How to export CAD files into VisedX_25

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This report presents the development of a computational methodology for converting objects produced in the AutoCAD software [1] into a 3D version for VisedX_25. The files produced in AutoCAD are mainly used for the elaboration of technical drawing parts in two dimensions (2D) and for the creation of three-dimensional (3D) models, and can be exported and converted to MCNP code [2]. This property connects professionals with mastery of other 3D modeling technologies to the VisedX_25 program which is a program that can trace and perform Monte Carlo N-particle (MCNP©) calculations as well as dynamic 3D geometries. To verify the compatibility of interfaces between the two programs we first produced a 3D drawing using the manual and automatic tools for creating 3D objects in AutoCAD, developing a cube with 50 cm of edges. After making the geometric figure, the file was exported to DWG, DXF, and SAT extensions. The file produced in AutoCAD was inserted into the VisedX_25 program as follows: At first the VisedX_25 program was started; in this way an algorithm was created to read DXF file. The CAD IMPORT and 3D IMPORT commands were selected, (Figure 1) and after their selection a window called CAD Import panel was opened. Through the IMPORT command, the files with extensions DXF, DWG and SAT were inserted one at a time, enabling the import compatibility test, as shown in the Figure 1.
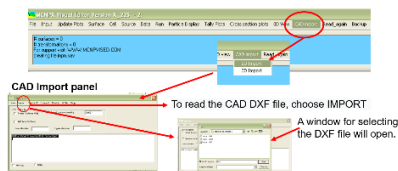

Figure 1. Exporting AutoCAD to Vised

The tests made with DWG and DXF extensions were not successful. The message: "*An unsupported entity of type 3DSOLID was found*" is presented to the user, discarding the possibility of compatibility between these extensions. The importation of the file is not completed and VisedX_25 advises the user to update the way to import the drawing and make the conversion in a row compatible with MCNP, so that later a valid file compatible with the program is created. For this reason, each file extension or file format has its specific application, capable of playing, editing, importing, exporting, saving and modifying its content in various ways. The Program VisedX_25 is not compatible with file extensions that are called interchange entities between CAD-type programs. Another attempt was then made, this time the SAT extension was used. The SAT extension stores three-dimensional geometry information in a standard text file format; used for the exchange of 3D data between systems. And because of its characteristics it proved to be compatible with the VisedX_25 program. The test performed followed the methodology that was applied to DWG and DXF extensions. In the following Figure 2 it can be seen that the file was compatible.
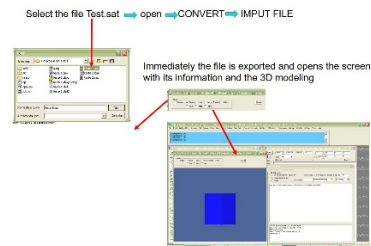

Figure 2. The compatibility of SAT file

For the file produced in 3D in AutoCAD to be compatible with VisedX_25 it must be exported to the SAT extension because it maintains the characteristics of reading compatibility with three-dimensional geometry information in a standard text file format. Furthermore, for those who already use AutoCAD to develop drawings and projects in 3D modeling, this compatibility between programs is a positive point, because there is no need to create the same geometry in MCNP, thus facilitating the development of new geometries and more complex work

References
[1] AUTOCAD for Windows. Free trial version (2021).
[2] PELOWITZ, D. B. MCNPX TM User's Manual, Version 2.5.0, LA-CP-05-0369, Los Alamos National Laboratory (2005). Research Reactor, Annals of Nuclear Energy 31 (2004) 481–516.