1. The coefficients depending cutting efforts at different angles and directions cutting /

The direction of cutting	Angle							
	30º	45º	50º	55º	60º	70º	80º	90º
Frontal	0.6	1.0	1.15	1.3	1.45	2.0	2.8	-
Longitudinal	0.7	1.0	1.10	1.2	1.3	1.7	2.4	-
Cross	0.9	1.0	1.05	1.06	1.09	1.15	1.22	1.3

Studies have shown that with increasing angle cutting a face, the longitudinal and transverse directions cutting force increases.

Conclusions

1. From the angle cut in different directions cutting cutting force increases.

2. In order to reduce energy consumption for cutting must use cutters with less cutting corners.

3. The smaller the angle the less deformation cutting chips.

References

1. Resurrection SA Rezanye timber / SA Resurrection. - M .: Hoslesbumyzdat, 1995. - 200 p.
2. Ivanovo EG Rezanye timber / EG Ivanovo. - M .: Lesnaya Industry, 1975. - 200 p.
3. Lubchenco VI Rezanye timber and drevesnыh materials / VI Lubchenco. - M .: Lesnaya Industry, 1986. - 295 p.
4. Deshevoy MA Mehanycheskaya TECHNOLOGY tree / MA Deshevoy. - L .: Hoslesbumyzdat, 1939. - 550 p.
5. Ivanovo EG Rezanye timber / EG Ivanovo. - M .: Lesnaya Industry, 1975. - 200 p.

The influence of research on the process corner rezanyya struzhkoobrazovanyya and usylyya rezanyya.

Timber and chips ugol rezanyya, usylye rezanyya, struzhkoobrazovanye

The influence of angle of cutting on chip formation process and cutting force was researched.

Wood, angle of cutting, cutting force, chip formation.

UDC 681.3.06 + 674.047

COMPUTER-AIDED DESIGN AND RESEARCH OF FOREST DRYING CHAMBERS BY MEANS OF SolidWorksAPI AND COSMOSFLOWORKS

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The thermal calculation and the analysis of physical steams in a forest drying chamber have been done using COSMOSFLOWORKS design information technologies. The system of SolidWorks 2011 computer-aided design has been used for the solid state modeling of a forest drying chamber and the creation of three-dimensional models of its components. On the basis of SolidWorks API the "Wood v.1.0" programmer-oriented complex has been developed and realized using the Microsoft Visual studio 2010 compiler which enables to research the chamber parameters, as well as control the geometry of the forest drying chamber and stack .

CAD, SolidWorks, SolidWorksAPI, SolidWorksSimulation, SolidWorksFlowSimulation (COSMOSFloWorks), model, forest drying chamber, drying process, temperature.

Stating the practical problem. By means of SolidWorks / Flow / Simulation, SolidWorks API interface three-dimensional geometric model of sawn timber drying chamber has been designed. The program supplement for the chamber input parameters control, results of conducted experiments, as well as the geometry of the three-dimensional forest drying chamber model and parameters change of the

charging wood stack have been developed. In SolidWorksFlowSimulation (COSMOSFloWorks) program medium the distribution of thermal fields in the chamber during the drying process of sawn timber has been modeled. There has been researched the distribution dependence of dried wood temperature and humidity, sawn timber imitation surfaces caused by different capacity degree and quantity of thermal radiators, air movement direction and speed in the chamber. The SolidWorks 2011 computer-aided design system has been used to create the three-dimensional forest drying chamber model. Its medium and tools are well adapted to the construction of complex surfaces and assemblies.

The constructed in detail 3-D model of the forest drying chamber corresponds to sizes of real chambers the scale to be 1: 1 what significantly slows down the process of the imitation modeling. In order to avoid the great loss of time on each experiment the simplified construction model of reduced sizes has been worked out (Fig. 1).

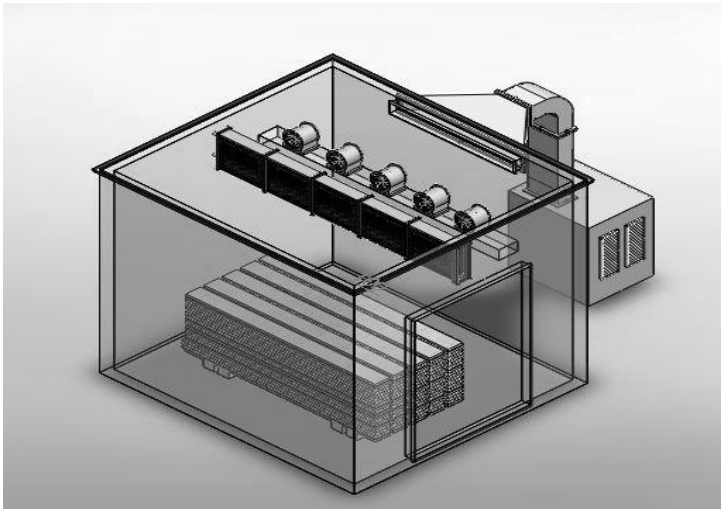

Fig. 1. Solid 3-D model of the forest drying chamber of periodic action in the assembly constructed by means of SolidWorks.

The analysis of the findings. The SolidWorks Flow Simulation (COSMOSFloWorks) computer-aided calculation system can receive results in graphics what makes them more available and comprehensible. In its turn the developed supplement enables to research variants as much as possible due to the change of input parameters for each new research. During the modeling process of forest drying chamber elements work it is possible to observe the temperature change in a chamber with every calculation iteration in real-time. In the upper part of the (Fig. 2) there are demonstrated denotations of all the parameters which we have set as the goals of the calculation. And in the lower part they are illustrated graphically. SolidWorks Flow Simulation (COSMOSFloWorks) enables to research corresponding parameters in necessary chamber spots and in any moment of time. The system emits results for other researched parameters as well, for instance speed, pressure, density, intensity.

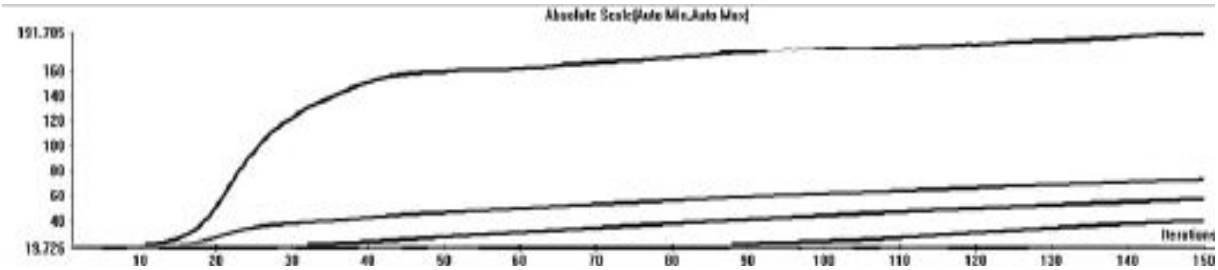

Fig. 2. Interim temperature denotations results concerning the time of research conducting.

Conclusions

The possibilities of SolidWorks API, SolidWorks Flow Simulation (COSMOSFloWorks) application for 3-D design of the forest-drying

chamber in the process of wood drying have been demonstrated. In particular, in research: 3-D model of the forest drying chamber and its components with their necessary arrangement in it has been developed; the wood drying process, in particular the distribution of air and thermal steams in the chamber and wood have been modeled; modeling findings in both numerical and graphic form have been received and analyzed.

References

1. *AA Alyamovskyy*. SolidWorksSimulation. How Reshat praktycheskye problem. - SPb .: BHV-Peterburh.2012. - 448.
2. White PV Theoretical Foundations of heat treatment and drying. - K: Izd "AGE, 2005.
3. miner ML Automation of timber in the construction industry: structural synthesis of SAK / Miner ML, Voronov VG, VA Safarok and others. - K: Izd "builder", 1992.
4. *Rozhak PI* Computer-aided design and research of drying chambers and means SolidWorksAPI COSMOSFLOWORKS // Boretsky IB Collected Works of APKT-2012, m. Khmelnitsky, p. 270-279.
5. *Sokolovsky YI* The development of computer-aided design tools drying chambers COSMOSFloWORKS // Dendyuk MV, MS Varenitsa Prusak Y. // Scientific Bulletin NLTU Ukraine. - 2010. - Vyp.20.10.
6. [electronic resource]. - Available with http://www.solidworks.ru /.
7. [electronic resource]. - Available with http://www.fsapr2000.ru /.

For solid-state modeling and creation lesosushylnoy kamerы trehmernыh models EE components yspolzovana avtomatyzyrovannoho system is designed SolidWorks 2011. Designing software-oriented complex "Wood v.1.0" Based on SolidWorks API, with kompylyatora Using Microsoft Visual Studio 2010, allows us to kotorыy yssledovat Options kamerы, as well as MANAGEMENT geometry lesosushylnoy kamerы and stacks. Osuschestvleno thermal calculation and analysis fyzycheskyh flows in lesosushylnoy Chamber C Using information technology Designing COSMOSFloWorks.

CAD, SolidWorks, SolidWorks API, COSMOSFloWorks, model lesosushylnaya camera, a drying temperature.

For solid state modeling Stoves and create three-dimensional models of the components used computer-aided design system SolidWorks 2011. The software-based complex "Wood v.1.0" based on SolidWorks API, using the compiler Microsoft Visual studio 2010, which makes it possible to investigate camera settings and manage geometry Stoves and stacks. Done thermal calculation and analysis of physical flows in Stoves using information technology design COSMOSFLOWORKS.

CAD, SolidWorks, SolidWorks API, COSMOSFloWorks, model, Stoves, drying process temperature.