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3D MODELING OF BLOCK-MODULE FACE-MILLING CUTTER CONSTRUCTIONS

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The article introduces the results of constructing of block-module face-milling cutters based on 3D modeling application.

Efficient operation of the cutting equipment is impossible without establishing a perfect tool inventory providing greater reliability and economical and labour-saving use of expensive breakthrough machinery which in its turn results in the growing role of the mentioned equipment.

Computer development allows for a wide application of specially developed computer-aided design and computer-aided manufacturing systems (CAD/CAM) in creating cutting tools.

Developing CAD/CAM systems in the field of metal cutting equipment requires a high degree of mathematical formalization of design styles and maximum unification in solving particular projection problems [1].

Implementation of CAD systems results in:

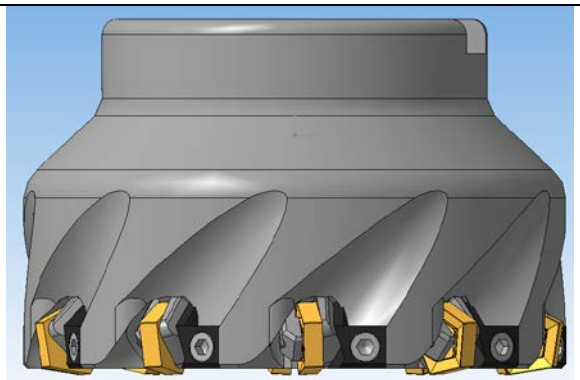
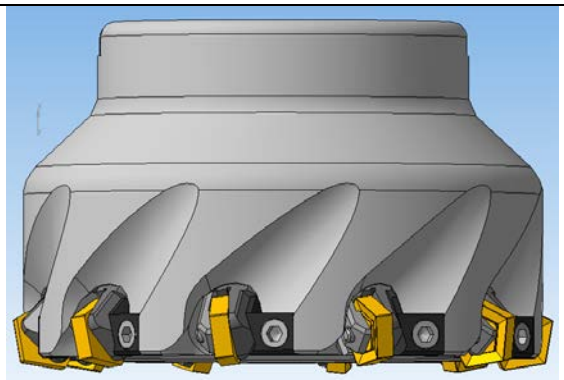
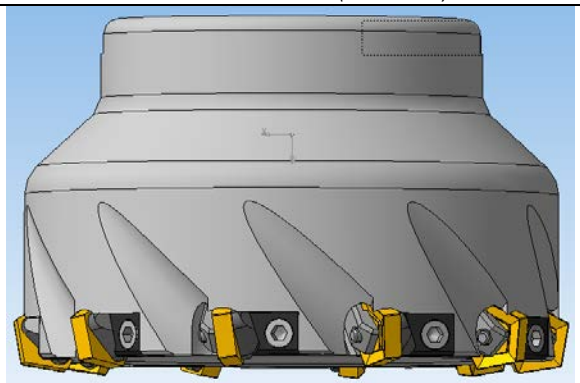
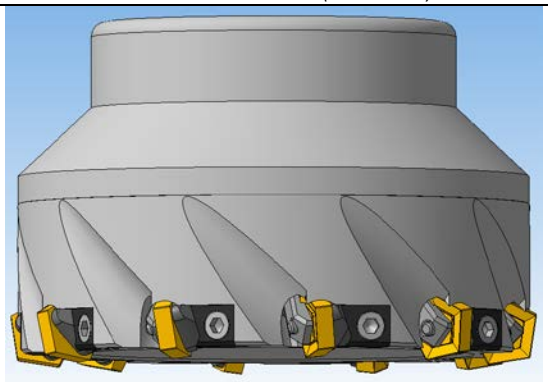
- time-saving design and manufacturing;
- higher quality and standard;
- reduction of material consumption;
- optimization of the constructs at the development stage.

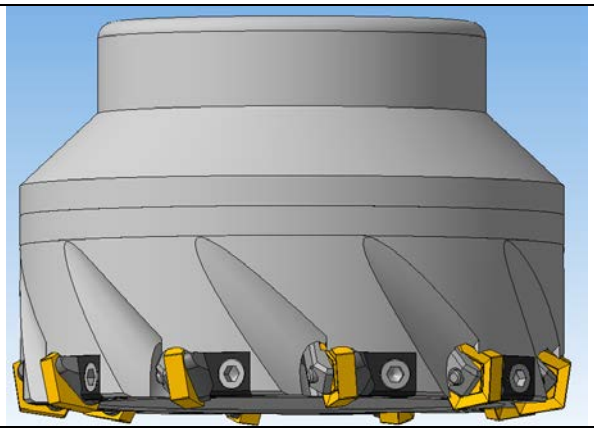
In this connection 3D modeling of general purpose cutting equipment has gained steady ground, being applied in various machining conditions.

The multipurpose block-module face-milling cutter constructions introduced are composed of about 80 % common parts [2, 3].

Model constructions of block-module face-milling cutters of arational shape are given in table 1.

Table 1. – Model constructions of block-module face-milling cutters of a rational shape

	
with recessed units (version 1)	*with recessed units (version 2)*
	
with recessed units (version 3)	*with a balancing mechanism (1 disk and a ball)*



with a balancing mechanism (2 disksand a ball)

The manufacture of block-module tool constructions such as complex workpieces in mechanical engineering is based on the development of an adequate 3D-model of a tool (workpiece). It is creating 3D models identical to those designed in block-module cutting tool constructions that enables better quality and time-saving production (complex and science-intensive output). Being a reliable, flexible and easy to use process 3D modeling has become an essential means to make the process of unified tools projection more efficient and finally to integrate CAD/CAM problems into a single system environment [4].

A considerable benefit in the increase of labour productivity is derived from the possibility of prompt problem solutions of the modeling process with return information flows (reverse engineering), when a set of parameter-oriented models actualize the closest approximation to an optimal variant.

Consistency of the results obtained is determined by an extensive normative framework used during the process of parameter-oriented models design.

Modern graphics packages provide capabilities of three-dimensional representation of complex technical processes, open up a totally new approach to electronic records: visual information is more easily perceived by the users than traditional textual manuals, it does not require translation into other languages and using optimized 3D-data allows the user to receive instructions over the Internet, view them on different computing machines, convert them into G-codes for further machining under numerical program control.

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