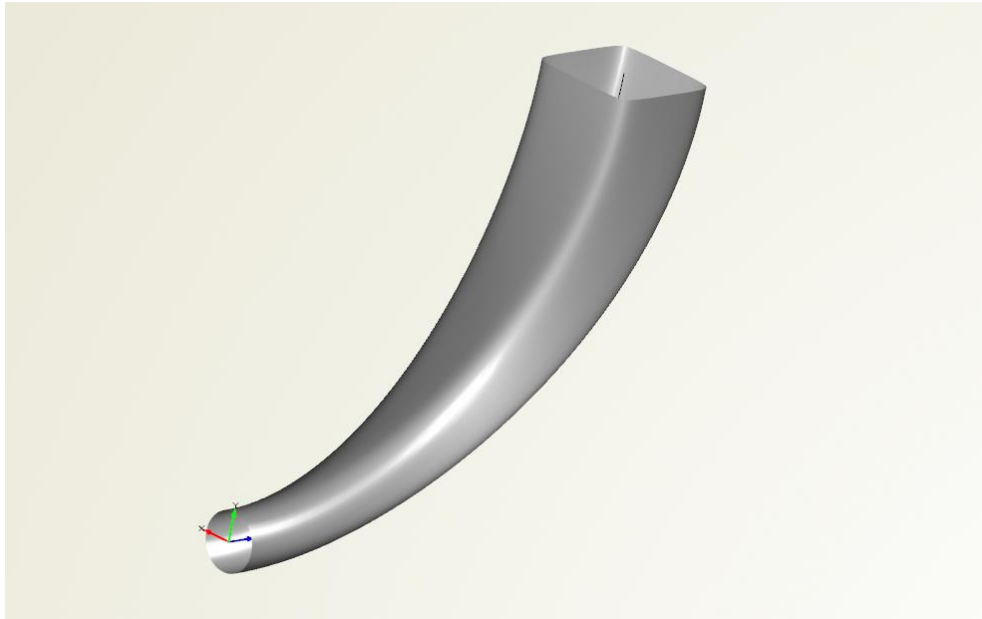# Tutorial

CAESES

Sweep Surface

In this tutorial a simple *sweep surface* is created. Two contour curves are utilized so that one curve definition blends into the other.

The parametric contour from the previous tutorial is used and the shape is controlled by the contour parameters, respectively.

More advanced sweep surfaces can be designed by using the *sweep transformation*. In combination with a *meta surface*, this transformation allows you to control the 2D contour parameters in sweep direction when generating the sweep surface. See the corresponding *meta surface* tutorial for more information.

CAESES Project

The resulting model can be found in the section *samples > tutorials* in the documentation browser.

Contour Curve

1

We will use the contour curve from the previous tutorial. By changing the parameters, the contour can generate various 2D shapes such as a circle, ellipse or rectangle.

▶ Choose *file > open sample > tutorials > 11_Parametric_Contour.fdb*.

▶ Choose *file > save project as* and save the project with a new name.
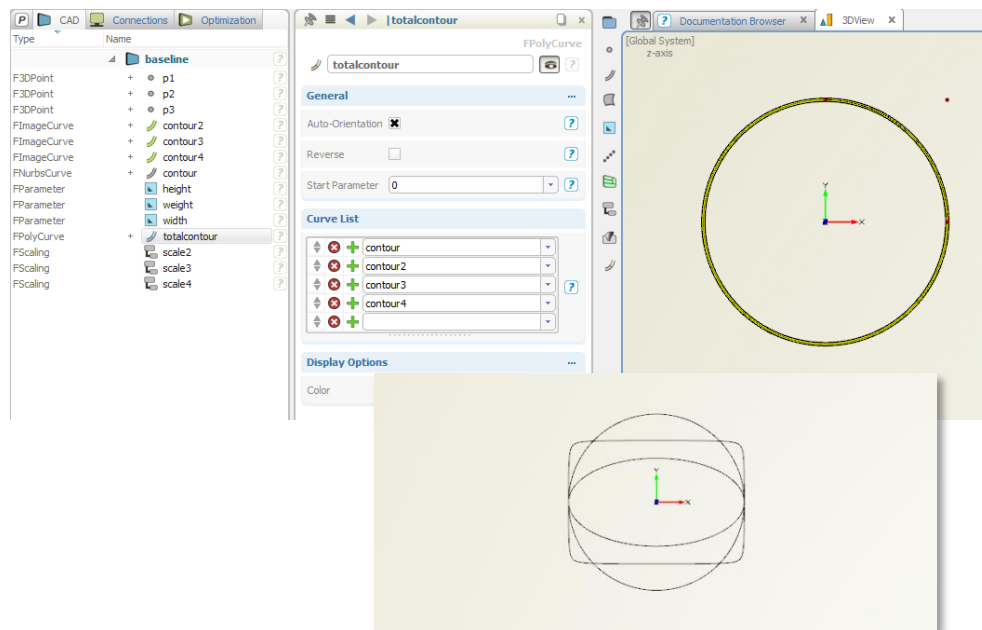
2 Second Contour

We would like to create a surface where we blend from a starting contour "A" into a second, terminating contour "B". In this step, we create the second contour.

► Select all objects in the *CAD* tree and create a scope via *CAD > scope.*

► Set the name of the new scope to "A".

► Copy & paste scope "A" and rename the second scope to "B".

► Set the values of "height" and "width" (of scope "B") to "2".
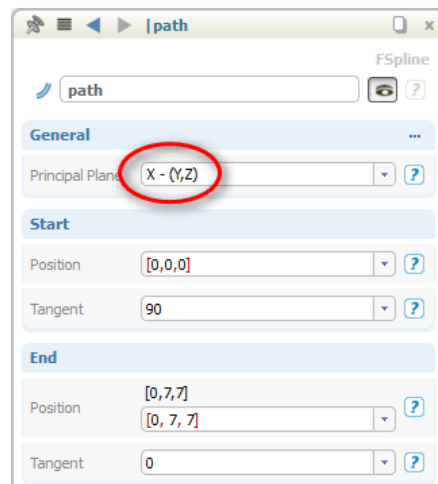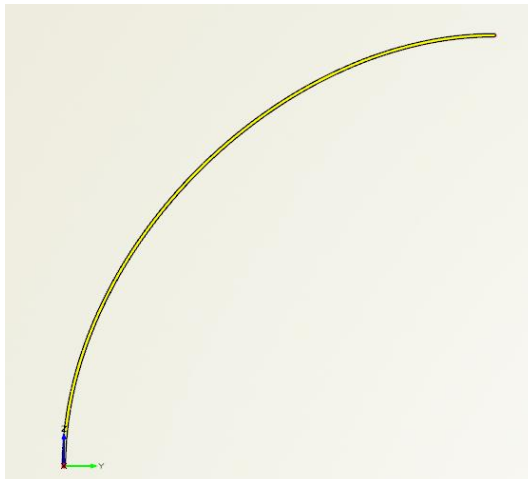
► Set the value of "weight" (of scope "B") to "5".
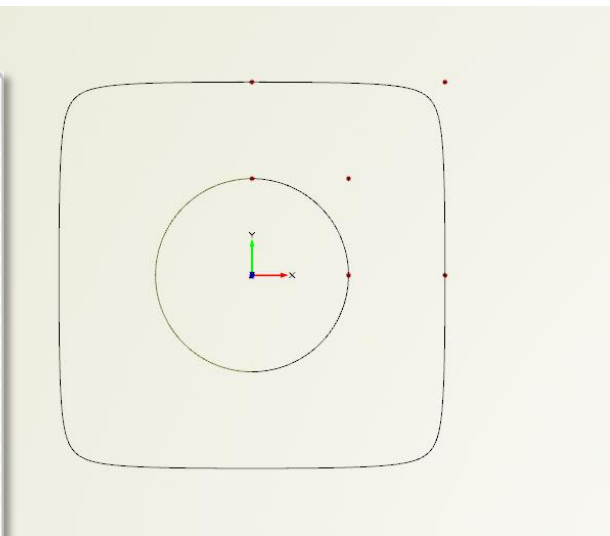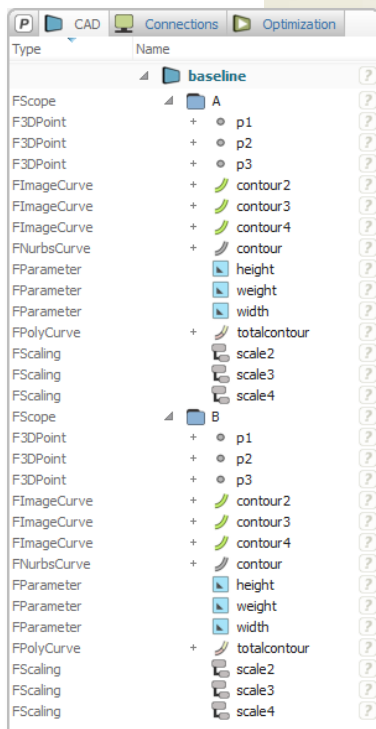
3 Sweeping Path

For the sweep path any curve type can be used. We will create a smooth curve for which the tangent angles at the start and end position can be controlled:

► Switch to the yz-plane view by clicking at the x-button of the 3D view.

► Choose *CAD > curves > f-spline curve* and set the name of the new curve to "path".

► Set *principal plane* to "X – (Y,Z)".

► Set *start position* to "[0,0,0]".

► Set *end position* to "[0,7,7]".

► Set *start tangent* to "90".

► Set *end tangent* to "0".
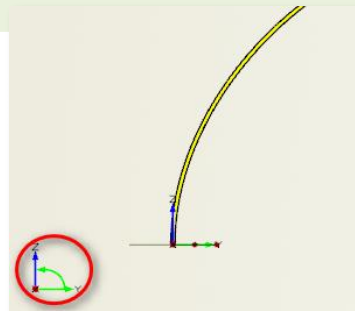
Sweep Surface

The contours as well as the path are ready. In this step, a *sweep surface* is created:

► Choose *CAD > surfaces > sweep surface* and name the new surface "sweep".
► For the attribute path, select the curve "path" either via pull-down menu of the attribute or by using drag & drop (note the curve name "path" matches the attribute name only by coincidence).
► Set *profile mode* to "both in start plane".

✓ The second *profile mode* "different planes" allows you to model the second contour directly at the terminating position. In general, at least one contour is required – the second is optional.

► For *start profile*, set "A|totalcontour".
► For *end profile*, set "B|totalcontour".
► Set *U* and *V resolution* to "50", respectively (category *display options*) for a smoother visualization.
► Change the profiles' contour parameters in order to modify the shape.

✓ The render resolution does usually only effect the visualization. Exception: This visualization is also taken if you select the surface and export it using the STL format. Note that more control of STL output files is given by *trimeshes*, see the corresponding tutorials (e.g *Basic Preprocessing*).
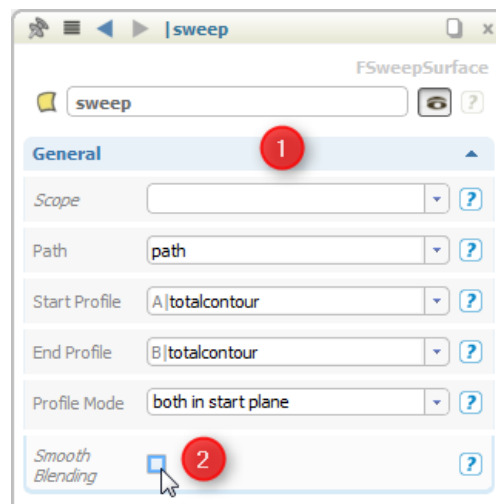
Blending Method

5
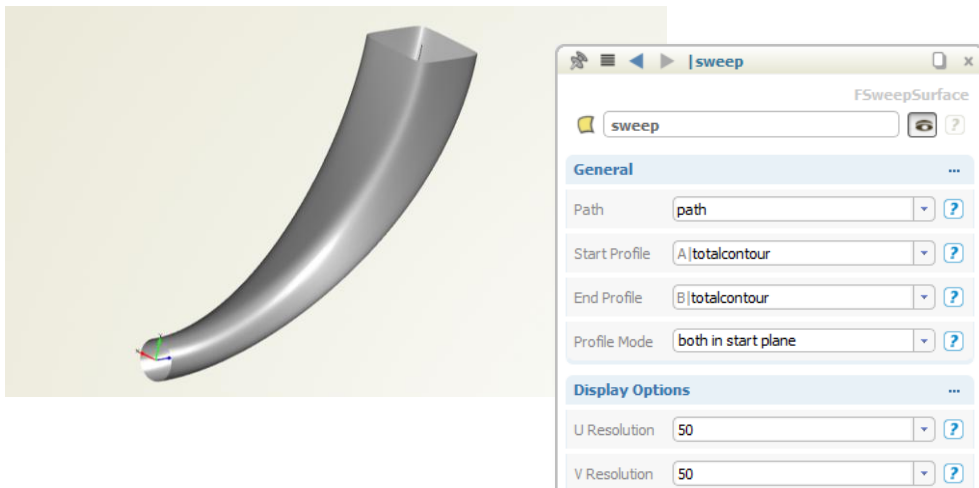
By default, the blending method from one contour into the other is a function with a smooth transition. If you like to use a *linear* blending, do the following steps:

► Click at the category header *general* of "sweep".

► Deactivate *smooth blending*.

✓ Often the path curve is hidden and cannot be accessed interactively. Use the wireframe mode of the 3D view in order to show and access the hidden curves.