

Mathcad generates IBL files from curve segments. But instead of simply rendering them in Creo, we show how to use Creo's Associative Topology Bus (ATB) to check for file updates and quickly update the Creo model

Set up header text

Create a four-column matrix, where the first column contains the header test, followed by 3 columns filled with empty strings:

$$h := 1..3$$

$$\text{CurveHeader}_{0,0} := \text{"Closed"}$$

$$\text{CurveHeader}_{0,h} := \text{" "}$$

$$\text{CurveHeader}_{1,0} := \text{"Arclength"}$$

$$\text{CurveHeader}_{1,h} := \text{" "}$$

Include CurveHeader once per IBL file.. see stack function below

$$\text{CurveSection}_{0,0} := \text{"Begin section"}$$

$$\text{CurveSection}_{0,h} := \text{" "}$$

$$\text{CurveSection}_{1,0} := \text{"Begin curve"}$$

$$\text{CurveSection}_{1,h} := \text{" "}$$

Repeat CurveSection for each curve.. see stack function below

$$\text{CurveSection} = \begin{bmatrix} \text{"Begin section"} & \text{" "} & \text{" "} & \text{" "} \\ \text{"Begin curve"} & \text{" "} & \text{" "} & \text{" "} \end{bmatrix}$$

$$i := 0..450$$

$$r := .5$$

$$x_i := \cos(i \cdot \text{deg}) + r$$

$$y_i := \sin(i \cdot \text{deg}) + r$$

$$z_i := \frac{i}{1000}$$

$$\text{data1} := \text{augment}(x, y, z)$$

$$\text{Index}_i := i + 1$$

$$\text{curve1} := \text{augment}(\text{Index}, x, y, z)$$

IBL file generator using Creo ATB to check for file updates and instructions to build sweeps and blends

A collaboration from Jeff Rembold,
Todd Kraft, Magnus Eklund and
John Sheehan

$$i := 0 .. 450$$
$$j_i := 450 + i$$

Notice this repeats end
points with `datat1/curve1`

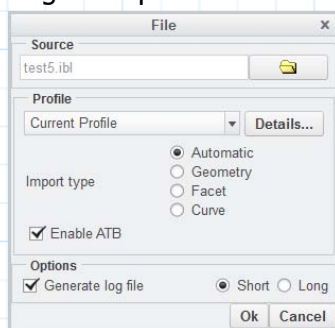
$$x_i := \cos(j_i \cdot \text{deg}) + r$$
$$y_i := \sin(j_i \cdot \text{deg}) + r$$
$$z_i := \frac{j_i}{1000}$$
$$\text{data2} := \text{augment}(x, y, z)$$
$$\text{curve2} := \text{augment}(j, x, y, z)$$
$$\text{IBLfile} := \text{stack}(\text{CurveHeader}, \text{CurveSection}, \text{curve1}, \text{CurveSection}, \text{curve2})$$
$$\text{res} := \text{WRITEWOQ}(\text{"c:\temp\test.ibl"}, \text{IBLfile})$$

How to import a curves (.ibl) file into PTC Creo Parametric

Step 1: In a part model, on the Model tab select **Get Data > Import**

Select the .ibl file and select **Open** (or hit Enter).

The File dialog box opens:



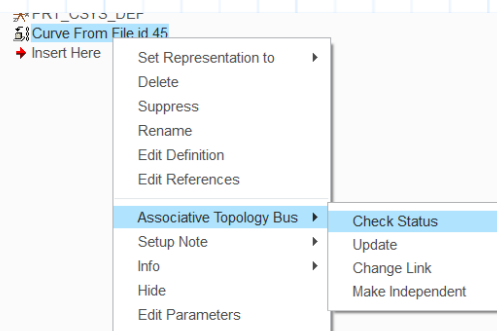
Step 2: Leave the **"Enable ATB"** box checked.

Select **OK**.

Note: The Associated Topology Bus (ATB) will allow for the imported curves to be updated if the original .ibl file is changed -- for example, if the Mathcad worksheet is modified to produce an updated .ibl file.

Step 3: Pick the **green check** (or hit Enter, or press middle mouse button) to finish Import.

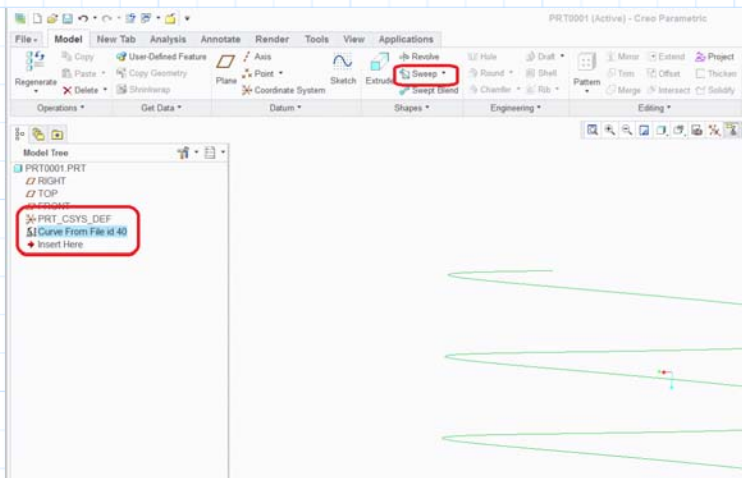
Step 4: To check the out-of-date status .ibl file from which the curves were created, hold down the right mouse button on the feature in the model tree, and select **Check Status** from the Associative Topology Bus fly-out menu.



Step 5: If the file dates are different, then you will want to use **Update** from the same fly-out menu to re-import the .ibl file and update the curve. Note that any features that depend upon the curves, such as surfaces, will update as well.

How to create sweeps and blends in PTC Creo Parametric from Mathcad curves

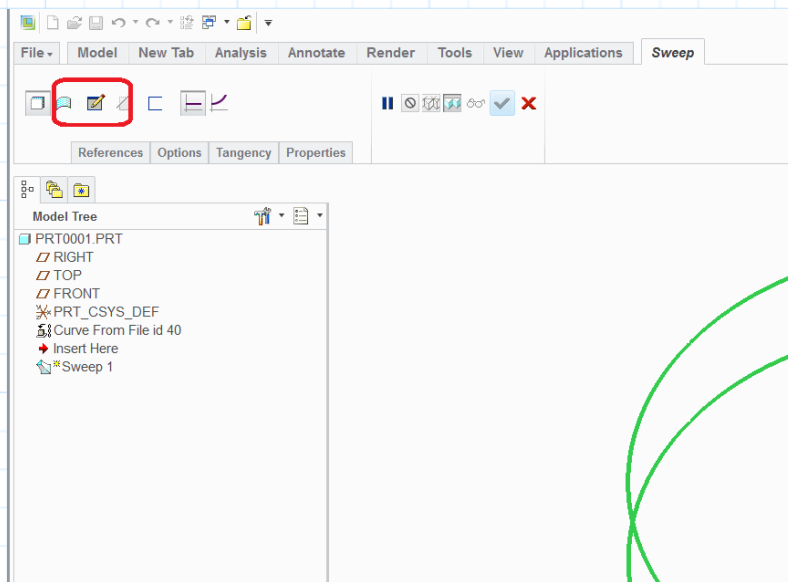
Step 1: In the model tree left mouse click on the **Curve from File id ##** and then click on Sweep on the Model tab in the Shapes Group



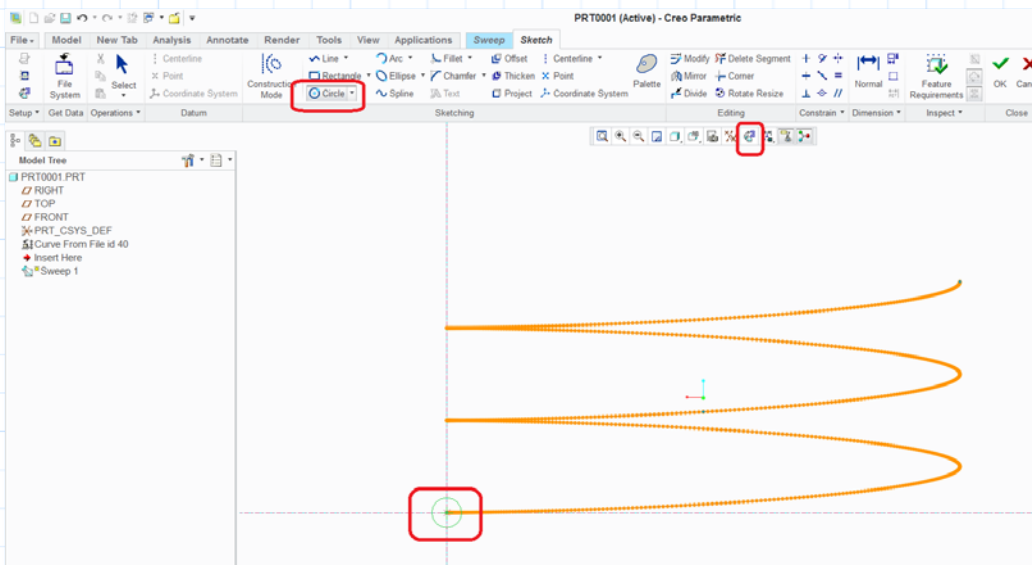
IBL file generator using Creo ATB to check for file updates and instructions to build sweeps and blends

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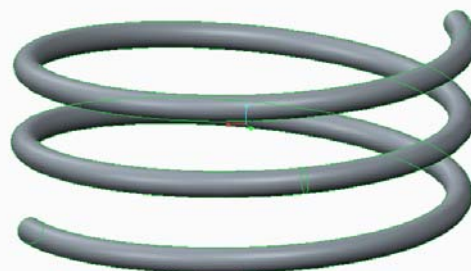
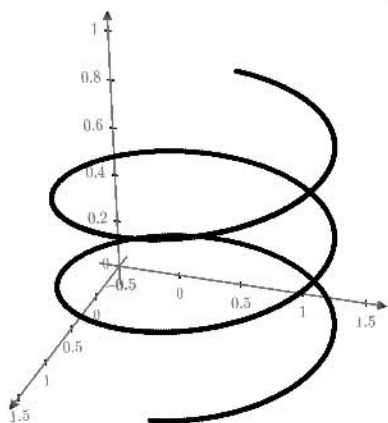
Step 2: In the Sweep tool select create or edit sweep section. Your whole curve should turn orange.



Step 3: Go into Sketch View and then sketch a small circle at 0,0.



Step 3: Click the green check mark top right to accept the Sketch. Click the green check mark in the middle of the sweep tool to accept sweep.



Boundary blend of 2 ellipses

```
a:=30          b:=10          clear(z)
i:=0..63      ti:=i*.1      ellipse_ii:=i
x:=a*cos(t)   y:=b*sin(t)   zi:=0      data1:=augment(x,y,z)
curve1:=augment(ellipse_i,x,y,z)

IBLfile:=stack(CurveHeader,CurveSection,curve1)

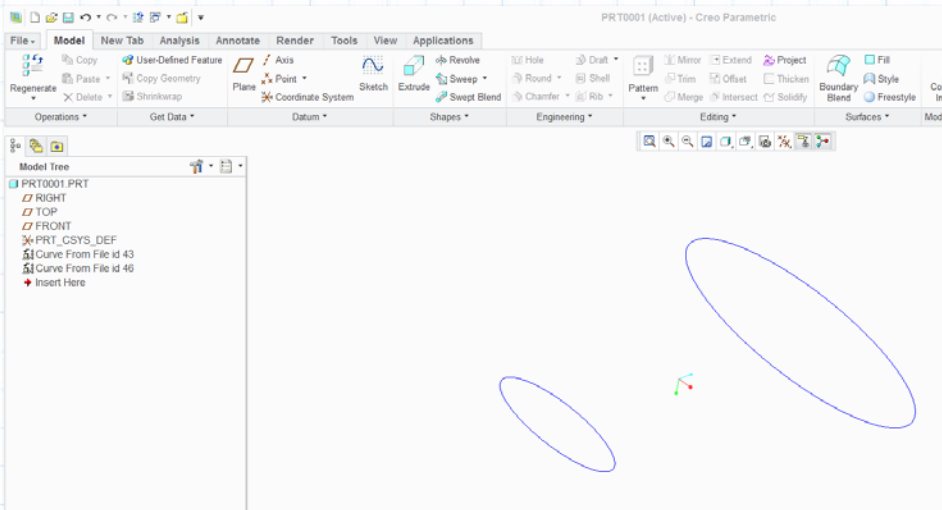
res:=WRITEWOQ("c:\temp\ellipse1.ibl",IBLfile)

a:=60          b:=20          clear(z)
i:=0..63      ti:=i*.1      ellipse_ii:=i
x:=a*cos(t)   y:=b*sin(t)   zi:=120      data2:=augment(x,y,z)
curve2:=augment(ellipse_i,x,y,z)

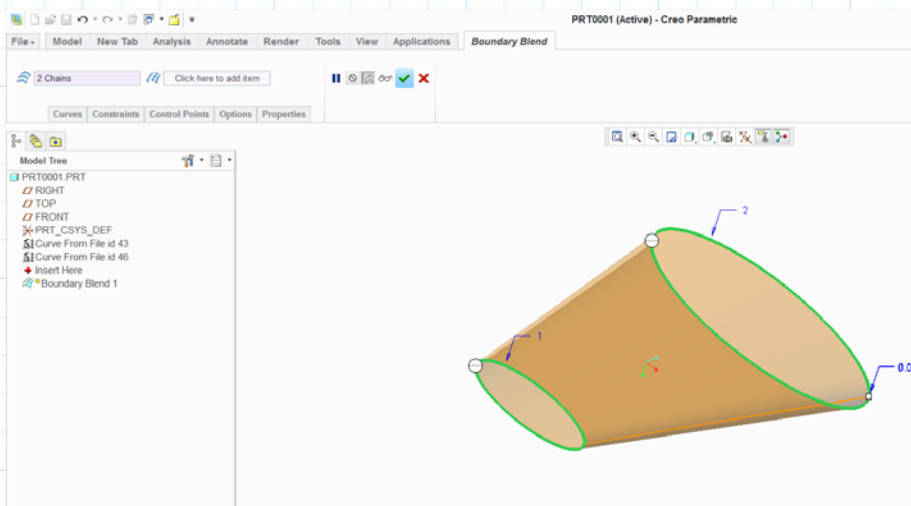
IBLfile:=stack(CurveHeader,CurveSection,curve2)

res:=WRITEWOQ("c:\temp\ellipse2.ibl",IBLfile)
```

Step 1: Import curve1 and curve2 as described above



Step 2: Select the Boundary Blend Tool and select both curves using LMB and Cntrl-LMB



Step 3: Click on the Green check mark to accept the blended surface

