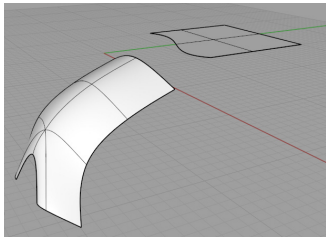
Appendix 2:
New commands in T-Splines 2.1

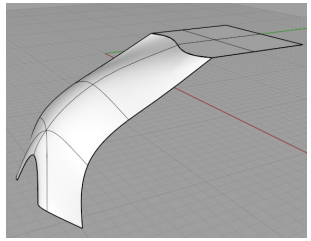
Model by Cafer

Match surface

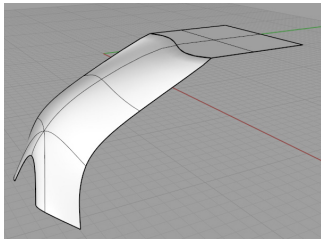
Similar to the Rhino **Match** command, **tsMatch** will position a T-Splines surface border edge to a Rhino NURBS surface or curve with *Position*, *Tangent*, or *Curvature* continuity. A *Refine* option will add control points to the T-spline to match the surfaces within file tolerance.



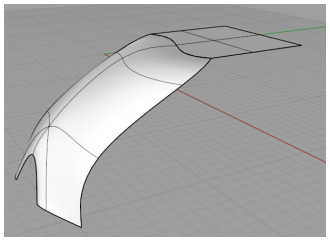
T-Splines (left) and NURBS (right) surfaces



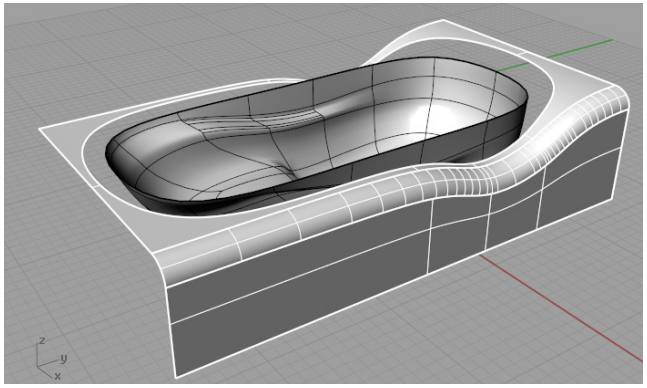
Match with Position continuity



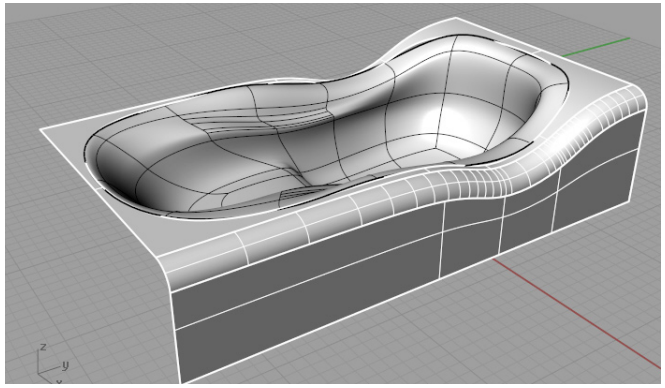
Tangent continuity



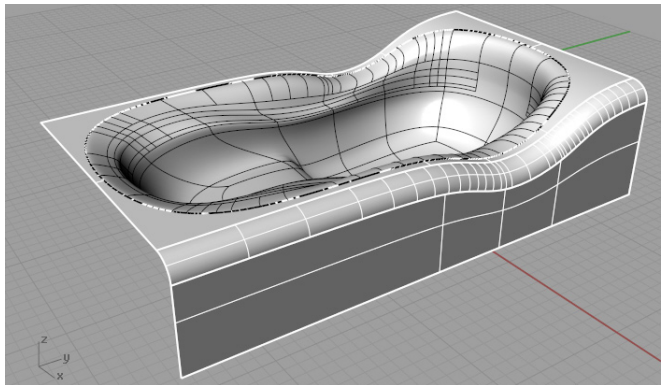
Curvature continuity



T-Splines (inside) and NURBS (outside) surfaces

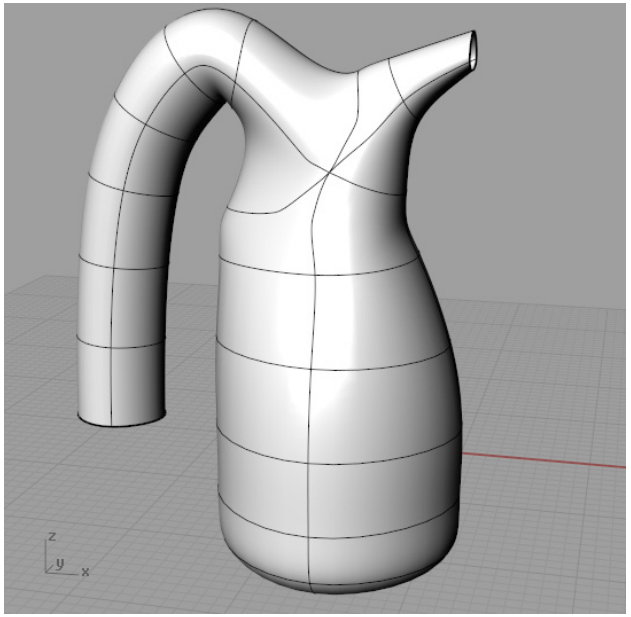


Refine option = No

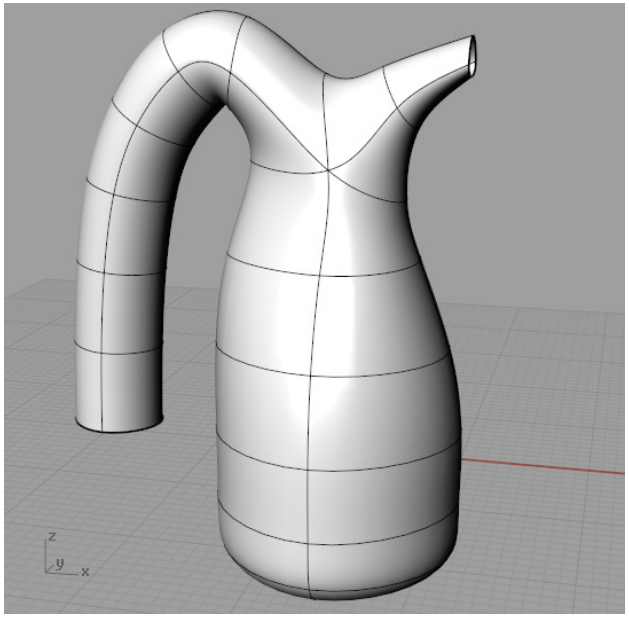


Refine option = Yes

Make uniform



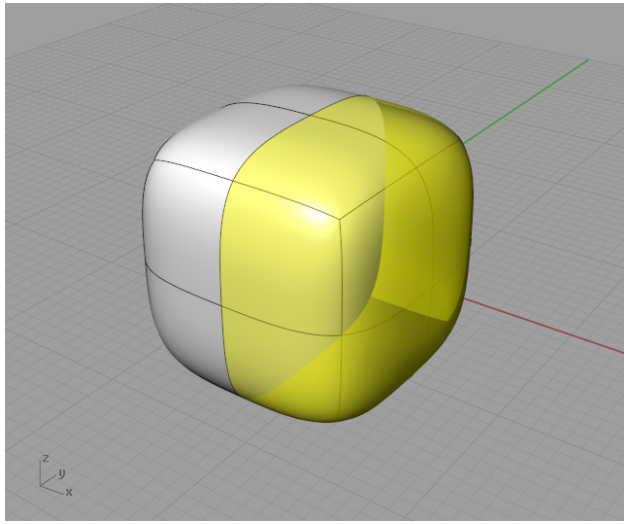
Surface with bunching

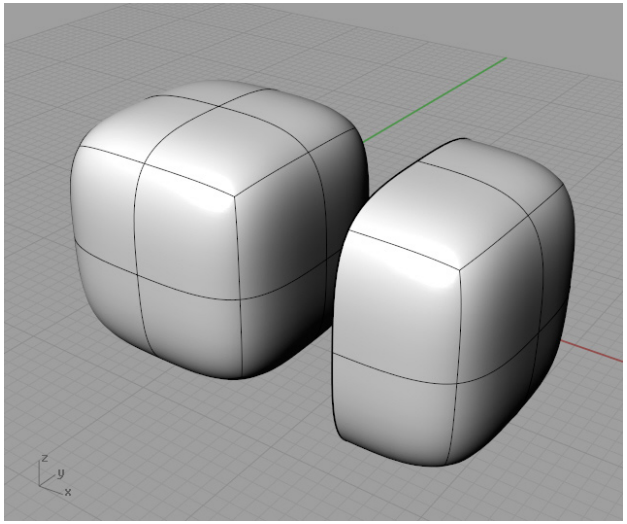


"Relaxed" surface after running the tsMakeUniform command

The **tsMakeUniform** command makes all the knots intervals in the T-Splines surface uniform. This is useful if the surface has strange bunching after adding control points. Make uniform will cause the surface to "relax".

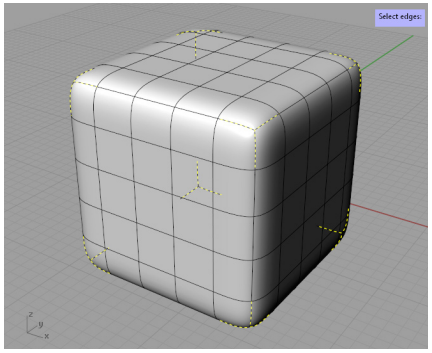
Duplicate faces


Select faces to duplicate

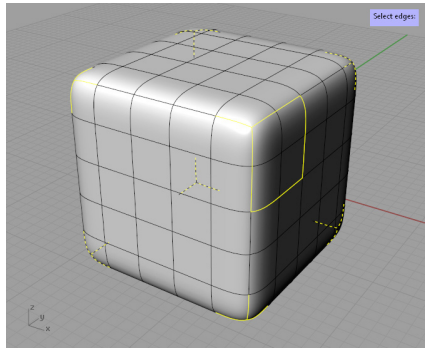

A new surface will be created

tsDuplicateFaces makes a copy of T-spline faces. This will copy the locations of the control points. If you are in box mode, it will look like an exact copy, but if you are in smooth mode, if you are copying an open selection, the border edges of the selection may have different curvature from the original surface.

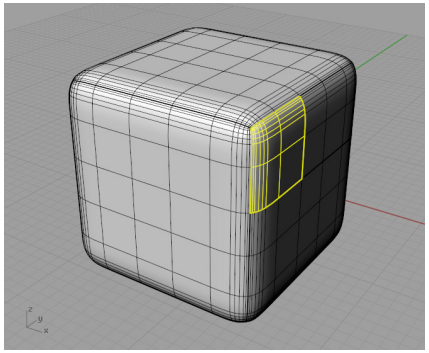
Set surface layout



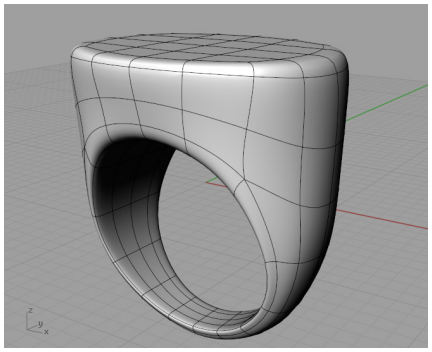
tsSetSurfaceLayout UI. The dashed edges at star points must be border edges for the NURBS patches and cannot be deselected.



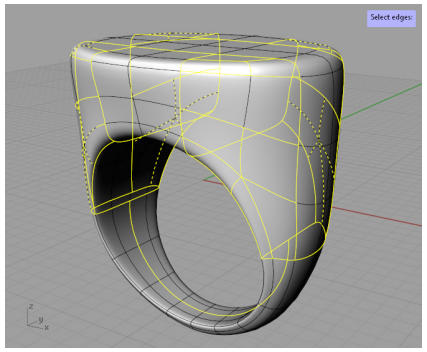
Click on edges to set the desired layout



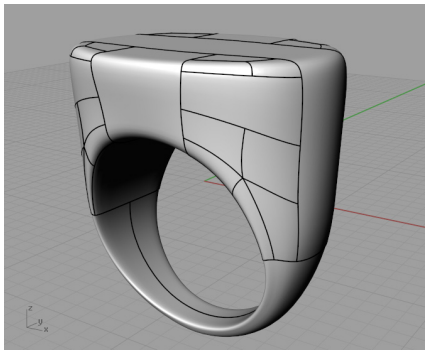
Converting to NURBS will make the new layout patches



T-Splines surface



New layout with the Set Surface Layout command



NURBS surface

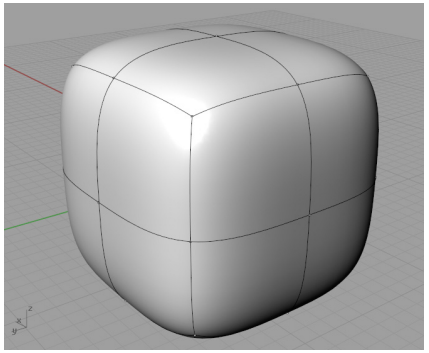
The **tsSetSurfaceLayout** command allows the user to define the regions where the T-spline surface will be split into NURBS patches.
By default, when T-spline surfaces are converted to NURBS, edges coming out of star points are extended to form the boundary of the NURBS patches, and all T-points within these areas are extended to form rectangular NURBS.

The Set Surface Layout command gives the user an opportunity to redefine how the T-spline is split into NURBS.

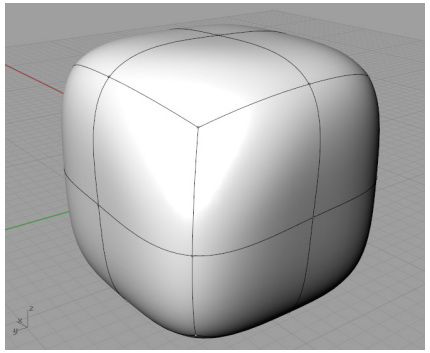
When the command is entered, edges coming out of all star points in the model are highlighted with a dashed line. These edges must be on the edges of NURBS surfaces and cannot be deselected. The user can select any other edges in the model, and the selections will be the borders of NURBS patches after **tsConvertToRhinosurf** is run. The *Default Extension* option highlights all edges that would be the borders of NURBS by default. The *Clear* option clears the edge selection.

Weight

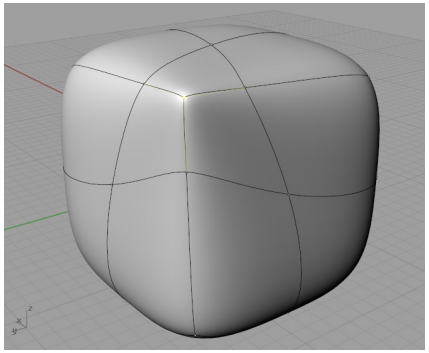
The **tsWeight** command assigns a weight to T-spline control points, similar to the Rhino **Weight** command.



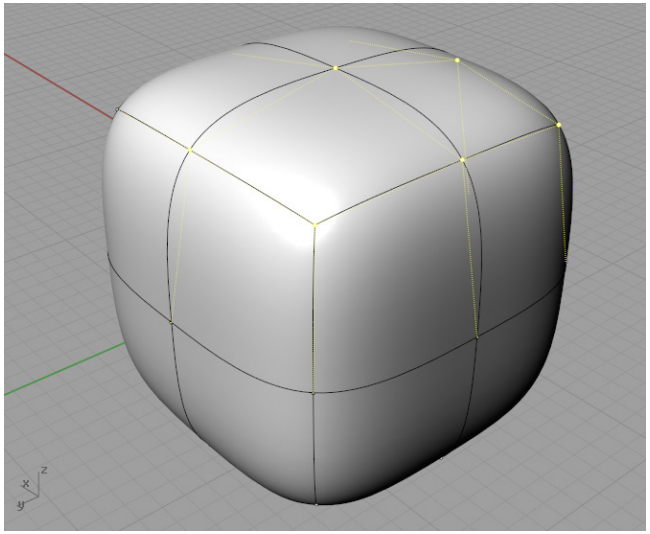
tsWeight of 1 (default)



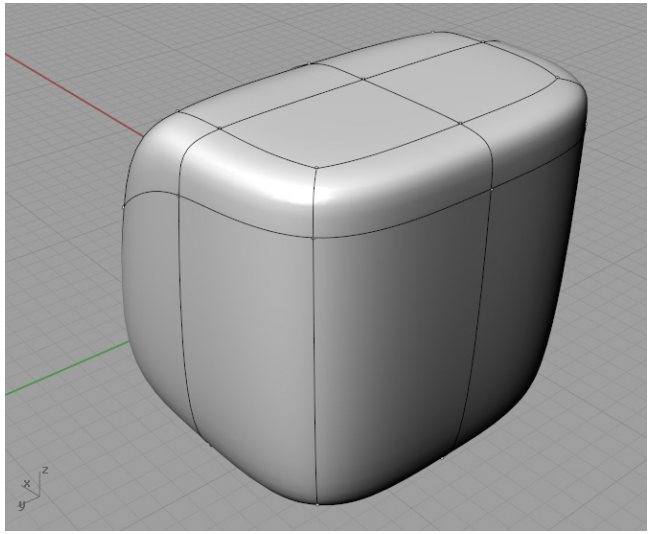
tsWeight of 0.1



tsWeight of 10

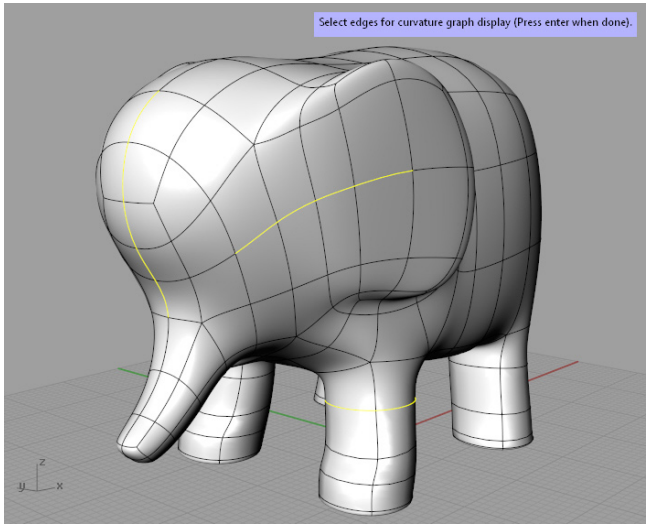


Six control points selected

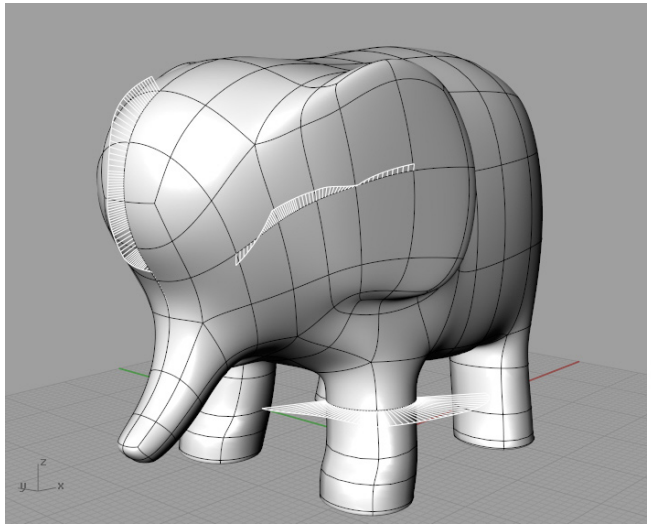


A tsWeight of 20 can make a soft crease

Set curvature graph edges



Select edges for analysis


Curvature graph appears only on selected edges

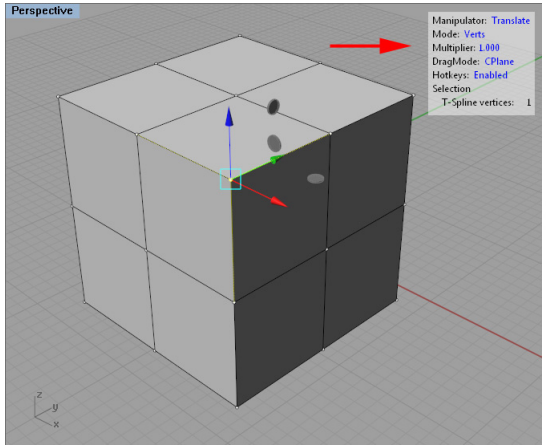
tsSetCurvatureGraphEdges allows the user to turn on specific T-spline edges for display while using the Rhino **CurvatureGraph** command.
The *Clear* option will turn CurvatureGraph on for all edges in the model. After the Set Curvature Graph Edges command is used, the Rhino Curvature Graph command must be run to see the curvature graph.

Manipulator

There are two new features with the T-Splines manipulator.

Multiplier

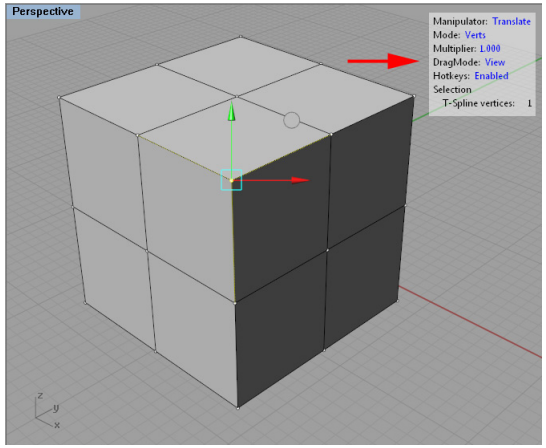
Changes the sensitivity of the T-Splines manipulator.



Click on Multiplier to change the value

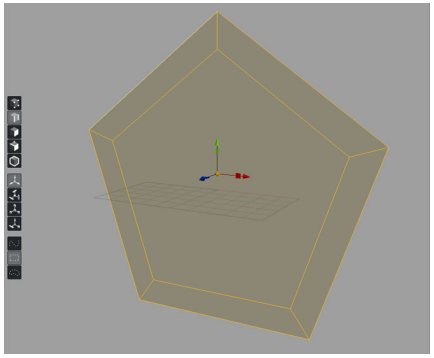
View mode

A new manipulator mode that is oriented to the current viewport position.

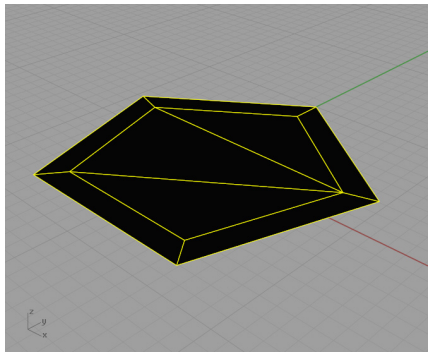


Click on DragMode to change to View mode

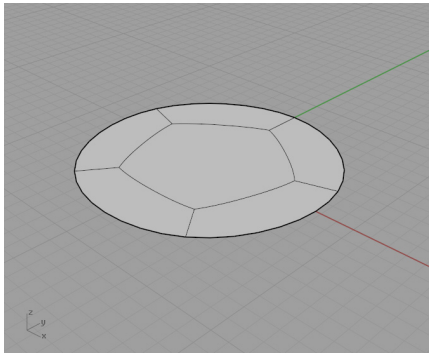
tsImportOBJ—NO LONGER NEEDED



Mesh (with n-sided face) created on Silo

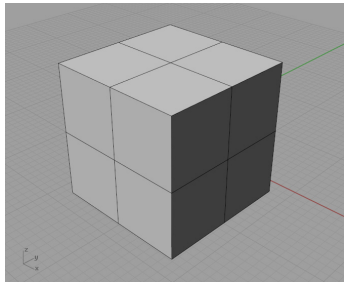


Mesh imported (as .obj file) into Rhino

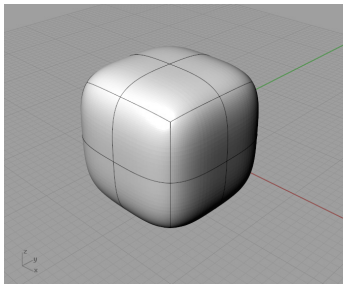


Rhino mesh converted to T-Splines

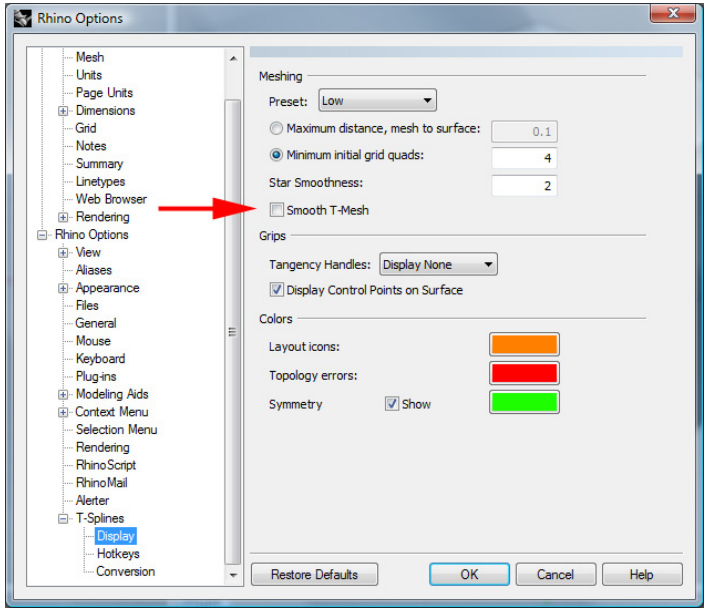
This command no longer exists, because Rhino now supports the import of .obj files with n-sided faces.



T-Mesh smooth off



T-Mesh smooth on



T-Splines option window

Smooth T-Mesh option

This display option allows you to display T-splines in box mode as smooth, flat-shaded meshes. This option is off by default, and is most useful when working with very large models where the T-Splines smooth mode responds slowly. By using the Smooth T-Mesh option, the model will respond more quickly when moving control points, adding geometry, etc.

TIP: T-spline surfaces displayed as a smooth T-Mesh are, in fact, meshes. To use Rhino NURBS commands, such as trim, etc., you will need to switch the T-Spline to smooth mode display by using tsSmoothToggle.

Old commands, new options

The following options were added to existing T-Splines commands.

tsConvert option: *Copy* (copy the mesh or NURBS being converted to T-Splines)
tsMerge option: *Smooth* (merge smoothly or not)
tsLayout: new icon to help find seashell conditions more easily