Iray Material Guidelines

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Headquarters:

Espace France
4 voie Romaine
33610 Canéjan
France

Documentation lead: P. Peyrevidal

INTRODUCTION

We are committed to offering our customers more flexibility in terms of generating ever more realistic visuals. That's why we decided in 2017 to integrate the NVIDIA Iray engine into the v8.0 version of Patchwork 3D.

Since then, we have been continuously improving the behavior of our software with this engine.

Depending on how the materials are created, there may be differences between the rendering of OpenGL and Iray. We have created these guidelines to allow you to match the rendering of the two engines as closely as possible.

You will find information on the behavior of materials in Patchwork 3D as well as information about the Iray Settings editor.

MATERIALS EDITOR

The behavior of multilayer materials with Iray

Iray has a different rendering for multilayer materials. The more layers in the material, the darker the result will be in Iray. Therefore, it is necessary to use the least layer possible if you want a similar result between OpenGL and the Iray rendering engine. In the case of a CarPaint material, we strongly recommend you use one diffuse layer, one haze layer, one flakes layer, and finally one clear coat layer only.


Multilayer Material with OpenGL


Multilayer Material with Iray

Illumination layer

Pay attention to the illumination layer for the velvet effect. The illumination layer creates light in Iray. In addition, the illumination layer ignores the hue and direction of light from the HDRI environment. To make a velvet effect in Iray, it is better to use the specular roughness parameter and set it to a high value.

Illumination with OpenGL
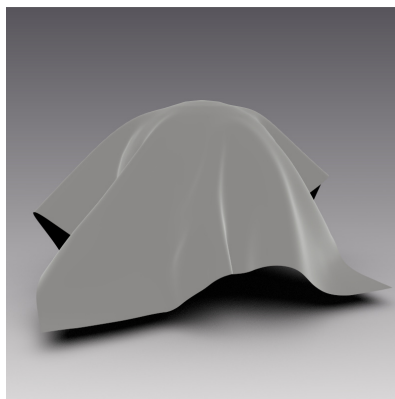
*Illumination with Iray*
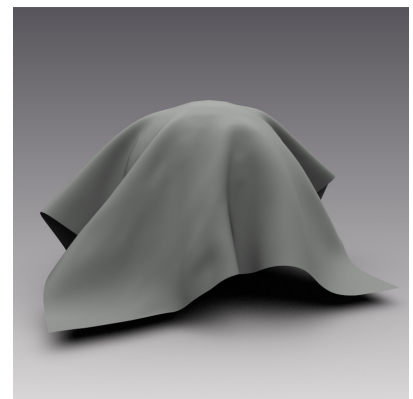
Iray with roughness

Specular Layer

In OpenGL, it is possible to set the specular intensity parameter for materials to be greater than 1. This value greater than 1 indicates that the material returns more energy than it does not receive, which is not realistic from the point of view of the physical properties of the materials.Because Iray is an engine that perfectly simulates the actual physical behavior of light and materials, you can not use specular

intensity values greater than 1. To have a similar result between OpenGL and Iray, please avoid setting the specular intensity greater than 1.
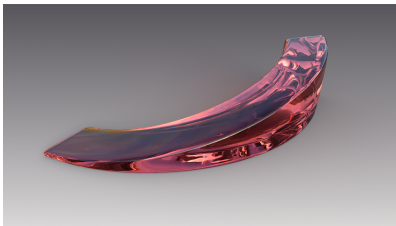

Specular layer with OpenGL
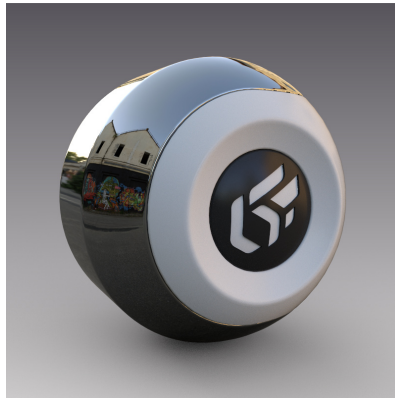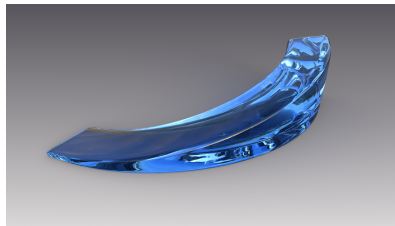

Specular layer with Iray

Behavior of Standard Materials with Iray

Setting Standard Materials in Transparent Filter Type.

In the **Raytracing** tab of the **Materials** editor, the transmission parameters are compatible with Iray. You can use the **Surface Filtering** to overwrite the material color in Iray.
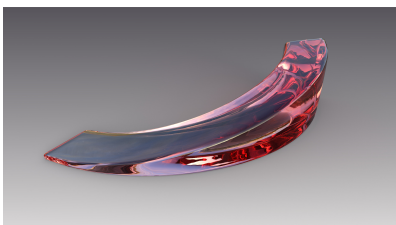

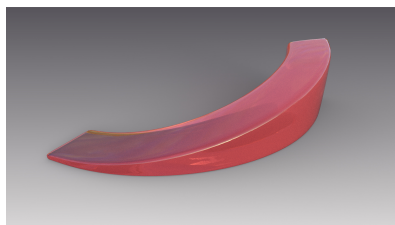*Transparent red filter in Iray*

Overwriting transparency red filter by a blue one in Iray

The **Volume absorption** allows having a transparent material which color depends on the thickness of the object. The more the object will be thin the more the color is light, and vice versa. The **Roughness** parameter is used to manage the roughness of the material and to obtain a frosted glass effect.

Transparent filter with Absorption

Transparent filter with Roughness

IRAY SETTINGS EDITOR

Scene tab

> 💡 **TIP**
> **How does refinement work?**
>
> The Iray rendering engine refines the image continuously to improve quality. The *Refinement stop criteria* parameter is used to define the calculation limit. The *Max samples per pixel* parameter determines the number of rendering passes allowed for the calculation of the image. It is also possible to put a time limit.
>
> **Iray will then stop calculating the image if it reaches one of the limiting parameters, either the number of passes or the maximum time.**

> 💡 **TIP**
> **What is the Fireflies parameter used for?**
>
> Enabling the *Fireflies* parameter allows you to clear light spots that may appear during the calculation. In order to make this parameter works, it is necessary to check also the *Degrain Filtering*.

> 💡 **TIP**
> **What is the Denoise Filtering parameter used for?**
>
> The parameter *Denoise Filtering* reduces the noise in the image from a given number of iterations. This setting should not be used if the scene has materials with very fine details, such as flakes of a Car paint material, or very small grain plastics, noise reduction would erase these details.
>
>
>
> *Denoise filtering **disabled***   *Denoise filtering **enabled***

Tone Mapping Tab

💡 **TIP**

What is the Exposure parameter used for?

The *Exposure* parameter (default: 7) allows you to underexposed or overexposed the rendering, as you would do with a conventional camera. Do not hesitate to modify this parameter according to the environment applied in the scene, to bring more or less light into the lens.

EV (Exposure Value): 7   *EV (Exposure Value): 8*   *EV (Exposure Value): 9*

Materials Tab

💡 **TIP**

What is the use of overriding a material in Iray and how to do it?

It is possible to override a material with another one in the *Materials* tab of the Iray settings. You can replace assigned material onto surfaces in OpenGL by another material when rendering with Iray. To do this, simply check the box *Override with the material*, then choose the material you want to use. It is possible to override an OpenGL material with a .kmt, .axf, or .mdl material.

💡 **TIP**

How to create a shadow material with more features than Patchwork 3D?

Tick the *Use as matte material* checkbox to transform a standard material into a matte material and display only shadows and specular reflections on the surfaces that have this material. This allows for a reflection of the product on the ground, as well as these shadows.
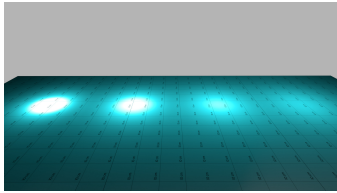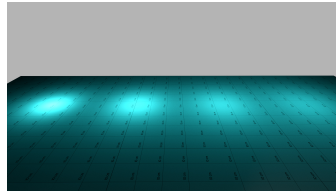
Lighting tab

💡 **TIP**

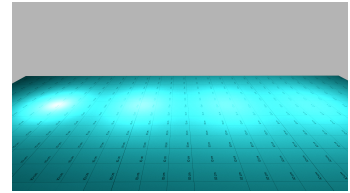**How to compensate for the lighting differences between OpenGL and Iray?**

OpenGL engine lights do not have the same rendering in Iray. The result in OpenGL gives a weaker illumination in Iray.To correct this, in the *Lighting* tab of the Iray settings, it is possible to override the intensity of the lights to make them brighter.

OpenGL illumination with intensity 1	*Iray illumination without light override*	*Iray illumination with light override, intensity 1*

Sun and Sky tab

💡 **TIP**

How to use the real-time Sun with Iray?

The renderings of the Iray Sun and the Real-Time Sun of Patchwork 3D are different. Depending on what you want to render, Iray Sun or the Real-Time Sun must be used.

- **If you enable the Sun from the Iray Settings editor**, you override/replace the HDRI environment with the Iray physical sky/sun model.

The Iray Sun and Sky is convenient for interior architecture scenes, where a specific environment is not required (the environment of the scene can not be used at the same time as the sky and the sun).

- **If you enable the Real-Time Sun** from its dedicated editor you create in Iray only the shadow of the sun and you keep the HDRI environment to be suitable for the rendering of Patchwork 3D.

How to integrate an environment in Iray?

The *Environment* material of Patchwork 3D is not supported in Iray. To be able to see the environment in the scene in Iray rendering mode, some manipulations are necessary.

1. We must first create a camera from the *Cameras* editor **[1]** and a sensor from the sidebar of *Matter* by following this path: *Internal Libraries* tab > *Sensor Library* **[2] [3] [4]**, which must be assigned to the camera by dragging and dropping from the Sensor Library to the Camera editor **[6]**.
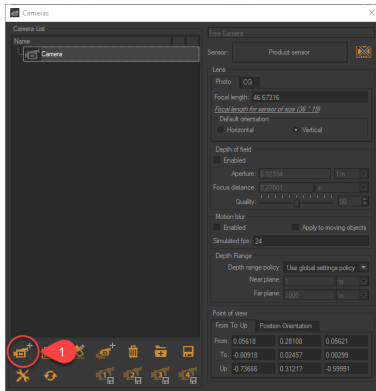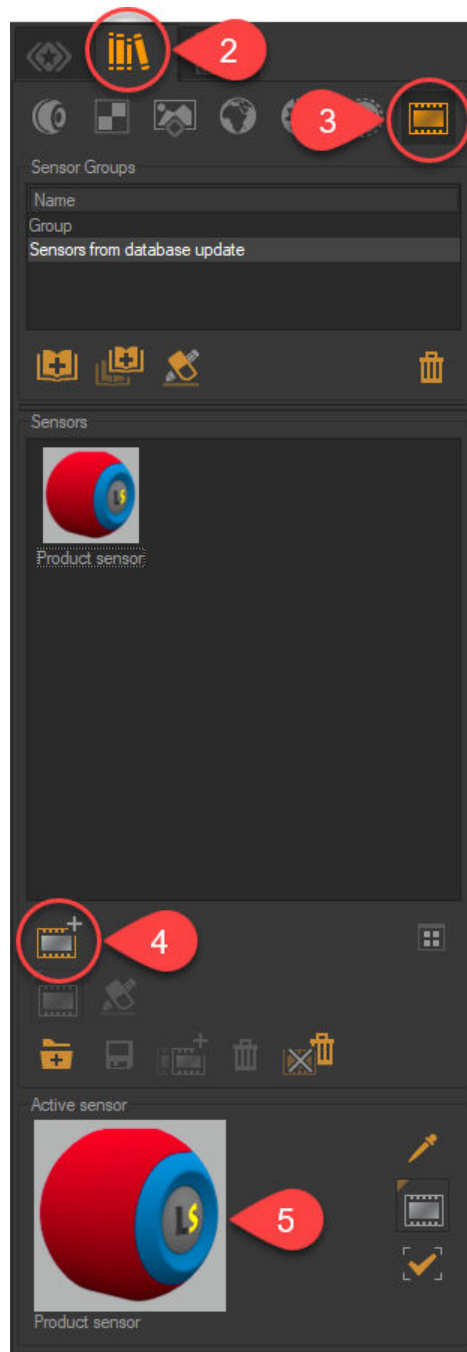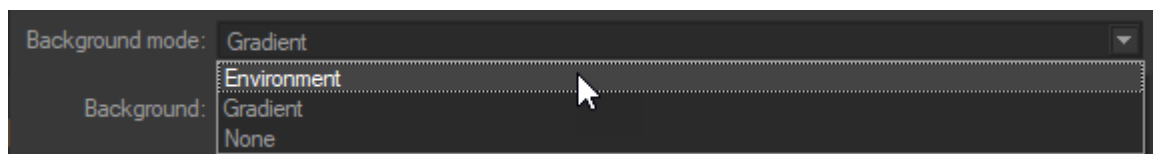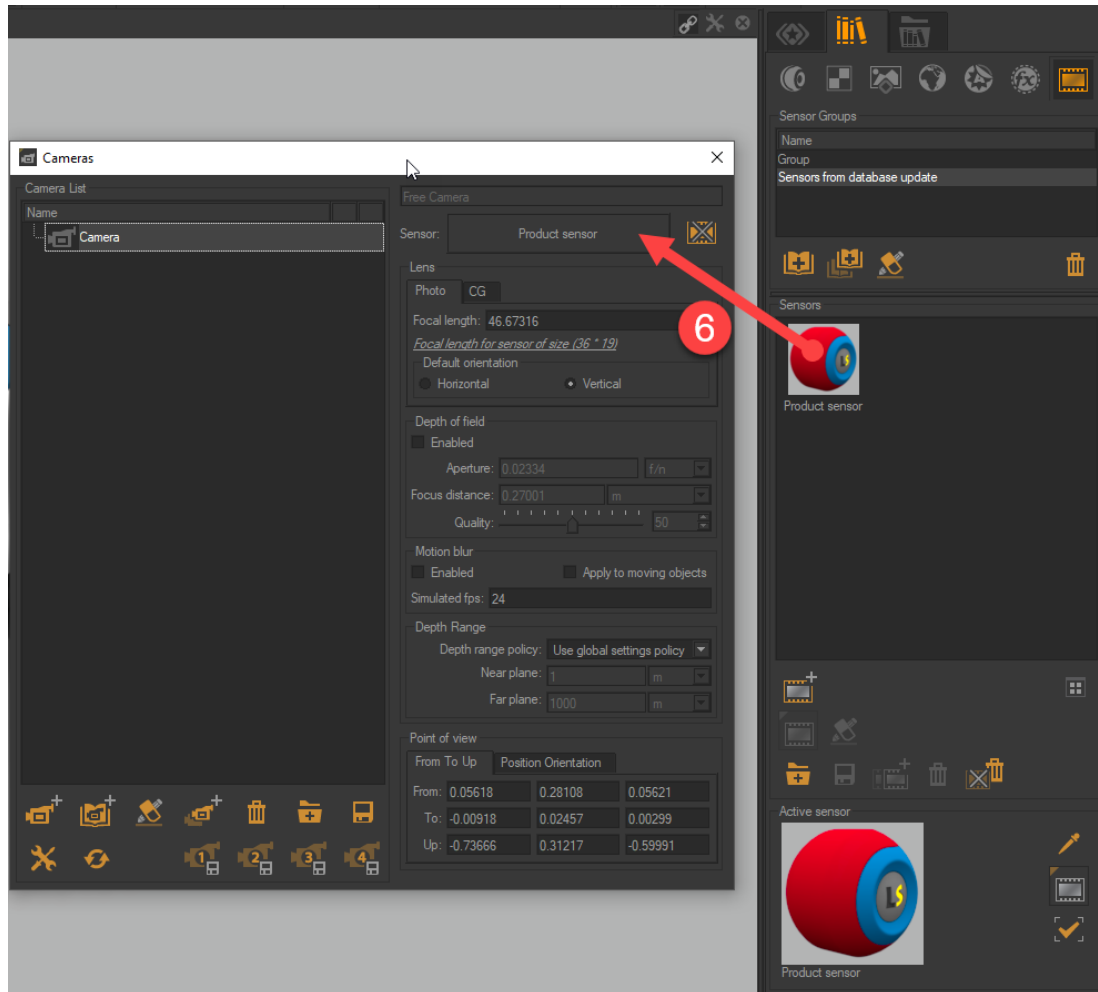
Creating a Camera

Creating a Sensor

2. From the **Sensor Library**, double-click the active sensor at the bottom of the sidebar to open the **Sensors** editor ⑤. In the editor, select **Environment** in the **Background Mode**.

*Drag and drop the sensor just created into the **Cameras** editor.*

3. Once this step is done, it remains to activate and adjust the parameter of parallax correction in the environment of the scene.

    From ***Environment Library*** 7 8 9 , double-click the active environment 10 at the bottom of the sidebar to open the environment editor.

    On the ***Parallax Correction*** tab 12 , select the type of geometry 13 . To make it easier to adjust the geometry scale, click this icon .
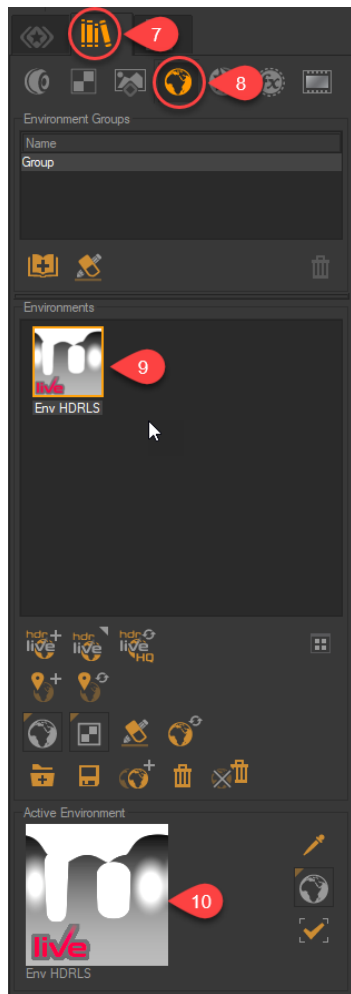
The Environment Library
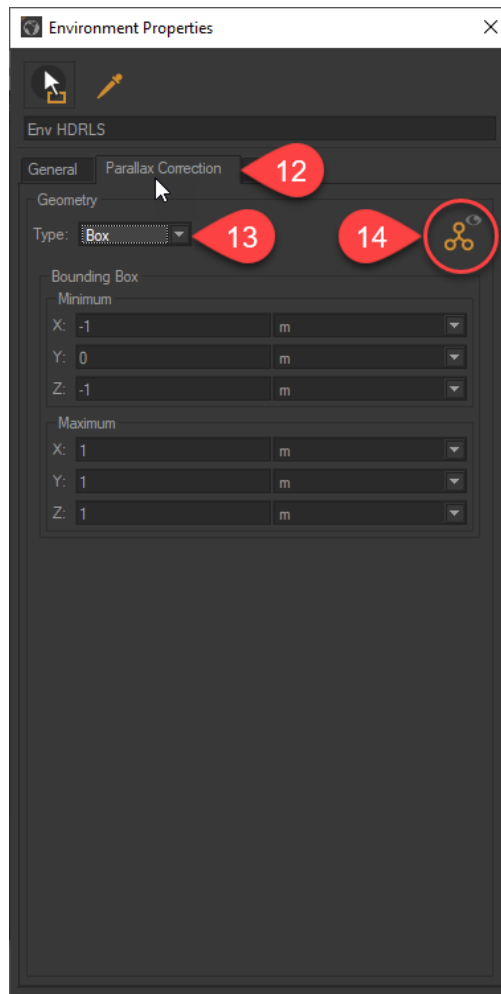
Assigning a geometry type to the environment