Clear Coat Parameters

In the parameters below, some of them can be overridden by a PxrLayer when connected to the **Input Material** or through a PxrLayerMixer. PxrLayerSurface is designed to better illustrate which parameters are not able to be overridden in a layer by including only parameters that are global. We recommend this material when you know you will be layering. The results of these settings are unchanged.

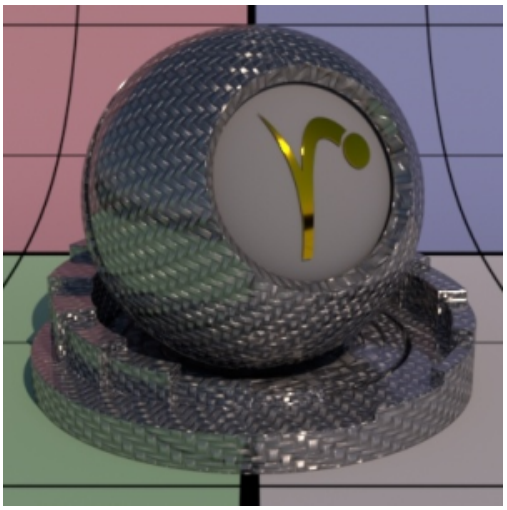
- **Bold Face** parameters are layerable, able to be overridden per layer.
- *Italicized* parameters are not able to be layered or overridden. These are globally obeyed for all layers. For example: Choosing GGX as a specular model will mean all layers will be GGX for that parameter.

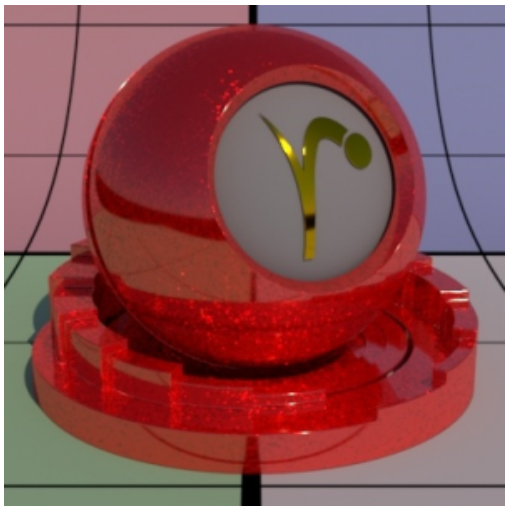
Clear Coat

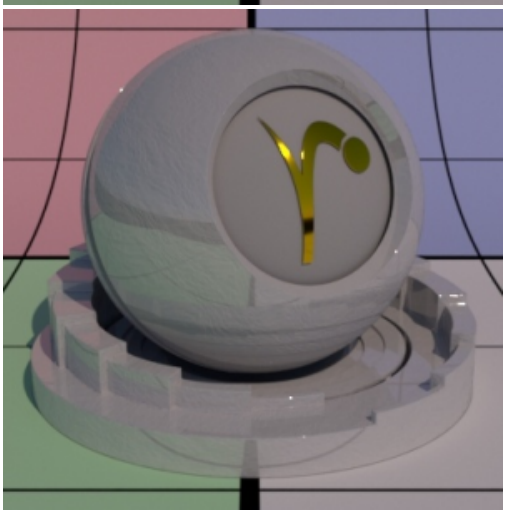
Clear coats are great for making a top glazed layer found in coated objects or paints like car paint, carbon fiber, and more. You can even use a bump exclusive to this layer to make for convincing coating imperfections. While roughness is available, this layer is intended for low amounts of roughness. You will notice in the parameter examples that the base diffuse is 50% gray to illustrate how this works as a coating. If you need a metallic surface, use the above Specular lobes.

The clear coat can also be used to fake a certain thickness like a glaze on a surface using the Layer Thickness parameter.

There's also the option for **Artistic** and **Physical** controls. The Artistic controls allow you to manually alter the properties of the reflection to match your tastes. Using Physical (with provided presets) can provide you with a matching real-world response for those looking to duplicate reality without endless tweaking.

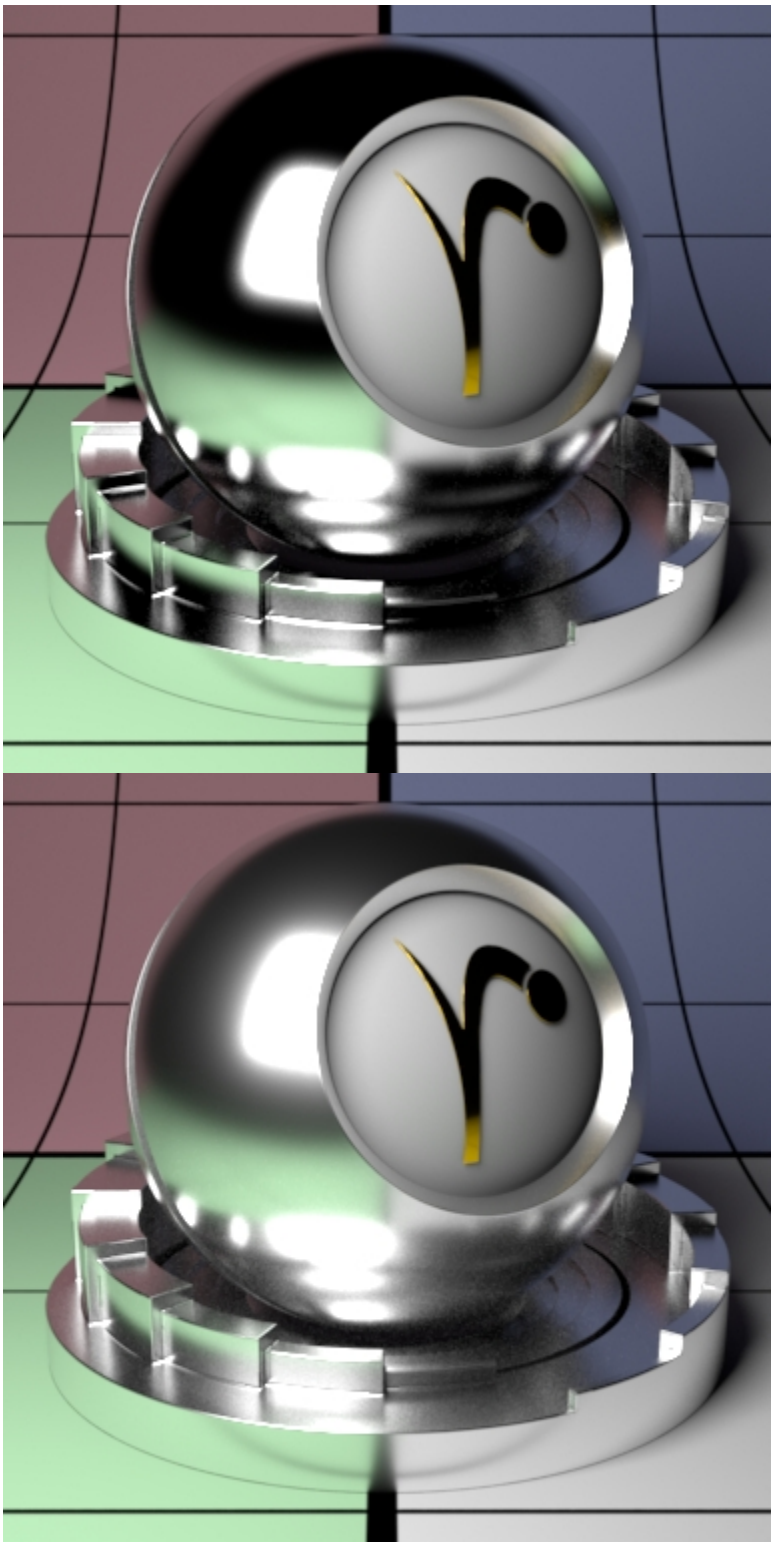






Specular Model

Select which specular model to use: Beckmann or Ggx. Again, Beckmann is useful for perfect mirrors and chrome-like materials. Ggx might be preferred for its "tail" or fade from the center highlight of reflected light sources.



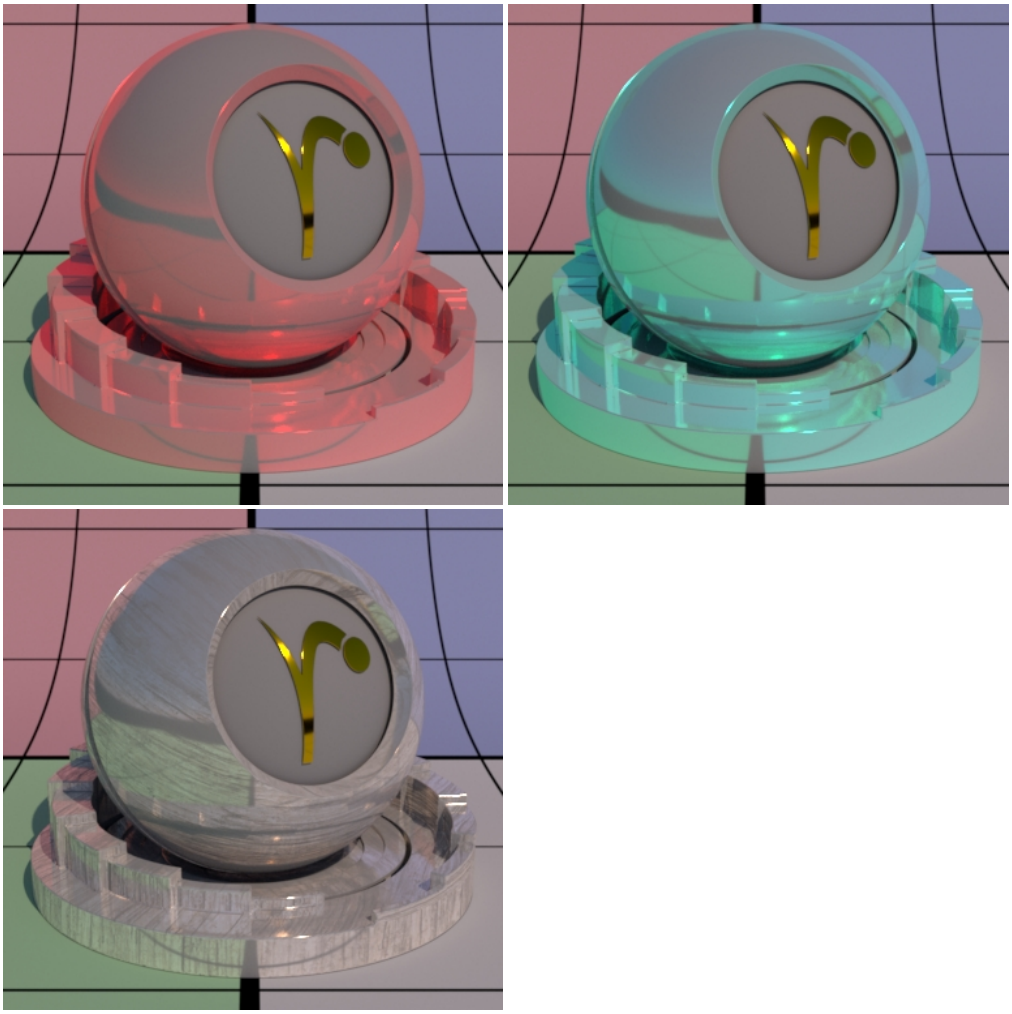
Specular Fresnel Mode

InArtisticmode, specular fresnel response will be controlled by its Face Color, Edge Color, and Fresnel Exponent.

InPhysicalmode, specular fresnel response will be controlled by its Refractive Index and Edge Color.

Face Color *(Artistic Mode)*

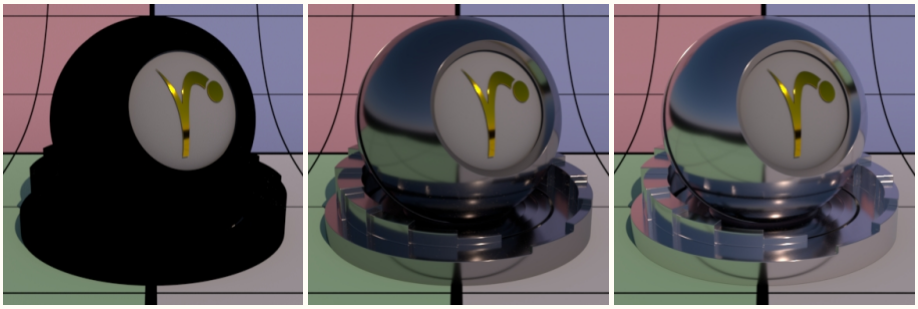
Specular color at facing angle (0-degree incidence). Note that there is no separate gain control. To control the specular "gain", simply adjust the color value or connect it to a PxrExposure node.

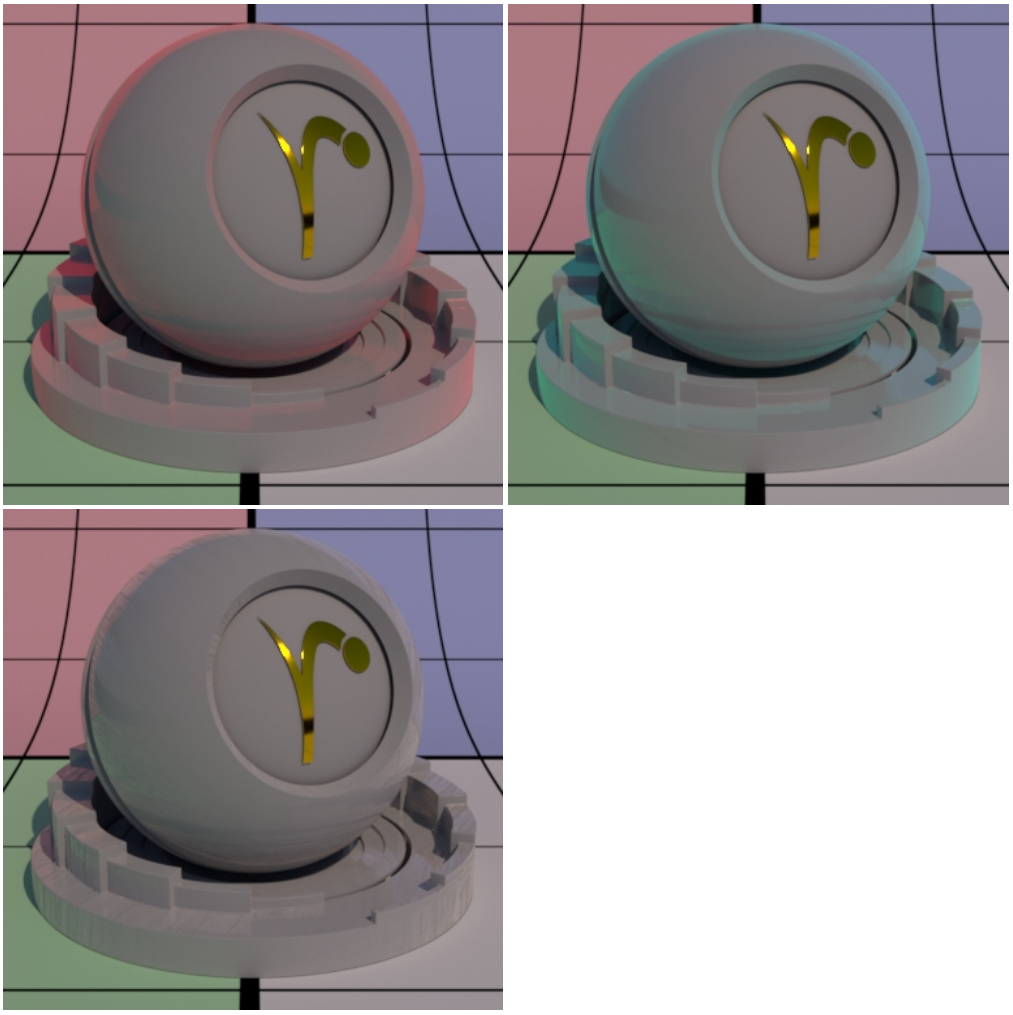


Edge Color

Specular color at the glancing angle (90-degree incidence). To control the edge specular "gain", simply adjust the color value or connect it to a PxrExposure node.

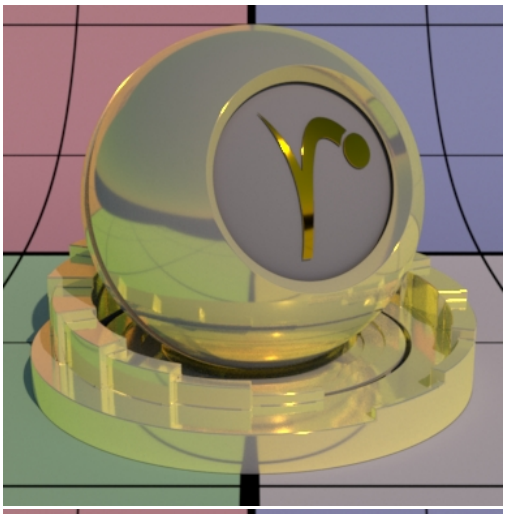
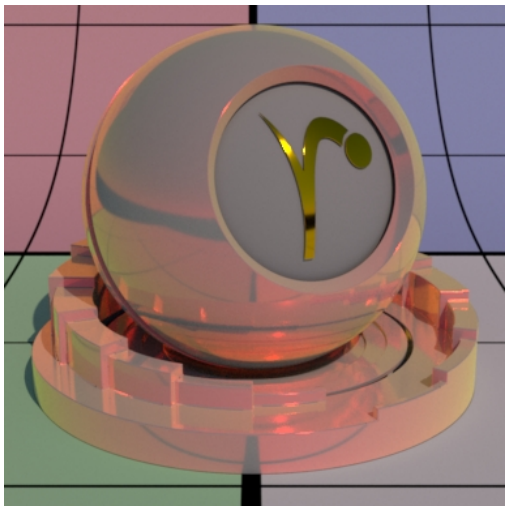
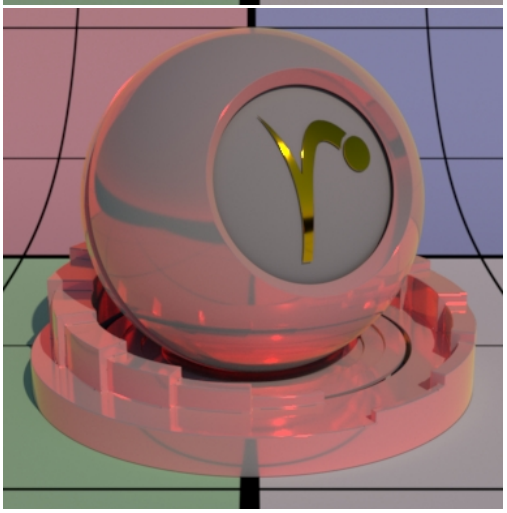
Understand that this control changes meaning in the **Physical Mode** and operates as a multiplier for the reflection result in Physical mode. You can control reflection intensity and even tint the result using this parameter in Physical Mode.





Fresnel Exponent (Artistic Mode)

Specular fresnel curve exponent. Lower numbers reduce the effect of **Face Color** while increasing the effect of **Edge Color** . Higher numbers reverse this. If your face and edge colors are the same, then there is no visible effect. Below we use a *red* Face Color and *green* Edge Color and increase the Fresnel Exponent from 0.1 to 1.5 and finally 5.0 with a small roughness.

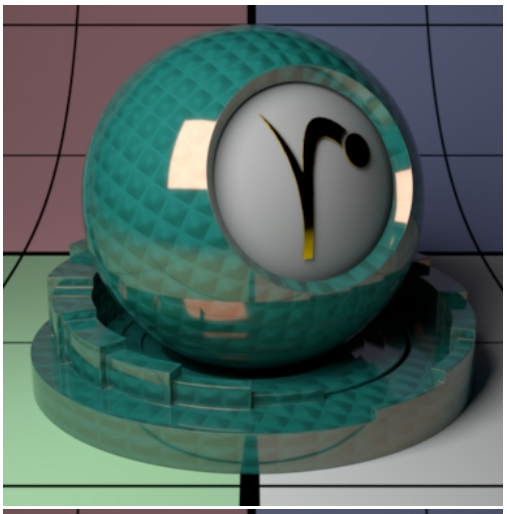
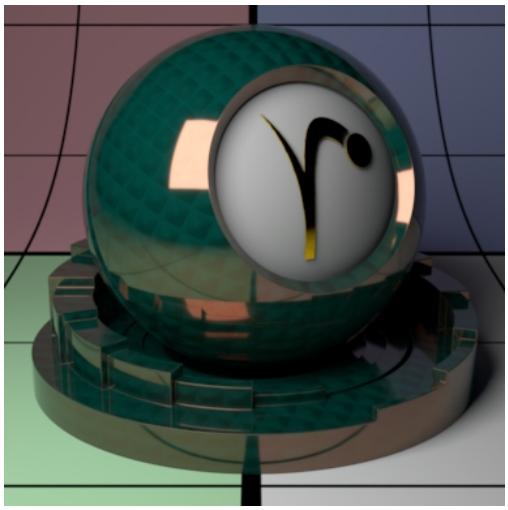
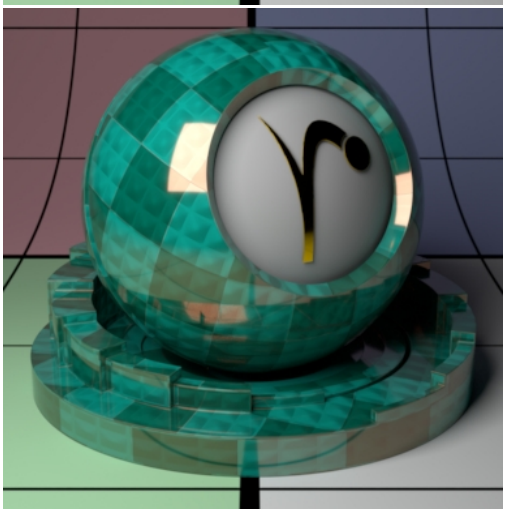




Refractive Index (Physical Mode)

This is a parameter meant to describe a physical refractive Index; the *dielectric* index of refraction for the material. Channel values for this parameter typically lie in the range 1 - 3. Since we support 3 color values to capture the spectral effect presets may be preferred over color pickers to avoid lots of tweaking.

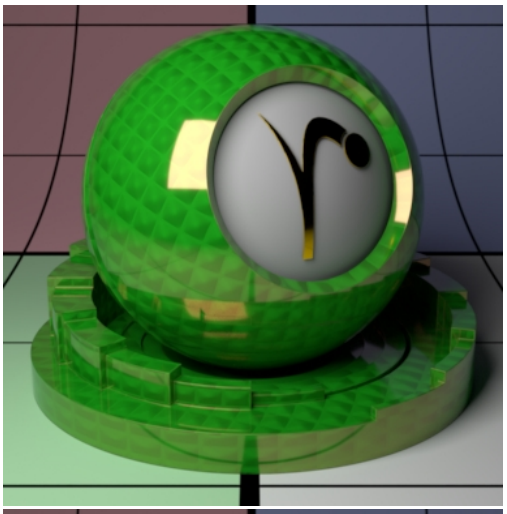
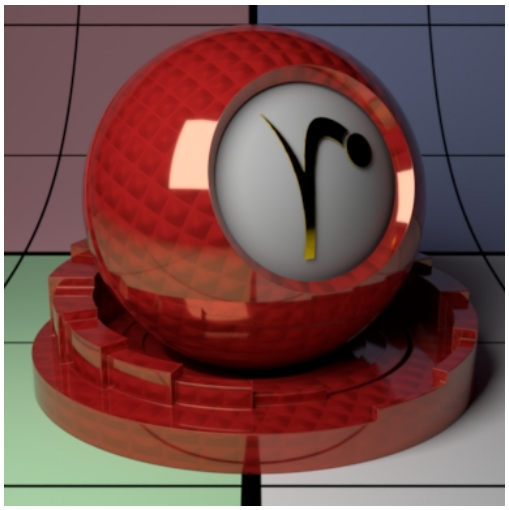
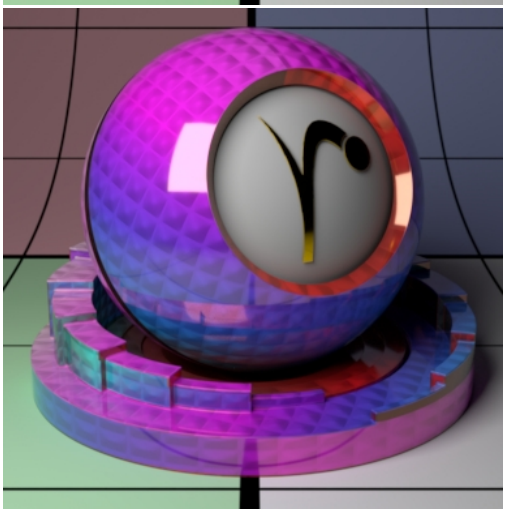
Layer Thickness (Physical Mode)

This control simulates a thick coating or glaze on the material. It can be textured to vary color as well. Below the shading ball has been given a bump on the Diffuse lobe only, making the effect of thickness more obvious for usage. The first two images are thickness 1 and 3 using the same Absorption Tint to show that thicker settings absorb more light physically. The last image is textured thickness using a checker pattern.

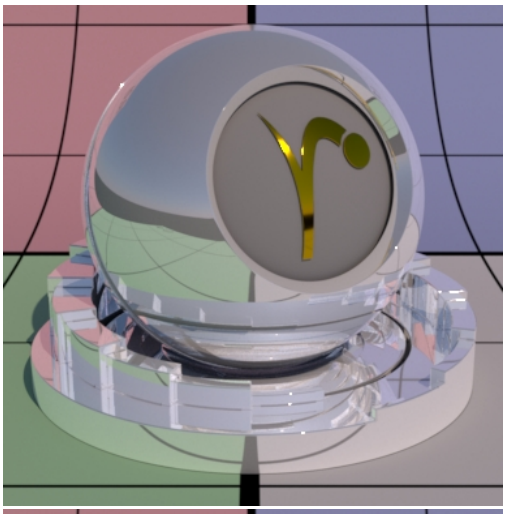
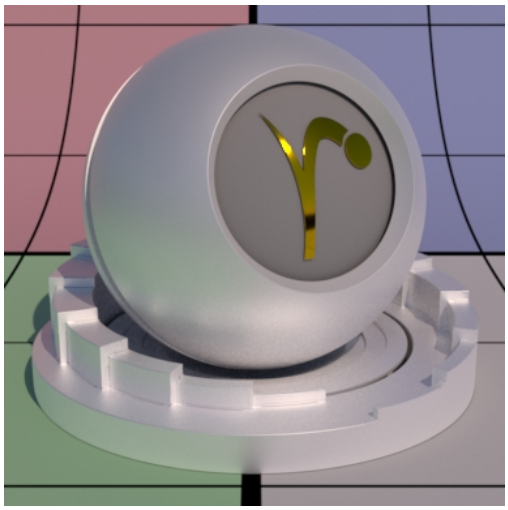
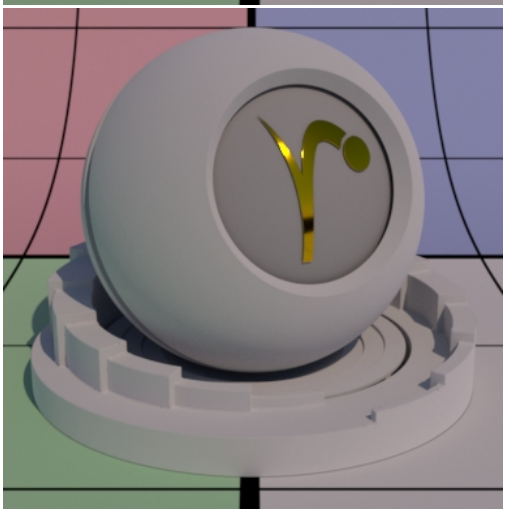
Absorption Tint (Physical Mode)

This parameter controls the color of the resulting attenuation or coating, note that the thickness parameter above may change the look, where thicker settings are more saturated or absorb more light. Below are two solid colors and then a ramp, thickness remains constant at 1.0 The underlying diffuse lobe has a bump applied to it to help simulate the "thickness".

Roughness

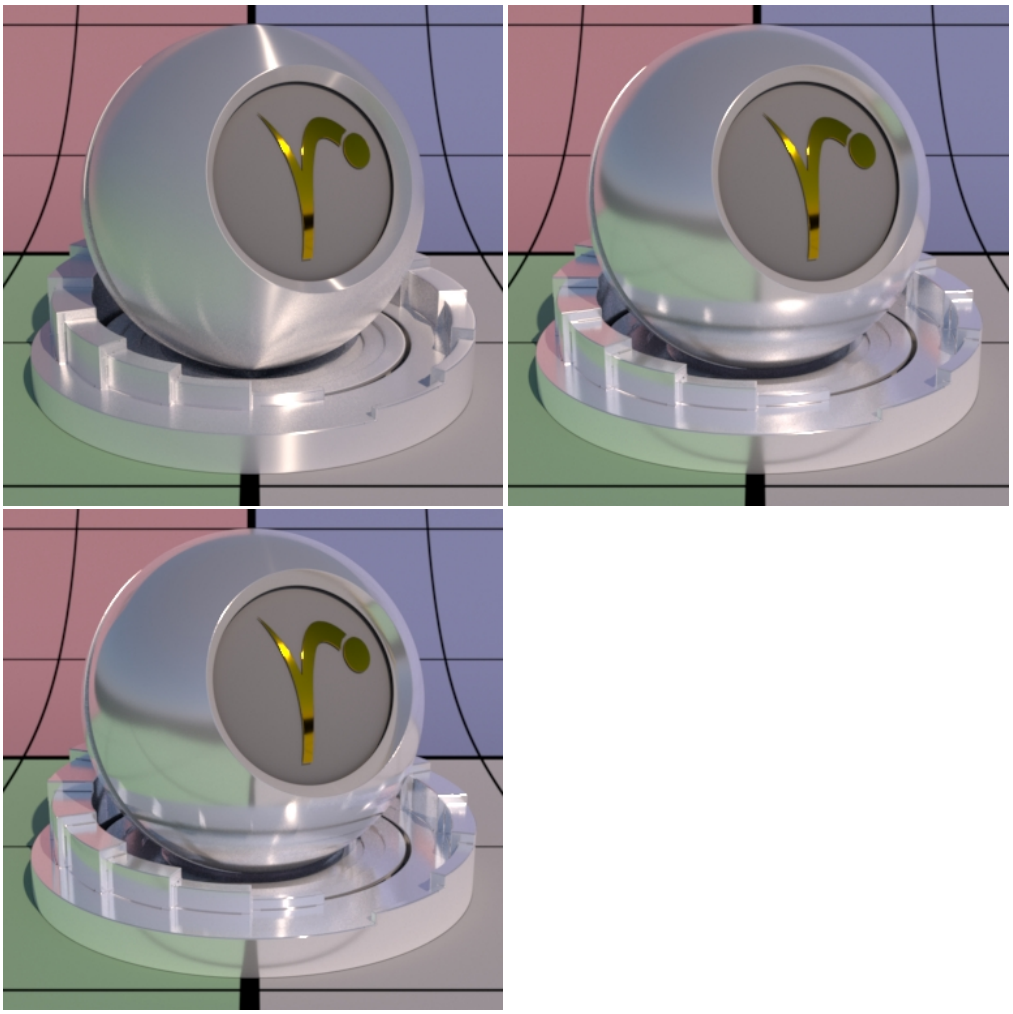
Specular roughness. A greater value produces rougher or "blurry" specular reflection. At 1.0 it resembles a diffuse surface and at 0.0 it's a perfectly clear reflection. Most objects will be realistic somewhere in between these values. Texturing this value may give you interesting effects like smudges, greasy fingerprints, and worn surfaces. Below are values 0.0, 0.5, and 1.0

Anisotropy

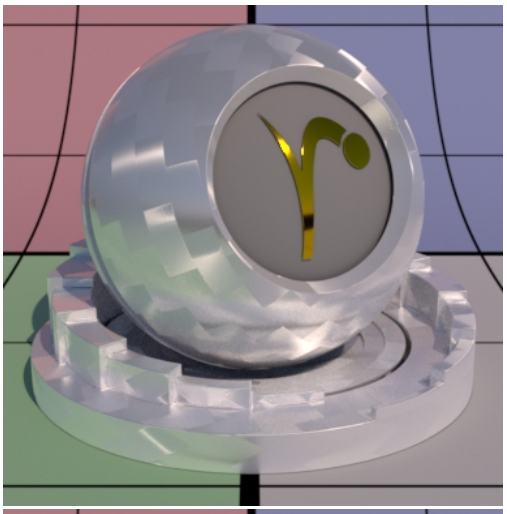
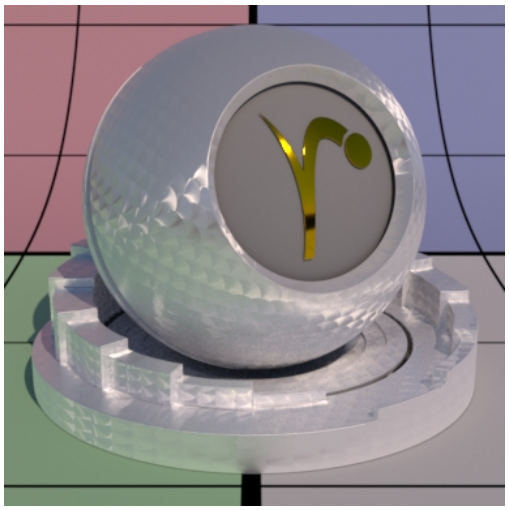
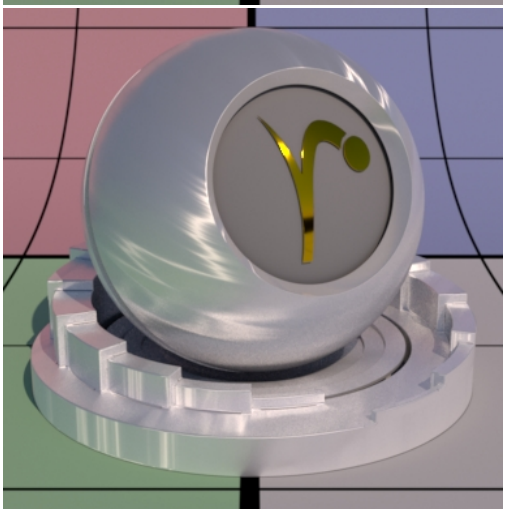
Controls the shape of the specular highlights and reflections. 0 means isotropy which produces the regular circular specular highlight. Values from -1.0 to 1.0 produce the range of ellipses (stretching) from wide to tall.

By default, the direction of anisotropy is controlled by the model texture parameters. If the Shading Tangent is specified, it is used instead. You may even "overdrive" the parameter by going further than -1.0 and 1.0.



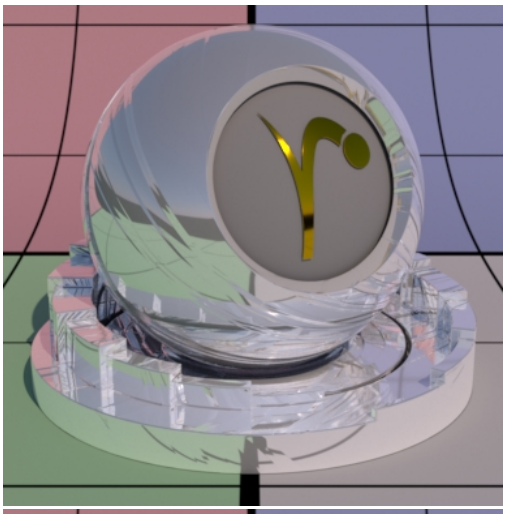
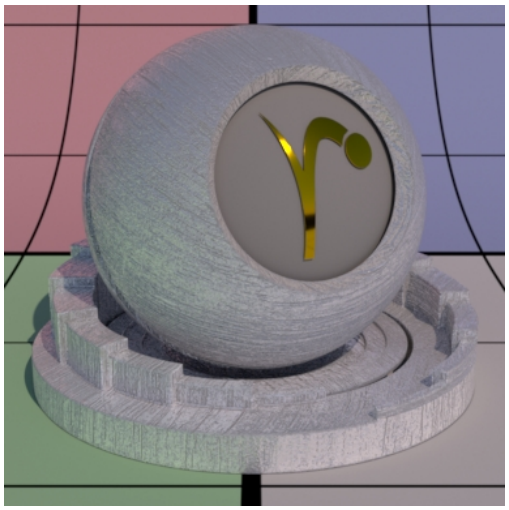
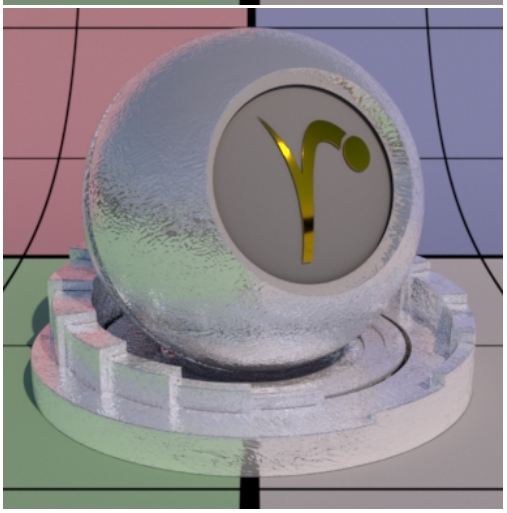
Shading Tangent

Controls the anisotropy direction. Only valid when it is connected to a pattern. This is useful for making brushed metals.

Bump

Normal to use for the clear coat illumination. If this is not set, it will use the global bump normal specified in the Properties near the bottom of the page. Setting this separately can produce a "glazed" effect where you have a bumpy clearcoat above a smooth surface.

Double Sided

If on, illuminate on both sides of the surface for this clear coat lobe, that is, this will illuminate the surface whose normal is pointing away from the camera as well.

Specular Energy Compensation

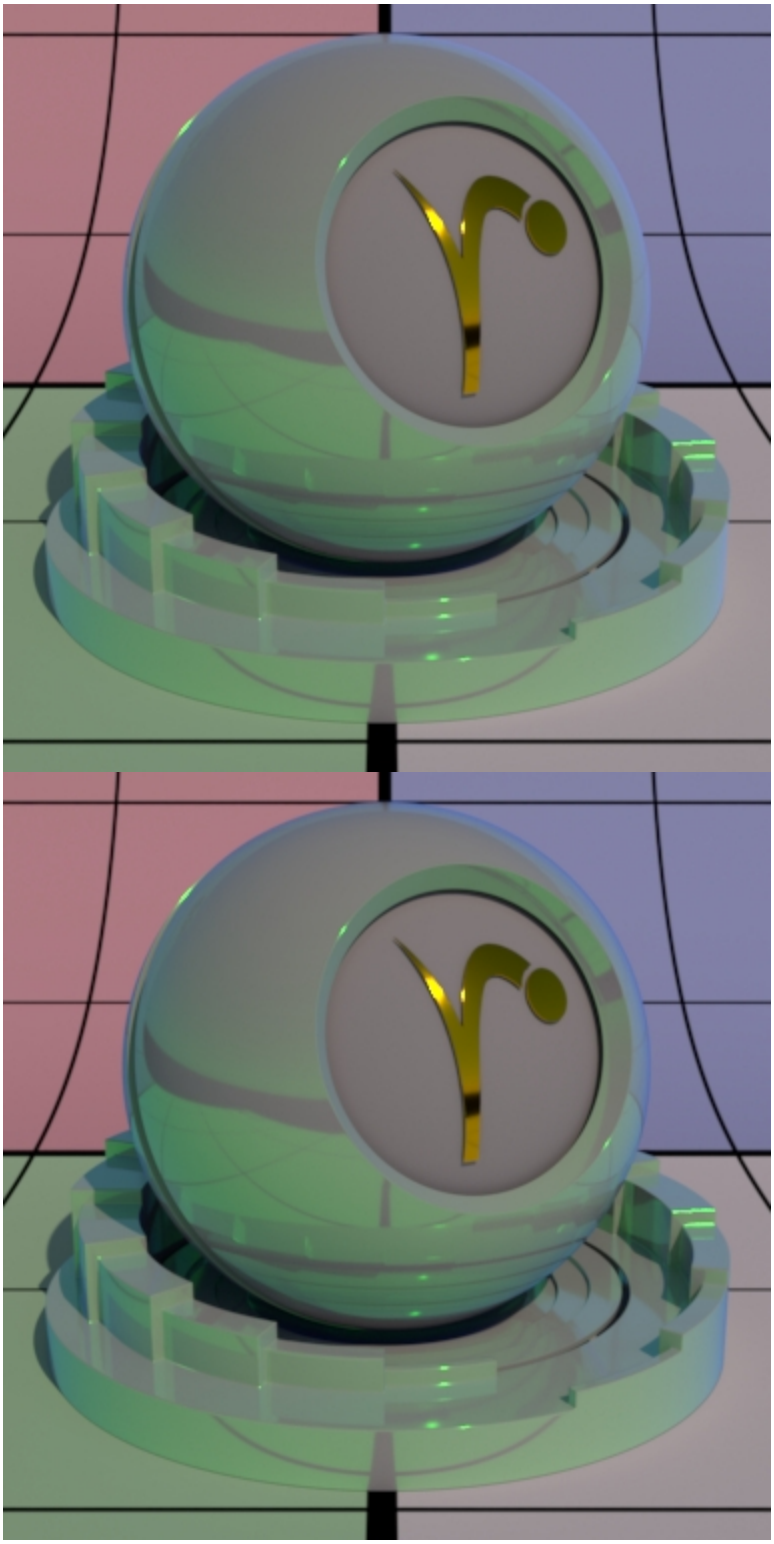
Applies fresnel energy compensation to diffuse and subsurface illumination lobes. A value of 1.0 attempts to fully balance those results by darkening them against the specular and rough specular illumination responses.

Specular and Rough Specular roughness are also taken into account. The effect fades off as specular face or edge color approaches 1.0, so metals can add a diffuse baseline color. Look at Clearcoat Energy Compensation for a visual example. When Physical Fresnel mode is enabled, the energy compensation will attenuate according to ior and kappa. When Artistic mode is enabled, it will attenuate according to a curve derived from the ratio faceColor/edgeColor and is not purely physical.

Clearcoat Energy Compensation

Applies fresnel energy compensation to all lobes other than clearcoat itself. A value of 1.0 attempts to fully balance those results by darkening them against the clearcoat illumination response.

Clearcoat roughness is also taken into account. The effect fades off as clearcoat face or edge color approaches 1.0, so metals can add a diffuse baseline color. Left is 0.0 (default) Right is 1.0. Notice the darkening (changes in energy conservation) that happens.



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