AMD Radeon ProRender plug-in for Maya

User Guide

This document is a user and setup guide with tips and tricks on how to render photorealistic images in real-time, set materials and lighting.
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OVERVIEW

AMD Radeon™ ProRender is a free un-biased rendering plug-in for your visualization needs in Autodesk® Maya®. Using physically accurate path-tracing technology, AMD Radeon ProRender can produce stunning photorealistic images of your scene and provides real-time interactive rendering and continuous effects adjustments to help create the perfect rendered image. The AMD Radeon ProRender plug-in is fully integrated into Maya – it supports the Maya lights, materials, and textures and renders your geometry accurately. AMD Radeon ProRender also comes with a library of materials to get you started.

This user guide will describe how to use and set up the AMD Radeon ProRender plug-in for Maya.
What’s New in AMD Radeon ProRender plug-in for Maya v2.4

- Added support for macOS® Mojave 10.14.0+
- Added checkbox to use Metal native raytracing API to render settings.
- Updated Uber shaders:
  - Diffuse backscattering option, allows simple backlighting for objects like tree leaves or semi-translucent film.
  - Clearcoat thickness and transmission color. Allows simulating effects like a lacquer on a surface, allowing the artist to specify how thick the coating is, and if the coating has a color to the substrate, for example a yellowish tint to a varnish on furniture.
  - Refraction absorption, for glass and liquid objects that scatter light, for example deep water or glass with particles in it.
  - Per lobe normals. Artists can specify a normal map for each lobe, for example in car paint, a different normal map can be used for just the clearcoat to simulate micro scratches from waxing the surface, while the underlying material has a smoother normal map.
  - Refractions (Glass) Now default to not allow caustics, this will lead to faster, less noisy images as caustics are not computed unless necessary. For materials that the user does want caustics for, simply enable the checkbox in the refraction section of Uber.
- Reorganization of render settings, allowing clearer user control of render settings.
  - Different device configurations for viewport and final renders.
  - Set number of CPU threads for CPU renders (additionally remove a limitation of 32 threads to support Threadripper™ systems).
  - Control ray depth separately for diffuse, shadow, reflections and refraction.
- An ambient occlusion node is added for various uses. This is helpful for simulating “dirt” on a material or any time a material is wished to be blended or changed based in concave sections of geometry. Set this to use the front side to blend on the crevices, or back for pointed parts.
- Better support for instanced objects.
- Exporting of geometry and materials to the renderer has been refactored and optimized.
- Added support for ignoring selected objects when rendering.
- Invisible objects are no longer exported to the renderer as a performance optimization.
- The place texture node now works with AMD Radeon ProRender materials.
- Camera Motion Blur is now added.
What’s New in AMD Radeon ProRender plug-in for Maya v2.3

- Support for macOS® High Sierra 10.13.3+ using Metal® 2. eGPU devices requires macOS® High Sierra 10.13.4.
- PBR Shader and Denoiser added in the render settings.
- An additional control for setting camera exposure to allow adding more motion blur is added.
- Texture gamma settings are now handled correctly.
- Physically based lighting controls greatly improve lighting setups.
- Additional area light shapes include: Rectangle, Disk, Cylinder, and Spheres.
- Light color can be set by temperature, color, texture, or all three.
- Intensity can be set additionally with physical units.
- Maya Remap HSV and Gamma Correct nodes are supported.
Supported Platforms for v2.4
AMD Radeon ProRender for Maya v2.4 runs on both GPUs and CPUS. OpenCL™ 1.2 is required for GPUs.

Software
- Autodesk® Maya® 2018
- Autodesk® Maya® 2017
- Autodesk® Maya® 2016.5
- Autodesk® Maya® 2016 with Service Pack 2

Operating System
- Microsoft Windows® 10 (64-bit)
- Microsoft Windows® 8.1 (64-bit)
- Microsoft Windows® 7 (64-bit)
- macOS® High Sierra 10.13.3+
- macOS® Mojave 10.14.0+

Supported Platforms for v2.1.20.14
AMD Radeon ProRender for Maya v2.1.20.14 runs on both GPUs and CPUS. OpenCL™ 1.2 is required for GPUs.

Software
- Autodesk® Maya® 2017
- Autodesk® Maya® 2016

Operating System
- CentOS 7.2
- CentOS 6.5

<table>
<thead>
<tr>
<th></th>
<th>CentOS 7.2</th>
<th>CentOS 6.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autodesk® Maya® 2017</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Autodesk® Maya® 2016</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Join the Discussion
Provide feedback [here](#) for all AMD Radeon ProRender plug-ins.
Install the AMD Radeon ProRender plug-in

AMD Radeon ProRender for Microsoft Windows

Download the AMD Radeon ProRender plug-in for Maya for Microsoft Windows®, launch the installer and agree to the license.

AMD Radeon ProRender will check your hardware and software to ensure requirements, before letting you select your installer settings.
Click the **Register** button – it will take you to an AMD website to obtain an activation key by registering.

Register using your information. You will receive your activation key after clicking Request Download. Enter it into the installer and continue the installation.
Click Finish and launch the Maya application to start rendering your images.
AMD Radeon ProRender for macOS

Download ProRenderForBlender-XX.dmg. Click to open.

Open the RadeonProRenderBlenderInstaller.
INSTALL RADEON PRORENDER

Copy and paste the website into browser to obtain the registration key.

Enter the registration key that will be emailed to you.
Continue through the installation

The Maya modules and shelves will also be installed.
Switching to AMD Radeon ProRender

Launch Maya. You should see menu item for AMD Radeon ProRender, as well as a custom shelf with icons for key functions and settings.

Go to Windows > Settings/Preferences > Plug-in Manager to set AMD Radeon ProRender as the renderer.
RADEON PRORENDER SET UP

Under the Plug-in Manager, make sure the Loaded and Auto Load check boxes are ticked next to the RadeonProRender.mll. Press Close.

You will also be able to set the 3D viewport to the rendered view using AMD Radeon ProRender.
RADEON PRORENDER SET UP

Change the layout to 4 x 4 by clicking the button on the left-hand side.

Create a sphere to make sure everything is working as expected. AMD Radeon ProRender will automatically create a light for your scene when you place an object. Create a sphere by selecting Create > Polygon Primitives > Sphere.
Set a viewport as the rendered view.

Note: There can be a delay the first time you use AMD Radeon ProRender. It may appear that the application has hung but it is simply doing some initial setup. The time to change renderers in the future will not have a same delay – it only happens this once when you first use it.

Bring up the Render Settings by clicking on the settings icon on the custom shelf in the Radeon ProRender tab or, click the button in the Maya tool bar to bring up the Render Settings.
In the **Render Settings**, change to the **AMD Radeon ProRender** as the Renderer.
Overview of User Interface

Render Settings
Render Viewports

After setting AMD Radeon ProRender as our renderer, locate the **Renderer** dropdown on the viewport menu and select **AMD Radeon ProRender**. You should see your viewport switch to AMD Radeon ProRender viewport and it will start cleaning up the render.

Open the **AMD Radeon ProRender** drop-down from the viewport menu.
Animation cache

This is used where you can view quick previews of animated object(s) in the scene before rendering the scene. It stores the first render iteration for each frame of the animation when the frame is first displayed, so the next time that frame is displayed, it can show the cached version, rather than having to render it again. This will allow you to scrub through the time-line without having to re-render the cached frames.

Clear Cache

This is used to clear the animation cache so the render can start over or re-render.

Viewport Mode

This is like render modes which are found in the Render Settings. The render mode can be selected without opening the Render Settings window.
AMD Radeon ProRender Settings

Open the Render Settings window.

Render Resources

In the Render Resources section select your hardware to render. There are hardware options like GPU only, CPU only, or CPU and GPU together.

![Render Resources](image)

Completion Criteria

In the Completion Criteria set the amount of time you want your render to complete or set the Iterations to the desired number of passes you would like AMD Radeon ProRender to render to complete to do before finishing.

![Completion Criteria](image)

If there are no limits set for time or iterations the render will keep rendering until the user cancels the render or closes the render window.

Texture Compression

![Texture Compression](image)
**Globals**

Globals provide you with the option of rendering in different modes. This changes the look of the 3D model in the viewport.

<table>
<thead>
<tr>
<th>MODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLOBAL ILLUMINATION</td>
<td>the full scene with full GI lighting and shadows</td>
</tr>
<tr>
<td>DIRECT ILLUMINATION</td>
<td>renders the scene with shadows, but no GI – gives “harsher” renders</td>
</tr>
<tr>
<td>DIRECT ILLUMINATION NO SHADOW</td>
<td>direct light, no GI, gives sharper renders without any shadows or semi-shadows</td>
</tr>
<tr>
<td>WIREFRAME</td>
<td>shows the wireframe of the mesh</td>
</tr>
<tr>
<td>MATERIAL ID</td>
<td>renders the whole scene in non-bordering colors to ease postwork/processing</td>
</tr>
<tr>
<td>POSITION</td>
<td>renders the normals of the scene</td>
</tr>
<tr>
<td>NORMAL</td>
<td></td>
</tr>
<tr>
<td>TEXCOORD</td>
<td>shows the current texture coordinates – UV’d or not</td>
</tr>
<tr>
<td>AMBIENT OCCLUSION</td>
<td>standard pass to do anything from showing off your models without textures to using it as an overlay for contact shadows, which GI doesn’t always catch</td>
</tr>
</tbody>
</table>
Global Illumination

![Global Illumination settings](image)

Quality Presets

With AMD Radeon ProRender we have 2 sets of settings, one for the **Production** rendering and one for the **Viewport** rendering. We can use the quality presets, these range from low to medium to high.

![Quality Presets settings](image)

Sampling

We can also use the **Sampling** section to increase the anti-aliasing. AMD Radeon ProRender’s anti-aliasing smooths the pixels in an image, by oversampling single pixels as if they were five pixels or more, and calculating the average. This will in many cases get rid of the harsh edges you can see in some renders with no AA set.

**Tip:** A high number of samples gives you a better render at the cost of render time.

![Sampling settings](image)

Filtering

The **Filter** section is used to add a filter on a sub pixel level. Several post render image filters are also supported including:

![Filter settings](image)
### Filters Description

<table>
<thead>
<tr>
<th>FILTERS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOX</td>
<td>the lowest quality Anti-Aliasing filter</td>
</tr>
<tr>
<td>TRIANGLE</td>
<td>for sharp results</td>
</tr>
<tr>
<td>GAUSSIAN</td>
<td>provides blurry Anti-Aliasing</td>
</tr>
<tr>
<td>MITCHELL</td>
<td>default filter, good for all-round rendering on images with no major high contrasts</td>
</tr>
<tr>
<td>LANCZOS</td>
<td>a second good all-round filter</td>
</tr>
<tr>
<td>BLACKMAN HARRIS</td>
<td>complements the Box and Gaussian filters, and is especially effective for Wireframe renders, as it makes edges look smoother</td>
</tr>
</tbody>
</table>

**Trace Depth**

The **Trace Depth** section allows a user to set the number of rays that will be cast and bounced around in the scene and is especially necessary for refractive surfaces. This is done by increasing the value of the **Max Ray Depth** input.

![Trace depth](image)

**Tip:** When using glass or other translucent appearances, use a high number of Ray Bounces to fully capture all reflections (generally, a good number is 6 unless there are complex, translucent parts).

The transparency and colour of the object is improved with more ray bounces. Improved image quality comes at a cost to other factors.

**Render Stamp**

This will create a stamp on the final rendered image showing details of hardware and Maya scene information.

![Render stamp](image)
Environment

There are 2 options for Environments: Image Based Lighting and Sun and Sky

Image Based Lighting

IBL is essential for creating real world lighting. It is basically a spherical image (HDR) that is projected onto a spherical object as your environment to simulate real world lighting.

Enable the IBL by clicking on the create button in the Environment section in Render Settings.

After clicking on the create button You will notice that the attribute editor now has RPRIBLShape loaded. Locate the IBL map section and find your IBL\HDR file.
Click on the folder icon, locate your HDRI file go ahead and load it into your scene. As you can see after loading the IBL into the scene the default lighting has been removed and replaced by the IBL.

You can see the reflections on the car shape model’s reflective surface that are being cast by the IBL.
While in AMD Radeon ProRender viewport We can adjust the lighting intensity and overall look by selecting the IBL and changing the intensity value. We are also able to rotate the IBL to get different reflections.

Sun and Sky

Sky is designed to enable physically plausible daylight simulations and accurate renderings of daylight scenarios. Under the Environment section in the Render Settings, create the Sky by clicking on the Create button (same as IBL).
This is what your scene should look like.

With the RPRSky selected, look in the attribute editor, you will see all the sky properties.
**Turbidity**

Increasing this value will simulate how much dust is in the air by changing the color of the sky to orange.

**Intensity**

This will raise or lower the intensity of the Sky

**Filter Color**

This is used to add a tint of color to you Sky. By clicking on the color box, you can select a color you wish to tint the Sky with.
**Ground Color**

This is used to select the color for the ground by also clicking on the color box and picking a color.

**Horizon Height**

This attribute will raise or lower the horizon line. Horizon height set to -4.
**Horizon Blur**

Increasing this attribute will blur the horizon and ground line.

**Sun Glow**

Changing this attribute will increase the size of the Glowing halo around the sun disk.
Sun Disk Size

This attribute is used to increase the size of the sun.

Altitude and Azimuth

These two attributes determine where the Sun is in the Sky. You will notice that if you lower or raise the altitude value you will be able to simulate a sunset or sunrise.
Azimuth

This attribute will change the placement of the sun by rotating the sun on the Y axis in the scene.

Sun Position

In this drop down, there are 2 options to control the Sky model:

So far, the settings are on the Altitude/Azimuth setting. By switching to **Time/Location**, that the Time/Location section is available and the Altitude/Azimuth section is now greyed out and is no longer available.

**Time/Location**

This used to create lighting for any place in the world at any given time. To control the Sun position, the user has a set of options like Hours, Minutes, Seconds, Month, day, year, latitude and longitude, that allow the user to simulate a precise sun position.
Tick the checkbox if you would like to enable **Daylight savings**. We are also able to automatically **Set Time To Now** simply by click on the button. It will use the Time from your System Clock and set it to that.

**Latitude and Longitude**

These 2 attributes work very like Altitude and Azimuth in that they determine where the sun is in the sky at any location.

**Get Location**

Clicking on the Get Location button will display a map to pick any location on the planet.

1. You can use the mouse to pick a place anywhere on the map. You will create a red dot where you have picked.
2. You can use the search option to more precisely find a certain city in any country.
**Note:** Most of the attributes for Sky are keyable for an artist to animate a full day cycle.

**Ground**
**Tone Mapping**

*Tone mapping* is a technique used in image processing and computer graphics to map one set of colors to another to approximate the appearance of high-dynamic-range images in a medium that has a more limited dynamic range.

With AMD Radeon ProRender we can use the **Tone Mapping** section in the **Render Settings** to select between five different tone mapping types: Linear, Photolinear, Autolinear, Max White and Reinhard02. You can also adjust display and texture gamma.

**Linear**

Raise or lower the brightness of the scene by increasing or decreasing the **Scale** value.
Photolinear

This is based on real-life camera settings. ISO is film speed – the higher the value, the more light is let into the image. F-Stop is aperture width, and follows regular camera settings – the smaller the number, the wider the aperture, and the more light will be transmitted to the film. Shutter Speed is how long the shutter stays open to let in light, also known as exposure.

![Photolinear](image)

Reinhard02

This is aimed at adapting the high dynamic range of real world lighting to your screen.

**Note:** It does this by letting you set values for Burn, Post Scale and Pre Scale. Pre Scale and Post Scale work together, this means that if you tweak one, you’ll probably have to tweak the others.

Pre Scale controls the brightness of darker areas (i.e. shadows). Post Scale controls the final brightness of the image and Burn is used to tweak the brightness of highlights in your image based on its darker areas.

![Reinhard02](image)

White-balance

White Balance follows the basic settings of a digital camera – lets you set the color temperature of the light in the image.

![White-balance](image)
Motion Blur

AMD Radeon ProRender’s Motion Blur will make object appear as if it’s in motion, in stills as well as animations.

![Motion Blur](image)

Render Passes (AOV)

We are also able to create render passes that can be saved into a single EXR file. This can be done by firstly checking all the render passes you would like to render in the Render passes tab in your render settings.

![Render Passes (AOV)](image)

To render a pass through your render viewer or AMD Radeon ProRender viewport you will need to select the render pass in the **Displayed in Render View** dropdown menu.
For you to render the output file as an EXR file you will need to follow these steps.

1. Make sure your Project is set correctly.
2. In the render settings, common section locate the file output tab. Give your output file a name by typing it into the File name prefix box.
3. In the Image format dropdown menu select EXR as the file type.

Initiate a render and once it finishes open it in any image editing software. You will notice that the EXR file when opened contains multiple layers for all the render passes you have selected.
Working with Lights

Initial Lighting of a Scene

Go to your Render Settings window, select the AMD Radeon ProRender tab and navigate to the Environment dropdown section. In the Environment dropdown click on the Create button next to Image Based Lighting. This will provide lighting of the scene reflective of the surrounding environment.

Emissive Material Lights

With AMD Radeon ProRender, we can also use objects as lights by applying an Emissive material to any 3d object in the scene. We will be adding an emissive material to a lantern shape in the scene.
Go to your **Hypershade Editor** and from the AMD Radeon ProRender materials create an **RPRMaterial**. You can rename and change it from **Diffuse** to **Emissive** from the **Type** dropdown.

In the emissive materials properties, under the emission section, you can change the color and the watts per sqm (brightness) of the light. Set your **Emission** to 5 and your color to a slightly yellow white color.
Select your geometry to apply the material. We will be applying the material to certain faces on the lantern.

Then right click and hold over your light Emissive material in the Hypershade and select Assign Material to Viewport Selection.
The rendered image will not have emissive lights
Portals

Portals are used to limit the amount of light being cast in scene. Using portals allows a user to allocate an exact point from where the light should come from when using a IBL or Sky instead of casting light over the entire scene. This is only useful when lighting interior scenes.

Here we have an interior scene that is being lit by using the Sky. You can see that the light is being cast through all the windows.

To activate the portals, create a Plane and place it in front of your windows.

Select the sky widget from the viewport or from the outliner. Navigate to the Sky attributes panel on the right hand side and locate the Portals dropdown. We can then select the Object As Portal dropdown and
find the pPlane1 object we created. Make this your portal. If it is not in your list hit the Refresh Objects List button.

Hit render and you will notice that the light is now only being cast from the plane instead of the entire scene.

This feature will increase rendering performance.
Working with Cameras

When working with cameras we have a couple options to choose from. The options can be found in **Render Settings** under the Camera section.

![Camera Settings](image)

When the camera type is set to default, it will render out the usual flat image to the resolution you set in your render settings. This is what you will probably use the most when rendering.

**Default**
Spherical Panorama

Spherical Panorama will render a 360-degree image that wraps around your scene. This can be used to create a 360 video of your scene that can be uploaded to YouTube and viewed. Sphere mapping (or spherical environment mapping) is a type of reflection mapping that approximates reflective surfaces by considering the environment to be an infinitely far-away spherical wall. This environment is stored as a texture depicting what a mirrored sphere would look like if it were placed into the environment [1].
Spherical Panorama Stereo

Spherical Panorama Stereo will be used to create 360 degree images to be used for VR. As you can see the Image is split in two and the reason for this is that it is rendering an image for both the Left and Right eye. Keep the aspect ratio to 1:1 for square pixels.
Cube Map

For cube mapping you will need to times your resolution width by 6 to get square pixels e.g: 1k res = 6144 x 1024

Cube Mapping is a method of environment mapping that uses the six faces of a cube as the map shape. The environment is projected onto the sides of a cube and stored as six square textures, or unfolded into six regions of a single texture.

Cube Map Stereo

This is pretty much the same as cube mapping except that it splits the render into 12 blocks, 6 for the Left eye and 6 for the Right. This is for VR. You will need to times your resolution width by 12 to get square pixels. 1k res = 12288 x 1024.
**Depth of Field**

With your camera selected, go to the Attribute Editor by clicking Windows > General Editors > Attribute Editor or by clicking the Camera attribute button.

Locate Depth of Field. Check the box to enable DOF.

Set in your focus distance to determine how far you want your camera to focus from the lens to the object. F-stop will determine how much blur will be added to the render. The higher the value the less amount of blur you will see.
VR Cameras

When working with cameras, there are a couple options to choose from. The options can be found in Render Settings under the Camera section.

When the camera type is set to default, it will render out the usual flat image to the resolution you set in your render settings. This is what you will probably use the most when rendering. The Spherical Panorama Stereo camera type provides you with a 360-degree split (over and under) stereoscopic image (one part for each eye) output suitable for viewing through VR devices.

Spherical Panorama Stereo will be used to create 360-degree images to be used for VR. As you can see the Image is split in two and the reason for this is that it is rendering an image for both the Left and Right eye. Keep the aspect ratio to 1:1 for square pixels.
Working with Materials

Included within the AMD Radeon ProRender install is the addition of AMD Radeon ProRender materials to the Maya material library for you to use.

Display the Material Library

Click on the **Hypershade Button** in the AMD Radeon ProRender shelf or use the **Hypershade Button** next to the Render Settings button.
Once the **Hypershade Editor** window is open, navigate to the AMD Radeon ProRender materials and select an **RPR Material**. And middle click and drag it onto your object in the viewport.
### AMD Radeon ProRender Material Library

**AMD Radeon ProRender Materials Breakdown:**

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPR BLEND</td>
<td>used to blend 2 or more materials together</td>
</tr>
<tr>
<td>RPR LAYERED</td>
<td></td>
</tr>
<tr>
<td>RPR MATERIAL</td>
<td></td>
</tr>
<tr>
<td>RPR SUBSURFACE</td>
<td>used for surfaces that does not reflect light off the surface like a mirror or water, but penetrates it a little, like candles, milk, skin or fruit, like grapes</td>
</tr>
<tr>
<td>RPR TRANSPARENT</td>
<td>used to generate only transparency. Will be used with Blend material to make more advanced materials such as meshes and layered shaders</td>
</tr>
<tr>
<td>RPR UBER</td>
<td>combines several inputs to generate one big shader, alleviating the need to combine and group many shader-nodes together</td>
</tr>
<tr>
<td>RPR VOLUME</td>
<td>used for streetlights at night, fog or mist</td>
</tr>
</tbody>
</table>

The installer also adds the following Maps:

<table>
<thead>
<tr>
<th>MAPS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPR TEXTURE</td>
<td></td>
</tr>
<tr>
<td>RPR ARITHMETIC</td>
<td></td>
</tr>
<tr>
<td>RPR BLEND VALUE</td>
<td></td>
</tr>
<tr>
<td>RPR BUMP</td>
<td></td>
</tr>
<tr>
<td>RPR CHECKER</td>
<td></td>
</tr>
<tr>
<td>RPR DOT</td>
<td></td>
</tr>
<tr>
<td>RPR FRESNEL</td>
<td></td>
</tr>
<tr>
<td>RPR FESNEL-SCHLICK</td>
<td></td>
</tr>
<tr>
<td>RPR GRADIENT</td>
<td></td>
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<tr>
<td>RPR INPUT LOOKUP</td>
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<td>RPR NOISE</td>
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The installer package adds complex materials that uses the materials above in conjunction with maps and node connections to create a large library of pre-configured materials for you to use.

In the viewport, open the **AMD Radeon ProRender Material Library**.

Double click the material to import into the Hypershade.
In the Hypershade, you will see the material, and various nodes used to create that particular material.
Assigning Basic Materials

Click on the object in the viewport. Right click the material node in the Hypershade Editor and select Assign Material to Viewport Selection.

Assign a IBL to your render settings and do a test render. You will notice that the RPRMaterial is set by default to Diffuse which will give you a matte shaded finish.
In the material attributes under **Swatch Properties > Type** you are able to switch between a range of different material types.

Change your material Type to **Microfacet**.
You will notice that in your AMD Radeon ProRender material attributes there are a couple more options that become available when changing the material type. We can change the roughness to make the material more shiny or we can change the index of refraction. Set your roughness to 0.1 to see the material with some reflectivity.

Material type set to Reflect, this will only give you the raw reflection of the scene and will most likely be used in a blend material:
Material type set to **Refact**, this will give you the raw refraction of the scene and will also most likely be used in a **Blend material**:

![Image of a sphere with a checkered background](image1.png)

Material type set to **Microfacet Refraction**, this material will simulate an opaque material like the paper on a Chinese lantern. It allows light to pass through it. You can change the amount of light that passes through the material by lowering the IOR(index of refraction) intensity.

![Image of a sphere with a transparent effect](image2.png)
Material type set to **Emissive**, this material will emit light from geometry which has the emissive material applied to it:

![Emissive Material Example](image)

Material type set to **Ward**, this material will give you more of a metal texture, it has an anisotropic quality by means of roughness X and Y. Setting the X and Y values differently will give you different reflections (stretched).

- **Default**
- **Roughness Y set to 0.1, X set to 0.5**
- **Roughness X set to 0.1, Y set to 0.5**
- **Rotation set to 45**
Using Maya Materials

Like the Standard Lights many of the Standard Materials are not supported by AMD Radeon ProRender. Many of these materials simulate a physical effect on the surface of an object which is not required when using a physically based material and ray-tracing renderer.

Although AMD Radeon ProRender will attempt to render the Maya Standard Materials, the result may be unpredictable as the renderer will only process the materials attributes that have a counterpart in the real world.

The specific models supported by AMD Radeon ProRender include:

- Blinn
- Metallic
- MultiLayer
- Oren-Nayar-Blinn
- Phong
- Strauss
- Translucent
Saving

To save your rendered images you have 2 options. You can save the image directly from your render view window under **File > Save Image**. Remember to consider that in the save image options you must set what color management you would like to save your image in.
Then we can also save the rendered image by using the **File Output** section in the **Render Settings** (this is dependent on having your project set correctly). This is what you would use to render out batch animations and store the files in your project directory.

**Diagnostics and Trace Files**

To allow developers to track down issues with the plug-in it is often necessary to provide trace files that log what happened to the plug-in and where the plug-in may have had problems.

On the top-level menu select **AMD Radeon ProRender > Debug > Enable Tracing** to activate the diagnostic tracing feature.
By default, the tracing is not set. This is to save space and assist performance. If you encounter a problem, it is advisable to:

- Enable tracing.
- Reproduce the problem.
- Locate the trace files.
- Zip the trace files into a single .zip file.
- If you don’t have an account you will need to set one up.
- Describe the procedure or steps you used to reproduce the problem.
- Attach a sample scene of where the error occurred.
- Attach the trace files .zip to the bug report.

Once you have captured the trace file, repeat the selection above to disable the tracing feature. This will stop the plug-in from recording all events and using up your valuable disk space in the future.

You will see in the top-level menu and option to **Open Trace Folder**. Select **AMD Radeon ProRender > Debug > Open Trace Folder**.

The directory location of the trace files is:
<%user%>/AppData/Local/RadeonProRender/Maya/Trace/YY.MM.DD-HH.MM

You will see there are a number of files generated by the plug-in's diagnostics system. Inside this directory are the following files:
It is advisable to zip the top level directory **YY.MM.DD-HH.MM** by right clicking the directory and sending it to compressed zip file.

You can then attach this .zip file to any bug report you lodge.