TRANSFER OF 3D MODELS FROM CAD TO CAE PROGRAMS

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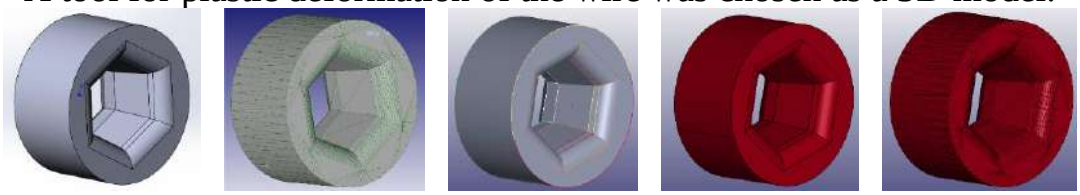
The current study compared the interaction of CAD (Computer-aided design) system and CAE (Computer-aided engineering) system on the example of three programs. The SolidWorks program was chosen as the CAD system. Deform-3D and ANSYS LS-DYNA programs were chosen as CAE system.

The SolidWorks program allows you to save 3D models in the following formats for data exchange: SolidWorks (*.sldprt), IGES (*.igs), STEP AP203(*.stp), STEP AP214(*.stp), Parasolid (*.x_b), Parasolid (*.x_t), STL (*.stl), DWG (*.dwg), ASIC (*.sat), CATIA Graphics (*.cgr).

A comparison of the formats for importing models from CAD programs and the formats for exporting models to CAE programs shows the presence of the three most common formats for exchanging the geometry of 3D models between these systems. Among the most widespread are the formats for exchanging the geometry of 3D models: IGES (*.igs), STEP (*.stp), STL (*.stl).

A tool for plastic deformation of the wire was chosen as a 3D model.



a b c d f

a – the model was created in the SolidWorks program;

b - the model is exported to the Deform-3D program in STL format;

c, d, f - the model is exported to the ANSYS LS-DYNA program in IGES, STEP and STL format, respectively

Figure 1. Appearance of the model after export

Table 1. Comparison of the ability to export the geometry of 3D models

Exporter program	Export format	Importer program	Evaluation criteria
SolidWorks	IGES (*.igs)	Deform-3D	*
	STEP (*.stp)		**
	STL (*.stl).		+
	IGES (*.igs)	ANSYS LS-DYNA	+
	STEP (*.stp)		+
	STL (*.stl).		+

* - only 2D models can be exported;

** - export format is not supported

Thus, it is advisable to use STL (*.stl). format for data exchange between CAD and CAE programs.