

# Refraction Filter

This page gives some basic details about the Refraction Filter Render Element and how it is used in compositing.

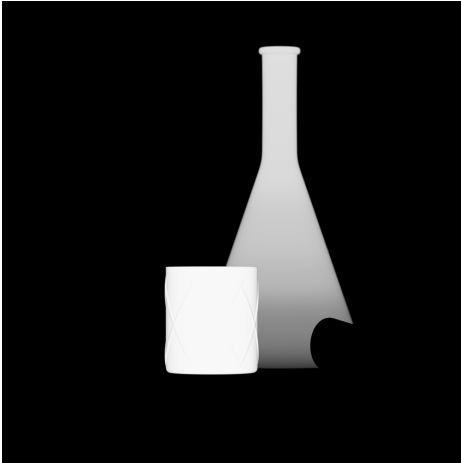
## Overview

---

The Refraction Filter Render Element is an image that stores refraction information calculated from the materials' refraction values in the scene. Materials with no refraction values appear as black, while refractive materials appear as white (maximum refraction) or gray (lesser amounts of refraction). If any hue (color) is specified in the material's Refractive Color parameter, that hue and value will be represented here in the Refraction Filter as well as being affected by the refraction's Amount parameter.

In comparison, the [Raw Refraction](#) Render Element is a color render element that takes materials and their colors into account when rendering refraction. Multiplying these two render elements together produces the [Refraction](#) Render Element.

To properly calculate the Refraction Filter Render Element, the Refraction Render Element must also be added to the list of render elements being calculated during the rendering process to properly determine all the refraction information in the scene.



## Attributes

---

The parameters for this render element appear in the [V-Ray RenderChannelColor](#) render channels node.

**Deep Output** – Specifies whether to include this render element in deep images.

**Color Mapping** – When enabled, the [Color Mapping](#) options in the render settings are applied to the current render channel.

**Consider For AA** – When enabled, anti-aliasing is used where possible.

**Filtering** – Applies the image filter to this channel. Image filter settings are in the [Image Sampler](#) tab of the [Sampler](#) tab of the [V-Ray Renderer](#) node.

**Denoise** – Enables the render element's denoising, provided the [V-Ray Denoiser](#) render element is present.

**Derive Raw Channels** – Generates data in the raw channels by combining the respective color and the filter color channels.

**VFB Color Corrections** – Applies the post render color adjustments made from the VFB.

## Common Uses

---

The Refraction Filter Render Element is useful for changing the appearance of refractive elements, after rendering, in a compositing or image editing application. In the example below, the refractions are brightened and tinted using the Refraction Filter RE. See the render before and after compositing.

Type **Refraction Filter**

Name ``opname('.'.')``

- ☒ Deep Output
- ☐ Color Mapping
- ☐ Consider For AA
- ☒ Filtering
- ☐ Denoise
- ☒ Derive Raw Channels
- ☐ VFB Color Corrections

Before  
After



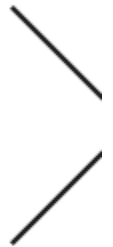


## Underlying Compositing Equation

---

The Refraction Filter Render Element is multiplied by the Raw Refraction to produce the same information seen in the Refraction pass, but having them separated out allows them to be manipulated individually before combining them together.

$$\text{Raw Refraction} \times \text{Refraction Filter} = \text{Refraction}$$



# Raw Refraction

## Notes

---

- To properly calculate the refraction information in the Refraction Filter and [Raw Refraction](#) Render Elements, the [Refraction Render Element](#) must also be rendered at the same time, even if it's not going to be used in the compositing process. Doing so enables all the refraction information to be included in the rendering calculations.