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APPLICATION OF INFORMATION TECHNOLOGIES IN THE CALCULATION OF DEVICES FOR CAR REPAIR

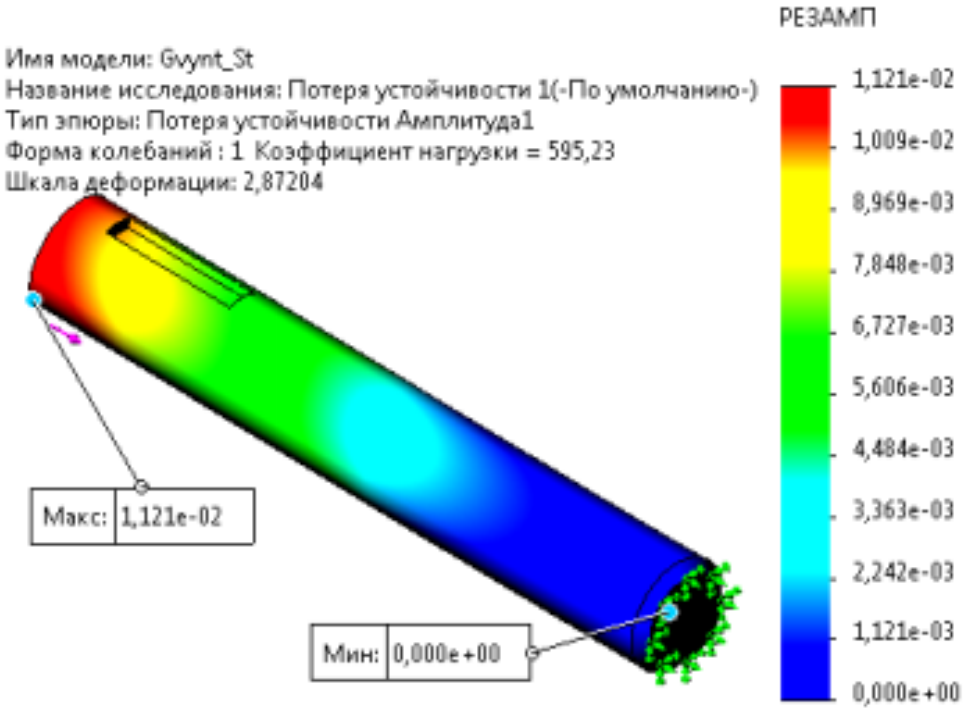
Today, information technology is the most important factor affecting the quality of the education system. The main prerogative is the quality and level of training of students in higher education institutions, which is the key to the successful functioning of the education system. The use of information technologies in the educational process reveals the creative abilities of students in the learning process.

Researchers [1] applied information technology (CAE/CAD automated complex SolidWorks and its application SolidWorks Simulation) on the example of solid-state design and subsequent verification of the static strength of the rocking lever of the stand for straightening deformed stamped discs of passenger car wheels (the minimum margin of strength exceeded the permissible, which guaranteed its operability).

The authors of [2] modeled the following of the part of the test stand – the power propeller. Calculations guarantee its static strength, but it can lose its bearing capacity as a result of the imbalance between external and internal forces in any element of the structure or the system as a whole. Therefore, a study of this screw was carried out, which can prevent its destruction – loss of stability [3]: during modeling in SolidWorks, a geometric model of the screw was created, and in SolidWorks Simulation, the material from which it was made (20G steel) was assigned, fixation was performed, the loading area was set, contact interactions were determined, and a finite element model of the screw was created: calculations guaranteed the stability of the model.

The purpose of this study is to investigate the possibility of replacing 20G steel with St1kp steel (DIN equivalent – S185), which is cheaper and more accessible in repair shops.

It was found that the maximum amplitude of oscillations a = 0.0121 (fig. 1); the safety margin for a possible loss of stability is n = 595.23 (much higher than the permissible [n] = 4).



а

Название исследования:Потеря устойчивости 1

Режим No.	Запас прочности при потере устойчивости
1	595,23

б

Fig. 1 – Resulting amplitude (a) and safety margin (b) at loss of stability the power propeller

In other words, if 20G steel is replaced by St1kp for the manufacture of a power screw, the safety margin is sufficient.

Therefore, the use of SolidWorks Simulation made it possible to investigate the stability of the power screw of the straightening stand for deformed stamped wheels of passenger cars (the loss of stability of one structural element means the almost complete loss of the load-bearing capacity of the entire structure).

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COMPUTER DESIGN OF TECHNOLOGICAL PROCESSES STRENGTHENING AND RECOVERY OF PARTS FOR AUTOMOBILE TRANSPORT

Design automation occupies a special place among information technologies. Firstly, design automation is a synthetic discipline; many other modern information technologies are its components. Thus, the technical support of computer-aided design (CAD) systems is based on the use of computer networks and telecommunication technologies.

At present, all technological CAD, if you do not consider programming for machines with numerical software control, is reduced to the automation of the design of technological documentation – to speed up the selection, databases (DB) of equipment, tooling etc. are used, typical technological processes (TP) are used. CAD/CAM/CAE/PDM-systems (systems of automated design, technological preparation of production and engineering analysis) belong to the number of the most effective technologies that allow you to fulfil these requirements.

In recent years, CAD/CAM/CAE/PDM-systems have gone from relatively simple drawing applications to integrated software complexes that provide unified support for the entire development cycle, starting from sketch design and ending with technological production preparation, examinations and support.

Accordingly, there are several well-known systems on the Ukrainian market that implement this task: TechCARD, Technologics, TekhnoPro, Kompas-Avtoproekt. These systems provide: TP processing of details, communication with AutoCAD, T-FLEX, Kompas-Grafik, creation of an archive of design and technological documentation, creation of a TP database, etc.

As a rule, such developments are used only at the enterprise for which they were developed, and an attempt to transfer them to other enterprises requires high costs of adaptation (at best, it will be necessary to change the information content of the system – database tables, text and configuration files, etc.; at worst, it may be necessary to change