Patterner

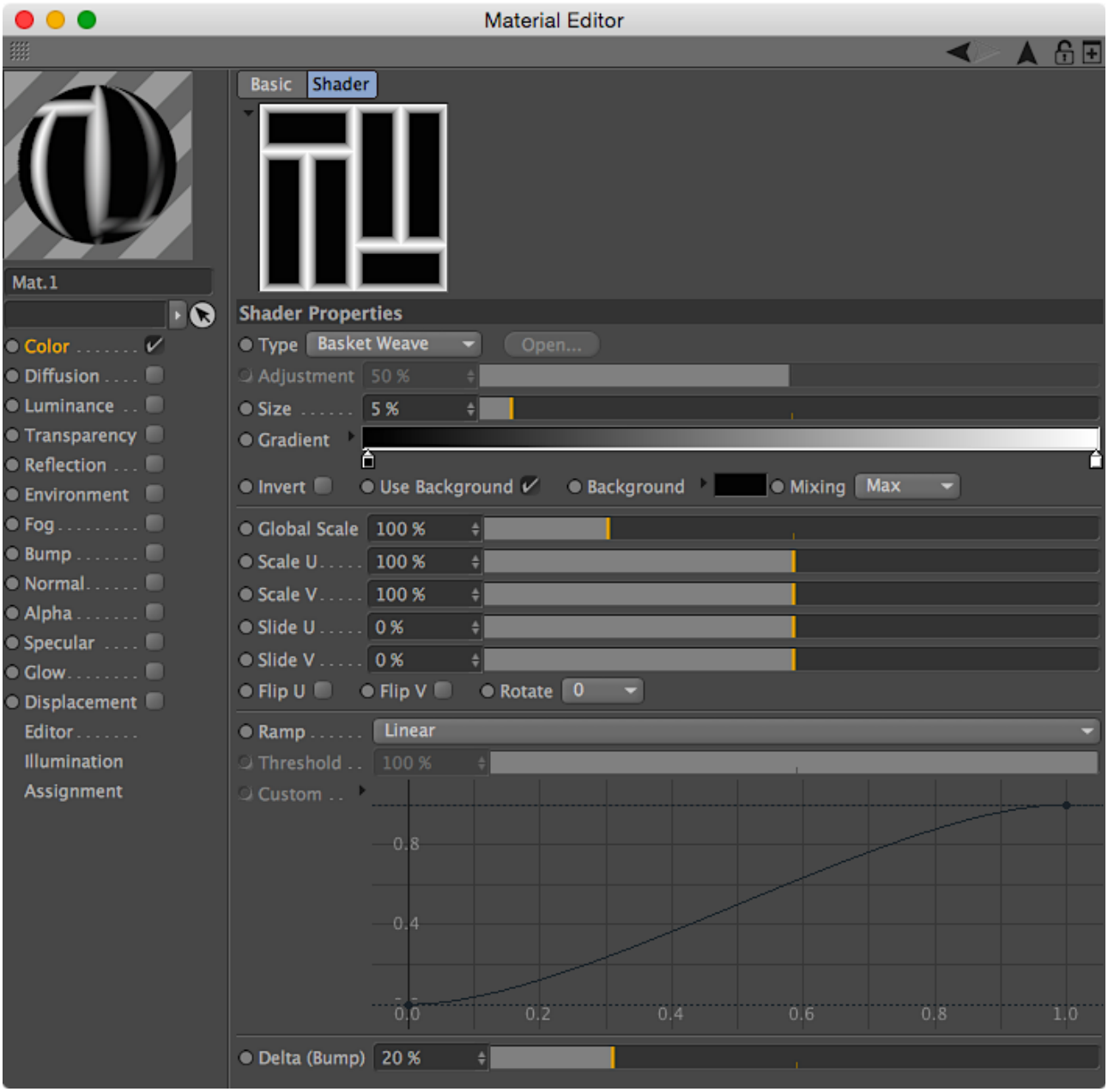
Patterner is a pattern generator shader. Since all patterns are generated programatically, their resolution is always the best possible, no matter how large is the render or the deformation of the surfaces that receive the pattern.

Besides including a list of pre-made patterns, it includes a pattern creator application that allows you to create custom vectorial patterns that can be re-used whenever needed.

This shader performs its calculations based on the UV coordinates of the surfaces. So, it is very important that the objects have good UV coordinates, in order to assure a proper rendering of the patterns.

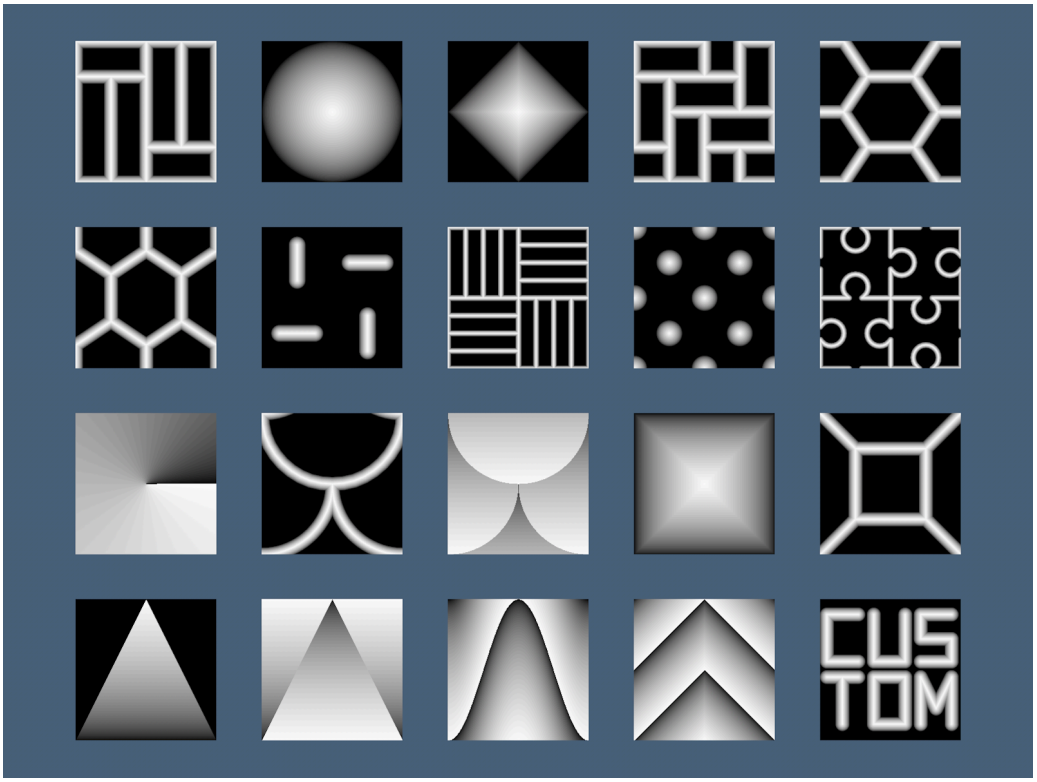
You can place this shader in any channel of any material and it can also be used where a bitmap would be used.

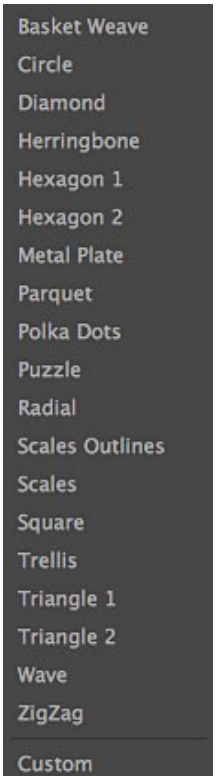
Once you add a **Patterner** shader to a channel and you click the **Patterner** slot, you are presented with this interface:



The first option allows you to set the **Type** of the pattern.

There are 20 patterns in total but the last one (**Custom**) is very special. More about that special type of pattern later on.





Some patterns have no additional special parameters, besides the usual geometrical adjustments. However, some patterns activate special parameters. Those are:

Metal Plate

The **Size** parameter defines the thickness of the lines.

The **Adjustment** parameter defines how long the lines are.

Parquet

The **Size** parameter defines the thickness of the lines.

The **Adjustment** parameter defines how many subdivisions are inside each board (0 to 50).

Radial

The **Size** parameter defines the size of the arc (100%=360°).

The **Adjustment** parameter defines the angle at which the arc starts (100%=360°).

Trellis

The **Size** parameter defines the thickness of the lines.

The **Adjustment** parameter defines the size of the inner square.

So, the **Size** and **Adjustment** parameters serve different purposes, depending on which **Type** of pattern is selected.

Below the **Size** and **Adjustment** parameters, there is a **Gradient**. This gradient defines the colors that will be used in gradients and in lines. The leftmost color of the gradient, if not stated otherwise, will be use as the background color (se below).

> **HINT:** If the size parameter does not produce lines thin enough for your needs, simply adjust the gradient to create a shorter ramp between the background color (left) and the line color (right).

Below the **Gradient**, there are four parameters:

Invert

When the gradient in internally interpreted, it is interpreted from right to left, instead of being interpreted from left to right.

Use Background

If this option is ON, the **Gradient** is only used for the line/space color and the background color is set by the **Background** parameter (see below). If this option if OFF, the leftmost color of the **Gradient** is used as the background.

Background

This sets the color used as background for some patterns when the **Use Background** option is turned ON.

Mixing

This sets the way the values of the intensity of the lines mix together, but only for linear-type patterns.

Usually, the **Max** option is the best (this is the default option). But you can try using the **Screen**, **Add** or **Cut** options. Some of them can create interesting effects with some patterns.

After this we have the geometrical adjustment parameters.

Global Scale

The **Global Scale** parameters sets how big or how small the pattern will be. It varies between 0.1% and 500%.

Scale U

The **Scale U** parameter sets how big or small the pattern is in the U direction (horizontal). This allows for the horizontal distortion of the pattern. It varies between 0.1% and 200%.

Scale V

The **Scale V** parameter sets how big or small the pattern is in the V direction (vertical). This allows for the vertical distortion of the pattern. It varies between 0.1% and 200%.

HINT: Using a combination of **Global Scale**, **Scale U** and **Scale V**, it is possible to vary the global scaling between 0.01% and 1000%.

Slide U

Adjusting this parameter it is possible to move (slide) the pattern horizontally. It varies between -100% and 100%. Negative values move the pattern to the left and positive values move the pattern to the right. If the combination of **Global Scale** and **Scale U** is not a value of 100/*n* (where *n* is any whole number between 1 and 100), some visible clipping can occur in the pattern.

Slide V

Adjusting this parameter it is possible to move (slide) the pattern vertically. It varies between -100% and 100%. Negative values move the pattern up and positive values move the pattern down. If the combination of **Global Scale** and **Scale V** is not a value of 100/*n* (where *n* is any whole number between 1 and 100), some visible clipping can occur in the pattern.

Flip U

When this option is ON, the resulting pattern will be mirrored horizontally.

Flip V

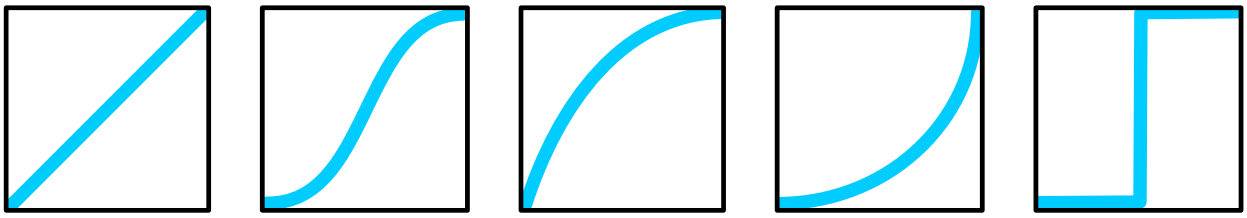
When this option is ON, the resulting pattern will be mirrored vertically.

Rotate

Patterns can be rotated in 90 degrees increments. They can rotate 90 degrees clockwise (90°), 90 degrees counter-clockwise (-90°) or 180°. Rotating 180° is not the same as flipping vertically but it may appear so for some types of patterns.

Then, we have the **Gradient** adjustments. They are placed after the geometrical adjustment parameters because they are used less often.

The type of **Ramp** defines how the colors from the **Gradient** are picked. There are five preset options and a custom option, where the user can adjust a spline to define a new ramp.



Linear Smooth Bulge Up Bulge Down Threshold

Actually, the **Threshold** option is not a preset curve. When this option is selected, the **Threshold** parameter slider becomes available. Any value of the **Gradient** above the value set in the **Threshold**, will result in the rightmost color of the **Gradient**. Otherwise, the leftmost color will be used. This only affects the output of the **Gradient**, not the **Background** color, if used.

Finally, we have the **Delta (Bump)** parameter. This is only useful if the **Patterner** shader is used in the **Bump** channel. The default value (20%) results in a bump effect that is similar to the effect seen in the editor preview. Higher values accentuate the effect and lower values soften the effect.

Let us talk a bit more about the **Custom** type of pattern. When that type of pattern is chosen, the **Open…** button becomes available. Clicking that button, opens a file open dialog to load a pattern file. Those files can be created and edited in the **Patterner Editor** application.

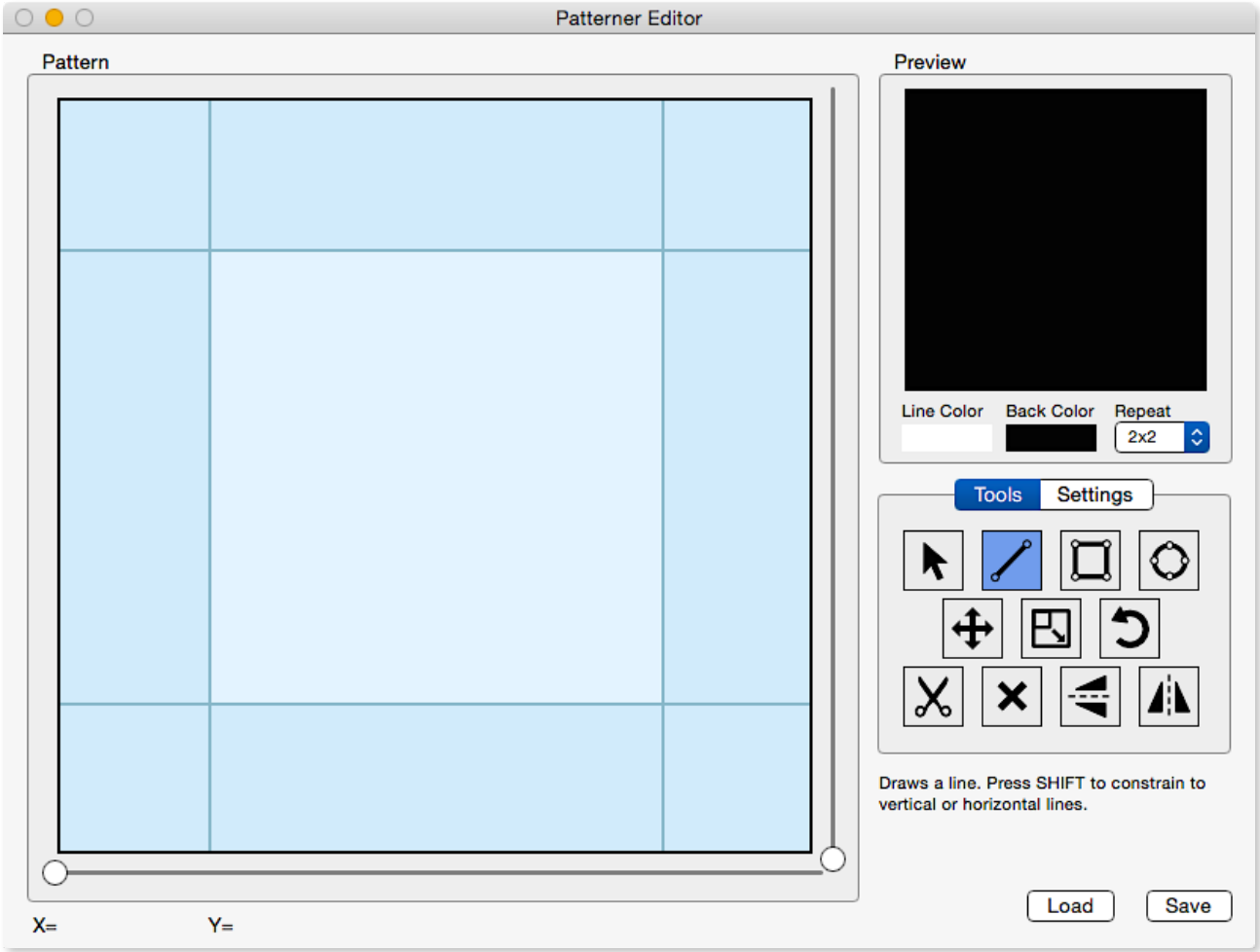
The next section talks about that application.

Patterner Editor

This application will allow the user to create or edit pattern files.

Pattern files are files that describe vectorial patterns. These patterns are rendered in high resolution, no matter what is the render size. The resulting vectors can have their thickness adjusted with the **Size** parameter of the **Patterner** shader.

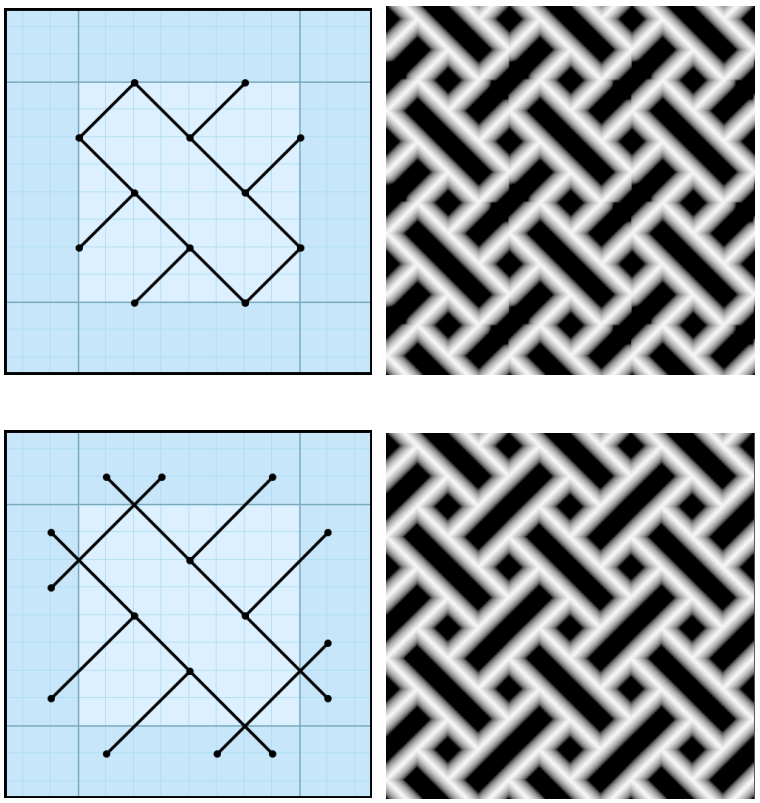
There is a MacOS and a Windows version of the application. In this manual, the screenshots are from the MacOS version but the Windows version is similar.



The main editing area is the left blue background square.

Everything that is drawn outside of the central lighter square will NOT appear in the final rendered pattern. However, for some tileable patterns, it is best that some of the vectors extend past the visible area so that it renders correctly.

For example:



The preview area (top left) shows a tiled repetition of the pattern (only the central visible area that will render in Cinema 4D).

The background and line colors of this preview area can be modified.

The number of repetition can be set but the **Repeat** parameters. They can be 2x2, 3x3 or 4x4.

Below the preview area, are the drawing and editing tools. Hoovering on them will display a ballon help indicating what each one does. After clicking on the tool a more detailed description about it is displayed below.

Here is what each tool does:

Selection

Dragging with the **Selection** tool will create a selection rectangle. All points inside that rectangle will become selected. Clicking or dragging in empty space will deselect all points. Dragging while pressing **Shift** will add to the selection, if there are already any points selected.

Line

The **Line** tool allows the creation of straight lines. Pressing the **Shift** key will constrain the line creation to vertical or horizontal lines.

Rectangle

The **Rectangle** tool allows the creation of rectangles and squares. Pressing the **Shift** key will constrain the creation of rectangles to squares. In this situation, some lines could be create with one or two vertexes outside the editor area. In those cases, the illegal lines are not created.

Ellipse

The **Ellipse** tool allows the creation of ellipses and circles. Pressing the **Shift** key will constrain the creation of ellipses to circles. In this situation (and when the ellipses/circles are drawn from the center), some lines could be create with one or two vertexes outside the editor area. In those cases, the illegal lines are not created.

Move

A marquee appears around the selected points. Drag to move the selected points around. Pressing the **Shift** key will constrain the movement to the vertical or horizontal. Pressing **Ctrl** will apply the snapping settings to the movement (see **Snapping Settings**, below).

Scale

A marquee appears around the selected points. Drag to scale the selected points. Pressing the **Shift** key will constrain the scale to a proportional scaling. Dragging from the middle of the editor to the left will scale down horizontally. Dragging from the middle of the editor to the right will scale up horizontally. Dragging up from the middle of the editor will scale down vertically. Dragging down from the middle of the editor will scale up vertically.

Rotate

A marquee appears around the selected points. Drag to rotate the selected points. Pressing the **Shift** key will constrain the rotation to a steps of 5 degrees. Pressing the **Ctrl** key will increase the amount of rotation (make it more aggressive). Dragging to the right will rotate clockwise. Dragging to the left will rotate counter-clockwise.

WINDOWS USERS WARNING

Due to limitations of the coding environment, when the **Shift** key is pressed, it becomes stuck. Just press **Alt** to un-stuck the **Shift** key. The same applies to the **Ctrl** key.

Mirror Horizontally/Vertically

Clicking any of those icons will mirror the selected points (and correspondent lines) accordingly.

Cut

Click on lines and a new point will be created at that location. Set the snapping options to help out this process (see **Snapping Settings**, below).

Delete

Click on lines to delete them. If the line shared one or two points with other lines, that point or those points are not deleted, just the line. If the line is isolated, the line and correspondent points are deleted.

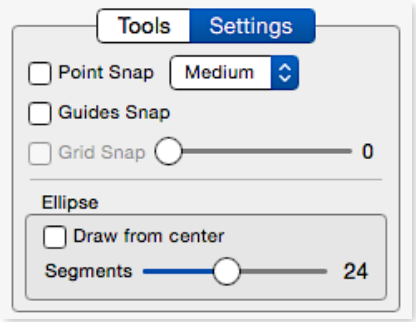
It is always possible to undo the last action by pressing **Command**+**Z** (**Ctrl**+**Z** in Windows).

Sorry, just one Undo.

Settings

Clicking in the Settings tab, the user has access to some special preferences.

Particularly useful are the Snapping Settings.



Snapping Settings

Point Snap

When this option is on, newly created points will snap to existing points. How close they need to be to snap, is set by the pop-up menu option. Tolerance can be set to **Low**, **Medium** or **High**.
A **Low** tolerance means that the points really need to be close together. A **High** tolerance means that the points can be further apart to be considered for snapping.

Guides Snap

If there are any guides in the editor area (see Guides, below), newly created points will snap to the horizontal and/or vertical guides. The tolerance is set by the **Point Snap** tolerance, even if the **Point Snap** is not turned on.

Grid Snap

It is only possible to turn on this option if the grid spacing is set to a value different from zero.

When the grid is other than zero, the grid is displayed in the editor. It can be used only as visual reference or, if the **Grid Snap** option is turned on, newly created points will snap to the horizontal and/or vertical guides. The tolerance is set by the **Point Snap** tolerance, even if the **Point Snap** is not turned on.

Guides

Dragging the horizontal slider below the editor area will create a vertical guide line.

Dragging the vertical slider on the right the editor area will create a horizontal guide line.

When any of these guide lines are visible and the **Guides Snap** option is on, newly created points will snap to the horizontal and/or vertical guides. The tolerance is set by the **Point Snap** tolerance, even if the **Point Snap** is not turned on.

Pressing **Ctrl** while dragging a guide will snap that guide to the grid, if any is set.

Pressing **Shift** while dragging a guide will snap that guide to the closest point in the editor.

Elipse settings

Draw from center

When this option is turned on, the ellipses are created from their center instead of being create inside a rectangular area defined by dragging inside the editor.

Segments

Set the number of segments used to create an ellipse. It can range from 3 (it creates a triangle) to 50 (an almost perfect ellipses/circle)

Finally, the **Load** and **Save** buttons.

Use the **Load** button to open a pattern file for editing.

Use the **Save** button to save a pattern file, to use in **Patterner**, in Cinema4D.

The default extension is **.ptn** but that is really not necessary. You can even save pattern files without extension.