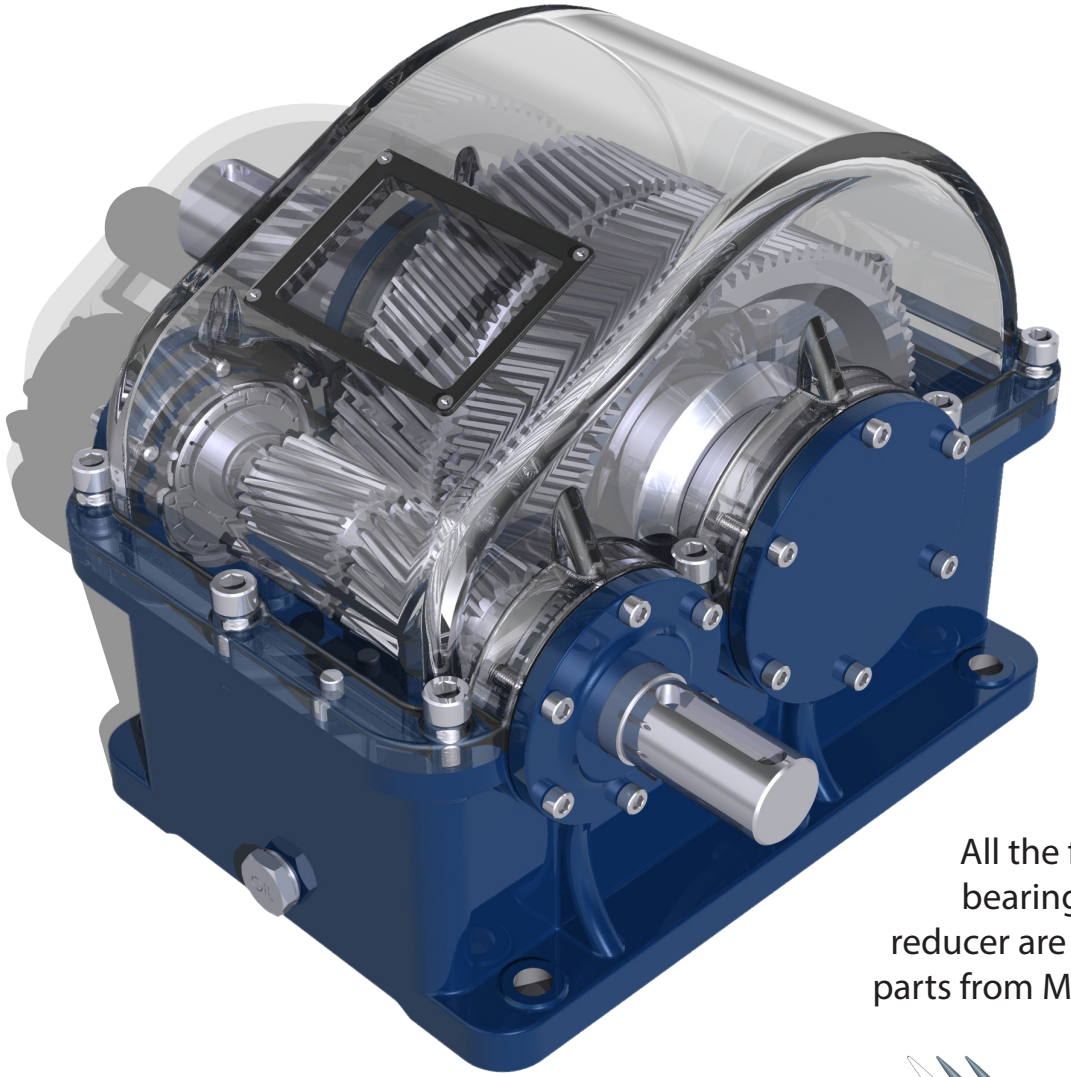
Using Standardized Parts can be a real time saver when designing with TurboCAD.

A standardized part is a component (part) or assembly that conforms to established industry or government published specifications. In essence, each standardized part (of a specific type) is identical and interchangeable.

Standardized parts include such things as fasteners, fittings, piping and bearings, to name but a few. They are generally purchased parts that a manufacturer, or other end-user, can purchase and integrate into their own designs, thus keeping development costs lower since these parts do not need to be produced from scratch.

There are many suppliers of standardized parts and many of these suppliers offer 3D models free of charge to all designers. The 3D models can be utilized during the development stage of any product and ensures that accuracy is achieved within the design.



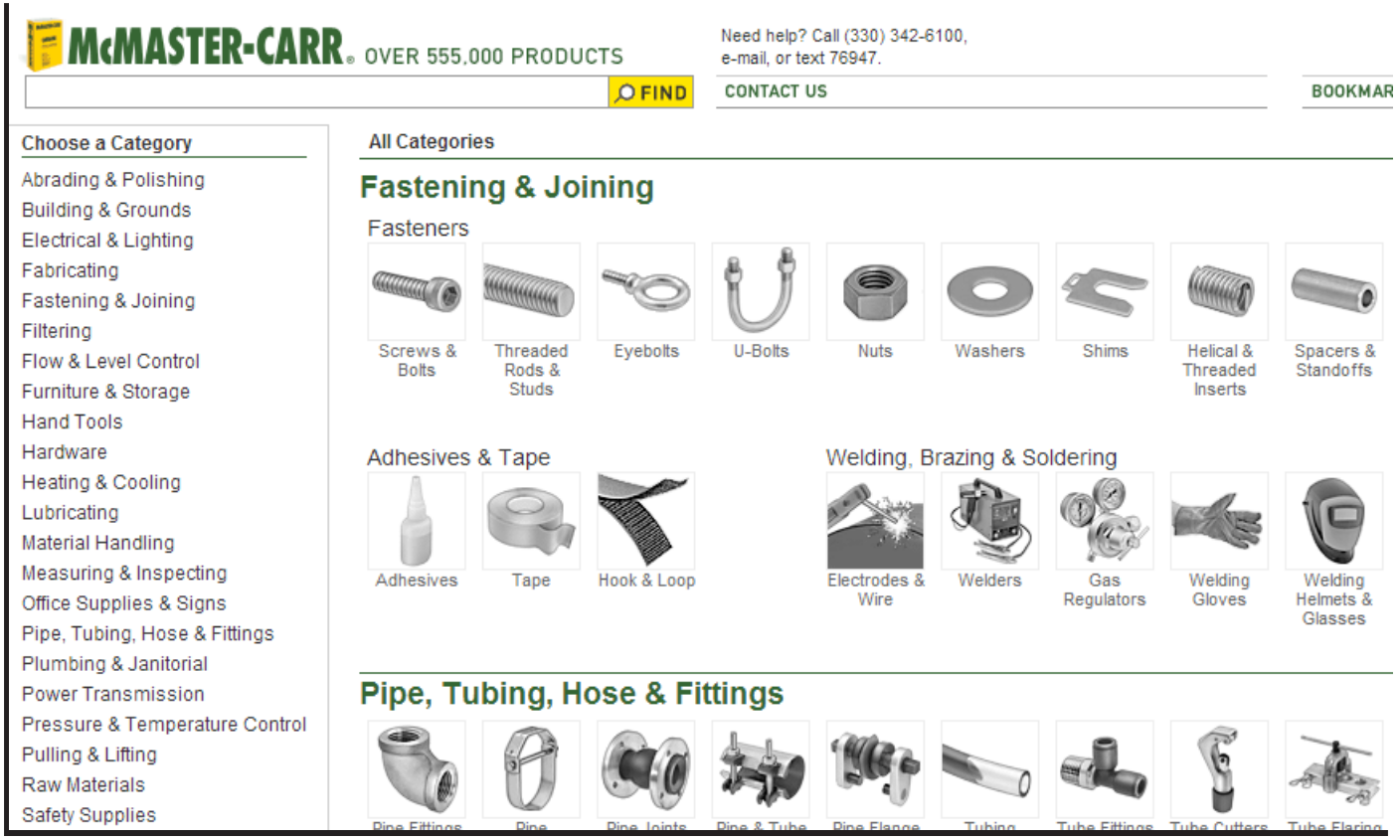
All the fasteners and bearings in this gear reducer are standardized parts from McMaster-Carr.

The best places to get 3D models of standardized parts is from places that specialize in this sort of thing, a place where one can be sure that the parts they are downloading are accurate. These places hope that their products will be specified in designs, so they work hard to ensure high quality.

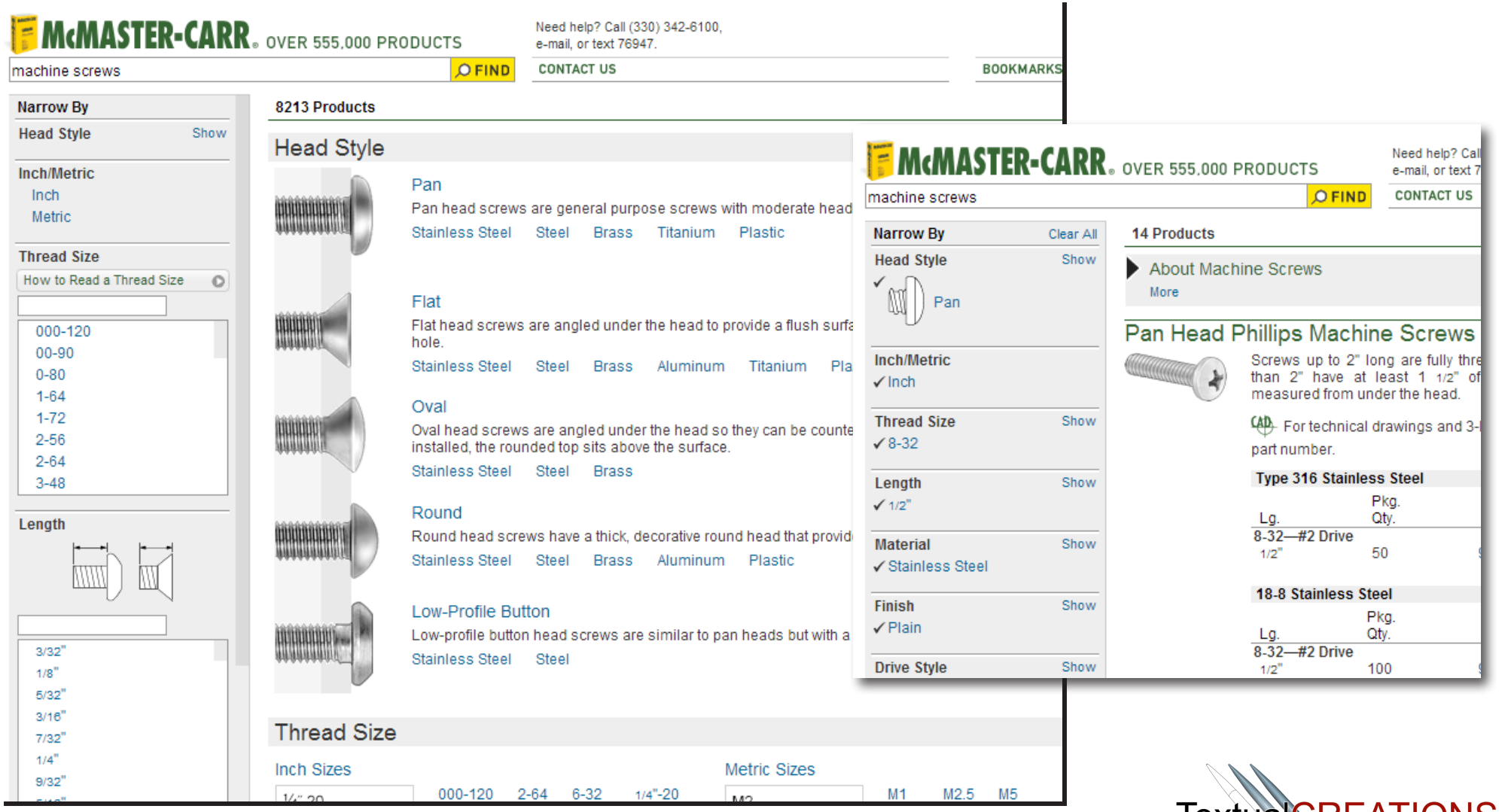
Using 3D models from places where any would-be engineer can post a model does not bode well in the trust department. The model may or may not be accurate, and really, there is no real way of knowing one way or the other.

One of Don Cheke's favorite places to get standardized parts from is McMaster-Carr. Unfortunately there is not a 3D model for all of their 555,000 products, but there are enough to consider them an excellent resource.

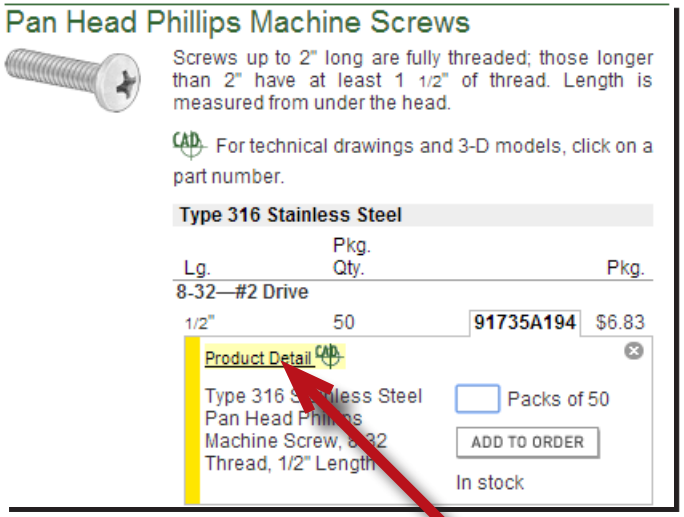
Visit: http://www.mcmaster.com/#

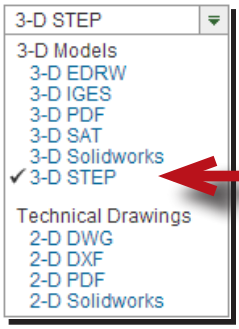


McMaster-Carr has a great user interface which helps to make part location fun and easy. Just select options to narrow parameters until a smaller selection is available for further viewing and drawing or model downloading.

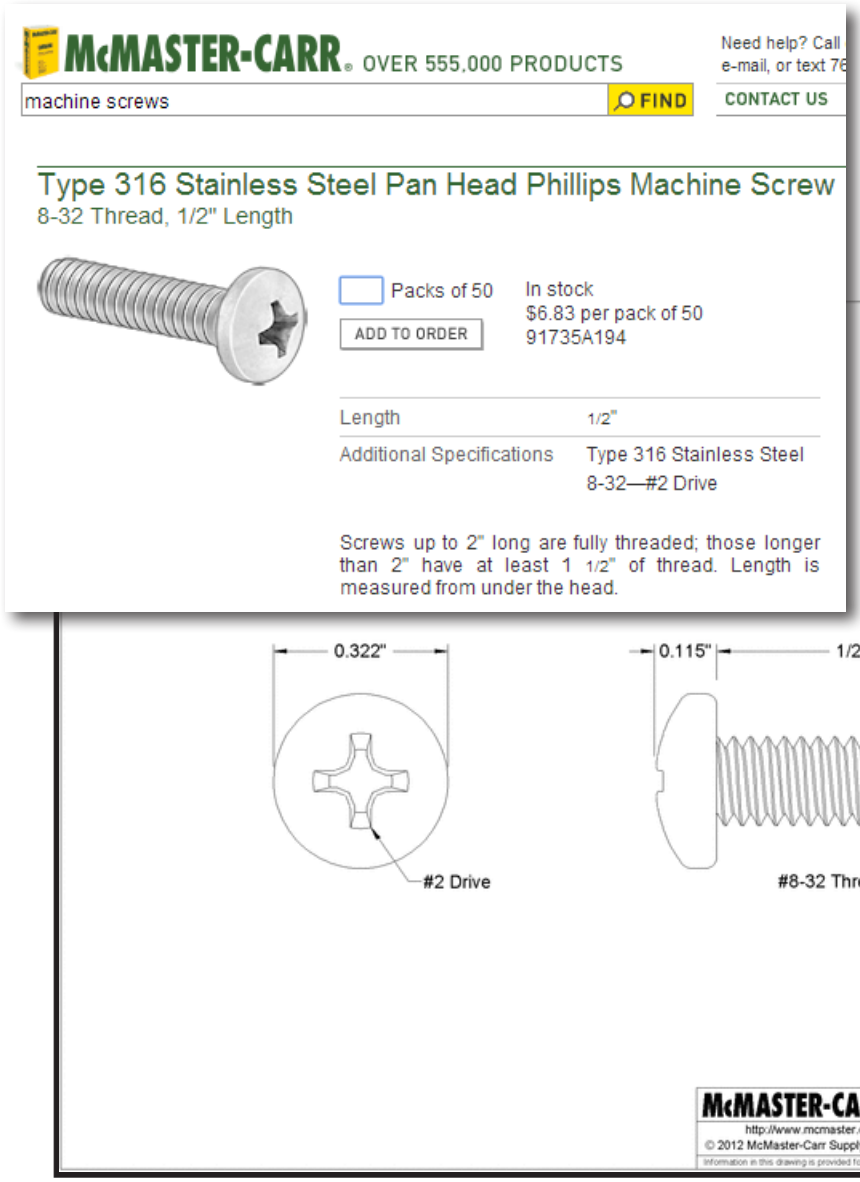


What is ideal about McMaster-Carr's models is the numerous 3D formats that are available and the 2D drawing(s) that accompany them.





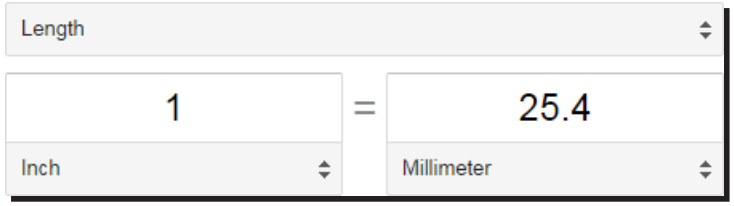
Select Product Detail to view 2D drawing and to download drawing and/ or 3D model.

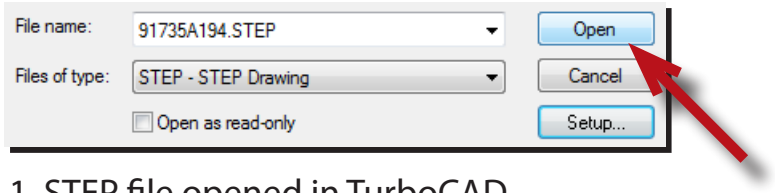


For use in TurboCAD STEP and SAT formats work best. IGES is not so good.

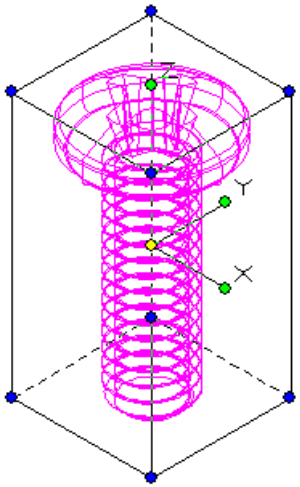
TurboCAD uses a different drawing units system that requires the user to adjust units for the STEP files downloaded from McMaster-Carr. The scale is always out by 25.4, which is the Imperial convertion to millimeters.

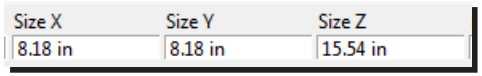
SAT files do not have this issue, but this issue is an important one to know about because when users export models from TurboCAD in these formats - for users of other programs such as SolidWorks, exporting may be off by 25.4. The TC user needs to make conversions to metric before exporting so the end user gets a model that reads the right size.





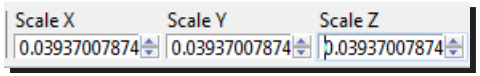
1. STEP file opened in TurboCAD.

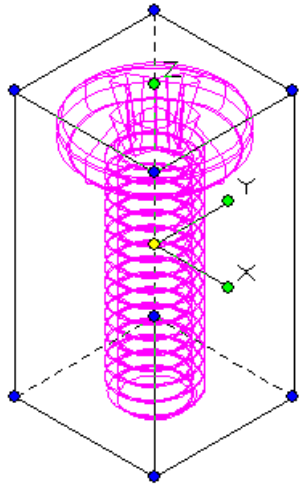




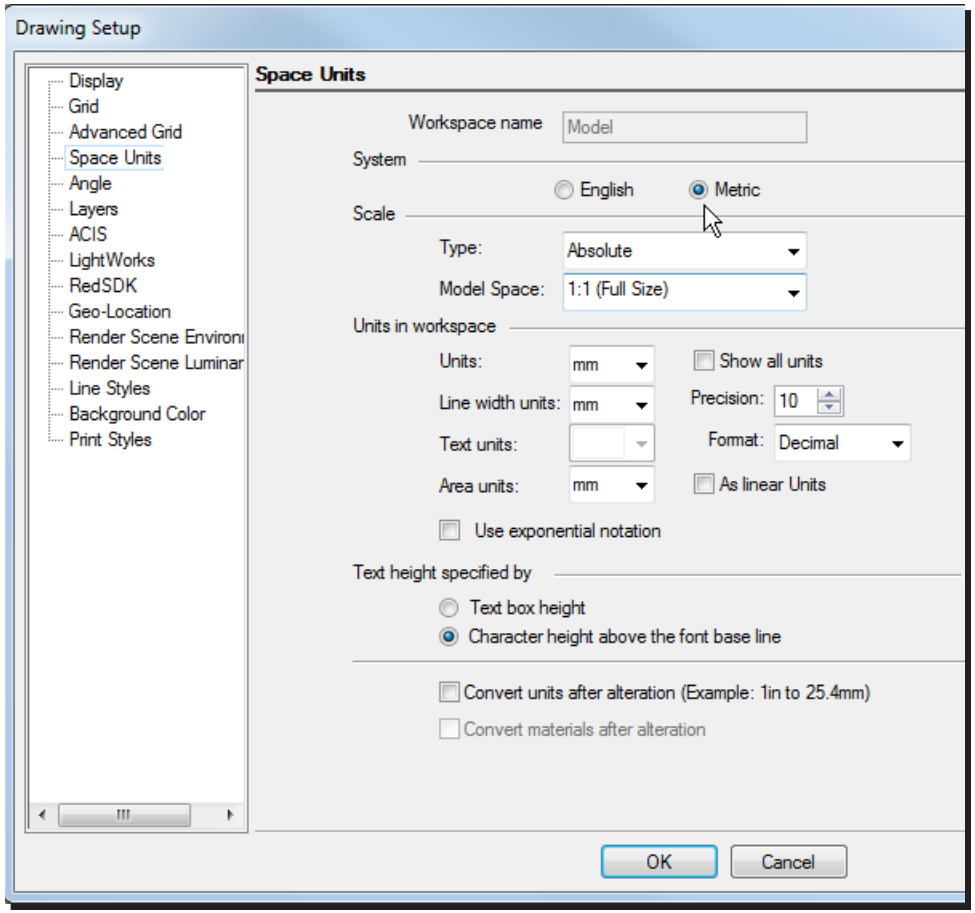
2. The part (a screw in this case) opens 25.4 times larger than it is supposed to be.

3. A user could just scale the object by 0.0393700787401575 (1 ÷ 25.4), but that is a hard number to remember without using a calculator and precision remains at two decimal places.

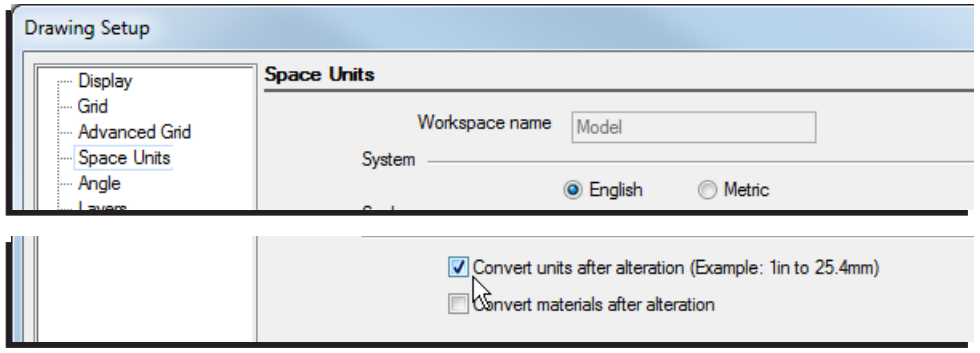


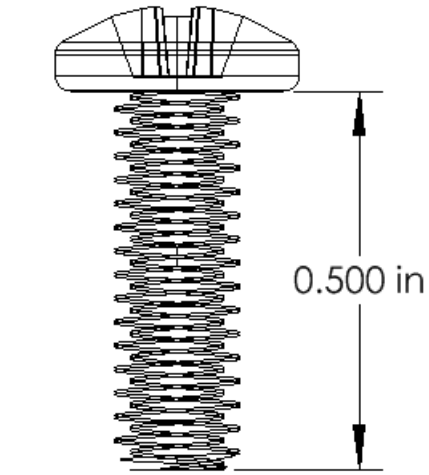


Don Cheke recommends opening the STEP file, opening Drawing Setup/Space Units, selecting Metric and increasing precision up from 2 (DBC always uses 10) and then clicking OK.



Don Cheke then recommends opening Drawing Setup/Space Units again, selecting Imperial, selecting "Convert units after alteration" and then clicking OK.



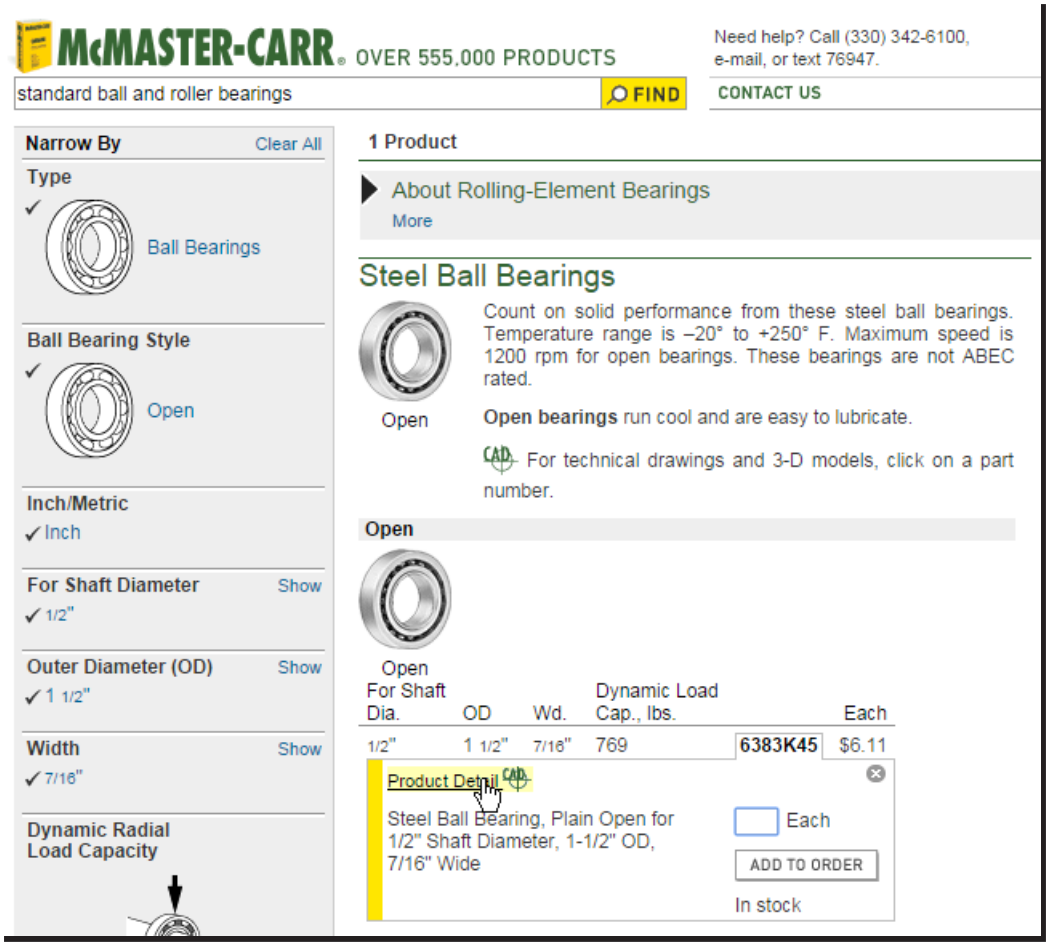


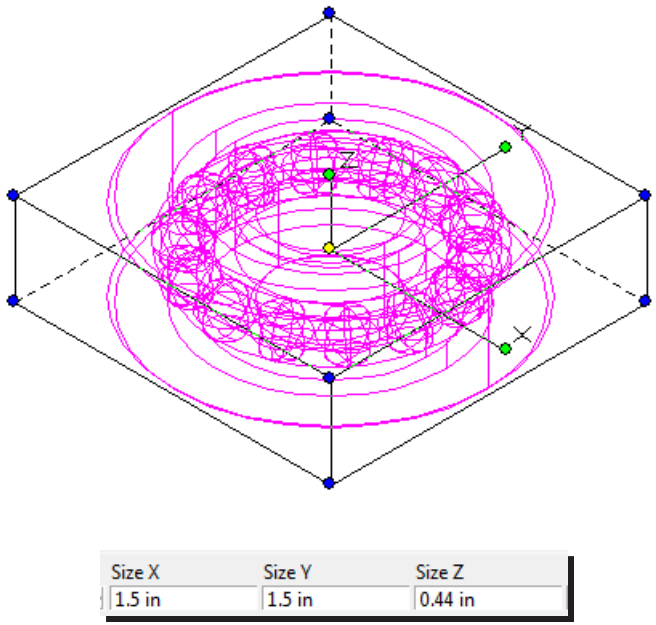
Size X	Size Y	Size Z
0.322 in	0.322 in	0.6119191125 in

The part is now at the correct scale in Imperial units.

If metric is the desired drawing unit just select metric under space units again, ensure "Converts units..." is checked and click OK.

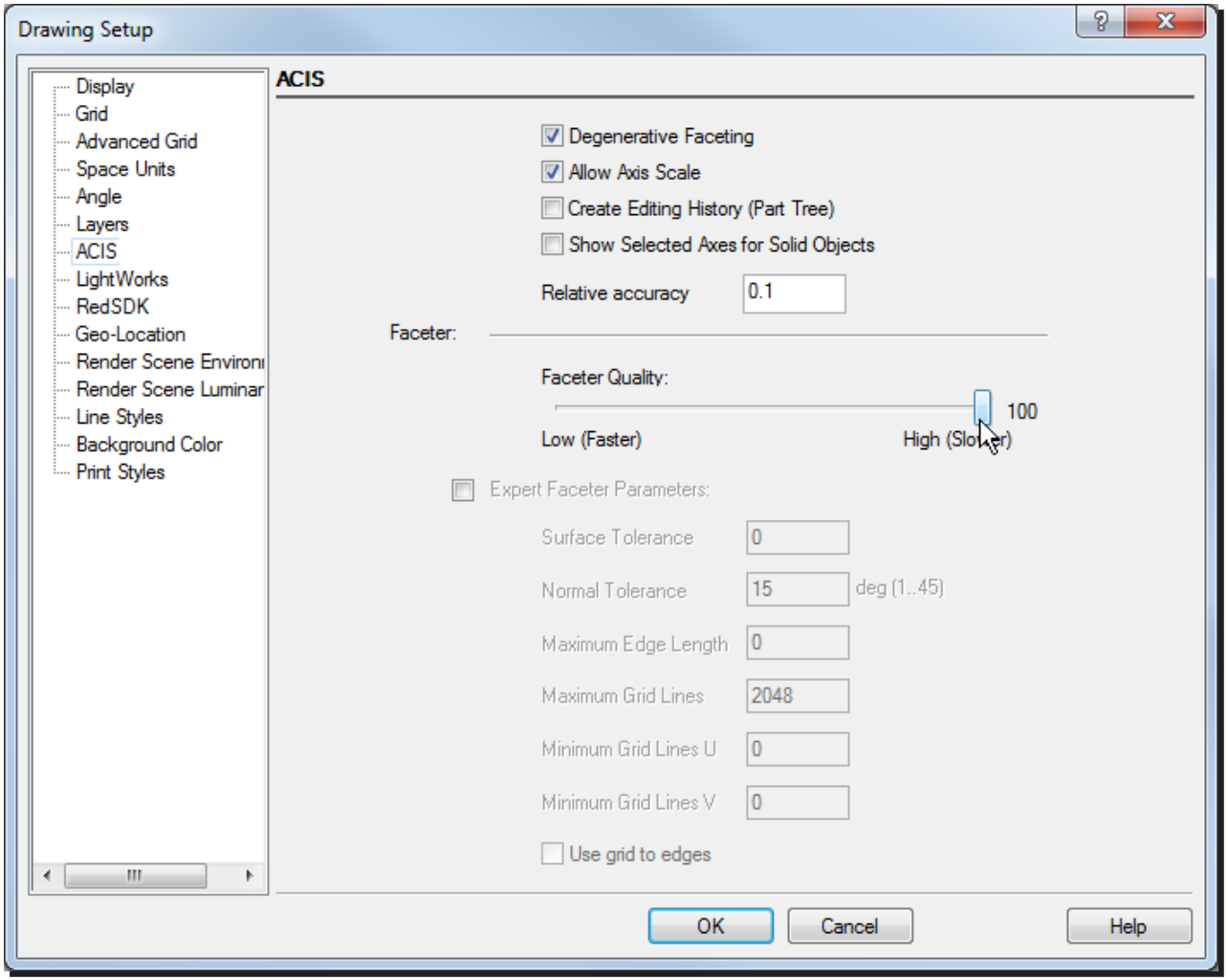
As mentioned earlier, SAT parts do not seem to have the drawing units issue that STEP does.

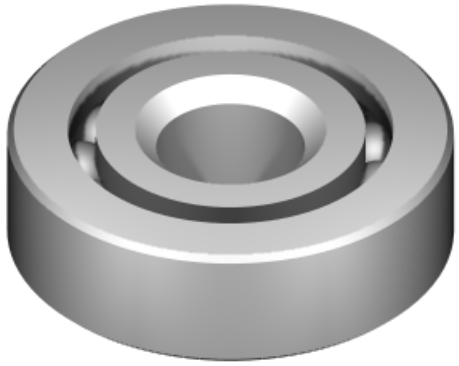




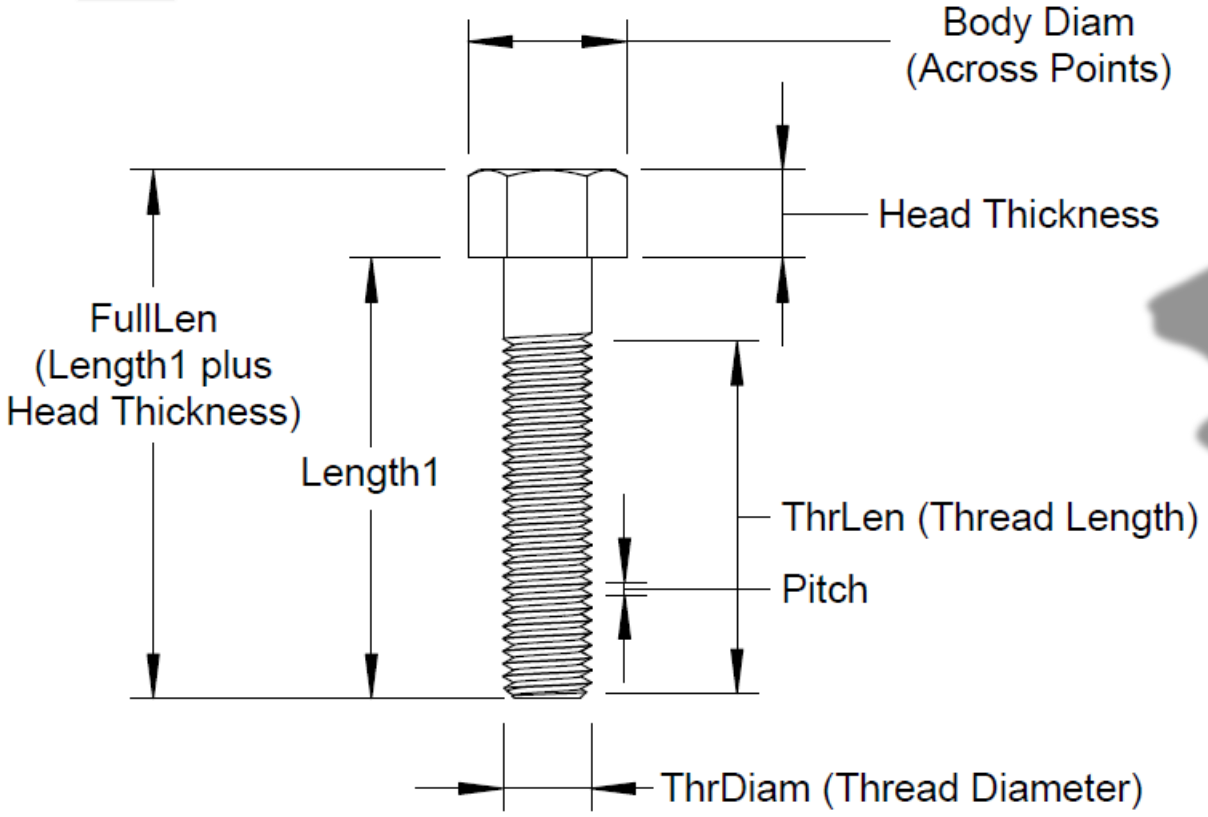
Part opened and selected.
Steel Ball Bearing
Plain Open for 1/2" Shaft Diameter, 1-1/2" OD, 7/16" Wide

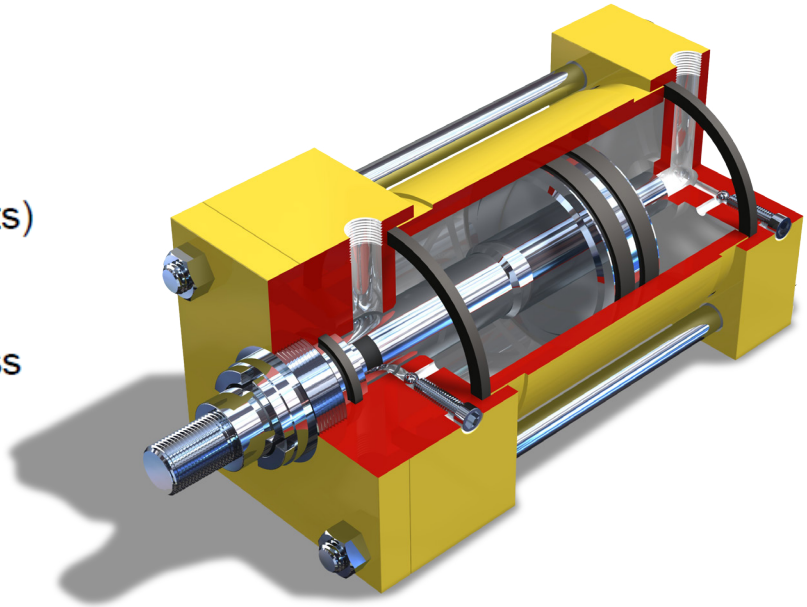
Like STEP files, one would do right to increase precision and set a higher ACIS to smooth curve generation.





Keep in mind that the TurboCAD user does have many tools to help create those non-standard parts when required. One such tool is the Thead3D tool.





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