

# The Power of Layers

Spicing up your materials in VUE

Tutorial written by VUE artist  
THD777

**Note:** This tutorial assumes that you are familiar with the basic operation of VUE and the material editor. No detailed knowledge of the function editor or math is needed. While the examples are shown in VUE 8 Infinite, any version of VUE that allows access to the function editor can be used.

Skill level  
Intermediate

Tools Needed  
VUE

The layered materials in VUE allow one to quickly add special effects to imported materials. Examples are dirt, blood, moss, and so on. This tutorial illustrates the basics of modifying materials with the help of layers and the built-in fractals/functions in VUE.

Let's have a look at the image below. The left half shows a character that was imported to VUE as OBJ file from DAZ Studio. As one can see, we have a maiden in peril. In the final scene, the character will be located at the edge of the sea. It becomes immediately obvious that the dress is lovely white and clean which doesn't really make sense in these circumstances. However, there is no need to go back and look for a dirty texture set for the dress or buy fancy shaders. All we need is right here in VUE. The right half of the image shows what one can achieve by simply adding some carefully adjusted layers to the base dress material. Not bad, eh? Read on and you can find out how this was done and how you can do the same for any material you want to modify. No matter if you want dirt, rust, oil stains, blood, mold, or moss, layered materials can get you there.



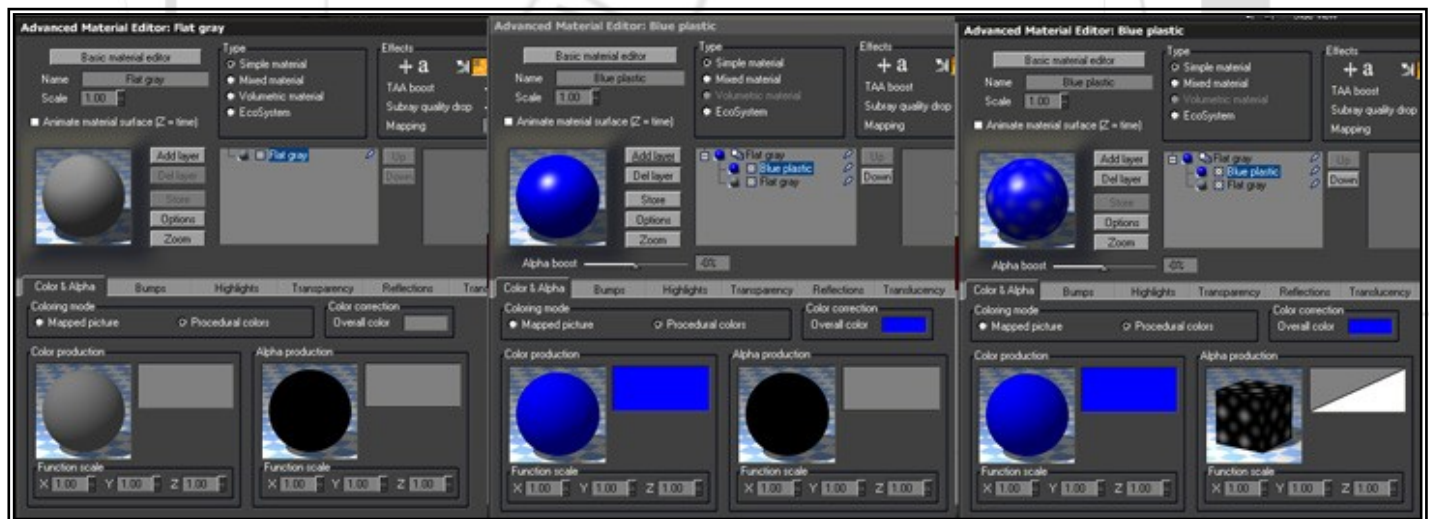
# The Power of Layers (continued..)

## The basics of layers

Layers in VUE are quite similar to those in Photoshop or Gimp. Each additional layer sits on top of the ones below and covers them unless some sort of transparency is assigned (alpha production, equivalent to a layer mask in PS). You can turn any simple material into a layered one by adding additional layers in the advanced material editor. For the examples shown in this first part, I will use a simple cylinder with a gray base texture. For the new layer we will add a simple "Blue Plastic" material on top. If you are working with DS or Poser imports, the base layer will usually have the texture map from the model assigned to it. Before you go and add layers, make sure that the base material looks good in VUE (specifically adjust highlights and bump if needed).

Ok, here we go. On the far left in the image below is our starting point: The material of a cylinder primitive with just the base gray texture. Now we add a new layer by clicking "Add layer" and choosing the "Blue Plastic" material in the browser (in the "Basic" directory). As you can see in the middle, the new layer completely covers the gray base. In order to change this, we need to add some information to the "Alpha Production" input. This can be in form of a texture map (for example painted in Photoshop based on the texture template) or by utilizing the internal VUE functions. In the image on the right, I have added one of the default functions (Leopard, under "Basic") to the "Alpha Production" by right clicking on the preview and loading the function via the browser. If you look at the overall material preview, you can see that the new layer covers the base wherever the alpha production function is dark and reveals it wherever it is light with a gradual transition in between the extremes. The range from total cover to no cover is represented inside VUE by a number between 1 and -1.

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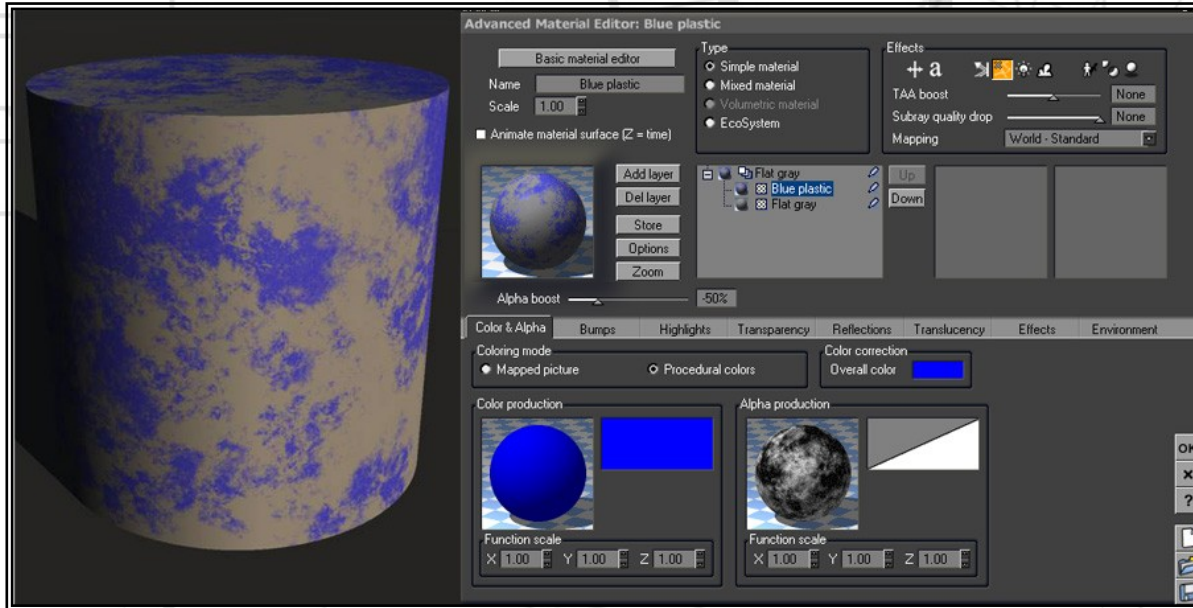
What does this mean for our ability to assemble multi-layer materials? Well, it allows us to quickly add various distributions of materials on top of the base texture and each other. For example dirt on clothing, blood on skin and so on. As long as we are using just the VUE internal functions to drive the alpha production, we do not need any additional resources. VUE offers a vast number of different functions with a mind boggling amount of parameters and it is easy to get lost.

In the following sections I will point out and explain some of the tools (fractals, functions, filters, environment dependence) that I use most frequently. There are many other options, so feel free to apply the same basic ideas for your own experiments. It's the best way to learn how to get the most out of VUE.

# The Power of Layers (continued..)

## Fractals in the alpha channel

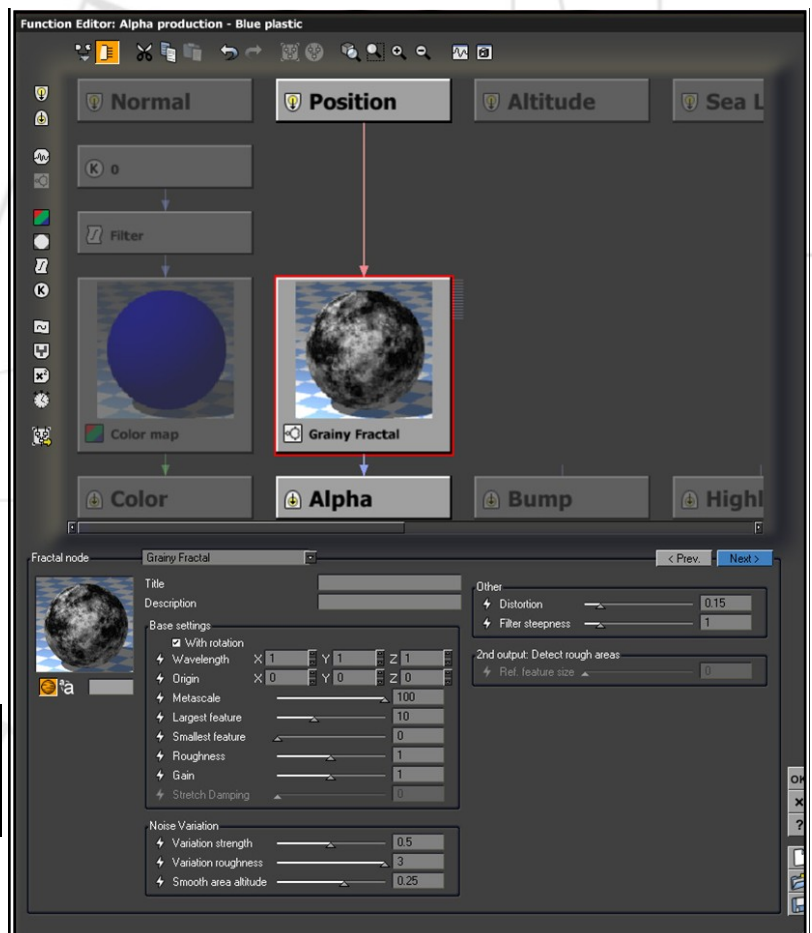
One of the best ways to drive the alpha production is via fractal functions. They add a very nice "random" look to the material distribution and are well suited for dirt, blood and similar layers. My first choice is usually the "Grainy Fractal". It renders fairly fast and is quite versatile. Below you can see what we get when we load the grainy fractal into the alpha channel via the browser.



That's a pretty good start for a dirt distribution or something like that. In order to modify the default look, we need to go into the function editor. Go ahead, right click into the "alpha production" preview and select "edit function". You end up with a screen like the one to the right.

As you can see, the Grainy Fractal function (node) is connected to Alpha input. The box at the bottom has all the parameters that control the look of the fractal. A detailed discussion goes beyond this tutorial, but here are a few examples of how we can modify the look of the fractal (and thereby the alpha production) to suit our goal.

The Grainy Fractal function is connected to Alpha input.



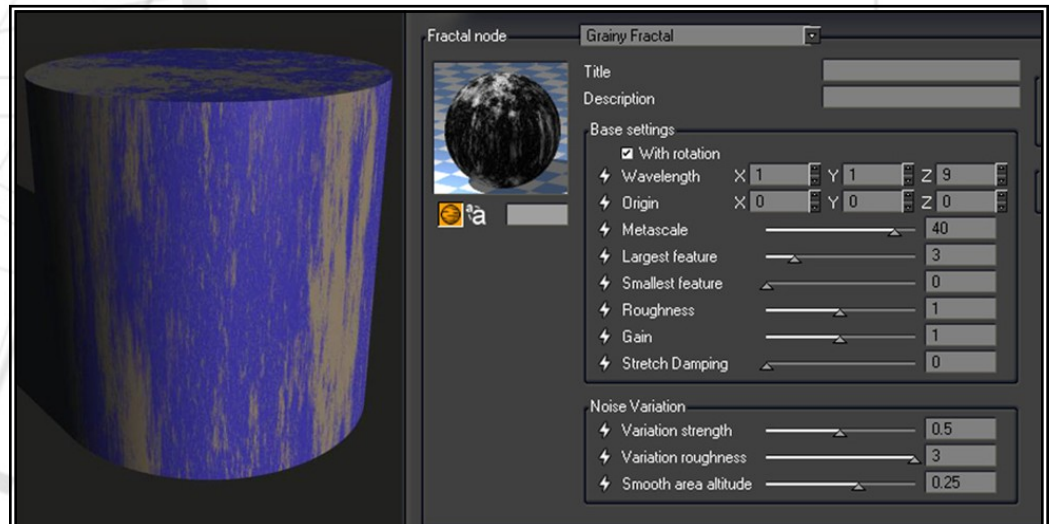
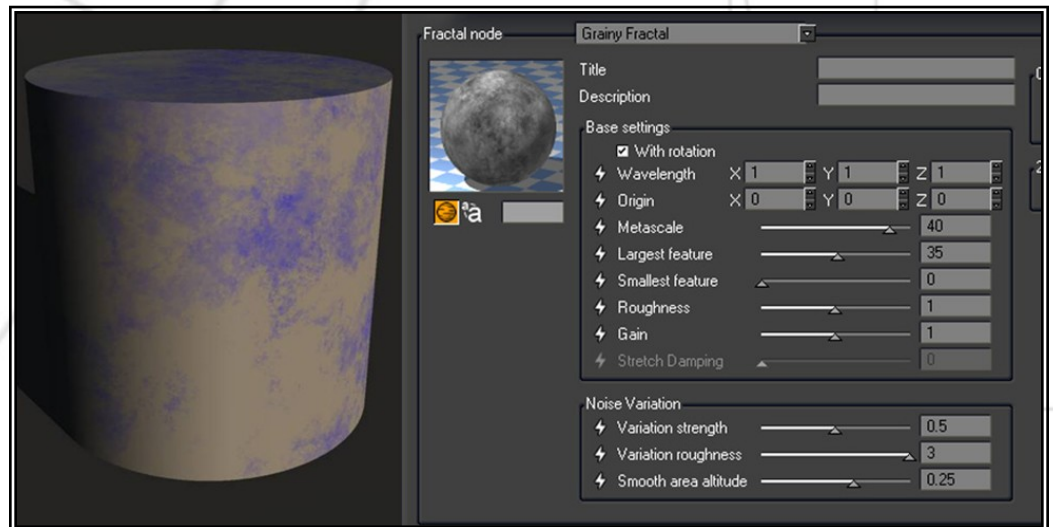
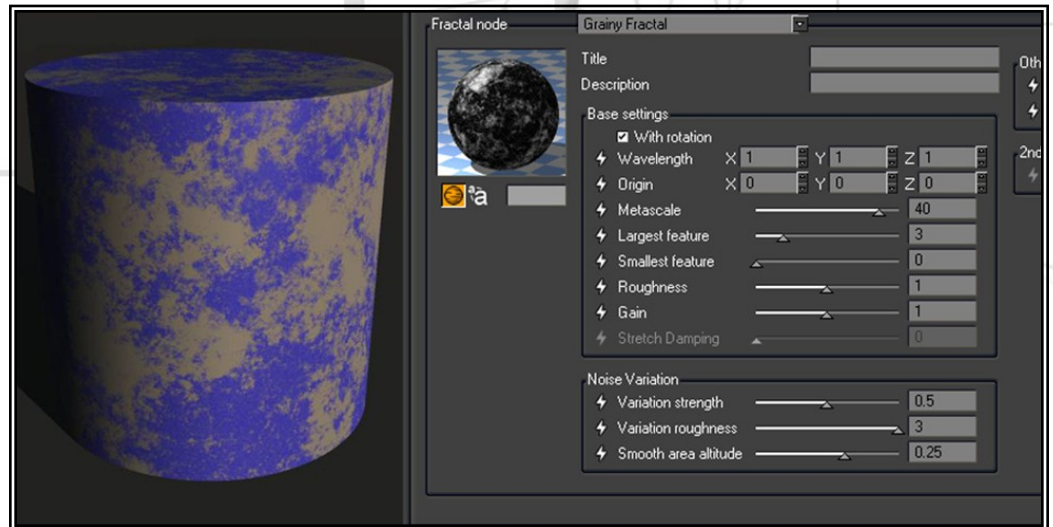


## The Power of Layers (continued..)

The two images below show the effect of the "Metascale" and "Largest feature" parameters. By manipulating those two, one can adjust the size, "intensity" and distribution of the fractal features. The first image has a metascale of 40 and a largest feature setting of 3. This results in dark, high contrast patterns. The second image uses 40 and 35 for these two parameters, respectively, and has a much smoother look.

Sometimes, you might want your dirt not to look randomly spread out, but rather be in form of streaks (think dirty water running down a wall). An easy way to achieve an effect like this is to adjust the wavelength of the fractal in the direction you want the streaks to run. In my setup the Z-axis is the vertical axis (this can be adjusted in VUE, so your setup might vary!). In order to have vertical streaks, I have increased the Z-value for the wavelength to 9. As you can see, this adds a nice streaky look to the fractal. Simply adjust to taste. You can also mix values for wavelength in all three directions for additional effects.

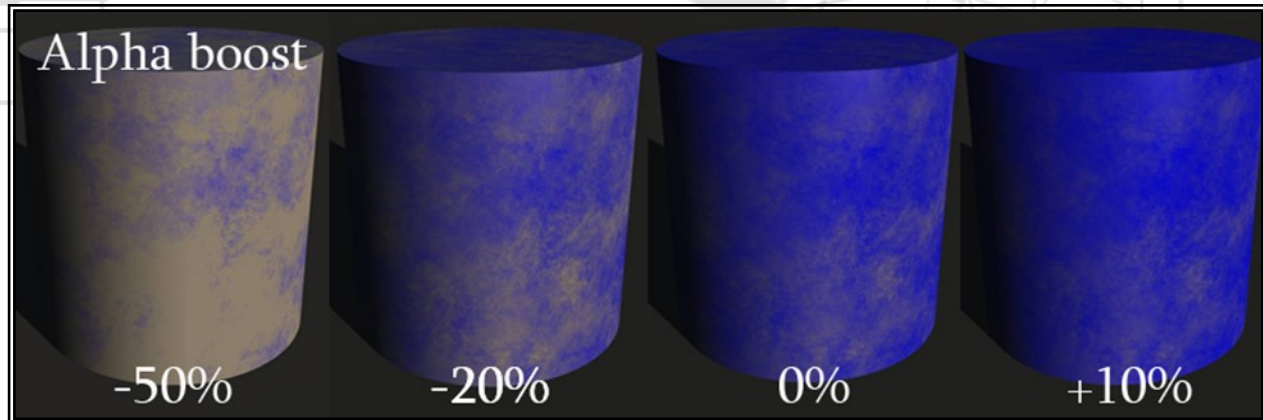
You might want your dirt not to look randomly spread out...



## The Power of Layers (continued..)

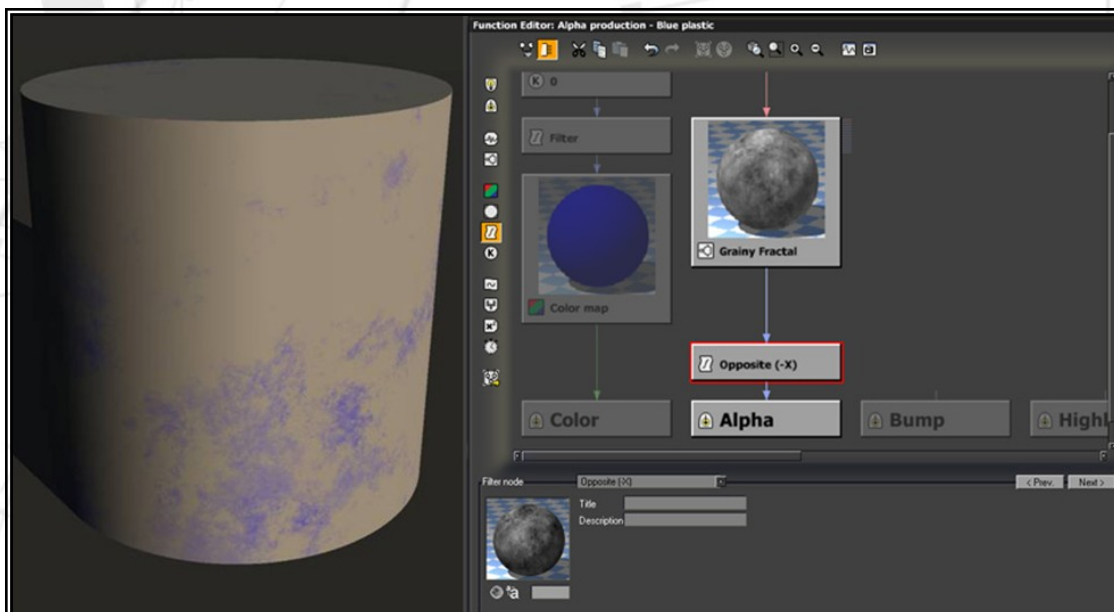
### Alpha boost

If you have looked at the screenshots carefully (and have really good eye sight...) you might have noticed, that adding a layer also adds a parameter for "Alpha boost". This is a very useful setting and in some ways similar to an opacity setting for the layer, but not quite. In addition to reducing coverage we can also use this to increase cover beyond the information provided by the function. In the image below you can see the effect of alpha boost on a simple grainy fractal like the one discussed above. If you are essentially happy with your alpha distribution, but want to have a bit more or less cover, "Alpha boost" is the way to go.



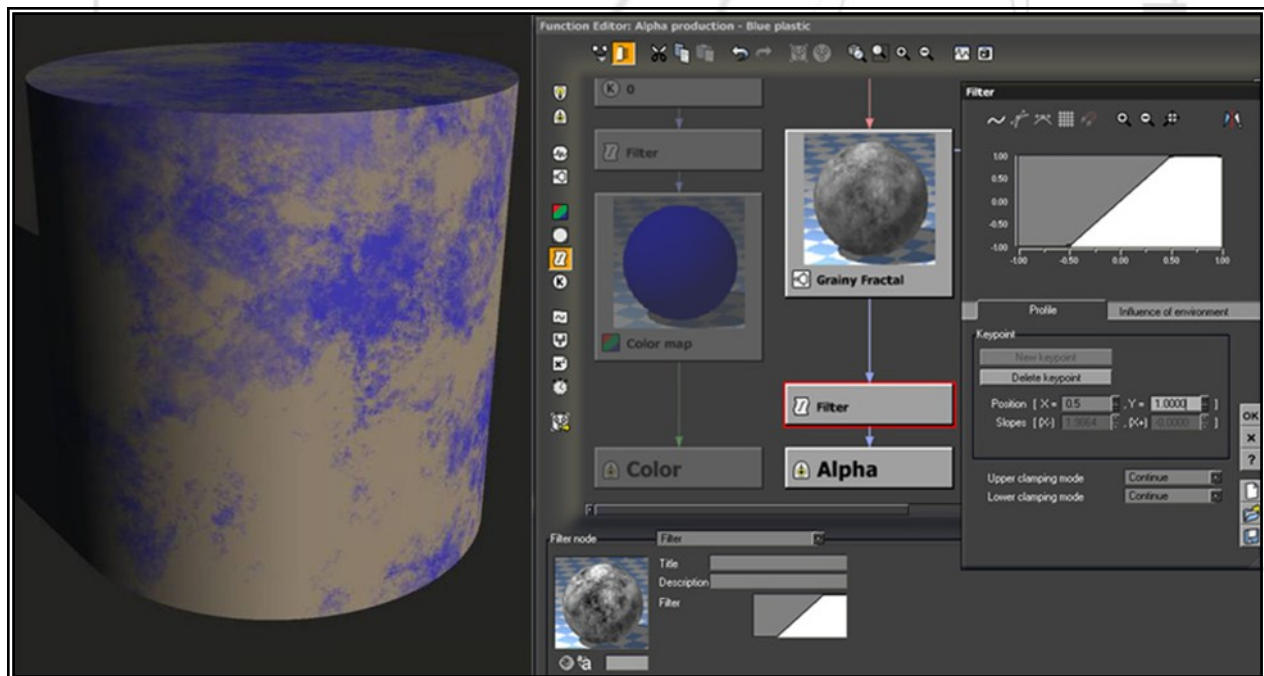
### Using filters to modify the fractal output

VUE offers another great tool to expand the use of functions. By using filters we can manipulate the output of a function to fit your scenario. Here are a couple of examples for situations where this can be useful. Imagine you got a great distribution by experimenting with the fractal function, but realize you really want the opposite of the alpha pattern (cover what is being revealed and vice versa). There is no need to go back and edit the fractal parameters. You can simply invert the output of the fractal by using an "Opposite" filter prior to sending it to the alpha input. The image below shows the setup. The grainy fractal is the same as the one in the example above with 40 and 35 for metascale and largest feature. All we needed to do was selecting the link between the fractal and the alpha input and then click on the "add filter" button. This automatically adds a filter node in the selected connection. In the "Filter node" box we can select the type of filter that is applied (in this case we select "Opposite (-X)").



## The Power of Layers (continued..)

Another common situation that I have run into is that I like the overall look of the alpha distribution, but I want a sharper (higher contrast) look for the pattern. This can also be easily adjusted with a filter. We select the link between the fractal and the alpha out and add a filter. This time we use a generic filter for the type. The filter is shown as a box with a diagonal line in it. If you check the axis you can see that each runs from -1 to 1. The line shows how an input value is translated into an output value. If the line runs along the diagonal (the default), then the input is equal to the output and the filter has no effect (neutral). In order to get a higher contrast (sharper transitions) we need to shift the transition into the center of the filter and "flatten" it at the high and low values. The easiest way to do this is by adding two key points to the filter. Right click on the filter box and select "Edit Filter". You get the filter editor as shown below. Now double-click on the line to add a keypoint and move it with the mouse to -0.5, -1.0 (you can also directly enter the values in the boxes). Repeat this with a second keypoint at 0.5, 1.0. Now your filter should look like the one in the image below. This filter shifts the transition of the input (-1 to +1) into the range from -0.5 to +0.5 and thereby results in a much sharper transition. You can modify the filter to your liking. The steeper the transition in the center, the sharper the contrast of the pattern will be (try to move both new keypoints closer to 0 and see what happens).



If we add some other functions into the mix we can further increase the variety of patterns...

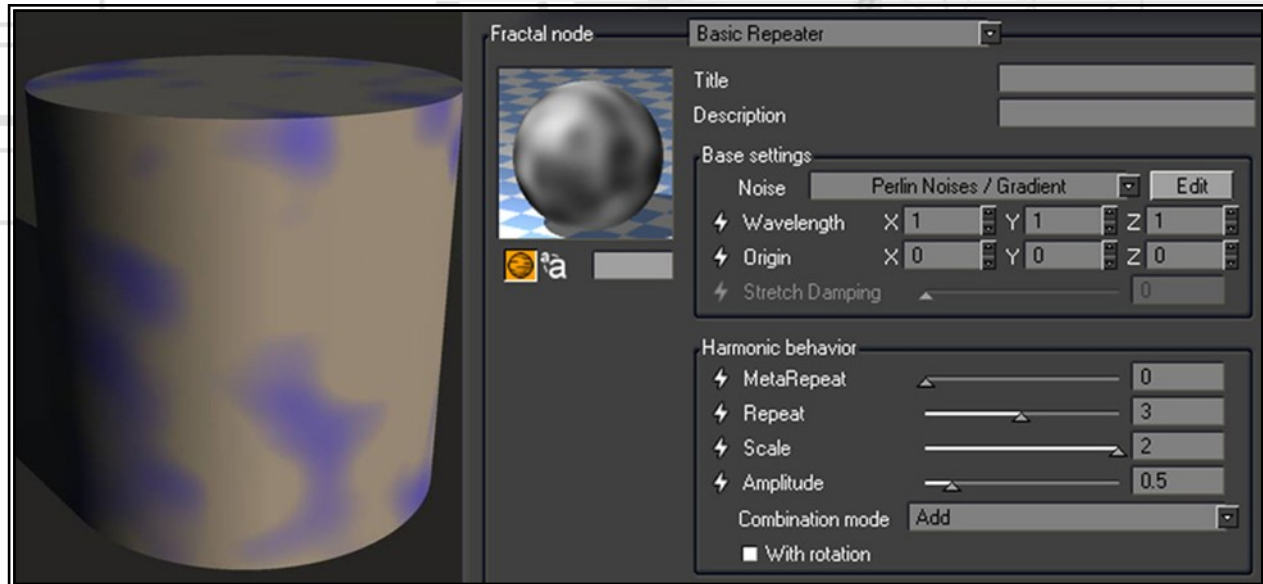
### Other useful functions

Alright, is your brain smoking yet? No? Well, here are some more useful functions to play with. Above we have just used variations of the grainy fractal to get various effects. If we add some other functions into the mix we can further increase the variety of patterns we can achieve.

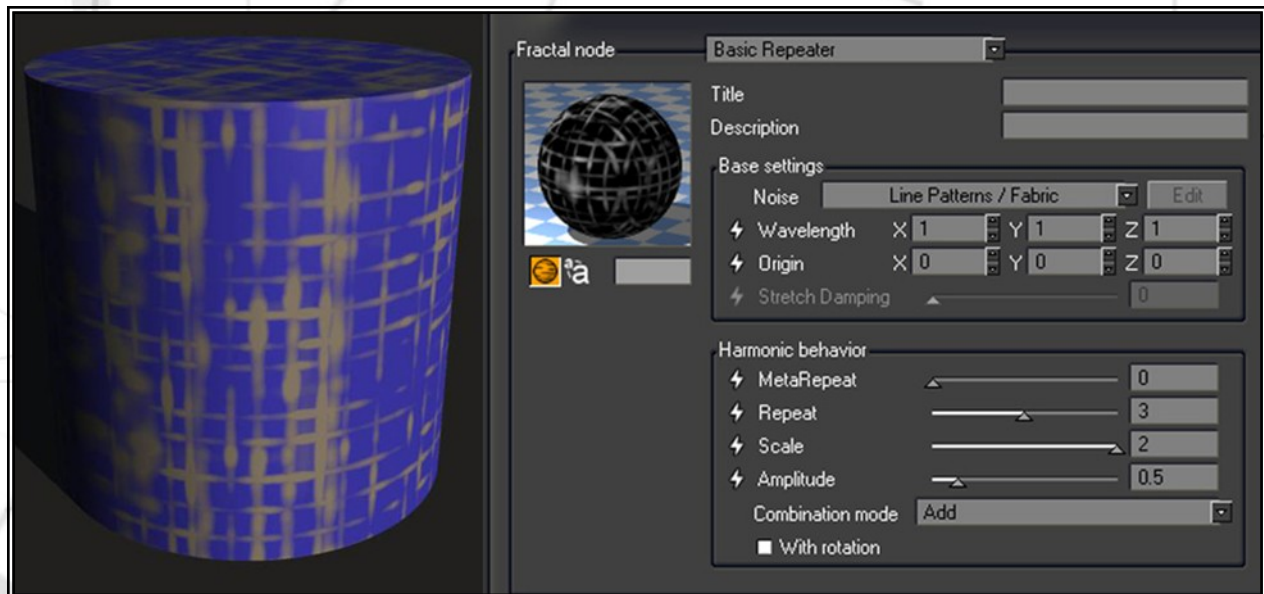


## The Power of Layers (continued..)

The first example is from the class of "Basic Repeaters": The "Perlin Noises/Gradient". This function is really nice for smudges and stains. It does not have the detail and noise of the grainy fractal.



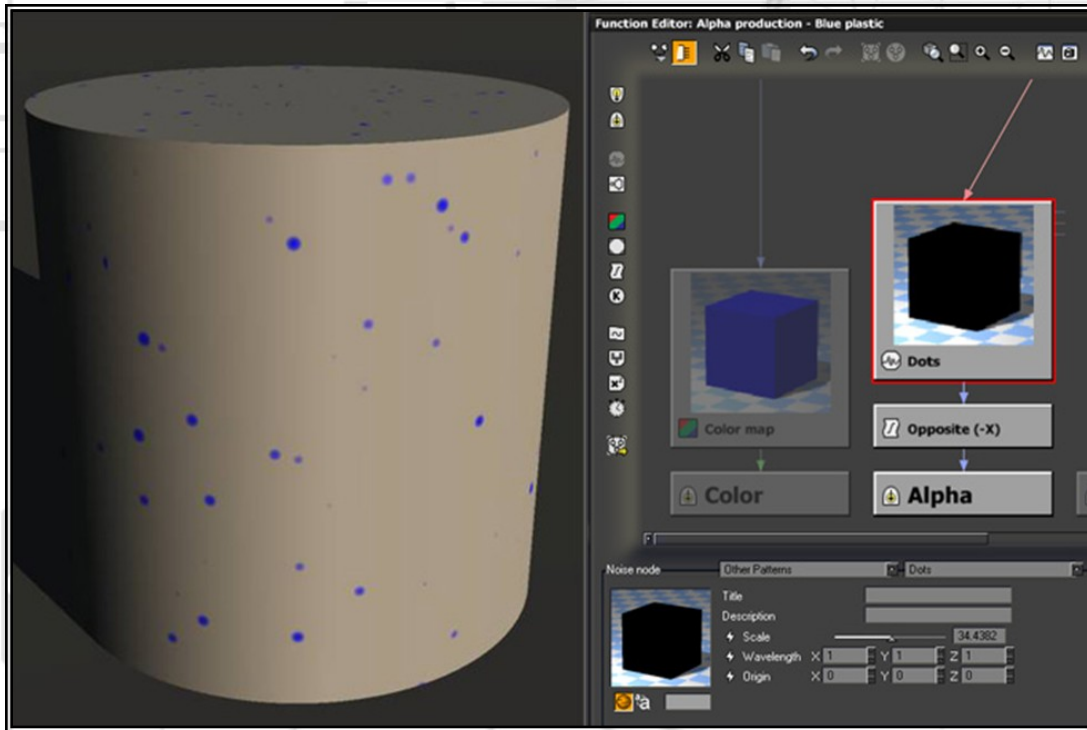
Another useful function is also located in the "Basic Repeater" category: The "Line Patterns/Fabric" function. This one can be used to make the fabric structure of a garment more visible or to have the dirt follow the fabric structure. It can be useful to combine this node with an opposite filter.



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## The Power of Layers (continued..)

Lastly we have "Other Patterns - Dots". As the name says, this function produces many dots on your layers. In order to get the dots rather than holes, we need to add an opposite filter as shown above. Either way, it is useful to add a "splatter" of something to a texture.



Of course, you can modify each of these via their parameters (wavelength!) or via filters.

### A word on scale

So far I have ignored the material scale. I usually work in VUE in real world units and the default scale of 1.0 works pretty well for most of the function examples shown here (for the dots you will usually have to reduce the scale) if you have your models imported at a realistic size. If your models are very large or very small (in real world units) you will have to adjust the sale of the materials and functions accordingly.

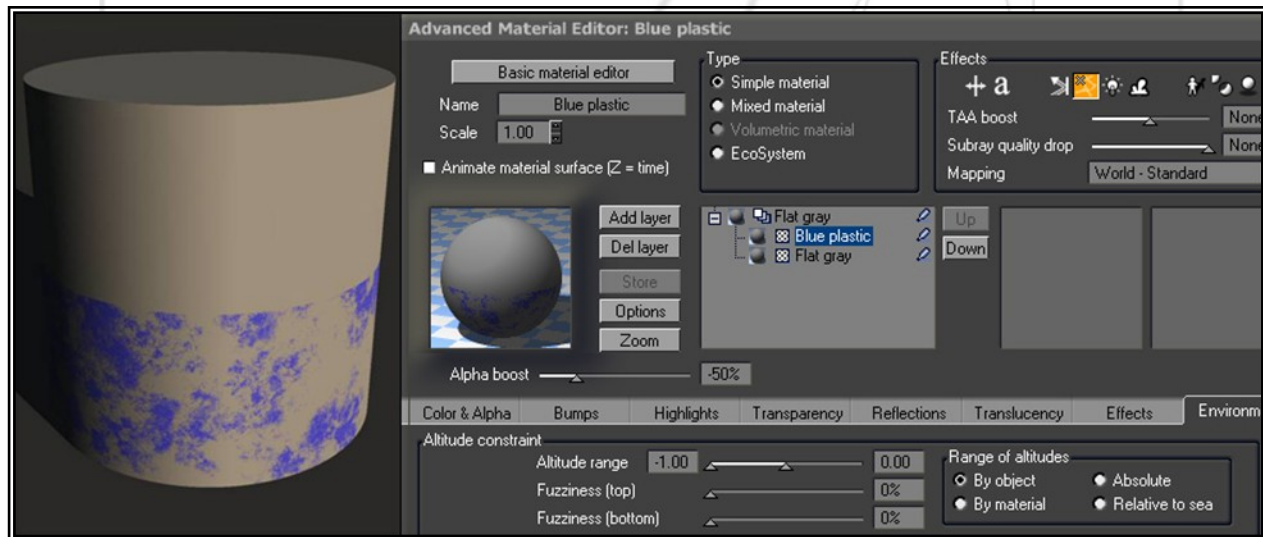


# The Power of Layers (continued..)

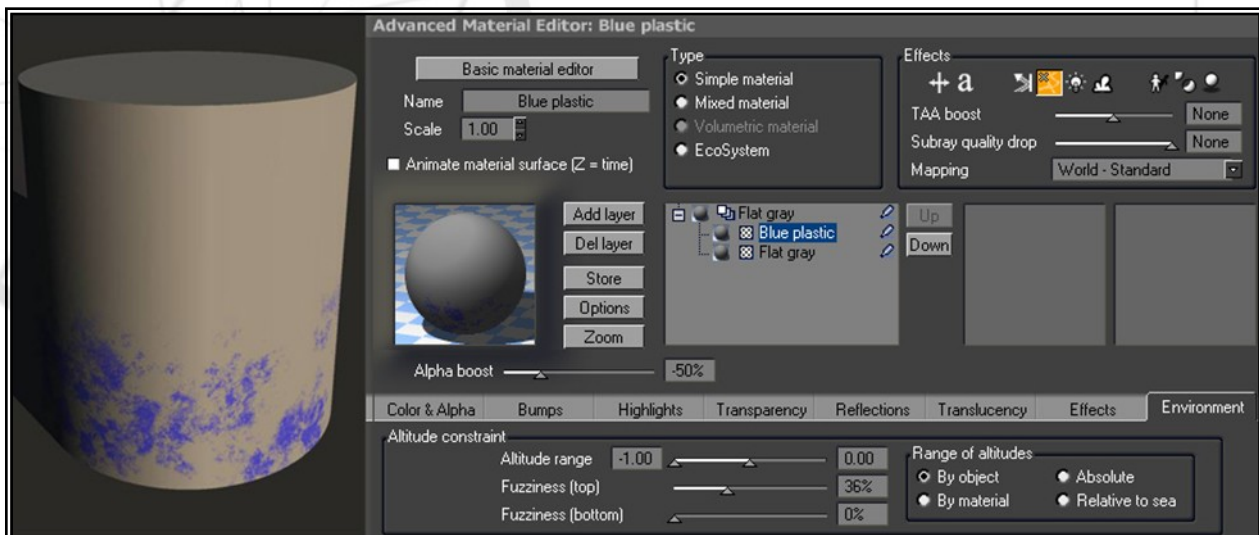
## When the distribution matters - The environment tab

Sometimes you want to have the layer effects to show up in a particular area of the model rather than everywhere. No problem. The environment tab in the layer control allows us to modify where the layer is applied. Let's have a look at two examples: Distribution by height and by direction.

We start with looking at how to restrict the new layer to a particular elevation of the model. To do this, select the layer and switch to the environment tab. Here you can find the altitude constraints. The constraint can be in internal units (-1 to 1 for bottom to top) or in absolute units (actual units like meters). Most of the time, I use the "by object" altitudes. Use the altitude range sliders to select the portion of the total object height that will be covered with the layer. In the example below I have selected the -1.0 to 0.0 range. As you can see, this restricts the layer to the bottom half of the object. In an analogous manner the 0.0 to 1.0 range would cover the top half and a selection of -0.5 to 0.5 would cover the center.



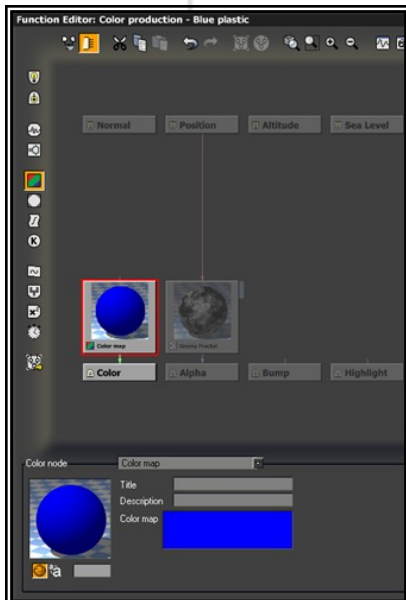
Well, that abrupt transition from layer to nothing looks odd in many cases. No worry, that's what fuzziness is for (it gives you that fuzzy feeling; sorry couldn't resist the pun...). By increasing the fuzziness at the top (or bottom or both if applicable) we can get a more gradual transition as shown below. Fuzziness will broaden the transition and fade the layer effect out as well as somewhat extend it beyond the set cut-off. The transition will be broader if the fuzziness value is larger.



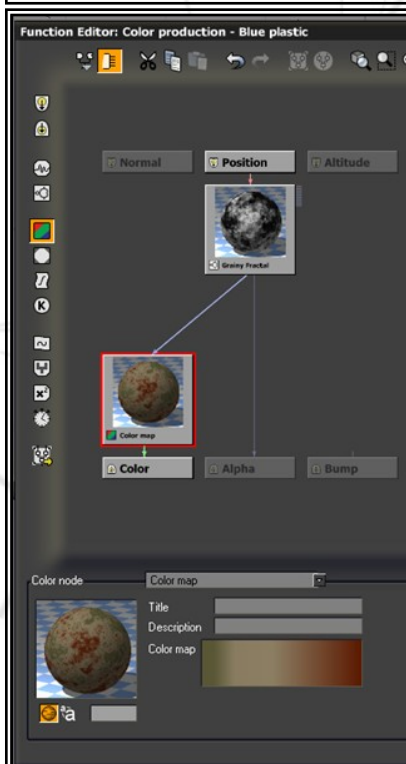
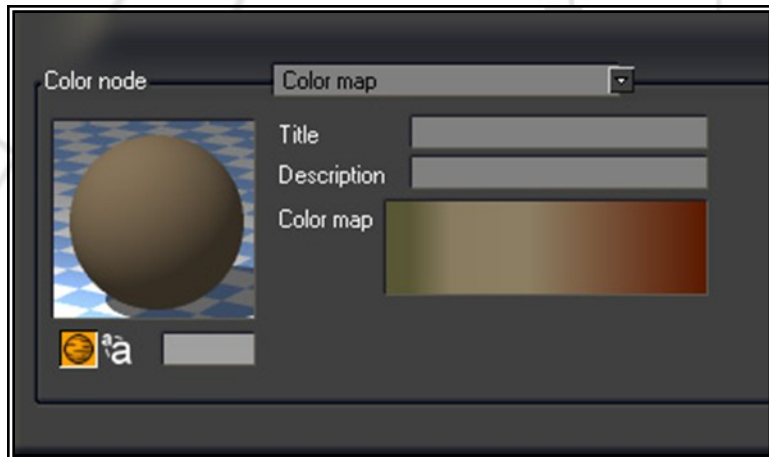
# The Power of Layers (continued..)

## Mixing it up – color maps, filters and fractals

Alright, now we have seen how we can cover the base layer with various patterns of blue plastic. What if we want mud, dirt, blood, gunk or whatever? Do we need to buy materials? No worries, the same tricks we have used to generate the alpha production can be used in combination with VUE's color maps to generate an infinite variety of textures to add to your models. This is really a topic for another tutorial, but here is a quick primer to get you started. Below is our basic example of the cylinder with the base layer and the "Blue Plastic" layer. The blue layer alpha is controlled by a grainy fractal. If we look at the color input we can see that we have a color map that is solid blue directly connected to it. There is no other control (depending on how you got here, there might be a constant and a filter connected to it, but they don't do anything). If we want a more interesting color variation, we need two things: A suitable color map and a source of variation. Let's start with the map.



Right click on the blue map area and choose "Load Color Map". This opens the browser and lets you choose from VUE's default maps (You can also make your own or buy additional ones). There are a lot of useful ones in there. For a general dirty look one could choose "Red desolate" in the "Rocks and Grass" collection. Let's try that one.



Bummer. All we get is brown. Well, as stated above we also need to tell VUE which colors to choose where. Otherwise we get just the value at 0. How do we do this? Any fractal or function will work. For simplicity we can just use the one we have already available: the grainy fractal that drives the alpha. Grab the little hook at the top of the color map node and drag it over to the grainy fractal node output. Done. There is our color mix.

This works, but has a drawback. Because we also use the same fractal to drive the alpha production, we will lose all the colors in the intermediate range which become transparent. There are several options to avoid this, the easiest being to use an independent fractal/function to drive the colors. To make a long story short, we can load a default color function, for example the "3 color production" function. The result is shown below. Now it's time to apply all this to a more interesting model than a cylinder.

## The Power of Layers (continued..)

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### Example: the dirty dress

Alright! Now it is time to apply what we have seen above to the example shown in the introduction. The scene I had in mind is featuring a maiden that is chained to a pillar at the base of a cliff as an offering to a sea monster (Don't worry! There will also be a hero to protect the monster from the maiden...). The character was posed and set up in DAZ Studio using dynamic cloth for the white gown. The model was then exported as OBJ file and loaded into VUE. As pointed out above, the pretty white gown does not fit the theme very well. Here is the imported model with the unmodified dress.



Because we use the same fractal to drive the alpha production, we will lose the colors in the intermediate range which becomes transparent.



## The Power of Layers (continued..)

In order to make it look suitable for a maiden in distress, I decided to add three layers on top of the base texture:

- A basic dirt layer

- A denser, streaky layer of mud/dirt at the bottom of the skirt

- Some minor patches of bloody gunk to account for small injuries

The basic dirt layer uses a grainy fractal and the “3 Color-Bump Variation” metanode for the color production. The streaky layer also uses the grainy fractal, but with a stretch applied via the Z-wavelength. This distribution is combined with a more complex color setup and environment effects (by altitude) to provide the brownish muck at the bottom of the skirt. Finally, the blood layer uses a basic repeater (Square blobs) based alpha production and a perlin noise based color distribution. Below you can see the result. The left image shows the color coded distribution (base dirt = blue, bottom muck = green, blood = red) and the right image shows the final version with all color variations applied.



What? You could not follow this condensed version? No problem! You can download and look at the included VUE material file to check out the details. The .mat file contains all three layers on a neutral base (without dress textures) and can be applied to any object to check the effect.

If you run into trouble or have specific question, feel free to drop me a note at the 3DHobby VUE forum or at deviantArt.

Are you wondering what the final image using this model will look like? Well, it is not done yet, but look on the next page for a sneak peek of a work-in-progress. It still needs lots of tweaking and the camera setup is not final either, but it will give you an idea.

## The Power of Layers (continued..)



Happy Vueing  
thd777

Turn the page to find out more about THD777 and view more of his amazing renders!





# A Cold Place

Mining Outpost on Nova Antarctica

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## Who is THD777?

In the real world THD777 is Thorsten Dieckmann, a University Professor. He teaches physical chemistry and biochemistry and runs a research group in the area of biophysics.

He has been working in CG since 2004. He uses DAZ Studio to assemble and pose characters and to import content. Most things are then exported to Vue 8 Infinite which is his primary 3D application for scene creation, lighting, atmospherics and rendering. For postwork he uses Photoshop CS4.

[More...](#)





## Evening at the Tavern

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THD777 is self taught, mostly using trial and error as well as free and commercial tutorials and books. However, he does have a background in using computers for graphics from his PhD and postdoctoral work where he used various programs to determine, display and analyze the 3D structures of biomolecules (Proteins and Nucleic Acids) all the way back into the early 1990's (anyone remember CONVEX, CRAY and Silicon Graphics?).

THD777's images can be viewed at <http://thd777.deviantart.com>.