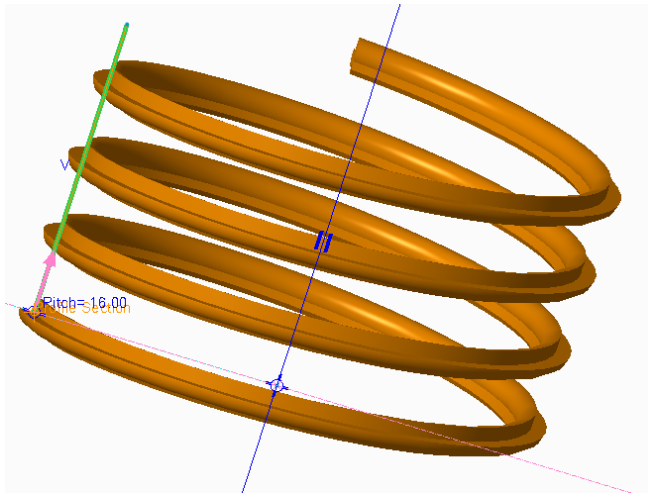
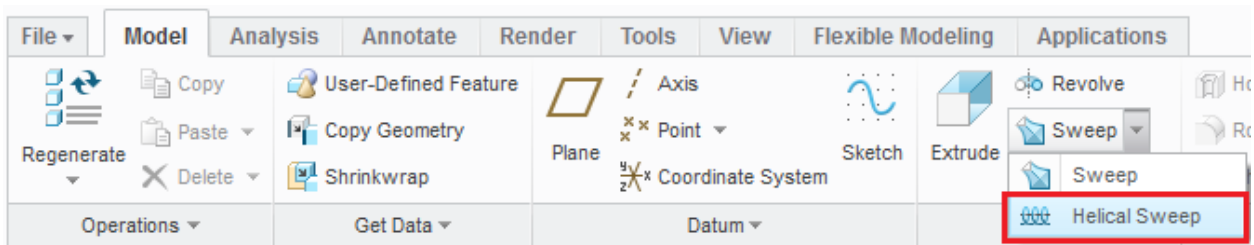


Helical sweeps are used to create features such as threads and springs. In this document we will demonstrate the creation of a swept helical cut. It should be noted that the same process, with minor alteration, can be used to create helical swept protrusions. Images of helically swept objects can be found on the last page of this document.

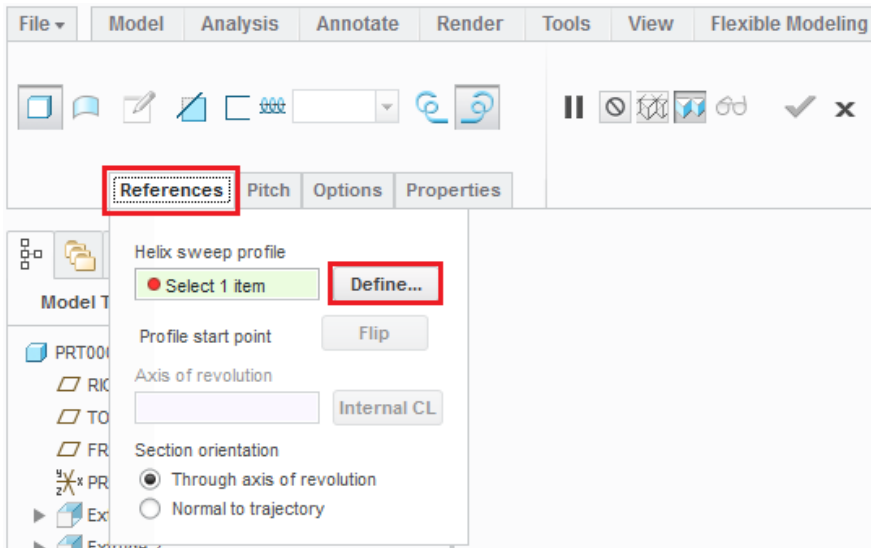


We must define a trajectory, a section, and a pitch to create a helical sweep. The trajectory, shown in green in the image above, defines the path along which the section, or the profile of the thread, will be swept. The pitch defines the center-to-center distance between sections along the trajectory.

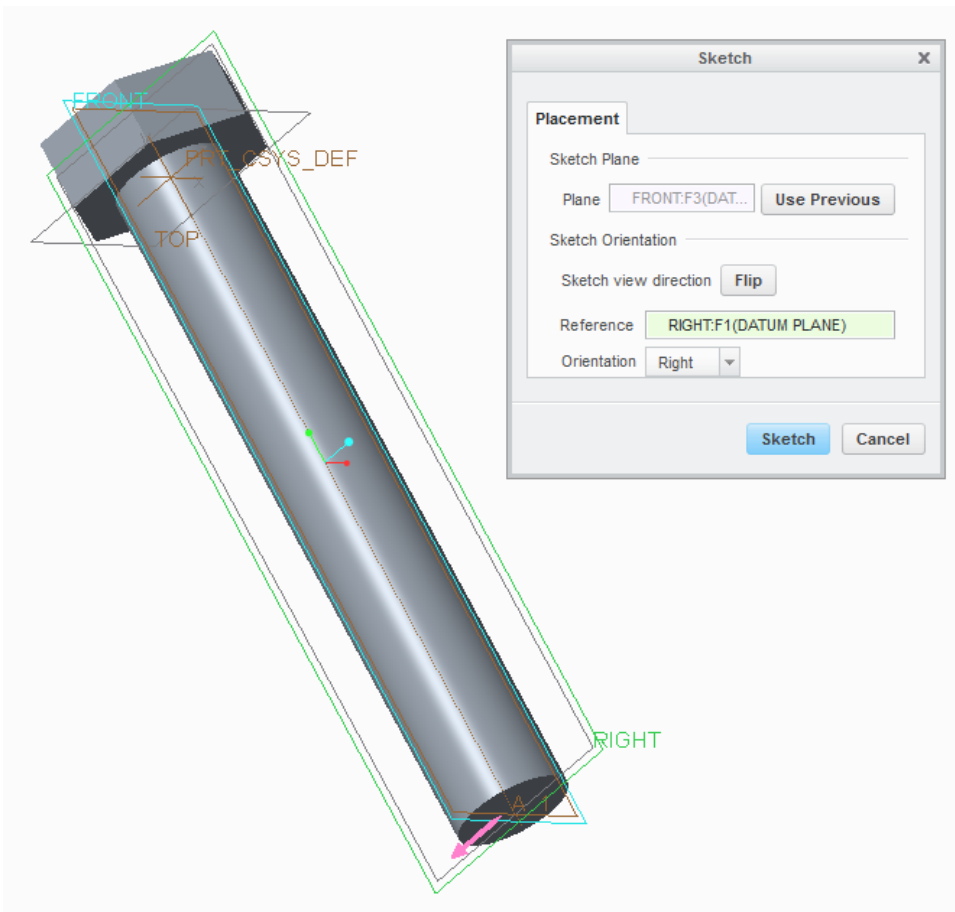
- 1) With your part open and ready for a new feature, navigate to the "Model" ribbon and select "Helical Sweep" from the "Sweep" menu.



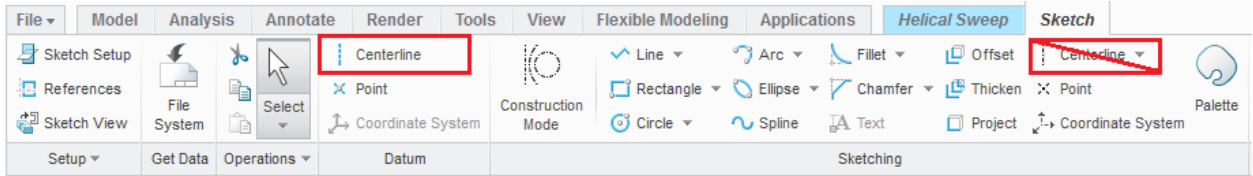
- 2) Define the trajectory by selecting the "References" tab and clicking "Define...".



- 3) Select a sketch plane that contains the axis around which you would like create your helical sweep or thread. This is typically a datum plane.



- 4) Click "Sketch" and then click "Sketch View" to properly orient your sketch.
- 5) Draw a geometry centerline where you would like the axis of revolution. Recall that geometry centerlines are used to create axis for revolved features.

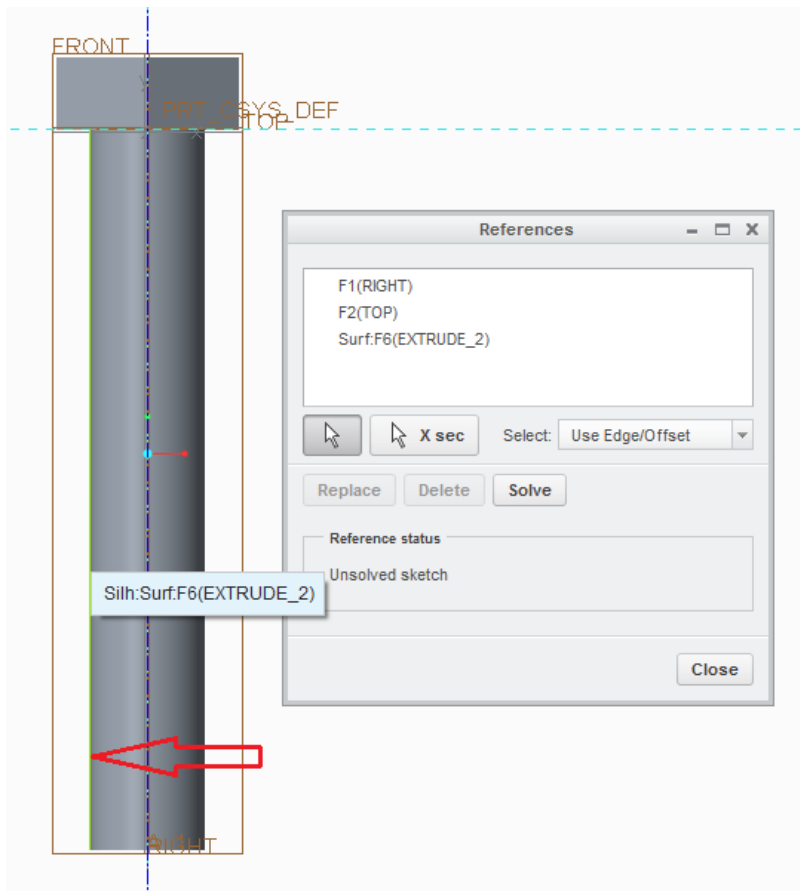


- 6) Define the round, outer surface of the bolt as a sketch reference.

If you are constructing an internal thread, set the inner surface as a sketch reference. To view the inner surface, set the visibility to "Wireframe" (via the "Display Style" button on the "View" ribbon.)

Note that a surface sketch reference is not required (and not needed for springs or other helical features). However, in the case of a thread it is quite useful. Defining the bolt's surface as a sketch reference ensures that the thread "stays with" the surface if we decide to change the bolt's diameter.

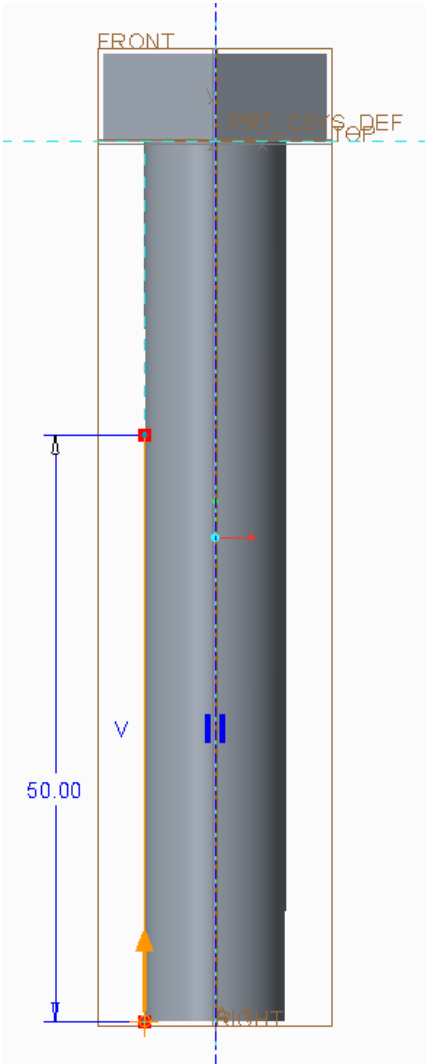
- a. Click "References" under the "Sketch" ribbon and select the appropriate surface reference.
- b. Click "Close".



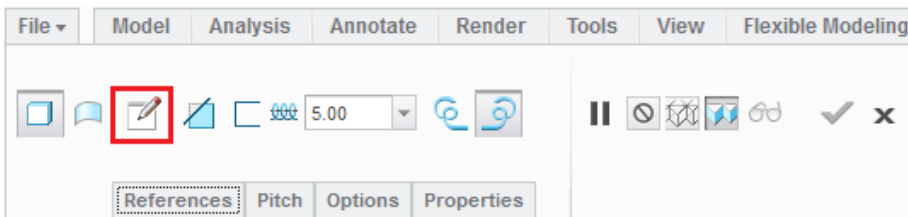
- 7) Sketch a line for the trajectory for your helical sweep. The orange arrow will indicate the starting end for the sweep.

Note that the trajectory should be an open sketch. Creo will indicate that the sketch is not closed by displaying red dots at the ends of the trajectory.

- 8) Click the green checkmark to confirm the sketch.

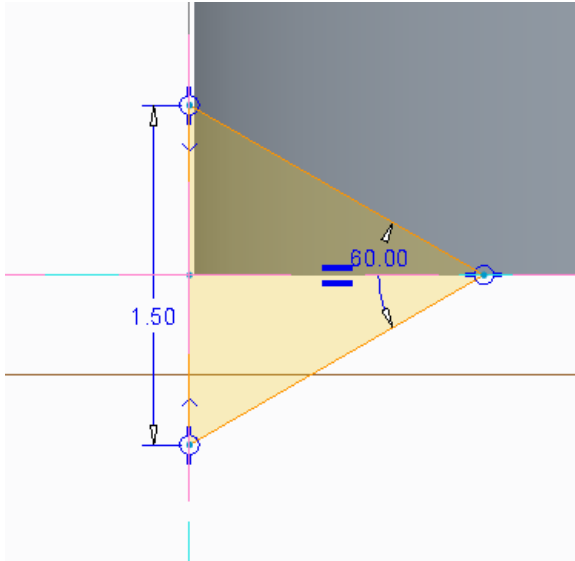


- 9) Click the "Create or edit sweep section" icon to define a section for your sweep.



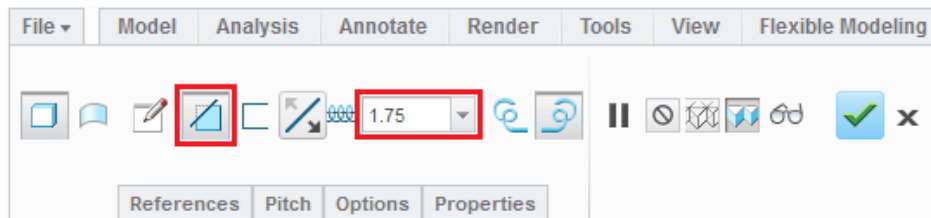
- 10) Click "Sketch View" to properly orient your sketch. Sketch your sweep's section at the intersection of the horizontal and vertical pink lines.

Be sure to create your sketch on the correct side of the vertical pink line. If you are cutting a thread (removing material), the section should be placed so that it removes material. If you are extruding a thread or a spring, ensure that the sweep will be created where there is currently no material. The section shown below is for a cut thread.



- 11) Confirm your section by clicking the green checkmark.
- 12) Click the "Remove material" button, you are creating a swept cut. Enter an appropriate value for your pitch.

Note that the pitch value must be greater than or equal to the largest dimension of your section as measured along the trajectory. Note that in this case the pitch, 1.75 (image below), is greater than the width of the thread, 1.50 (image above). If the pitch is too small, Creo will not create the helical sweep.



- 13) Confirm the helical sweep by clicking the green checkmark.
- 14) A final image of the bolt and some other helical sweep examples can be found on the following page.

Helical Sweep Examples

