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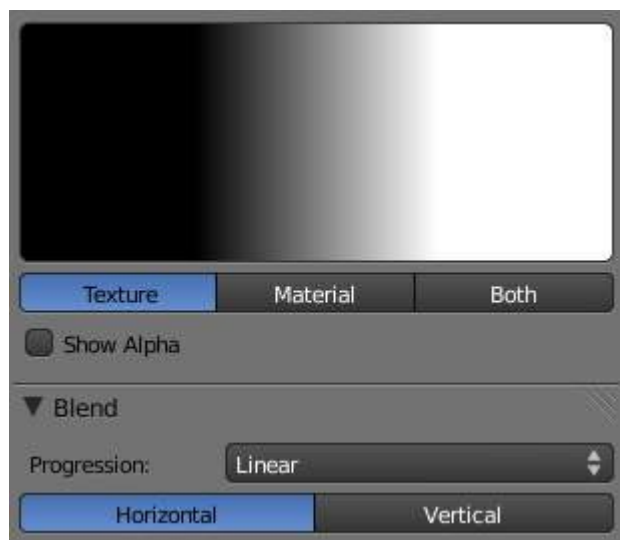
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Procedural Shaders

Ocean

TODO - see: <https://developer.blender.org/T46281>

Blend



Blend Texture Panels

Often used for

This is one of the most frequently used procedural textures. You can use blend textures to blend other textures together (with *Stencil*), or to create nice effects (especially with the *Mapping: Normal* trick). Just remember: if you use a ramp to create a custom blending, you may have to use *No RGB*, if the *Mapping* value needs an intensity input.

Result(s)

Intensity. The Blend texture generates a smoothly interpolated progression.

Options

Progression

Profile of blend

Linear

A linear progression

Quadratic

A quadratic progression

Easing

A flowing, non-linear progression

Diagonal

A diagonal progression

Spherical

A progression with the shape of a three-dimensional ball

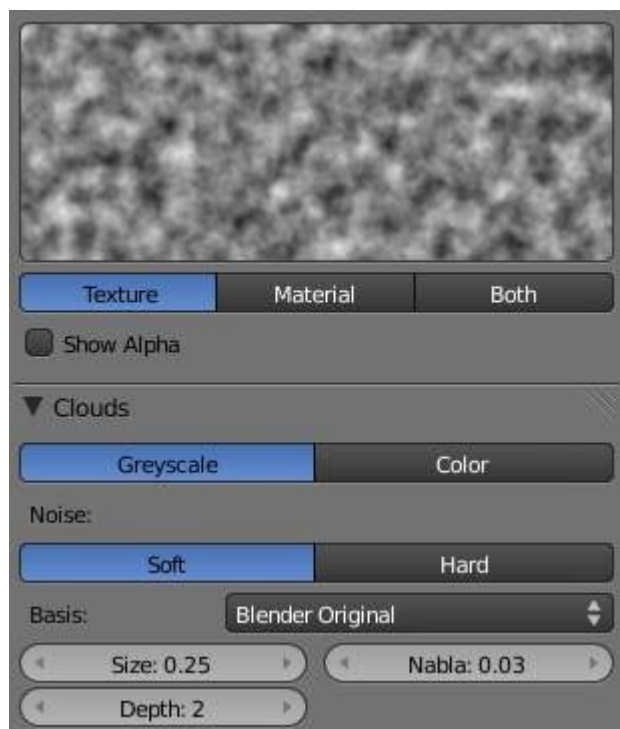
Quadratic Sphere

A quadratic progression with the shape of a three-dimensional ball

Radial

A radial progression **Horizontal** / **Vertical** The direction of the progression is flipped a quarter turn.

Clouds



Clouds Texture Panels

Clouds represent Perlin noise. In addition, each noise-based Blender texture (with the exception of Voronoi and simple noise) has a “Noise Basis” setting that allows the user to select which algorithm is used to generate the texture.

Often used for

Clouds, Fire, Smoke. Well-suited to be used as a Bump map, giving an overall irregularity to the material.

Result(s)

Greyscale (default) or *RGB Color*

Options

Greyscale

The standard noise, gives an intensity

Color

The noise gives an RGB value

Noise

Soft or *Hard*, changes contrast and sharpness

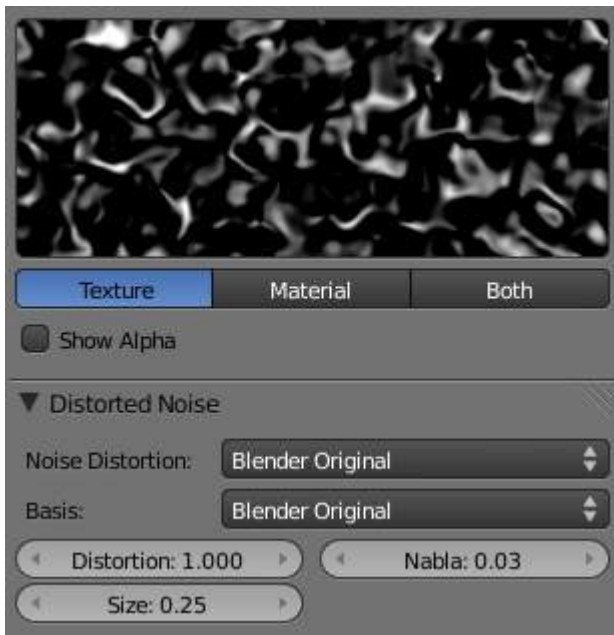
Size

The dimension of the Noise table

Depth

The depth of the *Clouds* calculation. A higher number results in a long calculation time, but also in finer details.

Distorted Noise



Distorted Noise Texture Panels

Distortion Noise takes the option that you pick from *Noise Basis* and filters it, to create hybrid pattern.

Often used for

Grunge, very complex and versatile

Result(s)

Intensity

Options

Noise Distortion

The texture to use to distort another

Basis

The texture to be distorted

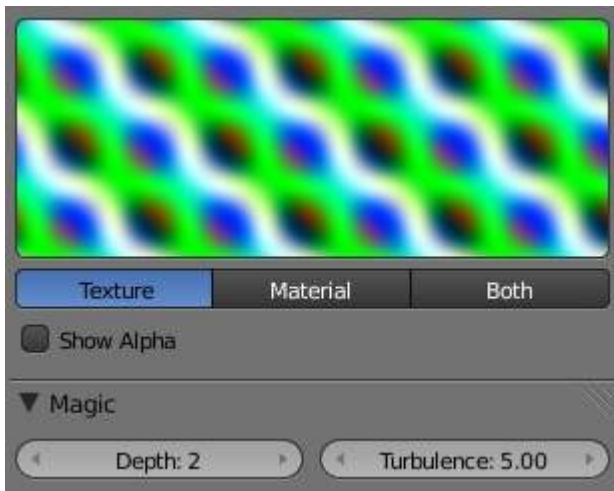
Noise

The size of the noise generated

Distortion

The amount that *Distortion Noise* affects *Basis*

Magic



Magic Texture Panels

Often used for

Not frequently used. It can be used for “Thin Film Interference”, if you set *Mapping* to *Reflection* and use a relatively high *Turbulence*.

Result(s)

RGB color. The RGB components are generated independently with a sine formula.

Options

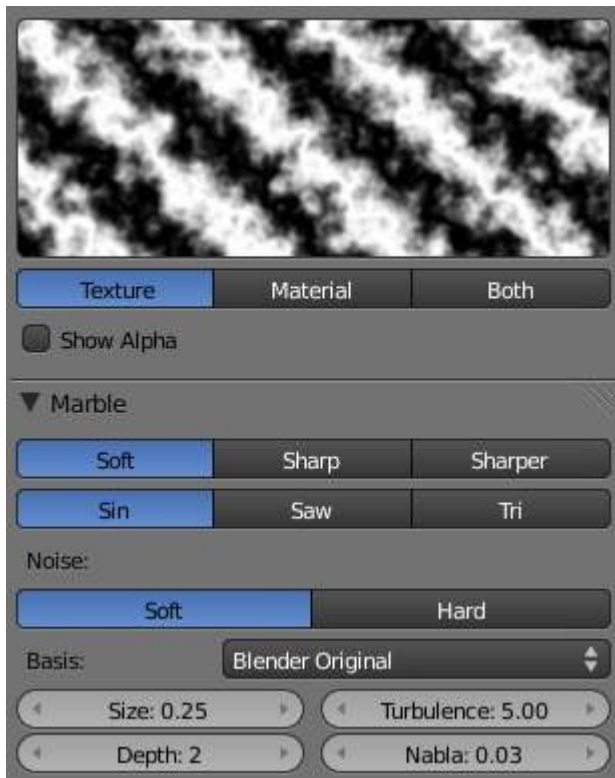
Depth

The depth of the calculation. A higher number results in a long calculation time, but also in finer details.

Turbulence

The strength of the pattern.

Marble



Marble Texture Panels

Often used for

Marble, Fire, Noise with a structure

Result(s)

Intensity value only

Bands are generated based on the sine, saw, or triangular formulae and noise turbulence.

Options

Soft / Sharp / Sharper

Three presets for soft to more clearly defined *Marble*

Sin / Saw / Tri

Shape of wave to produce bands

Soft / Hard

The noise function works with two methods.

Size

The dimensions of the noise table

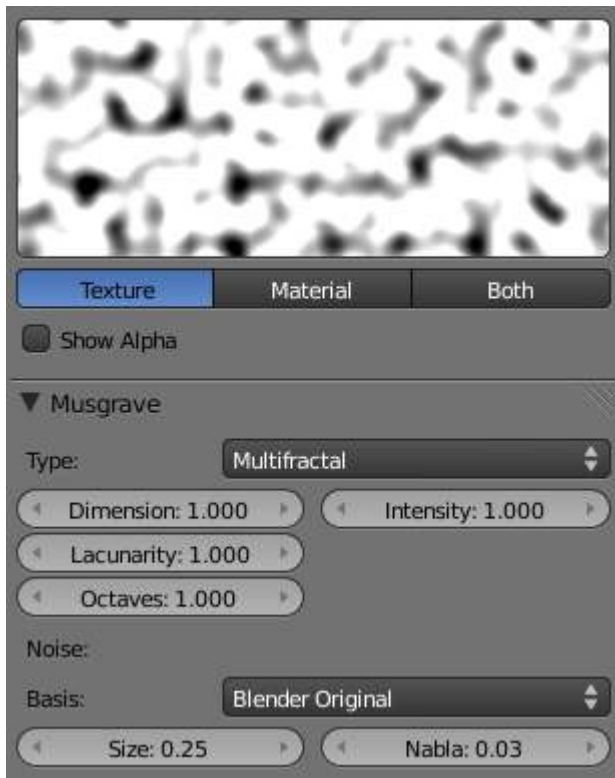
Depth

The depth of the *Marble* calculation. A higher value results in greater calculation time, but also in finer details.

Turbulence

The turbulence of the sine bands.

Musgrave



Musgrave Texture Panels

Often used for

Organic materials, but it's very flexible. You can do nearly everything with it.

Result(s)

Intensity

Options

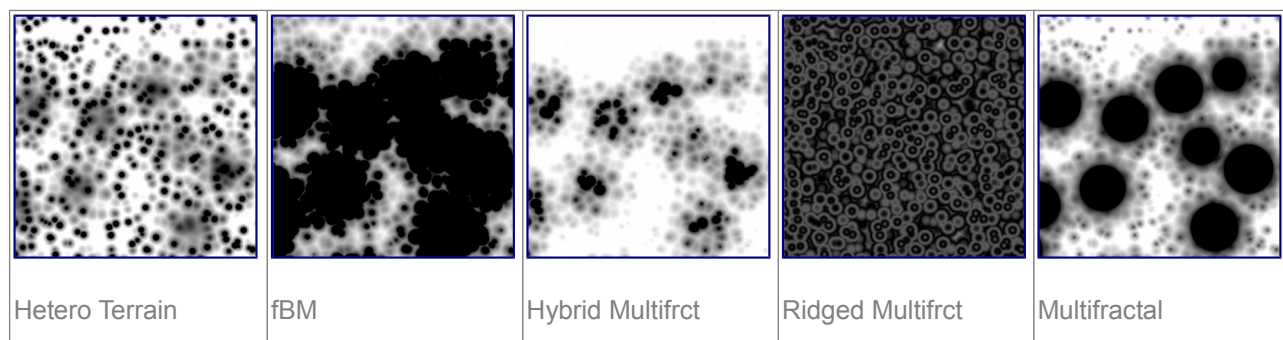
Type

This procedural texture has five noise types on which the resulting pattern can be based and they are selectable from a dropdown menu at the top of the tab. The five types are:

- Hetero Terrain
- fBm
- Hybrid Multifractal
- Ridged Multifractal
- Multifractal

These noise types determine the manner in which Blender layers successive copies of the same pattern on top of each other at varying contrasts and scales.

Examples with Basis : Voronoi F1 - Dimension : 0.5 - Lacunarity : 0.15 - Octave: 2.0



The main noise types have four characteristics:

Dimension

Fractal dimension controls the contrast of a layer relative to the previous layer in the texture. The higher the fractal dimension, the higher the contrast between each layer, and thus the more detail shows in the texture. Range: 0 to 2.

Lacunarity

Lacunarity controls the scaling of each layer of the Musgrave texture, meaning that each additional layer will have a scale that is the inverse of the value which shows on the button. i.e. Lacunarity = 2 → Scale = 1/2 original. Range: 0 to 6.

Octaves

Octave controls the number of times the original noise pattern is overlayed on itself and scaled/contrasted with the fractal dimension and lacunarity settings. Range: 0 to 8.

Intensity

Light intensity. Called *Offset* for *Hetero Terrain*. Range: 0 to 10.

The *Hybrid Multifractal* and *Ridged Multifractal* types have these additional settings:

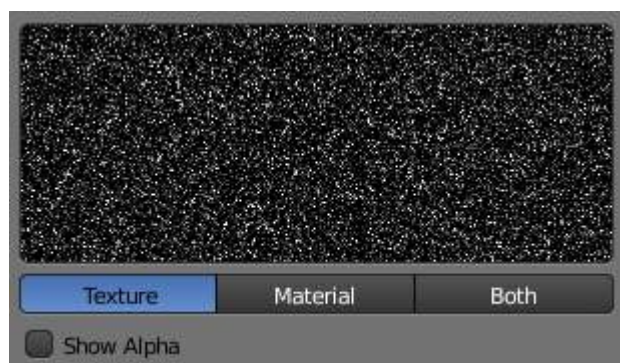
Offset

Both have a “Fractal Offset” button that serves as a “sea level” adjustment and indicates the base height of the resulting bump map. Bump values below this threshold will be returned as zero. Range: 0 to 6.

Gain

Setting which determines the range of values created by the function. The higher the number, the greater the range. This is a fast way to bring out additional details in a texture where extremes are normally clipped off. Range: 0 to 6.

Noise



Noise Texture Panel

Although this looks great, it is not Perlin Noise! This is a true, randomly generated Noise. This gives a different

result every time, for every frame, for every pixel.

There are no options for this noise

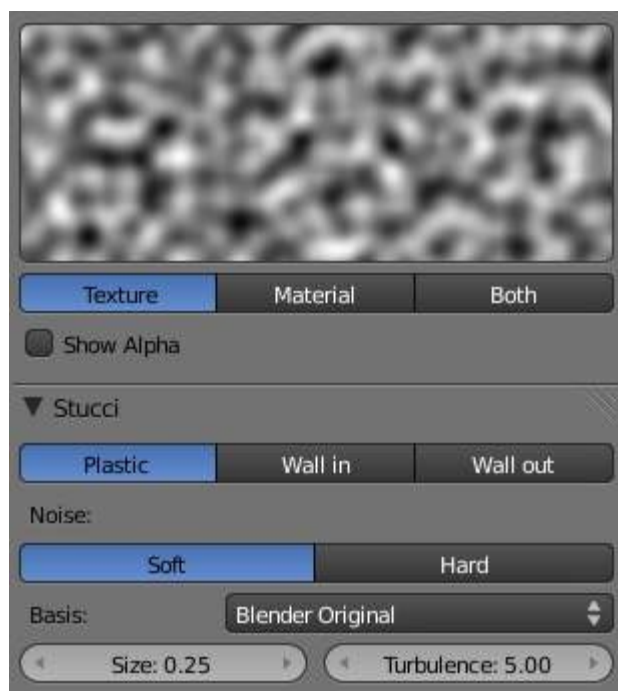
Often used for

White noise in an animation. This is not well suited if you don't want an animation. For material displacement or bump, use clouds instead.

Result(s)

Intensity

Stucci



Stucci Texture Panels

The *Stucci* texture is based on noise functions.

Often used for

Stone, Asphalt, Oranges. Normally for Bump-Mapping to create grainy surfaces.

Result(s)

Normals and Intensity

Options

Plastic / Wall In / Wall out

Plastic is the standard Stucci, whilst the “walls” is where Stucci gets its name. This is a typical wall structure with holes or bumps.

Soft / Hard

There are two methods available for working with Noise

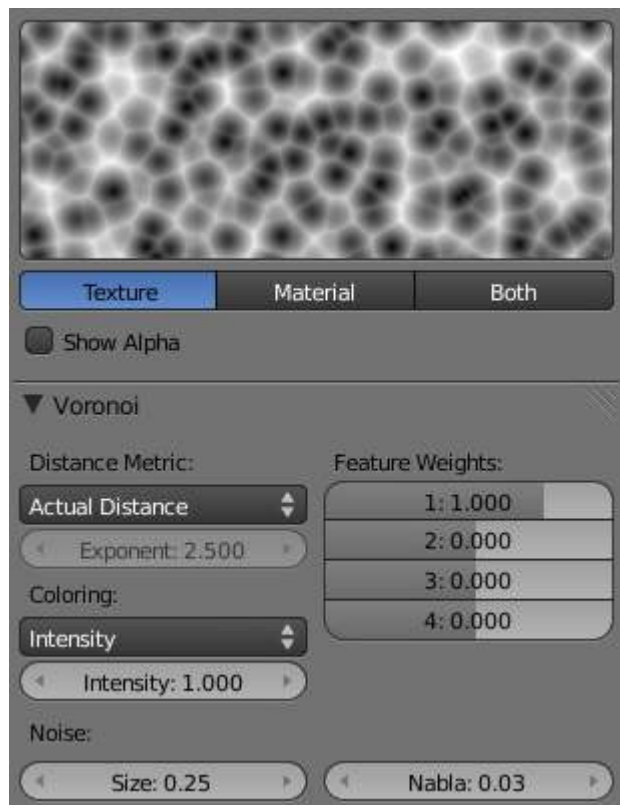
Size

Dimension of the Noise table

Turbulence

Depth of the *Stucci* calculations

Voronoi



Voronoi Texture Panels

Often used for

Very convincing Metal, especially the “Hammered” effect. Organic shaders (e.g. scales, veins in skin).

Result(s)

Intensity (default) and Color

Options

Distance Metric

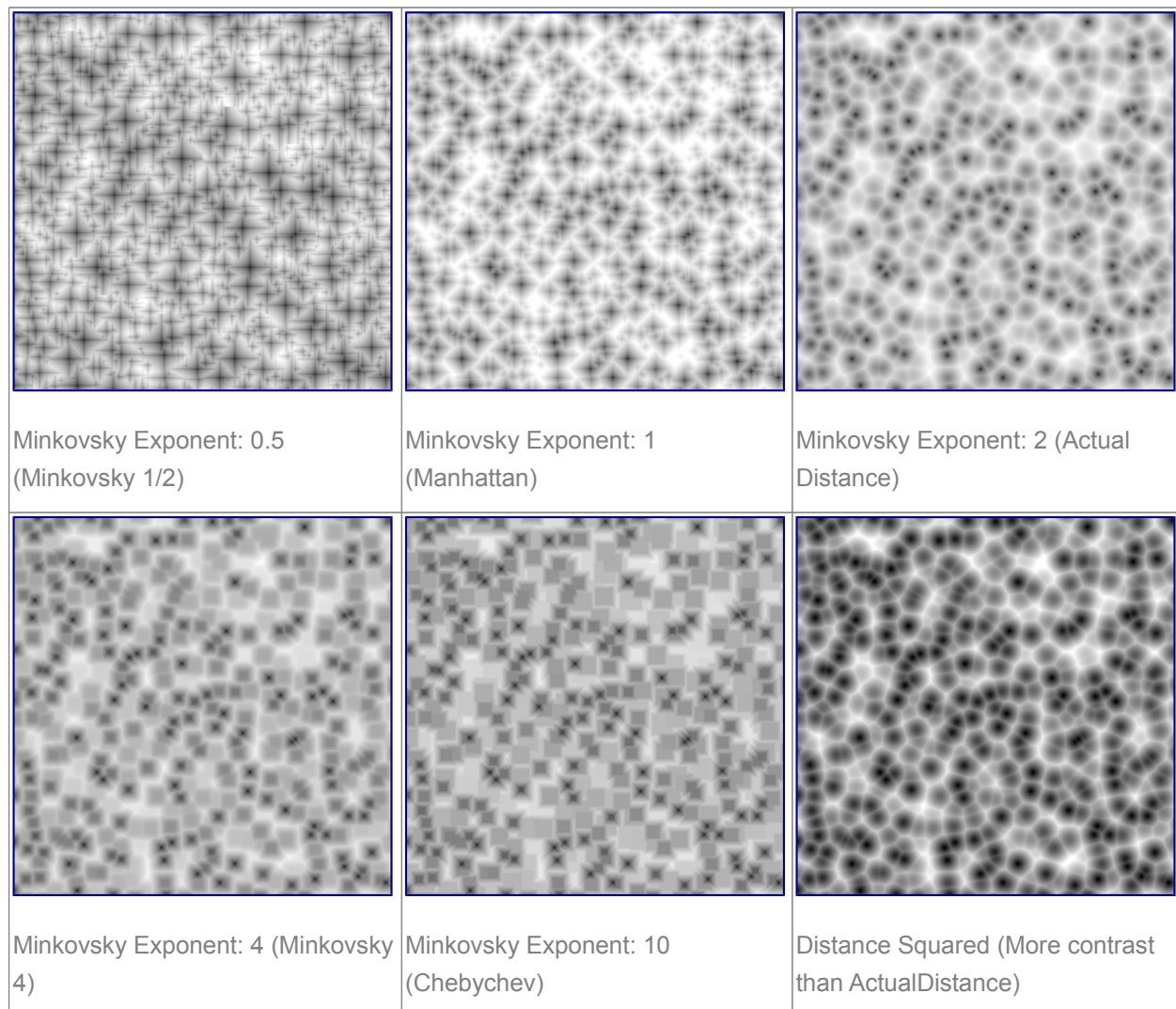
This procedural texture has seven Distance Metric options. These determine the algorithm to find the distance between cells of the texture. These options are:

- Minkovsky
- Minkovsky 4
- Minkovsky 1/2
- Chebychev
- Manhattan
- Distance Squared
- Actual Distance

The *Minkovsky* setting has a user definable value (the *Exponent* button) which determines the Minkovsky

exponent (e) of the distance function $(x^e + y^e + z^e)^{1/e}$. A value of one produces the *Manhattan* distance metric, a value less than one produces stars (at **0.5**, it gives a *Minkovsky 1/2*), and higher values produce square cells (at **4.0**, it gives a *Minkovsky 4*, at **10.0**, a *Chebychev*). So nearly all Distance Settings are basically the same - variations of *Minkowsky*.

You can get irregularly-shaped rounded cells with the *Actual Distance* / *Distance Squared* options.



Feature Weights

These four sliders at the bottom of the Voronoi panel represent the values of the four Worley constants, which are used to calculate the distances between each cell in the texture based on the distance metric. Adjusting these values can have some interesting effects on the end result...

Coloring

Four settings (*Intensity*, *Position*, *Position and Outline*, and *Position, Outline, and Intensity*) that can use four different noise basis as methods to calculate color and intensity of the texture output. This gives the Voronoi texture you create with the “Worley Sliders” a completely different appearance and is the equivalent of the noise basis setting found on the other textures.

Wood



Wood Texture Panels

Often used for

Woods and ring-shaped patterns.

Result(s)

Intensity only

Options

Sin / Saw / Tri

Shape of wave to produce bands

Bands / Rings / Band Noise / Ring Noise

Set the bands to either straight or ring-shaped, with or without turbulence

Soft / Hard

There are two methods available for the Noise function

Size

Dimension of the Noise table

Turbulence

Turbulence of the Band Noise and Ring Noise types