



Module #4

CAD/CAM

Advances in hardware and industrial technology work hand-in-hand with the advances of CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) design and operation software programs. There are hundreds of developers for both CAD and CAM software programs. All CAD files eventually need to be translated into CAM files before they can run on any CNC machine. Combination CAD and CAM programs are also available.

Popular CAD programs are AutoDesk, Sketchup and Rhino, but there are a plethora of others. CAD programs are capable of expressing 2D or 3D objects as parts or lines that can be scaled, edited and manipulated. These programs are capable of exporting into a variety of formats, however not all CAM software can translate the exported CAD files properly. This allows certain software developers to maintain a monopoly on process and prevent everyone from accessing the low cost ability to work CAM operated industrial equipment.

Many machine operators are hesitant to run unfamiliar files for fear of ruining a machine or potential risk to operators if the machine mistranslates and malfunctions. Therefore, operators usually import and re-draw or modify CAD files to work with their particular CAM software at a considerable time and expense.

OPEN SOURCE

Currently, the intellectual property protection of the codes traps people into certain software packages and limits the ability to transfer information freely. One way to avoid this complication is by encouraging software developers to use "open source" code to allow greater access. This in turn will allow designers and operators more freedom to have their products made and realized.



Dictionary.com defines open source as:

A method and philosophy for software licensing and distribution in which the code used to write a software program is available to the greater public. The goal of open source code is to encourage use and improvement of software by ensuring that anyone can copy the course code and modify it, writing their own versions of the software that is better or more advanced. People commonly use the term "open source" to refer to software that is free of distribution restrictions (not necessary free of charge). Note, there are different kinds of open source licenses that programmers can choose from when distributing their programs. (Dictionary.com)

TRUE NESTING

A great advantage to using CAD/CAM design software for CNC machines is the ability to true nest shapes. True nesting allows for each design object to be defined and analyzed. Objects have several input parameters. Some of these include rotation, grain direction where applicable and cutter head tolerance. Then, the user can specify the number of parts and stock size and true nesting software will lay out the parts to the highest machine performance and maximum material yield. True nesting is used for a variety of different applications and parts form kitchen cabinets and air duct manufacturing to automotive components.