

# Anodized Shader Notes

General usage for the Anodized Shader Pack would be to load the provided suite of presets as you would other shader sets. For advanced users looking to alter settings of existing presets or those who just want to know a little more about how things work I've outlined some of the key points that separate this shader from the default.

## Curve Values

Each of the three specular effects (Specular, Top Coat and Metallic Flakes) uses a Custom Curve instead of Index of Refraction. Custom Curves allow for greater control over the normal and grazing specularity, which can be used to produce unique results.

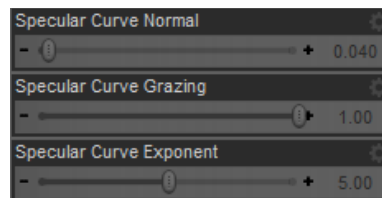
**Curve Normal** - Modifies strength of specularity on the surface normal.

**Curve Grazing** - Modifies strength of specularity on grazing edges (perpendicular to normals).

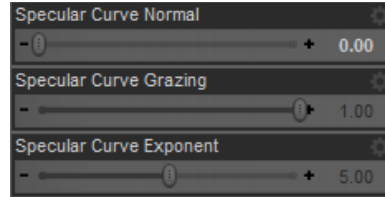
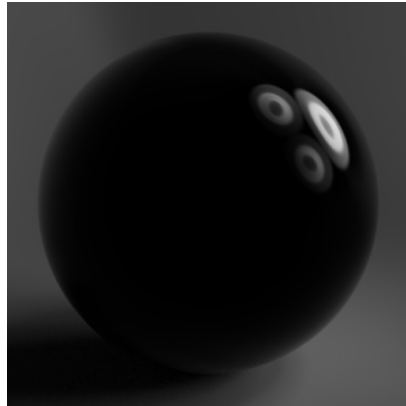
**Curve Exponent** – Alters the contrast between Normal and Grazing specularity

The following examples show how different values for each of these settings effects the specularity of a sphere (with basic HDRI lighting to produce reflections).

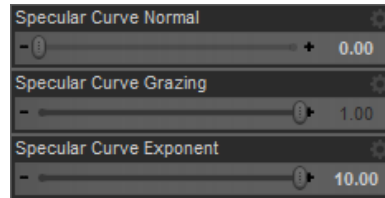
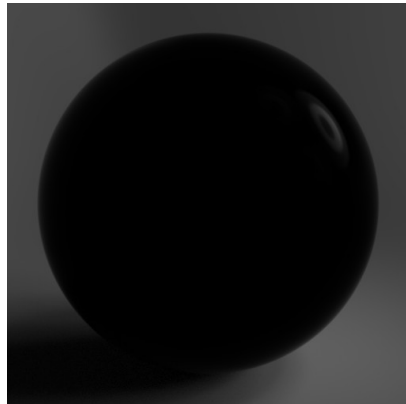
## Default Settings



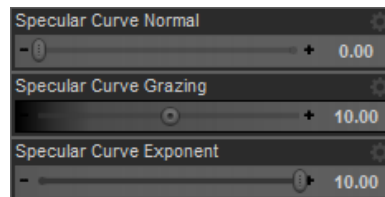
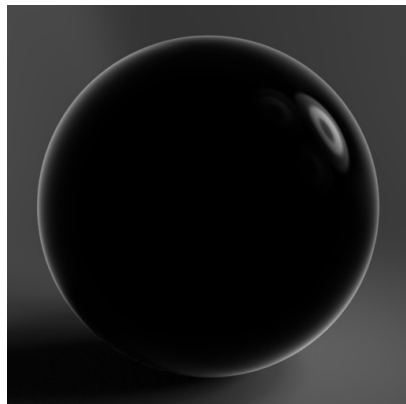
# Zeroed Normal



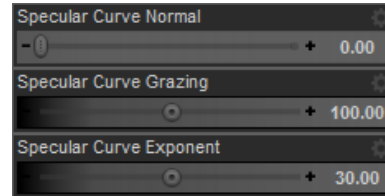
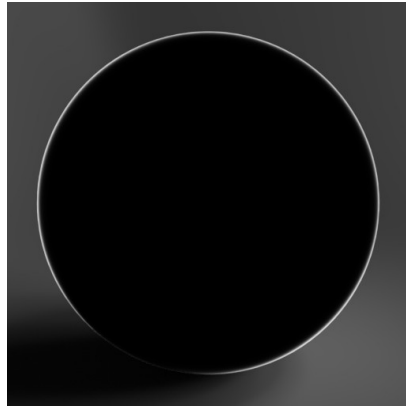
# Maxed Exponent



# Uncapped Grazing Value



# Uncapped Exponent



We started with the default values which get applied when first using the base shader, then removed all specularity from surface normals (in this case parts facing the camera). Then we increased the Exponent value further removing any reflections from the surface normals, restricting them more to the grazing edges. To greater accentuate the grazing edge reflections, we turned limits off for our Grazing value and increased it to 10 (pushing the strength of reflections above usual). After this we also removed the limits for our Exponent value and increased that to 30 while raising the Grazing value to 100, this is an extreme case and was only exaggerated to show what the effect is actually doing.

Removing limits of any values should be used with caution.

When it comes to reflections, any value above 1 will cause the reflection to be brighter than what it's reflecting (with a value of 2 each bounce will result in double brightness).

In situations where two reflective surfaces are reflecting one another this can lead to extremely bright areas in your render.

Since removing the limits can lead to some nice styles it might be worth having those unnaturally bright areas anyway, it all depends on the look you're going for.

One thing that can help alleviate the issue is reducing the Max Path Length in render settings to limit the number of bounces.

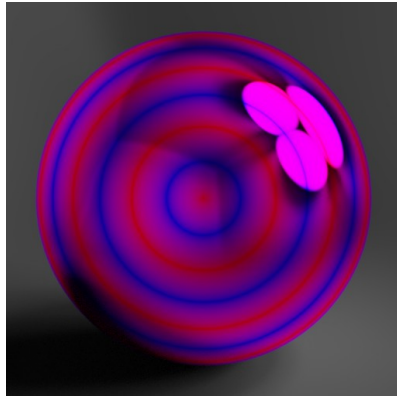
This will also restrict effects like glass however, so compositing in programs like Photoshop may end up giving you the best overall results.

The included presets marked with “Ghost” make use of the removed limits to provide effects with strong fresnel outlining accentuating geometry.

There may be times where using these presets result in the mentioned bright areas, in which case care should be taken to reduce the number of surfaces with the shader facing each other and bouncing reflections between them.

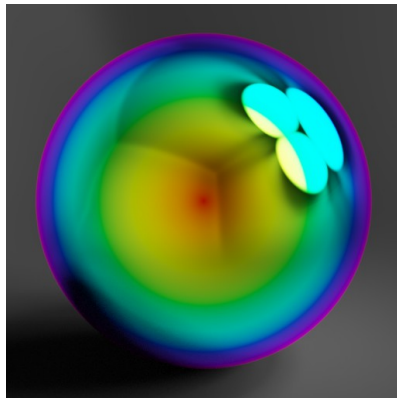
# Color Array

The three specular effects each have their own color array values that let you specify different colors, which blend between the normal and grazing edges of your surface. From Value 1 to Value 8 the colors get mapped from the center of your normal to outside the grazing edge. This first example shows a simple red-blue alteration so you can see how the colors get distributed on a simple surface.



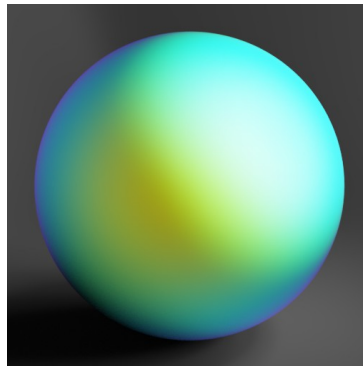
Specular Color Array 1	1.00	0.00	0.00
Specular Color Array 2	0.0005	0.00	1.00
Specular Color Array 3	1.00	0.00	0.00
Specular Color Array 4	0.0005	0.00	1.00
Specular Color Array 5	1.00	0.00	0.00
Specular Color Array 6	0.0005	0.00	1.00
Specular Color Array 7	1.00	0.00	0.00
Specular Color Array 8	0.0005	0.00	1.00

The following example shows a rainbow mapped to the same values

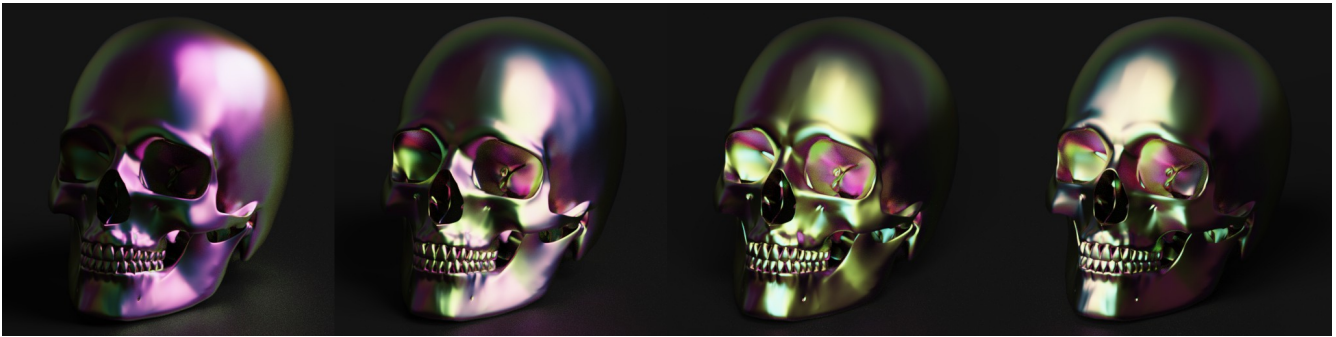


Specular Color Array 1	1.00	0.00	0.00
Specular Color Array 2	1.00	0.41	0.00
Specular Color Array 3	0.67	1.00	0.00
Specular Color Array 4	0.00	1.00	0.019
Specular Color Array 5	0.00	1.00	0.67
Specular Color Array 6	0.00	0.070	1.00
Specular Color Array 7	0.27	0.00	1.00
Specular Color Array 8	1.00	0.00	0.51

This example shows how those rainbow colors get blended with roughness



Since the Color Arrays are mapped to specularity effects they rely heavily on reflections and lighting to determine their look. Surfaces with widely varied arrays can look completely different when lit or viewed from the back than from the front. This is what provides that unique iridescence that makes these shaders interesting. The following is an example of the same prop with the same shader applied being lit from different angles. Note the difference in the colors being produced based on where the light is.



With the color being linked to surface normals in relation to lighting, normal and bump maps will also change the look of your material. Your normal and bump maps will cause your object to take on differences in colors the same way it's geometry does, so there will not be any discrepancies even with heavy normal or bump map usage. Using clever mapping you'll be able to get some very unique results out of the iridescence.

The following example shows a sphere with solid colors in the normal map slot.

