

# PxrDomeLight

In much of visual effects and animation work, scenes are primarily lit through a High Dynamic Range Image or HDRI. This is usually captured on-set and later used for replicating that lighting in your scene. In many ways, this gets your lighting 80% (or more) of the way to finished. All that's left for the artist to do is further polish the lighting for a great final shot!



When we talk about HDRI lighting, we mean full floating point (or half-float) images with light values well above 1.0 to produce lighting. Using low dynamic range or 8-bit images like JPEGs might produce acceptable reflections but the lighting will be dull and mostly flat. To avoid this we suggest EXR, HDR, or TIFF floating point images captured with multiple exposures. Understand that light sources (even man-made sources) are relatively high energy compared to their surroundings. If you find your shadows are too soft or too light in density, it's because the light sources in your HDRI are not sufficiently powerful enough. This can be solved by using an image editor to selectively increase the exposure of these light sources or mapping these light sources to area lights and altering their Exposure or Intensity.

This light simulates environment lighting. It works via Image Base lighting (IBL) to illuminate sets and characters with an environment map. Note that scaling and translation for this light will be ignored as it's considered nearly infinite or at least very far away. Only rotation matters so you can position your lighting accordingly. You may also have more than one in a scene for flexible lighting and linking to objects and portal lights.

To confine the illumination to a specific area for optimization purposes, you can use the [PxrPortalLight](#) with a PxrDomeLight to focus sampling for things like interiors with windows and skylights.



You will see mention of "non-physical" controls. These controls are designed to help artists make art-directed imagery by ignoring certain laws of physics we usually simulate.

## Parameters

### Basic

#### Intensity

Scales the contribution of this light linearly. This high dynamic range image (HDRI) has been edited where the sun is naturally bright and produces nice dark shadows and bright highlights. Notice that intensity 2.0 is quite bright in the sun! Other HDRIs with less range may benefit from values above 1.0.

```
intensity = 0.5
intensity = 1.0
intensity = 2.0
```

#### Exposure

Specifies the exposure of the area light as a power of 2. Increasing the exposure by 1 will double the energy emitted by the light source. A value of 0 produces an intensity of 1 at the source, -1 produces 0.5. Note this looks just like the above images. You may wonder why you might use **Exposure**, and the answer is that real world lighting has high energies and typical exposures are low values while you may have to type a really large number for equivalent **Intensity**. This is also comfortable to artists familiar with photographic measurements.

```
exposure = 0
exposure = 1
exposure = -1
```

#### Color

The color of the emitted light. If a color map is specified, this tints the color map. Below we have no map (defaults to white), red, and red tinting an HDRI. Note that tinting with a pure, saturated color may overpower textures as shown here.

```
color = red
color = red tinted map
color = white
```

## Color Map

Filename of the dome texture. Below are examples of different HDRIs used as the **Color Map**.

## Map Gamma

Gamma-correct the texture. Each channel (RGB) can be adjusted independently.

## Map Saturation

Adjust the saturation of the texture.

## Enable Temperature

Turns color temperature on or off. Below we use the same Luxo/Pixar HDRI.

temperature = 6500

temperature = 7000

temperature = 8500

## Color Temperature

Allows the user to choose the **color temperature** of the light in **Kelvins**. Unlike the basic light color, this allows the user to easily pick plausible light colors based on standard temperature measurements. This control will act like a filter or gel (a tinted transparent surface) in front of your light. If your light is white, you will get the chosen color temperature. If your light is colored, the color temperature will make it cooler (over 6500K) or warmer (below 6500K).



The effect will be less pronounced on fully saturated mono-chromatic lights. Defaults to 6500K, which should be very close to white on most monitors (D65 illuminant used by sRGB and Rec 709).

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## Refine

The below options are non-physical controls used to art direct your images. For example: You could use a light with **Diffuse Amount** 0.0 to act purely as a source of highlights for your scene objects.

### Specular Amount

Amount of specular light that is emitted. This is a non-physical control. You could use a light with Specular Amount 0.0 to act purely as a source of diffuse light for your scene objects and avoid adding highlights.

specular = 0

specular = 0.5

specular = 1.0

### Diffuse Amount

Amount of diffuse light that is emitted. This is a non-physical control. You could use a light with Diffuse Amount 0.0 to act purely as a source of highlights for your scene objects.

diffuse = 0

diffuse = 0.5

diffuse = 1.0

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## Shadows



All shadow parameters will be ignored if the light's **Trace Light Paths** is enabled in Advanced. The below options are all non-physical controls when used out of their default state. If **Trace Light Paths** is enabled then their physical nature is enforced.

### Enable Shadows

Enable raytraced shadows.

shadows = Off  
shadows = On

### Shadow Color

The color of the shadows cast by emitted light.

shadow color = Blue  
shadow color = Red  
shadow color = Yellow

0 0.

### Shadow Max Distance

The maximum distance of the shadow starting from the position of the point being shaded. -1.0 is unset which will use the distance between the point being shaded and the point on the light. You may use this control to artificially reduce the distance shadows are cast. This may also increase render speed by not calculating shadows outside this distance. The below example uses a distance that prevents the statue from casting a shadow on the wall behind it while preserving other shadows.

distance = Off  
distance = On

### Shadow Falloff

The distance from the light at which shadow falloff begins. -1.0 turns off shadow falloff. This is used along with **Shadow Max Distance** to create a false fade for shadows that are reduced or cut off by the **Shadow Max Distance** parameter. Below is an example with both parameters being used and the falloff is increased. Note this parameter may impact performance on complex lighting setups.

falloff = 0.5  
falloff = 1.0  
falloff = none

### Shadow Falloff Gamma

The gamma of the shadow strength in the falloff zone. This requires the use of **Shadow Max Distance** and **Shadow Falloff**. The falloff is more obvious as the value decreases.

gamma = 0.1  
gamma = 0.5  
gamma = 1

### Trace Subset

Set of geometry to consider for traced shadow intersection. If this is not specified, all geometry are considered for traced shadow intersection.

### Don't Trace Subset

Set of geometry to ignore for traced shadow intersection. If this is not specified, all geometry is used for traced shadow intersection.

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## Advanced

### Trace Light Paths

Enable light and photon tracing from this light. This value enforces a physically-based light and as a side-effect disables the above **Shadows** controls. Users may use this feature to selectively decide which lights emit photons when using the PxrVCM or PxrUPBP Integrators.

### Thin Shadow

Enable thin shadow and disable refraction caustics for this light. This parameter will be ignored if **Trace Light Paths** is enabled. This is a non-physical control that creates "fake" colored shadows for transmissive objects without needing to generate photons for caustics. Below we go from On (default) to Off (opaque shadowing). Notice we lose the colored shadows and interior colored reflection choosing Off, but we gain some render speed instead.

thin shadow = off  
thin shadow = On

### Light Samples

Specifies an override of the number of light samples to be taken for this light source. If set to something other than zero, it will override the sampling performed by the integrator. It's recommended to leave this at the default unless you experience unsolvable noise from the light.

### Light Group

Specify the light group name used for light group LPEs. This is useful to generate per-light AOVs for later adjustment in compositing.

### Importance Multiplier

Rather than setting explicit Light Samples, users can change the amount of samples the light will be assigned internally by changing this value. RenderMan creates a set of samples at render time for all lights in the scene and changing this value rebalances the samples across the lights. Note that increasing this value will cause *more* samples to be selected from this light while reducing it for others in the scene. Lower than the default will *decrease* the samples while providing more to others in the scene.

## See Also

- [PxrPortalLight](#)