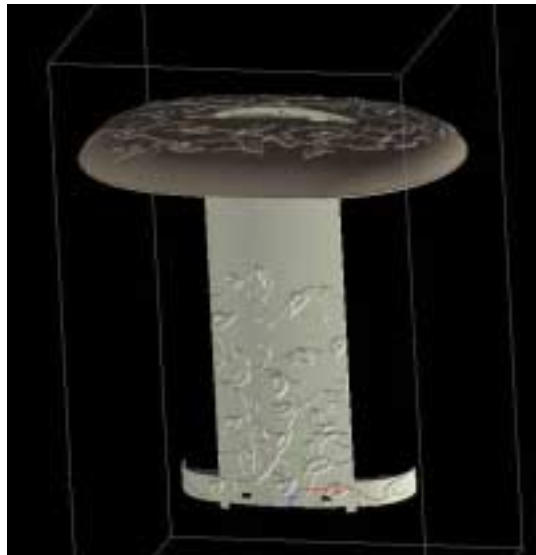


FreeForm Workflow Study “The Bird Feeder with Vine Sculpting”



Artist: Nancy Hairston – Product Specialist, SensAble Technologies

Description: this workflow study shows how FreeForm V2 can be used to add sculptural details like leaves and vines to a basic model created in CAD. Note: tooling for the finished product was then successfully milled from its .stl file.

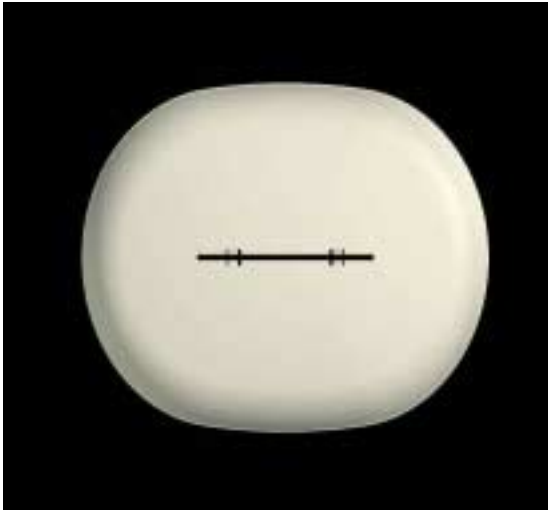
Timeline: half a day

Software Version: FreeForm[™] modeling system, Version 2

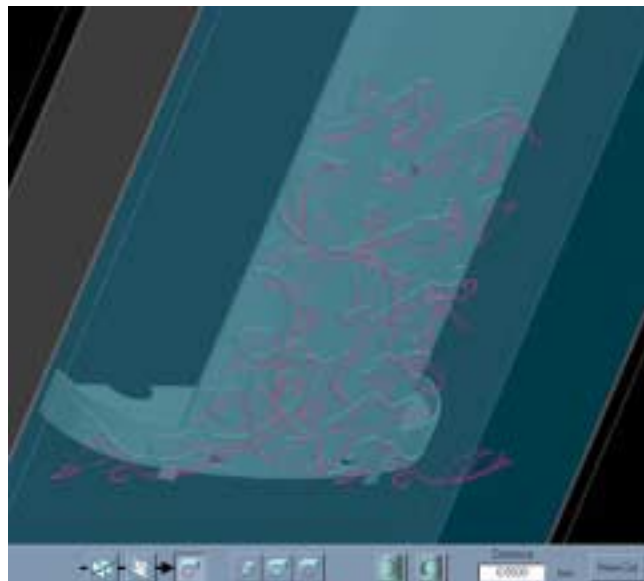
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To begin the process, import each of the .stl files that were exported from the client's CAD system (Pro/ENGINEER) into the FreeForm system. Do this at an Add Fine Detail resolution (.04mm) and then save them as .cly files.



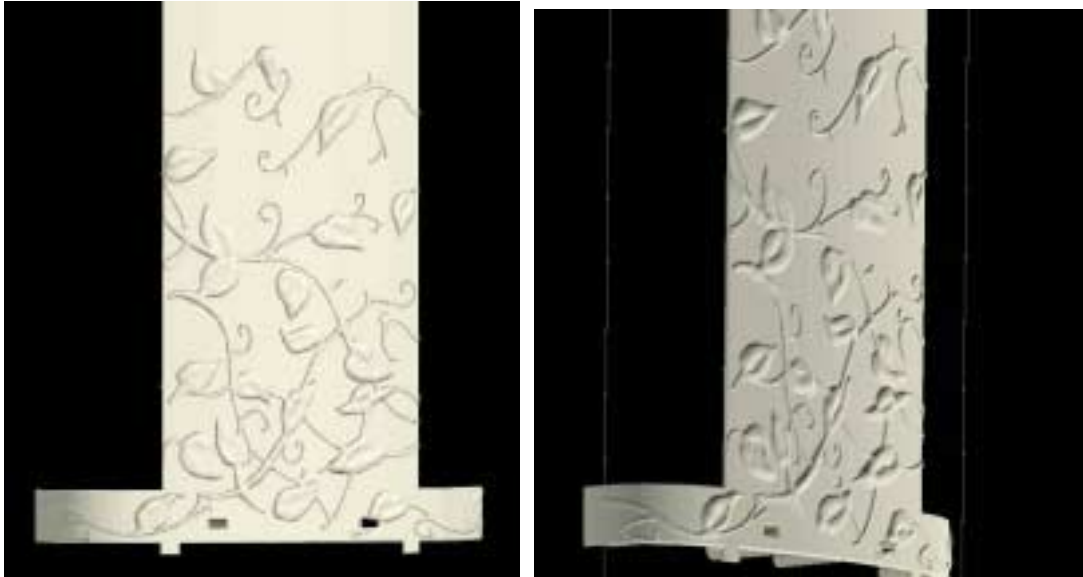
Next, open the “side1.cly” file (the side piece, shown in the right-hand picture above) and position it to the front view. Select Wire Cut and import the drawings from the client of the leaf and vine detail they wanted put on the bird feeder. It was an Adobe Illustrator file but has been saved in the FreeForm system's “sketch” format for you - sideF.skh. Open and position it over the part as shown below. Then use Wire Cut's “Emboss” option with a depth of .05mm.



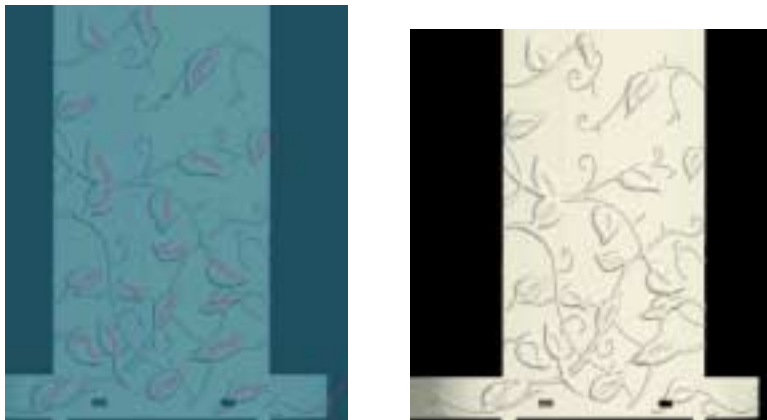
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The embossed leaves and vines are a bit flat, so select the Smudge Tool, set it to Work from Inside, and sculpt up the leaves to create nice curvature to their tops as shown below and to the right.

Time: roughly 1 hour



Then, re-enter Wire Cut and import the file “sideVeins.skh.” Use the Deboss option to recess the leaves’ veins to a distance of .025mm.



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To create the smaller veins leading away from the leaves' main vein, you can make a custom-shaped tool. In fact, you may want to create several, one that angles to the right, one that angles to the left, etc. To do this, select “Create Custom Tool” from the Tools menu. Draw a claw shape like the one shown below, orient the tool handle perpendicular to the shape, give the tool a name, and click the checkmark.



Before using your new tool, it might be helpful to increase the friction of the clay so that the leaves' top is not slippery. This will make it easier to accurately press the custom tool into the surface where you want it. Go to the “Tools->Options” menu, then click and set the slider to give the most friction.

Now, select the new tool under the Tools -> Select Custom Tool menu and begin stamping the shape, as well as the others that were made, into the leaves on the surface. See the leaves illustrated below.



Once all the leaves are done, finish the side piece by Changing Clay Coarseness to .03mm with the “Smoothing” option on.

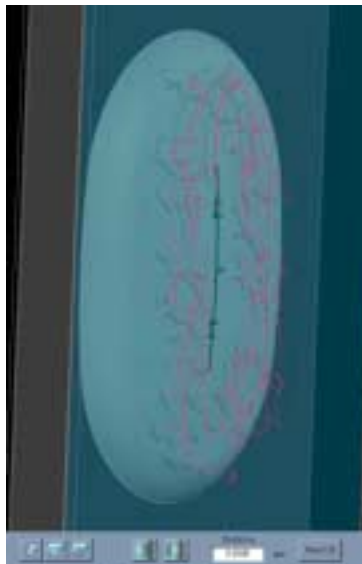
Time: roughly 1 hour

FreeForm Workflow Study – The Bird Feeder with Vine Sculpting



Follow the same basic procedure with the top part of the bird feeder. Open the file you had saved earlier (named “lid1.cly”). Hit “F5,” and you’ll notice that the part is horizontally oriented. Rotate it until it is vertical. Go to “Tools->Reposition Work Area” and hit the small arrow on the bottom bar of the UI. Type in a “90 degree” rotation in Y. This will re-orient the top properly.

Next, go into Wire Cut and import the sketch titled “top.skx.” Use it to emboss the leaf pattern to a depth of .1mm, as shown below.

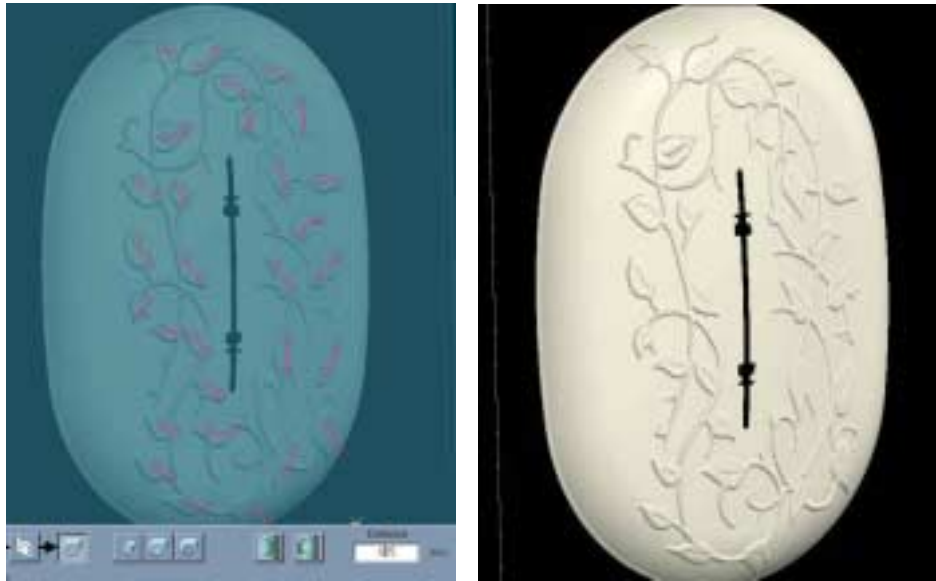


FreeForm Workflow Study – The Bird Feeder with Vine Sculpting

As before, use the Smudge Tool to push up the leaves a bit from the inside of the model. If the surface appears bumpy, be sure to have consistent movements back and forth while sculpting. Moreover, the clay should be at a hardness level of about 3 ticks on the slider. If necessary, correct the bumpiness by using the Smooth Tool adjusted to a high smooth level. Simply rub the areas that need smoothing.

Time: roughly 1 hour

The next step is to deboss the center vein into the centers of the leaves. While in Wire Cut, open the file called “topVeins.skh,” and then deboss to a distance of .05mm.



Sculpt the veins coming off of the center vein by using the Custom Tools created earlier.



Once finished with the veins, Change Clay Coarseness to .03mm with the “Smoothing” option on.

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To complete the model, combine both parts to the same file by opening one and then using “Paste from File” to bring in the second.

Time: roughly 1 hour

