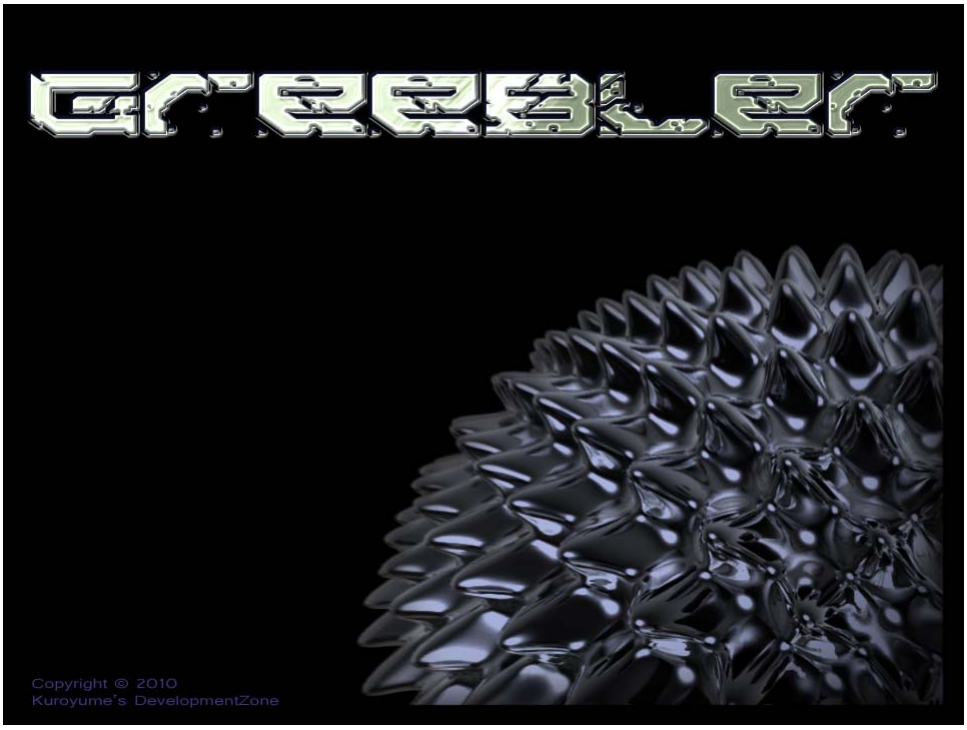
Greebler

Cinema 4D Greeble and Nurnie Generator plugin



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Introduction

Greebler is a powerful and integrated set of three plugins for adding greeble and nurnie detail geometry onto polygonal mesh objects. Nurnies can be represented as polygon geometry, instance objects, or render instances (R11.5+ only).

Greebler consists of a generator object plugin with an associated tag and library management system. The generator accepts all children objects that result in polygonal meshes as inputs. It is multi-processor aware and will utilize all available processors in the generation process. The Greebler tag allows you to restrict greebling only to polygons specified in a referenced Polygon Selection tag and contains its own configuration options similar to the generator object. It is used in conjunction with the generator object and any number of them can be added to an input object. Although the results are randomized, there is a great deal of user control. Materials can be assigned to the Greebler results generally as well as to specific area selections.

Along with a good selection of stock greeble shapes, you can add custom greeble shapes and objects (nurnies) as surface detailing. Since you might want to reuse these in the future, Greebler has a library management system which lets you store and organize libraries of greeble shapes and objects. Custom Greeble shapes and objects are stored on disk as regular Cinema 4D documents (.c4d) and are referenced automatically by the Greebler Library Management window. The library manager lets you add, remove, rename libraries and items as well as load them into the current scene for use with Greebler objects and tags. Before being able to use Custom Greeble shapes they must be added to the library as some preprocessing is required to prepare them for use.

If you are not careful, Greebler can quickly eat Cinema 4D's available memory. Remember that, when rendering, a copy of the scene is passed to the renderer which effectively doubles the memory consumption. Use beveling sparingly and only when it impacts the render. Stock Greeble Cylinder/Ring Rotation Segments should be set to the minimum tolerable using Phong tags to smooth the surface. If you are using Cinema 4D R11.5 then you have the option to represent nurnies as render instances for greater reduction of memory use.

What is a 'greeble' and 'nurnie'?

A greeble or nurnie is a small piece of detailing added to an object surface so as to break up the surface and add visual interest. The purpose is to add complexity to the object and yield the impression of greater size. It is essentially the small detailed technical part of a larger object. You will typically see greebling in movie special effects, particularly of the science fiction genre. In Greebler, the terms 'greeble' and 'nurnie' have been differentiated to mean 'surface feature' and 'surface object', respectively.

What's New

- Added "Select All" and "Deselect All" buttons for Groupings of Stock Greebles, Custom Greebles, and Nurnies on Greebler Object and Tag.

- Setup Library button on Greebler Object and Tag, Custom Greebles and Nurnies sections to open the Library Management dialog in modal mode and set the link to the last relevant inserted library (if any inserted) after the dialog is closed.

- Updated Greebler Tag to update results when parameters changed - worked previously but works again (??).

- Changed behavior of Greebler Tags so that they do not block active Greebler Object greebling. Polygons not covered by the PolygonSelection tags referenced by the Greebler Tags on an object will be greebled using the Greebler Object settings.

- Added "Greebler PDF Documentation" Command in Plugins menu to launch PDF documentation in your default Adobe PDF reader.

- Fixed issues with Greebler Object Nurnies library object icons.

To Do

- Material slots

- Polygon grouping

- Procedural surface pipe generation

Contact and Support

If you experience bugs or issues in the use of the plugin, please contact me by email or through the online forum. Please include this information in order to improve response times:

1. Greebler version. This information can be found in the Greebler Help dialog or in the Console window (if it hasn't been cleared).
2. Cinema 4D version.
3. Windows or MacOS version including whether 32-bit or 64-bit.
4. Bug report, feature request, support question, or description of problem.
5. If there was an error message, please send the exact message. Memory error messages have been designed to point me directly to the location of interest.

NOTE: Please do not send OS or Cinema 4D crash logs as these do not provide

information which will assist in determining the problem.

email: rtempleton@kuroyumes-developmentzone.com

forum: http://www.kuroyumes-developmentzone.com/phpBB2/index.php

Greebler End User License Agreement (EULA)

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System Requirements

Windows: Windows XP/XP Pro x64 or later

MacOS: MacOS 10.3.9 or later

Cinema 4D:

- Cinema 4D R12: R12 or later (includes Windows 32/64-bit and MacOS X Universal Binary 32/64-bit plugins)
- Cinema 4D R11: R11 or later (includes Windows 32/64-bit and MacOS X Universal Binary 32/64-bit plugins)
- Cinema 4D R10: R10.1 or later (includes Windows 32/64-bit and MacOS X Universal Binary 32-bit plugins)

Recommended

Hardware: 64-bit capable multi-core computer with 4 GB or more installed memory.

Windows: Windows 64-bit OS

MacOS: MacOS 10.5 (Leopard) or later

Cinema 4D:

- Cinema 4D R11 or later on MacOS for 64-bit support
- Cinema 4D R10.1 or later on Windows for 64-bit support

Installation

1. If Cinema 4D is currently running, save your work and exit Cinema 4D.

2. Extract the contents of the Greebler zip archive file to your Cinema 4D installation's Plugins folder, keeping the archive folder structure intact (e.g.: checking "Use folder names" in WinZip's Extract dialog).
   Any existing Greebler user data files, including the library and preferences, are stored elsewhere therefore you can replace the Greebler plugin folder without possibility of loss.
   Typically the target folder path is similar to one of these:
   - Windows: C:\Program Files\MAXON\Cinema 4D R10\Plugins
   - MacOS: Macintosh HD:Applications:MAXON:Cinema 4D R10:plugins

3. Start Cinema 4D.

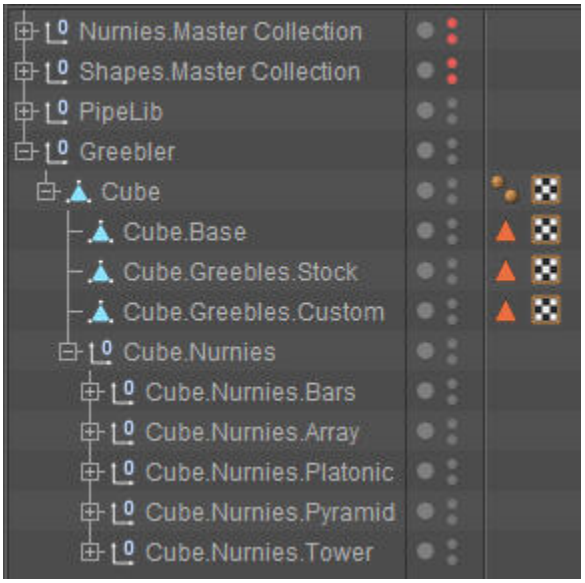
4. During restart of Cinema 4D, the Registration window should open requesting your Greebler serial number.
   - If you are installing Greebler for evaluation, enter '*demo*' in the entry box labeled "Greebler" on the right.
   - If Greebler is already installed in demo mode, open the Registration window from Cinema 4D's *"Help >>Personalize"* menu instead.
   Enter the 16-digit serial number that was provided via email into the entry box labeled "Greebler" on the right.
   The easiest method is to double-click the blue number in the email, copy, then paste into the entry box.
   Sometimes double-clicking to select the text includes hidden characters. If this is appears to be the case then you should select-drag to highlight just the 16-digit serial number. It may even require that you copy-paste into a text editor such as TexEdit or Notepad and copy-paste from there. You can type it into the entry box verbose but be sure to be viewing the serial number in a serif font where every character is easily distinguishable.

5. Verify that the plugin has been registered.
   - The plugin should be available in the main Cinema 4D menus under *Plugins >> Greebler* or *Plugins >> KuroyumeDZ >> Greebler*.
   - There should be banner text in the Console window which shows the name and version number.

Greebler Object

The Greebler object is the generator object which creates greebles and nurnies on input objects childed to it. The Greebler tag, used for greebling by polygon selection (Polygon Selection tag), still requires a Greebler object to generate the results. You can have as many Greebler objects as you like in a scene. You can even greeble a Greebler object by childing it to another Greebler object.

The end result, if made editable, is a hierarchy containing the target objects (those receiving the greebling), if they are retained, and a series of objects for each specific type of Greeble (Base, Stock Greebles, Custom Greebles, Nurnies). These are named according to several factors which will also be relevant if you want to texture the resulting Greebler geometries without making the Greebler object editable.



The above image shows one result of Make Editable (C key) for the Greebler object. The Greebler geometries and other objects are childed to the target object geometry or a Null object similarly named if the target object is not retained. Note that a naming hierarchy is constructed which will allow you to apply custom texturing to specific areas of the Greebler results even while the Greebler object is still procedural (not made editable). The target object's texturing is typically passed on to the results if no others are specified. Nurnies retain the texturing on the referenced Nurnie objects. You texture specific areas of the Greebler results by creating Materials/Shaders and adding them to the Greebler object so as to create respective Texture tags. The restriction to particular Greebler areas is done by naming convention of the Texture tags. As we see in the image above, if you wanted to use a specific material for the Cube's Custom Greebles,

the relevant Texture tag on the Greebler object would be named "Cube.Greebles.Custom". While this appears to be simple enough, there is even more in-depth texture control. The full specification is detailed below.

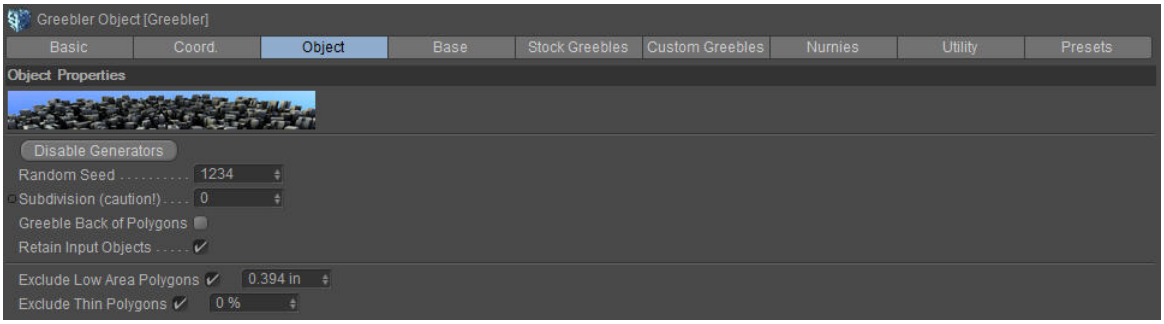
- Texture tag names are delineated by '.' characters.
- Each name starts with the input object's name.
- If restricting the greebling of an object's polygons using a Greebler tag, the Polygon Selection name is added next.
- ".Base" if Base enabled
- Greebles
    - ".Greebles" if combining Stock and Custom Greebles
    - ".Greebles.Stock" for Stock Greebles
    - ".Greebles.Custom" for Custom Greebles
- If Selections for Base or Greebles is enabled, add any of these as available or desired:
    - ".Top" always available
    - ".Sides" always available
    - ".Bevel" if Beveling is anything but 0.0
    - ".Cap" if 'Add Bottom Caps' is enabled

For example: Input object's name is "Cube", Bases enabled, not combining Stock/Custom Greebles, Selections enabled for both, Bevels for both, Bottom Caps for Base, no Bottom Caps for Greebles. If you were restricting the greebling to a Polygon Selection named "TopFace" referenced in a Greebler tag, you would then add that after the input object name, shown here optionally []. PolygonSelections available for your Greebler Texture tags would then be:

- Cube[.TopFace].Base.Top
- Cube[.TopFace].Base.Sides
- Cube[.TopFace].Base.Bevel
- Cube[.TopFace].Base.Cap
- Cube[.TopFace].Greebles.Stock.Top
- Cube[.TopFace].Greebles.Stock.Sides
- Cube[.TopFace].Greebles.Stock.Bevel
- Cube[.TopFace].Greebles.Custom.Top
- Cube[.TopFace].Greebles.Custom.Sides
- Cube[.TopFace].Greebles.Custom.Bevel

You can combine overall and detailed texturing. For instance, to use one texture for the Base of "Object" while using another to cover just the Base sides, you would name the former Texture tag "Object.Base" and the latter "Object.Base.Sides". In this way, you can selectively texture results while maintaining a general texture for other areas.

Greebler Object : Object tab



This contains general controls that apply to the target objects and the subsequent tabs that aid in generation. Each is explained in detail hereafter.

This image at the top of the tab section is actually a button which will open this documentation window, if not already opened. It is also available on the Greebler tag and Greebler Library Management window.

Disable Generators

A quick way to disable Base, Stock Greebles, Custom Greebles, and Nurnies without having to go to each tab to do so. This is useful to stop an unexpectedly long/large generation of objects more efficiently as the interface is bogged down in the process.

Random Seed

An integer value used to vary the random sequences created by the random number generators.

Subdivision (caution!)

All childed target objects will be polygon subdivided as many times as this number is set. This affects bases and the subsequent distribution and counts of Greebles and Nurnies as they are populated on a per-polygon basis. A subdivision of 1 takes 1 quadrangle and subdivides it into 4 polygons, a value of 2 takes 1 quadrangle and subdivides it into 16 polygons. The formulae for calculating the resulting numbers of polygons is:

- Triangle: (2 to the power of Subdivision) * (2 to the power of Subdivision) / 2

- Quadrangle: (2 to the power of Subdivision) * (2 to the power of Subdivision)

Be careful not to set this value too large! Large values can quickly consume memory and bog down Cinema 4D to the point of unusability.

Greeble Back of Polygons

Instead of extruding bases and placing greebles and nurnies with respect to the polygon normal, they will be done on the opposite side. This avoids the need to explicitly Invert Normals in order to achieve the same results.

Retain Input Objects

There may be times when you want to exclude the input target object or exclude it because of complete occlusion (when using Bases with no sparsity, for instance). In the latter case, this can increase performance and decrease render times (from the axiom: Don't render what is not seen).

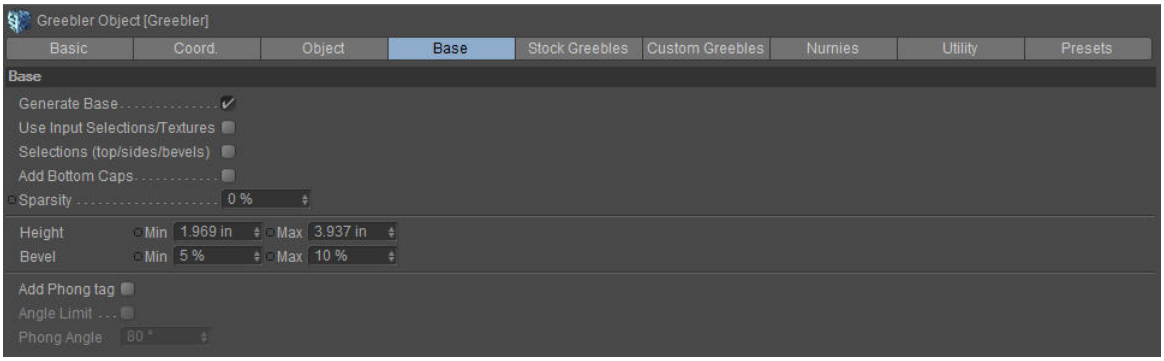
Exclude Low Area Polygons

This setting and the next allow you to control 'over greebling'. When dealing with small or thin polygons, the results might not be worth the extra effort of generating geometry with respect to them. The value represents the squared area under which (inclusively) polygons will be excluded. The larger the value the greater the number of polygons may be excluded.

Exclude Thin Polygons

You can also exclude polygons by their so-called thinness by enabling this option and setting the percentage value. The percentage value is applied to a ratio between width and length of a polygon. A square (equal width and length) represents the ultimate 'fat' polygon with a ratio of 1:1 = 1. At 100%, all polygons are considered 'thin' and excluded, even square polygons. At 0%, all polygons are included. As you increase the percentage from 0 to 100, polygons with less disparity between width and length are excluded.

Greebler Object : Base tab



Bases are bevelled extrusions of the input objects' polygons in the direction of their normals (or opposite direction if Greeble Back of Polygons is enabled). This is very similar to performing the Cinema 4D Structure commands Extrude followed by a Bevel (with Preserve Groups disabled) on a Polygon object.

Generate Base

Enable or disable the generation of bases on the input objects.

Use Input Selections/Textures

In cases where you want the input object surface varied with bases but without disrupting the current texturing or requiring texturing later on to retain it, this will apply the input object texturing to the Base geometry automatically.

Selections (top/sides/bevels)

Polygon Selection tags will be created for the top, sides, and bevel (if beveling is greater than 0%). This allows you texture these separate areas of the Base extrusion independently.

Add Bottom Caps

Geometry is created to close the underside of the extrusion so that you won't have hollow extrusions. Bottom caps can be textured independently of other areas as described on the main Greebler Object page.

Sparsity

Sparsity is a percentage of how many polygons will be excluded from the generation of

Bases. At 0% sparsity, all polygons are employed. At 100% sparsity, no polygons are employed (same as not generating bases at all). Polygons are randomly selected for exclusion.

Height

Two values set the minimum and maximum height to which Bases will be extruded away from the input polygon surface, given in real units of distance.

Bevel

In order to soften the extrusion edges, you can add some edge beveling (45° breaks between the top and sides). The percentage is from 0%, where there is no beveling, to 100%, where the top basically becomes a point.

Add Phong Tag

Adds a Phong tag to the generated Base objects so that you can control surface smoothing while Greebler is still procedural (not Made Editable). The next two options are identical to Cinema 4D's Phong tag settings and set the added Phong tag values accordingly.

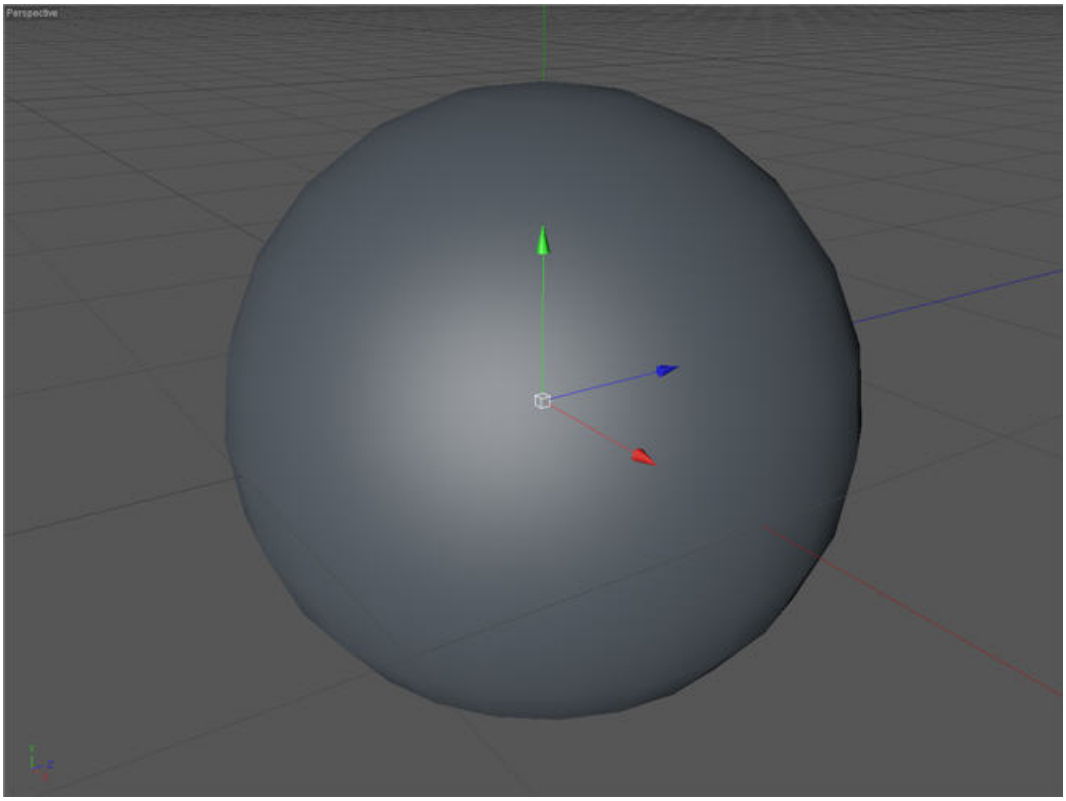
Angle Limit

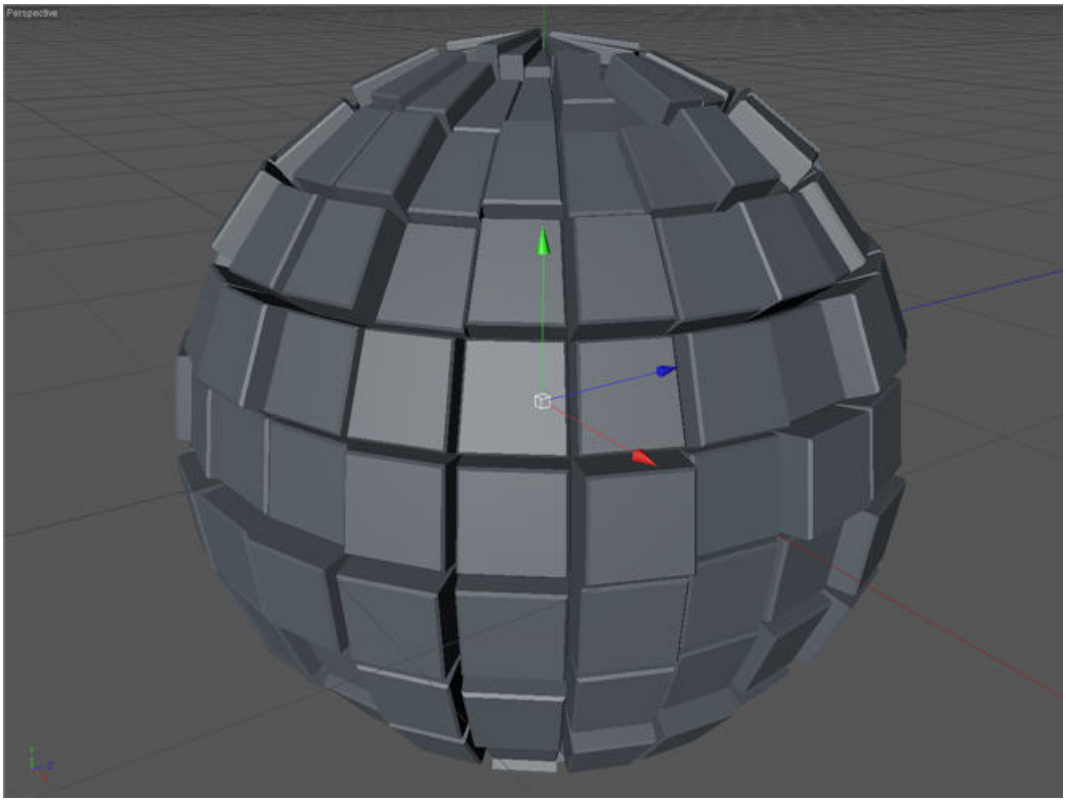
Enable the use of the Phong Angle as a determination of whether or not to smooth between two neighboring polygons.

Phong Angle [0..180°]

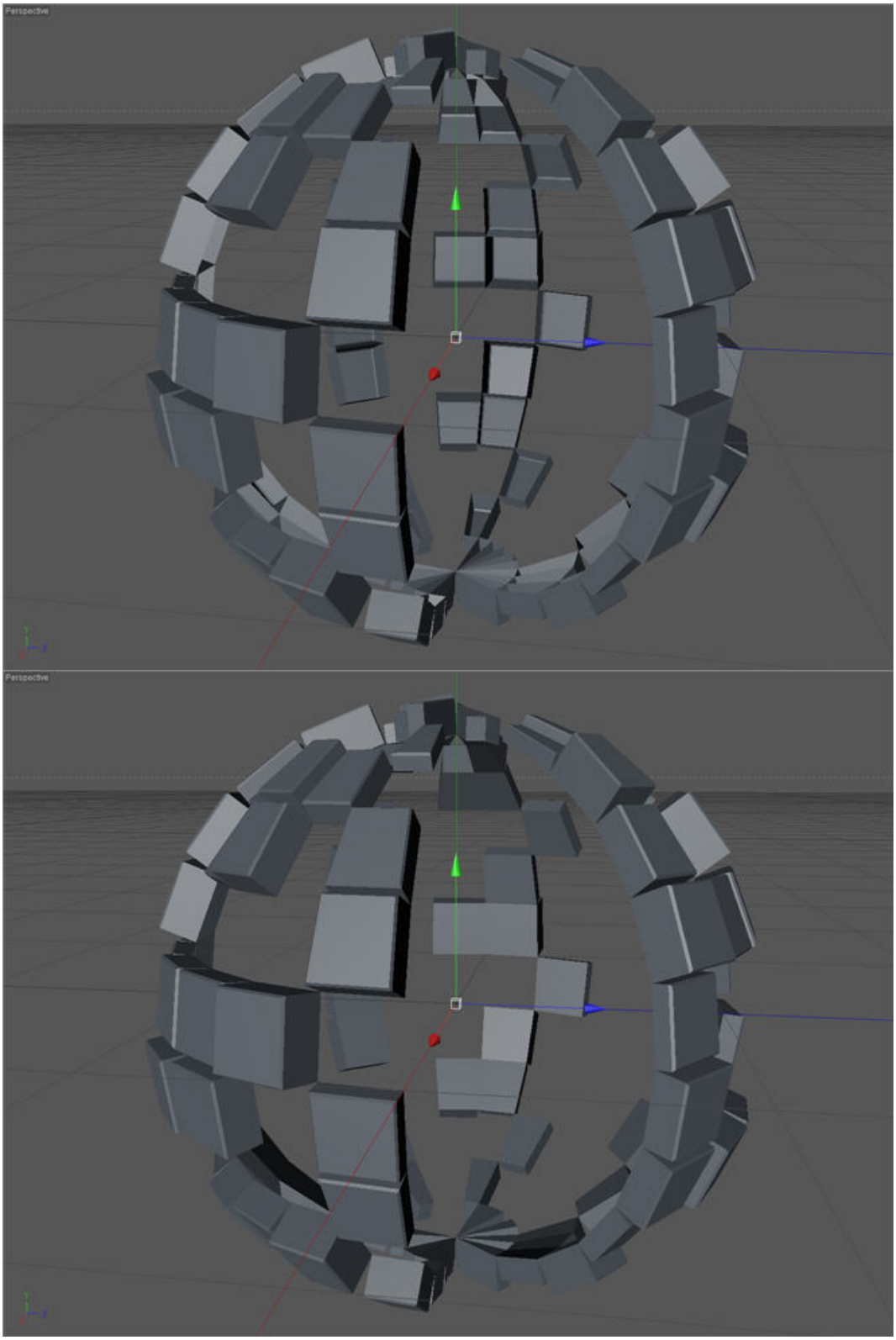
The angle represents the difference in angle between two neighboring polygons being considered in the Phong smoothing. The greater the value, the greater the polygon-polygon angular difference included in the smoothing process.

First image shows the input Sphere object. Second image shows the Sphere object with beveled bases generated.

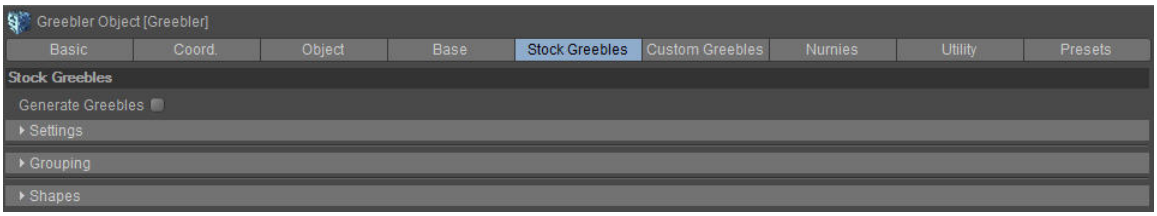

Perspective


Perspective

First image shows bases without bottom caps. Second shows bases with.



Greebler Object : Stock Greebles tab

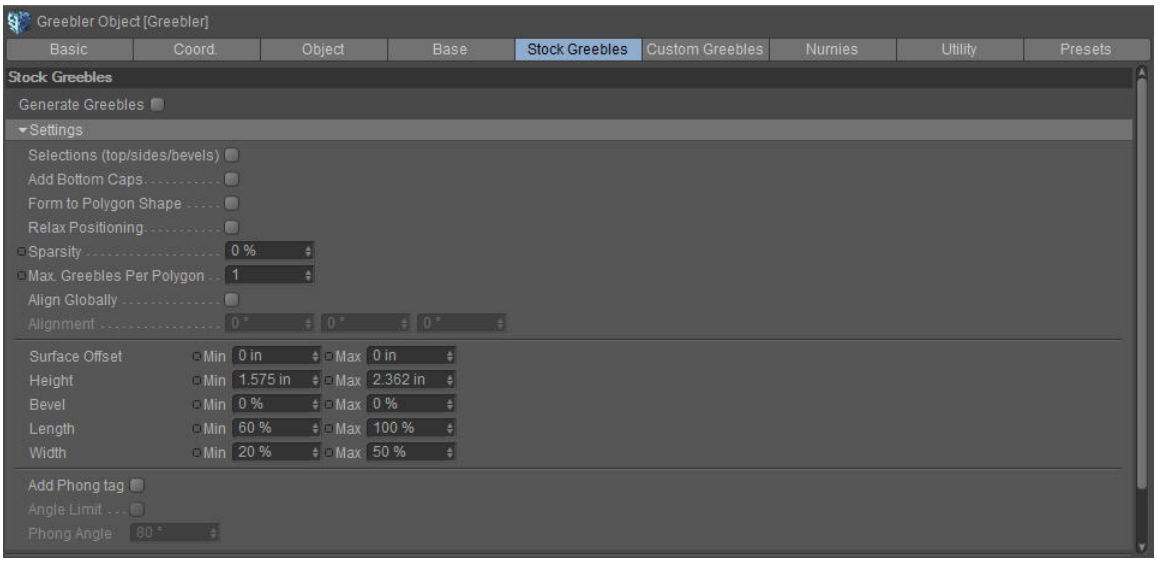


Greebles are protuberances that represent basic nondescript details on an object so as to create a sense of size or give it technical part details such as boxes, louvers, pipes, lights, and so on. Greebler has a decent set of stock greebles which will get you pretty far in detailing your objects. Each polygon is populated by 0 or more greeble objects and all greebles for an object are coalesced into a single greeble mesh (virtually, unless you Make Editable the Greebler object).

Generate Greebles

Enable or disable the generation of Stock Greebles on the input objects.

Settings



Selections (top/sides/bevels)

Polygon Selection tags will be created for the top, sides, and bevel (if beveling is greater than 0%). This allows you texture these separate areas of the greeble extrusions

independently.

Add Bottom Caps

Geometry is created to close the underside of the greeble extrusion so that you won't have hollow extrusions. Bottom caps can be textured independently of other areas as described on the main Greebler Object page.

Form to Polygon Shape

When disabled, greebles are simply placed onto the polygon as is. When enabled, the polygon is mapped into a unit-square and the greebles placed onto that. When the unit-square is mapped back onto the polygon shape, the greebles are misshaped so as to follow the polygon's form.

Relax Positioning

This allows the greebles to be placed less stringently with respect to the polygon's edges, thus creating a less obvious polygon-to-polygon greebling appearance.

Sparsity

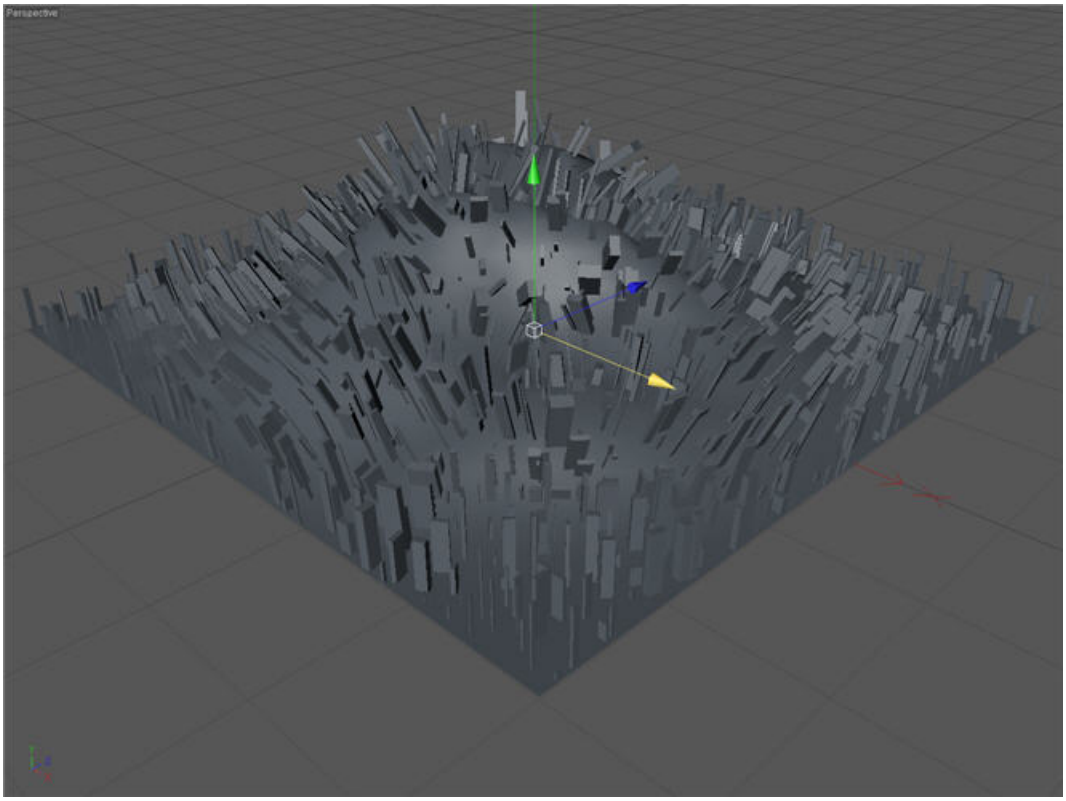
Sparsity is a percentage of how many polygons will be excluded from being populated with greebles. At 0% sparsity, all polygons are employed. At 100% sparsity, no polygons are employed (same as not generating greebles at all). Polygons are randomly selected for exclusion.

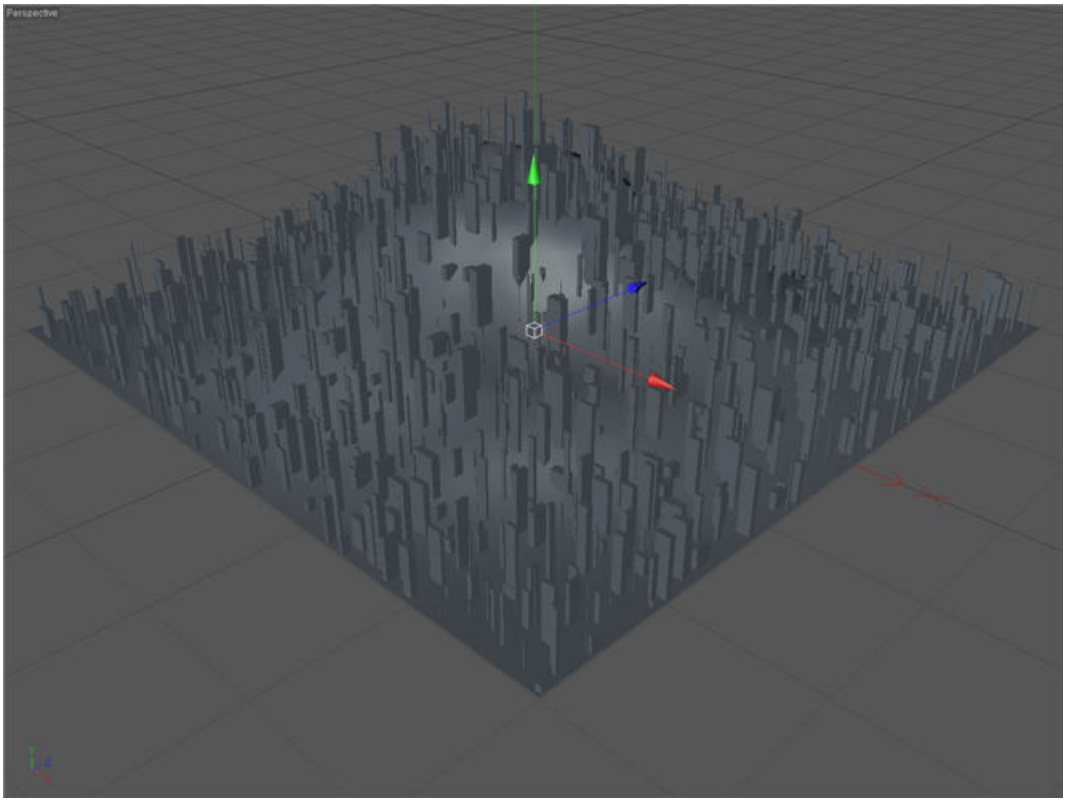
Max. Greebles Per Polygon

The maximum number of greebles that will populate any polygon. For each polygon, a random number of greebles from 0 to this maximum is created.

Align Globally / Alignment

On more unidirectional surfaces such as a Landscape object, you may want the greebles to point in the up direction despite the change in surface normals. Enabling this setting allows you to achieve just that. The **Alignment** vector is an HPB rotation vector that lets you change the global pointing direction of the greebles. The first image below shows the nonaligned greeble results (following the polygon normals). The second image shows the result of enabling **Align Globally**.


Perspective


Perspective

Surface Offset

Two values set the minimum and maximum distance greebles will be moved away from the polygon surface, given in real units of distance. The offset range can be positive or negative. Note that the greebles follow the path of the direction they face. If **Align Globally** is enabled then they will move in the same direction. If disabled, they will move along their polygon's normal direction.

Height

Two values set the minimum and maximum height to which greebles will be extruded away from the input polygon surface, given in real units of distance.

Bevel

In order to soften the extrusion edges, you can add some edge beveling (45° breaks between the top and sides). The percentage is from 0%, where there is no beveling, to 100%, where the top basically becomes a point.

Length

These two values let you specify a range for which the greeble will occupy polygon space along one direction. For instance, 100-100% will cause the greeble to be about as long as the polygon.

Width

Similar to **Length**, these two values specify a range for occupying space in the other, perpendicular direction.

Add Phong Tag

Adds a Phong tag to the generated Stock Greeble objects so that you can control surface smoothing while Greebler is still procedural (not Made Editable). The next two options are identical to Cinema 4D's Phong tag settings and set the added Phong tag values accordingly.

Angle Limit

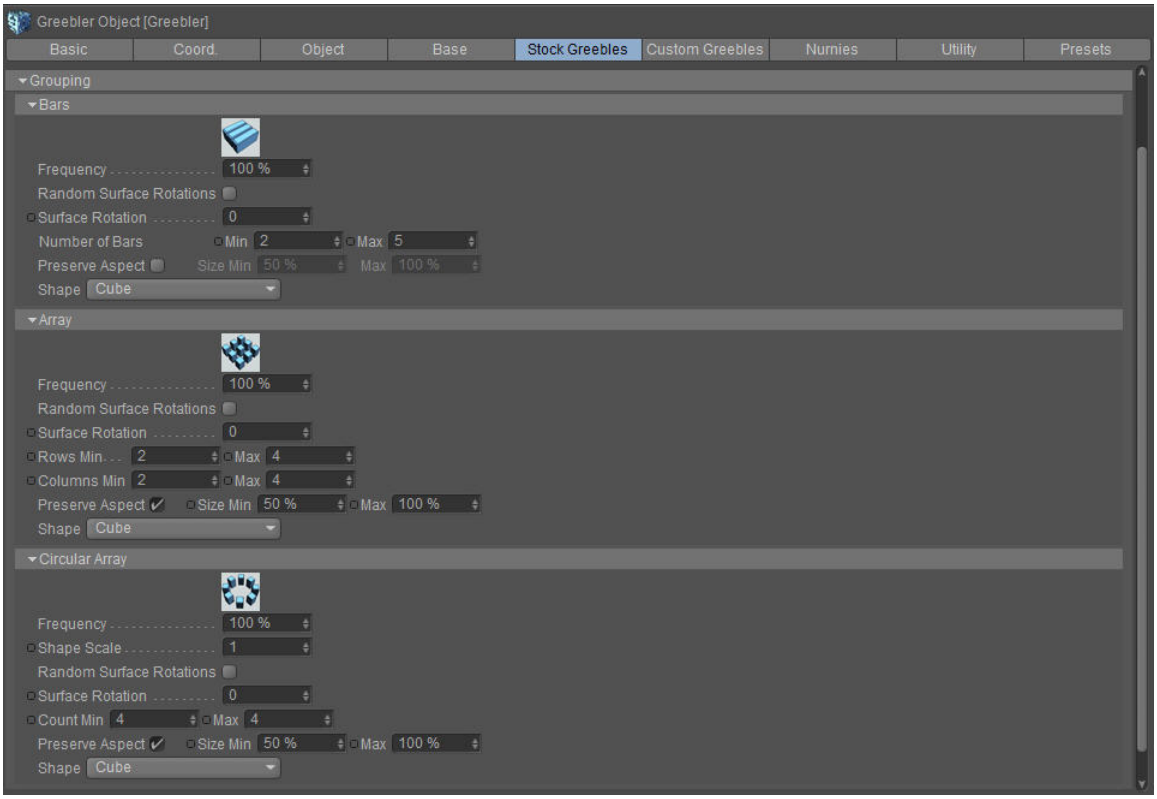
Enable the use of the Phong Angle as a determination of whether or not to smooth between two neighboring polygons.

Phong Angle [0..180°]

The angle represents the difference in angle between two neighboring polygons being considered in the Phong smoothing. The greater the value, the greater the polygon-

polygon angular difference included in the smoothing process.

Grouping



Shapes can be grouped into any of three types: Bars (linear array), Array (MxN array), or Circular Array. Any of the Shapes listed below can be grouped. Note that additional variation parameters for those Shapes having them are also applied when grouped.

Bitmap Buttons

The descriptive images for each grouping type are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various stock shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is

disabled then its Frequency value takes no part in the random decision process.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

Preserve Aspect

When enabled, the array remains square (Bars and Array) or circular (Circular Array). When disabled, it's shape can be rectangular (Bars and Array) or elliptical (Circular Array) as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the grouping between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Shape

A pull-down list which contains all of the available Stock Greebles, minus the grouping types, that can be used as the grouping element object.

Bars

Number of Bars

The minimum and maximum number of objects in the linear array (Bars).

Array

Rows / Columns

The minimum and maximum number of row and column objects in the Array.

Circular Array

Shape Scale

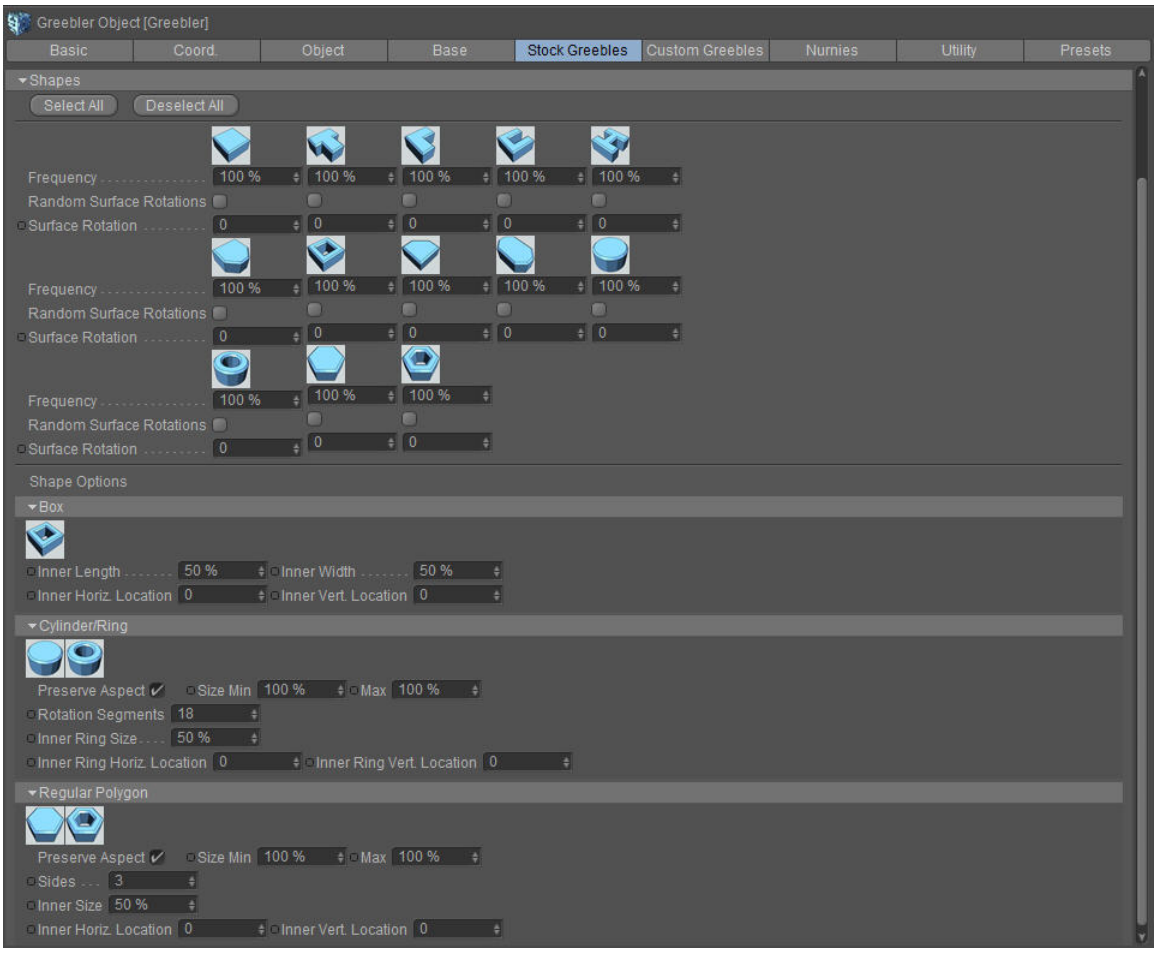
A relative scale value applied to each object in the Circular Array that allows you to vary

the size of the objects with respect to the Circular Array size.

Count

The minimum and maximum number of objects on the circumference of the Circular Array.

Shapes



There are 13 stock greebles which can be used to populate the surfaces of your objects. Of these, 5 have additional parameters for variation (italicized in the list below). The types are, from top-left to bottom-right:

- Cube
- T
- L
- C
- H
- D

- *Box*
- Diamond
- Oblong Octagon
- *Cylinder*
- *Ring*
- *Regular Polygon*
- *Regular Polygon Ring*

Select All

Convenience button which enables all Stock Greeble Shapes and Grouping types.

Deselect All

Convenience button which disables all Stock Greeble Shapes and Grouping types.

Bitmap Buttons

The descriptive images for each shape are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various stock shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is disabled then its Frequency value takes no part in the random decision process.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

For those Shape types with parametric variations, these parameters are available:

Box

Inner Length / Inner Width

These settings let you control the size of the opening in the box shape. The dimensions are clamped so that the size does not cause the opening to go beyond the outer perimeter.

Inner Horiz. Location / Inner Vert. Location

These provide an offset of the opening with respect to the box's center. The values are clamped with respect to **Inner Length** and **Inner Width** so that the offset does not go beyond the outer perimeter.

Cylinder/Ring

Preserve Aspect

When enabled, Cylinders and Rings remain circular. When disabled, their shapes can be elliptical as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the Cylinder and Ring shapes between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Rotation Segments

The number of polygons around the circumference of the Cylinders and Rings. If you enable **Add Phong Tag**, you will be able to keep this value low and still get a smooth surface.

Inner Ring Size

The percentage of size of the inner opening with respect to the outer diameter of the Ring shape. 0% closes the opening, making it look like a Cylinder. 100% opens up to a thin ring surface.

Inner Ring Horiz. Location / Inner Ring Vert. Location

Offsets of the Ring opening with respect to the Ring's center. The values are clamped with respect to **Inner Ring Size** so that the offset does not go beyond the outer perimeter.

Regular Polygon

Preserve Aspect

When enabled, Regular Polygons remain 'circular'. When disabled, their shapes can be elliptical as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the Regular Polygon shapes between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Sides

The number of polygon sides around the circumference. The value can be from 3 to 10 sides.

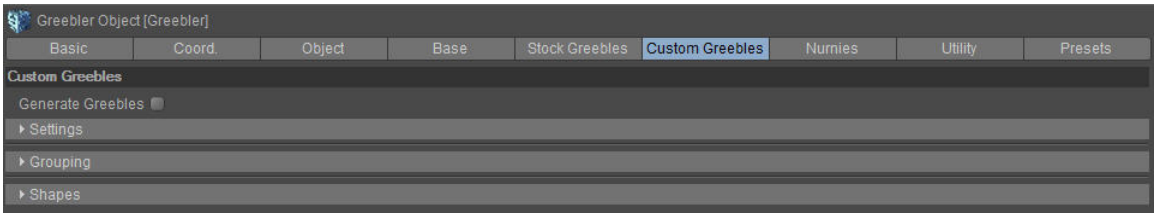
Inner Size

The percentage of size of the inner opening with respect to the outer diameter of the Regular Polygon shape. 0% closes the opening, making it look like a Regular Polygon. 100% opens up to a thin Regular Polygon Ring surface.

Inner Horiz. Location / Inner Vert. Location

Offsets of the ring opening with respect to the Regular Polygon's center. The values are clamped with respect to **Inner Size** so that the offset does not go beyond the outer perimeter.

Greebler Object : Custom Greebles tab

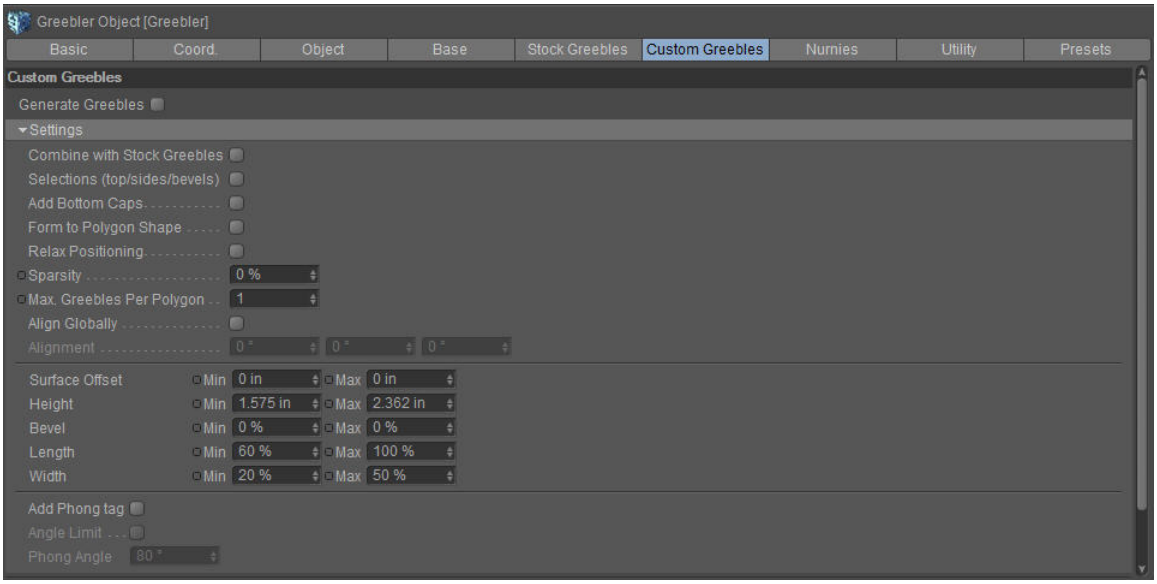


Although the 13 Stock Greebles with 3 grouping types and 5 variable Shapes goes a long way in allowing rich surface details, it would not be a very flexible tool if you could not use custom shapes to meet your goals. With Custom Shapes, you can expand your Greeble choices almost indefinitely (up to 1000 custom shapes per Greebler object or tag).

Generate Greebles

Enable or disable the generation of Custom Greebles on the input objects.

Settings



Combine with Stock Greebles

This option will combine the Custom Greeble mesh with the Stock Greeble mesh to form one Polygon object instead of the two separate ones.

Selections (top/sides/bevels)

Polygon Selection tags will be created for the top, sides, and bevel (if beveling is greater than 0%). This allows you texture these separate areas of the greeble extrusions independently.

Add Bottom Caps

Geometry is created to close the underside of the greeble extrusion so that you won't have hollow extrusions. Bottom caps can be textured independently of other areas as described on the main Greebler Object page.

Form to Polygon Shape

When disabled, greebles are simply placed onto the polygon as is. When enabled, the polygon is mapped into a unit-square and the greebles placed onto that. When the unit-square is mapped back onto the polygon shape, the greebles are misshaped so as to follow the polygon's form.

Relax Positioning

This allows the greebles to be placed less stringently with respect to the polygon's edges, thus creating a less obvious polygon-to-polygon greebling appearance.

Sparsity

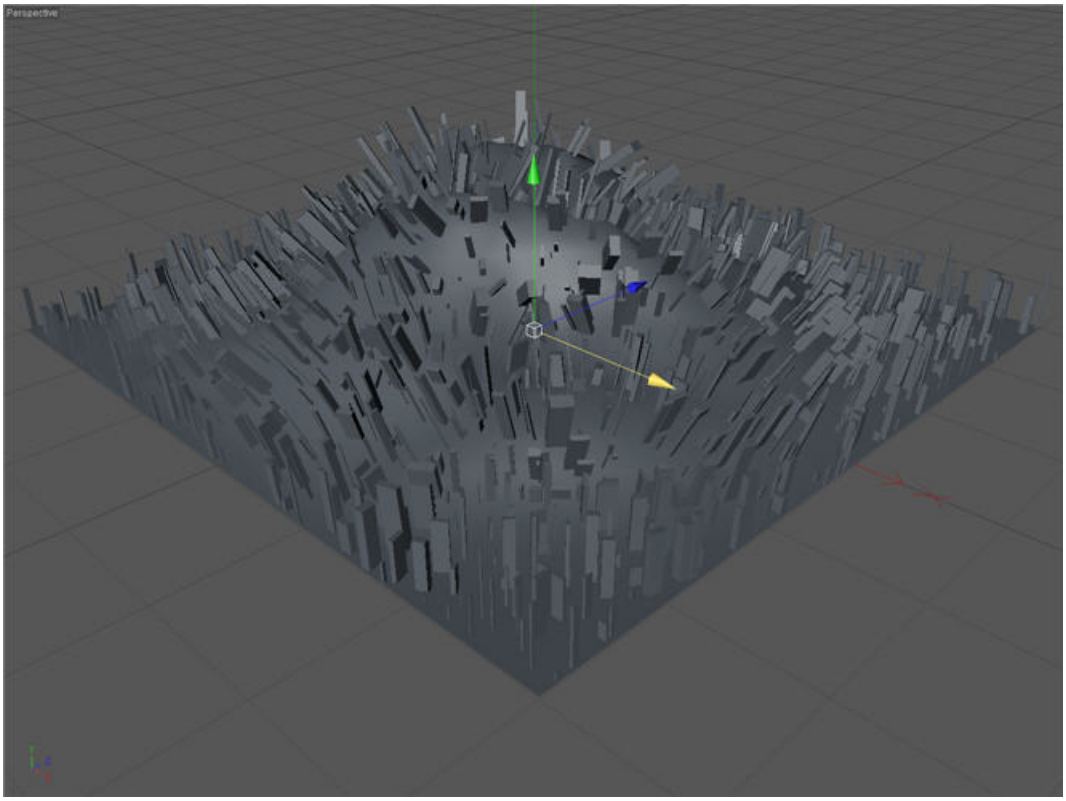
Sparsity is a percentage of how many polygons will be excluded from being populated with greebles. At 0% sparsity, all polygons are employed. At 100% sparsity, no polygons are employed (same as not generating greebles at all). Polygons are randomly selected for exclusion.

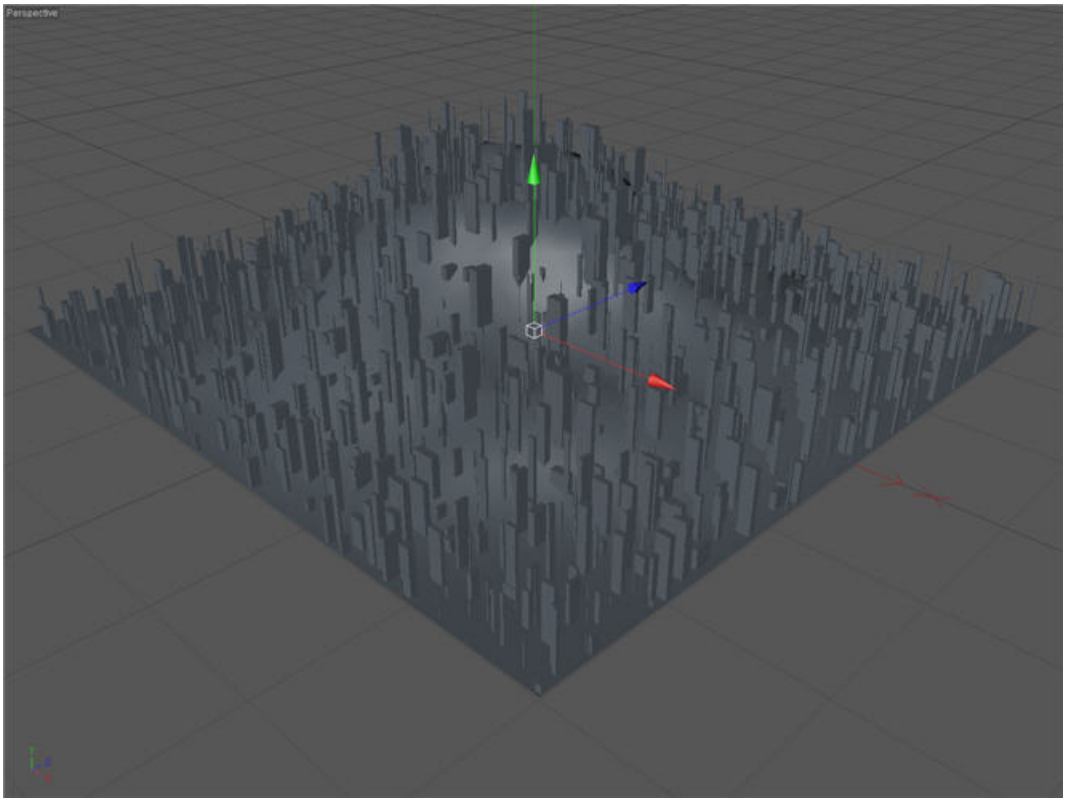
Max. Greebles Per Polygon

The maximum number of greebles that will populate any polygon. For each polygon, a random number of greebles from 0 to this maximum is created.

Align Globally / Alignment

On more unidirectional surfaces such as a Landscape object, you may want the greebles to point in the up direction despite the change in surface normals. Enabling this setting allows you to achieve just that. The **Alignment** vector is an HPB rotation vector that lets you change the global pointing direction of the greebles. The first image below shows the nonaligned greeble results (following the polygon normals). The second image shows the result of enabling **Align Globally**.


Perspective


Perspective

Surface Offset

Two values set the minimum and maximum distance greebles will be moved away from the polygon surface, given in real units of distance. The offset range can be positive or negative. Note that the greebles follow the path of the direction they face. If **Align Globally** is enabled then they will move in the same direction. If disabled, they will move along their polygon's normal direction.

Height

Two values set the minimum and maximum height to which greebles will be extruded away from the input polygon surface, given in real units of distance.

Bevel

In order to soften the extrusion edges, you can add some edge beveling (45° breaks between the top and sides). The percentage is from 0%, where there is no beveling, to 100%, where the top basically becomes a point.

Length

These two values let you specify a range for which the greeble will occupy polygon space along one direction. For instance, 100-100% will cause the greeble to be about as long as the polygon.

Width

Similar to **Length**, these two values specify a range for occupying space in the other, perpendicular direction.

Add Phong Tag

Adds a Phong tag to the generated Custom Greeble objects so that you can control surface smoothing while Greebler is still procedural (not Made Editable). The next two options are identical to Cinema 4D's Phong tag settings and set the added Phong tag values accordingly.

Angle Limit

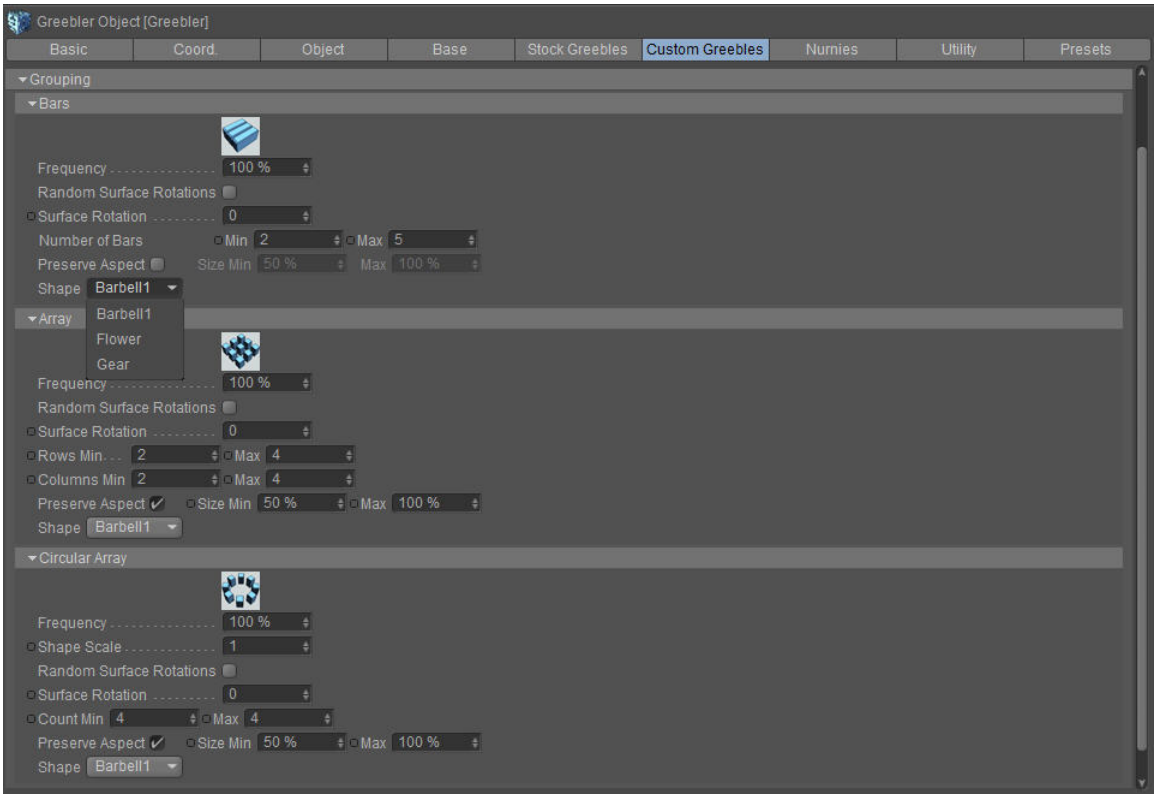
Enable the use of the Phong Angle as a determination of whether or not to smooth between two neighboring polygons.

Phong Angle [0..180°]

The angle represents the difference in angle between two neighboring polygons being considered in the Phong smoothing. The greater the value, the greater the polygon-

polygon angular difference included in the smoothing process.

Grouping



Shapes can be grouped into any of three types: Bars (linear array), Array (MxN array), or Circular Array. Any of the Shapes available from the linked Library can be grouped.

Bitmap Buttons

The descriptive images for each grouping type are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various custom shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is

disabled then its Frequency value takes no part in the random decision process.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

Preserve Aspect

When enabled, the array remains square (Bars and Array) or circular (Circular Array). When disabled, it's shape can be rectangular (Bars and Array) or elliptical (Circular Array) as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the grouping between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Shape

A pull-down list which lists all of the available Custom Greebles, minus the grouping types, that can be used as the grouping element object. The pull-down list is dynamically seeded with the available Shapes.

Bars

Number of Bars

The minimum and maximum number of objects in the linear array (Bars).

Array

Rows / Columns

The minimum and maximum number of row and column objects in the Array.

Circular Array

Shape Scale

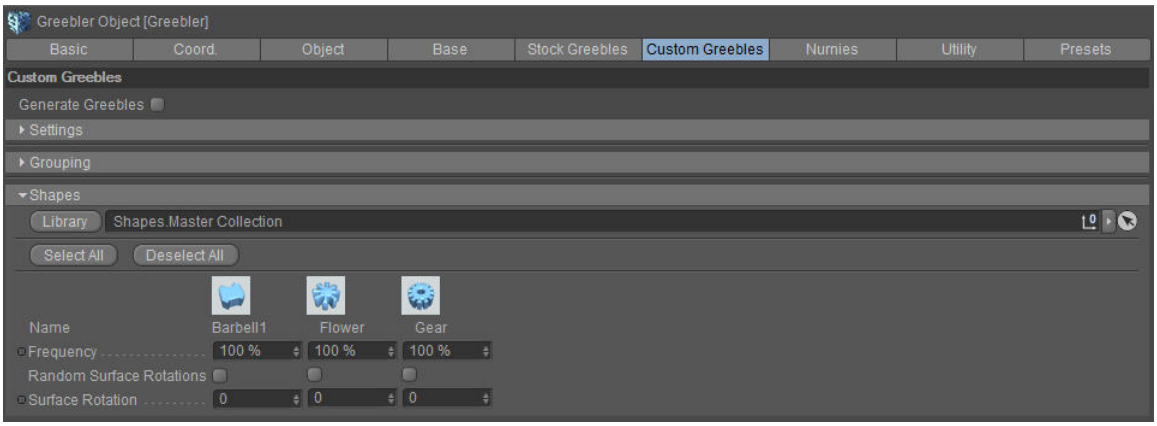
A relative scale value applied to each object in the Circular Array that allows you to vary

the size of the objects with respect to the Circular Array size.

Count

The minimum and maximum number of objects on the circumference of the Circular Array.

Shapes



You can use up to 1000 custom shapes to extend your greebling possibilities. The custom shapes used for Custom Greebles must exist in the document and the container Null object added to the **Library Linkbox** to be utilized with the Greebler object or tag.

Library

Opens the Greebler Library Management window so that you can add Custom Shapes from your Library into the document for use with Greebler objects and tags. Custom Shapes must be prepared and added to the Greebler Shape Library before being able to be used with Greebler objects and tags. This only has to be done once but it is a critical step. See the Custom Shapes section for detailed information and a tutorial on how to create and use Custom Shapes with Greebler.

Library Linkbox

Custom Shapes are added to the document and childed to a Null object so as to keep them grouped for easier reference. When you drop the Null object into the Library Linkbox, all of the Custom Shapes are dynamically added to the Shapes list with toggleable images and Name for reference.

Select All

Convenience button which enables all Custom Greeble Shapes and Grouping types.

Deselect All

Convenience button which disables all Custom Greeble Shapes and Grouping types.

Bitmap Buttons

The descriptive images for each shape are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Name

The name given the Custom Shape when added to the Shape Library. This name is also given to the C4D document file for the Custom Shape stored on disk.

Frequency

This allows you to control how many of the available custom shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is disabled then its Frequency value takes no part in the random decision process.

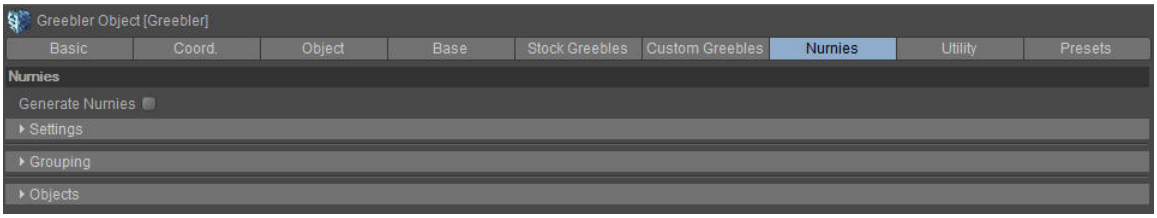
Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

Greebler Object : Nurnies tab

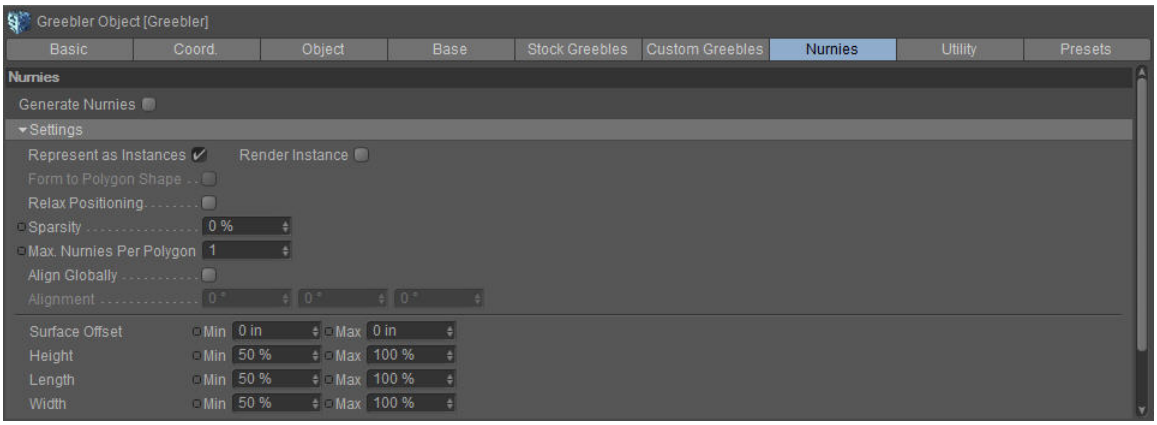


As well as Greebles, Greebler lets you use objects to populate a surface. These objects are called Nurnies. You can use any object but it is recommended to consider the memory usage and use Instances whenever possible. Texturing and Phong are taken from the source object. Neither is applied from the Greebler object onto the nurnie objects.

Generate Nurnies

Enable or disable the generation of Nurnies on the input objects.

Settings



Represent as Instances

Nurnies will be represented as Instance objects, which is much more memory efficient than simple copies of each Nurnie object. Note that **Form to Polygon Shape** is unavailable when nurnies are Instances because the instancing does not allow for that type of deformation.

Render Instance

In Cinema 4D R11.5 and later there is the option to use so-called Render Instances, instances which are only fully realized during the render process. They are very memory efficient and it is recommended to enable this whenever possible.

Form to Polygon Shape

When disabled or unavailable, nurnies are simply placed onto the polygon as is. When enabled, the polygon is mapped into a unit-square and the nurnies placed onto that. When the unit-square is mapped back onto the polygon shape, the nurnies are misshaped so as to follow the polygon's form. This is only available when nurnies are Polygon objects and not being represented as Instances.

Relax Positioning

This allows the nurnies to be placed less stringently with respect to the polygon's edges, thus creating a less obvious polygon-to-polygon greebling appearance.

Sparsity

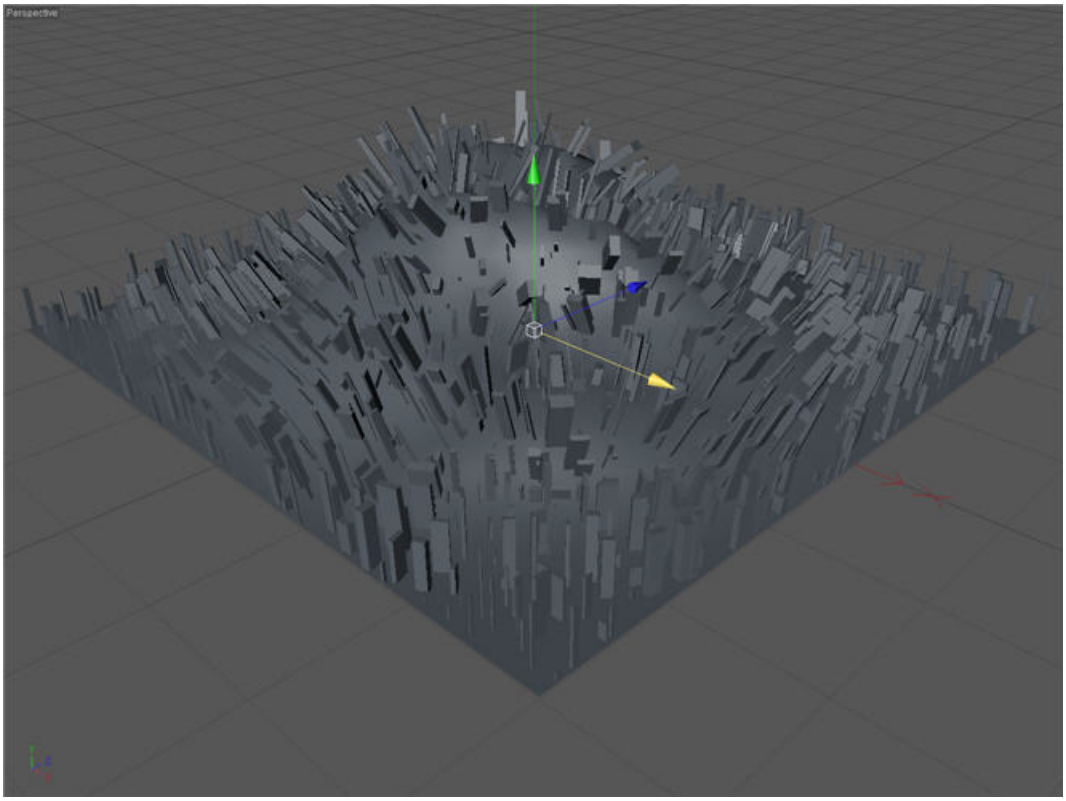
Sparsity is a percentage of how many polygons will be excluded from being populated with nurnies. At 0% sparsity, all polygons are employed. At 100% sparsity, no polygons are employed (same as not generating nurnies at all). Polygons are randomly selected for exclusion.

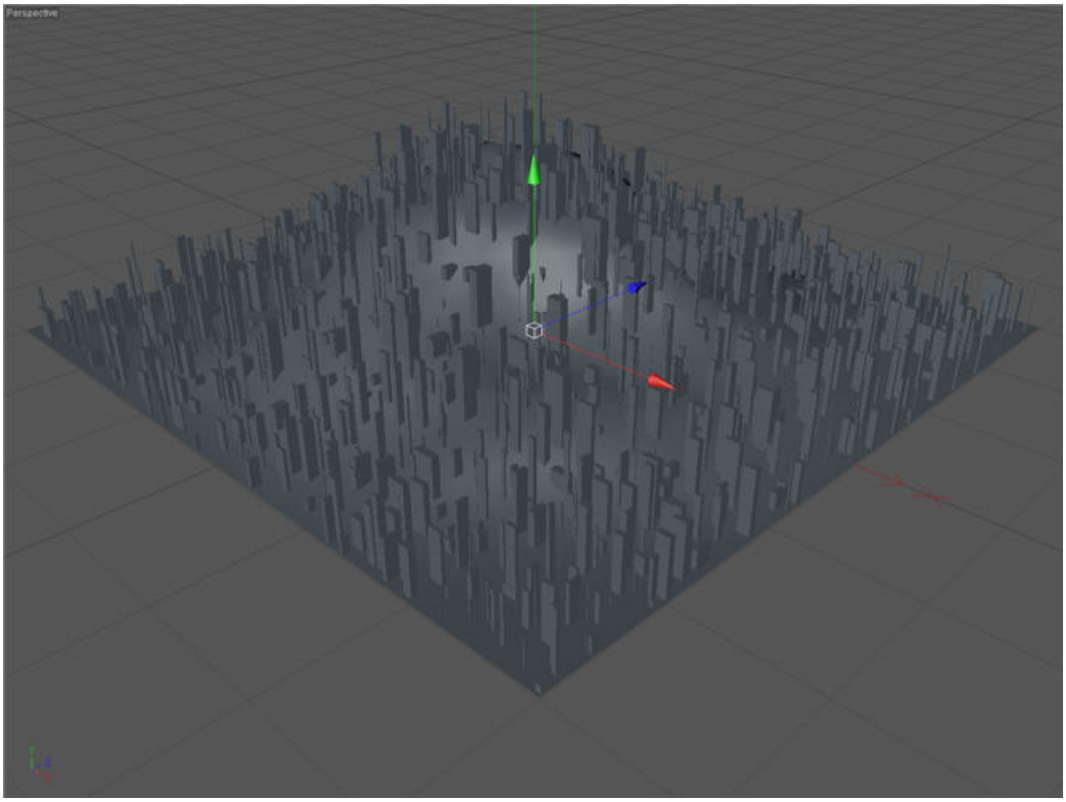
Max. Nurnies Per Polygon

The maximum number of nurnies that will populate any polygon. For each polygon, a random number of nurnies from 0 to this maximum is created.

Align Globally / Alignment

On more unidirectional surfaces such as a Landscape object, you may want the nurnies to point in the up direction despite the change in surface normals. Enabling this setting allows you to achieve just that. The **Alignment** vector is an HPB rotation vector that lets you change the global pointing direction of the nurnies. The first image below shows the nonaligned nurnie results (following the polygon normals). The second image shows the result of enabling **Align Globally**.


Perspective


Perspective

Surface Offset

Two values set the minimum and maximum distance nurnies will be moved away from the polygon surface, given in real units of distance. The offset range can be positive or negative. Note that the greebles follow the path of the direction they face. If **Align Globally** is enabled then they will move in the same direction. If disabled, they will move along their polygon's normal direction.

Height

Two values set the minimum and maximum height to which nurnies will be scaled, given as a percentage.

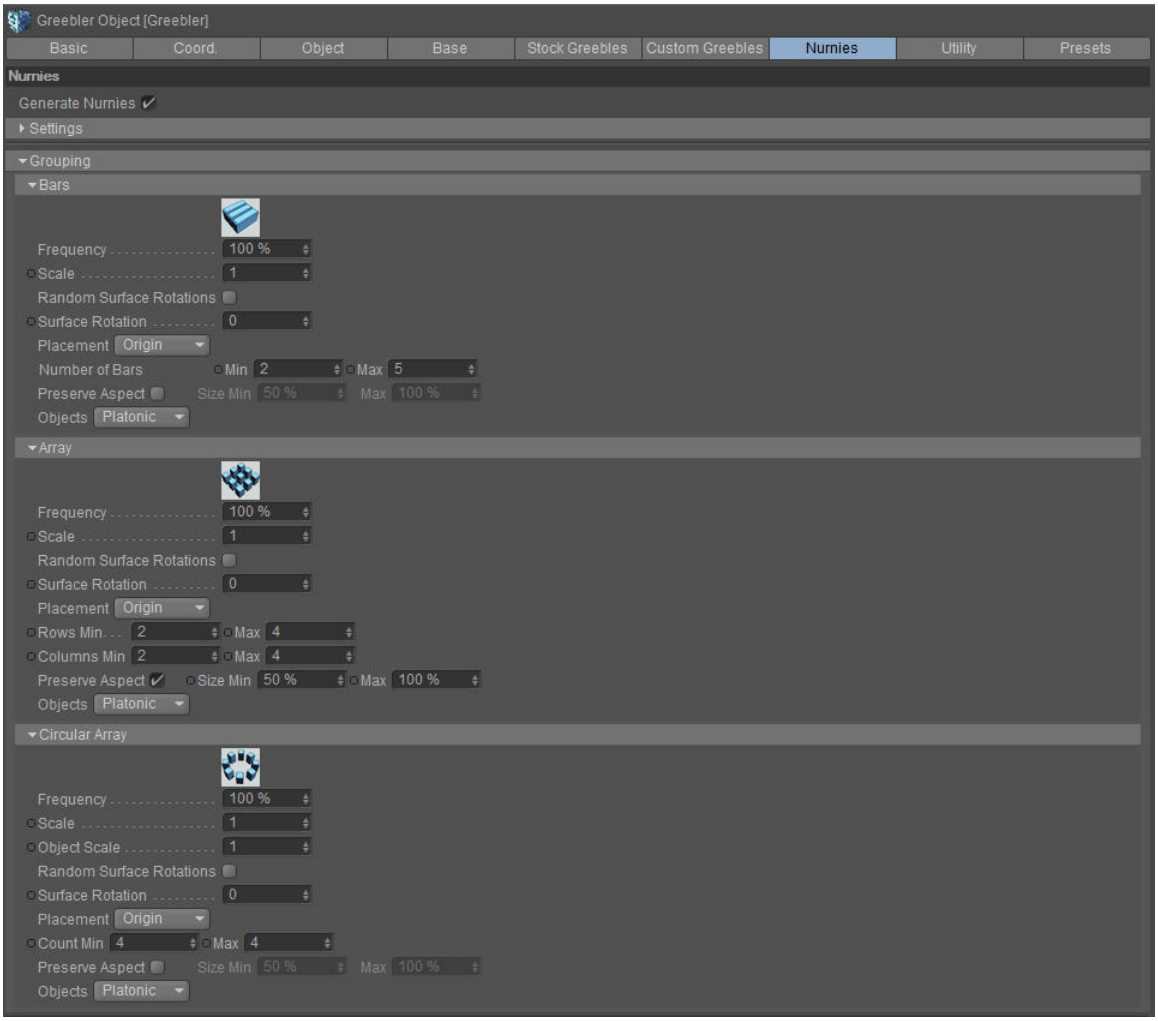
Length

These two values let you specify a range for which the nurnie will occupy polygon space along one direction. For instance, 100-100% will cause the nurnie to be about as long as the polygon, limited with respect to its vicinity to the polygon edges.

Width

Similar to **Length**, these two values specify a range for occupying space in the other, perpendicular direction.

Grouping



Shapes can be grouped into any of three types: Bars (linear array), Array (MxN array), or Circular Array. Any of the Shapes available from the linked Library can be grouped.

Bitmap Buttons

The descriptive images for each grouping type are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various nurnie and grouping types populate the object surface. At 100%, the particular nurnie has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a nurnie for population. 0% is equivalent to disabling the nurnie. Basically, you can control whether or not there are

more or less of a particular nurnie. If a nurnie is disabled then its Frequency value takes no part in the random decision process.

Scale

Sets the scaling of the array, scaling the element objects respectively.

Random Surface Rotations

All nurnies of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All nurnies of this type will be rotated on the surface plane by the angle given.

Placement

Same as for individual nurnies. This lets you dictate the orientation of the object on the surface that is different from its default. The options are:

- Origin - the object is placed on the surface at its origin and not reoriented in any way.
- Bottom - the bottom of the object, in the Y direction, is determined and used to place the object on the surface.
- Top - rotated 180 degrees (along its X axis) so that its top is now the bottom and placed on the surface.
- Left - rotated 90 degrees along its Z axis.
- Right - rotated -90 degrees along its Z axis.
- Front - rotated -90 degrees along its X axis.
- Back - rotated 90 degrees along its X axis.

Preserve Aspect

When enabled, the array remains square (Bars and Array) or circular (Circular Array). When disabled, it's shape can be rectangular (Bars and Array) or elliptical (Circular Array) as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the grouping between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Shape

A pull-down list which lists all of the available Nurnies, minus the grouping types, that can be used as the grouping element object.

Bars

Number of Bars

The minimum and maximum number of objects in the linear array (Bars).

Array

Rows / Columns

The minimum and maximum number of row and column objects in the Array.

Circular Array

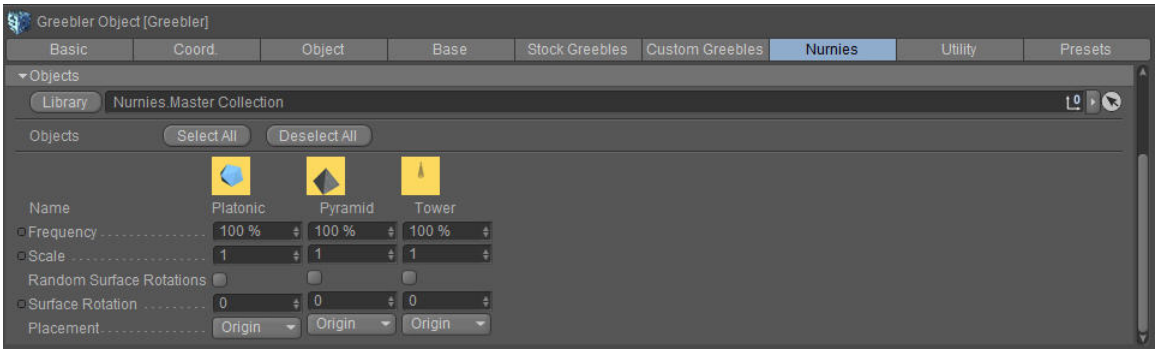
Object Scale

A relative scale value applied to each object in the Circular Array that allows you to vary the size of the objects with respect to the Circular Array size.

Count

The minimum and maximum number of objects on the circumference of the Circular Array.

Objects



You can use up to 1000 nurnies to extend your greebling possibilities. The objects used as Nurnies must exist in the document and the container Null object added to the **Library Linkbox** to be utilized with the Greebler object or tag.

Library

Opens the Greebler Library Management window so that you can add Nurnie objects from your Library into the document for use with Greebler objects and tags. See the Custom Objects section for detailed information and a tutorial on how to create and use Custom Objects as Nurnies with Greebler.

Library Linkbox

Nurnies must exist in the document and be childed to a Null object so as to keep them grouped. When you drop the Null object into the Library Linkbox, all of the objects are dynamically added to the Objects list with toggleable images and Name for reference.

Select All

Convenience button which enables all Nurnie and Grouping types.

Deselect All

Convenience button which disables all Nurnie and Grouping types.

Bitmap Buttons

The descriptive images for each nurnie are also toggle buttons which, when clicked, change whether or not the type is used. If you use objects that are not part of the Greebler Library, the image will be a generic one as shown below.

Colored when enabled. Gray-scale when disabled.

Name

The name of the object representing the Nurnie. This name is also given to the C4D document file for the Nurnie stored on disk if added to the Greebler Library.

Frequency

This allows you to control how many of the available nurnie and grouping types populate the object surface. At 100%, the particular nurnie type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a nurnie type for population. 0% is equivalent to disabling the nurnie type. Basically, you can control whether or not there are more or less of a particular nurnie type. If a nurnie type is disabled then its Frequency value takes no part in the random decision process.

Scale

Scales the object with respect to the scale calculated in order to fit within the polygon. Use this to make the object larger or smaller when the calculated size is undesirable.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

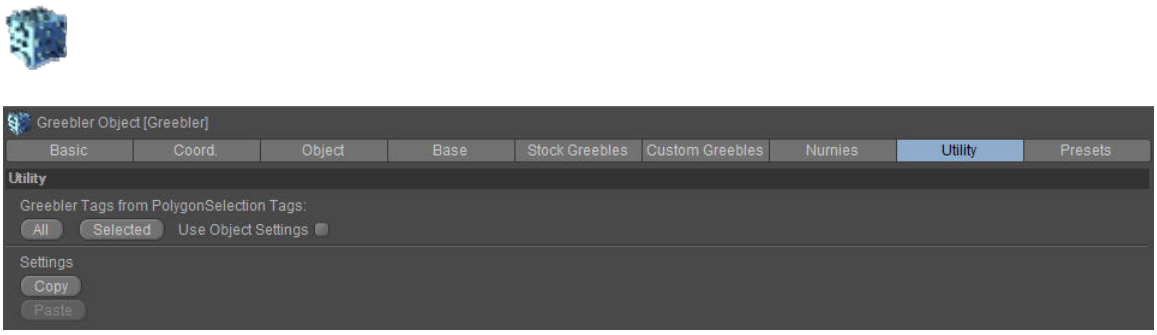
All greebles of this type will be rotated on the surface plane by the angle given.

Placement

This lets you dictate the orientation of the object on the surface that is different from its default. The options are:

- Origin - the object is placed on the surface at its origin and not reoriented in any way.
- Bottom - the bottom of the object, in the Y direction, is determined and used to place the object on the surface.
- Top - rotated 180 degrees (along its X axis) so that its top is now the bottom and placed on the surface.
- Left - rotated 90 degrees along its Z axis.
- Right - rotated -90 degrees along its Z axis.
- Front - rotated -90 degrees along its X axis.
- Back - rotated 90 degrees along its X axis.

Greebler Object : Utility tab



This tab contains some utility functions to simplify your greebling experience.

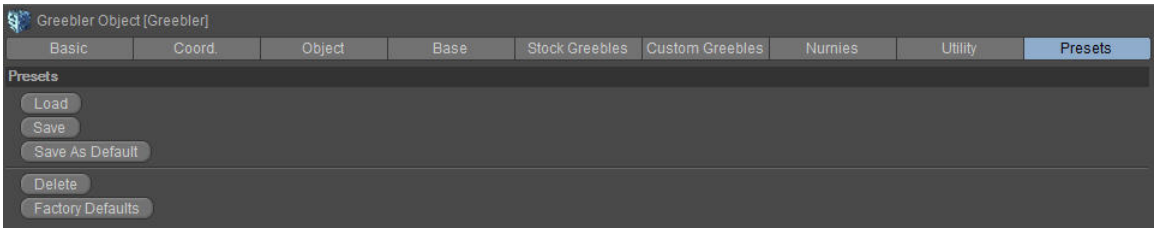
Greebler Tags from PolygonSelection Tags

Instead of adding Greebler tags one by one and then drag-and-dropping existing PolygonSelection tags into each one, you can elect to create Greebler tags for **All** existing PolygonSelection tags or the ones **Selected** on the input objects. Additionally, you can have the current Greebler object settings transferred to the newly created Greebler tags by enabling **Use Object Settings**. Otherwise, their settings will be defaults (Factory or from the last settings).

Settings

On both Greebler objects and tags are **Copy** and **Paste** functions to ease the replication of settings between Greebler objects and tags. Click **Copy** on the object or tag whose settings you want transferred. On other objects and tags, the **Paste** option will then be available so that you can opt to receive the copied settings. The same copied settings will be available for pasting until another copy is performed.

Greebler Object : Presets tab



Presets are unique settings stored for later application to the Greebler object or tag being considered. Presets are stored in the Greebler application data folder as files with a 'gpr' extension. Note that the filename "default.gpr" is reserved for the default settings applied to newly created Greebler objects and tags. If you **Save** using that filename, it will be the same as **Save As Default**. Settings on dynamically added elements such as Custom Greeble and Nurnie library objects are not stored. All static settings from Object, Base, Stock Greebles, Custom Greebles, and Nurnies are stored.

Load

Load a unique Preset whose settings will be applied to this Greebler object.

Save

Save a unique Preset whose settings are based upon those of this Greebler object.

Save As Default

Save the current settings of this Greebler object so as to be used as the default settings for Greebler objects and tags when they are created.

Delete

Delete a particular Preset file (with a 'gpr' extension) from disk. **This action is permanent!**

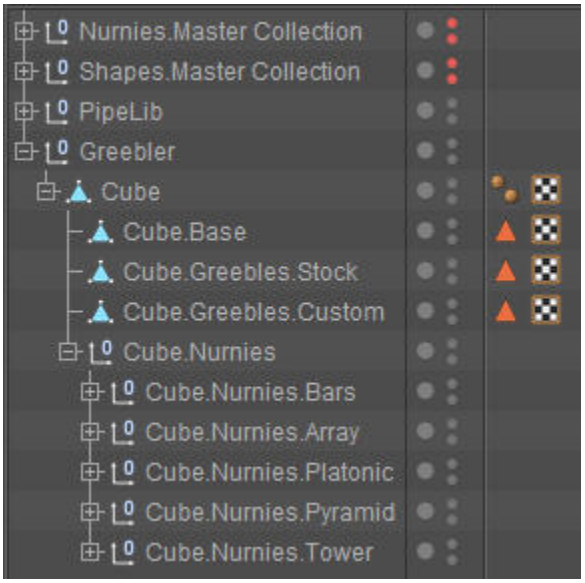
Factor Defaults

Set the settings of this Greebler object to the rudimentary defaults.

Greebler Tag

The Greebler tag allows you to selectively apply greebles and nurnies over the Polygon Selection tag added to the Polygon Selection linkbox on the tag. The Greebler tag still requires a Greebler object to generate the results. You can have as many Greebler tags as you like on an object but each should have a unique Polygon Selection tag. The tag will only affect the object on which it is added.

The end result, if made editable, is a hierarchy containing the target objects (those receiving the greebling), if they are retained, and a series of objects for each specific type of Greeble (Base, Stock Greebles, Custom Greebles, Nurnies). These are named according to several factors which will also be relevant if you want to texture the resulting Greebler geometries without making the Greebler object editable.



The above image shows one result of Make Editable (C key) for the Greebler object. The Greebler geometries and other objects are childed to the target object geometry or a Null object similarly named if the target object is not retained. Note that a naming hierarchy is constructed which will allow you to apply custom texturing to specific areas of the Greebler results even while the Greebler object is still procedural (not made editable). The target object's texturing is typically passed on to the results if no others are specified. Nurnies retain the texturing on the referenced Nurnie objects. You texture specific areas of the Greebler results by creating Materials/Shaders and adding them to the Greebler object so as to create respective Texture tags. The restriction to particular Greebler areas is done by naming convention of the Texture tags. As we see in the image above, if you wanted to use a specific material for the Cube's Custom Greebles,

the relevant Texture tag on the Greebler object would be named "Cube.Greebles.Custom". While this appears to be simple enough, there is even more in-depth texture control. The full specification is detailed below.

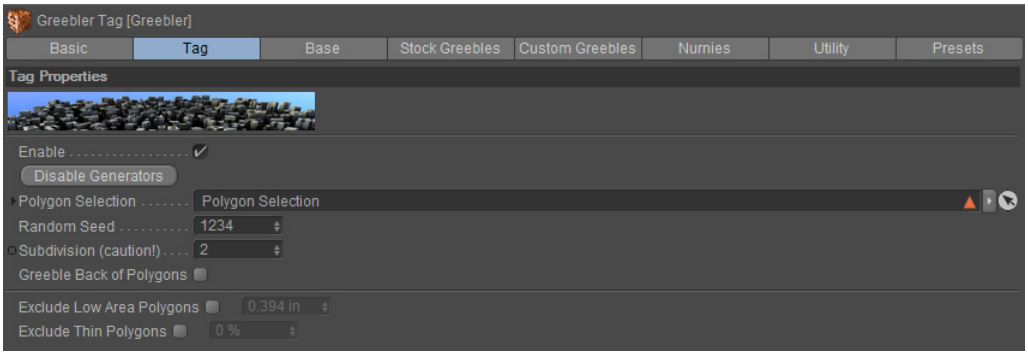
- Texture tag names are delineated by '.' characters.
- Each name starts with the input object's name.
- If restricting the greebling of an object's polygons using a Greebler tag, the Polygon Selection name is added next.
- ".Base" if Base enabled
- Greebles
    - ".Greebles" if combining Stock and Custom Greebles
    - ".Greebles.Stock" for Stock Greebles
    - ".Greebles.Custom" for Custom Greebles
- If Selections for Base or Greebles is enabled, add any of these as available or desired:
    - ".Top" always available
    - ".Sides" always available
    - ".Bevel" if Beveling is anything but 0.0
    - ".Cap" if 'Add Bottom Caps' is enabled

For example: Input object's name is "Cube", Bases enabled, not combining Stock/Custom Greebles, Selections enabled for both, Bevels for both, Bottom Caps for Base, no Bottom Caps for Greebles. When restricting the greebling to a Polygon Selection named "TopFace" referenced in a Greebler tag, you would then add that after the input object name. PolygonSelections available for Texture tags would then be:

- Cube.TopFace.Base.Top
- Cube.TopFace.Base.Sides
- Cube.TopFace.Base.Bevel
- Cube.TopFace.Base.Cap
- Cube.TopFace.Greebles.Stock.Top
- Cube.TopFace.Greebles.Stock.Sides
- Cube.TopFace.Greebles.Stock.Bevel
- Cube.TopFace.Greebles.Custom.Top
- Cube.TopFace.Greebles.Custom.Sides
- Cube.TopFace.Greebles.Custom.Bevel

You can combine overall and detailed texturing. For instance, to use one texture for the Base of "Object" while using another to cover just the Base sides, you would name the former Texture tag "Object.Base" and the latter "Object.Base.Sides". In this way, you can selectively texture results while maintaining a general texture for other areas.

Greebler Tag : Tag tab



This contains general controls that apply to the target object and the subsequent tabs that aid in generation. Each is explained in detail hereafter.

This image at the top of the tab section is actually a button which will open this documentation window, if not already opened. It is also available on the Greebler object and Greebler Library Management window.

Enable

Determines whether or not to use this Greebler tag for generating. If none are enabled, the Greebler object takes precedence. If any Greebler tags are enabled, they take precedence over the Greebler object.

Disable Generators

A quick way to disable Base, Stock Greebles, Custom Greebles, and Nurnies without having to go to each tab to do so. This is useful to stop an unexpectedly long/large generation of objects more efficiently as the interface is bogged down in the process.

Polygon Selection

The Polygon Selection tag containing the polygons over which this Greebler tag will generate bases, greebles, and nurnies.

Random Seed

An integer value used to vary the random sequences created by the random number

generators.

Subdivision (caution!)

The target object on which this tag resides will be polygon subdivided as many times as this number is set. This affects bases and the subsequent distribution and counts of Greebles and Nurnies as they are populated on a per-polygon basis. A subdivision of 1 takes 1 quadrangle and subdivides it into 4 polygons, a value of 2 takes 1 quadrangle and subdivides it into 16 polygons. The formulae for calculating the resulting numbers of polygons is:

- Triangle: (2 to the power of Subdivision) * (2 to the power of Subdivision) / 2
- Quadrangle: (2 to the power of Subdivision) * (2 to the power of Subdivision)

Be careful not to set this value too large! Large values can quickly consume memory and bog down Cinema 4D to the point of unusability.

Greeble Back of Polygons

Instead of extruding bases and placing greebles and nurnies with respect to the polygon normal, they will be done on the opposite side. This avoids the need to explicitly Invert Normals in order to achieve the same results.

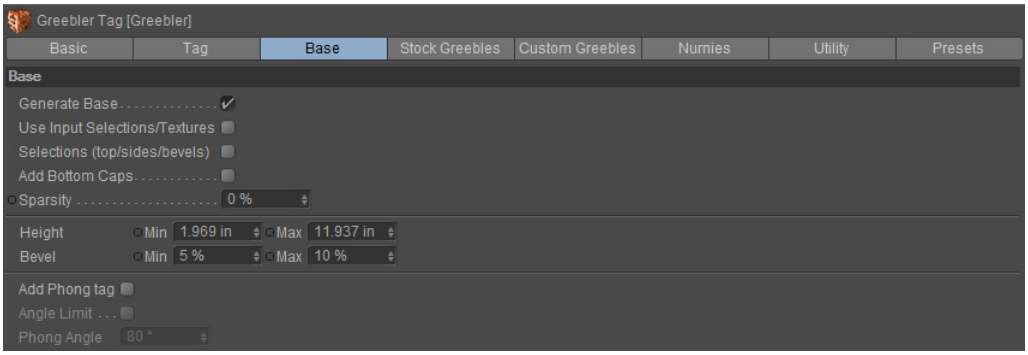
Exclude Low Area Polygons

This setting and the next allow you to control 'over greebling'. When dealing with small or thin polygons, the results might not be worth the extra effort of generating geometry with respect to them. The value represents the squared area under which (inclusively) polygons will be excluded. The larger the value the greater the number of polygons may be excluded.

Exclude Thin Polygons

You can also exclude polygons by their so-called thinness by enabling this option and setting the percentage value. The percentage value is applied to a ratio between width and length of a polygon. A square (equal width and length) represents the ultimate 'fat' polygon with a ratio of 1:1 = 1. At 100%, all polygons are considered 'thin' and excluded, even square polygons. At 0%, all polygons are included. As you increase the percentage from 0 to 100, polygons with less disparity between width and length are excluded.

Greebler Tag : Base tab



Bases are bevelled extrusions of the input objects' polygons in the direction of their normals (or opposite direction if Greeble Back of Polygons is enabled). This is very similar to performing the Cinema 4D Structure commands Extrude followed by a Bevel (with Preserve Groups disabled) on a Polygon object.

Generate Base

Enable or disable the generation of bases on the input object polygon selection.

Use Input Selections/Textures

In cases where you want the input object surface varied with bases but without disrupting the current texturing or requiring texturing later on to retain it, this will apply the input object texturing to the Base geometry automatically.

Selections (top/sides/bevels)

Polygon Selection tags will be created for the top, sides, and bevel (if beveling is greater than 0%). This allows you texture these separate areas of the Base extrusion independently.

Add Bottom Caps

Geometry is created to close the underside of the extrusion so that you won't have hollow extrusions. Bottom caps can be textured independently of other areas as described on the main Greebler Tag page.

Sparsity

Sparsity is a percentage of how many polygons will be excluded from the generation of

Bases. At 0% sparsity, all polygons in the selection set are employed. At 100% sparsity, no polygons are employed (same as not generating bases at all). Polygons are randomly selected for exclusion.

Height

Two values set the minimum and maximum height to which Bases will be extruded away from the input polygon surface, given in real units of distance.

Bevel

In order to soften the extrusion edges, you can add some edge beveling (45° breaks between the top and sides). The percentage is from 0%, where there is no beveling, to 100%, where the top basically becomes a point.

Add Phong Tag

Adds a Phong tag to the generated Base objects so that you can control surface smoothing while Greebler is still procedural (not Made Editable). The next two options are identical to Cinema 4D's Phong tag settings and set the added Phong tag values accordingly.

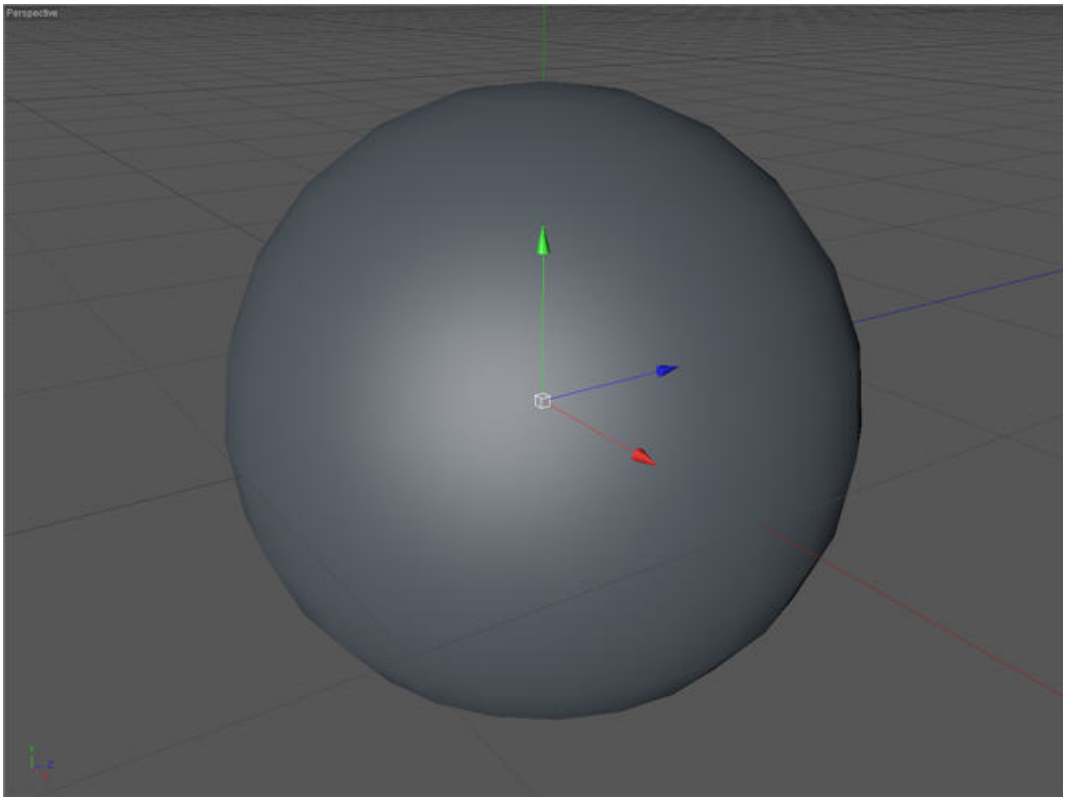
Angle Limit

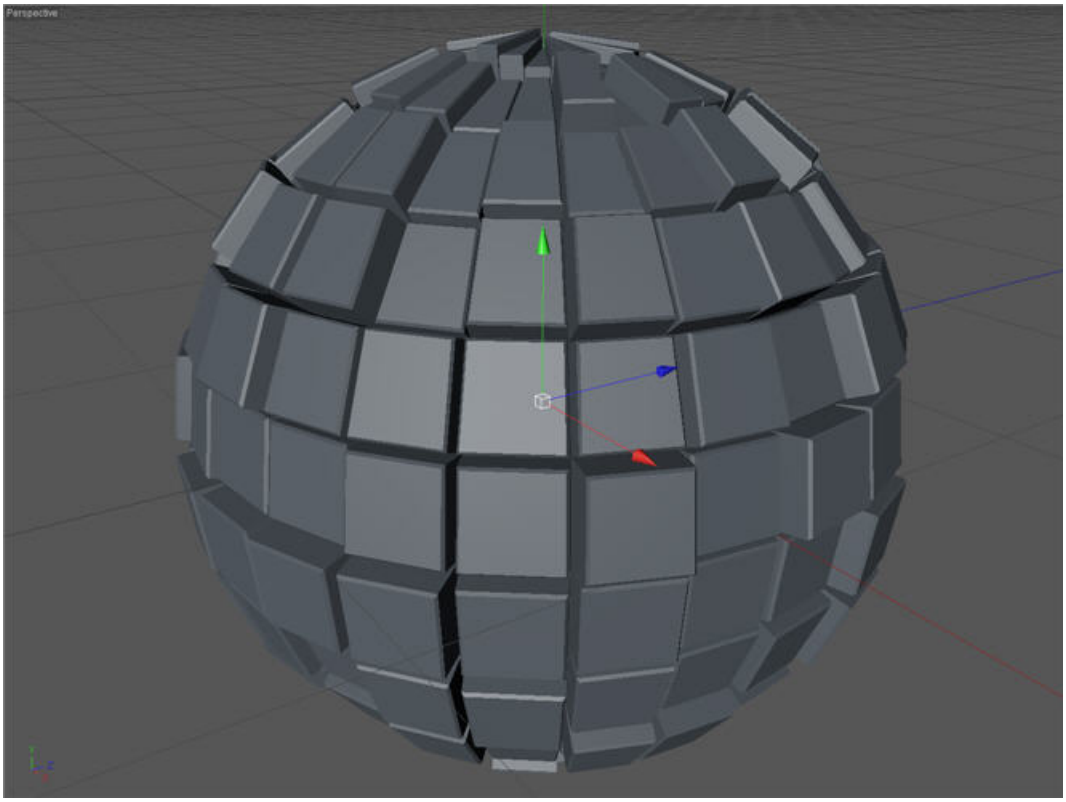
Enable the use of the Phong Angle as a determination of whether or not to smooth between two neighboring polygons.

Phong Angle [0..180°]

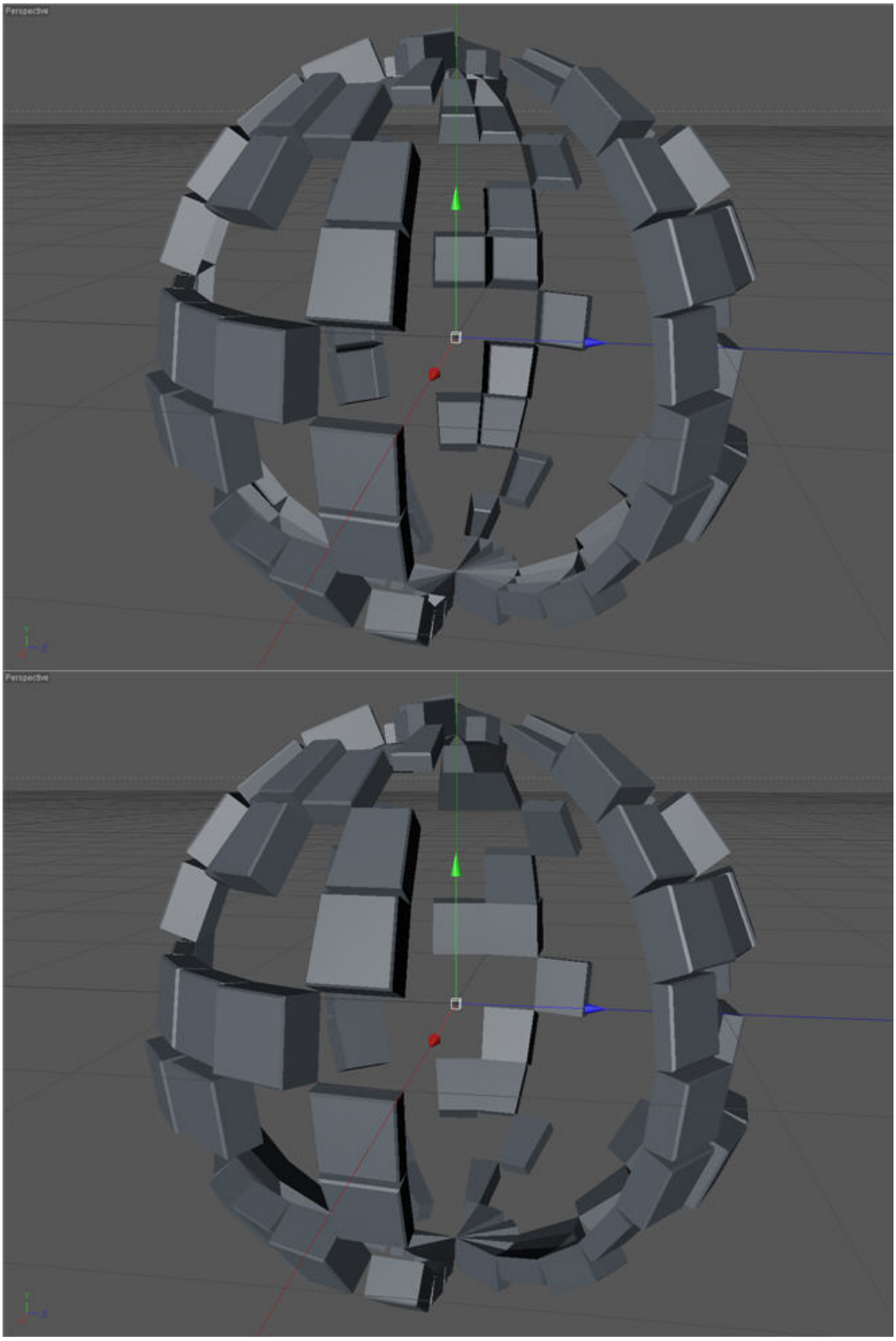
The angle represents the difference in angle between two neighboring polygons being considered in the Phong smoothing. The greater the value, the greater the polygon-polygon angular difference included in the smoothing process.

First image shows the input Sphere object. Second image shows the Sphere object with beveled bases generated.

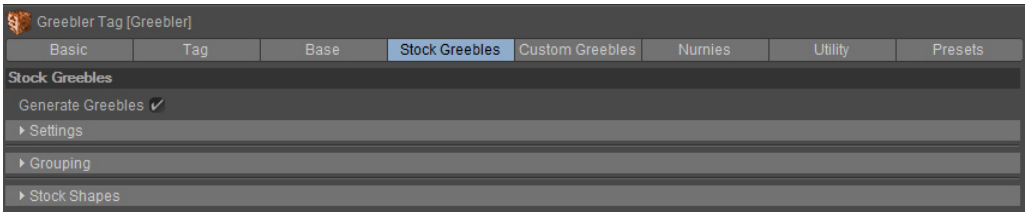

Perspective


Perspective

First image shows bases without bottom caps. Second shows bases with bottom caps.



Greebler Tag : Stock Greebles tab

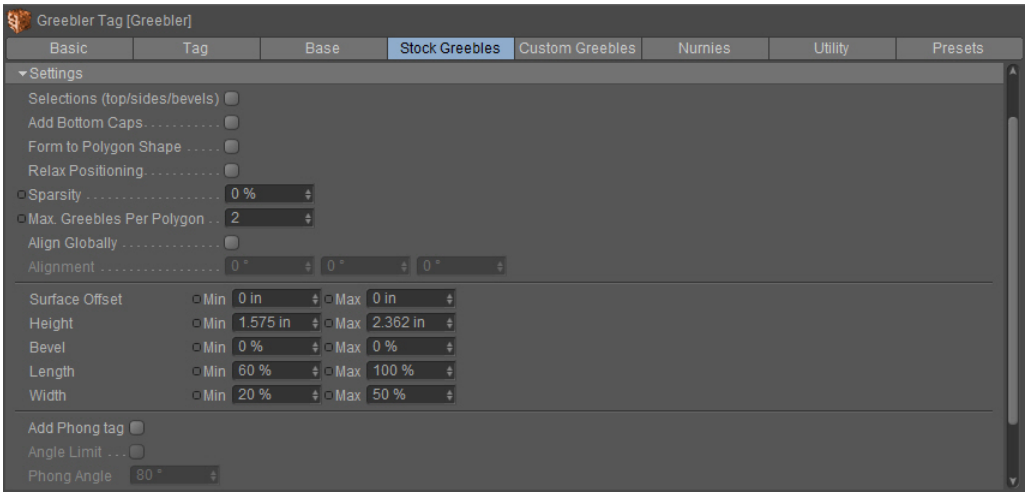


Greebles are protuberances that represent basic nondescript details on an object so as to create a sense of size or give it technical part details such as boxes, louvers, pipes, lights, and so on. Greebler has a decent set of stock greebles which will get you pretty far in detailing your objects. Each polygon is populated by 0 or more greeble objects and all greebles for an object are coalesced into a single greeble mesh (virtually, unless you Make Editable the Greebler object).

Generate Greebles

Enable or disable the generation of Stock Greebles on the input object's polygon selection set.

Settings



Selections (top/sides/bevels)

Polygon Selection tags will be created for the top, sides, and bevel (if beveling is greater than 0%). This allows you texture these separate areas of the greeble extrusions

independently.

Add Bottom Caps

Geometry is created to close the underside of the greeble extrusion so that you won't have hollow extrusions. Bottom caps can be textured independently of other areas as described on the main Greebler Object page.

Form to Polygon Shape

When disabled, greebles are simply placed onto the polygon as is. When enabled, the polygon is mapped into a unit-square and the greebles placed onto that. When the unit-square is mapped back onto the polygon shape, the greebles are misshaped so as to follow the polygon's form.

Relax Positioning

This allows the greebles to be placed less stringently with respect to the polygon's edges, thus creating a less obvious polygon-to-polygon greebling appearance.

Sparsity

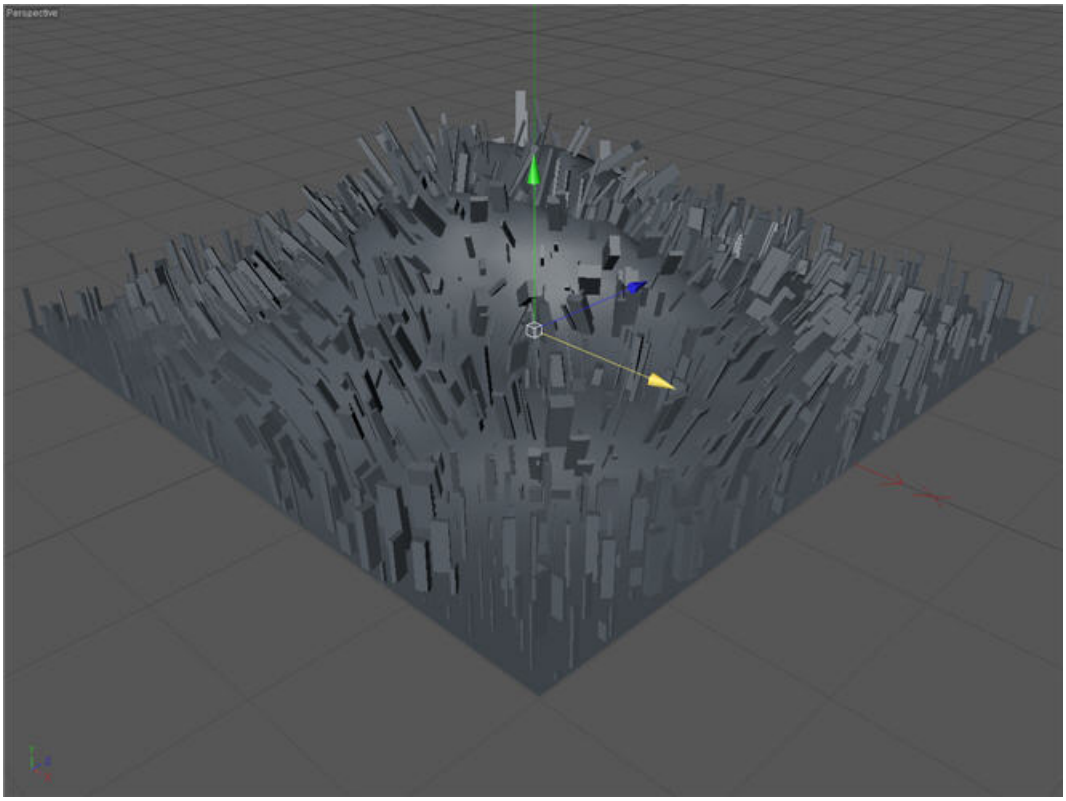
Sparsity is a percentage of how many polygons will be excluded from being populated with greebles. At 0% sparsity, all polygons are employed. At 100% sparsity, no polygons are employed (same as not generating greebles at all). Polygons are randomly selected for exclusion.

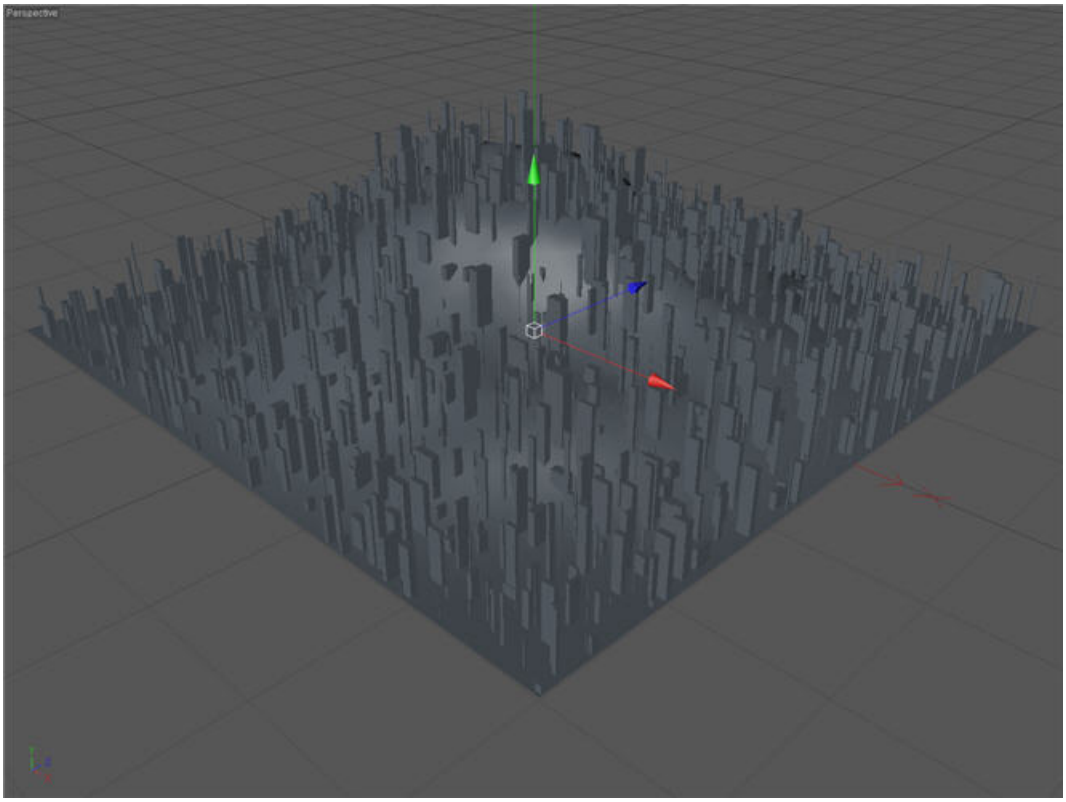
Max. Greebles Per Polygon

The maximum number of greebles that will populate any polygon. For each polygon, a random number of greebles from 0 to this maximum is created.

Align Globally / Alignment

On more unidirectional surfaces such as a Landscape object, you may want the greebles to point in the up direction despite the change in surface normals. Enabling this setting allows you to achieve just that. The **Alignment** vector is an HPB rotation vector that lets you change the global pointing direction of the greebles. The first image below shows the nonaligned greeble results (following the polygon normals). The second image shows the result of enabling **Align Globally**.


Perspective


Perspective

Surface Offset

Two values set the minimum and maximum distance greebles will be moved away from the polygon surface, given in real units of distance. The offset range can be positive or negative. Note that the greebles follow the path of the direction they face. If **Align Globally** is enabled then they will move in the same direction. If disabled, they will move along their polygon's normal direction.

Height

Two values set the minimum and maximum height to which greebles will be extruded away from the input polygon surface, given in real units of distance.

Bevel

In order to soften the extrusion edges, you can add some edge beveling (45° breaks between the top and sides). The percentage is from 0%, where there is no beveling, to 100%, where the top basically becomes a point.

Length

These two values let you specify a range for which the greeble will occupy polygon space along one direction. For instance, 100-100% will cause the greeble to be about as long as the polygon.

Width

Similar to **Length**, these two values specify a range for occupying space in the other, perpendicular direction.

Add Phong Tag

Adds a Phong tag to the generated Stock Greeble objects so that you can control surface smoothing while Greebler is still procedural (not Made Editable). The next two options are identical to Cinema 4D's Phong tag settings and set the added Phong tag values accordingly.

Angle Limit

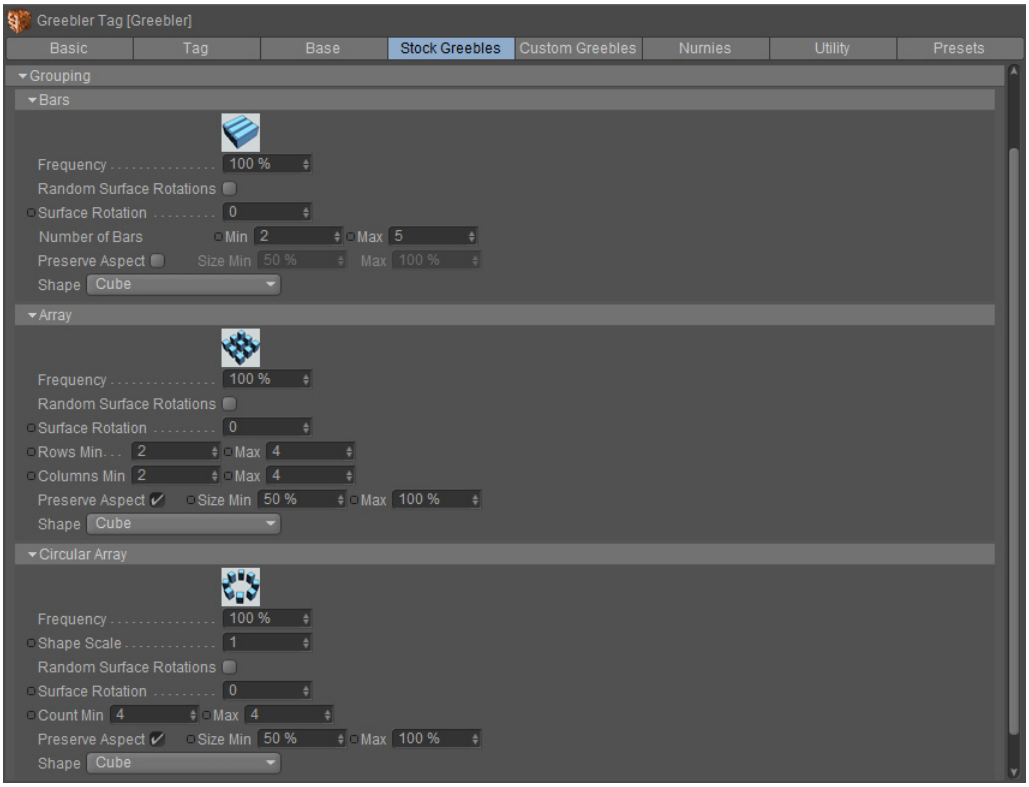
Enable the use of the Phong Angle as a determination of whether or not to smooth between two neighboring polygons.

Phong Angle [0..180°]

The angle represents the difference in angle between two neighboring polygons being considered in the Phong smoothing. The greater the value, the greater the polygon-

polygon angular difference included in the smoothing process.

Grouping



Shapes can be grouped into any of three types: Bars (linear array), Array (MxN array), or Circular Array. Any of the Shapes listed below can be grouped. Note that additional variation parameters for those Shapes having them are also applied when grouped.

Bitmap Buttons

The descriptive images for each grouping type are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various stock shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is

disabled then its Frequency value takes no part in the random decision process.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

Preserve Aspect

When enabled, the array remains square (Bars and Array) or circular (Circular Array). When disabled, it's shape can be rectangular (Bars and Array) or elliptical (Circular Array) as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the grouping between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Shape

A pull-down list which contains all of the available Stock Greebles, minus the grouping types, that can be used as the grouping element object.

Bars

Number of Bars

The minimum and maximum number of objects in the linear array (Bars).

Array

Rows / Columns

The minimum and maximum number of row and column objects in the Array.

Circular Array

Shape Scale

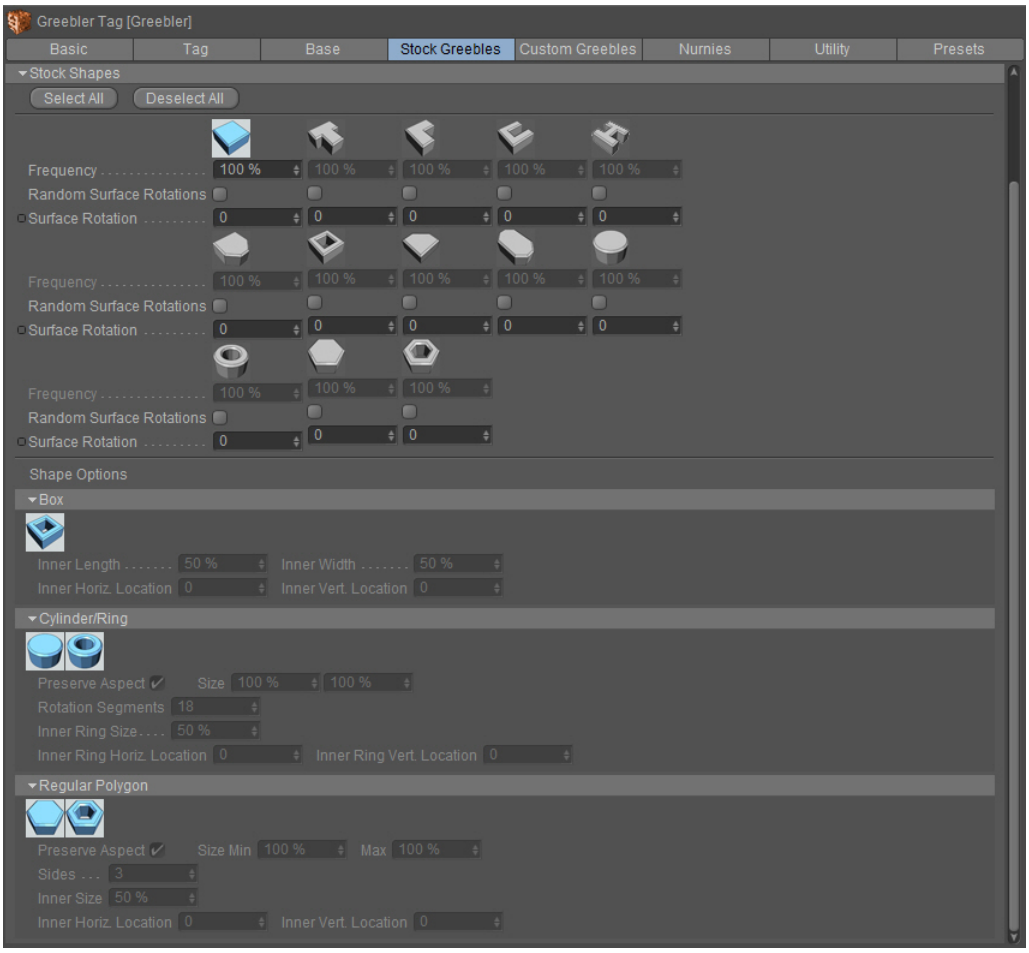
A relative scale value applied to each object in the Circular Array that allows you to vary

the size of the objects with respect to the Circular Array size.

Count

The minimum and maximum number of objects on the circumference of the Circular Array.

Shapes



There are 13 stock greebles which can be used to populate the surfaces of your objects. Of these, 5 have additional parameters for variation (italicized in the list below). The types are, from top-left to bottom-right:

- Cube
- T
- L
- C
- H
- D

- *Box*
- Diamond
- Oblong Octagon
- *Cylinder*
- *Ring*
- *Regular Polygon*
- *Regular Polygon Ring*

Select All

Convenience button which enables all Stock Greeble Shapes and Grouping types.

Deselect All

Convenience button which disables all Stock Greeble Shapes and Grouping types.

Bitmap Buttons

The descriptive images for each shape are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various stock shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is disabled then its Frequency value takes no part in the random decision process.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

For those Shape types with parametric variations, these parameters are available:

Box

Inner Length / Inner Width

These settings let you control the size of the opening in the box shape. The dimensions are clamped so that the size does not cause the opening to go beyond the outer perimeter.

Inner Horiz. Location / Inner Vert. Location

These provide an offset of the opening with respect to the box's center. The values are clamped with respect to **Inner Length** and **Inner Width** so that the offset does not go beyond the outer perimeter.

Cylinder/Ring

Preserve Aspect

When enabled, Cylinders and Rings remain circular. When disabled, their shapes can be elliptical as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the Cylinder and Ring shapes between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Rotation Segments

The number of polygons around the circumference of the Cylinders and Rings. If you enable **Add Phong Tag**, you will be able to keep this value low and still get a smooth surface.

Inner Ring Size

The percentage of size of the inner opening with respect to the outer diameter of the Ring shape. 0% closes the opening, making it look like a Cylinder. 100% opens up to a thin ring surface.

Inner Ring Horiz. Location / Inner Ring Vert. Location

Offsets of the Ring opening with respect to the Ring's center. The values are clamped with respect to **Inner Ring Size** so that the offset does not go beyond the outer perimeter.

Regular Polygon

Preserve Aspect

When enabled, Regular Polygons remain 'circular'. When disabled, their shapes can be elliptical as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the Regular Polygon shapes between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Sides

The number of polygon sides around the circumference. The value can be from 3 to 10 sides.

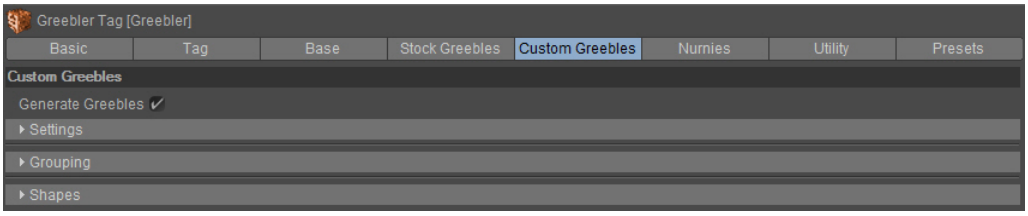
Inner Size

The percentage of size of the inner opening with respect to the outer diameter of the Regular Polygon shape. 0% closes the opening, making it look like a Regular Polygon. 100% opens up to a thin Regular Polygon Ring surface.

Inner Horiz. Location / Inner Vert. Location

Offsets of the ring opening with respect to the Regular Polygon's center. The values are clamped with respect to **Inner Size** so that the offset does not go beyond the outer perimeter.

Greebler Tag : Custom Greebles tab

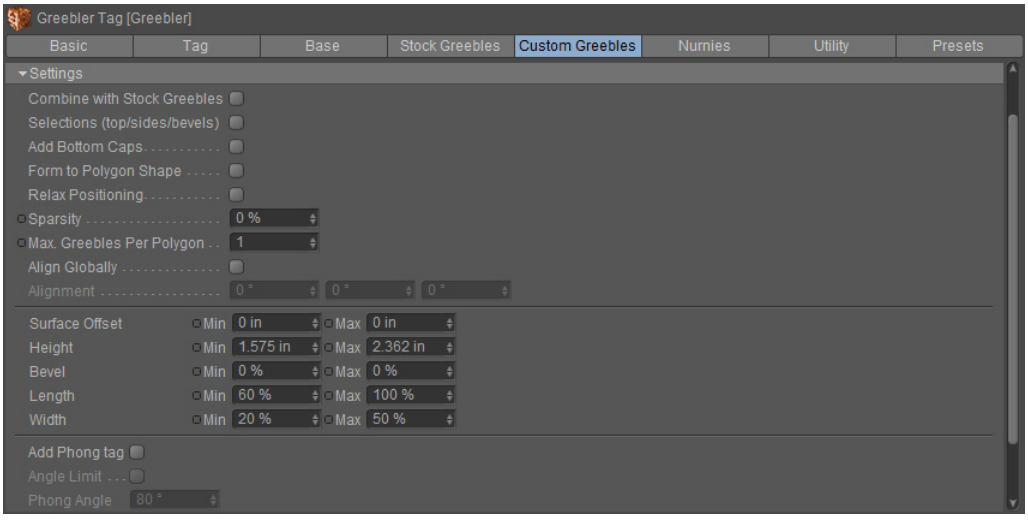


Although the 13 Stock Greebles with 3 grouping types and 5 variable Shapes goes a long way in allowing rich surface details, it would not be a very flexible tool if you could not use custom shapes to meet your goals. With Custom Shapes, you can expand your Greeble choices almost indefinitely (up to 1000 custom shapes per Greebler object or tag).

Generate Greebles

Enable or disable the generation of Custom Greebles on the input object's polygon selection set.

Settings



Combine with Stock Greebles

This option will combine the Custom Greeble mesh with the Stock Greeble mesh to form one Polygon object instead of the two separate ones.

Selections (top/sides/bevels)

Polygon Selection tags will be created for the top, sides, and bevel (if beveling is greater than 0%). This allows you texture these separate areas of the greeble extrusions independently.

Add Bottom Caps

Geometry is created to close the underside of the greeble extrusion so that you won't have hollow extrusions. Bottom caps can be textured independently of other areas as described on the main Greebler Object page.

Form to Polygon Shape

When disabled, greebles are simply placed onto the polygon as is. When enabled, the polygon is mapped into a unit-square and the greebles placed onto that. When the unit-square is mapped back onto the polygon shape, the greebles are misshaped so as to follow the polygon's form.

Relax Positioning

This allows the greebles to be placed less stringently with respect to the polygon's edges, thus creating a less obvious polygon-to-polygon greebling appearance.

Sparsity

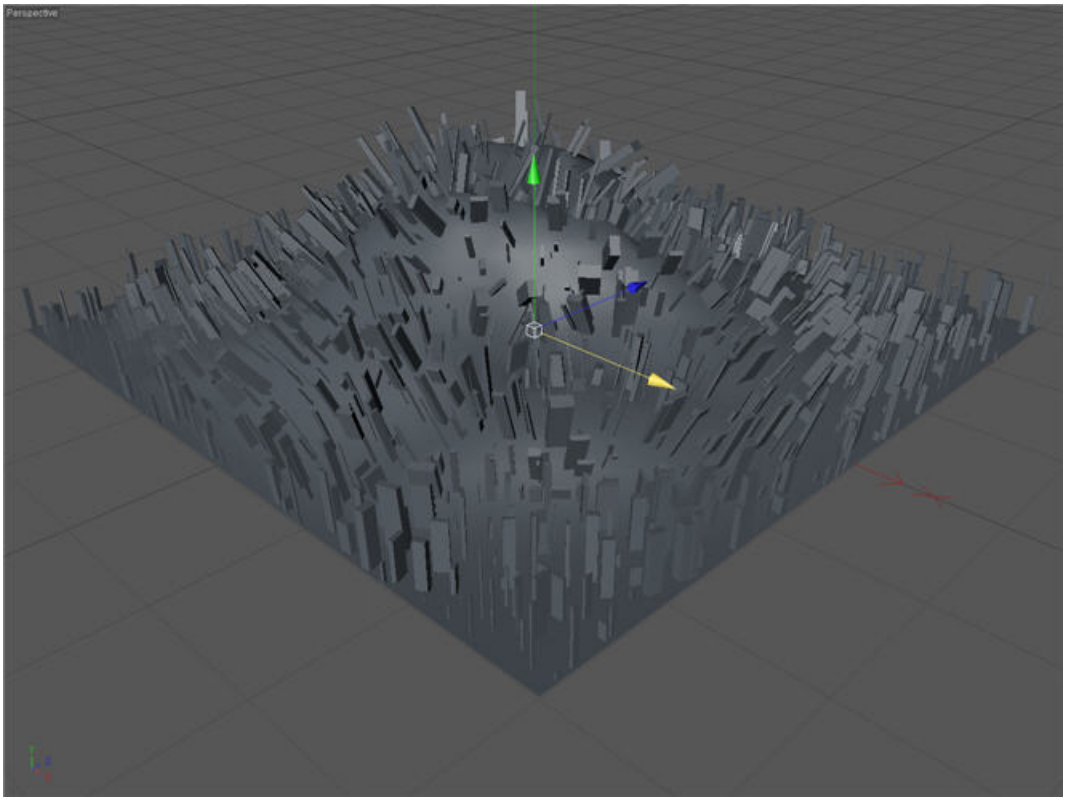
Sparsity is a percentage of how many polygons will be excluded from being populated with greebles. At 0% sparsity, all polygons are employed. At 100% sparsity, no polygons are employed (same as not generating greebles at all). Polygons are randomly selected for exclusion.

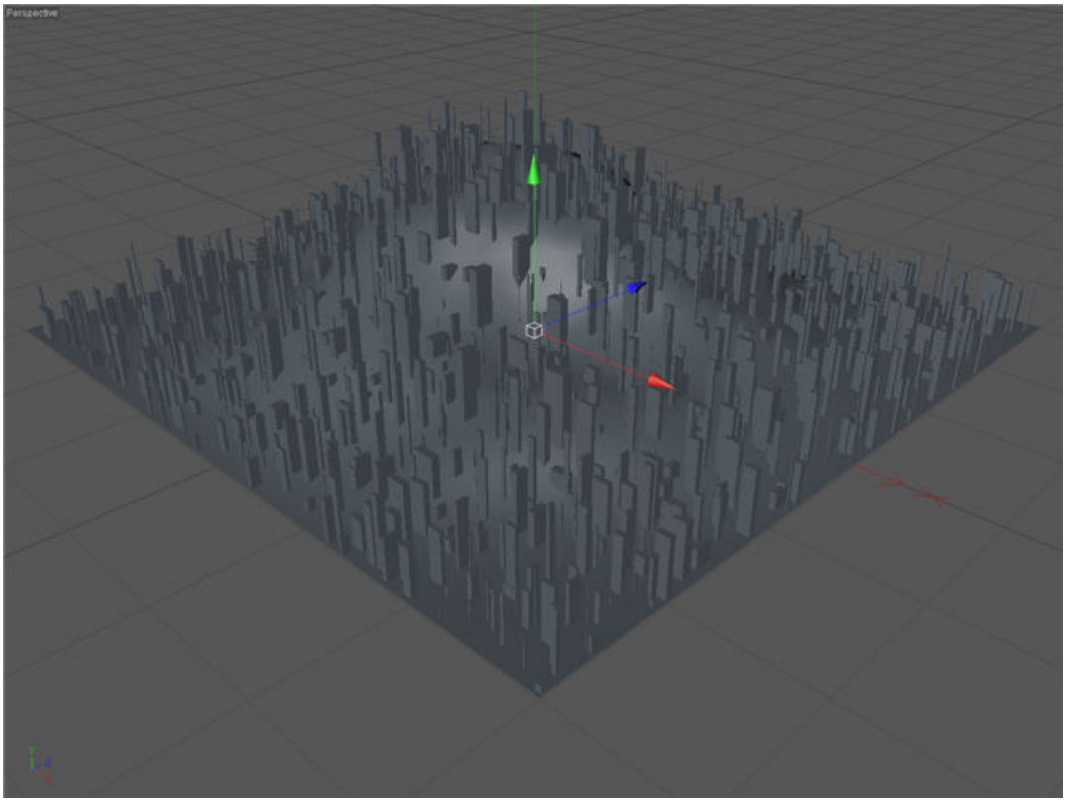
Max. Greebles Per Polygon

The maximum number of greebles that will populate any polygon. For each polygon, a random number of greebles from 0 to this maximum is created.

Align Globally / Alignment

On more unidirectional surfaces such as a Landscape object, you may want the greebles to point in the up direction despite the change in surface normals. Enabling this setting allows you to achieve just that. The **Alignment** vector is an HPB rotation vector that lets you change the global pointing direction of the greebles. The first image below shows the nonaligned greeble results (following the polygon normals). The second image shows the result of enabling **Align Globally**.


Perspective


Perspective

Surface Offset

Two values set the minimum and maximum distance greebles will be moved away from the polygon surface, given in real units of distance. The offset range can be positive or negative. Note that the greebles follow the path of the direction they face. If **Align Globally** is enabled then they will move in the same direction. If disabled, they will move along their polygon's normal direction.

Height

Two values set the minimum and maximum height to which greebles will be extruded away from the input polygon surface, given in real units of distance.

Bevel

In order to soften the extrusion edges, you can add some edge beveling (45° breaks between the top and sides). The percentage is from 0%, where there is no beveling, to 100%, where the top basically becomes a point.

Length

These two values let you specify a range for which the greeble will occupy polygon space along one direction. For instance, 100-100% will cause the greeble to be about as long as the polygon.

Width

Similar to **Length**, these two values specify a range for occupying space in the other, perpendicular direction.

Add Phong Tag

Adds a Phong tag to the generated Custom Greeble objects so that you can control surface smoothing while Greebler is still procedural (not Made Editable). The next two options are identical to Cinema 4D's Phong tag settings and set the added Phong tag values accordingly.

Angle Limit

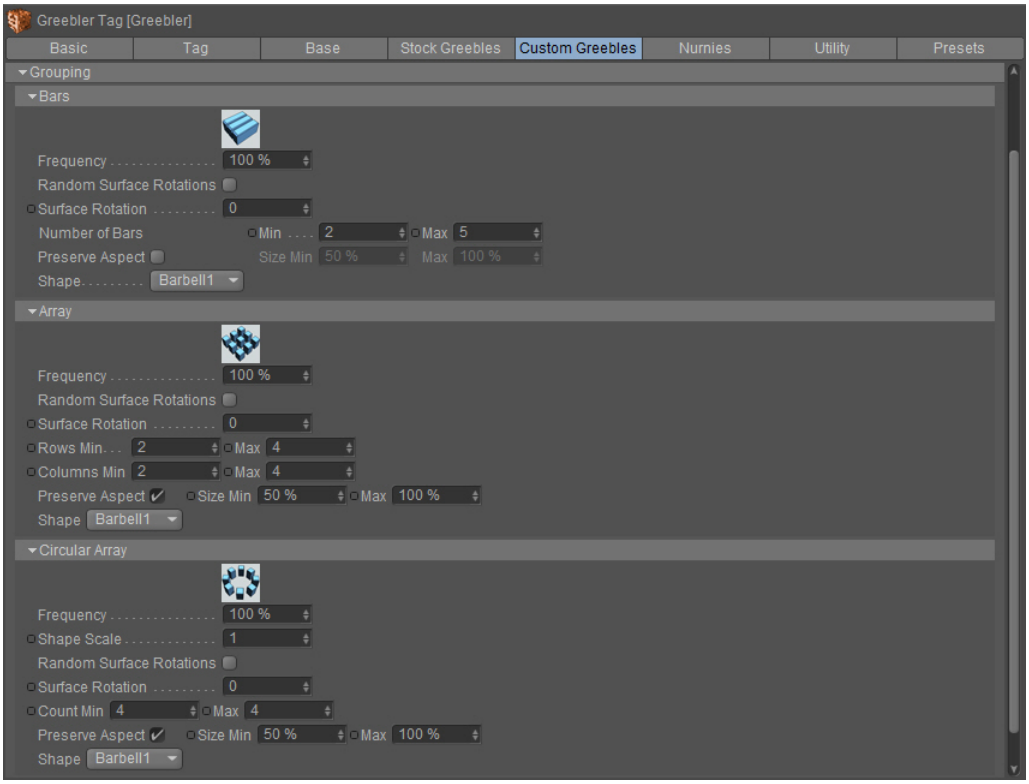
Enable the use of the Phong Angle as a determination of whether or not to smooth between two neighboring polygons.

Phong Angle [0..180°]

The angle represents the difference in angle between two neighboring polygons being considered in the Phong smoothing. The greater the value, the greater the polygon-

polygon angular difference included in the smoothing process.

Grouping



Shapes can be grouped into any of three types: Bars (linear array), Array (MxN array), or Circular Array. Any of the Shapes available from the linked Library can be grouped.

Bitmap Buttons

The descriptive images for each grouping type are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various custom shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is disabled then its Frequency value takes no part in the random decision process.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

Preserve Aspect

When enabled, the array remains square (Bars and Array) or circular (Circular Array). When disabled, it's shape can be rectangular (Bars and Array) or elliptical (Circular Array) as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the grouping between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Shape

A pull-down list which lists all of the available Custom Greebles, minus the grouping types, that can be used as the grouping element object. The pull-down list is dynamically seeded with the available Shapes.

Bars

Number of Bars

The minimum and maximum number of objects in the linear array (Bars).

Array

Rows / Columns

The minimum and maximum number of row and column objects in the Array.

Circular Array

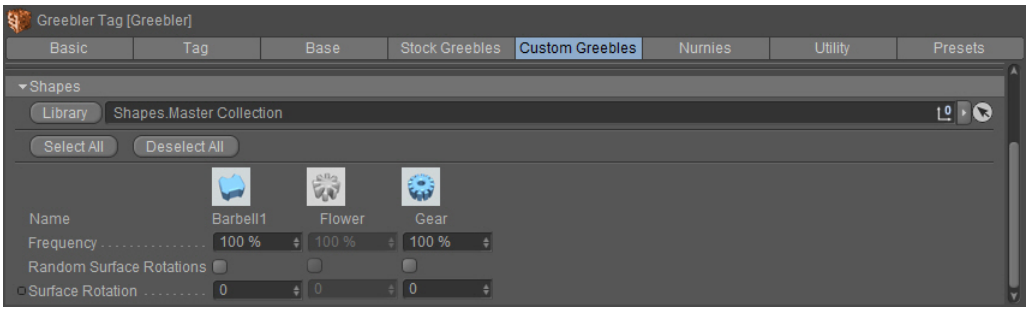
Shape Scale

A relative scale value applied to each object in the Circular Array that allows you to vary the size of the objects with respect to the Circular Array size.

Count

The minimum and maximum number of objects on the circumference of the Circular Array.

Shapes



You can use up to 1000 custom shapes to extend your greebling possibilities. The custom shapes used for Custom Greebles must exist in the document and the container Null object added to the **Library Linkbox** to be utilized with the Greebler object or tag.

Library

Opens the Greebler Library Management window so that you can add Custom Shapes from your Library into the document for use with Greebler objects and tags. Custom Shapes must be prepared and added to the Greebler Shape Library before being able to be used with Greebler objects and tags. This only has to be done once but it is a critical step. See the Custom Shapes section for detailed information and a tutorial on how to create and use Custom Shapes with Greebler.

Library Linkbox

Custom Shapes are added to the document and childed to a Null object so as to keep them grouped for easier reference. When you drop the Null object into the Library Linkbox, all of the Custom Shapes are dynamically added to the Shapes list with toggleable images and Name for reference.

Select All

Convenience button which enables all Custom Greeble Shapes and Grouping types.

Deselect All

Convenience button which disables all Custom Greeble Shapes and Grouping types.

Bitmap Buttons

The descriptive images for each shape are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Name

The name given the Custom Shape when added to the Shape Library. This name is also given to the C4D document file for the Custom Shape stored on disk.

Frequency

This allows you to control how many of the available custom shape and grouping types populate the object surface. At 100%, the particular greeble type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a greeble type for population. 0% is equivalent to disabling the greeble type. Basically, you can control whether or not there are more or less of a particular greeble type. If a greeble type is disabled then its Frequency value takes no part in the random decision process.

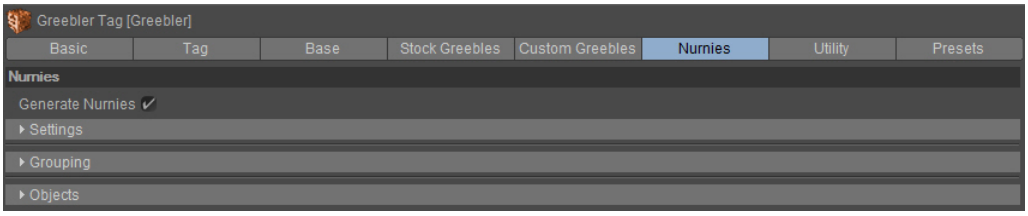
Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All greebles of this type will be rotated on the surface plane by the angle given.

Greebler Tag : Nurnies tab

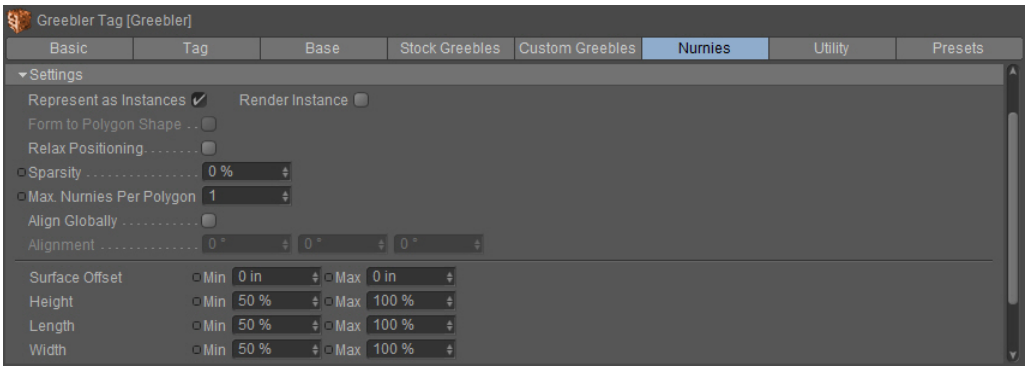


As well as Greebles, Greebler lets you use objects to populate a surface. These objects are called Nurnies. You can use any object but it is recommended to consider the memory usage and use Instances whenever possible. Texturing and Phong are taken from the source object. Neither is applied from the Greebler object onto the nurnie objects.

Generate Nurnies

Enable or disable the generation of Nurnies on the input object's polygon selection set.

Settings



Represent as Instances

Nurnies will be represented as Instance objects, which is much more memory efficient than simple copies of each Nurnie object. Note that **Form to Polygon Shape** is unavailable when nurnies are Instances because the instancing does not allow for that type of deformation.

Render Instance

In Cinema 4D R11.5 and later there is the option to use so-called Render Instances, instances which are only fully realized during the render process. They are very memory

efficient and it is recommended to enable this whenever possible.

Form to Polygon Shape

When disabled or unavailable, nurnies are simply placed onto the polygon as is. When enabled, the polygon is mapped into a unit-square and the nurnies placed onto that. When the unit-square is mapped back onto the polygon shape, the nurnies are misshaped so as to follow the polygon's form. This is only available when nurnies are Polygon objects and not being represented as Instances.

Relax Positioning

This allows the nurnies to be placed less stringently with respect to the polygon's edges, thus creating a less obvious polygon-to-polygon greebling appearance.

Sparsity

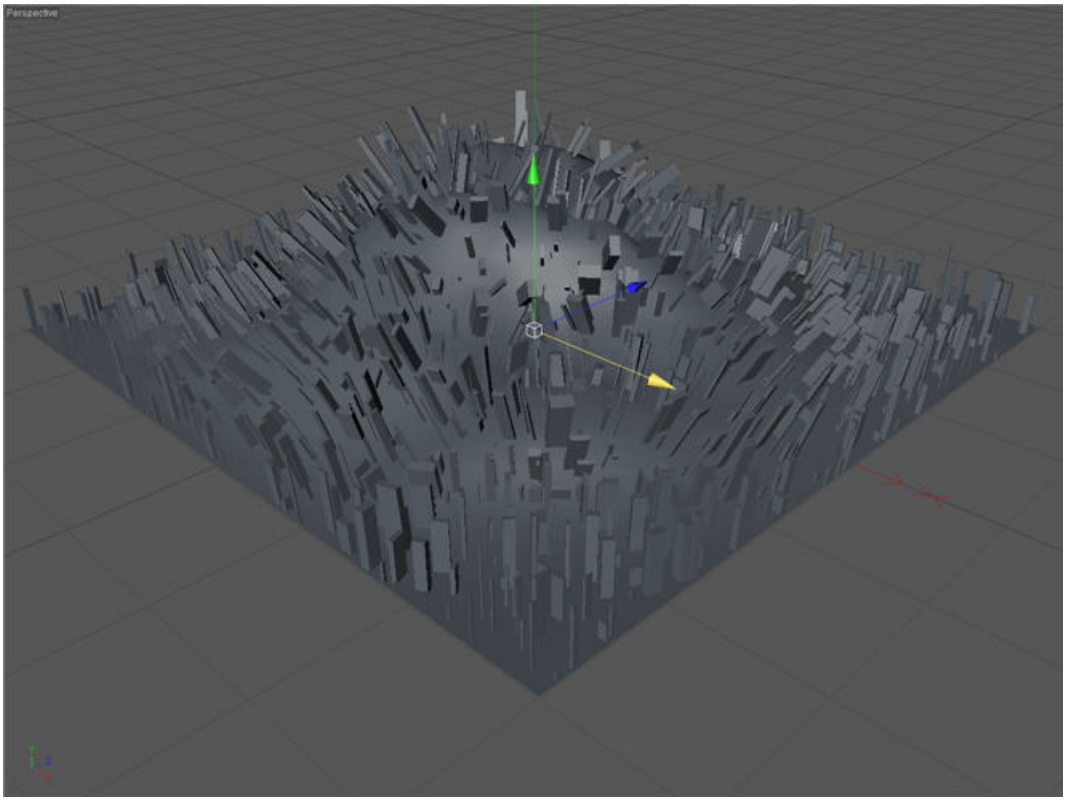
Sparsity is a percentage of how many polygons will be excluded from being populated with nurnies. At 0% sparsity, all polygons are employed. At 100% sparsity, no polygons are employed (same as not generating nurnies at all). Polygons are randomly selected for exclusion.

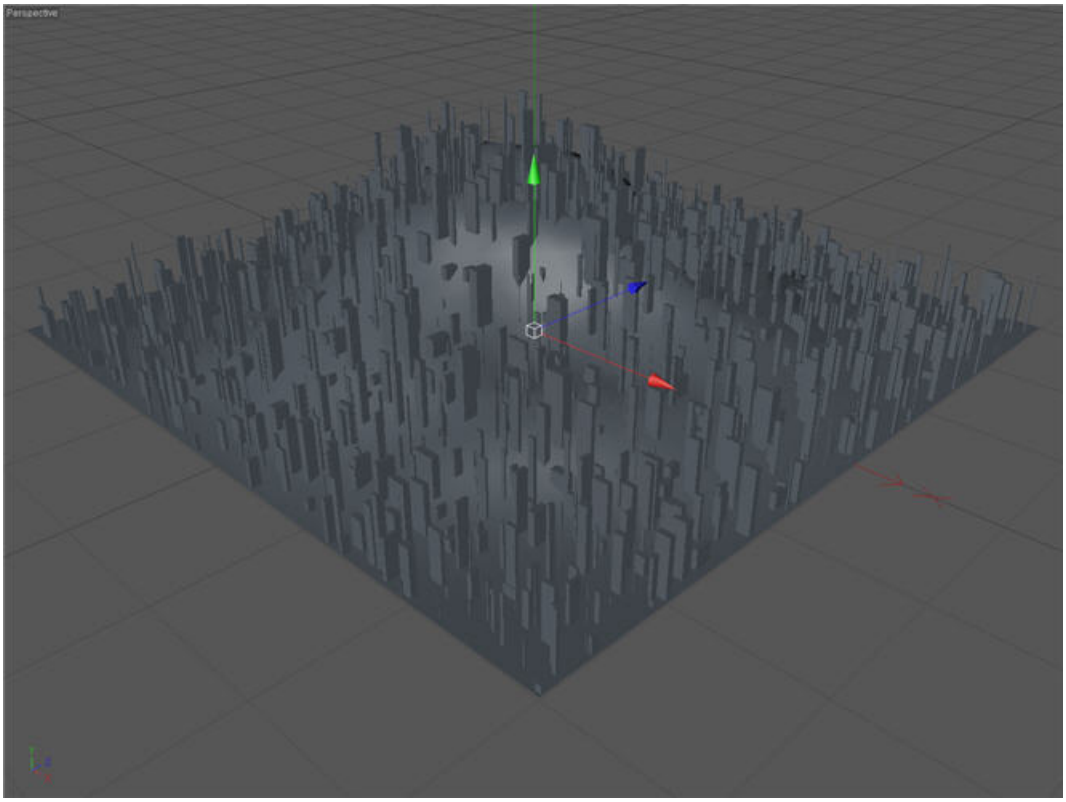
Max. Nurnies Per Polygon

The maximum number of nurnies that will populate any polygon. For each polygon, a random number of nurnies from 0 to this maximum is created.

Align Globally / Alignment

On more unidirectional surfaces such as a Landscape object, you may want the nurnies to point in the up direction despite the change in surface normals. Enabling this setting allows you to achieve just that. The **Alignment** vector is an HPB rotation vector that lets you change the global pointing direction of the nurnies. The first image below shows the nonaligned nurnie results (following the polygon normals). The second image shows the result of enabling **Align Globally**.


Perspective


Perspective

Surface Offset

Two values set the minimum and maximum distance nurnies will be moved away from the polygon surface, given in real units of distance. The offset range can be positive or negative. Note that the greebles follow the path of the direction they face. If **Align Globally** is enabled then they will move in the same direction. If disabled, they will move along their polygon's normal direction.

Height

Two values set the minimum and maximum height to which nurnies will be scaled, given as a percentage.

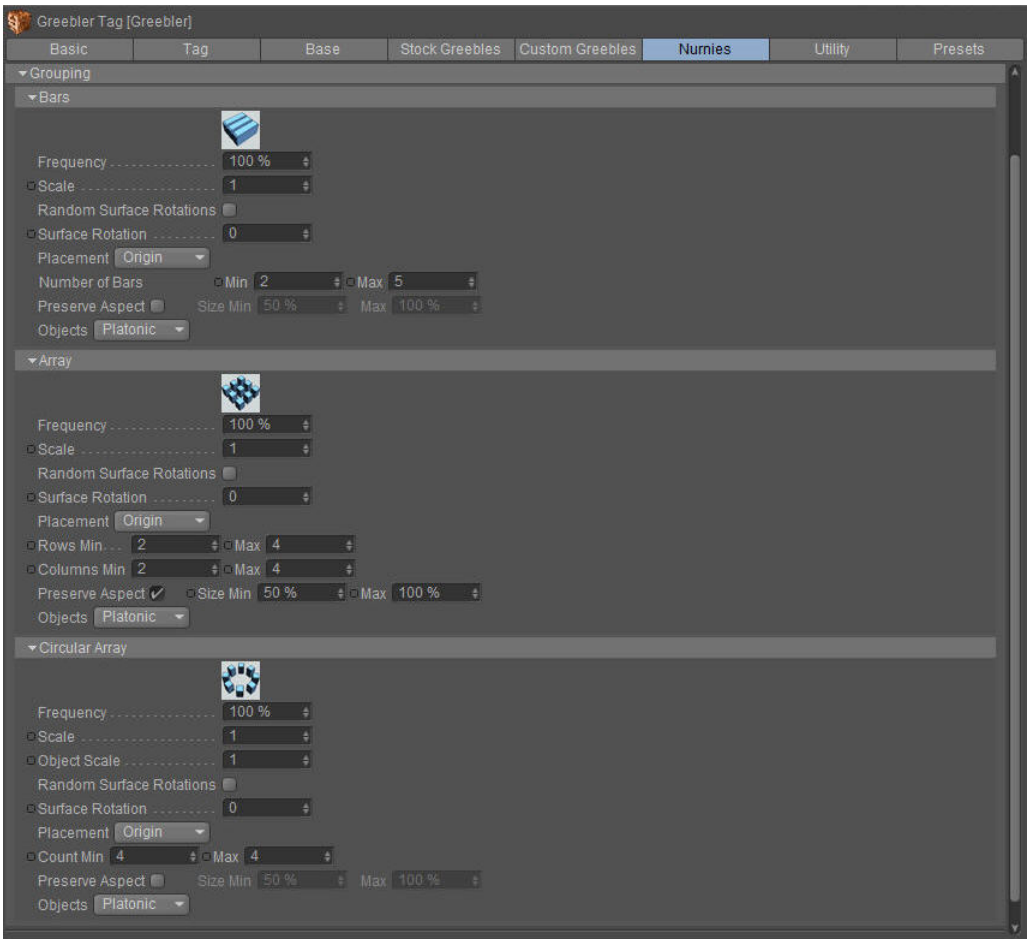
Length

These two values let you specify a range for which the nurnie will occupy polygon space along one direction. For instance, 100-100% will cause the nurnie to be about as long as the polygon, limited with respect to its vicinity to the polygon edges.

Width

Similar to **Length**, these two values specify a range for occupying space in the other, perpendicular direction.

Grouping



Shapes can be grouped into any of three types: Bars (linear array), Array (MxN array), or Circular Array. Any of the Shapes available from the linked Library can be grouped.

Bitmap Buttons

The descriptive images for each grouping type are also toggle buttons which, when clicked, change whether or not the type is used.

Colored when enabled. Gray-scale when disabled.

Frequency

This allows you to control how many of the various nurnie and grouping types populate the object surface. At 100%, the particular nurnie has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a nurnie for population. 0% is equivalent to disabling the nurnie. Basically, you can control whether or not there are more or less of a particular nurnie. If a nurnie is disabled then its Frequency value takes no part in the random decision process.

Scale

Sets the scaling of the array, scaling the element objects respectively.

Random Surface Rotations

All nurnies of this type will be rotated randomly on the surface plane. Note that this overrides **Surface Rotation**.

Surface Rotation

All nurnies of this type will be rotated on the surface plane by the angle given.

Placement

Same as for individual nurnies. This lets you dictate the orientation of the object on the surface that is different from its default. The options are:

- Origin - the object is placed on the surface at its origin and not reoriented in any way.
- Bottom - the bottom of the object, in the Y direction, is determined and used to place the object on the surface.
- Top - rotated 180 degrees (along its X axis) so that its top is now the bottom and placed on the surface.
- Left - rotated 90 degrees along its Z axis.
- Right - rotated -90 degrees along its Z axis.
- Front - rotated -90 degrees along its X axis.
- Back - rotated 90 degrees along its X axis.

Preserve Aspect

When enabled, the array remains square (Bars and Array) or circular (Circular Array). When disabled, it's shape can be rectangular (Bars and Array) or elliptical (Circular Array) as determined randomly by **Size**.

Size

If **Preserve Aspect** is disabled, you can alter the aspect (change the width to length ratio) of the grouping between the minimum and maximum percentages given. **Size** aspects are determined randomly between **Min** and **Max**.

Shape

A pull-down list which lists all of the available Nurnies, minus the grouping types, that can be used as the grouping element object.

Bars

Number of Bars

The minimum and maximum number of objects in the linear array (Bars).

Array

Rows / Columns

The minimum and maximum number of row and column objects in the Array.

Circular Array

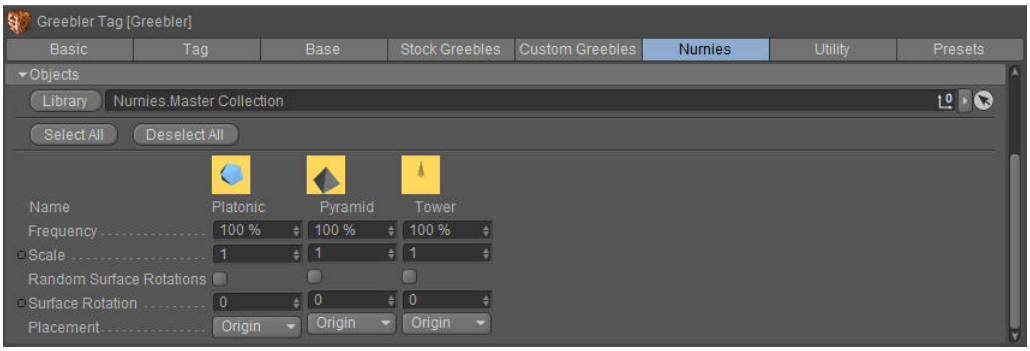
Shape Scale

A relative scale value applied to each object in the Circular Array that allows you to vary the size of the objects with respect to the Circular Array size.

Count

The minimum and maximum number of objects on the circumference of the Circular Array.

Objects



You can use up to 1000 nurnies to extend your greebling possibilities. The objects used as Nurnies must exist in the document and the container Null object added to the **Library Linkbox** to be utilized with the Greebler object or tag.

Library

Opens the Greebler Library Management window so that you can add Nurnie objects from your Library into the document for use with Greebler objects and tags. See the Custom Objects section for detailed information and a tutorial on how to create and use

Custom Objects as Nurnies with Greebler.

Library Linkbox

Nurnies must exist in the document and be childed to a Null object so as to keep them grouped. When you drop the Null object into the Library Linkbox, all of the objects are dynamically added to the Objects list with toggleable images and Name for reference.

Select All

Convenience button which enables all Nurnie and Grouping types.

Deselect All

Convenience button which disables all Nurnie and Grouping types.

Bitmap Buttons

The descriptive images for each nurnie are also toggle buttons which, when clicked, change whether or not the type is used. If you use objects that are not part of the Greebler Library, the image will be a generic one as shown below.

Colored when enabled. Gray-scale when disabled.

Name

The name of the object representing the Nurnie. This name is also given to the C4D document file for the Nurnie stored on disk if added to the Greebler Library.

Frequency

This allows you to control how many of the available nurnie and grouping types populate the object surface. At 100%, the particular nurnie type has an equal chance as any other at 100%. At 50%, it has half the chance to be chosen as a nurnie type for population. 0% is equivalent to disabling the nurnie type. Basically, you can control whether or not there are more or less of a particular nurnie type. If a nurnie type is disabled then its Frequency value takes no part in the random decision process.

Scale

Scales the object with respect to the scale calculated in order to fit within the polygon. Use this to make the object larger or smaller when the calculated size is undesirable.

Random Surface Rotations

All greebles of this type will be rotated randomly on the surface plane. Note that this

overrides **Surface Rotation**.

Surface Rotation

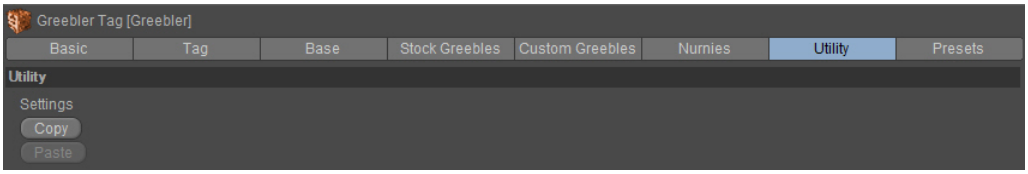
All greebles of this type will be rotated on the surface plane by the angle given.

Placement

This lets you dictate the orientation of the object on the surface that is different from its default. The options are:

- Origin - the object is placed on the surface at its origin and not reoriented in any way.
- Bottom - the bottom of the object, in the Y direction, is determined and used to place the object on the surface.
- Top - rotated 180 degrees (along its X axis) so that its top is now the bottom and placed on the surface.
- Left - rotated 90 degrees along its Z axis.
- Right - rotated -90 degrees along its Z axis.
- Front - rotated -90 degrees along its X axis.
- Back - rotated 90 degrees along its X axis.

Greebler Tag : Utility tab

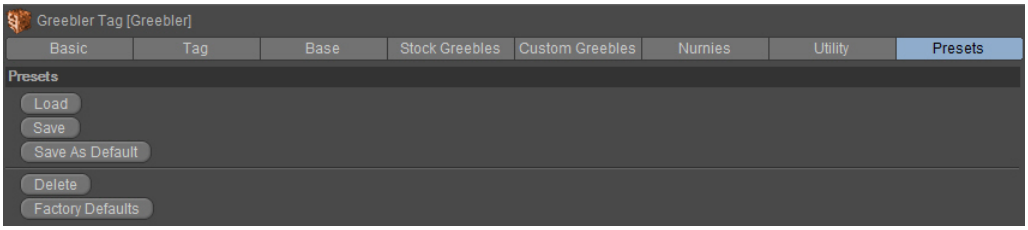


This tab contains some utility functions to simplify your greebling experience.

Settings

On both Greebler objects and tags are **Copy** and **Paste** functions to ease the replication of settings between Greebler objects and tags. Click **Copy** on the object or tag whose settings you want transferred. On other objects and tags, the **Paste** option will then be available so that you can opt to receive the copied settings. The same copied settings will be available for pasting until another copy is performed.

Greebler Tag : Presets tab



Presets are unique settings stored for later application to the Greebler object or tag being considered. Presets are stored in the Greebler application data folder as files with a 'gpr' extension. Note that the filename "default.gpr" is reserved for the default settings applied to newly created Greebler objects and tags. If you **Save** using that filename, it will be the same as **Save As Default**. Settings on dynamically added elements such as Custom Greeble and Nurnie library objects are not stored. All static settings from Object, Base, Stock Greebles, Custom Greebles, and Nurnies are stored.

Load

Load a unique Preset whose settings will be applied to this Greebler tag.

Save

Save a unique Preset whose settings are based upon those of this Greebler tag.

Save As Default

Save the current settings of this Greebler tag so as to be used as the default settings for Greebler objects and tags when they are created.

Delete

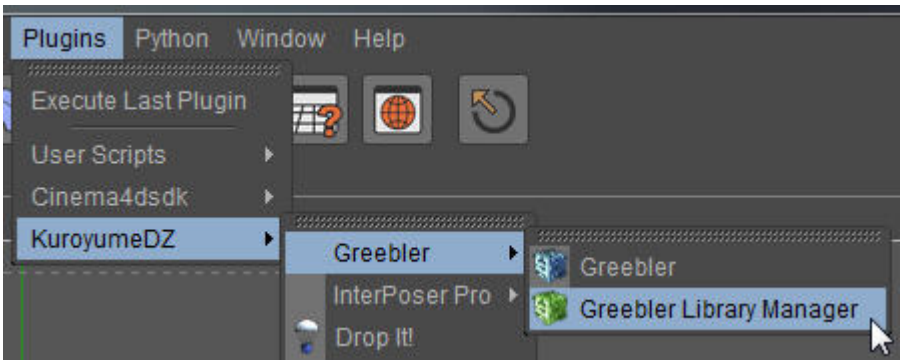
Delete a particular Preset file (with a 'gpr' extension) from disk. **This action is permanent!**

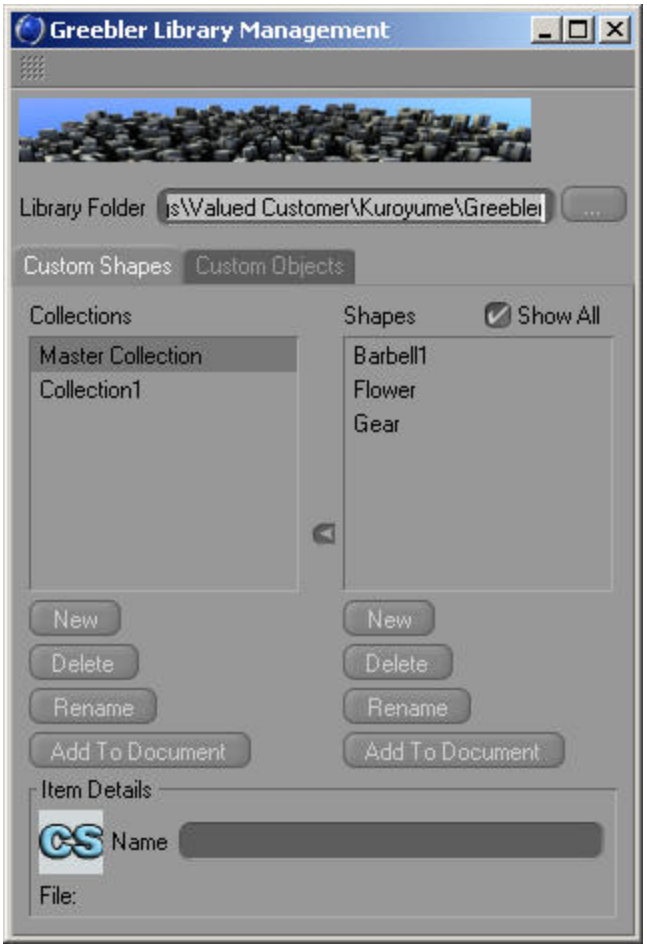
Factor Defaults

Set the settings of this Greebler tag to the rudimentary defaults.

Greebler Library Management

Besides the stock greeble extrusion shapes and in-document objects, one can include custom ones as well. Custom shapes and objects must exist in the document for the Greebler Object and Tags to reference. If you use particular shapes and objects often then the Greebler Library Manager provides a one-stop place for saving, organizing, and using them. The Greebler Library Management window can be found in and launched from the KuroyumeDZ>>Greebler plugins menu. You can also launch it using the Library button to the left of the Custom Greebles and Nurnies library reference. It is dockable and can be included in a layout for restoration between Cinema 4D sessions.





At the top is the Greebler banner button which, when clicked, opens the Greebler HTML Help window if it is not already opened.

Library Folder

Below that is a text field which shows the storage location for Greebler preferences, custom shapes, and custom objects. This is available mainly for reference but can also be used to temporarily or permanently change the location of the library. You may want to change the location temporarily if, say, a client sends you a set of custom shapes and objects that you do not want to be combined with your own library.

Custom Shapes, Custom Objects tabs

While Custom Shapes and Custom Objects are discussed in more detail on separate pages, some facets are the same between them. Double-clicking a list item will open a dialog for renaming. Names must be unique. Lists are always sorted alphanumerically. The information below pertains to both as well.

Collections

Custom Shapes and Custom Objects items can be grouped into Collections. You can group items for easier categorization or as a quicker way to insert them into a scene for use. In the library folder on disk, collections are represented simply as folders with empty files named to match the items included within the collection. Collection and item names must therefore be unique. This is enforced to avoid duplicate names. The Master Collection for each contains all Shape or Object items and always exists (it cannot be renamed or deleted).

While you can only drop a new shape or object into the Shapes or Objects list from the Object Manager, it can be automatically added to a collection by having that collection selected during the drop. The same behavior is implemented for the item New button.

Show All

For now, to keep the library interface simple, the pool of items and the list of items are displayed in the same items list. When you select a collection besides the Master Collection, normally only the items in that collection would be displayed. Since this type of list interface does not support drag-and-drop of list items, one cannot simply drag an item over a collection to add it to it. So, how do you add other items to a collection? Show All is a workaround which displays all items despite the selected collection. You can then select the items to add to the currently selected collection and hit the arrow button between the collection and items lists. Hopefully, as the plugin gains usership, augmentation of the interface will be justified.

New

For collections, this creates a new uniquely-named collection into which you can add items.

For items, this expects that one or more polygon objects are selected in the active scene as candidates to be added to the particular library. The objects can also be drag-and-dropped from the Object Managers onto the items list to create a new library item. Limitations and expectations for shapes and objects are discussed in more detail on the individual pages. Each item is stored on disk individually as a Cinema 4D document file (.c4d).

Delete

For collections, this removes the collection from the list and deletes the folder on disk. None of the actual items it references are deleted.

For items, this removes the item from the list and deletes the Cinema 4D document file

on disk. Also, it is removed from any collections referencing it.

This has no effect on collections and items previously added to documents.

Rename

For both collections and items, this is simply another way to change the name of the selected collection or item.

Add To Document

The Greebler Object and Tag can only reference custom shapes and objects that exist in the scene. The library acts solely as a repository of items from which you can select to use in the scene. This button adds either the selected collection or the selected items to the currently active scene.

Item Details

This displays information about the currently selected Shape or Object item. The image is the icon used by the Greebler Object and Tag and may help you remember what the shape or object looks like. If an image doesn't exist then a default icon is used. Name displays the name of the item. File shows the full path to the Cinema 4D document containing the item.

Greebler Library Management : Custom Shapes

Although there are a number of shape choices already provided as Stock Greebles, it is expected that users would want the option to use other shapes. Custom Greebles support and Custom Shape libraries have been provided for this.

In Greebler, a greeble starts as a set of flat 2D shapes which are then extruded and possibly beveled to populate the surface with various protrusions. This set of shapes created is used for optimal representations under different usages. The reason for this approach is because the built-in Cinema 4D Extrude and Bevel structure modifications are not usable during multi-processor parallel work (that is, these functions cannot be called simultaneously and had to be recreated from scratch). A generalized algorithm like the one used in Cinema 4D could not be acquired so some of the work is preprocessed into the construction of the shapes from the original provided by the user and then finished during the greebling. With this in mind, a custom shape must be added to the library before it can then be added to the scene for greebling. The input shape object must have these characteristics:

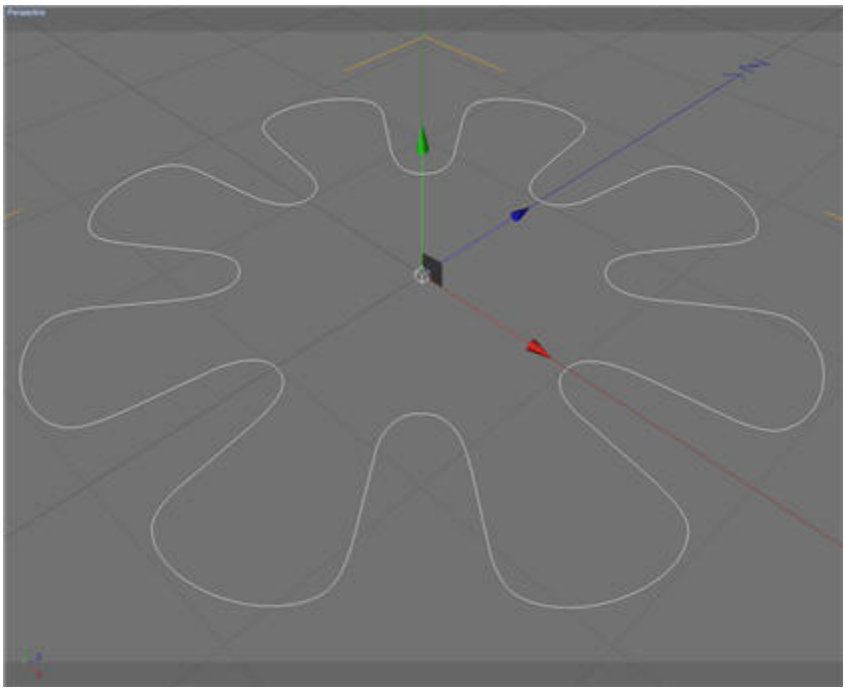
- Polygon object
- Polygon normals facing up (in the +Y direction)
- Planar with respect to the X-Z plane (floor)

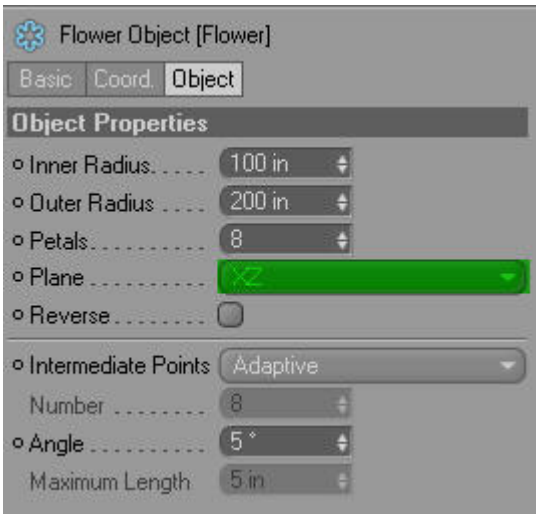
You are at liberty to use whatever process that achieves the input shape you desire. For shapes utilizing splines, put the spline under an Extrude NURBS offset along the Y axis, make editable ('C' key), and retain only Cap 2 (or whichever has its normal facing up).

Tutorial

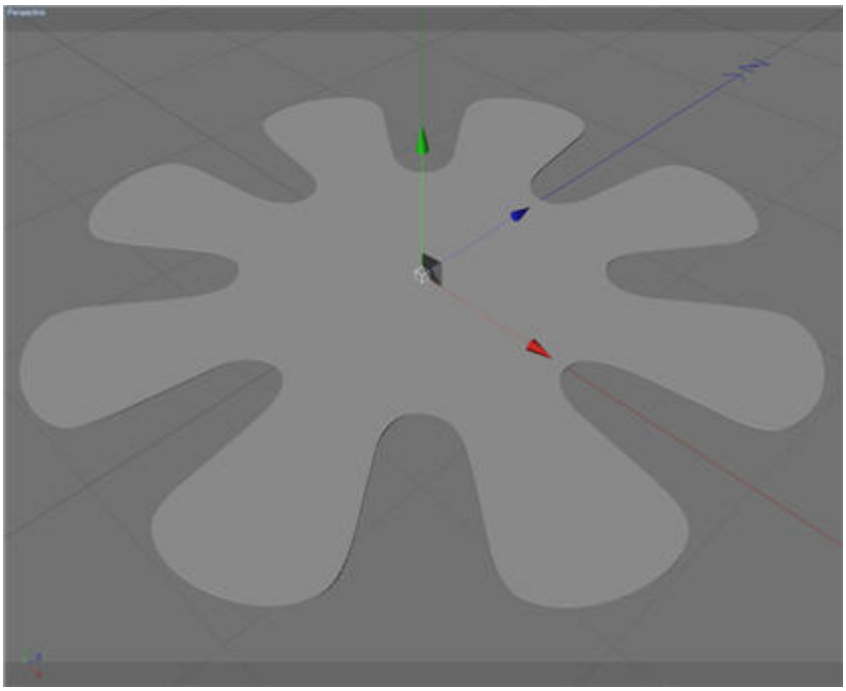
This is a quick tutorial that shows how to take a spline object and turn it into a Greebler shape for reuse from the library and use it in a scene.

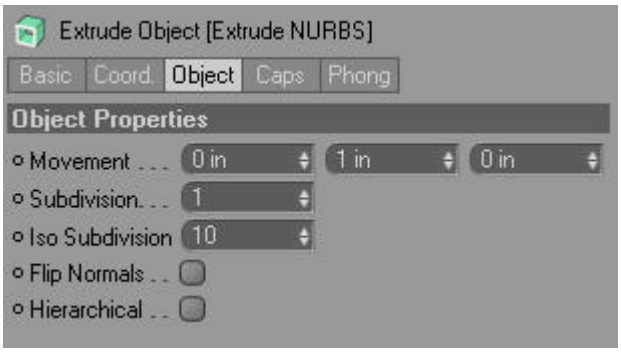
Start by adding a Flower spline primitive to a new scene. In its Object properties, set Plane to XZ.



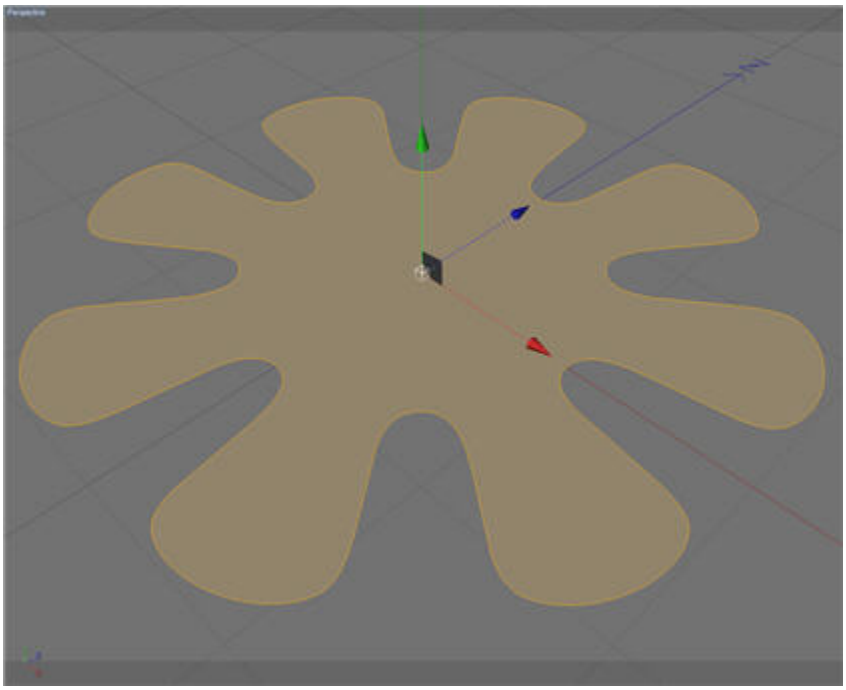


Add an Extrude NURBS. In its Object properties, set Movement to 0-1-0. Child the Flower spline to this object.

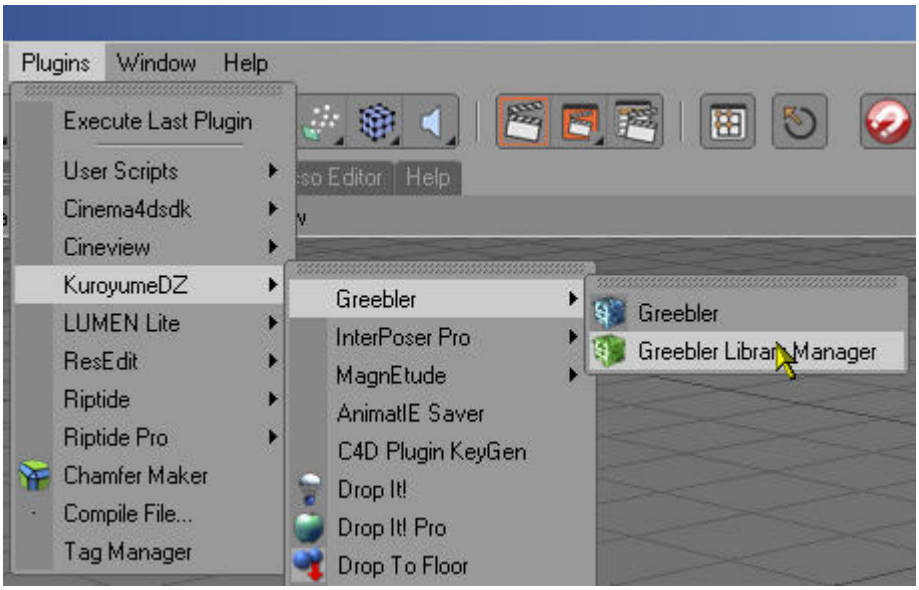


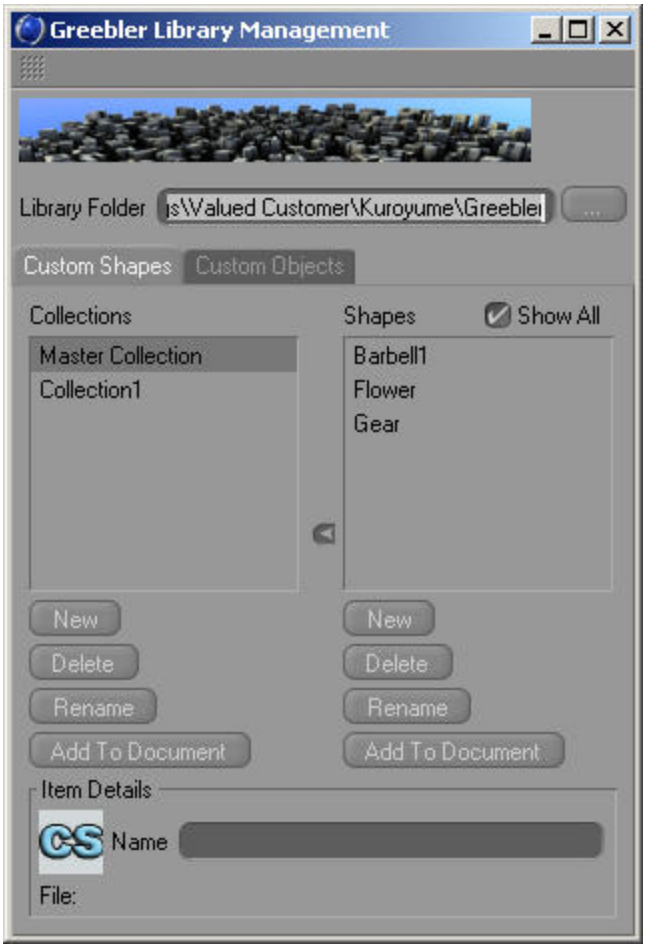


Select the Extrude NURBS and Make Editable (C key or right click for menu). Move the Cap 2 object to the root. Rename Cap 2 to Flower. You can now delete the remaining objects.

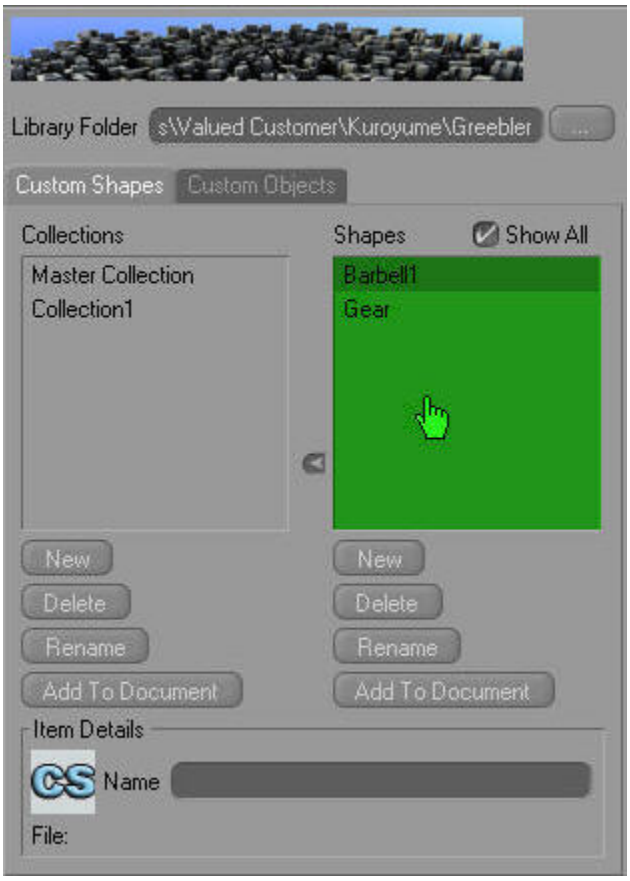


From the main menus, launch the Greebler Library Manager from Plugins>>KuoryumeDZ>>Greebler. Go to the Custom Shapes tab.

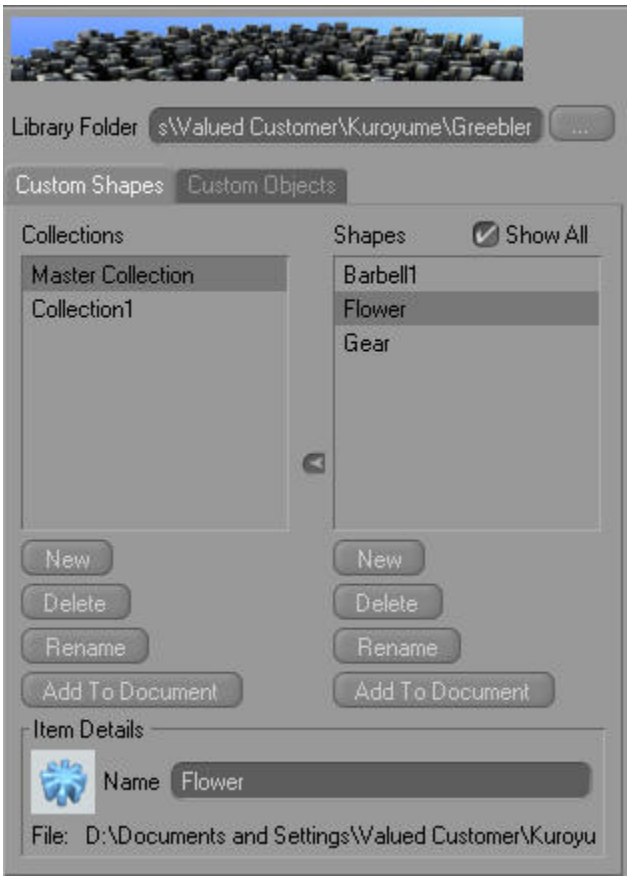




In the Object Manager, click on Flower, drag it over the Shapes list box in the Greebler Library Management window, and let go. Note the hand cursor signifies that you can drop the object. Give the process a few seconds as the shape set is being created and an icon rendered, all saved to disk.

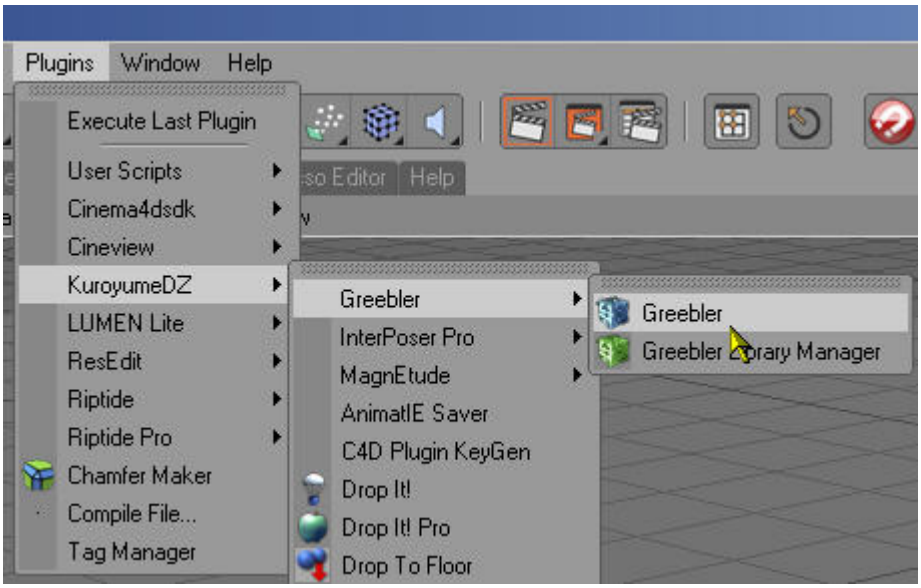


You should now have a Flower shape added to your Greebler library, ready for use. In the Object Manager, delete the Flower object.

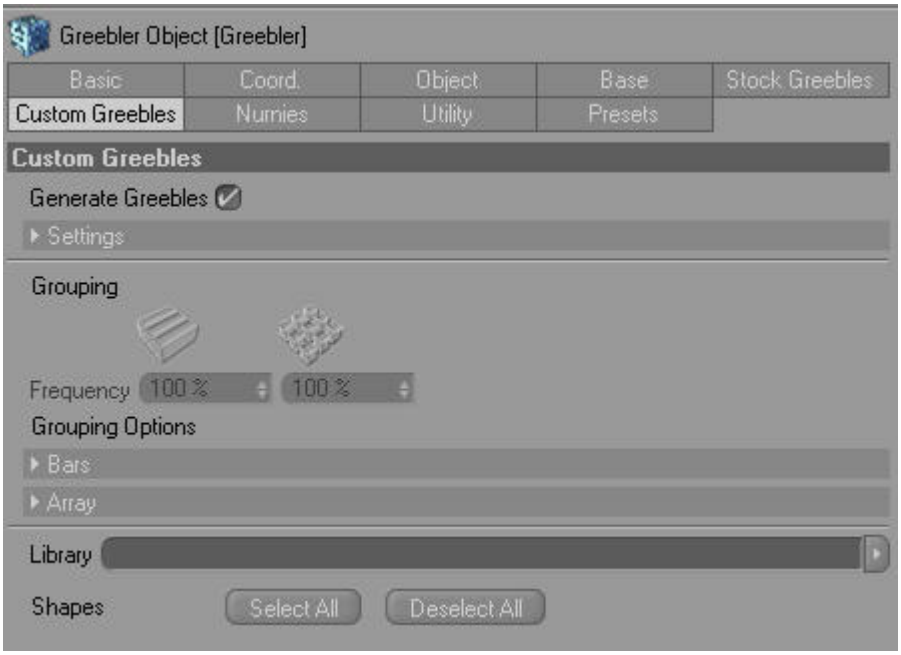


With the Greebler Library Management window still open, select the Flower shape and click Add To Document. Note that when a collection is added to the scene, the name will reflect this, e.g.: Shapes_Library_Collection1. You can add as many collections as you like or add to the miscellaneous library from the Shapes item list.

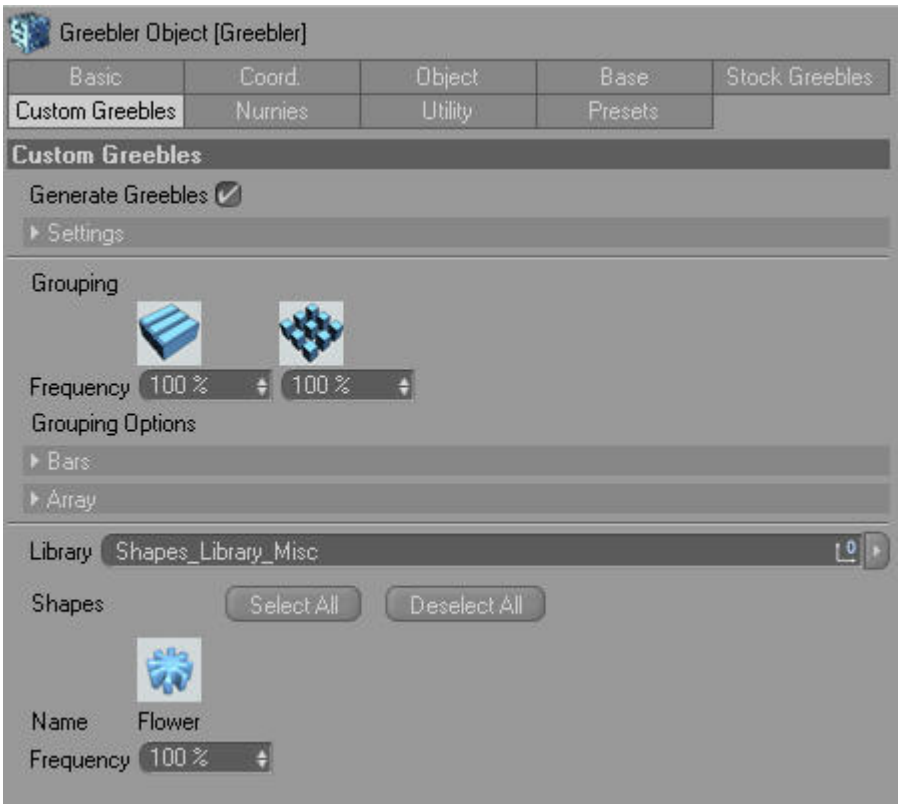
From the main menus, add a Greebler Object by selecting Plugins>>KuroyumeDZ>>Greebler>>Greebler.

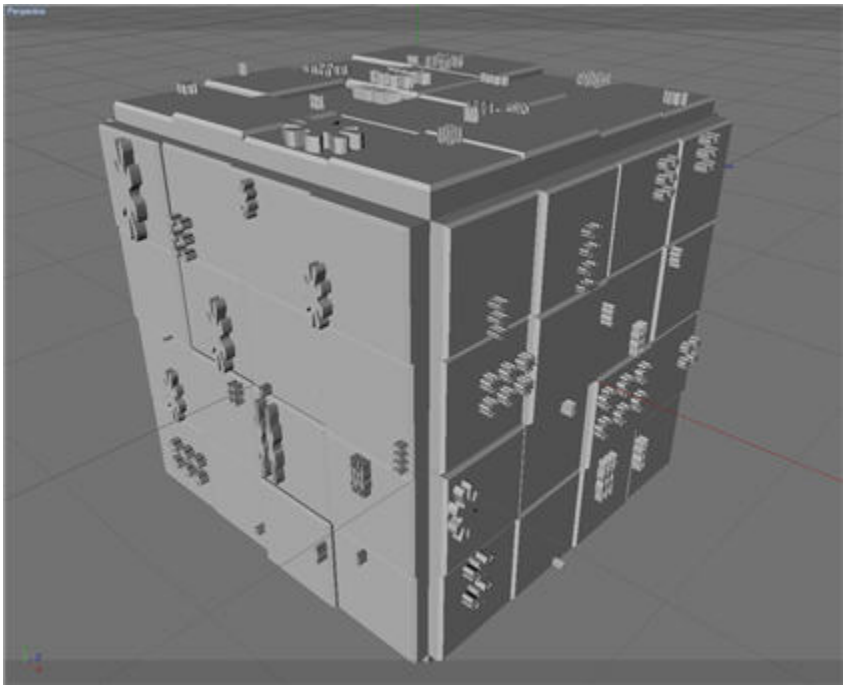


Add a Cube primitive and set Segments X, Segments Y, Segments Z each to 4. Child to the Greebler object. Select the Greebler object. Select the Stock Greebles tab in the Attributes Manager and disable Generate Greebles. Select the Custom Greebles tab and enable Generate Greebles.



Drag-and-drop the Shapes_Library_Misc Null object into the Library linkbox under the Custom Greebles tab. Note that two things occur. First, all of the shapes under the Null object are displayed under the Shapes area of the Greebler Object or Tag. Second, Grouping options are enabled and set to the first shape.





This process is a bit convoluted but it only has to be done once for each shape you want to create and add to the library. They are stored permanently on disk for later use.

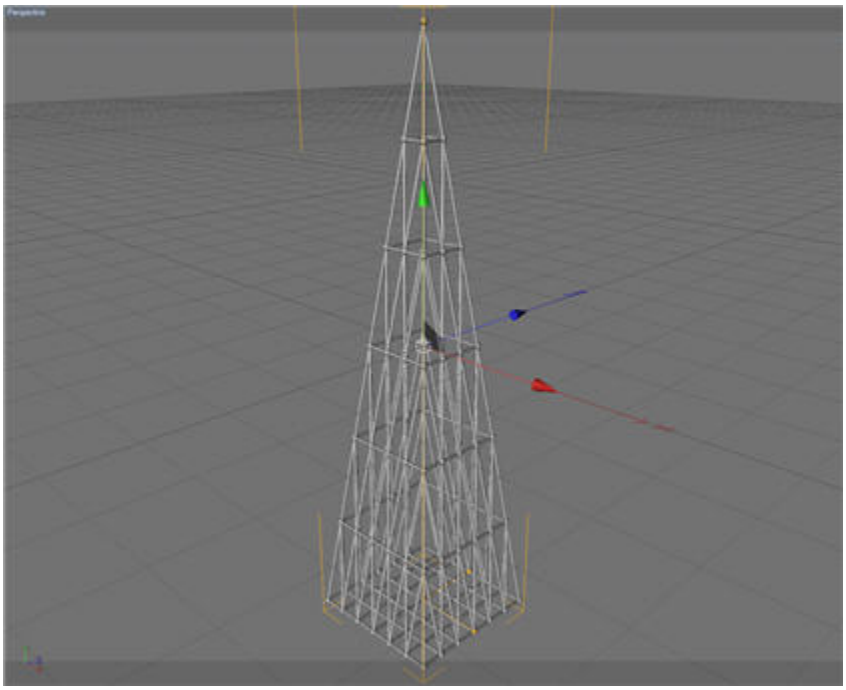
Greebler Library Management : Custom Objects

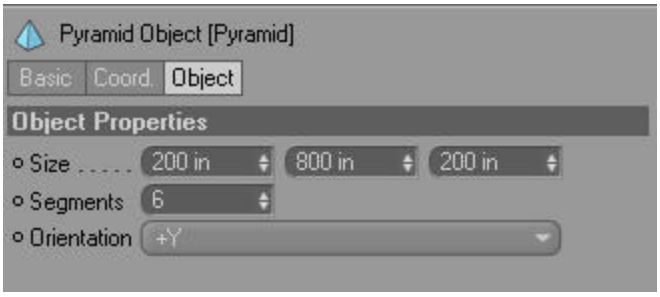
Custom Objects represent Nurnies objects stored in the Greebler library. It isn't necessary to store your custom objects in the Greebler library but this feature is provided so that you can collect and organize those that you use often for reuse in other projects. The only restriction on the object being used as a Custom Object is that it result in a Polygon object. This restriction does not apply when using "Represent as Instances" for Nurnies.

Tutorial

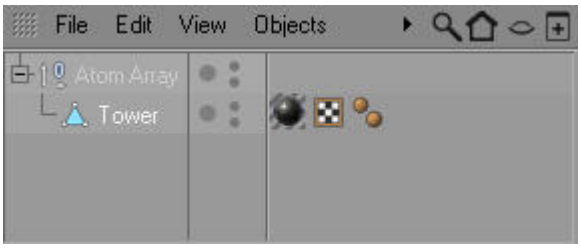
This is a quick tutorial that shows how to prepare and add a custom object to the Greebler library and use it in a scene.

Add an Atom Array object from the Objects>>Modeling menu and a Pyramid object from the Objects>>Primitive menu. Child the Pyramid to the Atom Array. Set the Pyramid to Size to 200, 800, 200 and Segments to 6. Add a material to the Atom Array object if you like.

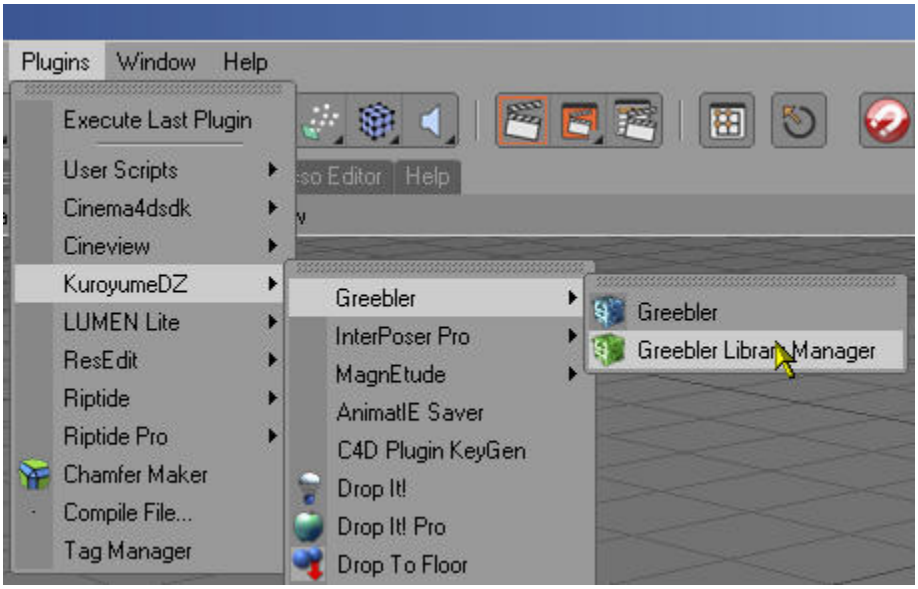




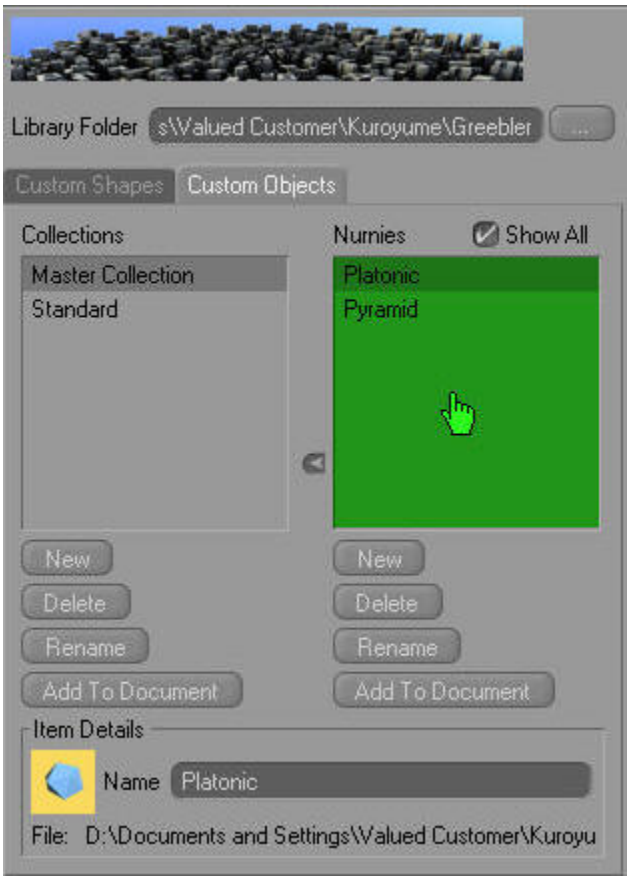
Make Editable (C key) and, if you added a material, move it to the Pyramid polygon object. Rename Pyramid to Tower.



From the main menus, launch the Greebler Library Manager from Plugins>>KuoryumeDZ>>Greebler. Go to the Custom Objects tab.



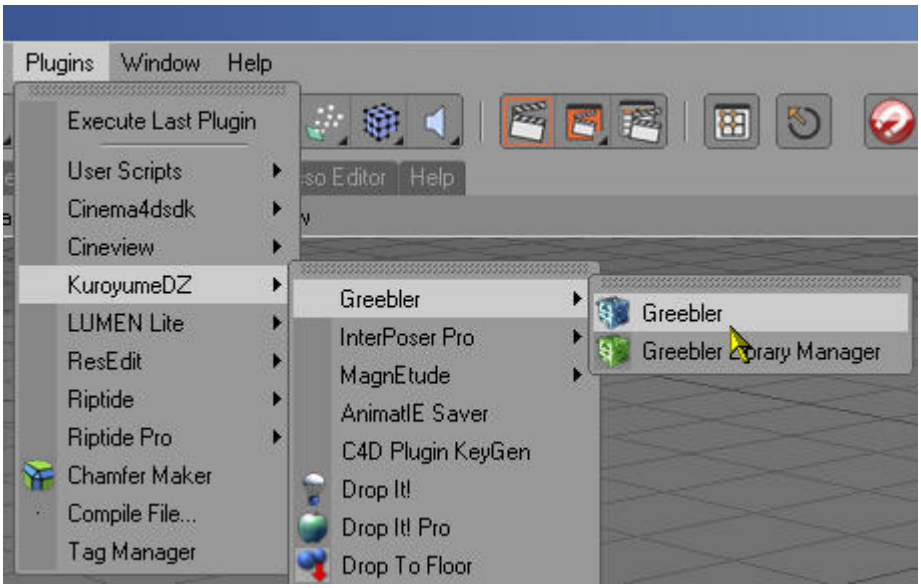
In the Object Manager, click on Tower, drag it over the Nurnies list box in the Greebler Library Management window, and let go. Note the hand cursor signifies that you can drop the object. Give the process a few seconds as an icon is rendered. The icon image and object are saved to disk.



You should now have a Tower object added to your Greebler library, ready for use. Close the current scene document to start a new one.

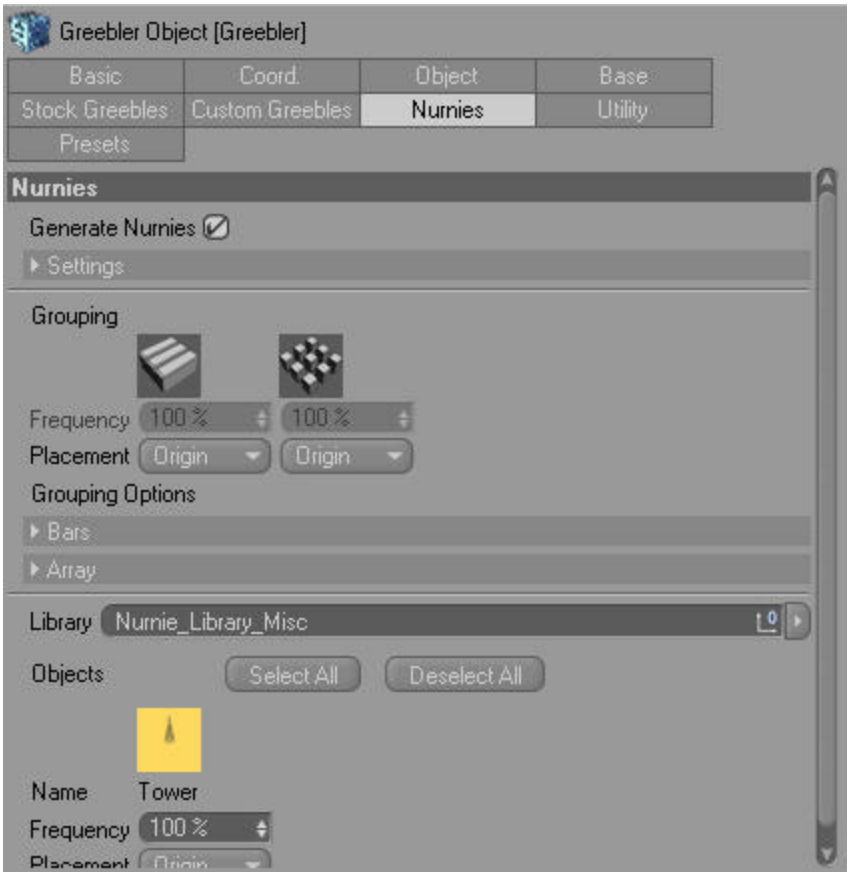
With the Greebler Library Management window still open, select the Tower item and click Add To Document. Note that when a collection is added to the scene, the name will reflect this, e.g.: Nurnie_Library_Collection1. You can add as many collections as you like or add to the miscellaneous library from the Nurnies item list.

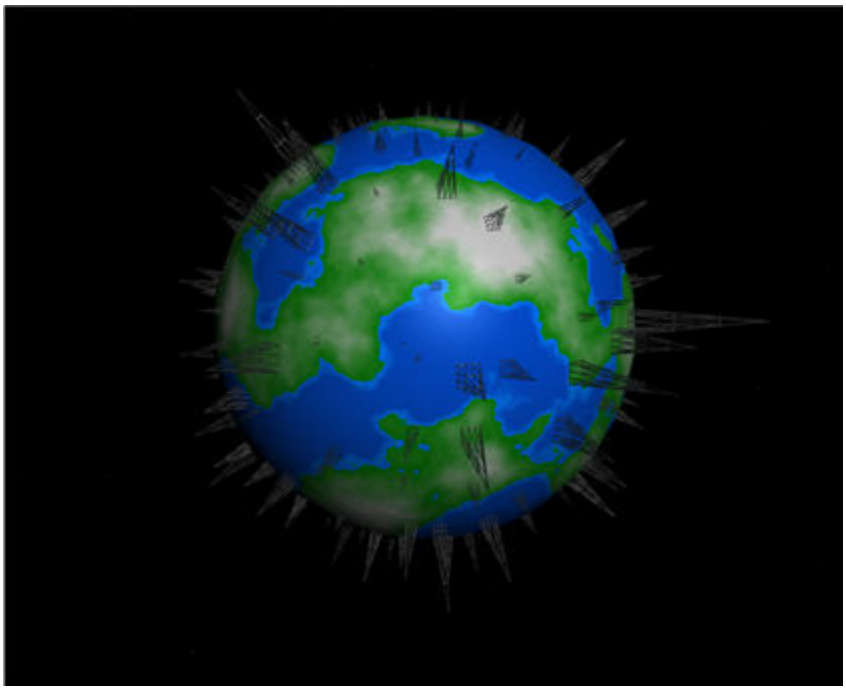
From the main menus, add a Greebler Object by selecting Plugins>>KuroyumeDZ>>Greebler>>Greebler.



Add a Sphere primitive. Child the Sphere to the Greebler object. Select the Greebler object. Select the Base tab and disable Generate Base. Select the Stock Greebles tab and disable Generate Greebles. Select the Custom Nurnies tab and enable Generate Nurnies. Disable both Grouping options.

Drag-and-drop the Nurnie_Library_Misc Null object into the Library linkbox under the Custom Nurnies tab.





That's it. Each object you add to the library is stored permanently on disk for later use

as a Cinema 4D document file.