
Surface Modeling - V

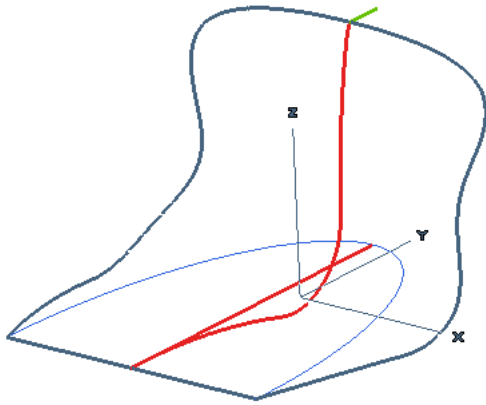
This task deals with one of the important features of thinkdesign. The inputs are 3D curves that represent a stadium chair. We will use these curves to create surfaces. We will create "static" shapes from these surfaces, and dimension driven shapes from profiles. We will also add parametric features such as fillets and profile cuts.

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1. Step 1 - Surfaces

Now let's create the surface using the basic curve. The command that we will use is a powerful tool with GSM engine. We can change one or more entities to obtain complex shape based on geometrical constraints.

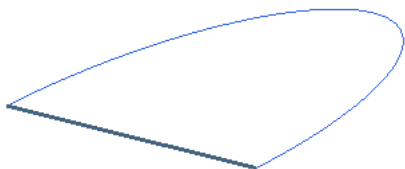


NOTE:

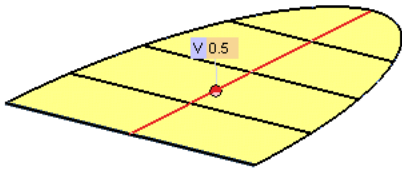
With a double click on the exe file you can run the webtraining session. ThinkDesign will be open with the right model to start.

If request to open a file, you can find it in the C:\MyTraining path.


Activate Layer 0.

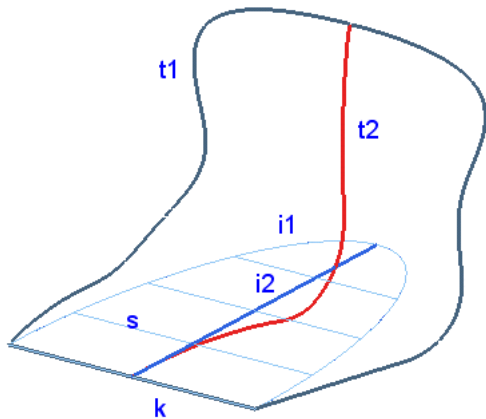


Make a **Plane Surface** and the **Isoparametric Curve** in 0.5 parameter.

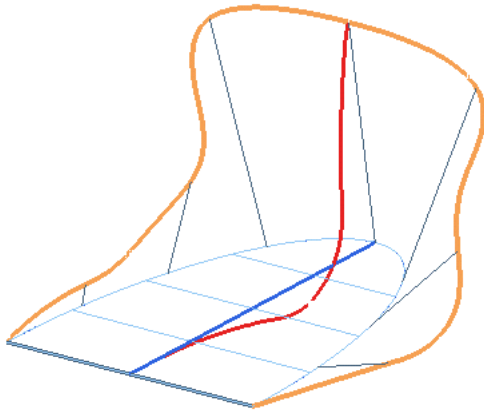


Activate Layer 1.

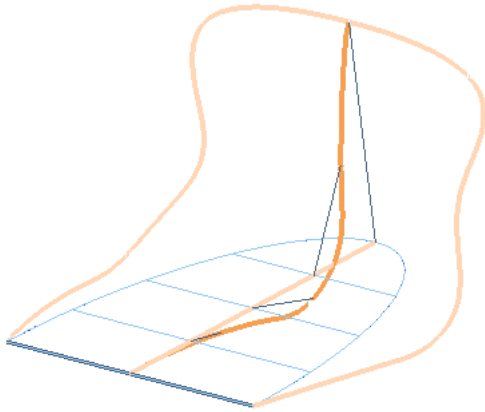
- Start the **Advanced Modeling** command.
- Pick  More Options and Hit Default button in the Approximation, Precision and Shape Control windows. Close them.




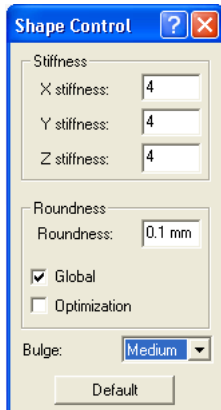
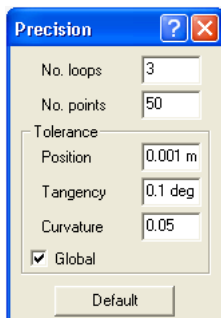
- Select front boundary (**k**) as constraint to keep in position condition.

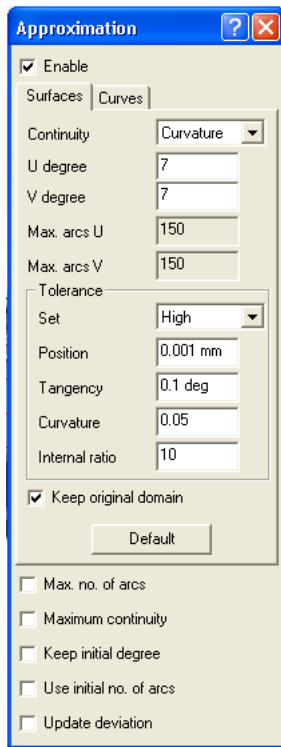




- Select the first group to matching. From (**i1**) to (**t1**).

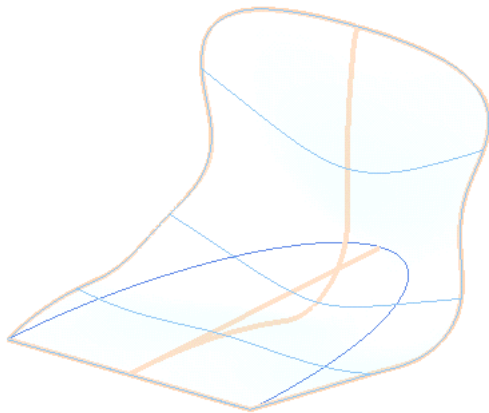


- Select the second group for matching, to assign the internal behaviour. From (i2) to (t2).
- Select the plane surface as entity to change.
- Under  More Options, set the parameters as in below images. Remember to hit 'Enable' on approximation window.

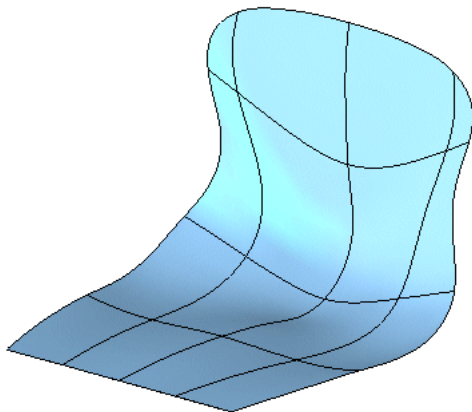




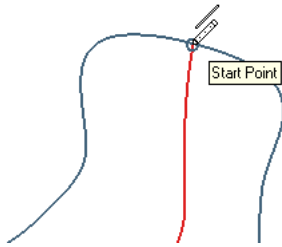
- Select  Preview to create the basic surface.
- Hit  OK to complete the command.



Look at the result..






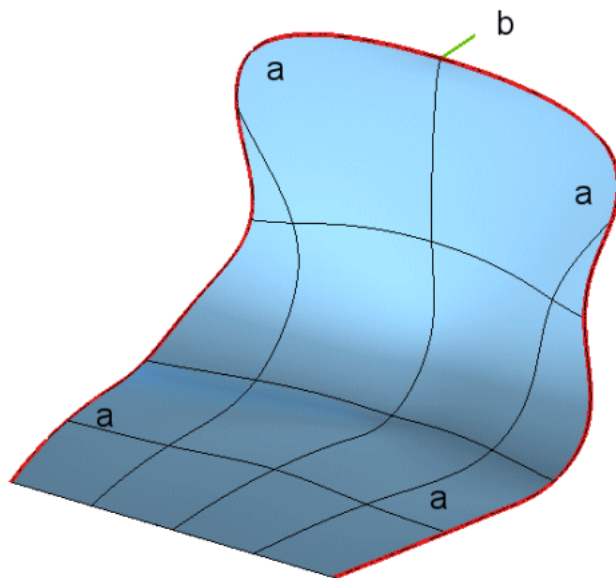
Now let us design a surface that defines the border of the seat. The behavior of this new surface has to follow a line. Start the **Two-point Line** and select first point as **End Point Snap** of internal curve.






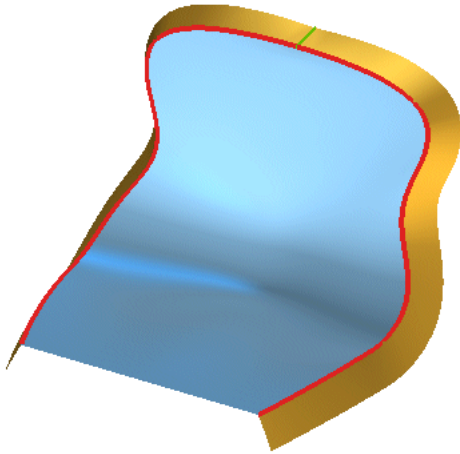
- As second point select **Enable Point Coordinates** and impose PX 0mm - PY 50mm - PZ 0mm.

Now we have all entities to create a border surface using Global Sweep.

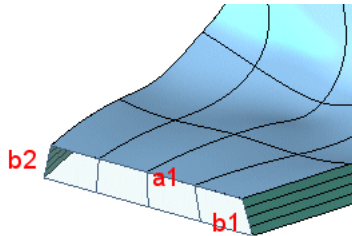
- Start the Global Sweep command.
- Pick  Drive Curves and select the red border curve (a). You have to select the boundary of surface and not one generic curve that represents it.
- Pick  Sweep - Curves and like  Curve 1 select the line (b).



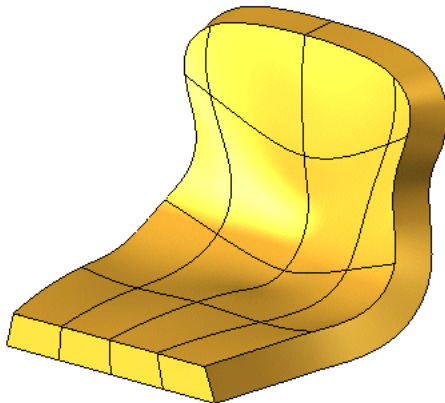
- Like  Motion Mode choose Surface based. It isn't necessary to select again the surface if you have done correctly selecting like drive curve the surface boundary.
- Select  Preview to verify that the selection is right.
- Hit  OK to complete the command.



Use **Lofted Surface** to close front side. Make the three boundary curves and use them to make a loft surface (b1-b2 as boundary A and a1 as boundary B) .



We obtain the main surfaces that represent the shape of our seat.



2. Step 2 - Make solid

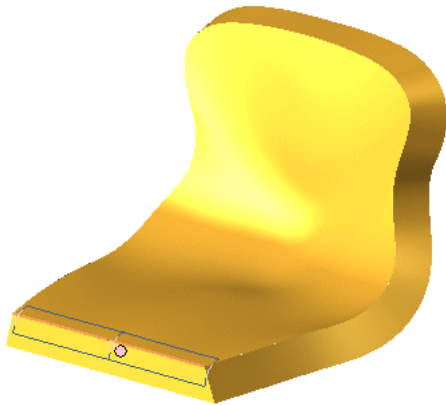
We will make a solid from these surfaces, using the **Make Solid** command, for further processing and insert solid feature to conclude the hybrid task.

- Start the **Make Solid** command.
- Select all the surfaces.
- Set the tolerance to **0.01 mm** to close inner edges.
- Hit OK.

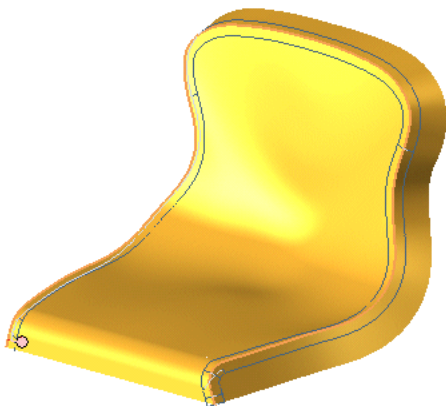
- The surface selection gives the error **solid is open**, which we know is the case with all external boundaries.
- Before to hit the tab **Continue**, if necessary, increase the tolerance to obtain the open edges only in the external boundaries.

Next job is to fillet the sharp edges.

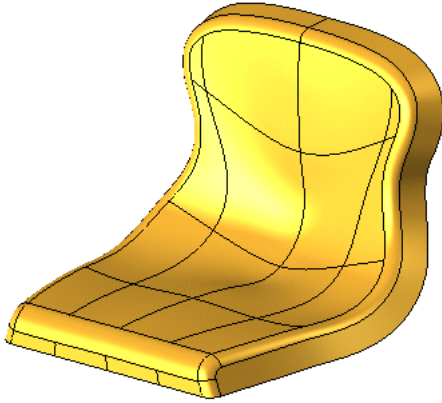
- Start the **Fillet Edges** command.
- Select the edges of the solid as **Group 1**.
- Keep the option **Constant**.
- Give a fillet of radius of **30** to this first group.



- Start the **Fillet Edges** command again.
- Select the edges.
- Keep the option **Constant**.
- Check **Tangency chain**.
- Give a fillet of radius **20**.

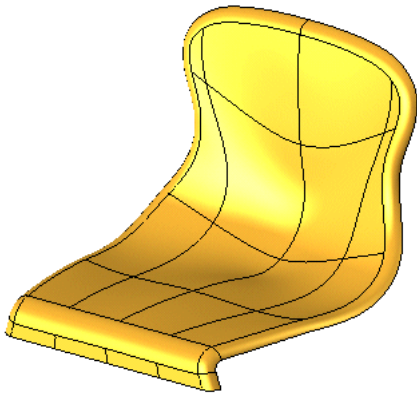


We have removed all tangent discontinuity.



We will use **Break Solid** command to remove the extra side walls.

- Click on **Break Solid**.
- Select **Local** Mode.
- Select the lateral lofted surfaces.



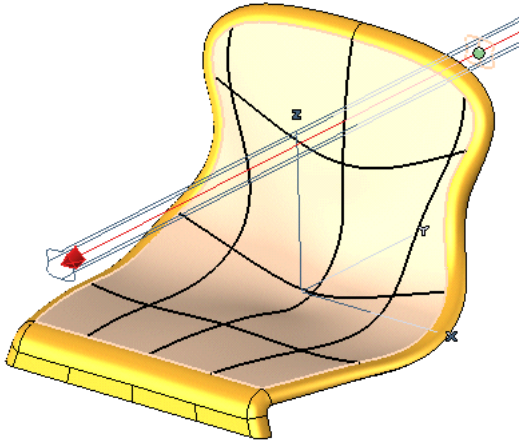
Delete the surfaces which we broke in the above step. We will add thickness to the solid using **Solid Shell** command.

- Start the **Solid Shell** command.
- Select the option **Add thickness**.
- Select **solid**.
- Ensure that the thickness is added in the inner side of the solid. If the direction is not correct, just reverse it by double clicking on the handle.
- Add an internal thickness of **8**.

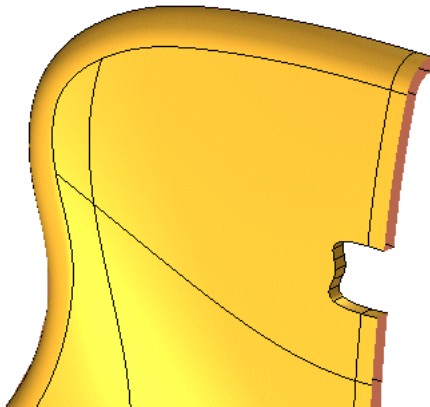
Use the profile in the layer **3** to make a **Linear Slot** on the front curved face of the chair.

- Select **Linear Slot** command.
- Select the **Profile**.

- Extension-Thru all.



Use **Section View** for a graphic split.



Use **Hide Entities** for the profile and see how the chair looks now.



Having come to the end of this task, you should now be familiar with both surface and solid modeling in a single environment.