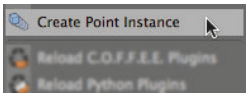
ToPoly

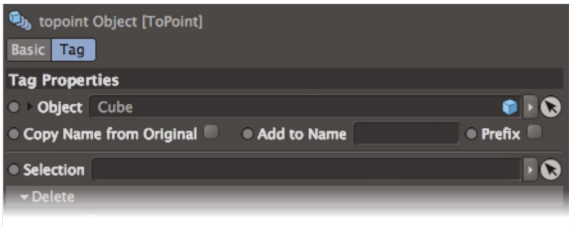
ToPoly is a set of plugins (a tag and a command) that create polygonal live instances of parametric objects.
It can also create new and improved versions of parametric splines. See page 3.

To create a new polygonal live instance of a parametric object, the easiest way is to select a parametric object and choose **Create Point Instance** from the **Plugins** menu.



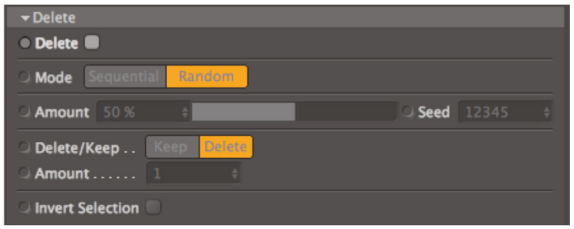
This will create a polygonal object witha **ToPoint** tag alreadya ttached, instantiating the original parametric object. Optionally, if the **Ctrl** key is pressed when choosing **Create Point Instance** from the **Plugins** menu, the original parametric object will be hidden in the editor and in the render.

The original parametric object will appear in the **Object** field of the **ToPoint** tag. So, if another parametric object is dragged into this field, a new polygonal mesh will be generated.



If the **Copy Name from Original** option is ON, the polygonal object will be receive the same name as the parametric object, dynamically. This means that, if the name of the parametric object changes, the name of the polygonal object will automatically change too. An optional suffix or prefix could be added to the name, with the **Add to Name** and **Prefix** parameters.

The **Selection** field could store an optional **Polygon Selection** tag.
If this field is kept empty, the following options will operate on the whole object. If it containsa **Polygon Selection** tag, the options will only apply to the polygons referenced by the selection tag.



With this option turned ON, polygons will be deleted from the polygonal object.

If the **Mode** is set to **Random**, random faces will be deleted. Changing the **Seed** parameter will create different sets of deleted faces. The amount of faces to delete is set with the **Amount** parameter.

If the **Mode** is set to **Sequential**, sets of sequential faces will be deleted. The amount of faces to delete or keep is set with the **Amount** parameter.

If the **Delete/Keep** option is set to **Delete**, *n* faces (set by the **Amount** parameter) are deleted, one is kept, then *n* faces are deleted, one is kept, and so on.

If the **Delete/Keep** option is set to **Keep**, *n* faces (set by the **Amount** parameter) are kept, one is deleted, then *n* faces are kept, one is deleted, and so on.

If there is a selection tag in the **Selection** field, only the polygons included in the selection are affected by the **Delete** operation.

If the **Invert Selection** option is ON, all polygons are affected by the **Delete** operation, except those in the selection.

WARNING!! If a selection tag is present in the Selection field, the deleted polygons will no longer be available for other operations. This will mess up the indexes of the polygons and unexpected results will occur.

With this option turned ON, polygons from the polygonal object will be distorted, as they were crumpled.

Adjust the amount of distortion with the **Amount** parameter. Positive values will move points in the direction of the normals and negative values in the opposite direction.

For a new set of distortions, insert new values in the **Seed** parameter.

To move points in both directions (normals directions and opposite direction) at the same time, turn ON the **In & Out** option.

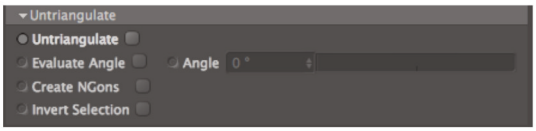
If there is a selection tag in the **Selection** field, only the polygons included in the selection are affected by the **Crumple** operation.

If the **Invert Selection** option is ON, all polygons are affected by the **Crumple** operation, except those in the selection.

With this option turned ON, polygons from the polygonal object will be triangulated, if they are not triangles already.

If there is a selection tag in the **Selection** field, only the polygons included in the selection are affected by the **Triangulate** operation.

If the **Invert Selection** option is ON, all polygons are affected by the **Triangulate** operation, except those in the selection.



With this option turned ON, polygons from the polygonal object that are triangles will be untriangulated.

If the **Evaluate Angle** option is OFF, a brute force method will be used and all triangles will be converted to quadrangles. This may result in unwanted edges and/or shading errors.

If the **Evaluate Angle** option is ON, adjust the **Angle** parameter to set the angle at which two triangles should be combined to create a quadrangle (or NGon). Very high values will result in extremely non-planar polygons.

If the **Create NGons** option is ON, instead of creating quadrangles, NGons will be created when possible.

If there is a selection tag in the **Selection** field, only the polygons included in the selection are affected by the **Untriangulate** operation.

If the **Invert Selection** option is ON, all polygons are affected by the **Untriangulate** operation, except those in the selection.

With this option turned ON, polygons from the polygonal object will be triangulated, with a special type of triangulation, with the vertex in the middle of the original polygons.

If there is a selection tag in the **Selection** field, only the polygons included in the selection are affected by the **Cross Triangulate** operation.

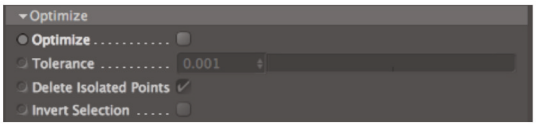
If the **Invert Selection** option is ON, all polygons are affected by the Triangulate operation, except those in the selection.

With this option turned ON, polygons from the polygonal object will create a hollow frame.

The thickness of the frame is controlled by the **Thickness** parameter. Very high values can produce overlapping artifacts.

If there is a selection tag in the **Selection** field, only the polygons included in the selection are affected by the **Wire** operation.

If the **Invert Selection** option is ON, all polygons are affected by the **Wire** operation, except those in the selection.



With this option turned ON, points from the polygonal object will be optimizes (welded or deleted).

Points whose distance is less than or equal to the **Tolerance** value will be welded.

If the **Delete Isolated Points** option is ON, all points that are not used to create edges or faces will be deleted.

If there is a selection tag in the **Selection** field, only the polygons included in the selection are affected by the **Optimize** operation.

If the **Invert Selection** option is ON, all polygons are affected by the **Optimize** operation, except those in the selection.

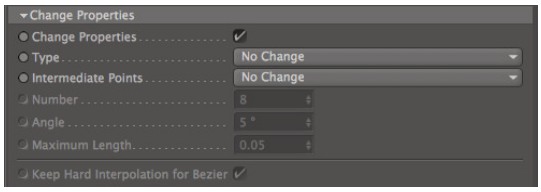
If the object that is selected when you choose **Create Point Instance** from the **Plugins** menu is a parametric spline, the object that is created is a editable spline and the set of options that can be used in the **ToPoint** tag is different.

This option, if set, forces the opening or closing of the resulting editable spline.

Even if the original parametric spline is a opened spline (an Helix, for example), choosing **Closed**, will force close the resulting editable spline.

Even if the original parametric spline is a closed spline (a Circle, for example), choosing **Opened**, will force open the resulting editable spline.

Choosing **No Change** will keep the spline opened or closed, as set by the original parametric spline.

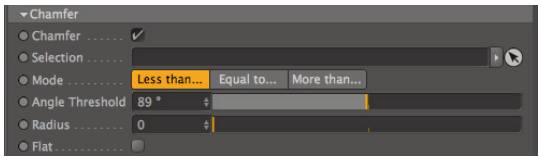


This option, when set, will change the Type and the Interpolation calculation of the generated spline, independently of how the original parametric spline is generated.

Setting the **Type** and/or **Intermediate Points** to **No Change** will keep the same calculation method as the original parametric spline.

If any of the parameters is changed, the new editable spline will be generated with the options set.

The **Keep Hard Interpolation for Bezier** option only becomes active if the **Type** option is set to **Bezier**. When On, all the corner edges (Linear corners) will become Bezier corners with Hard Interpolation. This will ensure that the splines will retain their shape but still be prepared for potential curve adjustment. This is specially important for chamfering (see below).



This option, when set, will allow you to chamfer corners of the generated spline.

If the **Selection** field containsa **Point Selection Tag**, only the points included in the selection tag will be chamfered.

If the **Selection** field is empty, the chamfered vertexes are defined by angle thresholds.

The **Angle Threshold** parameter defines the angle values.

The **Less than...**, **Equal to...** and **More than...** options define what type of comparison will be made to select what vertexes should be chamfered.

The **Radius** parameter defines the size of the chamfer.

The **Flat** option, when On, will create a straight chamfer, instead of a curved one.

To create predictable chamfers, the generated spline should be set to **Bezier** and the **Keep Hard Interpolation for Bezier** option (see above) should be On.

This option, when set, will allow you to create an outline duplicate of the original parametric spline.

The **Amount** parameter defines how far from the original spline, the outline will be created. Negative values will create the outline in the opposite direction.