



Burintekh Products lines

ROLLER-CONE BITS PRODUCT LINE MANUFACTURING

ABOUT PRODUCTS

- **“BURINTEKH”, Ltd** roller-cone bits provide the highest level of reliability and performance. Each design embodies many years of design and manufacturing experience, the most stringent acceptance testing criteria and multiple tests in field conditions.
- Process of developing all designs is based on our own cutting structure and bearings design algorithms. Computer-aided design, mathematical and statistical analysis are used. Huge drilling experience in the most severe geological conditions is taken into account.
- Team of engineers is involved not only in the process of designing and manufacturing roller-cone bits, but also in analyzing all the incoming information regarding the operation of the tool.
- Up-to-date simulating, visualizing, analysis and data verification tools are at design-and-engineering team disposal. All this ensure task success.
- Equipment and unique technical solutions used in the production of bits act as a guarantor of the quality of manufacturing products.
- We can offer full range of designs for solving tasks of any complexity. Set of options provides an individual approach in the selection and use of bits.
- The quality management system controls all the production processes of the tool. Bit designs, equipment, production processes and quality control system fully complies with the requirements of API Q1 and ISO 9001 standards.
- **“BURINTEKH”, Ltd** adheres to the philosophy of building partnerships with consumers of products. For us every review of product manufactured by our company is important.





DESIGN AND MODELLING

ENGINEERING AND DESIGN

The purpose of design process is the development of roller-cone bits corresponding to specific conditions and possessing high performance characteristics throughout the entire operation cycle.

Drilling conditions comprehensive analysis. Design process takes into account the interaction of cutting structure performance, characteristics of rocks, drive system, effect of individual BHA components.

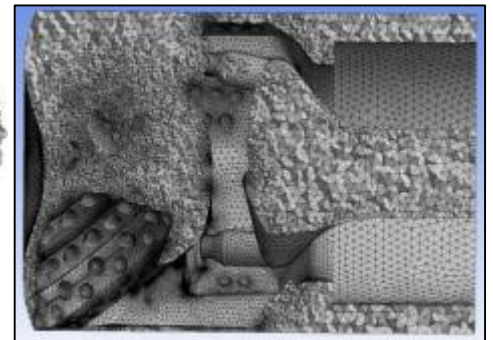
Design development. Design development cycle is an ongoing process of design improvements aimed at improving bits performance reliability. Changes are based both on laboratory tests, field trials and on a continuous analysis of bits performance statistics.

Own tool performance data analysis software allows conducting comprehensive analysis bits usage which in turn allows improving existing roller-cone bits designs and design new ones, taking into account all the features of its application.



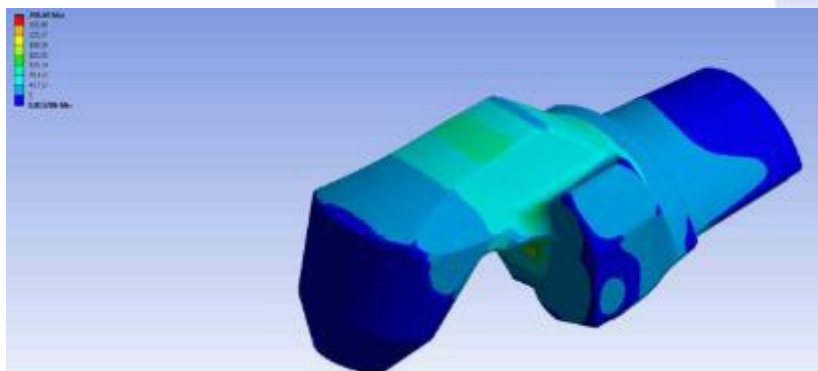
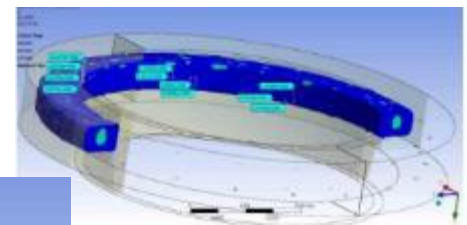
MODERN SOFTWARE

Modern software is used under construction that allows receiving full visualization of finished product, carry out calculations of both separate units and the whole bit.



FINITE ELEMENT ANALYSIS

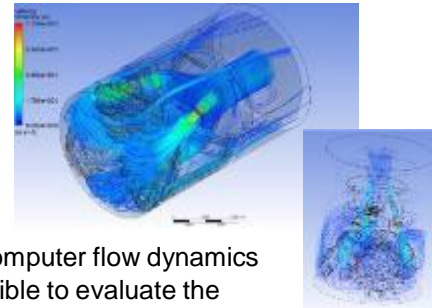
At the design stage it is important to assess the reliability of all structural elements affected by various factors that occur during drilling. Analysis carried out according to this method allows minimizing risks of premature wear during designing both individual components and the entire structure.





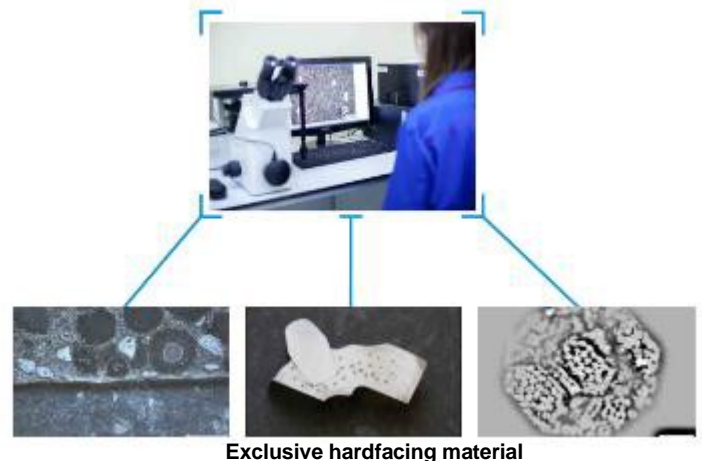
EFFECTIVE BIT HYDRAULICS

Properly selected and technically implemented model of hydraulic parameters of the bit is one of the most important reasons for the effective operation of cutting structure. That is why engineers pay special attention to solve problems of improving the performance of the hydraulic system when designing bits. **BURINTEKH** design engineers use CFD analysis to simulate the interaction of the bit with the drilling fluid in the bottomhole formation zone. CFD is a process of mathematical modeling of the fluid close to the bit. Computer flow dynamics analysis shows tangential stresses and turbulent processes; this method also makes possible to evaluate the efficiency of cuttings transportation, bottomhole and cutting structure cleaning.



MATERIALS RESEARCHES & DEVELOPMENT, SELECTION AND TESTING

BURINTEKH Company permanently improves design practices by means of independent scientific researches and innovative offers with the involvement of national and foreign companies for cooperation. Highly professional materials scientists carry out researches of construction materials corresponding to the design, technology and performance specifications and meeting the highest requirements applicable to product.



Exclusive hardfacing material

The search for new solutions in the field of increasing the lifetime of roller-cone bits is inseparably connected with the study of new materials, its wear and destruction mechanism.

Also, the most important task is to increase the physical and mechanical properties of materials already used in the production of bits; for this purpose selection of new processing modes is carried out, which is subsequently comprehensively investigated.

An important field of work in the selection of materials is working with leading domestic and foreign manufacturers of products necessary for the production and assembly of roller-cone bits.

The result of this collaboration is the solutions applied in our tool. These solutions are unique in characteristics and obtained as a result of years of research and tests in the most difficult conditions, in order to obtain a guaranteed level of quality.

Company conducts its own developments in the field of creating materials with unique characteristics and has proprietary solutions used in roller-cone bits manufactured by BURINTEKH.

Importantly a regular analysis of run roller-cone bits is performed in order to obtain reliable information on changes in the characteristics of materials used in them. This information is necessary to ensure reliable operation of bits in any application conditions.

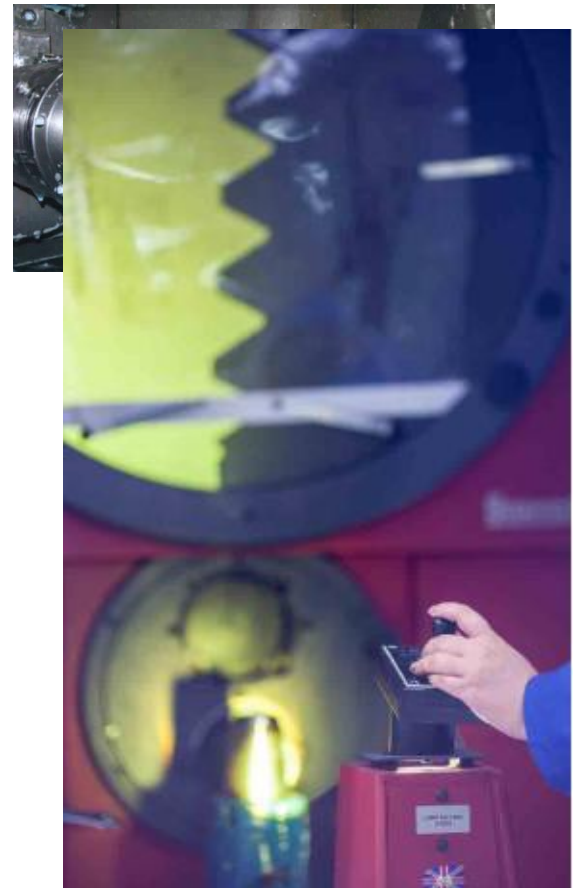


PRODUCTION

The fleet of modern equipment including five-axis machining center units and team of professionals successfully solves the most complex tasks of matching the product to the design documentation.

All operations including special processes are validated for compliance with ISO and API Q1 standards. Production personnel regularly undergo certification confirming the level of their own qualifications.

At the present time production can master new designs within shortest time observing the highest quality standards.



QUALITY CONTROL

The company's objective is to match the quality of products to the customer's expectations. Our goal is to exceed industry standards in the field of production and operation of roller-cone bits. To that effect company has implemented and successfully operates quality management system which includes comprehensive control of products as well as control of suppliers of materials and components involved in the process of manufacturing and assembling roller-cone bits. Company organizes the production and control process to provide customers with high-quality products with a guarantee of reliable operation.





TEST BENCH TOOL RESEARCH

The company's design engineers have at their disposal a set of test equipment, including mobile drilling rig tests on which are an important part of creating roller-cone bits. These benches allow both testing complete roller-bit and its separate units, including sealing units and cutting structure.

Together with the analysis in real conditions this is a powerful tool in designing and predicting the work of roller-cone bits.

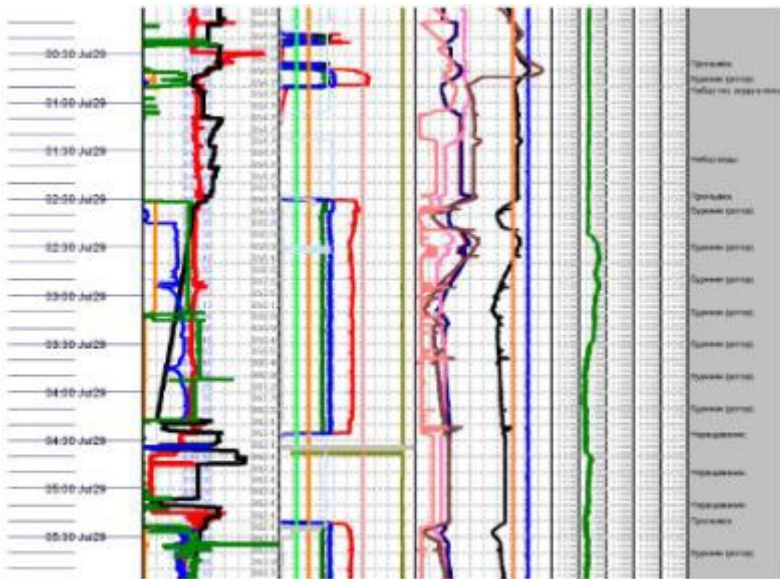
ANALYSIS OF TOOL PERFORMANCE

When designing a bit and in order to achieve high operational parameters of roller cone bits, a comprehensive analysis of tool operation is important.

That is why engineering departments of company pay special attention to the study of drilling processes and its impact on the wear of roller-cone bits and for the company performance potential and mutual beneficial cooperation with customers and providing highly professional product the following cycle is implemented: fundamental research, advanced techniques and technologies used in production and product assimilation, service rendering and further bits improvement.

All possible tool operation reports are carefully analyzed entered into the database system and, if necessary, can be re-analyzed at any time. This information is very important for predicting tool operation under various operating conditions for different drilling parameters.

For operative and precise response to customer requests all bit runs data is carefully examined and bit wear is carefully analyzed. The results find application during creation new designs as well as help in creation and selection new materials.





ROLLER CONE BITS SERIES

“Z” BITS SERIES

Journal bearing bits made with the use of anti-friction, “floating” elements made of a special material having a low coefficient of friction able to withstand high revolutions and loads. Sealing unit rings of which are made of wear resistant

Rubber compound **HNBR** reliably protect the entire design of journal. By means of patented assembly system all journals are assembled with optimally calculated clearances which allow equally loading all 3 sections of the bit.

The bearings of these bits series are equipped with **O-ring** seals made from the best modern materials, bushings and washers of maximum sizes which allow applying high axial weights on bit and receive maximum rates of penetration in drilling hard rocks.

“Z” bits series includes wide range of bits for working in any mining and geological conditions. All bits of this series are equipped with options of reinforcing shirrtail and back taper which allows using it in directional drilling applications.



DOUBLE SEAL BITS “ZW” SERIES

Bits of “ZW” series are purposed for construction deviated wells and drilling with high build-up rate.

The main feature of these bits is design of sealing unit consisting of two big rectangular section seal rings.

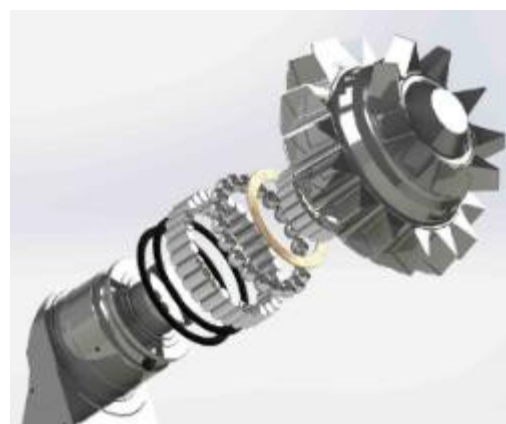
In combination with strict tolerance system in manufacturing process and patented pressure compensated system in this design gives ability to considerably increase bit bearing stability.

This series also includes all range of bits for any mining and geological conditions.



“R” BITS SERIES

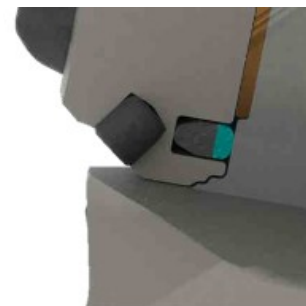
Roller bearing bits is designed in such a way that roller saddle is located in the bit cone. This made possible to maximize the size of bearing which in turn allows withstanding increased axial loads and high bit rotational speeds. By means of unique manufacturing techniques, all clearances in the bearing are minimized. Guaranteed repeatability accuracy in the manufacture of bearings is essential for steady operation of bits.





SEAL DESIGN

Seal unit of special design with complex energy saving sealing element secures bearing from drilled rocks impact.



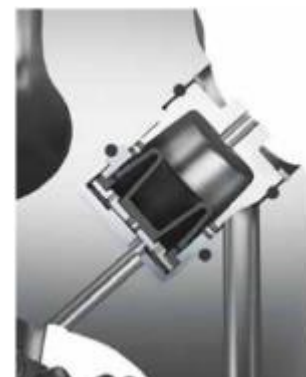
LUBRICATION SYSTEM

Special grease distribution and circulation system provides effective heat transfer from bearing.

Innovative receipt of cup grease developed together with sealing material which allows facilitate operation mode and increase bearing operating life.

Pressure compensation system allows neutralize deleterious effect of hydrostatic head pressure at great depths.

Control over seal-ability of all bit sections guarantees hundred percent reliability of lubricating system.

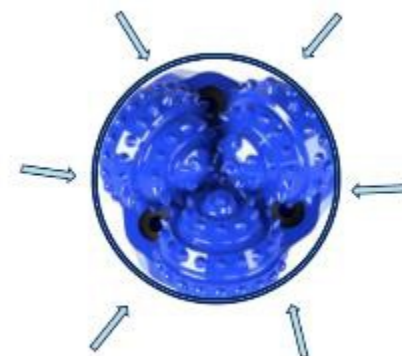


SIX-POINT STABILIZATION SYSTEM

The six-point stabilization system provides special geometry of seal units allowing maximum stabilization to the bit.

This will facilitate its performance and reduces harmful vibration loads in both cutting structure and bearing that prolonging the lifetime of the bit and increasing its efficiency in both vertical and directional applications

This system well-proved itself in field tests and showed bearing stability over the 50 hours of drilling on the bottom without bearing seal failure.



CUTTING STRUCTURES DESIGNS

For the most effective cutting structure operation the widest range of various geometrical shapes of carbide inserts is needed - the mains elements that perform rock destruction. **BURINTEKH** roller-cone bits use all the variety of inserts, including own designed geometry.



Conical



Chisel



Biconical



Flat



Bevelled



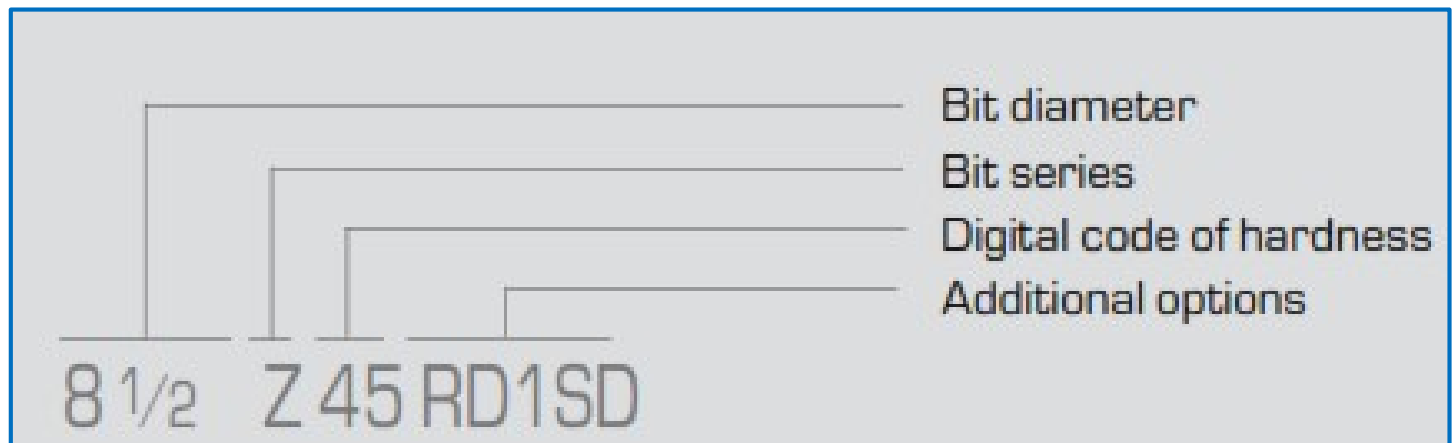
Spherical



Profiled



BIT NOMENCLATURE AND OPTIONS



	Code	Description
Prefix – before hardness digital code	Z	Journal bearing (sealed by default)
	R	Roller bearing
	W	Double seal unit (function)
	O	Unsealed bearing (function)*
Suffix – after hardness digital code	J	Central jet
	K	Conical tooth
	G	Inserts on reaming gage
	B	Additional (gage) inserts row
	S	Shirrtail reinforcement with carbide inserts
	L	Stabilizing pad on shirrtail**
	D, D1, D2	Diamond inserts reinforcement (33%, 66%, 100%)
	T	Cone hardfacing
	E	Elongated nozzles
	H	Cones additional protection with carbide inserts
J+	Additional flushing ports***	