is equipped with check valve to prevent self-filling of string and exclude overflow after cementing.

+ Shoe guide is made of easy-to-drill-out alloy which allows taking high axial loads when lowering and quick drilling out during normalization.

| | | BUR-BEVK-102 | BUR-BEVK-114 | BUR-BEVK-127 | BUR-BEVK-140 | BUR-BEVK-146 | BUR-BEVK-168 | BUR-BEVK-178 | BUR-BEVK-245 |
|---|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 | 244,5 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 | 269,9 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 | 226,6 |
| Max compression load | kN ts | 500 | 600 | 600 | 700 | 700 | 900 | 900 | 1500 |
| | | 51,0 | 61,2 | 61,2 | 71,4 | 71,4 | 91,8 | 91,8 | 153,0 |
| Valve hole area | $mm^2$ | 1256,0 | 1256,0 | 1256,0 | 1256,0 | 3316,6 | 3316,6 | 3316,6 | 3316,6 |
| Max pressure difference per valve | Mpa | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 30 |
| Length | mm | 425 | 425 | 435 | 450 | 450 | 480 | 490 | 550 |
| Weight | kg | 8,3 | 9,0 | 9,5 | 17,0 | 19,0 | 31,9 | 38,8 | 71,1 |

ECCENTRIC SHOE
SPRING-LOADED

# BUR-BEN

For guiding of casing string when lowering in open hole, flushing of bottomhole and casing annulus.

+ Eccentric shape of nose piece provides guiding and facilitates string lowering.

+ Shoe is spring-loaded and can rotate under axial load by 60 degrees in a single reciprocating motion.

+ Shoe nose piece is made of easy-to-drill-out alloy, which allows taking high axial loads when lowering and quick drilling out during normalization.

| | | BUR-BEN-102 | BUR-BEN-114 | BUR-BEN-127 | BUR-BEN-140 | BUR-BEN-146 | BUR-BEN-168 | BUR-BEN-178 |
|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 |
| Rotation angle per single reciprocating motion | deg | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Max compression load | kN | 500 | 600 | 600 | 700 | 700 | 900 | 900 |
| | ts | 51,0 | 61,2 | 61,2 | 71,4 | 71,4 | 91,8 | 91,8 |
| Length | mm | 1280 | 1280 | 1330 | 1380 | 1380 | 1580 | 1580 |
| Weight | kg | 30,6 | 35,8 | 38,3 | 67,1 | 69,8 | 92,7 | 98,4 |

ECCENTRIC SHOE
SPRING-LOADED WITH VALVE

# BUR-BENK

For guiding of casing string when lowering in open hole, flushing of bottomhole and casing annulus.

Prevents inadvertent filling of casing string with drilling mud and excludes overflow of cement grout from annulus inside casing string.

+ Eccentric shape of nose piece provides guiding and facilitates string lowering.

+ Shoe is equipped with check valve to prevent self-filling of string and exclude overflow after cementing.

+ Shoe is spring-loaded and can rotate under axial load by 60 degrees in a single reciprocating motion.

+ Shoe nose piece is made of easy-to-drill-out alloy, which allows taking high axial loads when lowering and quick drilling out during normalization.

| | | BUR-BENK-102 | BUR-BENK-114 | BUR-BENK-127 | BUR-BENK-140 | BUR-BENK-146 | BUR-BENK-168 | BUR-BENK-178 |
|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 |
| Rotation angle per single reciprocating motion | deg | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Max compression load | kN ts | 500 | 600 | 600 | 700 | 700 | 900 | 900 |
| | | 51,0 | 61,2 | 61,2 | 71,4 | 71,4 | 91,8 | 91,8 |
| Valve hole area | $mm^2$ | 1256,0 | 1256,0 | 1256,0 | 1256,0 | 3316,6 | 3316,6 | 3316,6 |
| Max pressure difference per valve | Mpa | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| Length | mm | 1350 | 1350 | 1400 | 1470 | 1470 | 1680 | 1680 |
| Weight | kg | 32,3 | 37,7 | 40,3 | 70,2 | 75,1 | 102,5 | 106,4 |

MECHANICAL WORKOUT SHOE

# BUR-BPM

For guiding of casing string when lowering in open hole, flushing of bottomhole and casing annulus.

+ Shoe is spring-loaded and can rotate under axial load by two turns in a single reciprocating motion.

+ Shoe is equipped with abrasive cutting structure to work out difficult areas of open hole during lowering.

+ Circulation is provided through central and side holes.

+ Shoe nose piece is made of easy-to-drill-out alloy, which allows taking high axial loads when lowering and quick drilling out during normalization.

| | | BUR-BPM-102 | BUR-BPM-114 | BUR-BPM-127 | BUR-BPM-140 | BUR-BPM-146 | BUR-BPM-168 | BUR-BPM-178 |
|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 |
| Nominal open hole diameter, min | mm | 142,9 | 155,6 | 171,4 | 187,3 | 194,7 | 215,9 | 222,3 |
| Max outer diameter by workout portion | mm | 136,0 | 149,0 | 164,0 | 176,0 | 188,0 | 210,0 | 216,0 |
| Max outer diameter by body | mm | 126,0 | 139,0 | 154,0 | 166,0 | 178,0 | 200,0 | 206,0 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 |
| Max compression load | kNts | 500 | 600 | 600 | 700 | 700 | 900 | 900 |
| | | 51,0 | 61,2 | 61,2 | 71,4 | 71,4 | 91,8 | 91,8 |
| Length | mm | 3270 | 3270 | 3320 | 3410 | 3410 | 3520 | 3550 |
| Weight | kg | 116,3 | 120,4 | 130,5 | 142,8 | 157,4 | 175,7 | 217,1 |

**Old field well workover by sidetracking with subsequent lowering of ⌀102 mm cemented liner from under ⌀146 mm string with capability to perform formation hydraulic fracturing**

South Alamyshik field of Andijanpetro

FLOAT COLLAR

# BUR-MO

For guiding of casing string when lowering in open hole, flushing of bottomhole and casing annulus.

Prevents inadvertent filling of casing string with drilling mud and excludes overflow of cement grout from annulus inside casing string.

+ Valve design provides reliable packing in vertical and horizontal wells.
+ Inner parts of the collar are made of non-ferrous alloys which ensure fast drilling-out and drill bit cutting structure wear reduction.

| | | BUR-MO-102 | BUR-MO-114 | BUR-MO-127 | BUR-MO-140 | BUR-MO-146 | BUR-MO-168 | BUR-MO-178 | BUR-MO-245 |
|---|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 | 244,5 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 | 269,9 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 | 150,4 | 159,4 | 226,6 |
| Valve hole area | $mm^2$ | 1256,0 | 1256,0 | 1256,0 | 1256,0 | 3316,6 | 3316,6 | 3316,6 | 3316,6 |
| Length | mm | 275 | 275 | 295 | 310 | 310 | 330 | 340 | 400 |
| Weight | kg | 7,8 | 8,4 | 8,6 | 12,0 | 14,2 | 22,8 | 26,9 | 57,9 |

BAFFLE COLLAR

# BUR-MP

It serves for liner tooling activation and plugs tandem setting during well cementing.

+ Availability of reliable system for plugs tandem fixation against axial movement and rotation when drilling out.
+ Simple adjustment of shear pressure for seat with ball.
+ Inner parts of the collar are made of non-ferrous alloys which ensure fast drilling-out and drill bit cutting structure wear reduction.

| | | BUR-MP-102 | BUR-MP-114 | BUR-MP-127 |
|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 |
| Ball diameter for activation | mm | 32,0 | 32,0 | 32,0 |
| Shear pressure for seat with ball | MPa | 20 | 20 | 20 |
| "Bottom-up" pressure difference withstood after plugs setting | Mpa | 35 | 35 | 35 |
| Length | mm | 290 | 290 | 300 |
| Weight | kg | 9,2 | 9,7 | 10,6 |

ACTIVATION COLLAR

# BUR-MA

It serves for liner tooling activation.

In provides free circulation of drilling mud with subsequent leak-free shutoff of casing string flow passage.

+ It has high resistance to abrasion and allows flushing with fluid.
+ It does not require any additional operations during lowering. Activation (flow passage shutdown) is performed

using a ball thrown into the liner.

+ Collar duplicates check valve operation after activation.

| | | BUR-MA-102 | BUR-MA-114 | BUR-MA-127 |
|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 |
| Maximum outer diameter | mm | 114,3 | 127,0 | 141,3 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 |
| Ball diameter for activation | mm | 25,0 | 25,0 | 25,0 |
| Circulation channel closing pressure | MPa | 12 | 12 | 12 |
| Pressure difference withstood after circulation channel closing | Mpa | 35 | 35 | 35 |
| Length | mm | 290 | 290 | 300 |
| Weight | kg | 9,2 | 9,7 | 10,6 |

NORMALIZATION COLLAR

# BUR-MN

It is used to catch and mix large portions of liner tooling elements during normalization.

+ Valve design provides reliable packing in vertical and horizontal wells.
+ Inner parts of the collar are made of non-ferrous alloys which ensures fast drilling-out and drill bit cutting structure wear reduction.
+ it is used with multi-stage formation hydraulic fracturing equipment package

| | | BUR-MN-102 | BUR-MN-114 | BUR-MN-127 |
|---|---|---|---|---|
| Passage diameter of casing string | *mm* | 101,6 | 114,3 | 127,0 |
| Maximum outer diameter | *mm* | 114,3 | 127,0 | 141,3 |
| Inner diameter after drilling-out | *mm* | 89,0 | 99,6 | 112,0 |
| Diameter in receiving seat | *mm* | 28,0 | 28,0 | 28,0 |
| Length | *mm* | 275 | 275 | 295 |
| Weight | *kg* | 6,9 | 7,2 | 8,5 |

MULTIPLE-STAGE
CEMENTING COLLAR

# BUR-MSTs

It is used for well cementing in two stages (below and above the collar).

Package includes first stage cement grout squeezing plug, "Bomb" plug, second stage cement grout squeezing plug and stop elbow for first plug setting.

+ Simple opening pressure adjustment immediately prior to lowering.
+ Cementing ports are opened both hydraulically and with "Bomb" plug.
+ Inner parts of the collar are made of non-ferrous alloys which ensure fast drilling-out and drill bit cutting structure wear reduction.

| | | BUR-MSTs-146 | BUR-MSTs-168 | BUR-MSTs-178 |
|---|---|---|---|---|
| Passage diameter of casing string | mm | 146,1 | 168,3 | 177,8 |
| Maximum outer diameter | mm | 177,0 | 203,0 | 209,0 |
| Inner diameter after drilling-out | mm | 129,1 | 150,4 | 159,4 |
| Cementing ports opening pressure | MPa | 24 | 24 | 24 |
| Cementing ports opening pressure when setting "bomb" plug | MPa | 5 | 5 | 5 |
| Cementing ports closing pressure (after second stage plug setting) | MPa | 4 | 4 | 4 |
| Maximum internal pressure on the unit after ports closing | MPa | 35 | 30 | 30 |
| Maximum external pressure on the unit after ports closing | Mpa | 35 | 25 | 25 |
| Length | mm | 1100 | 1100 | 1100 |
| Weight | kg | 80,2 | 96,0 | 105,0 |

HYDRAULIC COLLAR
FOR FORMATION HYDRAULIC FRACTURING

# BUR-GRP-MG

Used for multi-interval formation hydraulic fracturing when performing completion operations in cemented horizontal and directional wells.

+ May be used with selective packer system for completion of wells with large number of stages.
+ Provides possibility of continuous liner cementing with subsequent multi-stage formation hydraulic fracturing.
+ It is fully flush and does not require drilling out.

| | | BUR-GRP-MG-102 | BUR-GRP-MG-114 | BUR-GRP-MG-127 | BUR-GRP-MG-140 | BUR-GRP-MG-146 |
|---|---|---|---|---|---|---|
| Passage diameter of casing string | мм | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 |
| Maximum outer diameter | мм | 120,0 | 136,0 | 148,0 | 160,0 | 165,0 |
| Inner diameter after drilling-out | мм | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 |
| Activation pressure | МПа | 35 | 35 | 35 | 35 | 35 |
| Length | мм | 500 | 500 | 500 | 550 | 550 |
| Weight | кг | 12,7 | 18,5 | 25,4 | 35,8 | 41,3 |

HYDRAULIC COLLAR
FOR FORMATION HYDRAULIC FRACTURING

# BUR-GRP-MG

It is used to perform injection when performing the first stage of formation hydraulic fracturing as a part of multi-stage formation hydraulic fracturing liner.

+ It is fully flush and does not require drilling out.
+ Simple adjustment of circulation ports opening pressure using shear bolts.
+ Ports may be closed with special tool.

| | | BUR-GRP-MR-102 | BUR-GRP-MR-114 | BUR-GRP-MR-127 | BUR-GRP-MR-140 | BUR-GRP-MR-146 |
|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 |
| Maximum outer diameter | mm | 116,0 | 133,0 | 146,0 | 160,0 | 165,0 |
| Inner diameter after drilling-out | mm | 89,0 | 99,6 | 112,0 | 124,3 | 129,1 |
| Activation pressur | Mpa | 35 | 35 | 35 | 35 | 35 |
| Length | mm | 390 | 390 | 390 | 420 | 420 |
| Weight | kg | 10,4 | 12,3 | 16,7 | 20,4 | 22,7 |

FORMATION HYDRAULIC
FRACTURING BALL COLLAR

# BUR-GRP-MSh

Used for multi-interval formation hydraulic fracturing in non-cemented well interval.

+ Maximum number of stages is 18.
+ Collar is opened with balls made of soluble alloys.
+ Simple adjustment of circulation ports opening pressure using shear bolts.
+ Provides possibility of seats normalization.
+ Seat made of soluble alloys may be installed.
+ Collar may be closed with special tool.

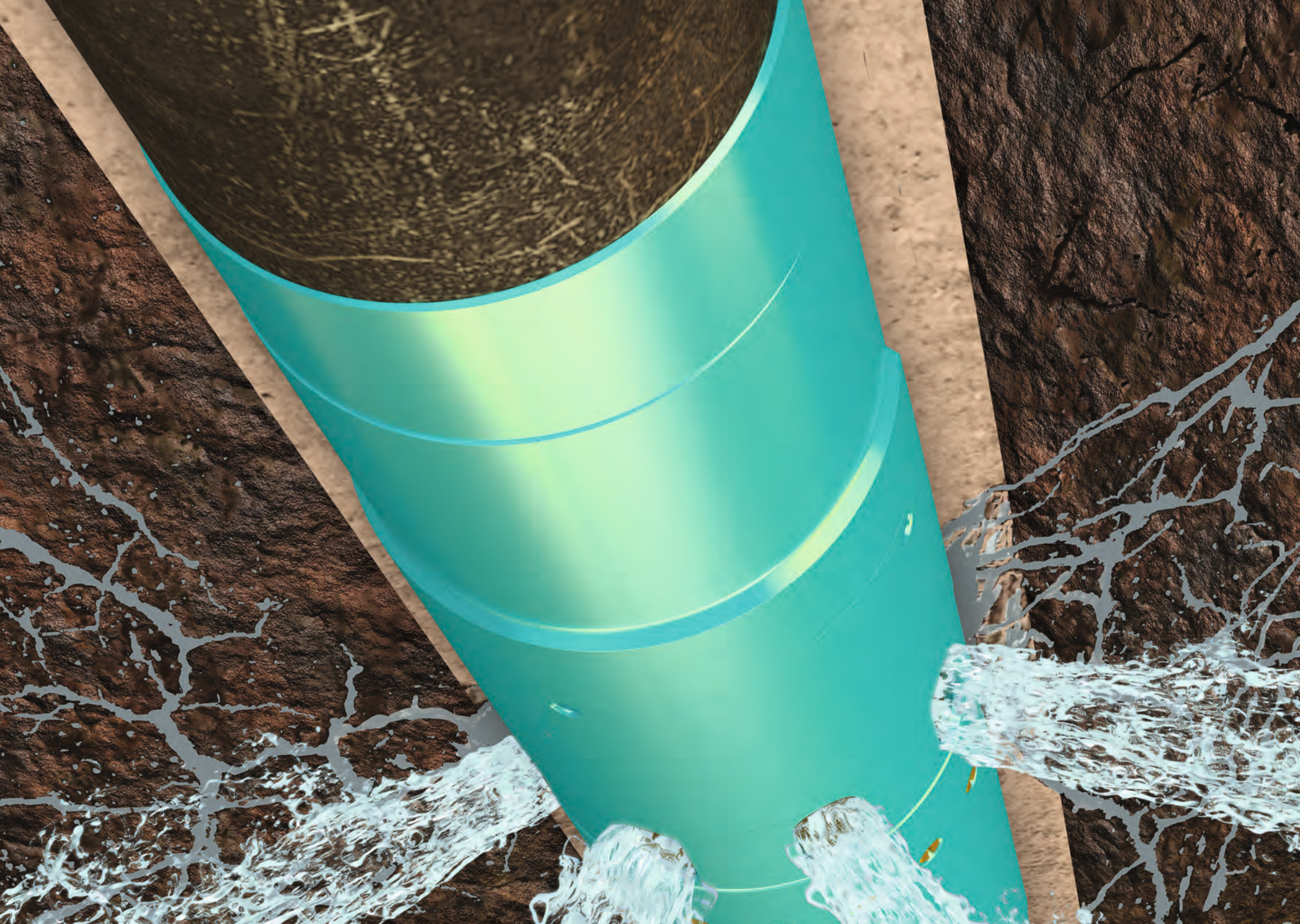
| | | BUR-GRP-MSh-102 | BUR-GRP-MSh-114 |
|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 |
| Maximum outer diameter | mm | 118,0 | 133,0 |
| Inner diameter after drilling-out | mm | 88,6 | 99,6 |
| Activation pressure | Mpa | 35 | 35 |
| Length | mm | 500 | 500 |
| Weight | kg | 16,2 | 18,5 |

Innovative technology of extended reach wells completion with liner rotation capability when lowering and cementing

FORMATION HYDRAULIC FRACTURING COLLAR

# BARRACUDA

With impressive number of possible stages – up to **100**



FORMATION HYDRAULIC
FRACTURING COLLAR BARRACUDA

# BUR-GRP-MV

Used for multi-interval formation hydraulic fracturing when performing completion operations in cemented horizontal and directional wells.

If it is necessary to remove key sleeves, service tool is lowered. Up to 20 key sleeves may be removed in a single run.

+ Maximum number of stages is 100.
+ Provides possibility of liner rotation as well as formation hydraulic fracturing collars cementing.
+ Collar is opened by release and pumping of key sleeve with soluble allot ball.
+ Drilling out is not required.
+ Simple adjustment of circulation ports opening pressure using shear bolts.
+ Circulation ports may be closed to cap watered interval or perform repeated formation hydraulic fracturing.

| | | BUR-GRP-MV-102 | BUR-GRP-MV-114 | BUR-GRP-MV-140 | BUR-GRP-MV-146 |
|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 139,7 | 146,1 |
| Inner casing string diameter, min | mm | 89,0 | 99,5 | 121,4 | 127,1 |
| Maximum outer diameter | mm | 118,0 | 133,0 | 160,0 | 166,0 |
| Inner diameter with key sleeve installed, min | mm | 70,0 | 81,0 | 102,0 | 108,0 |
| Inner diameter after key sleeve removal | mm | 82,0 | 95,0 | 116,0 | 122,0 |
| Activation pressure | Mpa | 35 | 35 | 35 | 35 |
| Pressure difference withstood (from inside / from outside) with closed curtain | Mpa | 70 | 70 | 70 | 70 |
| Length | mm | 1180 | 1180 | 1250 | 1250 |
| Package weight (with sleeve and ball) | kg | 51,5 | 56,2 | 80,9 | 85,0 |

In order to perform multi-stage formation hydraulic fracturing operations without pumping stoppage (without overflushing excessive liquid volume to formation), a system of key sleeves shooting to the flow based on revolver cylinder principle may be used.

Cylinder is installed on formation hydraulic fracturing Christmas tree and controlled remotely to comply with industrial safety regulations.

Gates are opened by hydraulic actuator.

Maximum key sleeves load in cylinder is 20 pcs.

Max working pressure is 70 Mpa.

If it is necessary to remove key sleeves from Barracuda formation hydraulic fracturing collars, special service tool is used removing up to 20 sleeves in a single run.

Tool is designed for circulation and emergency release.

HYDROMECHANICAL PACKER

# BUR-PGM

For borehole intervals separation when performing formation hydraulic fracturing. It is lowered to open hole as a part of casing string tooling to perform multi-stage formation hydraulic fracturing.

After lowering down to design depth packer is activated by differential pressure.

+ Simple activation pressure adjustment immediately prior to lowering.
+ Fully flush.

| | | BUR-PGM-102/118 | BUR-PGM-102/120 | BUR-PGM-114/136 | BUR-PGM-114/146 | BUR-PGM-114/148 |
|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 101,6 | 114,3 | 114,3 | 114,3 |
| Nominal open hole diameter | mm | 123,8 | 126,0 | 142,9 | 152,4 | 155,6 |
| Maximum outer diameter | mm | 118,0 | 120,0 | 136,0 | 146,0 | 148,0 |
| Inner diameter | mm | 89,0 | 89,0 | 99,5 | 99,5 | 99,5 |
| Activation pressure | MPa | 16 | 16 | 16 | 16 | 16 |
| Max internal excess pressure | MPa | 70 | 70 | 70 | 70 | 70 |
| Pressure difference between separate areas withstood by the packer, min | Mpa | 70 | 70 | 70 | 70 | 70 |
| Length | mm | 770 | 770 | 770 | 800 | 800 |
| Weight | kg | 21,1 | 23,4 | 29,3 | 35,2 | 38,7 |

HYDRAULIC PACKER

# BUR-PG

For borehole intervals separation. It is lowered to open hole as a part of casing string.

Installed in open hole cementing interval to exclude behind-the-casing flows.

Activated after shearing of safety screws by displacement plug and receipt of stop signal when well cementing is ended.

+ Fully flush.

+ High packer setting coefficient.

+ Overlap interval up to 1,400 mm.

| | | BUR-PG-146 | BUR-PG-168 | BUR-PG-178 |
|---|---|---|---|---|
| Passage diameter of casing string | mm | 146,1 | 168,3 | 177,8 |
| Nominal open hole diameter, min | mm | 193,7 | 215,9 | 222,3 |
| Maximum outer diameter by body | mm | 178,0 | 201,0 | 208,0 |
| Outer diameter by sealing element | mm | 170,0 | 191,0 | 201,0 |
| Inner diameter | mm | 129,1 | 150,4 | 159,4 |
| Packer setting pressure | Mpa | 8 | 8 | 8 |
| Max packer setting coefficient | | 1,45 | 1,45 | 1,40 |
| Well interval length overlapped by packer element | mm | 1400 | 1400 | 1400 |
| Pressure difference between separate areas withstood by the packer (at packer setting coefficient of 1.10) | Mpa | 25 | 20 | 20 |
| Length | mm | 4530 | 4600 | 4600 |
| Weight | kg | 209 | 253 | 275 |

COLLAR CEMENTING PACKERS

# BUR-PMTs

For open hole intervals separation and collar cementing.

Packer is installed in the well immediately prior to cementing area.

Excludes settling of cement grout in filter part of casing string.

+ Three-valves system automatically controls packing element inflation
+ Opening valve responds only after ball setting.
+ Availability of reliable system for plugs tandem fixation against axial movement and rotation when drilling out.

| | | BUR-PMTs-102 | BUR-PMTs-114 | BUR-PMTs-127 |
|---|---|---|---|---|
| Passage diameter of casing string | | 101,6 | 114,3 | 127,0 |
| Nominal open hole diameter, min | | 126,0 | 142,9 | 152,4–155,6 |
| Maximum outer diameter | | 118,0 | 133,0 | 144,0 |
| Inner diameter after drilling-out | | 89,0 | 99,5 | 108,6 |
| Packer setting pressure | | 8 | 8 | 8 |
| Cementing ports opening pressure | | 16 | 16 | 16 |
| Cementing ports closing pressure | | 5 | 5 | 5 |
| Ball diameter for activation | | 32,0 | 32,0 | 32,0 |
| Max packer setting coefficient | | 1,3 | 1,3 | 1,3 |
| Well interval length overlapped by packer element | | 1400 | 1400 | 1400 |
| Pressure difference between separate areas withstood by the packer (at packer setting coefficient of 1.10) | | 25 | 20 | 20 |
| Length | | 4870 | 4910 | 4910 |
| Weight | | 230,0 | 278,3 | 302,5 |

WATER-SWALLABLE PACKER

# BUR-PNV

OIL-SWALLABLE PACKER

# BUR-PNN

COMBINED SWELLABLE PACKER

# BUR-PNK

For separation of borehole intervals with high porosity or when inline pressure cannot be created. It is lowered to open hole as a part of casing strings equipment configuration.

Packer is activated by water/oil based mud.

+ Fully flush.
+ High packer setting coefficient.
+ Overlap interval up to 3,000 mm.

| | | BUR-PNV-102, BUR-PNN-102, BUR-PNK-102/118. | BUR-PNV-102, BUR-PNN-102, BUR-PNK-102/120. | BUR-PNV-114, BUR-PNN-114, BUR-PNK-114/136. | BUR-PNV-114, BUR-PNN-114, BUR-PNK-114/146 | BUR-PNV-114, BUR-PNN-114, BUR-PNK-114/148. |
|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 101,6 | 114,3 | 114,3 | 114,3 |
| Nominal open hole diameter, min | mm | 123,8 | 126,0 | 142,9 | 152,4 | 155,6 |
| Max outer diameter by body | mm | 118,0 | 120,0 | 136,0 | 146,0 | 148,0 |
| Inner diameter | mm | 88,0 | 88,0 | 99,5 | 99,5 | 99,5 |
| Max packer setting coefficient | | 1,3 | 1,3 | 1,25 | 1,2 | 1,2 |
| Well interval length overlapped by packer element | mm | 3000 | 3000 | 3000 | 3000 | 3000 |
| Pressure difference between separate areas withstood by the packer (after complete swelling) | Mpa | 70 | 70 | 70 | 70 | 70 |
| Length | mm | 6200 | 6200 | 6200 | 6200 | 6200 |
| Weight | kg | 118,1 | 120,5 | 130,8 | 148,7 | 155,3 |

SELECTIVE PACKER

# BUR-PS

For selective formation hydraulic fracturing through collars with rupture discs or perforation interval.

Lowered on pumping and compression pipe inside the liner in target interval.

+ Proppant backwash upon “STOP” signal receipt.
+ Casing string connections detector for precise positioning.
+ Pressure and temperature recording by sensors in formation hydraulic fracturing area
+ Efficient magnetic part for metal chips and foreign bodies removal.

| | | BUR-PS-102 | BUR-PS-114 | BUR-PS-127 | BUR-PS-140 | BUR-PS-146 |
|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 |
| Inner casing string diameter, min | mm | 89,0 | 99,5 | 108,6 | 121,4 | 127,1 |
| Maximum outer diameter of packer by centralizer | mm | 83,0 | 95,0 | 104,0 | 117,0 | 123,0 |
| Outer diameter by sealing elements | mm | 92,4 | 103,2 | 111,4 | 125,3 | 131,1 |
| Inner diameter | mm | 34,0 | 44,0 | 44,0 | 55,0 | 55,0 |
| Maximum formation hydraulic fracturing pressure | MPa° | 70 | 70 | 70 | 70 | 70 |
| Max. operating temperature | C | 120 | 120 | 120 | 120 | 120 |
| Max. pumping rate | m3/min | 2,5 | 3,8 | 3,8 | 4,5 | 4,5 |
| | l/s | 41,7 | 63,3 | 63,3 | 75,0 | 75,0 |
| Connecting thread (collar) | | HKT 60 | HKT 73 | HKT 73 | HKT 73 / HKT 89 | HKT 73 / HKT 89 |
| Length (with one elbow) | mm | 6700 | 6390 | 6390 | 6450 | 6450 |
| Weight | kg | 151,5 | 170,3 | 207,2 | 273,5 | 296,1 |

CEMENTED LINER
PACKER-HANGER

# BUR-PKhTs-35

For liner fixation in production casing with subsequent cementing.

+ Leak-tight travel of running tool relative to packer-hanger after disconnection is more than 750 mm.
+ Two disconnection options: by mechanical breakage or hydraulically.
+ Disconnection by mechanical breakage before cementing.

| | | BUR-PKhTs-102/146 | BUR-PKhTs-102/168 | BUR-PKhTs-102/178 | BUR-PKhTs-114/168 | BUR-PKhTs-114/178 | BUR-PKhTs-127/178 |
|---|---|---|---|---|---|---|---|
| Passage diameter of production casing in which the liner is lowered and fixed | mm | 146,1 | 168,3 | 177,8 | 168,3 | 177,8 | 177,8 |
| Inner diameter of production casing string, min | mm | 127,1 | 147,1 | 157,1 | 147,1 | 157,1 | 157,1 |
| Maximum outer diameter of packer-hanger by centralizer | mm | 122,0 | 141,0 | 152,0 | 141,0 | 152,0 | 152,0 |
| Inner diameter after disconnection | mm | 89,0 | 89,0 | 89,0 | 99,5 | 99,5 | 112,0 |
| from running toolInner diameter of polished bowl for stinger | mm | 110,0 | 125,0 | 132,0 | 125,0 | 132,0 | 132,0 |
| Polished bowl working part length | mm | 750 | 750 | 750 | 750 | 750 | 750 |
| Anchor unit activation pressure | Mpa | 14 | 14 | 14 | 14 | 14 | 14 |
| Packer unit activation force | kN ts | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 |
| | | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 |
| Max pressure difference withstood on packer unit | Mpa | 35 | 35 | 35 | 35 | 35 | 35 |
| Max. operating temperature | ºC | 120 | 120 | 120 | 120 | 120 | 120 |
| Upper connecting thread (collar) | | 3-86 | 3-102 | 3-102 | 3-102 | 3-102 | 3-102 |
| Length | mm | 4275 | 4275 | 4275 | 4275 | 4275 | 4275 |
| Weight | kg | 231,5 | 256,7 | 277,0 | 243,7 | 270,2 | 291,6 |

NON-CEMENTED LINER PACKER-HANGER

# BUR-PKhN-70

Cemented liner packer-hanger is designed for liner fixation in production casing with subsequent cementing.

Operation at pressure up to 70 Mpa.

+ Indicator of relief weight reduction during packer setting.
+ Leak-tight travel of running tool relative to packer-hanger after disconnection is more than 1,500 mm.
+ Two disconnection options: by breakage or hydraulically.
+ Two anchor units for reliable fixation in wells with high formation pressure.

| | | BUR-PKhTs - 102/146 | BUR-PKhTs - 102/168 | BUR-PKhTs- 102/178 | BUR-PKhTs- 114/168 | BUR-PKhTs- 114/178 | BUR-PKhTs- 127/178 |
|---|---|---|---|---|---|---|---|
| Passage diameter of production casing in which the liner is lowered and fixed | mm | 146,1 | 168,3 | 177,8 | 168,3 | 177,8 | 177,8 |
| Inner diameter of production casing string, min | mm | 127,1 | 147,1 | 157,1 | 147,1 | 157,1 | 157,1 |
| Maximum outer diameter of packer-hanger by centralizer | mm | 122,0 | 141,0 | 152,0 | 141,0 | 152,0 | 152,0 |
| Inner diameter after disconnection from running tool | mm | 89,0 | 89,0 | 89,0 | 99,5 | 99,5 | 112,0 |
| Inner diameter of polished bowl for stinger | mm | 110,0 | 125,0 | 132,0 | 125,0 | 132,0 | 132,0 |
| Polished bowl working part length | mm | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |
| Anchor unit activation pressure | Mpa | 14 | 14 | 14 | 14 | 14 | 14 |
| | | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 |
| Packer unit activation force | kN ts | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 |
| Max pressure difference withstood on packer unit | Mpa | 70 | 70 | 70 | 70 | 70 | 70 |
| Max. operating temperature | °C | 120 | 120 | 120 | 120 | 120 | 120 |
| Upper connecting thread (collar) | | 3-86 | 3-102 | 3-102 | 3-102 | 3-102 | 3-102 |
| Length | mm | 5770 | 5770 | 5770 | 5770 | 5770 | 5770 |
| Weight | kg | 273,4 | 295,3 | 318,2 | 285,5 | 314,1 | 330,2 |

NON-CEMENTED
LINER PACKER-HANGER

# BUR-PKhN-35

For liner fixation in production casing.

+ Leak-tight travel of running tool relative to packer-hanger after disconnection is more than 750 mm.
+ Two disconnection options: by mechanical breakage or hydraulically.

| | | BUR-PKhN-102/146 | BUR-PKhN-102/168 | BUR-PKhN-102/178 | BUR-PKhN-114/168 | BUR-PKhN-114/178 | BUR-PKhN-127/178 |
|---|---|---|---|---|---|---|---|
| Passage diameter of production casing in which the liner is lowered and fixed | mm | 146,1 | 168,3 | 177,8 | 168,3 | 177,8 | 177,8 |
| Inner diameter of production casing string, min | mm | 127,1 | 147,1 | 157,1 | 147,1 | 157,1 | 157,1 |
| Maximum outer diameter of packer-hanger by centralizer | mm | 122,0 | 141,0 | 152,0 | 141,0 | 152,0 | 152,0 |
| Inner diameter after disconnection from running tool | mm | 89,0 | 89,0 | 89,0 | 99,5 | 99,5 | 112,0 |
| Inner diameter of polished bowl for stinger | mm | 110,0 | 125,0 | 132,0 | 125,0 | 132,0 | 132,0 |
| Polished bowl working part length | mm | 750 | 750 | 750 | 750 | 750 | 750 |
| Anchor unit activation pressure | Mpa | 14 | 14 | 14 | 14 | 14 | 14 |
| Packer unit activation force | kN ts | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 |
| | | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 |
| Max pressure difference withstood on packer unit | Mpa | 35 | 35 | 35 | 35 | 35 | 35 |
| Max. operating temperature | °C | 120 | 120 | 120 | 120 | 120 | 120 |
| Upper connecting thread (collar) | | 3-86 | 3-102 | 3-102 | 3-102 | 3-102 | 3-102 |
| Length | mm | 5025 | 5025 | 5025 | 5025 | 5025 | 5025 |
| Weight | kg | 226,9 | 251,6 | 271,5 | 238,8 | 264,7 | 285,8 |

NON-CEMENTED
LINER PACKER-HANGER

# BUR-PKhN-70

For liner fixation in production casing.

+ Indicator of relief weight reduction during packer setting.
+ Leak-tight travel of running tool relative to packer-hanger after disconnection is more than 1,500 mm.
+ Two disconnection options: by breakage or hydraulically.
+ Two anchor units for reliable fixation in wells with high formation pressure.

| | | BUR-PKhN-102/146 | BUR-PKhN-102/168 | BUR-PKhN-102/178 | BUR-PKhN-114/168 | BUR-PKhN-114/178 | BUR-PKhN-127/178 |
|---|---|---|---|---|---|---|---|
| Passage diameter of production casing in which the liner is lowered and fixed | mm | 146,1 | 168,3 | 177,8 | 168,3 | 177,8 | 177,8 |
| Inner diameter of production casing string, min | mm | 127,1 | 147,1 | 157,1 | 147,1 | 157,1 | 157,1 |
| Maximum outer diameter of packer-hanger by centralizer | mm | 122,0 | 141,0 | 152,0 | 141,0 | 152,0 | 152,0 |
| Inner diameter after disconnection from running tool | mm | 89,0 | 89,0 | 89,0 | 99,5 | 99,5 | 112,0 |
| Inner diameter of polished bowl for stinger | mm | 110,0 | 125,0 | 132,0 | 125,0 | 132,0 | 132,0 |
| Polished bowl working part length | mm | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |
| Anchor unit activation pressure | Mpa | 14 | 14 | 14 | 14 | 14 | 14 |
| Packer unit activation force | kN ts | 100–120<br>10,2–12,2 | 100–120<br>10,2–12,2 | 100–120<br>10,2–12,2 | 100–120<br>10,2–12,2 | 100–120<br>10,2–12,2 | 100–120<br>10,2–12,2 |
| Max pressure difference withstood on packer unit | Mpa | 70 | 70 | 70 | 70 | 70 | 70 |
| Max. operating temperature | °C | 120 | 120 | 120 | 120 | 120 | 120 |
| Upper connecting thread (collar) | | 3-86 | 3-102 | 3-102 | 3-102 | 3-102 | 3-102 |
| Length | mm | 5770 | 5770 | 5770 | 5770 | 5770 | 5770 |
| Weight | kg | 268,0 | 289,4 | 311,8 | 279,8 | 307,8 | 323,6 |

ROTATING CEMENTED LINER PACKER-HANGER

# BUR-PKhTsV

Liner packer-hanger capable of rotation when lowering and cementing is designed for liner lowering and fixing in in deep and extra-deep extended reach wells.

Operation is at pressure up to 100 Mpa.

+ Capable of rotation when lowering and cementing.
+ Polished bowl for 3,000 mm long floating stinger.
+ Validation class V0 per GOST ISO 14310-2014
+ Two disconnection options: by breakage or hydraulically.
+ Two anchor units for reliable fixation in wells with high formation pressure.

| | | BUR- PKhTsV-114/178 |
|---|---|---|
| Passage diameter of production casing in which the liner is lowered and fixed | mm | 177,8 |
| Inner diameter of production casing string, min | mm | 157,1 |
| Maximum outer diameter of packer-hanger by centralizer | mm | 152,0 |
| Inner diameter after disconnection from running tool | mm | 99,5 |
| Inner diameter of polished bowl for stinger | mm | 132,0 |
| Polished bowl working part length | mm | 3000 |
| Anchor unit activation pressure | Mpa | 14 |
| | | 100–120 |
| Packer unit activation force | kN ts | 10,2–12,2 |
| Max pressure difference withstood on packer unit | MPa | 100 |
| Maximum rotation torque when lowering and cementing | kNm | 17 |
| Max. operating temperature | ºC | 150 |
| Upper connecting thread (collar) | | 3-102 |
| Length | mm | 7558 |
| Weight | kg | 307,8 |

NON-CEMENTED LINER PACKER-HANGER
WITH FILTERS INSULATION UNIT

# BUR-PKh-UIF

For fixation of liner with filter part in production casing without cementing.

+ Indicator of relief weight reduction during packer setting.
+ Two disconnection options: by breakage or hydraulically.

| | | BUR-PKh-UIF-102/146 | BUR-PKh-UIF-102/168 | BUR-PKh-UIF-102/178 | BUR-PKh-UIF-114/168 | BUR-PKh-UIF-114/178 | BUR-PKh-UIF-127/178 |
|---|---|---|---|---|---|---|---|
| Passage diameter of production casing in which the liner is lowered and fixed | mm | 146,1 | 168,3 | 177,8 | 168,3 | 177,8 | 177,8 |
| Inner diameter of production casing string, min | mm | 127,1 | 147,1 | 157,1 | 147,1 | 157,1 | 157,1 |
| Maximum outer diameter of packer-hanger by centralizer | mm | 122,0 | 141,0 | 152,0 | 141,0 | 152,0 | 152,0 |
| Inner diameter after disconnection from running tool | mm | 89,0 | 89,0 | 89,0 | 99,5 | 99,5 | 112,0 |
| Inner diameter of polished bowl for stinger | mm | 110,0 | 125,0 | 132,0 | 125,0 | 132,0 | 132,0 |
| Polished bowl working part length | mm | 750 | 750 | 750 | 750 | 750 | 750 |
| Anchor unit activation pressure | Mpa | 14 | 14 | 14 | 14 | 14 | 14 |
| | | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 | 100–120 |
| Packer unit activation force | kN ts | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 |
| Max pressure difference withstood on packer unit | MPa | 70 | 70 | 70 | 70 | 70 | 70 |
| Upper connecting thread (collar) | | 120 | 120 | 120 | 120 | 120 | 120 |
| Max. operating temperature | °C | 3-86 | 3-102 | 3-102 | 3-102 | 3-102 | 3-102 |
| Length | mm | 5359 | 5359 | 5359 | 5359 | 5359 | 5359 |
| Weight | kg | 226,9 | 251,6 | 271,5 | 238,8 | 264,7 | 285,8 |

REPAIR PACKER

# BUR-PKh-PR

For elimination of packer-hanger non-tightness

+ Two disconnection options: by breakage or hydraulically.

| | | BUR-PKh-PR-146 | BUR-PKh-PR-168 | BUR-PKh-PR-178 |
|---|---|---|---|---|
| Passage diameter of production casing in which lowering is performed | mm | 146,1 | 168,3 | 177,8 |
| Inner diameter of production casing string, min | mm | 127,1 | 147,1 | 157,1 |
| Maximum outer diameter of packer by centralizer | mm | 122,0 | 141,0 | 152,0 |
| Inner diameter after disconnection from running tool | mm | 89,0 | 99,5 | 112,0 |
| Inner diameter of polished bowl for stinger | mm | 110,0 | 125,0 | 132,0 |
| Polished bowl working part length | mm | 750 | 750 | 750 |
| Anchor unit and packer unit activation force | kN ts | 100–120 | 100–120 | 100–120 |
| | | 10,2–12,2 | 10,2–12,2 | 10,2–12,2 |
| Max pressure difference withstood on packer unit | Mpa | 70 | 70 | 70 |
| Max. operating temperature | °C | 120 | 120 | 120 |
| Upper connecting thread (collar) | | 3-86 | 3-102 | 3-102 |
| Length | mm | 5347 | 5347 | 5347 |
| Weight | kg | 204,2 | 225,7 | 244,4 |

STINGER

# BUR-ST

For leak-tight connection with polished bowl of liner packer-hanger, performance of formation hydraulic fracturing and other production operations.

+ Used jointly with hydraulic anchor BUR-YaG.
+ Reliable sealing system.
+ Shoe part with chamfer for improved penetration in polished bowl.

| | | BUR-ST-7-89/146 | BUR-ST-14-89/146 | BUR-ST-7-89/168 | BUR-ST-14-89/168 | BUR-ST-7-89/178 | BUR-ST-14-89/178 | BUR-ST-7-114/168 | BUR-ST-14-114/178 | BUR-ST-7-114/178 | BUR-ST-14-114/178 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Passage diameter of production casing in which lowering is performed | mm | 146,1 | 146,1 | 168,3 | 168,3 | 177,8 | 177,8 | 168,3 | 168,3 | 177,8 | 177,8 |
| Maximum outer diameter of stinger by centralizer | mm | 122,0 | 122,0 | 141,0 | 141,0 | 152,0 | 152,0 | 141,0 | 141,0 | 152,0 | 152,0 |
| Inner passage diameter | mm | 76,0 | 76,0 | 76,0 | 76,0 | 76,0 | 76,0 | 99,5 | 99,5 | 99,5 | 99,5 |
| Inner diameter of polished bowl for stinger | mm | 110,0 | 110,0 | 125,0 | 125,0 | 132,0 | 132,0 | 125,0 | 125,0 | 132,0 | 132,0 |
| Working part length | mm | 700 | 1400 | 700 | 1400 | 700 | 1400 | 700 | 1400 | 700 | 1400 |
| Max pressure difference withstood | MPa | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Max. operating temperature | °C | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Upper connecting thread (collar) | | HKT 89 | HKT 89 | HKT 89 | HKT 89 | HKT 89 | HKT 89 | HKT 114 | HKT 114 | HKT 114 | HKT 114 |
| Length | mm | 950 | 1650 | 950 | 1650 | 950 | 1650 | 950 | 1650 | 950 | 1650 |
| Weight | kg | 46,8 | 92,7 | 58,5 | 115,9 | 71,2 | 140,7 | 60,9 | 118,5 | 73,1 | 142,2 |

FLOATING STINGER

# BUR-STP

For leak-tight connection with polished bowl of liner packer-hanger, performance of formation hydraulic fracturing and other production operations.

+ Reliable sealing system.
+ 2,800 mm long working part.
+ Shoe part with chamfer for improved penetration in polished bowl.

| | | BUR-STP-114/168 | BUR-STP-114/178 |
|---|---|---|---|
| Passage diameter of production casing in which lowering is performed | mm | 168,3 | 177,8 |
| Maximum outer diameter of stinger by centralizer | mm | 141,0 | 152,0 |
| Inner passage diameter | mm | 99,5 | 99,5 |
| Inner diameter of polished bowl for stinger | mm | 125,0 | 132,0 |
| Working part length | mm | 2800 | 2800 |
| Max pressure difference withstood | Mpa | 100 | 100 |
| Max. operating temperature | °C | 150 | 150 |
| Upper connecting thread (collar) | | HKT 114 | HKT 114 |
| Length | mm | 3050 | 3050 |
| Weight | kg | 235 | 274 |

DOWNHOLE FILTER

# BUR-FS

For prevention of mechanical impurities ingress in the well during operation.

Installed as s part of liner in productive formation area of oil and gas extraction and water supply wells.

+ Different filter part options for different well conditions.
+ May have both one or several filter parts.
+ May be equipped with shear or soluble plugs.
+ Full set of bench tests.
+ Optical vision is used to control necessary winding gap

| | | BUR-FS-102 | BUR-FS-114 | BUR-FS-127 | BUR-FS-140 | BUR-FS-146 | BUR-FS-168 | BUR-FS-178 |
|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 |
| Outer diameter by collar | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 |
| Slot gap value | mm | 0,1–0,4 | 0,1–0,4 | 0,1–0,4 | 0,1–0,4 | 0,1–0,4 | 0,1–0,4 | 0,1–0,4 |
| Pipe holes diameter | mm | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 |
| Number of holes in pipe per 1 running meter | pc. | до 360 | до 360 | до 360 | до 360 | до 360 | до 360 | до 360 |
| Max. tension load | kN ts | 579–1477 | 579–1477 | 579–1477 | 579–1477 | 579–1477 | 579–1477 | 579–1477 |
| | | 59–150,6 | 59–150,6 | 59–150,6 | 59–150,6 | 59–150,6 | 59–150,6 | 59–150,6 |
| Max. compression load | kN ts | 347–886 | 347–886 | 347–886 | 347–886 | 347–886 | 347–886 | 347–886 |
| | | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 |
| Filter part length | mm | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 |
| Filter length | mm | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 |
| Weight | kg | 81,6–155,2 | 97,9–194,1 | 106,1–265,3 | 120,5–301,4 | 125,8–314,4 | 168,5–421,2 | 183,4–458,4 |

PERFORATED WELL FILTER

# BUR-FPS

Used in wells with stable walls and low sand production.

Installed as s part of liner in productive formation interval of oil and gas extraction and water supply wells.

liner in productive formation interval of oil and gas extraction and water supply wells.

+ Low cost.
+ May be equipped with shear or soluble plugs
+ Well may be slushed after lowering (in case of version with plugs).

| | | BUR-FPS-102 | BUR-FPS-114 | BUR-FPS-127 | BUR-FPS-140 | BUR-FPS-146 | BUR-FPS-168 | BUR-FPS-178 |
|---|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | 101,6 | 114,3 | 127,0 | 139,7 | 146,1 | 168,3 | 177,8 |
| Outer diameter by collar | mm | 114,3 | 127,0 | 141,3 | 153,7 | 166,0 | 187,7 | 194,5 |
| Pipe holes diameter | mm | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 | 10,0–20,0 |
| Number of holes in pipe per 1 running meter | pc. | до 360 | до 360 | до 360 | до 360 | до 360 | до 360 | до 360 |
| Max. tension load | kN ts | 579–1477<br>59–150,6<br>347–886 | 579–1477<br>59–150,6<br>347–886 | 579–1477<br>59–150,6<br>347–886 | 579–1477<br>59–150,6<br>347–886 | 579–1477<br>59–150,6<br>347–886 | 579–1477<br>59–150,6<br>347–886 | 579–1477<br>59–150,6<br>347–886 |
| Max. compression load | kN ts | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 | 35,4–90,4 |
| Filter part length | mm | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 | 3000–10 000 |
| Filter length | mm | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 | 4000–13 000 |
| Weight | kg | 65,3–124,2 | 78,3–155,3 | 84,9–212,3 | 96,4–241,1 | 100,6–251,5 | 134,8–336,9 | 146,7–366,7 |

BOW-SPRING CENTRALIZERS

# BUR-TsTsP

It is intended to center casing strings in the well.

It is used to mitigate the risk of differential sticking and provide uniform annular clearance in cementing interval.

Centralizers application allows obtaining uniform clearance between casing pipe and wellbore walls.

| | | | BUR-TsTsP-102/120 | BUR-TsTsP-102/124 | BUR-TsTsP-114/142 | BUR-TsTsP-114/146 | BUR-TsTsP-114/152 |
|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | | 101,6 | 101,6 | 114,3 | 114,3 | 114,3 |
| Nominal open hole diameter | mm | | 120,6 | 123,8 | 142,9 | 146,0 | 152,4 |
| Outside diameter on springs is | mm | | 120,0 | 124,0 | 142,0 | 146,0 | 152,0 |
| Number of spring planks | pc. | | 6 | 6 | 6 | 6 | 6 |
| Mounting on pipe | pc. | | with rings | with rings | with rings | with rings | with rings |
| Ring retaining force, min. | kgf | | 2500 | 2500 | 3500 | 3500 | 3500 |
| Max. shooting force, max. | kgf | | 10 | 10 | 10 | 10 | 10 |
| Min. righting force with 67% centering rate (per ISO 10427-1:2001) | kg | | 202 | 202 | 206 | 206 | 206 |
| Max. operating temperature | °C | | 250 | 250 | 250 | 250 | 250 |
| Length | mm | | 300 | 300 | 310 | 310 | 310 |
| Weight | kg | | 2,1 | 2,1 | 2,6 | 2,6 | 2,6 |

| | | | BUR-TsTsP-168/216 | BUR-TsTsP-168/220 | BUR-TsTsP-178/216 | BUR-TsTsP-178/220 | BUR-TsTsP-194/245 |
|---|---|---|---|---|---|---|---|
| Passage diameter of casing string | mm | | 168,3 | 168,3 | 177,8 | 177,8 | 193,7 |
| Nominal open hole diameter | mm | | 215,9 | 220,7 | 215,9 | 220,7 | 244,5 |
| Outside diameter on springs | mm | | 216,0 | 220,0 | 216,0 | 220,0 | 245,0 |
| Number of spring planks | pc. | | 6 | 6 | 6 | 6 | 6 |
| Mounting on pipe | pc. | | with rings | with rings | with rings | with rings | with rings |
| Ring retaining force, min. | kgf | | 5500 | 5500 | 5500 | 5500 | 6000 |
| Max. shooting force, max. | kgf | | 20 | 20 | 20 | 20 | 25 |
| Min. righting force with 67% centering rate (per ISO 10427-1:2001) | kg | кг | 427 | 427 | 462 | 462 | 469 |
| Max. operating temperature | °C | °C | 250 | 250 | 250 | 250 | 250 |
| Length | mm | мм | 460 | 460 | 460 | 460 | 560 |
| Weight | kg | кг | 5,5 | 5,5 | 5,7 | 5,7 | 7,6 |

+ Centering planks of centralizer have no welded joints and are made from solid sheet of tempered alloy steel.
+ Centralizers are made for a wide range of casing pipe and well sizes.

+ Installed between two retaining rings allowing for axial movement and rotation on the pipe.
+ It has only two minimally loaded weld seams located on shells.

| | BUR-TsTsP-114/156 | BUR-TsTsP-127/152 | BUR-TsTsP-127/156 | BUR-TsTsP-140/191 | BUR-TsTsP-140/216 | BUR-TsTsP-146/191 | BUR-TsTsP-146/216 |
|---|---|---|---|---|---|---|---|
| | 114,3 | 127,0 | 127,0 | 139,7 | 139,7 | 146,1 | 146,1 |
| | 155,6 | 152,4 | 155,6 | 190,5 | 215,9 | 190,5 | 215,9 |
| | 156,0 | 152,0 | 156,0 | 191,0 | 216,0 | 191,0 | 216,0 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | with rings | with rings | with rings | with rings | with rings | with rings | with rings |
| | 3500 | 4000 | 4000 | 4600 | 4600 | 4600 | 4600 |
| | 10 | 10 | 10 | 20 | 20 | 20 | 20 |
| | 206 | 231 | 231 | 276 | 276 | 326 | 326 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | 310 | 400 | 400 | 460 | 460 | 460 | 460 |
| | 2,6 | 2,8 | 2,8 | 5,1 | 5,1 | 5,2 | 5,2 |

| | BUR-TsTsP-219/270 | BUR-TsTsP-219/295 | BUR-TsTsP-245/295 | BUR-TsTsP-245/320 | BUR-TsTsP-324/394 | BUR-TsTsP-426/490 | BUR-TsTsP-426/508 |
|---|---|---|---|---|---|---|---|
| | 219,1 | 219,1 | 244,5 | 244,5 | 323,9 | 426,0 | 426,0 |
| | 269,9 | 295,3 | 295,3 | 320,0 | 393,5 | 490,0 | 508,0 |
| | 270,0 | 295,0 | 295,0 | 320,0 | 394,0 | 490,0 | 508,0 |
| | 8 | 8 | 8 | 8 | 10 | 10 | 10 |
| | with rings | with rings | with rings | with rings | with rings | with rings | with rings |
| | 7500 | 8000 | 8000 | 8000 | 8500 | 8500 | 8500 |
| | 30 | 30 | 30 | 30 | 40 | 50 | 50 |
| | 640 | 640 | 712 | 712 | 526 | 578 | 578 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | 560 | 560 | 560 | 560 | 650 | 650 | 650 |
| | 9,7 | 9,7 | 9,8 | 9,8 | 14 | 15,5 | 15,5 |

HYDRAULIC ANCHOR

# BUR-YaG

Intended to hold stinger installed in polished bowl of liner packer-hanger when performing of formation hydraulic fracturing and other production operations.

+ Anchor system is protected against proppant ingress in piston part.

| | | BUR-YaG-89/146 | BUR-YaG-89/168 | BUR-YaG-89/178 | BUR-YaG-114/168 | BUR-YaG-114/178 |
|---|---|---|---|---|---|---|
| Passage diameter of casing string in which lowering is performed | mm | 146,1 | 168,3 | 177,8 | 168,3 | 177,8 |
| Inner casing string diameter, min | mm | 127,1 | 147,1 | 157,1 | 147,1 | 157,1 |
| Maximum outer anchor diameter | mm | 120,0 | 140,0 | 150,0 | 140,0 | 150,0 |
| Inner passage diameter | mm | 76,0 | 76,0 | 76,0 | 99,5 | 99,5 |
| Max pressure difference withstood | Mpa | 70 | 70 | 70 | 70 | 70 |
| Max. operating temperature | °C | 120 | 120 | 120 | 120 | 120 |
| Connecting thread (collar/nipple) | | HKT 89 | HKT 89 | HKT 89 | HKT 114 | HKT 114 |
| Length | mm | 550 | 550 | 550 | 550 | 550 |
| Weight | kg | 18,2 | 26,0 | 31,2 | 24,7 | 29,8 |

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