

Generic Reflection

The Reflection rollout is part of the Generic material's parameters.

Reflection

Some options are available only in Advanced mode.

Reflection – Enables reflection of the material.

Reflection Color – Specifies the reflection color. Note that the reflection color dims the diffuse surface color based on the **Energy preservation** option. *For more information, please see the [Reflection Color Parameter example](#) below.*

Reflection Glossiness – Available when the **Surface Control** option is set to **Use Glossiness**. Specifies the sharpness of reflections. A value of 1.0 means perfect mirror-like reflection; lower values produce blurry or glossy reflections. Use the **Subdivs** parameter below to control the quality of glossy reflections. *For more information, please see the [Reflection Glossiness Parameter example](#) below.*

Reflection Roughness – Available when the **Surface Control** option is set to **Use Roughness**. Specifies the sharpness of reflections. A value of 0.0 means perfect mirror-like reflection; higher values produce blurry or glossy reflections. Use the **Subdivs** parameter below to control the quality of glossy reflections.

Fresnel – When enabled, the reflection strength depends on the viewing angle of the surface. Some materials in nature (e.g. glass, etc.) reflect light in this manner. Note that the Fresnel effect depends on the index of refraction as well. *For more information, please see the [Fresnel Option example](#) below.*

Reflection IOR – When disabled, the Refraction IOR is used as Reflection IOR. Enable for finer control over the Reflection IOR.

Metalness – Controls the reflection model of the material from dielectric (metalness 0.0) to metallic (metalness 1.0). Note that any intermediate value between 0.0 and 1.0 does not correspond to a physical material. This parameter can be used with PBR setups coming from other applications. The Metalness texture map should be considered a mask between two different types of materials: dielectric or conductive.

GTR Tail Falloff – Active only when the BRDF is set to GGX. It allows fine tuning of the specular reflections by controlling the **transition from highlighted to non-highlighted areas**. Higher values such as the default make the highlights sharper, while lower values make the transition more subtle. This parameter does not affect the size of the actual highlight - this is controlled by the **Reflect glossiness** parameter. *For more information, please see the [GTR tail falloff example](#) below.*

Surface Control – Changes the behavior of all material parameters controlling the surface smoothness:

Use Glossiness – The base and coat reflection layers as well as the Sheen will use Glossiness values. A value of 1.0 means perfectly smooth surface, while a value of 0.0. means rough/diffuse-like reflection.

Use Roughness – The base and coat reflection layers as well as the Sheen will use Roughness values. A value of 1.0 means rough/diffuse-like reflection, while a value of 0.0. means perfectly smooth surface.

BRDF – Determines the type of BRDF (the shape of the highlight). There are 4 types available - **Phong**, **Blinn**, **Ward**, **Microfacet GTR (GGX)**. *For more information, please see the [BRDF Type example](#) below.*

GGX is the most modern and flexible BRDF (Bidirectional reflectance distribution function) type and is able to better represent a broad range of materials thanks to its ability to control the shape of the specular lobe. There currently isn't any particular performance difference between models and there is little reason to choose any of the other types.

Historically, the Phong, Blinn, Ward and GGX are successive reflectance models developed over the years in computer graphics where each model aimed to improve on the limitations of the previous ones. For example, the specular highlights with the Phong model have a very narrow and bright center with no falloff, but it doesn't work well with anisotropic reflections. The Blinn model has broader highlight center with a tight falloff. The Ward model has an even broader center and falloff. The GGX model has a bright center and an even longer falloff (at default settings). In the past, each model's characteristics resembled more closely a certain type of material, for example Phong could be used for plastics, Ward for cloth and metals, and Blinn for other common surfaces. However with the introduction of the GGX model, all of these surfaces can be approximated well, thus reducing the need for using the other models.

It should be noted that no principled model is able to represent all possible materials entirely accurately, and where those models fail - for example when the material isn't viewed frontally - only approaches such as that of **VRscans** are able to capture the correct material representation.

Back Side Reflect – When disabled, reflections are calculated for the front side of the objects only. When enabled back-side reflections are also calculated.

Max depth – Specifies the number of times a ray can be reflected. Projects with lots of reflective and refractive surfaces may require higher values to look right.

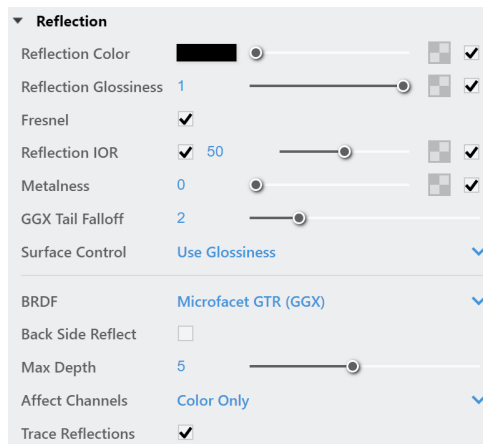
Affect Channels – Specify which channels are affected by the reflectivity of the material.

Color Only – The reflectivity of the material affects only the RGB channel of the final render

Color+Alpha – Causes the material to transmit the alpha of the reflected objects instead of displaying an opaque alpha.

All Channels – The reflectivity of the material affects all channels and render elements.

Trace Reflections – Enables reflection tracing for the current material. If disabled, disables only reflections and not specular highlights.



Example: BRDF Type

This example demonstrates the differences between the BRDFs available in V-Ray.



Phong



Blinn



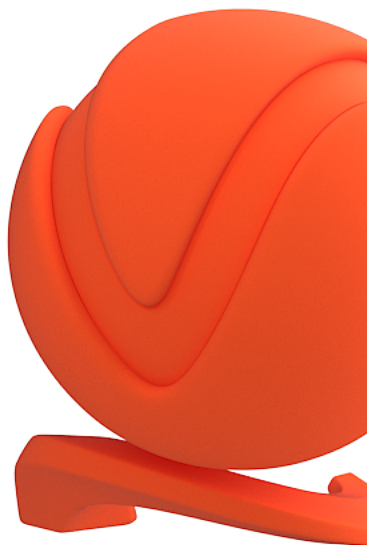
Ward



Microfacet GTX (GGX)

Example: GTR Tail Falloff

This example demonstrates the effect of the GTR tail falloff parameter.



GTR tailoff: 0.1



GTR tailoff: 0.5



GTR tailoff: 1.0



GTR tailoff: 1.5



GTR tailoff: 2.0 (default)

Anisotropy

Anisotropy (-1 to 1) – Determines the shape of the highlight. A value of 0.0 means isotropic highlights. Negative and positive values simulate brushed surfaces. *For more information, please see the [Anisotropy example](#) below.*

Rotation – Determines the orientations of the anisotropic effect in a float value between 0 and 1 (where 0 is 0 degrees and 1 is 360 degrees). *For more information, see the [Rotation example](#) below.*

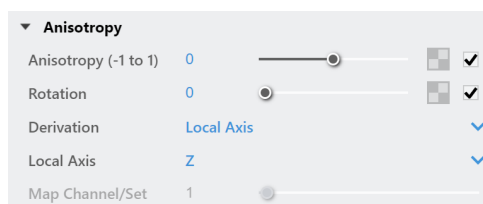
Derivation – Determines the anisotropy orientation method.

Local Axis – The orientation of the anisotropic reflection/highlight is based on the object's local X, Y or Z axis.

Map Channel – When enabled, the orientation of the anisotropic reflection/highlight is based on the specified map channel/set.

Local Axis – Specifies a local axis used for Anisotropy orientation. (X, Y, Z)

Map Channel/Set – Specifies a map channel that is used for the anisotropic reflections /highlights orientation.



Example: The Anisotropy and Rotation Parameters

This example demonstrates the effect of the **Anisotropy** and **Rotation** parameters, which determines the shape of the highlight. For the examples below the **Type** was set to **Microfacet GTR (GGX)**.



Anisotropy= -0.8



Anisotropy = -0.4



Anisotropy = -0.2



Anisotropy = 0.2



Anisotropy = 0.4



Anisotropy = 0.8



Rotation = 0.1



Rotation = 0.2



Rotation = 0.3



Rotation = 0.4



Rotation = 0.5



Rotation = 0.6



Rotation = 0.7



Rotation = 0.8



Rotation = 0.9



Rotation = 1

Dim Distance

Dim Distance – Enables Dim Distance.

Distance – Specifies a distance after which the reflection rays are not traced.

Dim Falloff – Sets a fall off radius for the dim distance.

▼ Dim Distance

Distance

100

Dim Falloff

0

Example: The Reflection Color Parameter

This example demonstrates how the **Reflection color** parameter controls the reflectivity of the material. Note that this color also acts as a filter for the diffuse color.



Reflection color = Black (0, 0, 0)



Reflection color = Medium Gray (128, 128, 128)



Reflection color = Light Gray (200, 200, 200)



Reflection color = White (255, 255, 255)

Example: The Reflection Glossiness Parameter

This example demonstrates how the **Reflection glossiness** parameter controls the highlights and reflection blurriness of the material.



Reflection Glossiness = 1.0 (perfect mirror reflections)



Reflection Glossiness = 0.8



Reflection Glossiness = 0.6

Example: The Fresnel Option

This example demonstrates the effect of the **Fresnel** option. Note how the strength of the reflection varies with the **IOR** of the material. For this example, the **Reflection color** is pure white (255, 255, 255).



Fresnel = On, **IOR** = 1.3



Fresnel = On, IOR = 2.0



Fresnel = On, IOR = 10.0



Fresnel = Off, **IOR** = 10.0

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[Generic Refraction](#)