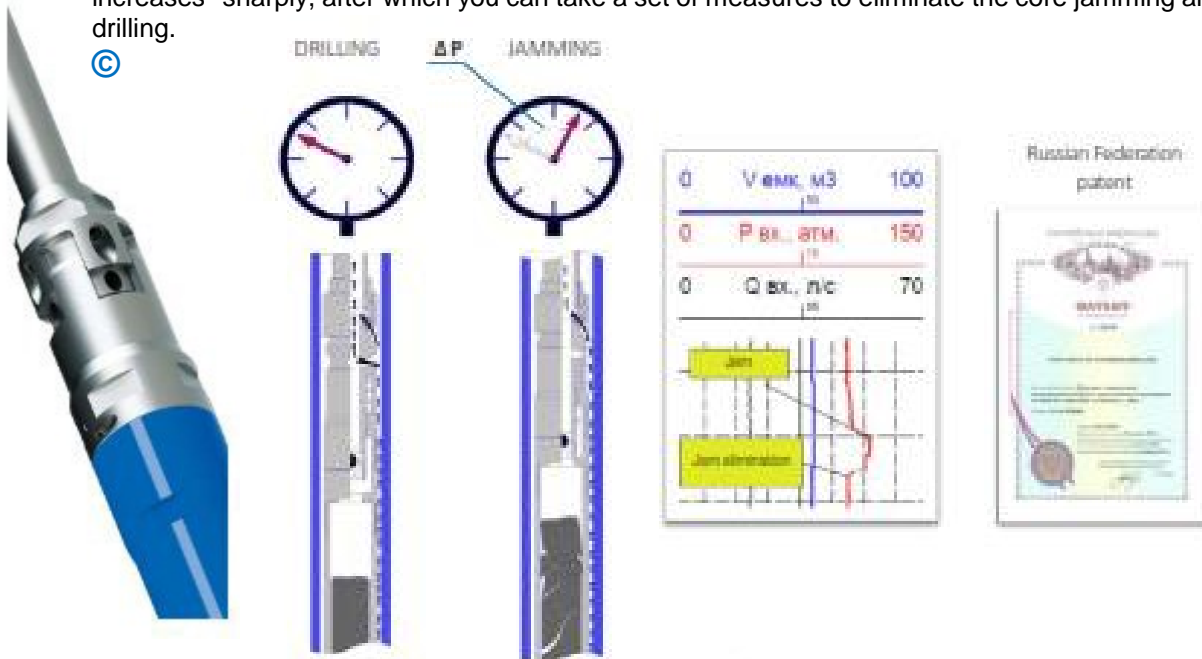




## CORE TOOLS AND EQUIPMENT

### CORE JAM DETECTOR

Using a core jam detector (**RZK**) a **patented development** that allows real-time identification of the destruction and wedging of a core in a core tube, or a set of core catchers makes it possible to significantly increase core recovery in loose, alternating and clastic rocks where it is impossible to determine jamming by ROP reduction or pressure loss. During the core jamming the flushing ports in the RZK overlap and the pressure on the manifold manometer increases sharply, after which you can take a set of measures to eliminate the core jamming and continue further drilling.



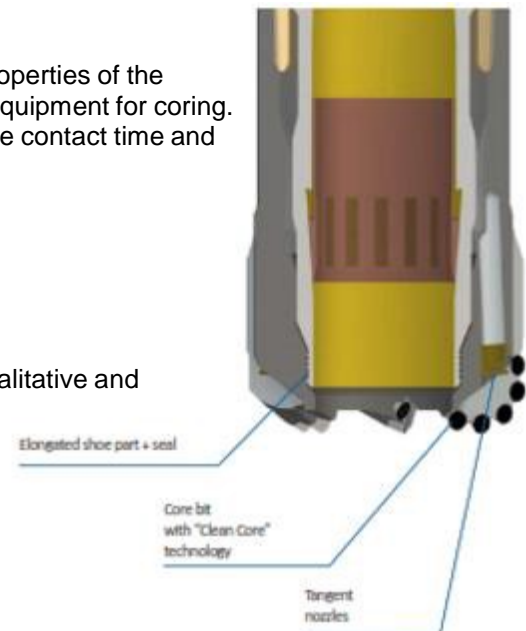
### “CLEAN CORE” SYSTEM TECHNOLOGY

Protecting the core from the negative impact of drilling mud on the initial properties of the material is one of the most important tasks in the design and selection of equipment for coring. The special design of the core bit and the core catchers shoe minimizes the contact time and the degree of influence of the drilling fluid on the core.

#### ADVANTAGES

- Special configuration core bit (tangent nozzles, junk slot shape)
- Elongated shoe part with groove seal preventing mud passage
- Isolating agent “**IZOKOR**” envelopes core surface

**RESULT:** core protection from mud, properties retention, more qualitative and representative core for analysis.





## ISOLATING AGENT IZOKOR

Isolating agent “IZOKOR” is a gel produced by “BURINTEKH”, Ltd with high rheological properties, adhesion, lubricity, which allows to prevent penetration of drilling mud into core material. There are options for the composition of both water’s based and anhydrous based.

### ADVANTAGES

- Enveloping core and protection from drilling mud.
- Does not contain water.
- Does not contain HC.
- Excellent lubricity thus less Jam possibility
- Minimum filtering and impact on core.



### VALVE SYSTEM

Core protection from cuttings and mud when coring into the isolating fluid makes it possible to obtain a large array of additional data on the reservoir. However, when coring in wellbores with a complex profile that reveal unstable interlayers where there is a constant formation of sludge pads and rock debris, there is a great risk of sludge getting into the core tube and squeezing the isolating fluid during trip in hole of the assembly. This system will prevent the above complications.

Valve system to protect core from cuttings and drilling mud is designed to ensure the purity of core.

### ADVANTAGES

- Protection of core receiver from mudding up during TIH during coring with isolating fluid.
- Protection of core from drilling mud while drilling.
- Uniform core enveloping with isolating agent.
- Protection against cuttings and drilling mud penetration into core receiver during reaming (in complicated wellbores).





## CORE CATCHING SYSTEM



### COLLET CORE CATCHER

The most universal core catcher for core recovery. It is produced under the unique patented technology.



### LEVER CORE CATCHER

Core catcher for any types of rocks allows tearing off and keeping fractured and incoherent core.



### SPRING CORE CATCHER

Core catcher specially designed for loose incompetent rocks. It provides maximum coverage and protects core from rush during pulling out to the surfa [ORIENTING CORE SYSTEM- AZIMUTHALLY](#)

## ORIENTED CORE RECOVERY

In order to receive more information about the reservoir, such as grains, change in permeability depending on the azimuth is used oriented core – core recovery with its orientation tying in space.

“Orienting Core” system is designed for receiving oriented core using MWD and non-magnetic drill pipes. With possibility of using fiberglass and aluminum core tubes.



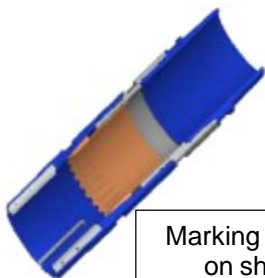
Orienting mark



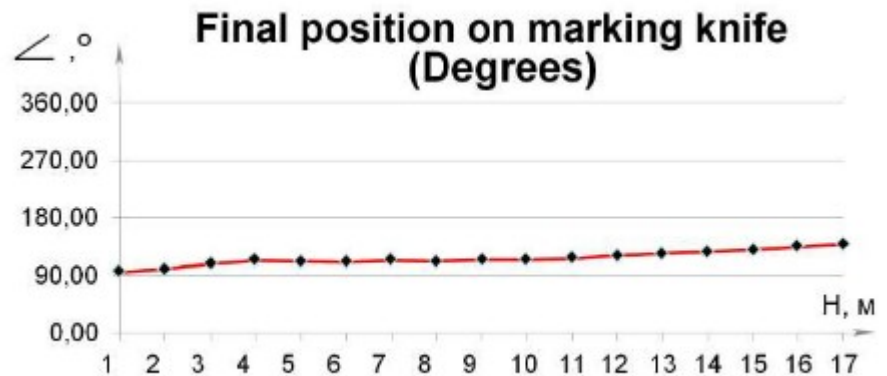
Orienting slip with sub to inclination module



Set slip on core tube



Marking knives on shoe



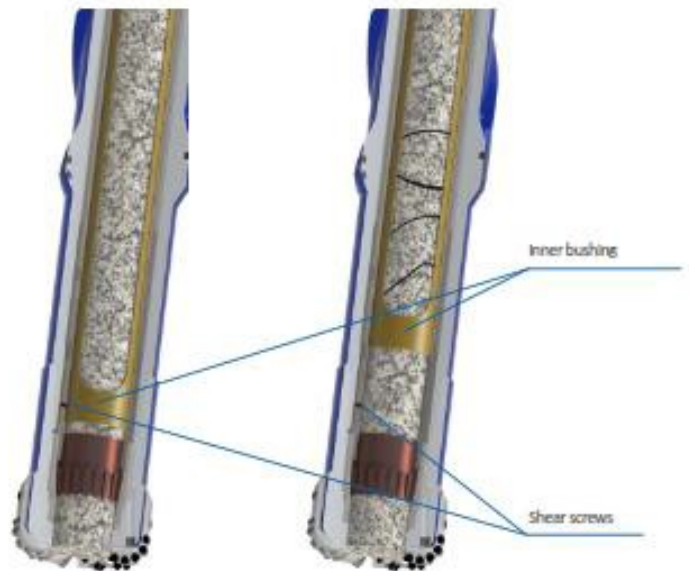


## ANTI-JAMMING SYSTEM

Jamming in core tube during coring in fractured rocks is a major cause of premature drilling interruption. The increase in the number of round-trip operations due to core jams can lead to a significant increase in well construction time. Using anti-jamming systems to eliminate 1 jam can effectively solve this problem.

### ADVANTAGES

- The elimination of one core jam.
- Increased core recovery.
- Increased meterage per 1 run.
- Reduction of well construction time by reducing the number of round-trip operations.
- Coring with isolating fluid.

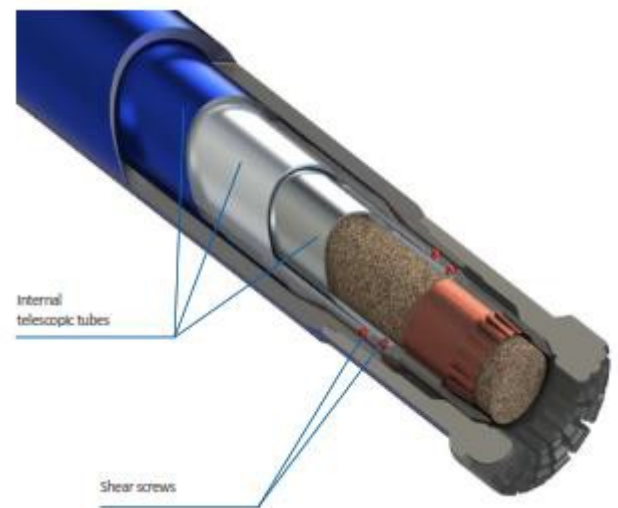


## TELESCOPIC CORE TUBES

Telescopic core tubes were designed specifically for coring in highly fractured rocks. Their feature is the presence of two sliding internal pipes. The use of telescopic core tubes makes it possible to eliminate two core jams per run and, accordingly, reduce the number of round-trip operations by 2 per each run.

### ADVANTAGES

- The elimination of 2 core jams.
- Increased core recovery.
- Increased meterage per 1 run.
- Reduction of well construction time by reducing the number of round-trip operations.
- Coring with isolating fluid.







## SINGLE-USE CORE TUBES

### FIBERGLASS CORE TUBES

Specially designed single-use core tubes have low friction coefficient of the inner surface, which reduces the likelihood of core jamming. After POOH they are sawn into meter sections, closed with plugs and placed in boxes for transportation.



### ALUMINUM CORE TUBES

Aluminum core tubes of special design for coring in rocks of any category of coring difficulty.

Have low friction coefficient of the inner surface. Used when working in cross-sections with abnormally high temperatures.



### SAFETY JOINT

Special unit of the barrel allowing to unscrew the tool and remove the inner core tube with a core in the event of a sticking of core barrel.



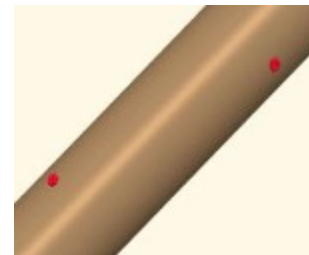
### SPIRAL CENTRALIZERS

Solid bladed centralizers are made from high quality alloy steel. Carbide teeth are used as main cutting structure. Centralizers reduce vibrations and protect core from destruction. It can be made for any size of core head.

### GAS-RELIEF VALVE DURING TIH

It is a Gas relief unit device for safe core tube sections disassembly when coring in gas-containing rocks.

It works during pulling out of hole, as the gas may be emitted into the core tube, which can lead to the destruction of core when it is removed.



Gas-relief device during removal of core