

Filleting NURBS surfaces in Maya

Introduction
Filleting is a term for creating a smooth transition between two surfaces at angles to each other. Maya supports the creation of circular, freeform, and blended fillets. We'll look at the first of these in this handout.

Exercise
Create a NURBS plane and cylinder in the scene something like this. Note that the cylinder has no top or bottom; if it did then our filleting procedure would fail because more than two surfaces would have been selected unless we took care only to select the sides of the cylinder in the Outliner. Select the plane first and the cylinder second, so that it is green as shown.

Use Surfaces – Surface Fillet – Circular Fillet from the main menu in the Modeling environment and click on the small square to the right of the Circular Fillet option.
We want to check the Create curve on surface box to make a trim curve on the surface.

Bearing in mind the relative sizes of the cylinder and the plane, choose an appropriate radius size and hit Apply.

If the radius is too big you'll get this warning in the status bar:

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Error file: C:\Program Files\Autodesk\Maya2015\scripts\others\circularFilletPreset.mel line 1:6: Select two NURBS surfaces, two isoparms or two surface points to do circular fillet.
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Undo the operation, repeat the Fillet command, reduce the radius and try again. Now that we have a good radius, it's time to trim the surfaces. Use the 4 key to see the surfaces in wireframe. If the radius is created below the plane or inside the cylinder, reverse the normals of that surface with **Surfaces – Reverse Direction** and try again.

At this point, I'm going to turn the grid off in the window so things are clearer. You can see in the image below that the fillet's top edge is highlighted in green, indicating there are two objects here.

Deselect everything and just choose the top edge: this is the trim line for the cylinder.

Note that this is because
we chose the cylinder last. If we’d chosen the plane second, the trim line would have been created on the plane.

Trim the cylinder with the line by selecting it and then the trim line and using the **Surfaces – Trim Tool** command. Click on the part you want to keep so that it is drawn with solid lines, not dotted.

Now we have to do the same for the plane, but its intersection line hasn’t been created yet (only one is drawn in the Fillet command for some reason). Select the fillet object and use **Curves – Duplicate Surface Curves**, then select the top edge. Trim the second object with this new curve.

You should have something like this. If not, try it again. It takes some practice to get used to this process.

Note that you will have a lot of history in the Attributes Editor for all three surfaces. This means you can still change some of the parameters of the fillet (and animate them) but it means a larger file. If you don’t want to change them, consider using **Edit – Delete by Type – History**.

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