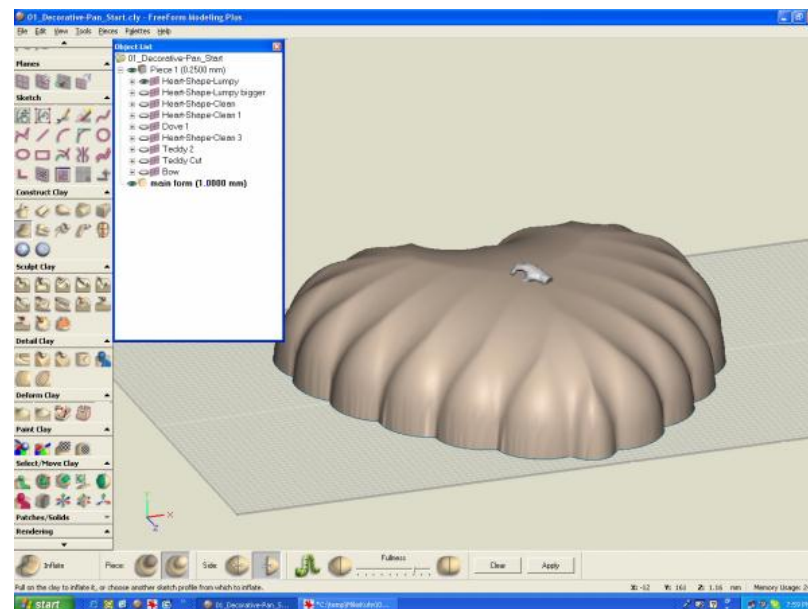
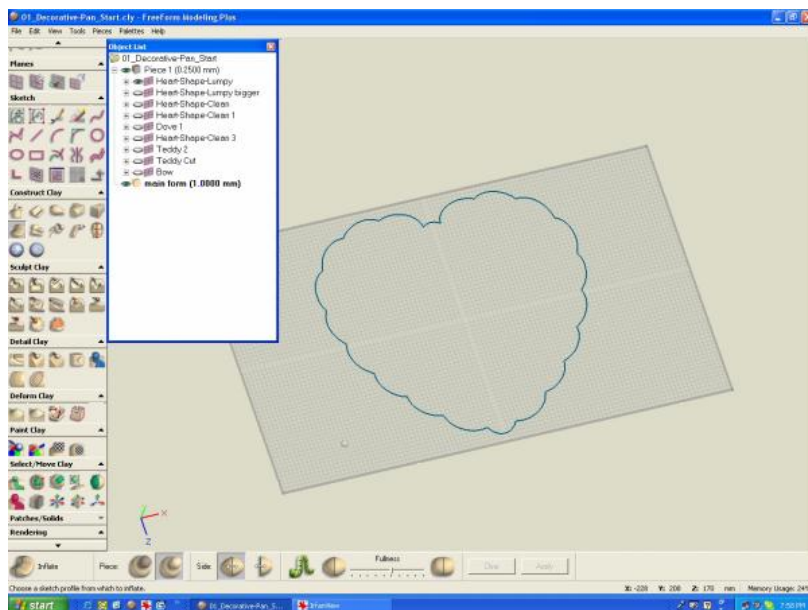


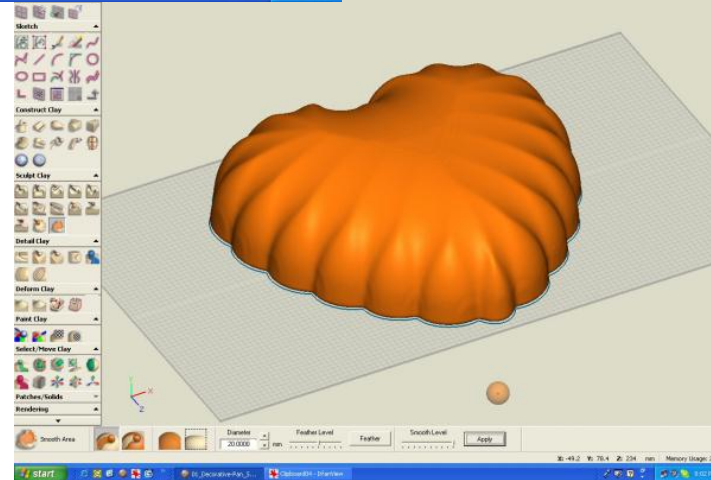
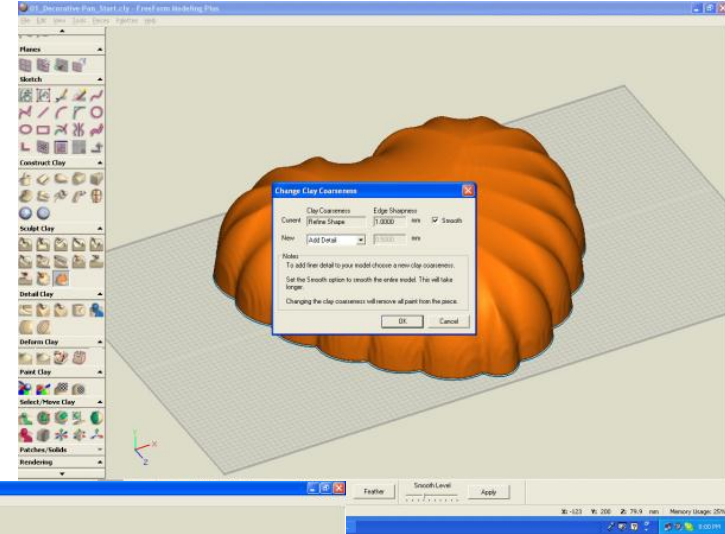
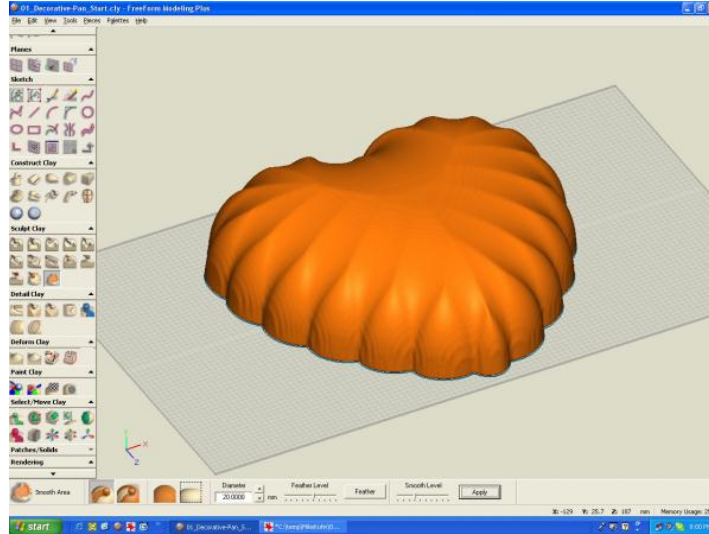
Creating Decorative Pans Using FreeForm Modeling Plus



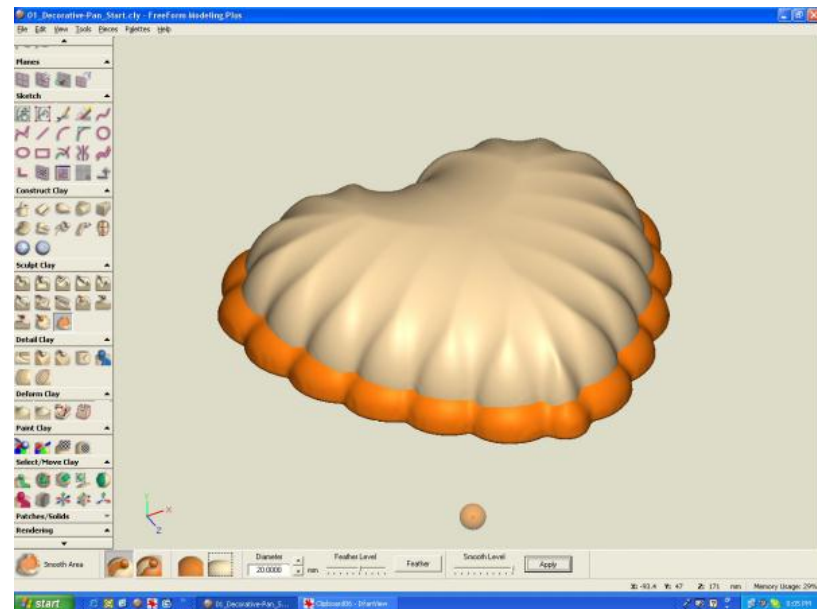
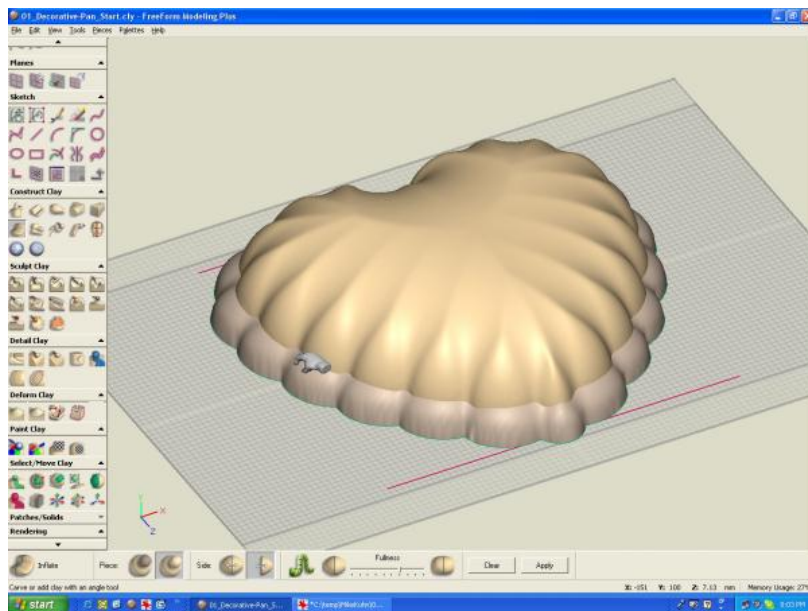
Decorative pan for molding cakes, chocolate, jello and more.



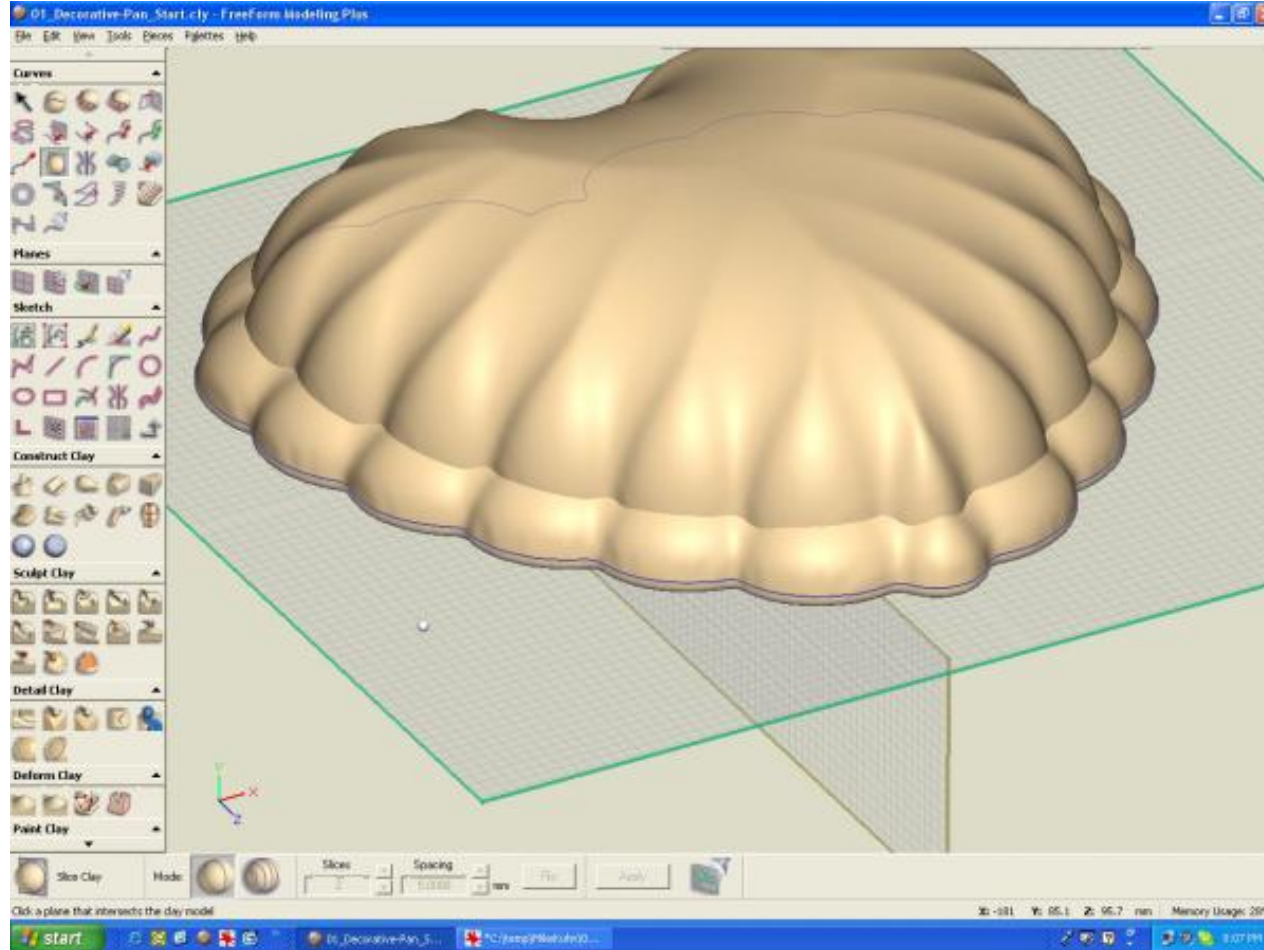
To begin this workflow in the FreeForm® Modeling Plus™ system we use Inflate on a 2D profile and set the options to do a non-symmetrical inflate to one side of the plane. During the process of inflating, we experiment with the Fullness option until we achieve the desired form.



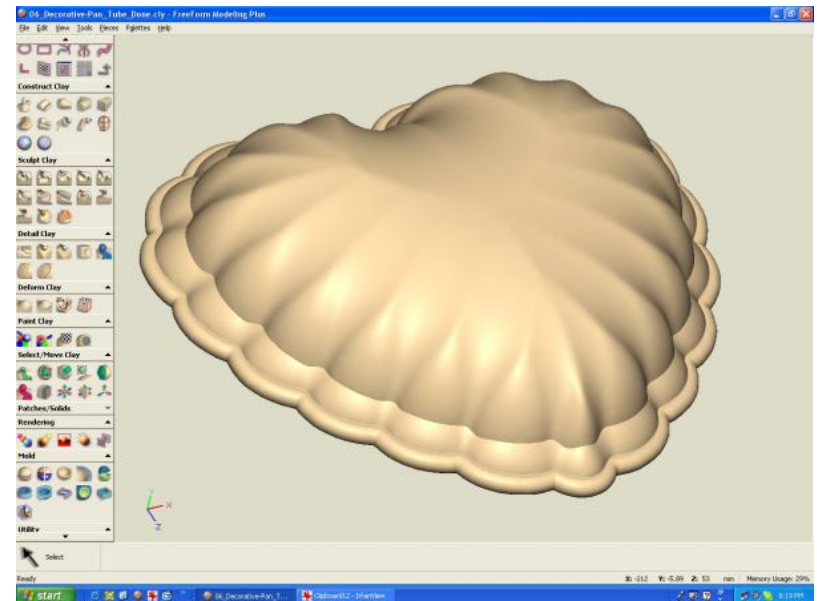
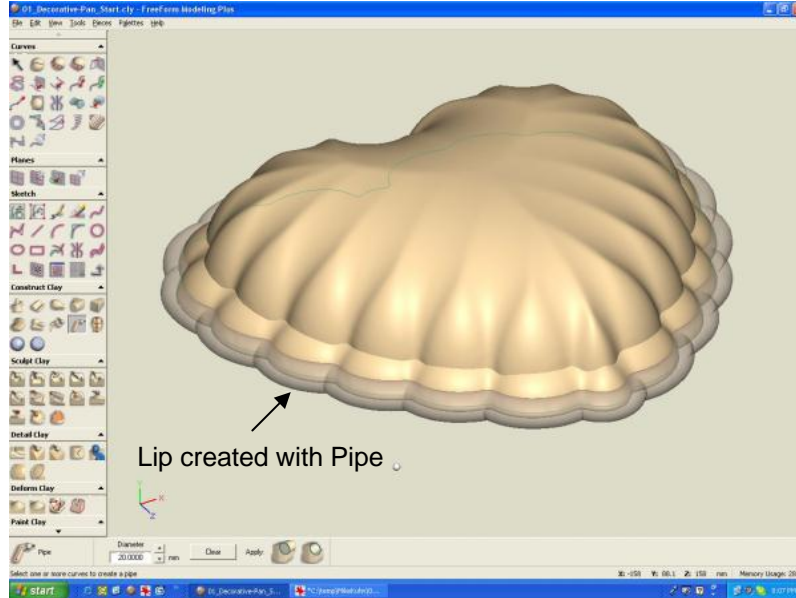
Then we smooth the surface using the Smooth Area tool. We want to get a smoother surface so we reduce the clay coarseness (increase resolution) and smooth the model again using a higher Smooth Level.



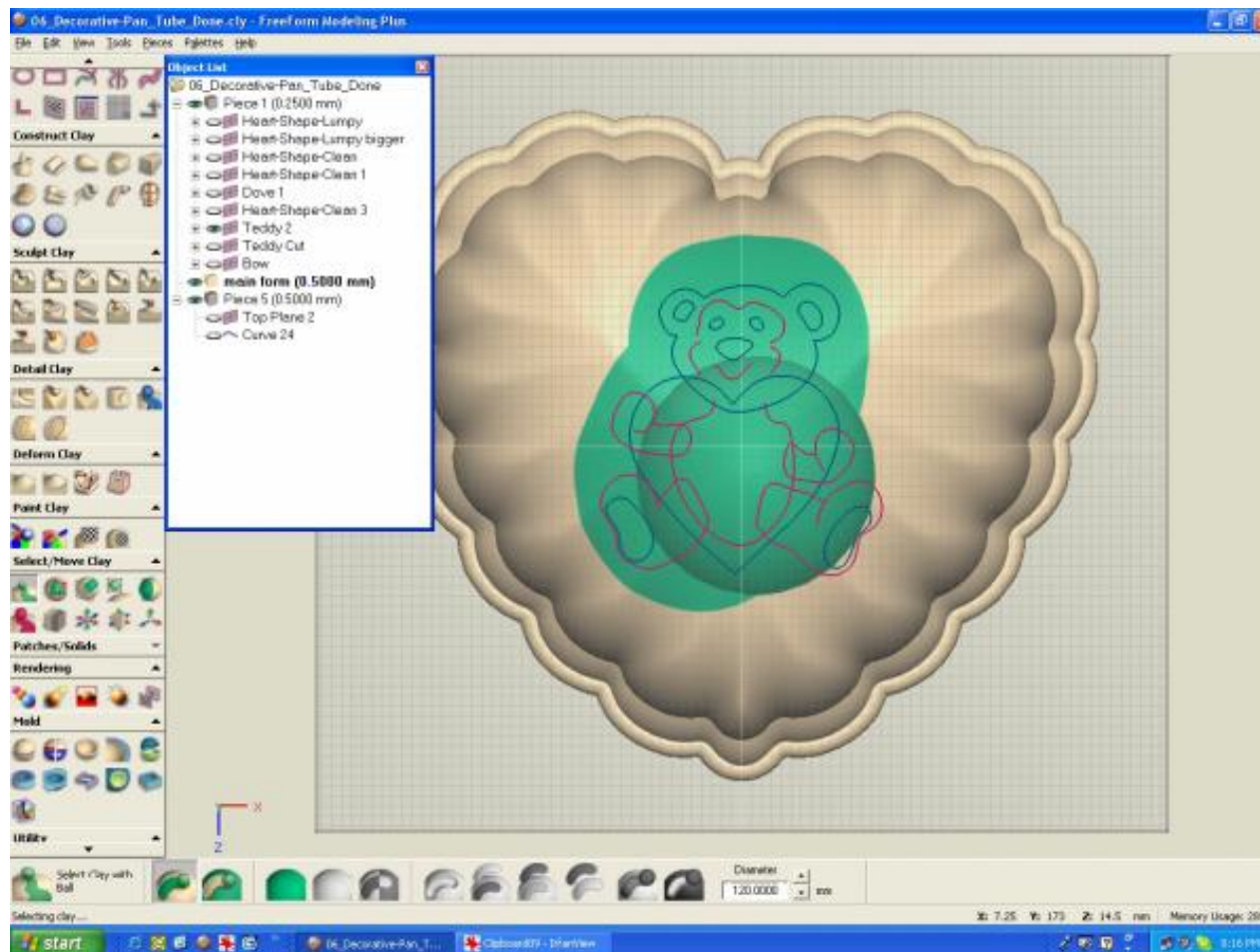
We then repeat the same inflate steps using a slightly larger profile, except this time we don't pull the inflation as high. We use this second piece to create a tier in the form.



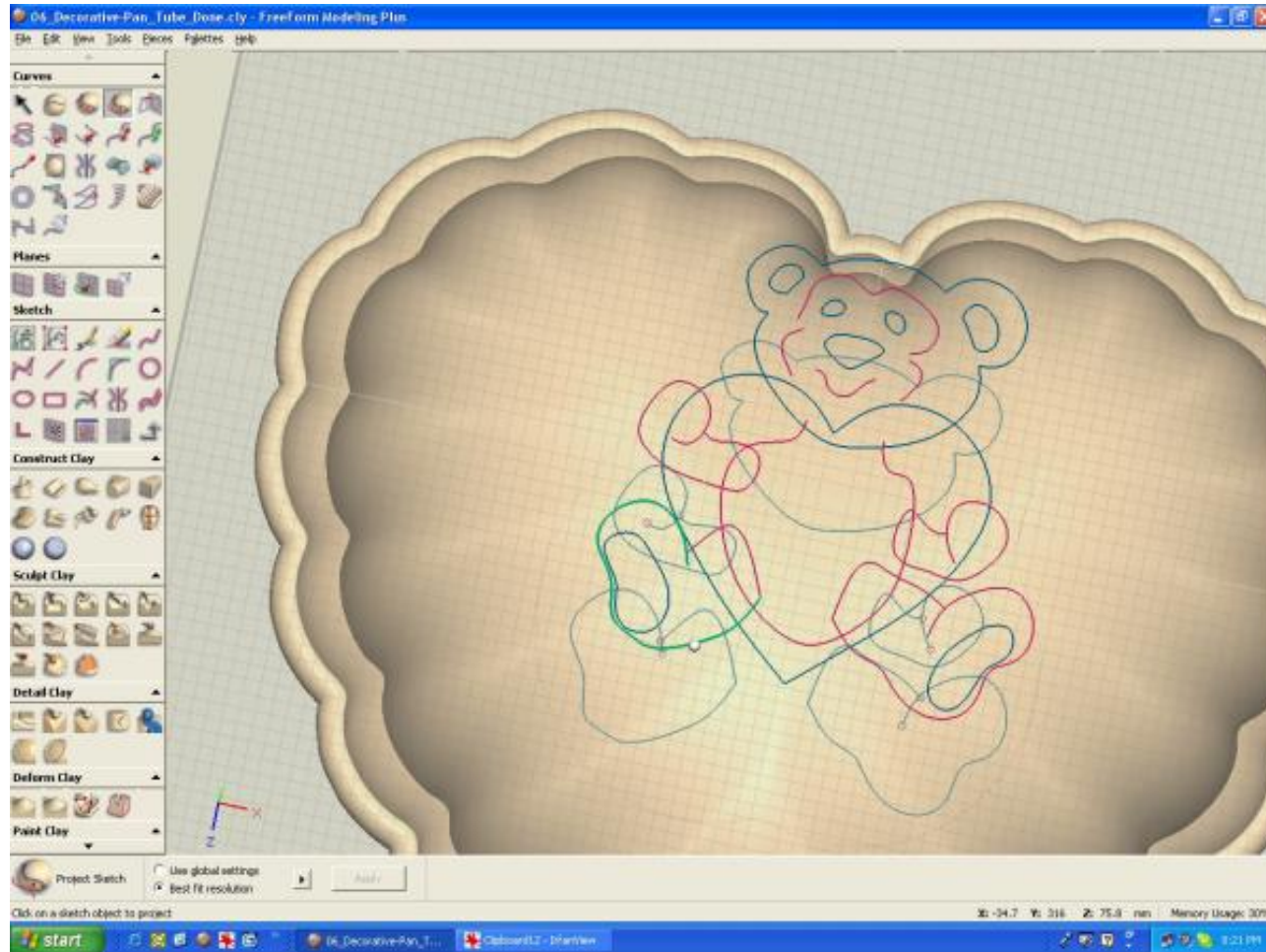
Using the Slice Plane, we create a curve where the plane intersects the clay.



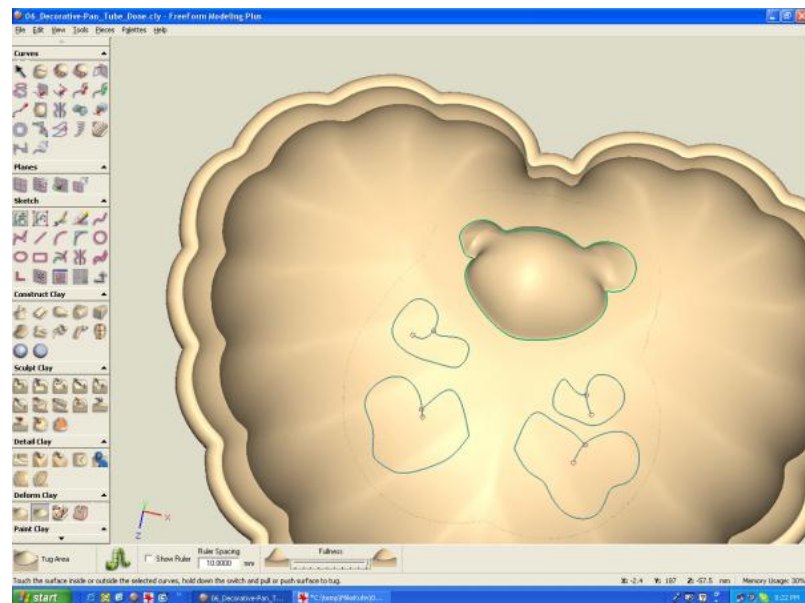
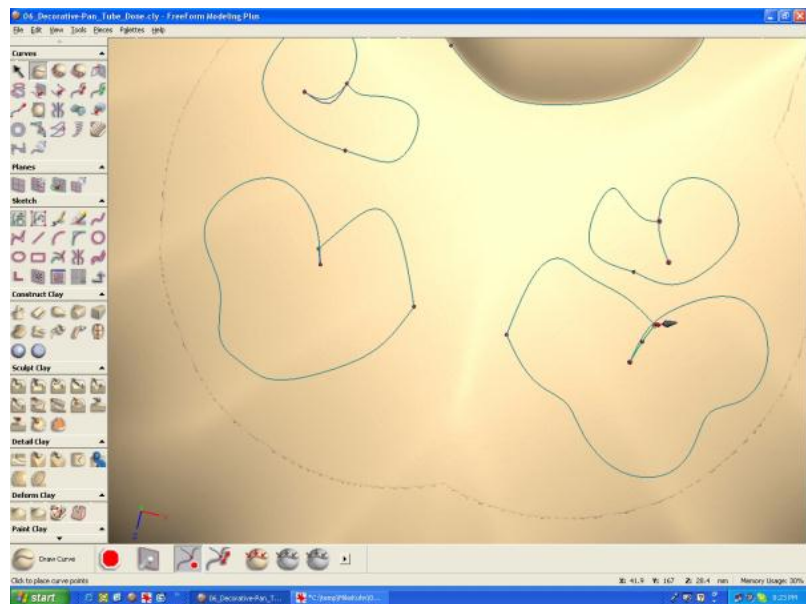
We create the lip of the pan using the Pipe tool and user defined radius. This creates a cylindrical shaped piece of clay out of a curve in 3D space.



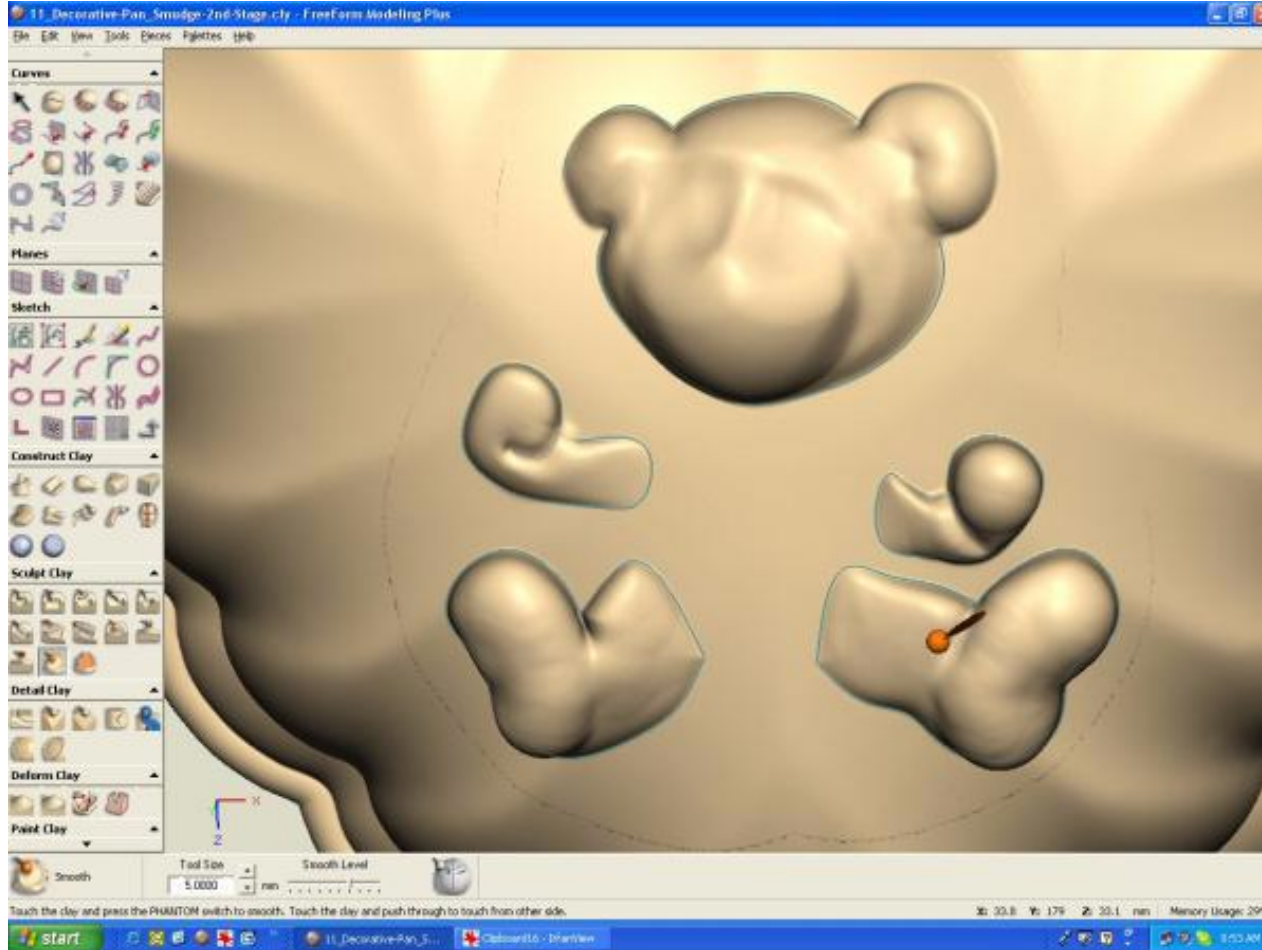
Using the Paint Selection tool, we select the area where we want the shape of the bear to be on the top of the cake. We copy the selection as a new piece.



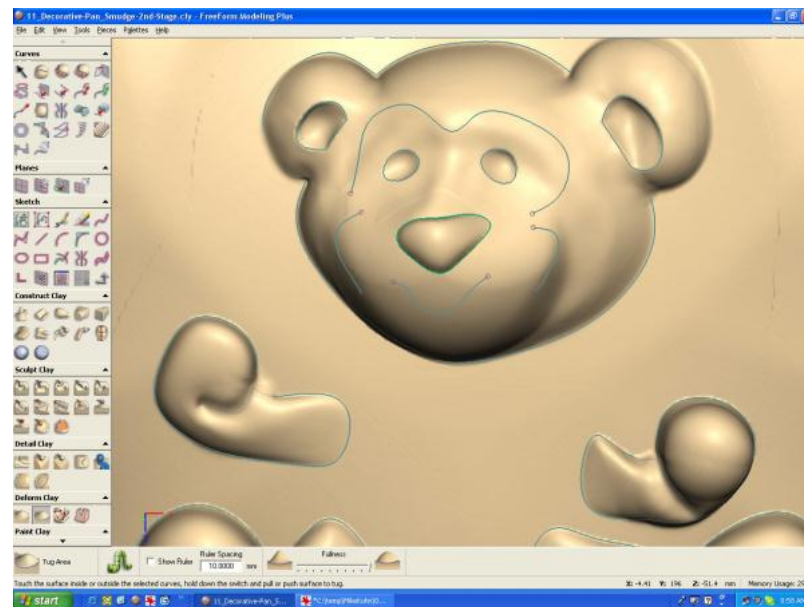
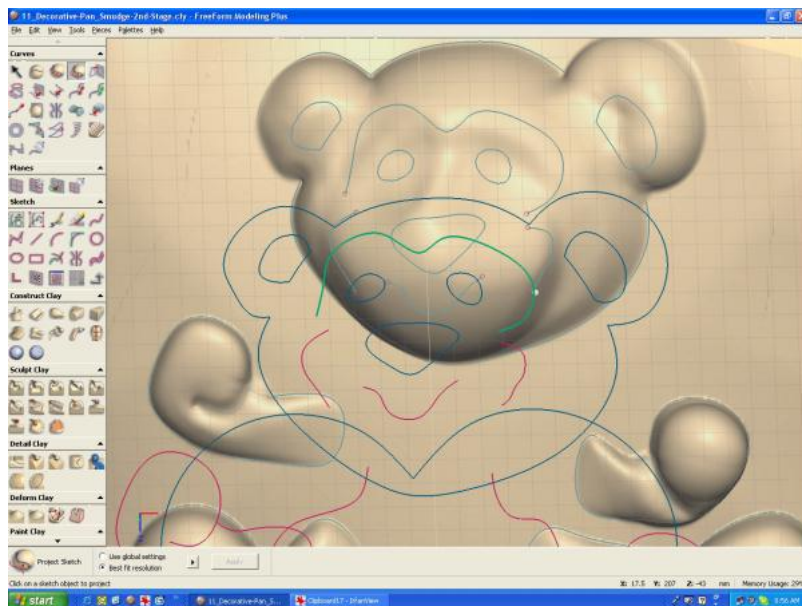
We then project the reference curves from a 2D sketch onto the new piece of clay.



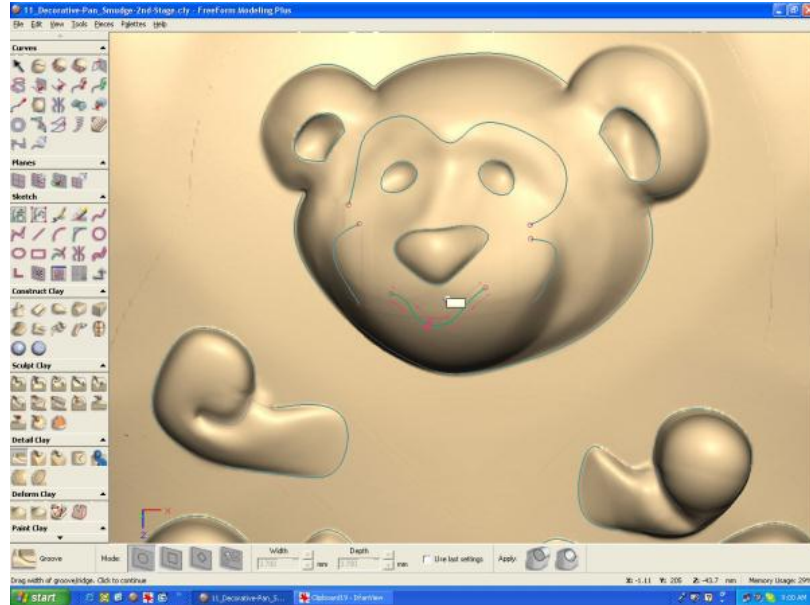
We edit any open curve loops to form closed curve loops. With the Tug Area tool, we lift areas to give initial shape to the bear's legs and arms.



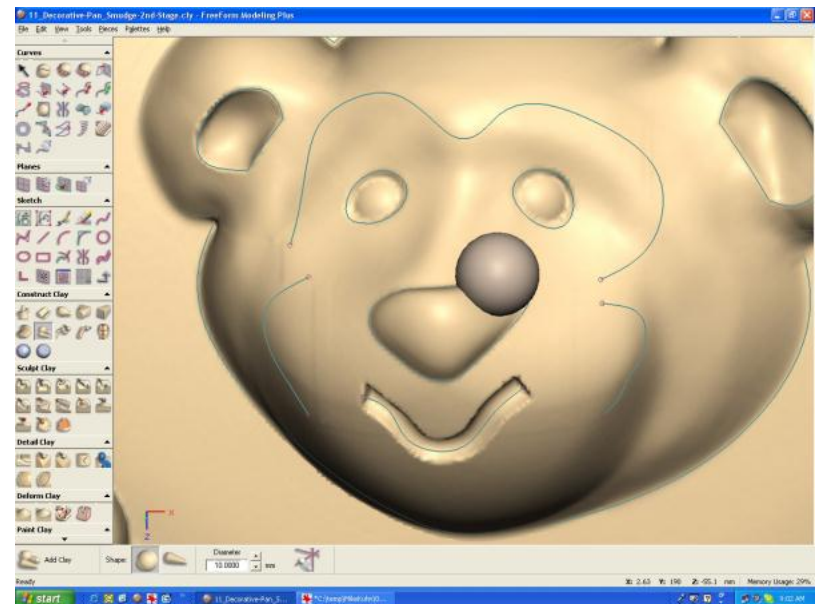
With the Carve, Smudge, and Smooth tools, we refine the shape of the bear's features.



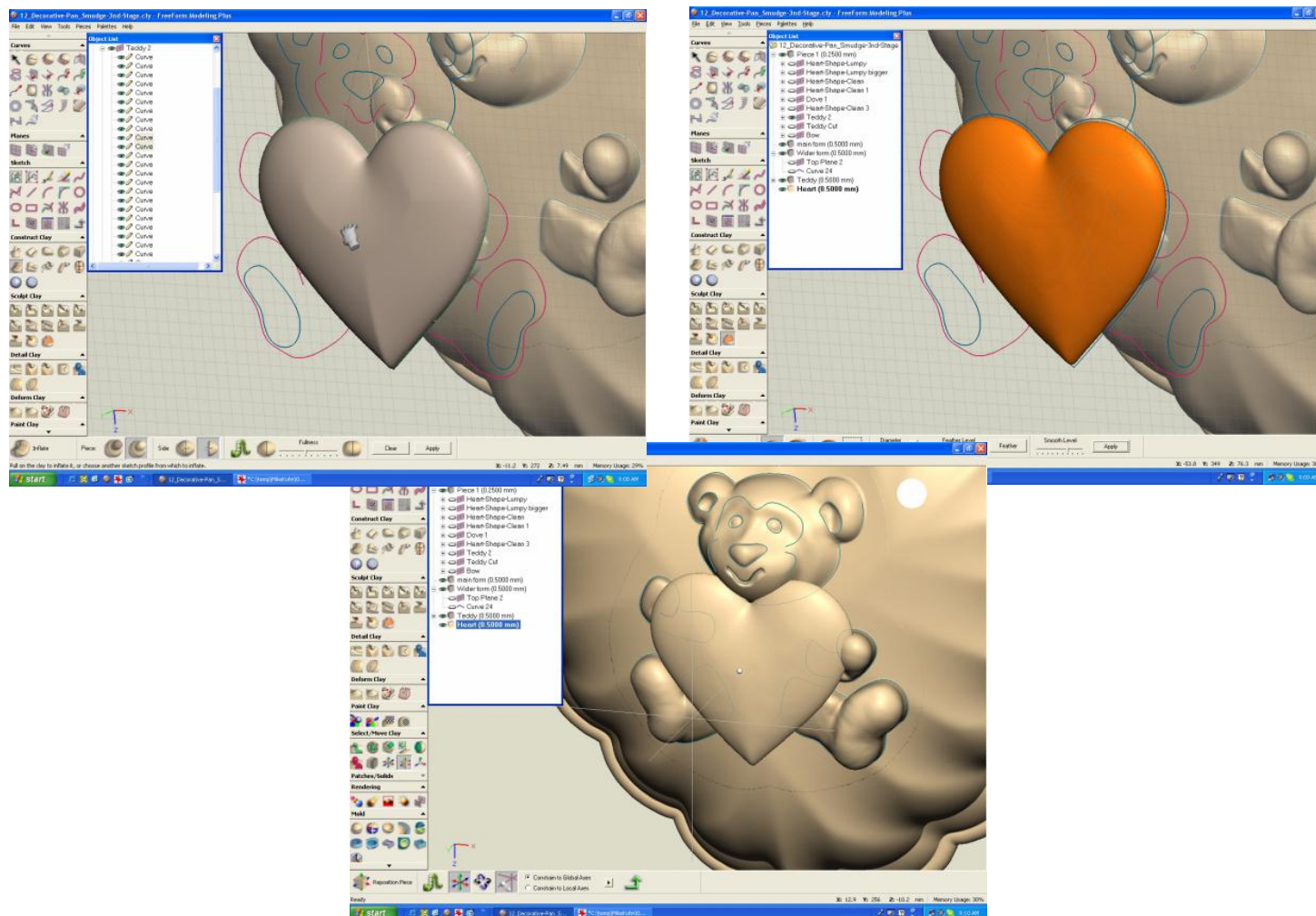
We project additional sketches onto the clay. These resulting curve loops are again used together with the Tug Area tool to define more details; the ears, nose, and eye sockets.



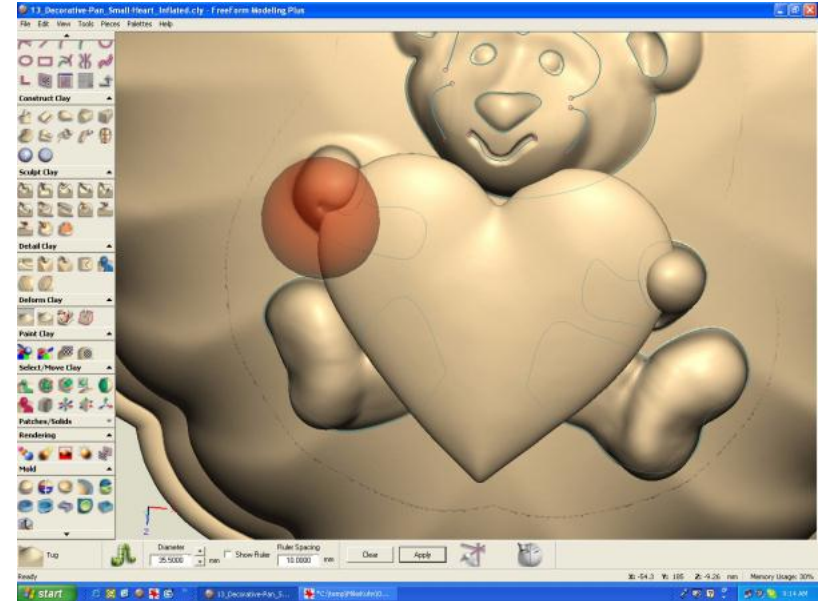
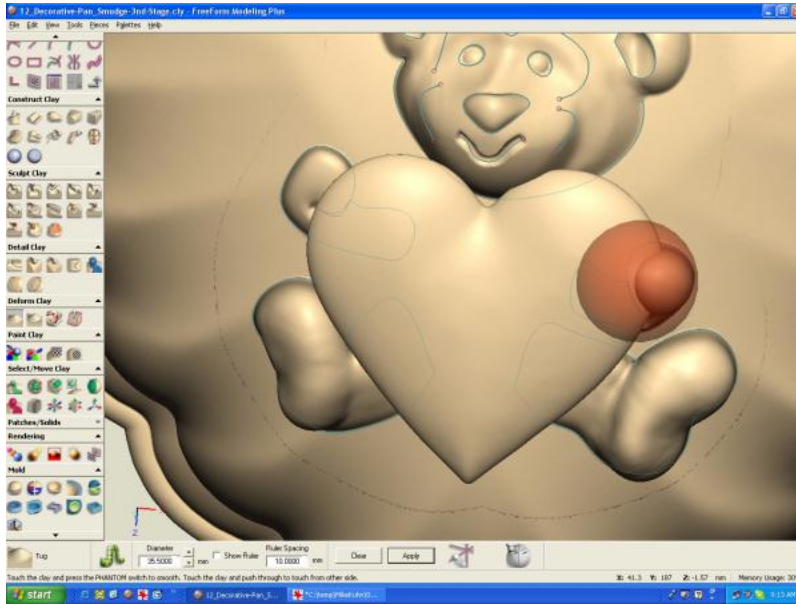
We create the mouth with the Groove tool.



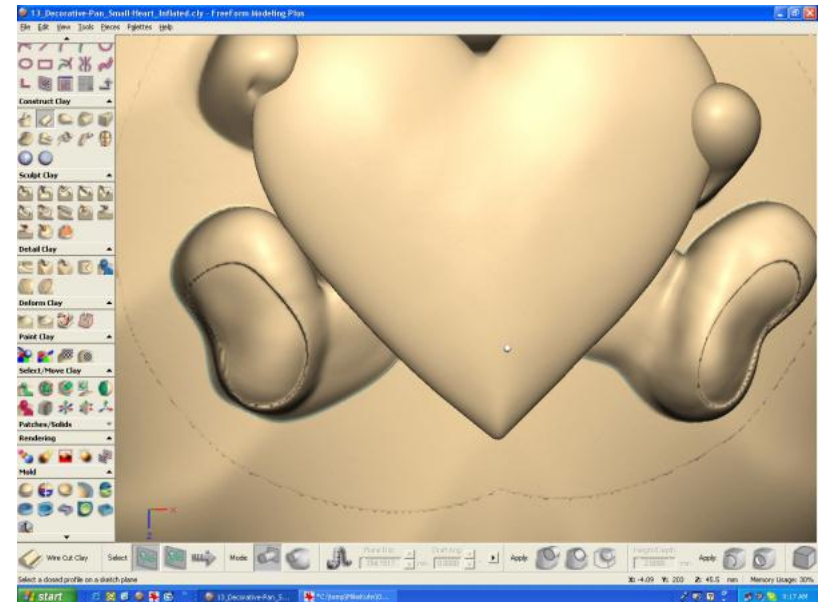
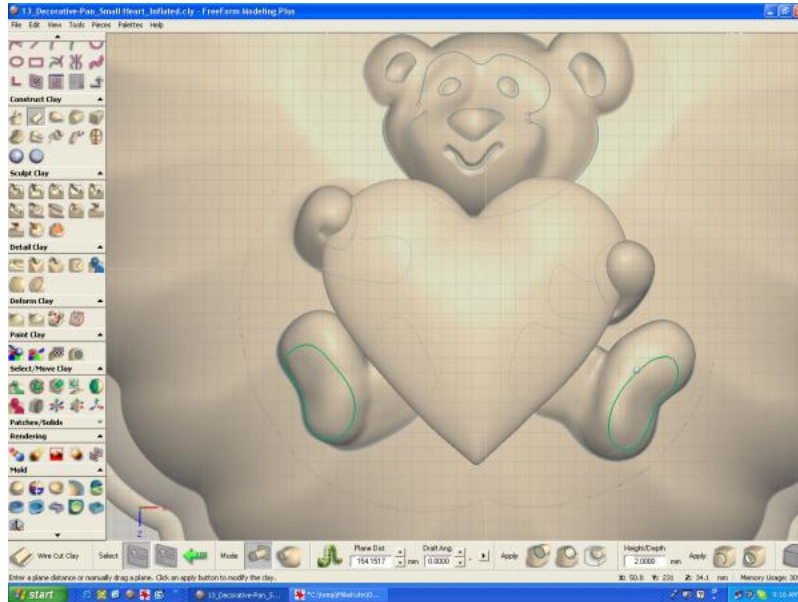
We create the eyes by simply adding spheres and automatically adding them to the existing piece of clay.



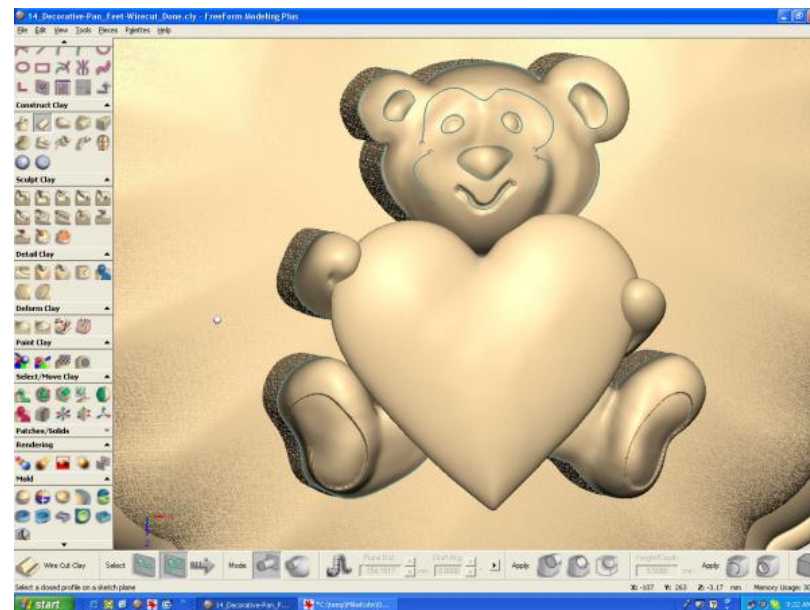
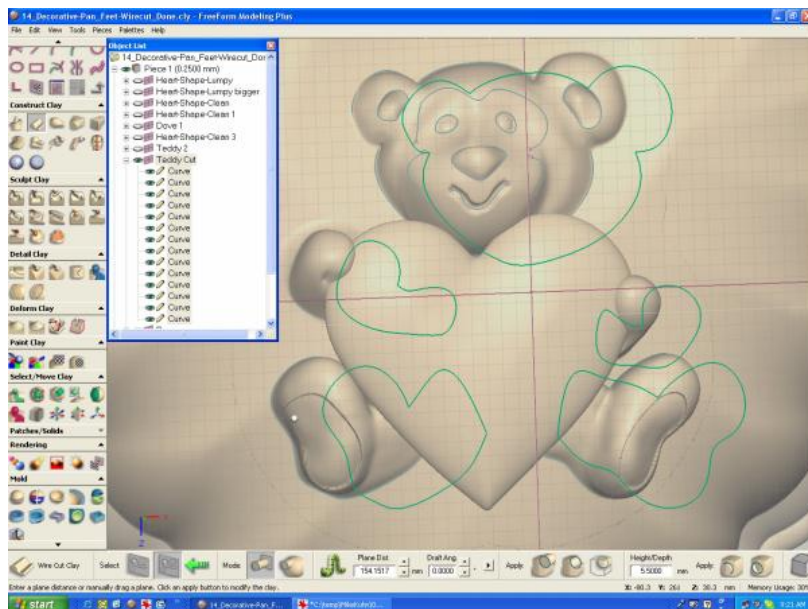
We create the heart for the center by inflating from the profile and smoothing it.
With the Reposition Piece tool, we place the heart shape in its final position;
with Axis Snap we can use haptic feedback to guide this positioning.



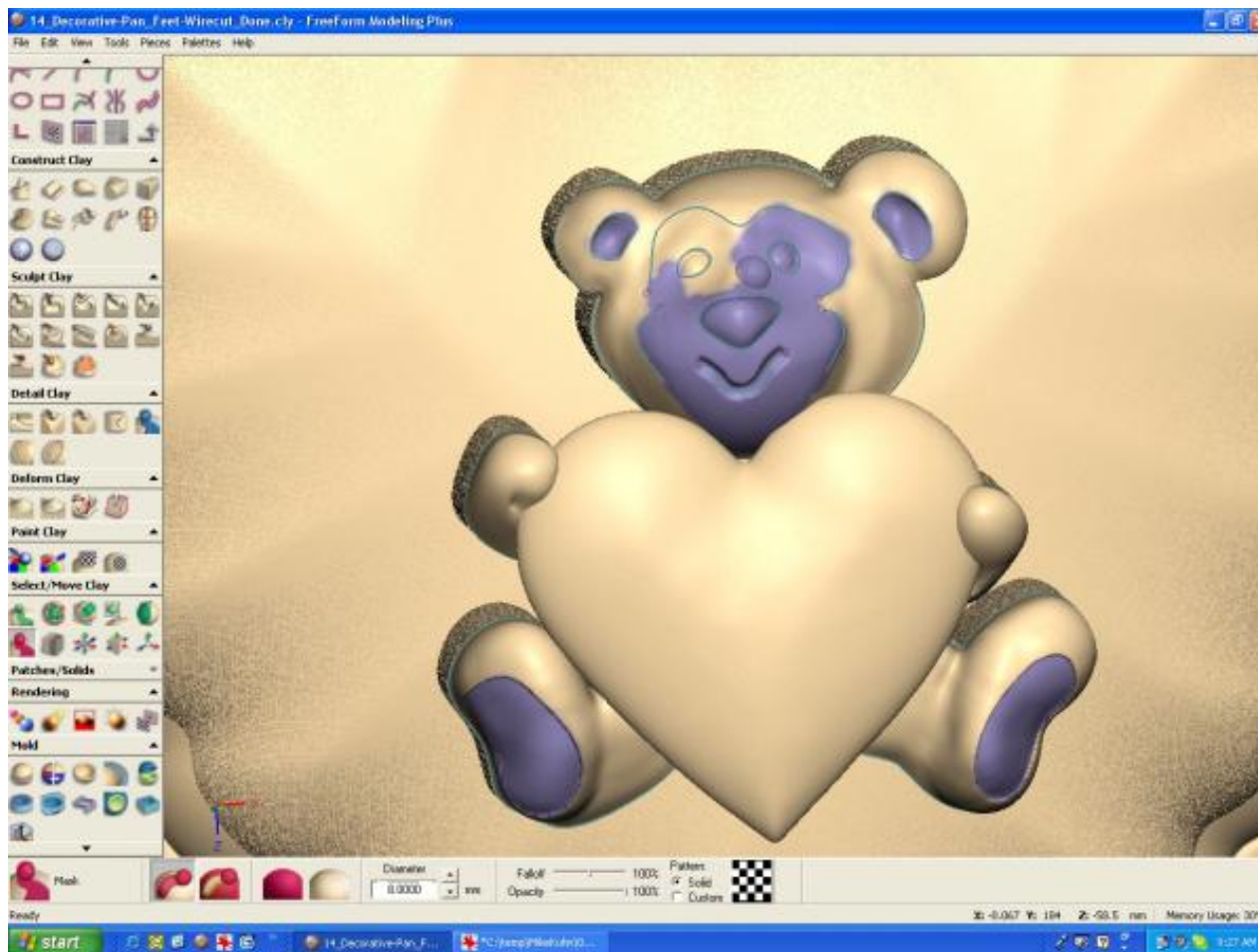
After we place the heart shape, we use the Tug tool to pull the hands so the bear appears to be holding the heart.



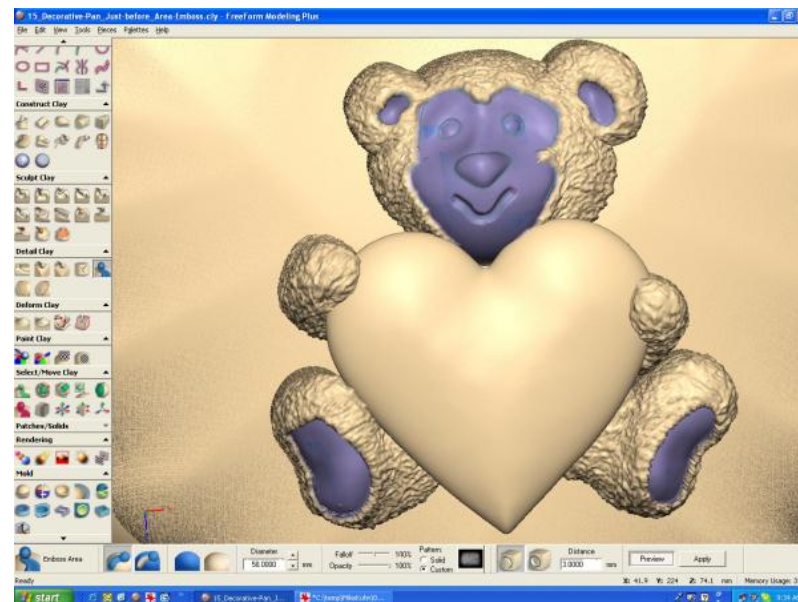
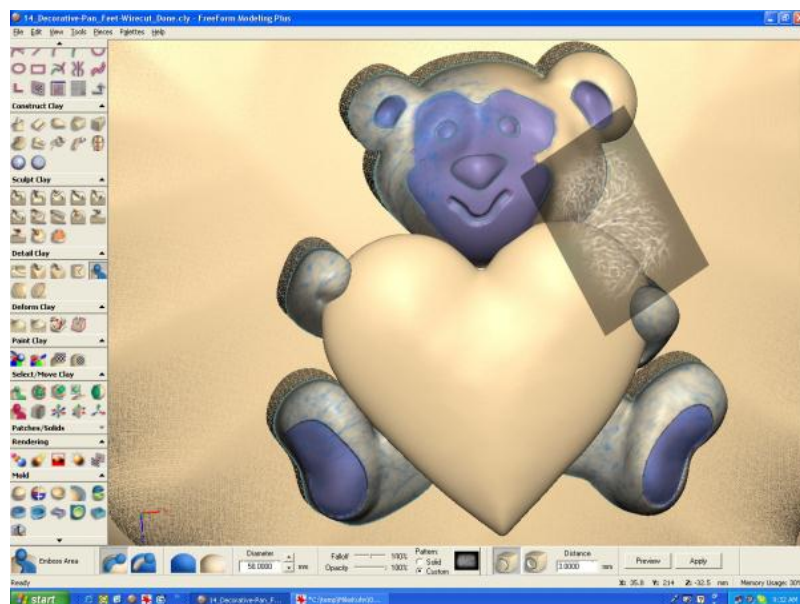
We use the Wire Cut tool and a sketch profile to create the pads of the feet by lowering the area inside the profile by 2 mm.



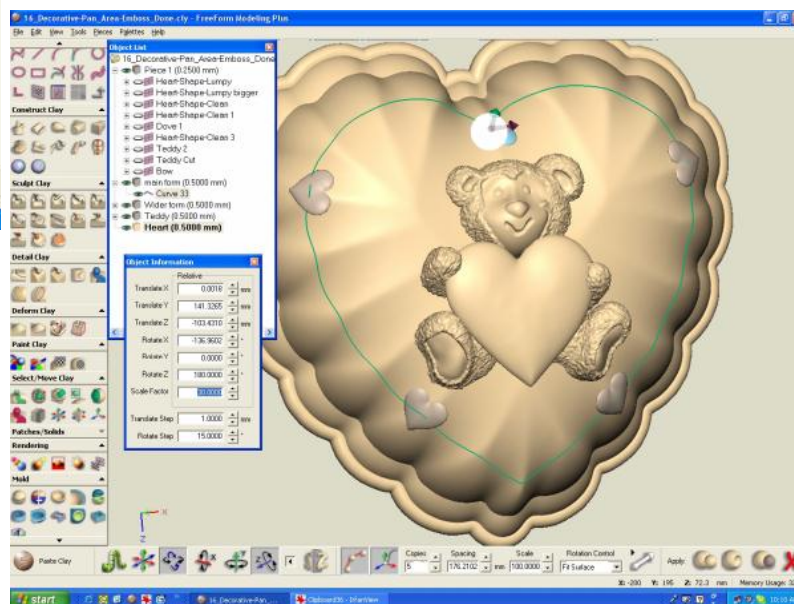
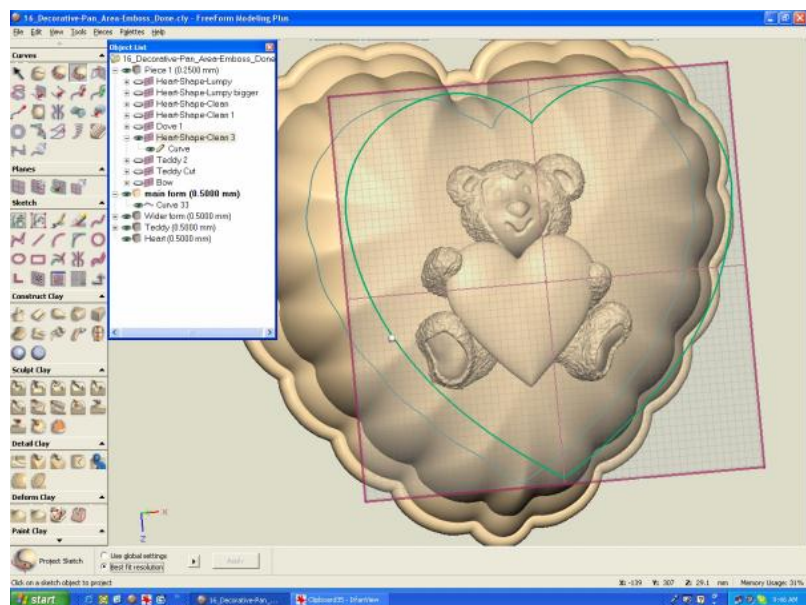
Again we use Wire Cut and the profiles we used to create the bear and the heart, but this time we cut away all the digital clay outside of the shape of the bear.



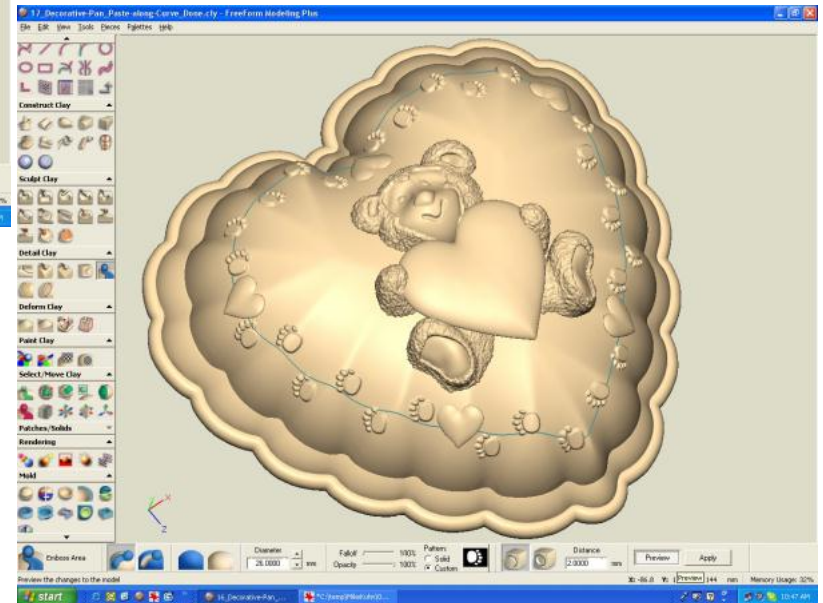
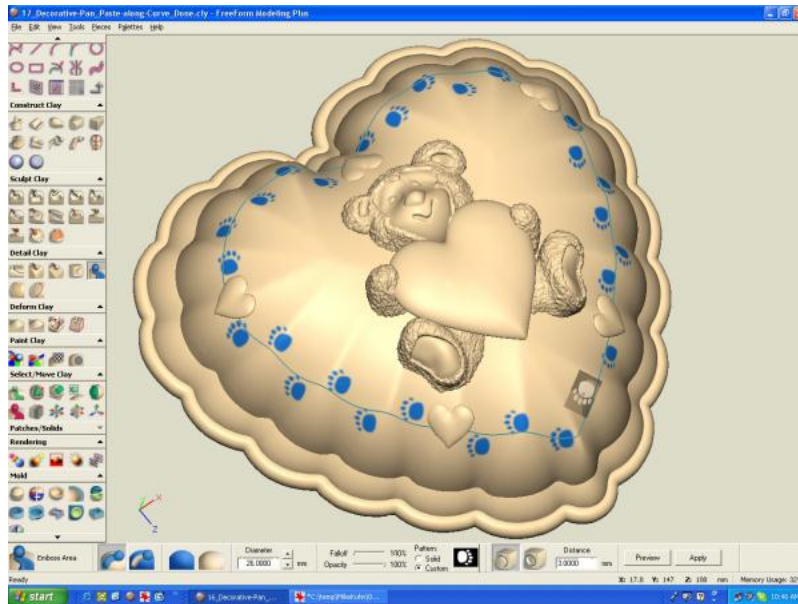
Next we want to texture the bear, but first we want to protect some areas from being modified. To do this we use the Mask tool to paint a mask on the areas that we want to protect.



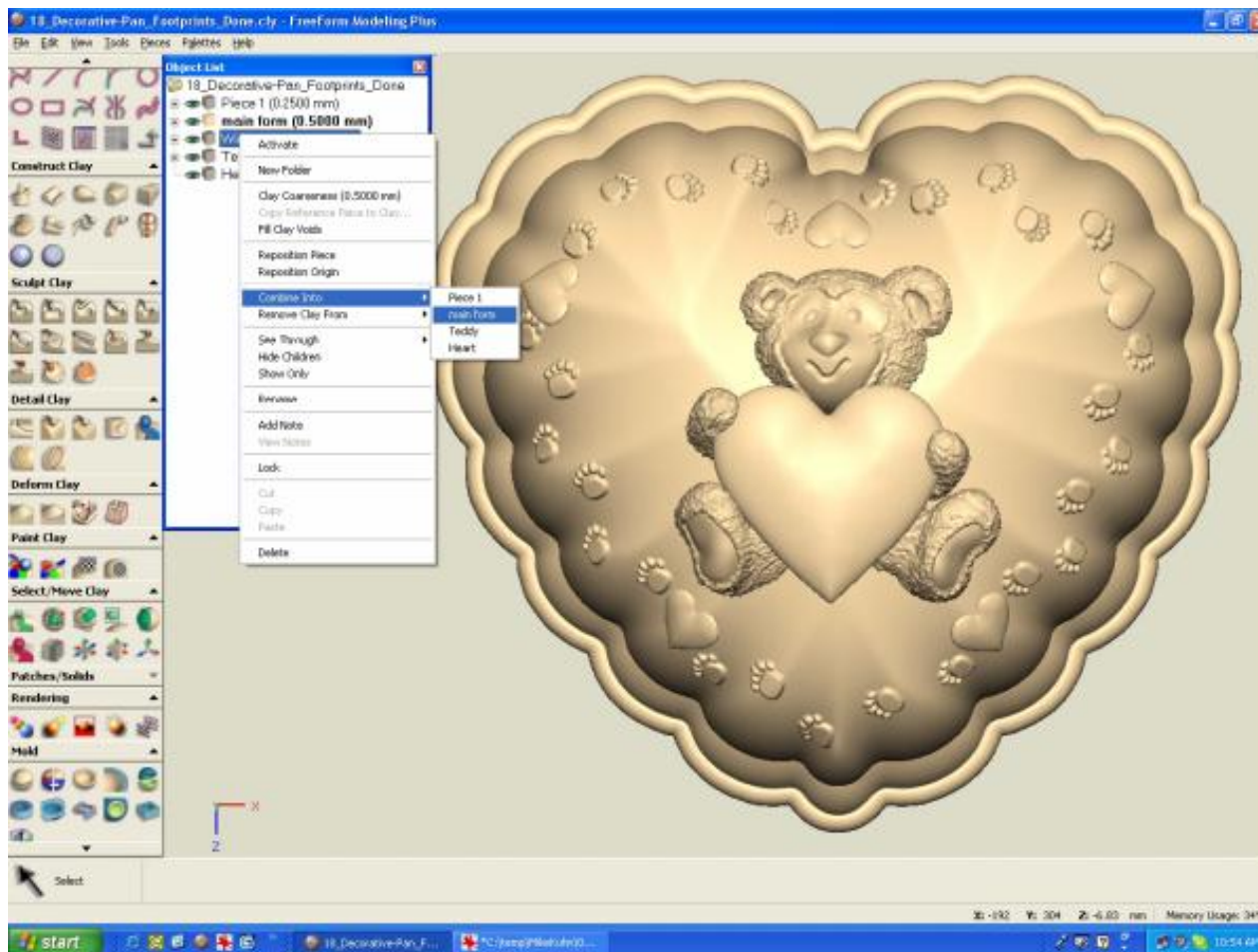
We use the Emboss Area tool with an image to stamp the bear, shown above left. We then raise the stamped area a user defined distance. The distance of the emboss is made based on the tonal values of the stamp.



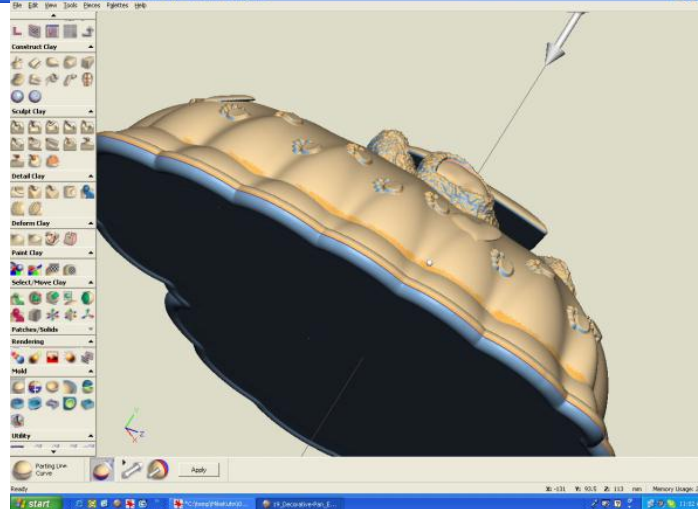
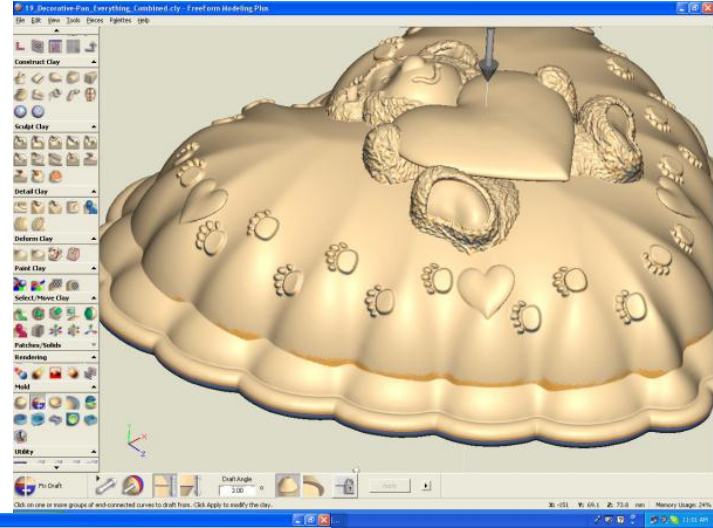
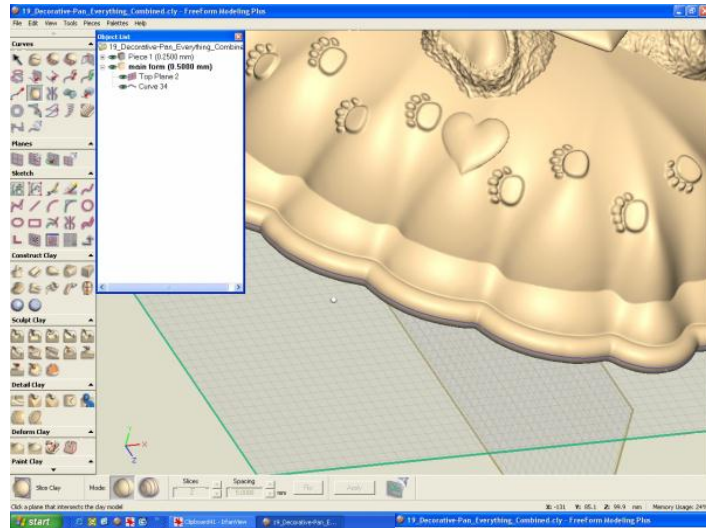
We project another sketch onto the clay. Then we reuse the center heart by copying it and pasting it along the curve as a repetitive pattern. During this process we scale it down and rotate the pieces so that they are facing away from the normals of the surface.



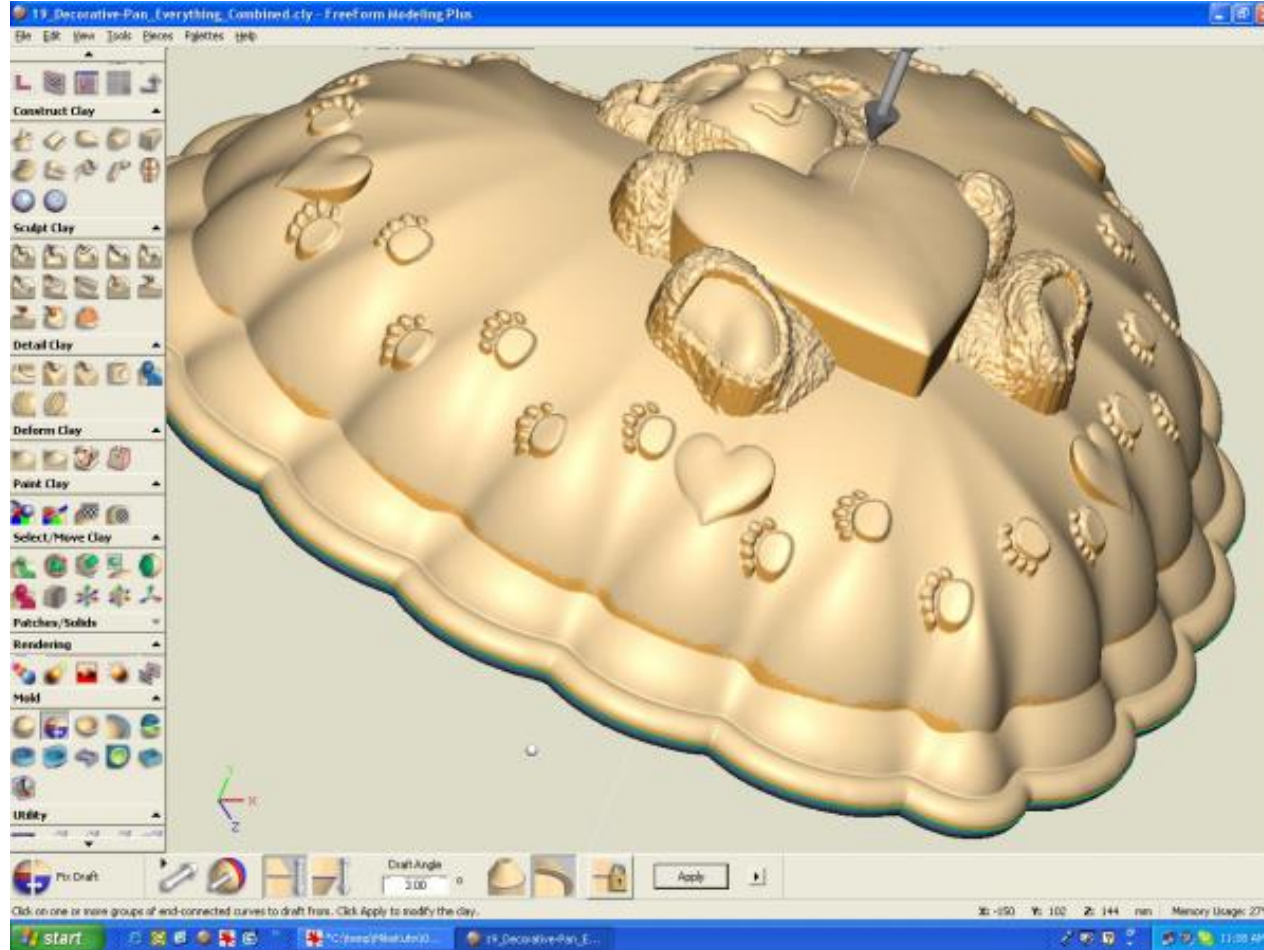
Again we use Emboss Area and an image to stamp small bear footprints on the cake and raise the clay.



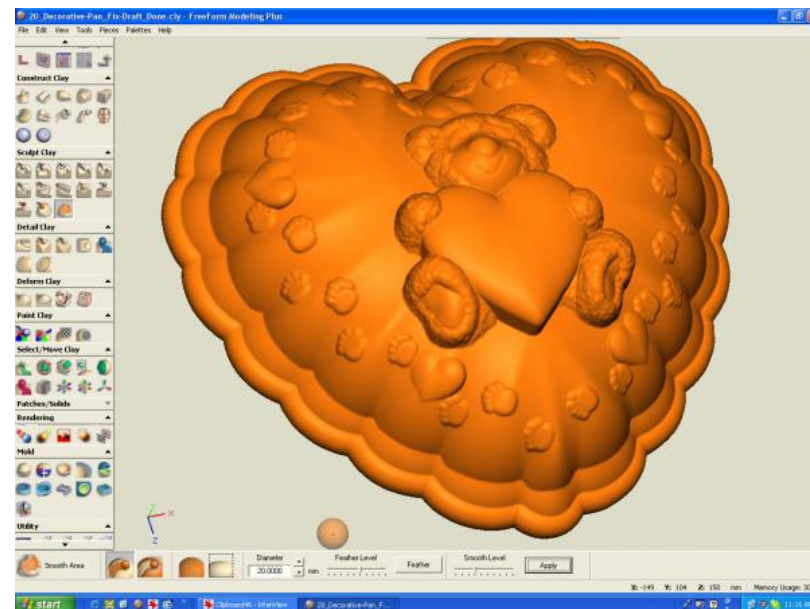
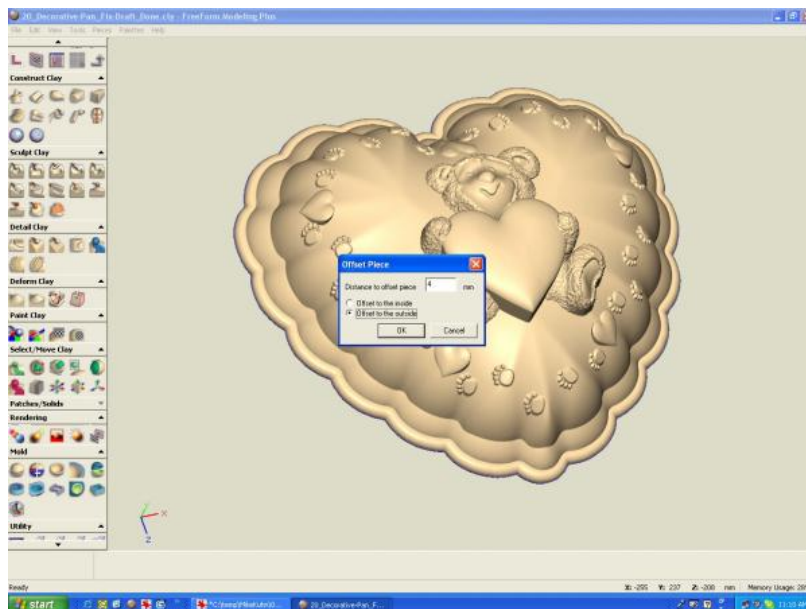
We then combine all the pieces into one piece. Voxels (volumetric pixels) are the basic element of FreeForm digital clay they enable easy, accurate Boolean operations.



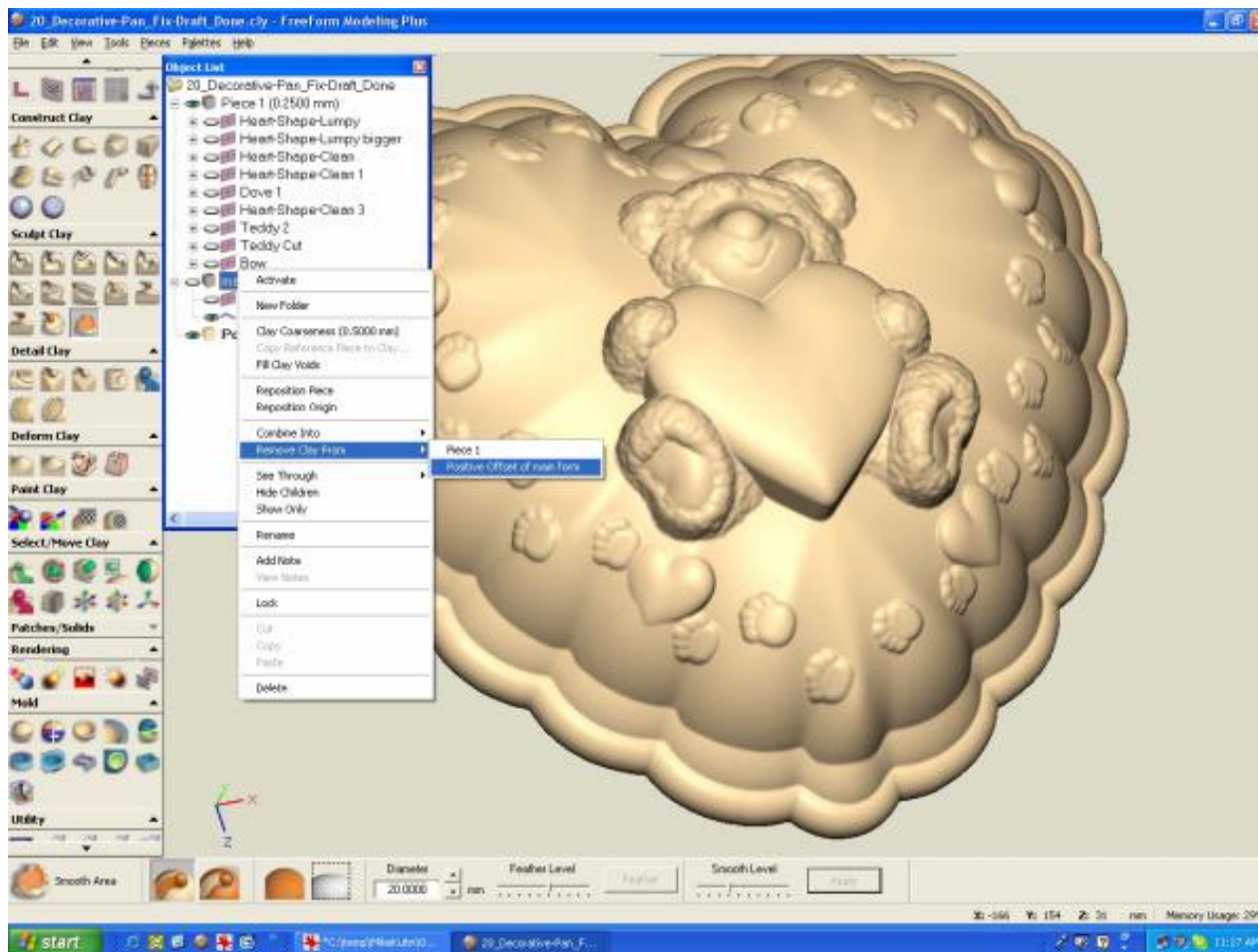
Again we create a curve with the Slice Plane tool. This curve serves as the parting line. By turning on Show Parting Line Colors, we can see which areas are facing the front, which face the back, as well as information about areas affected by the draft angle.



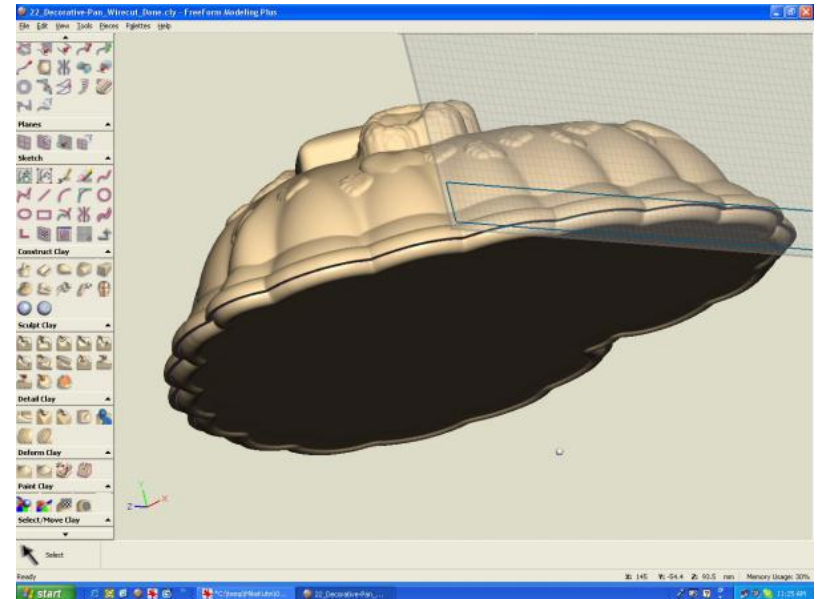
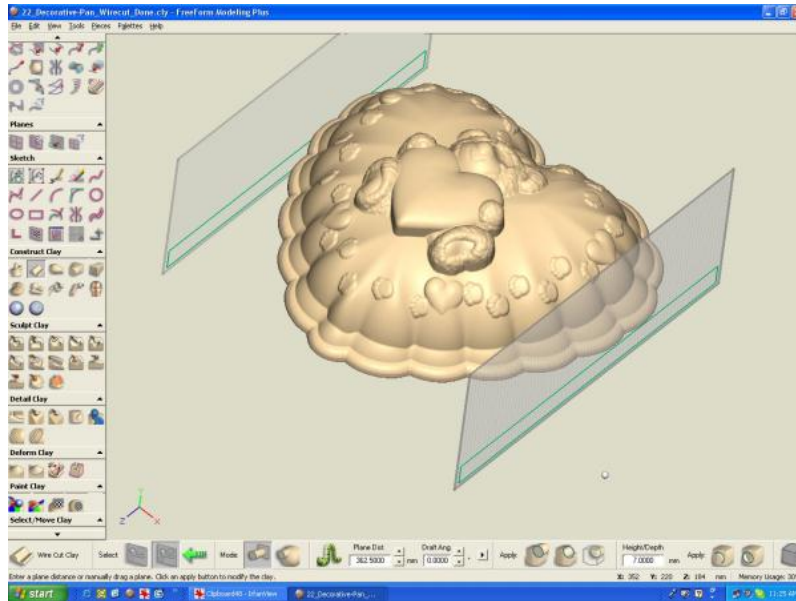
With the Fix Draft tool we can ensure that the model may be removed safely from the mold; undercuts are filled and excess material is removed to achieve the user-defined draft angle. After the draft has been checked the piece is ready for molding.



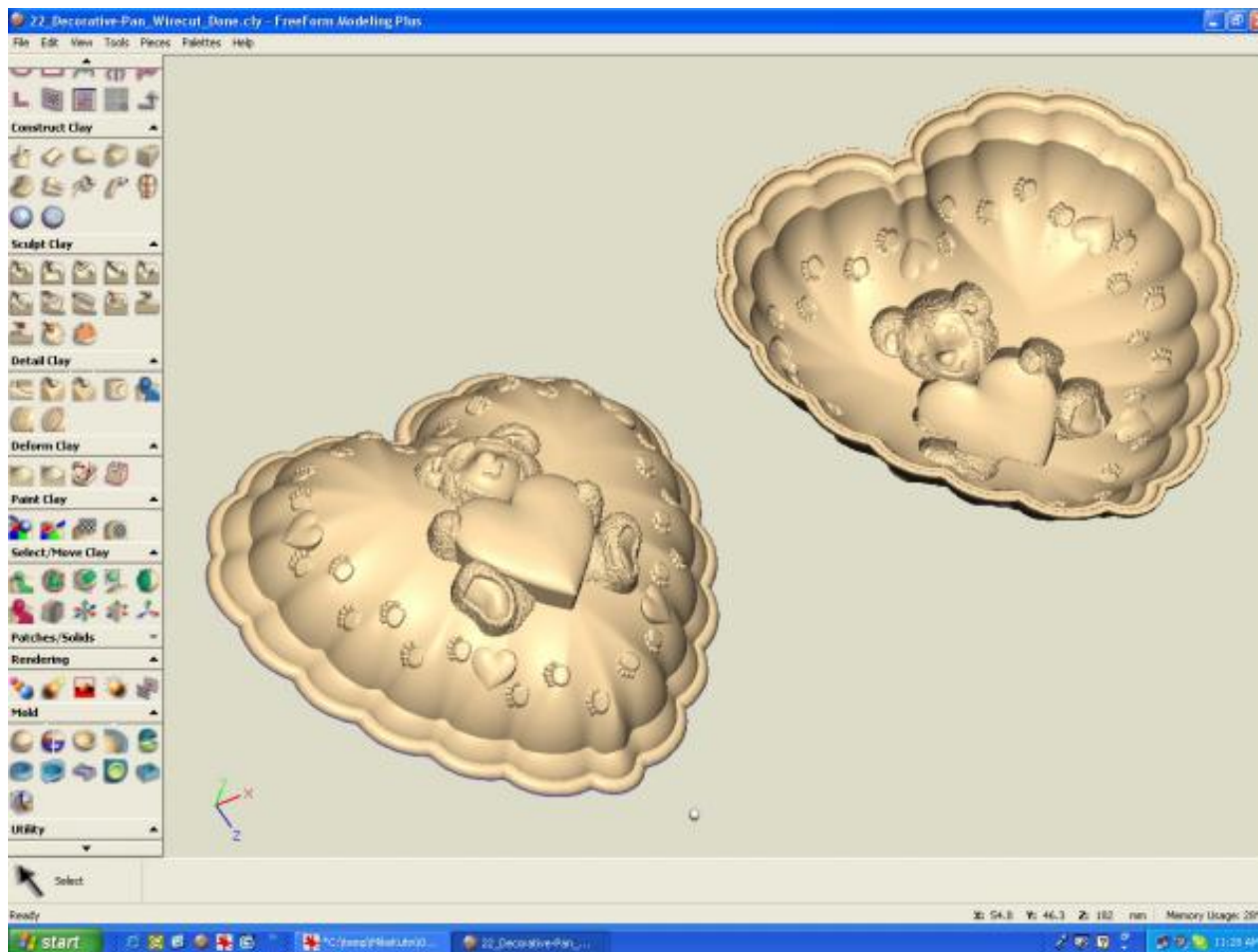
We create an offset to the outside and smooth it. We could also use the Shell tool, but in this case we have modeled the surface that will become the inside of the pan.



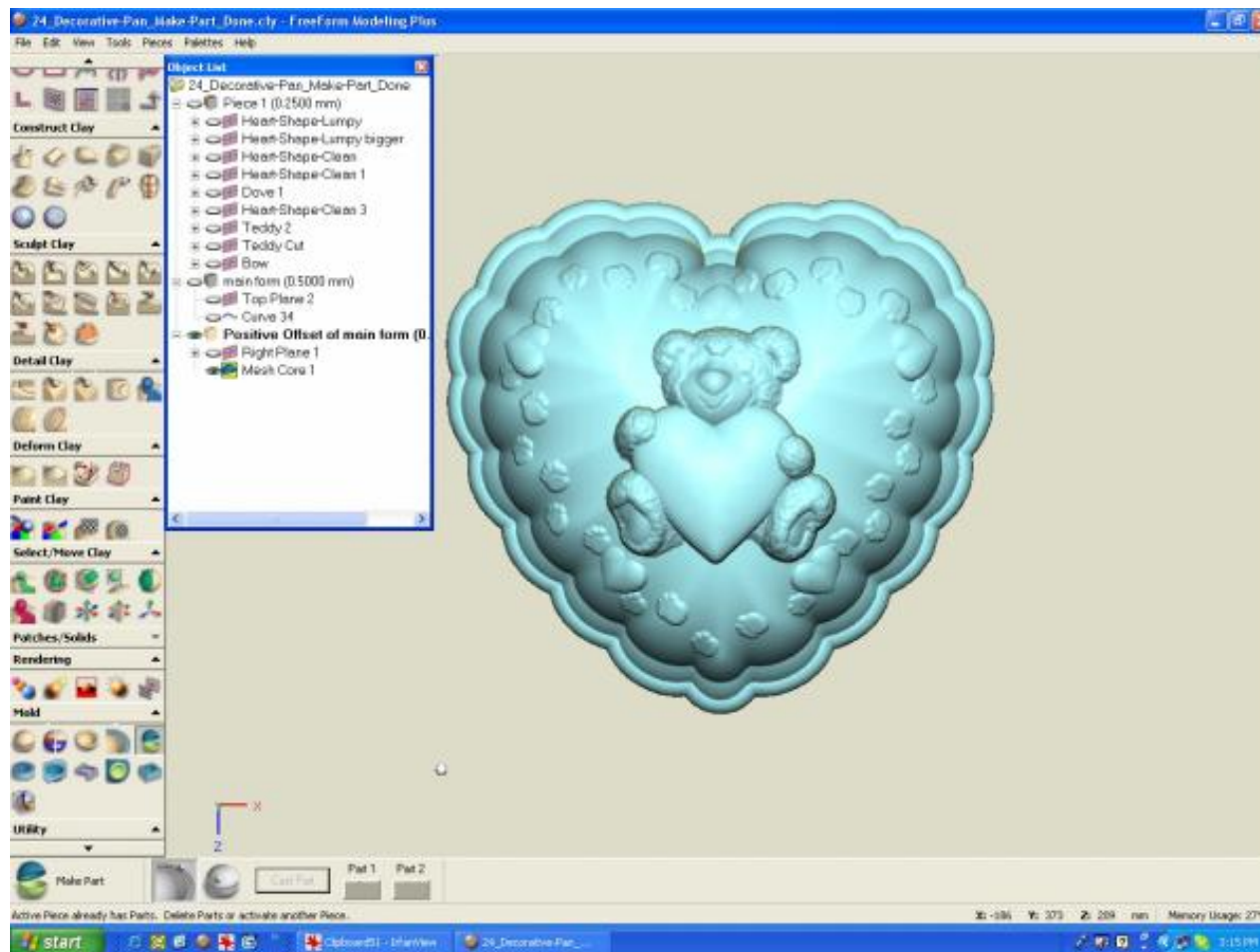
We subtract the piece that we modeled from the offset. The offset will become the decorative pan.



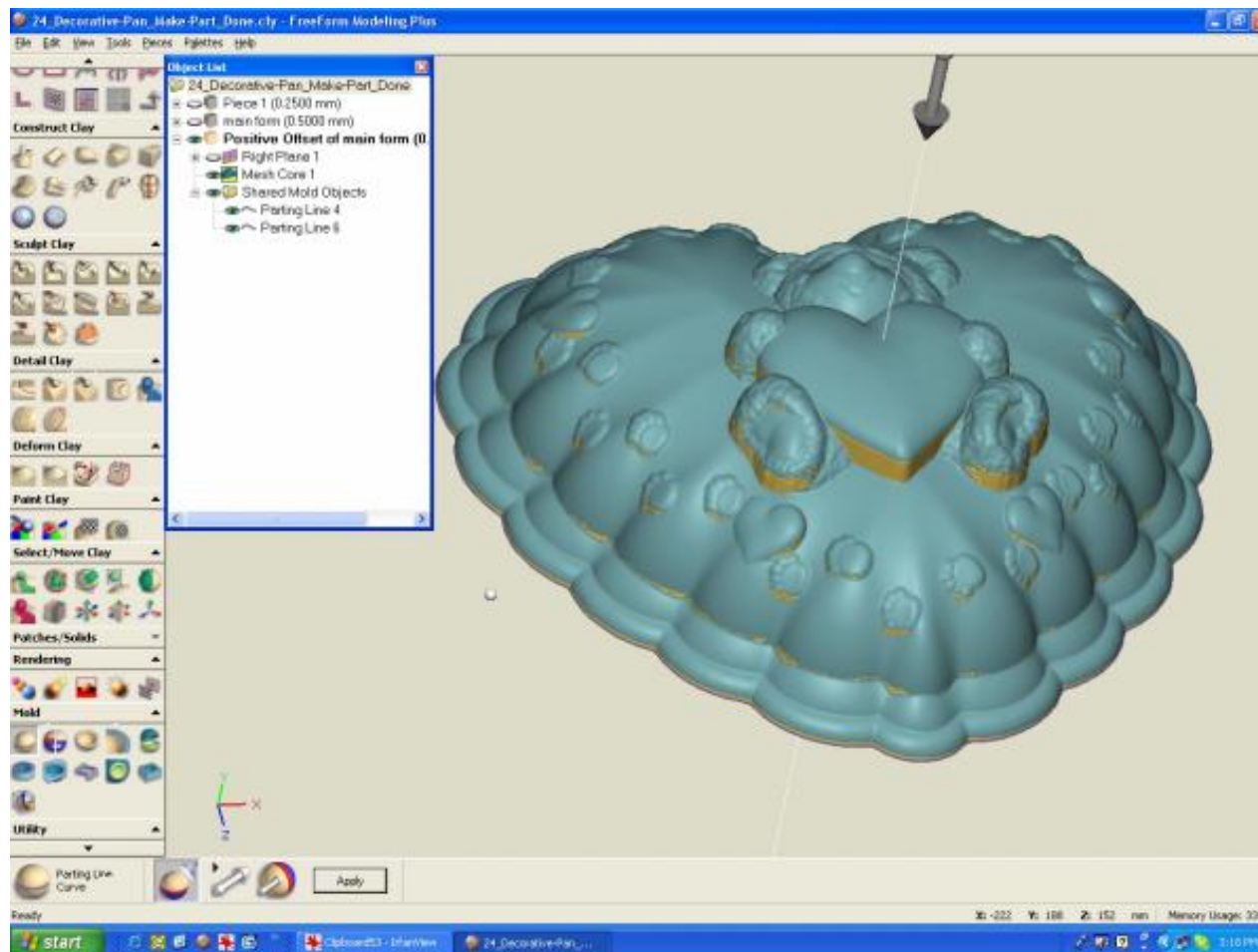
We use Wire Cut to trim both pieces on the lower part. This creates the opening of the decorative pan as shown above on the right.



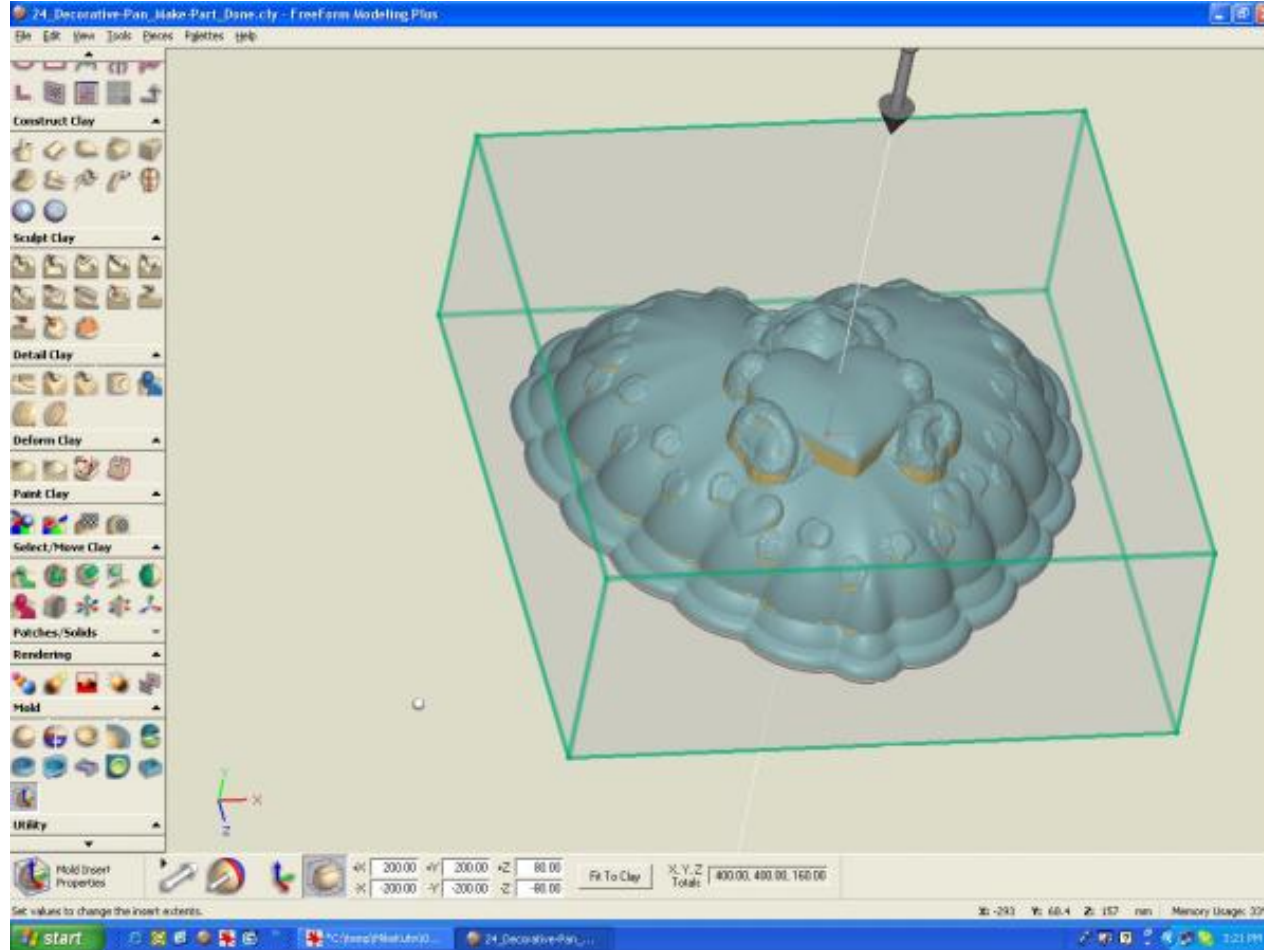
In just 1 hour we modeled a decorative pan for molding cake, chocolate or jello with the FreeForm Modeling Plus touch-enabled 3D modeling system.



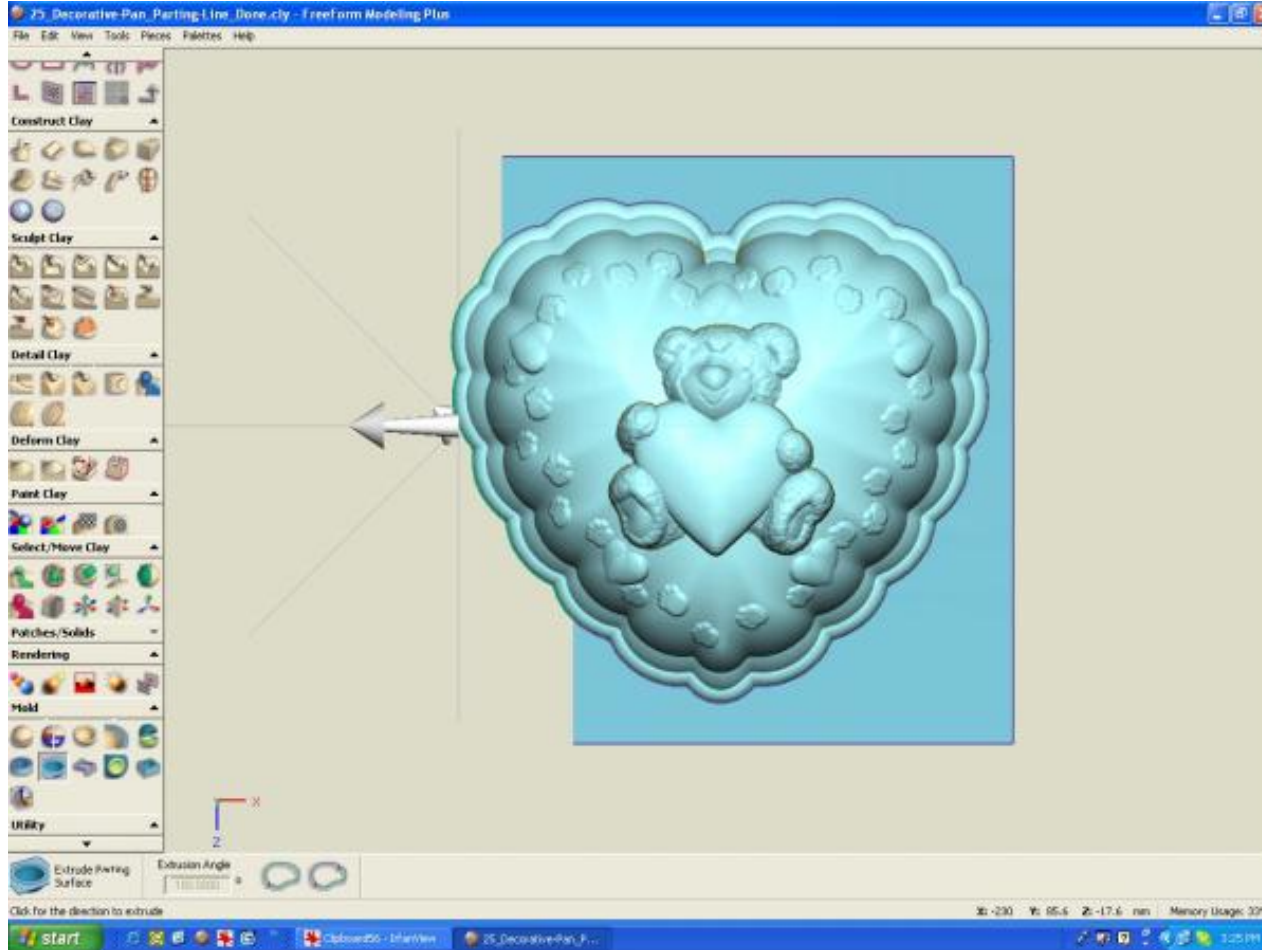
Ow, to create the mold for manufacturing this pan, since this model is made up of only one part, we simply click the Make Part tool.



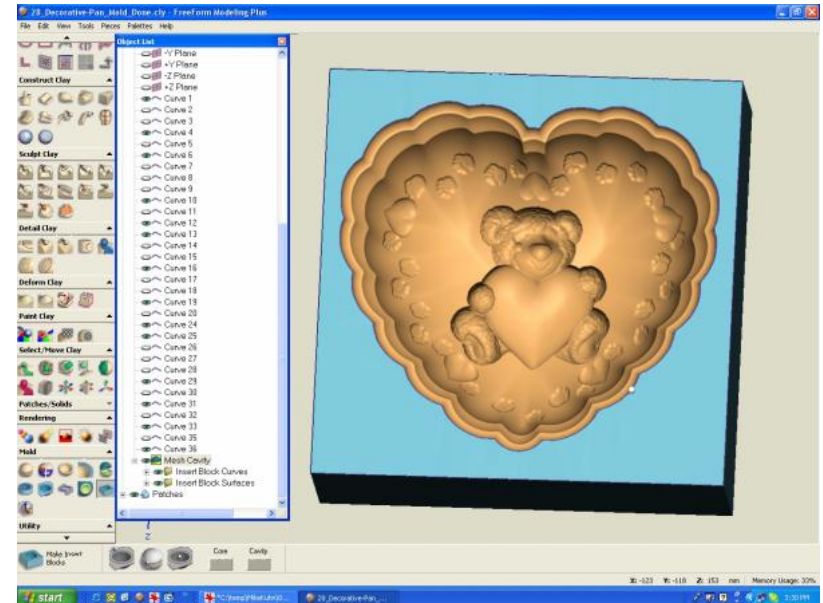
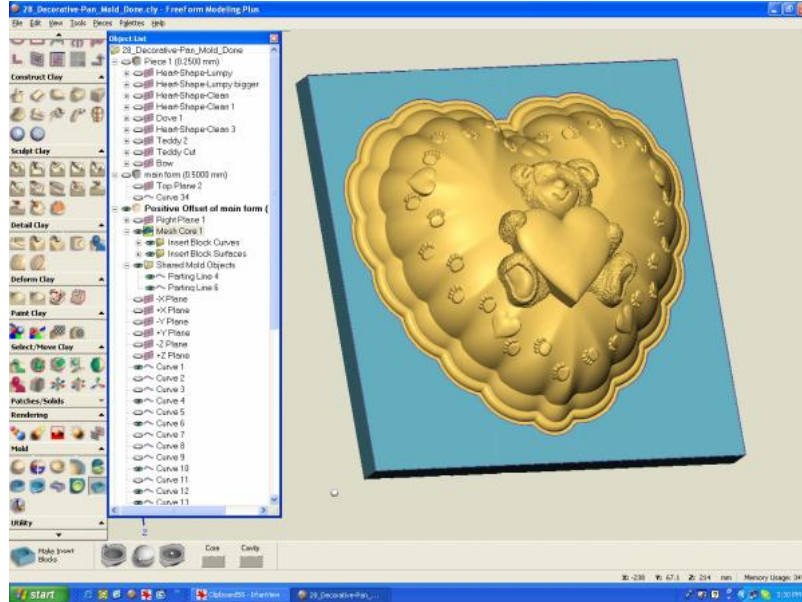
We previously created a parting line from the parting line color information and fixed the draft so we can be sure that we have a clean parting line.



Next we define the mold insert dimensions.



We create the parting surfaces by extruding them from the parting line. The surfaces consist of NURBS patches. Since we have defined the mold dimensions in the previous step, the FreeForm software automatically knows how far to extrude the patches.



With just three more clicks to define the Parting Surface Perimeter, the Outer Parting Line Curve, and which side is the cavity, the mold is done.



– Decorative Mold –