



KEYCREATOR®

TIPS AND TRICKS



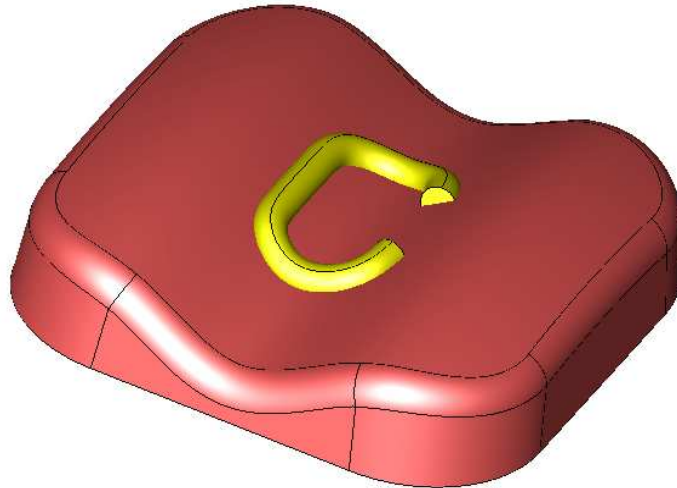
KUBOTEK
FREEDOM AND PRECISION
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Mapping Shapes to Surfaces

There are times when you want to map text or a design curve to a surface on a part. I've illustrated a box cover to the right that has an undulating surface and a pipe form that lies on the surface, tracing the path made by the letter "C."



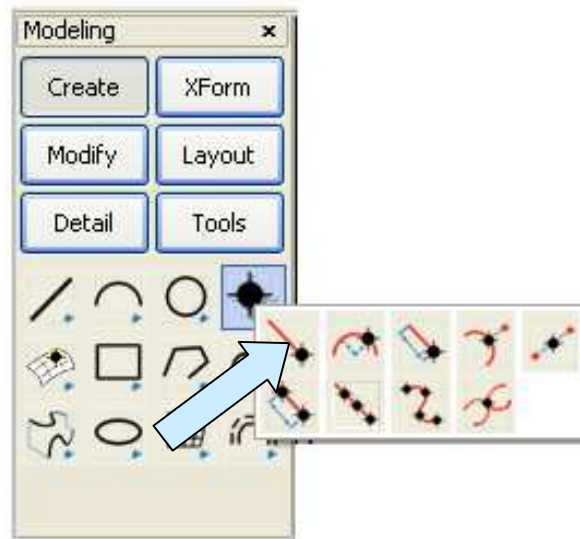
In this exercise we'll work through the steps required to create this and point out some pitfalls to avoid along the way.

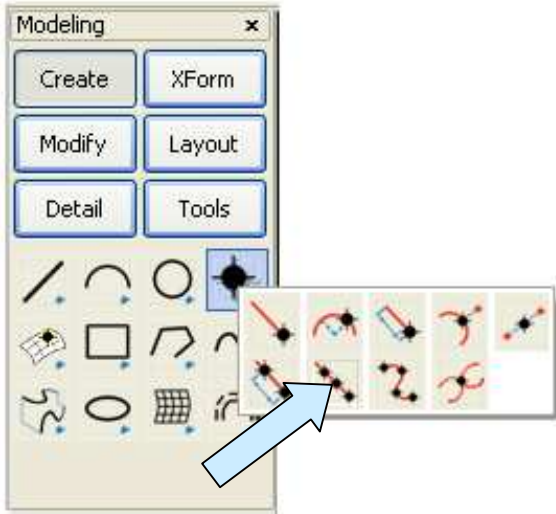
We'll start with a new file in View 1. (The Top View.)

Click on the CREATE RECTANGLE BY WIDTH HEIGHT Icon and make a rectangle that is 4 inches wide and 4 inches high. You can use any Anchor Option and place it anywhere on the screen.

Next, click on the CREATE POINT AT A POSITION Icon.

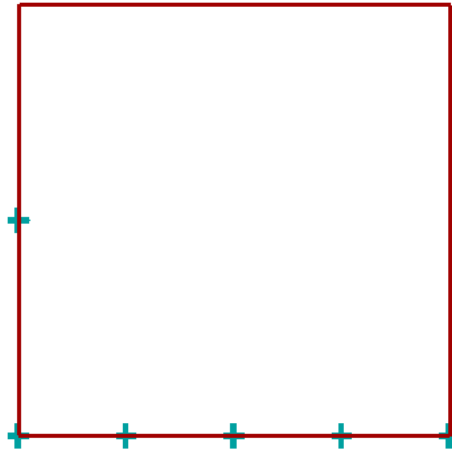
Using the CtrMid Option, click on the left side of the rectangle.





Now, click on the CREATE SPECIFIED NUMBER OF POINTS Icon.

Type 4 and click on the bottom edge of the rectangle.



Your screen should now look like this: (You'll see in a moment what the points are for.)



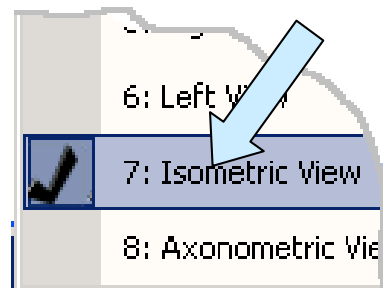
Click on the XFORM DELTA JOIN Icon.

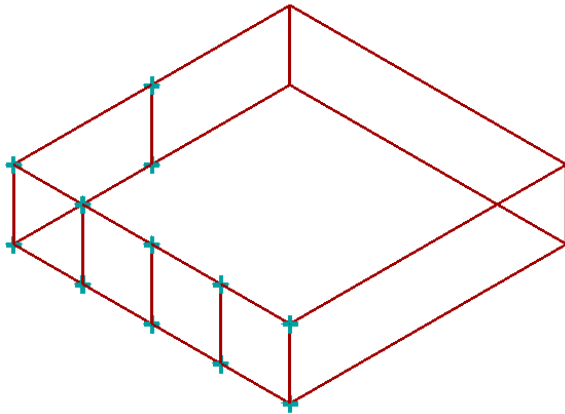
Click on the ALL DSP Option and then on the ALL Option. Hit the ENTER Key.

Type 1 for the Number of copies and hit the ENTER Key.

Now, hit the ENTER Key twice, type 1 for the dZC Value, and hit the ENTER Key once more.

Now, switch to the Isometric View. (View 7.)



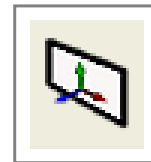


Your screen should look like this:

Notice that each point generated a tiebar when we used the Xform Delta Join Operation.

These tiebars will make it easy to create the two control curves we need to define our surface.

Establish a Construction Plane on the left side of this spatial grid.

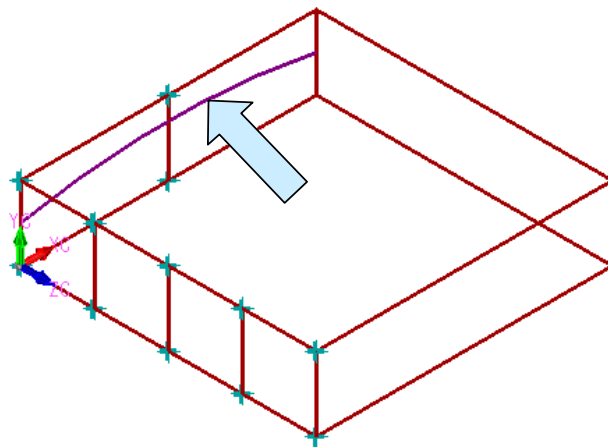


Then, click on the ARC BY THREE POSITIONS Icon.

Using the CtrMid Option, click on the left, front edge of the grid.

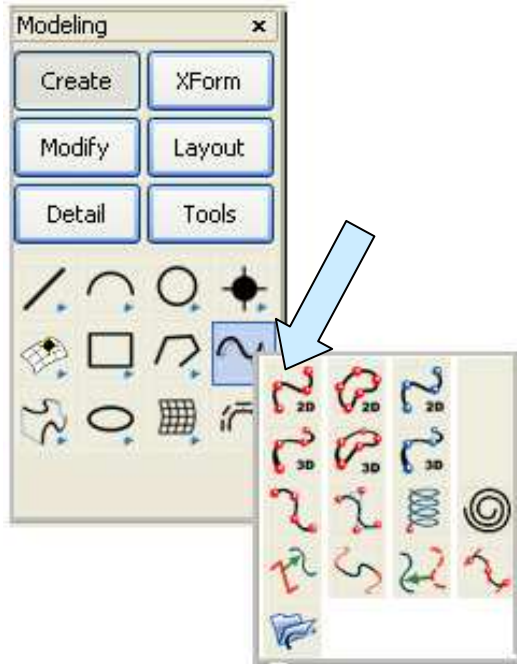
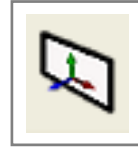
Then using the AlongE Option, click on the top end of the middle vertical line on the left side of the grid. Type 0.3 for the Distance.

Using the CtrMid Option, click on the left, rear vertical corner of the grid.



This creates a curve on the left side of the grid that look like this:

Establish a Construction Plane on the front face of the grid.



Now, click on the 2D OPEN CUBIC SPLINE Icon.

Using the CtrMid Option, click on the left, front vertical edge of the grid.

Next, using the AlongE Option, click on the top end of the second vertical line from the left on the front grid face and type 0.3 for the distance.

Still using AlongE, click on the bottom end of the next vertical line and type 0.3 for the distance.

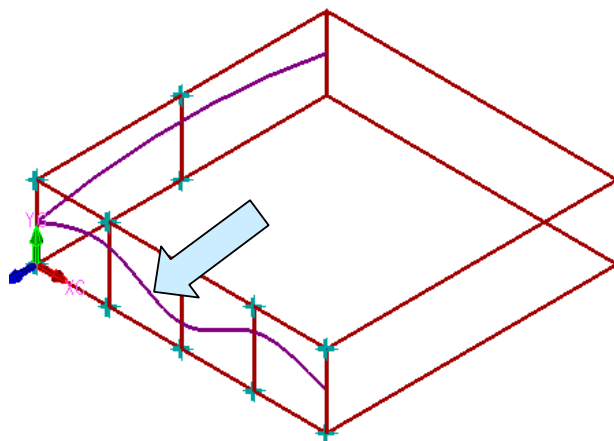
Next, using the AlongE Option, click on the top end of the next vertical line and type 0.3 for the distance.

Finally, using the CtrMid Option, click on the right, front vertical edge of the grid.

Click on the DONE Button and then click twice on the NATURAL OPTION.

You will now have a spline on the front face of the grid. (Notice how the vertical lines created by the points that we made earlier simplified creation of the spline and arc. This is a great technique to use when you need to digitize curves for construction purposes.)

Your screen should now look like this:

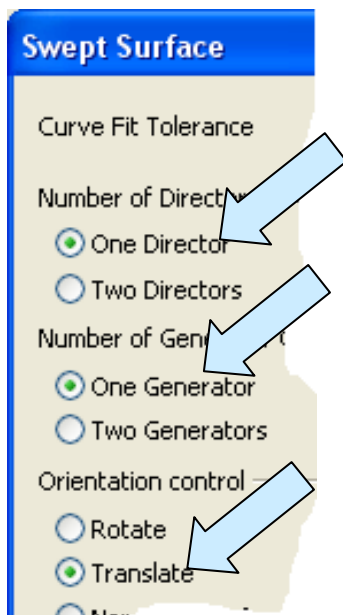




Select a new Construction Color.

Now, click on the SWEPT SURFACE Icon.

A Dialog Box appears.



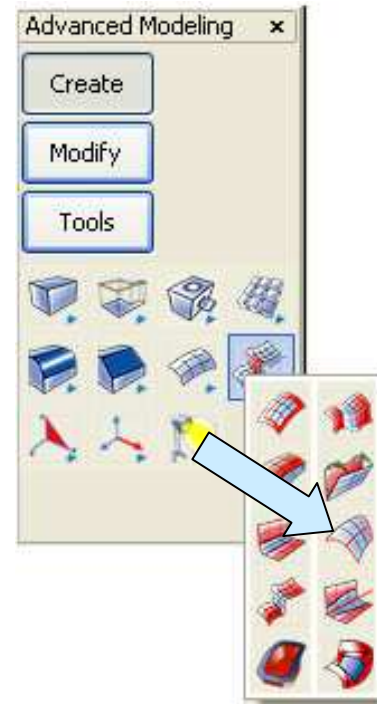
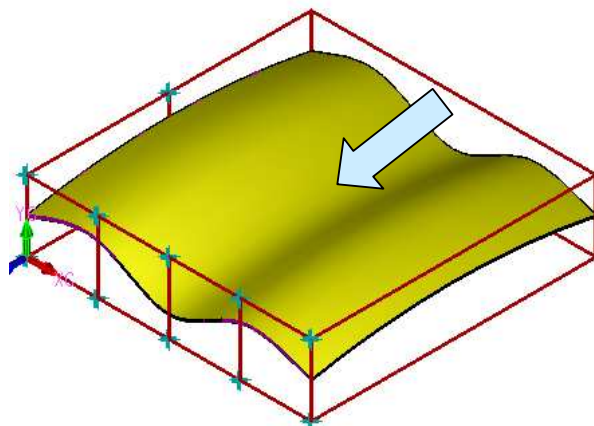
Click on the One Director and One Generator Options.

Click on the Translate Option and hit the ENTER key.

Click on the arc and then using the EndEnt Option, click on the front end of the arc.

Next, click on the spline and using the EndEnt Option click on the left end of the spline.

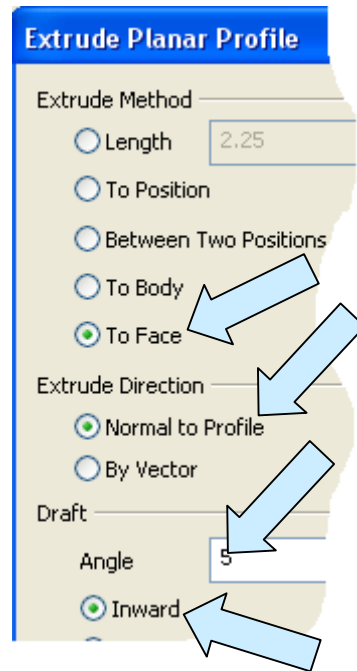
You will now have a surface that looks like this:





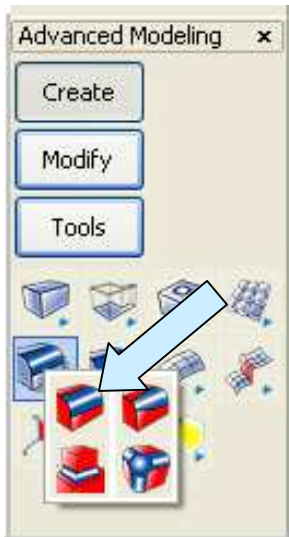
Click on the EXTRUDE Icon.

A Dialog Box appears.



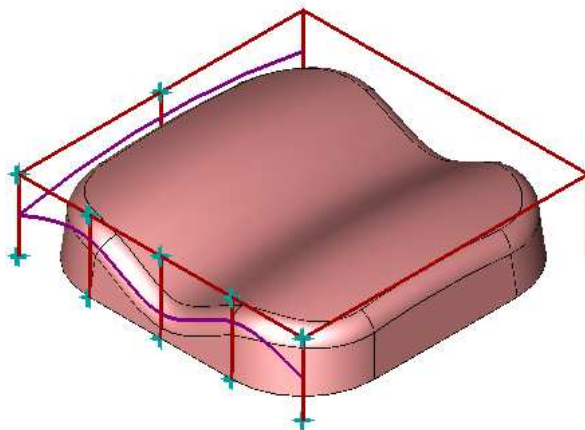
Select the To Face Option. We'll extrude Normal to the profile. Type 5 for the Draft Angle and select the Inward Option. Hit the ENTER Key.

Select the four bottom edges of the grid and hit the ENTER Key. Click on the upward-facing vector and then click on the surface that you just created.

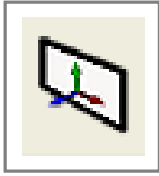


You will now get a solid with a top undulating surface that matches the control surface that you made earlier. You can now either delete the original surface or remove it from the display by placing it on another level.

Use the CONSTANT RADIUS BLEND Tool to create 1 inch radius blends on the four near-vertical corners of the solid. Then, create a 0.25 inch radius blend around the top edge.



Your part should now look like this:



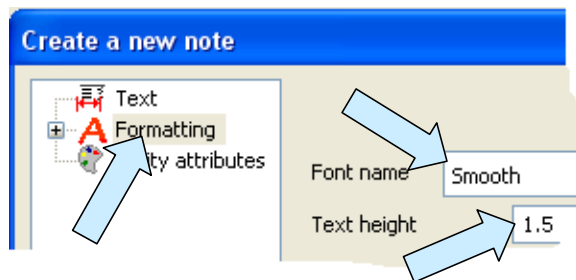
Click on the CONSTRUCTION PLANE Icon.

Then, click on the left end of the top, front edge of the grid and the bottom end of the top, left edge of the grid.

Next, click on the CREATE NOTE BY TYPING Icon.

Type the capital letter “C” for the note.

Click on the Formatting Option and use a smooth Font, making the Text Height 1.5 inches.



Now, to locate the letter, click on the TwoPos Option on the Conversation Bar.

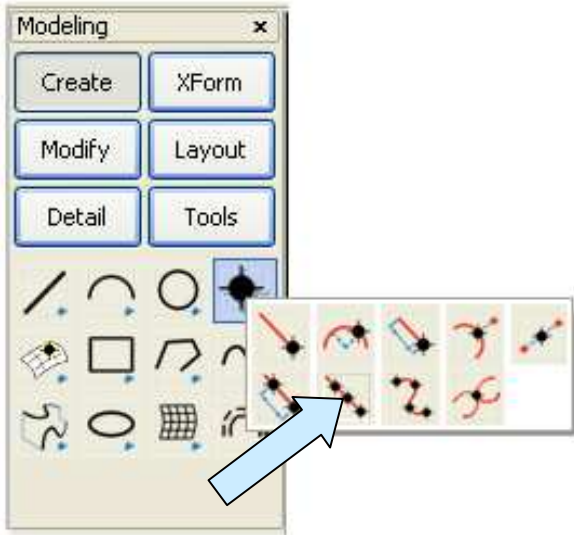
Using the CtrMid Option, click on the top, left edge of the grid and then on the top, right edge of the grid. This centers the letter on the grid.

Now, we’re going to turn the letter into geometry. You could have done this right in the Note Dialog Box by clicking on the “Create as Geometry” Option below the entry field.



Instead, we’re going to do this now by clicking on the GENERIC BURST Icon. Then, click on the letter C. The letter is changed into two polylines.

Now, if we tried to use this geometry directly for our next operations, the lack of smoothness would create problems. So we’re going to take a moment to create a smooth spline that follows the shape of the two polylines.

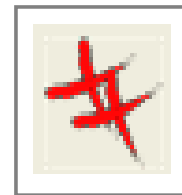


Click on the CREATE SPECIFIED NUMBER OF POINTS Icon.

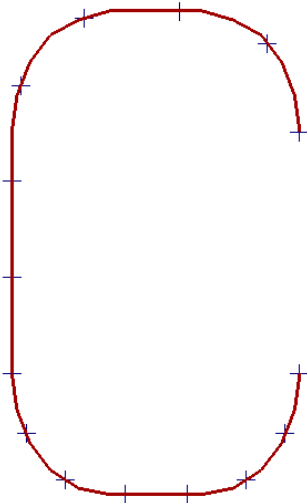
Type 7 for the Number.

Click on the top polyline that makes up part of the original “C.”

A series of points is mapped on the polyline.

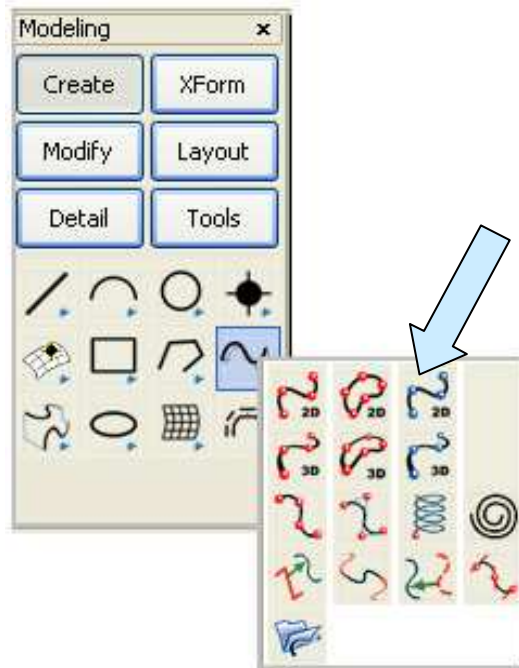


Delete the bottom-most point.



Then, use the CREATE SPECIFIED NUMBER OF POINTS Function again to make points on the bottom polyline. Zoom in on the polylines and points.

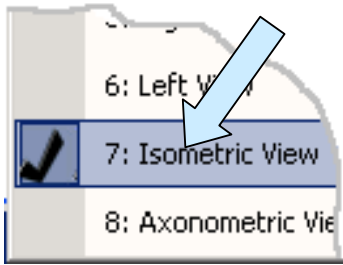
Your screen should look like this:



Now, click on the 2D AUTO SPLINE Icon.

Select the first point at the top end of the “C” and the very next point.

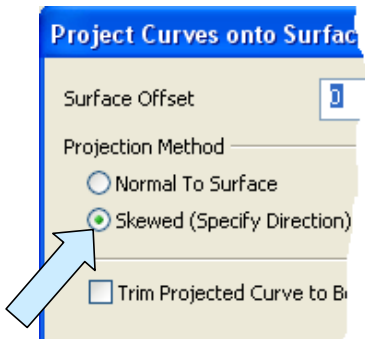
Then, select the point at the other end of the “C.” Click twice on the NATURAL Option. A smooth spline is automatically created on the “C” shape. (Important! Since you are zoomed in, the other points on your grid are not selected.)



Now, switch to the Isometric View. (View #7.)

Click on the PROJECT CURVE ONTO SURFACE Icon.

A Dialog Box appears.



Select the Skewed Option and hit the ENTER Key.



To set the direction vector, select the 2 Points Option and using the EndEnt Option click on the top end of a grid corner and the bottom end of the same grid corner.

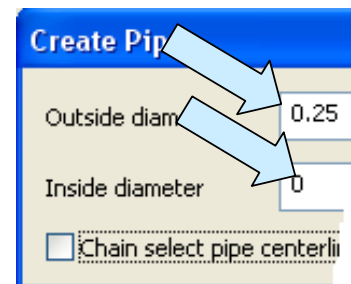
Select the top, wavy surface of the part and then the spline that you created. You will now have a spline mapped onto the undulating surface of the part.

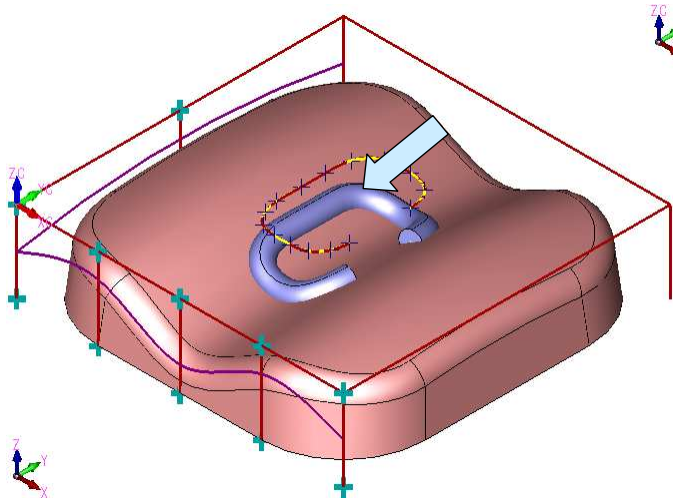


Click on the PIPE Icon.

A small Dialog Box appears. Type 0.25 for the outside diameter and 0 for the inside diameter. Hit the ENTER Key.

Select the spline that lies on the surface and hit the ENTER Key.





You will now have a pipe form mapped to the surface of the part. This is a great way to create raised designs like piping and embossed shapes on artistic containers.

This file with the spatial grid, profiles, and solids is available for download as “DesignerCase1.”