

ARNOLD TO RADEON PRORENDER CONVERSION REPORT

Version 2.7, 06 September 2019 ([all reports](#))

This report summarizes results of tests made to convert Arnold nodes to Radeon ProRender nodes.

- **Software:** Maya 2018, Arnold 3.1.2.1, ProRender 2.5.261
- **Hardware:** Ryzen 1700x, i5 7500, i7 6700k

SUMMARY

For the report, **110** Arnold nodes within **7** node groups has been tested in total. The results of conversion are as follows:

- **CONVERTIBLE:** **31 nodes (28%)**, [see details](#)
- **PARTIALLY CONVERTIBLE:** **24 nodes (22%)**, [see details](#)
- **NOT CONVERTIBLE:** **55 nodes (50%)**, [see details](#)
- **RESEARCH IS NEEDED:** **0 nodes (0%)**, [see details](#)

This week, we focused on adding the remaining utility nodes and on any improvements that needed to be done. We decided to convert as many Maya standard nodes as possible to RPR nodes. We also added improvements with Maya area lights, Ai car paint, Ai standard surface material, and ai Mesh Light.

REPORT DETAILS

In this report:

- [History](#)
- [Script Link](#)
- [Known Issues](#)
- [Complex Scenes](#)
- [Test Report Link](#)
- [Conversion Status by Node Group](#)

HISTORY

v.2.7 - improved Maya area light intensity, Maya Standard node conversion, Arnold Adaptive sampling, Ai Mesh Light conversion, fixed bug with conversion of complex node setup with bump and normal maps, improved SSS type diffusion for Ai standard surface material, ai car paint coat conversion improvements, blending Bump and normal maps now supported, ai dome light intensity improved, added support for ai Layer Shader.

v.2.6 - Cone angle not convert correctly, ai EXP to convert to 3 RPR arithmetic nodes any ai material that cannot be converted should convert to default RPR uber Material, complex material setup with ai mix gets broken in conversion, Physical sky gets added in scene when not supposed to ai triplanner and ai UVtransform convert to Maya Projection, ai ColorCorrect convert to Maya ColorCorrect node, ai Length converts to RPR arithmetic, interior scene gets errors when converting, ai atmosphere to Volume material breaks connections, ai Matte converts to Uber and Flat color blended, ai Passthrough converts to RPR Material Passthrough.

v.2.5 - ai Passthrough now converts to RPR passthrough material, DOF now is partially convert in camera settings, emissive intensity values was adjusted using a formula, aiMatte now converts using blended uber and flat color, ai ThinFilm now partially converts to rpr fresnel (minor tweaks may be needed), Photometric lights now converts temperature to color using a formula, ai toon shader to UBER material was adjusted to match specular metalness, ai Ambient Occlusion samples now convert to RPR Ambient Occlusion samples, ai Ambient Occlusion to RPR Ambient Occlusion colors was switched to match results, ai Ambient Occlusion now converts using RPR passthrough node if connected directly to object, 2d bump nodes had minor adjustments in formula to give better results, Displacement was adjusted to match subs and height strength, Formula was added to Ai area lights for better results.

v.2.4 - aiStandard emissive to Uber emissive now converts with less weight values, Vector map now converts with correct connection for displacement, aiBlackBody now converts to RPR Arithmetic nodes, aiToonShader now partially converts to Uber material, Maya standard lights now convert to ProRender Physical lights, 2d bump and ai 2d bump now converts with correct strength levels, aiNegate now converts to ProRender Arithmetic nodes, aiSqrt now converts using ProRender Arithmetic nodes, aiComposite now is partially convertible using ProRender Arithmetic nodes.

v.2.3 - aiVectorMap conversion support, aiCellNoise and aiNoise conversion support, aiStandartSurface cameraMap conversion, Volume materials update, aiBlackbody conversion supports, aiCurvature conversion support, Maya Ai atmosphere to object with RPR Volume material.

v.2.2 - Fixes for aiSkyDome intensity, fixes for Maya 2d bump not being converted to correct ProRender Bump or Normal nodes, fixed thickness Values and color when converting aiStandardSurface material using Coat, added aiColor convert utility node, converts to Maya RGB to HSV and HSV to RGB utility nodes, added conversion of aiShadowMatte to ProRender shadow catcher, added aiFog and aiAtmosphere to ProRender Volume material (note a user may have to do some changes in Volume material to get correct results), added aiCarPaint to ProRender Uber material with exceptions of Flakes.

v.2.1 - aiMath nodes support, ailmage and aiFacingRatio conversion support, aiAmbientOcclusion material conversion support, Improve metalness, coat, subsurface and normal map conversion in aiStandartSurface, improve displacement conversion, fixed issue with group of lights, fixed issue with unassigned materials with shadow catcher

v.2.0 - Rewritten to python, update material conversion.

v.1.7 - Fix bug with channel converting, fix bug with creating extra materials.

v.1.6 - Fix ies light position; aiStandartVolume, aiMixShader, aiFlat, aiSky, aiAdd, aiSubstract, aiDivide, aiMultiply support.

v.1.5 - aiPhotometricLight support.

v.1.4 - Opacity reverse node, rotate IBL and aiPhysicalSky support.

v.1.3 - aiSkyDomeLight and aiAreaLight support.

v.1.2 - displacement, bump2d conversion.

v.1.1 - aiStandartSurface support.

v.1.0 - first version.

SCRIPT LINK

The latest version of the conversion script: [download script](#).

KNOWN ISSUES

The following JIRA issues affecting the conversion process were identified:

- [\[RPRMAYA-1253\]](#) Light Portals issue when Emmissve backdrop is behind light source
- [\[RPRMAYA-971\]](#) incorrect render results with interior scene when IOR of glass is set to 1.52
- [\[RPRMAYA-887\]](#) CarPaint material
- [\[RPRMAYA-891\]](#) Shadow catcher + refract and Volume gives very bad results
- [\[RPRMAYA-216\]](#) IES lights no longer work after adding a new more powerful IES light
- [\[RPRMAYA-73\]](#) Bad results with Transparency and Shadow Catcher

Currently, we are having issues when adding aiLightMesh to RPR Physical light mesh type. Andrey says it is something in the API. We also have issues with IES lights not showing when more powerful lights are in the scene. This is an old issue with the plugin.

We are still investigating the IES formula. We are having issues with the scale of the scene when freeze transformations are used. Another issue we are running into with IES and coming up with a formula is IES losing data with more power full lights in the scene. We also decided to leave light portals out of script still due to [\[RPRMAYA-1253\]](#).

COMPLEX SCENES

Scene 1

Happy Buddha scene.

Happy Buddha scene using SSS material. For SSS, users may have to tweak the backscattering attributes to get a similar result. aiStandard material uses SSS without backscattering settings.

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 2





Porsche car scene.

Porsche car scene with metal and roughness maps, aiSkyDome light, and aiShadowMatte material. With some Adjustments like Ray depth settings, the glass material gives closer results. Shadow matte now gets converted to the ProRender Shadow Catcher material. Added the New feature aiCarPaint to the scene. Ray Depths may need some tweaks to get the same results as glass materials.

At the moment, there is no way to convert aiCarPaint flakes. Current work around would be the user will have to create their own custom texture map for flakes.

We also have a plugin issue regarding Refraction and transparency and Shadow Catcher. This is a very old issue we had for long time in plugin [[RPRMAYA-73](#)]. There seems to be an issue with IOR as well 1.52 is what is set in scene.

- [[RPRMAYA-887](#)]
- [[RPRMAYA-891](#)]
- [[RPRMAYA-73](#)]

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 3

Rifle and Pistol scene.

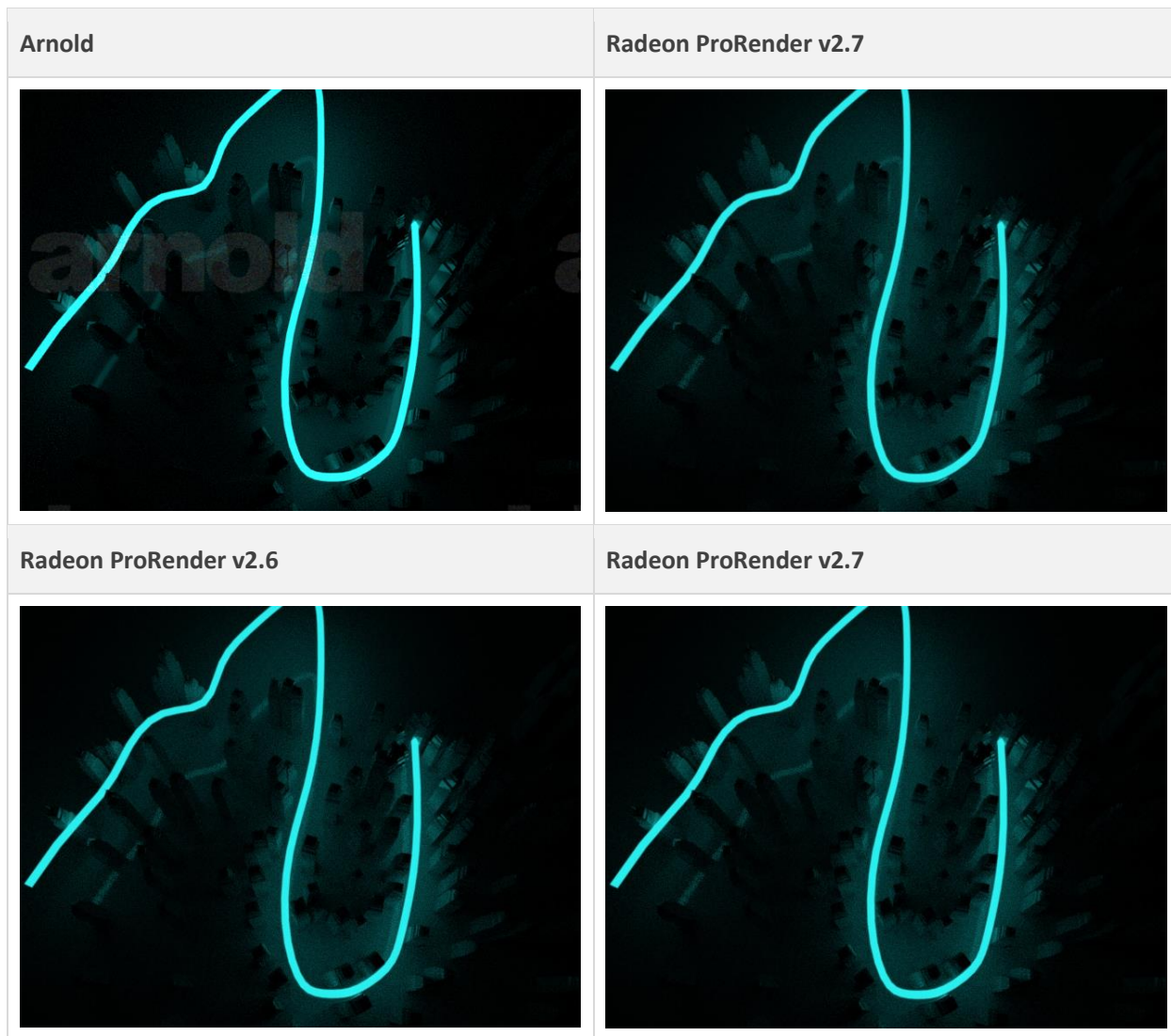
Gun scene: using the newest addition of Arithmetic nodes. aiAbs, aiAtan aiDot, aiPow and aiTrigo, alongside with aiDivide, add subtract and Maya standard Multiply/Divide node.

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 4

Emissive city scene.





Simple scene with emissive materials lighting the entire scene.



Scene 5

Laptop scene.

Emissive with Ramp nodes and Texture maps using aiStandard surface shader. Lighting setup is with aiSkyDome with IBL image.

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 6

Interior room scene.

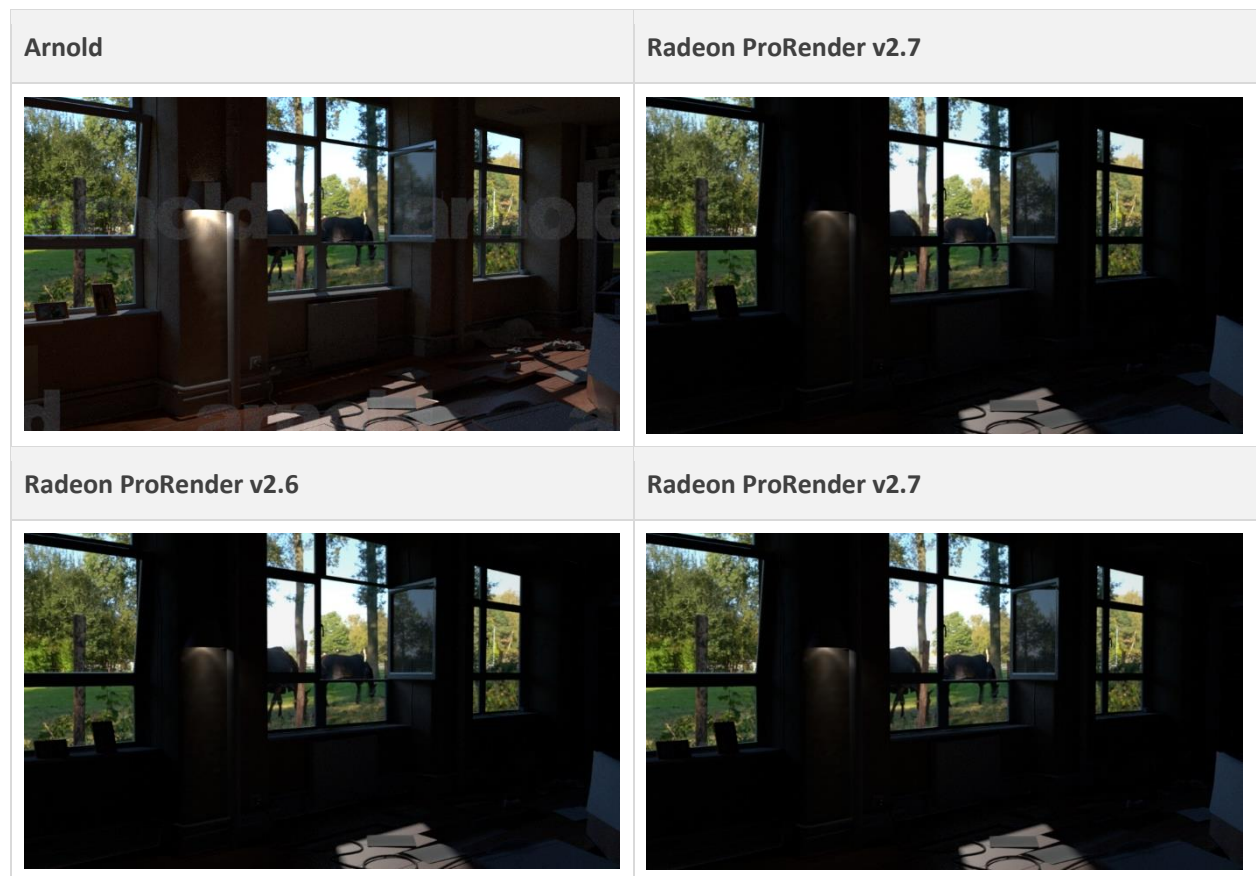
Interior room using aiSky, aiSkyDome, Maya directional light with some Materials and textures aiStandardSurface Shader.

Tweaking Tone mapping in ProRender slightly helps with the brightness issue. But there's still a main issue that we are not converting the intensity brightness for all lights correctly.

We made some changes in the scene to get better results. We manually fixed the issue with out-of-place objects by centering the pivot and using freeze transformations. We also grouped all objects in the scene and scaled down the entire scene to show the IES light visible in scene.

We have an issue within the plugin for some time where more powerful lights override IES lights in the scene. To work around it, a user can slightly increase the intensity of ProRender IES lights. There seems to be something wrong with IOR and light passing through glass on the plugin side as well.

- [\[RPRMAYA-216\]](#)
- [\[RPRMAYA-971\]](#)



Scene 7

IES test scene.

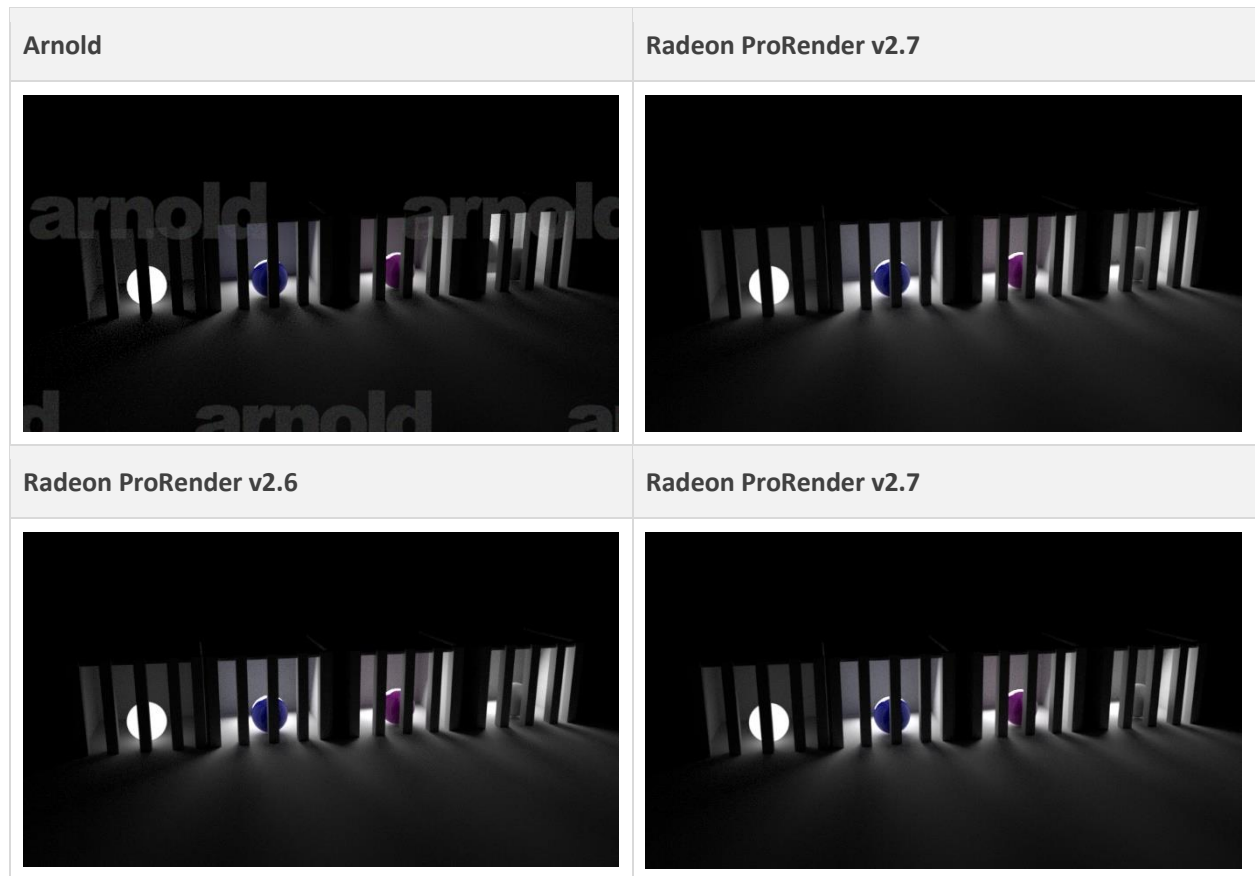
Scene using Photometric lighting with multiple IES lights.



Scene 8

Light test scene.





Scene with aiStandard surface materials using SSS skin preset and Procedural math nodes like aiAdd, subtract, multiply and divide.



Scene 9

Dragon Scene.

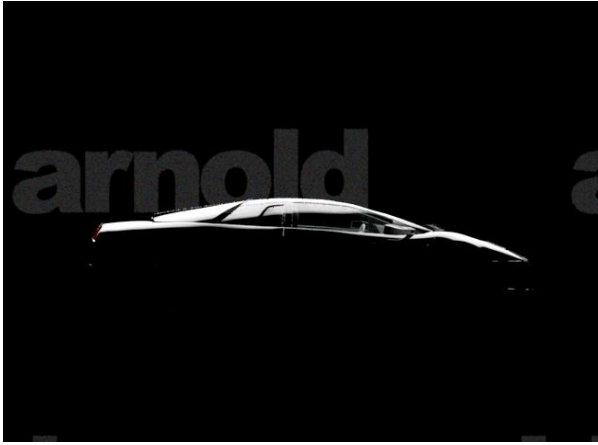
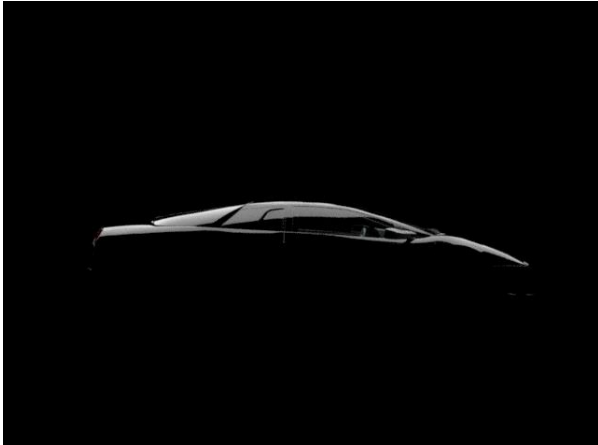
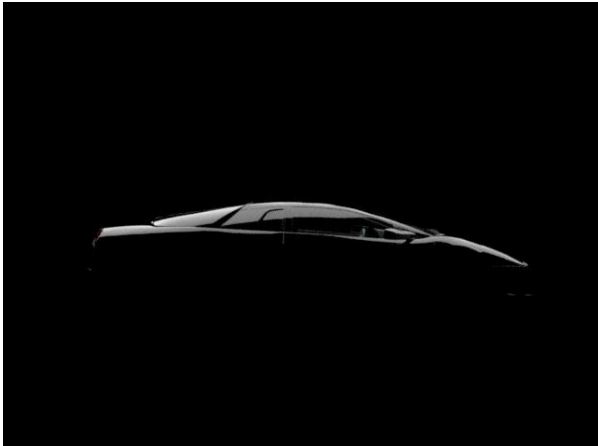
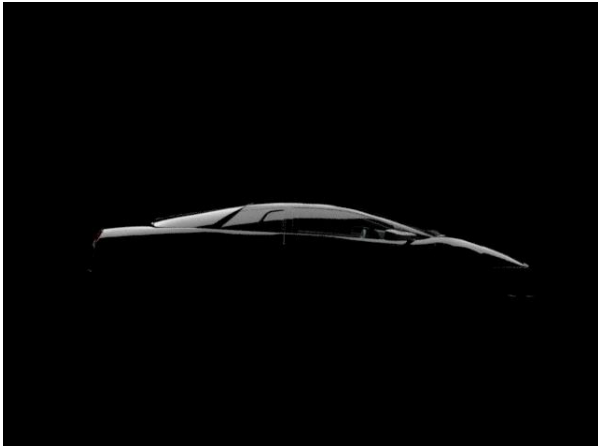
Dragon using aimage, ai2dbump, aiSkyDome, as well as TIFF and TGA file types.

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 10

Car-Side scene.




We use a formula to convert Maya standard lights to ProRender Physical light. We'll be adding this formula to aiStandard area light as well, as it should give better results.

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 11

Car-Rear scene.

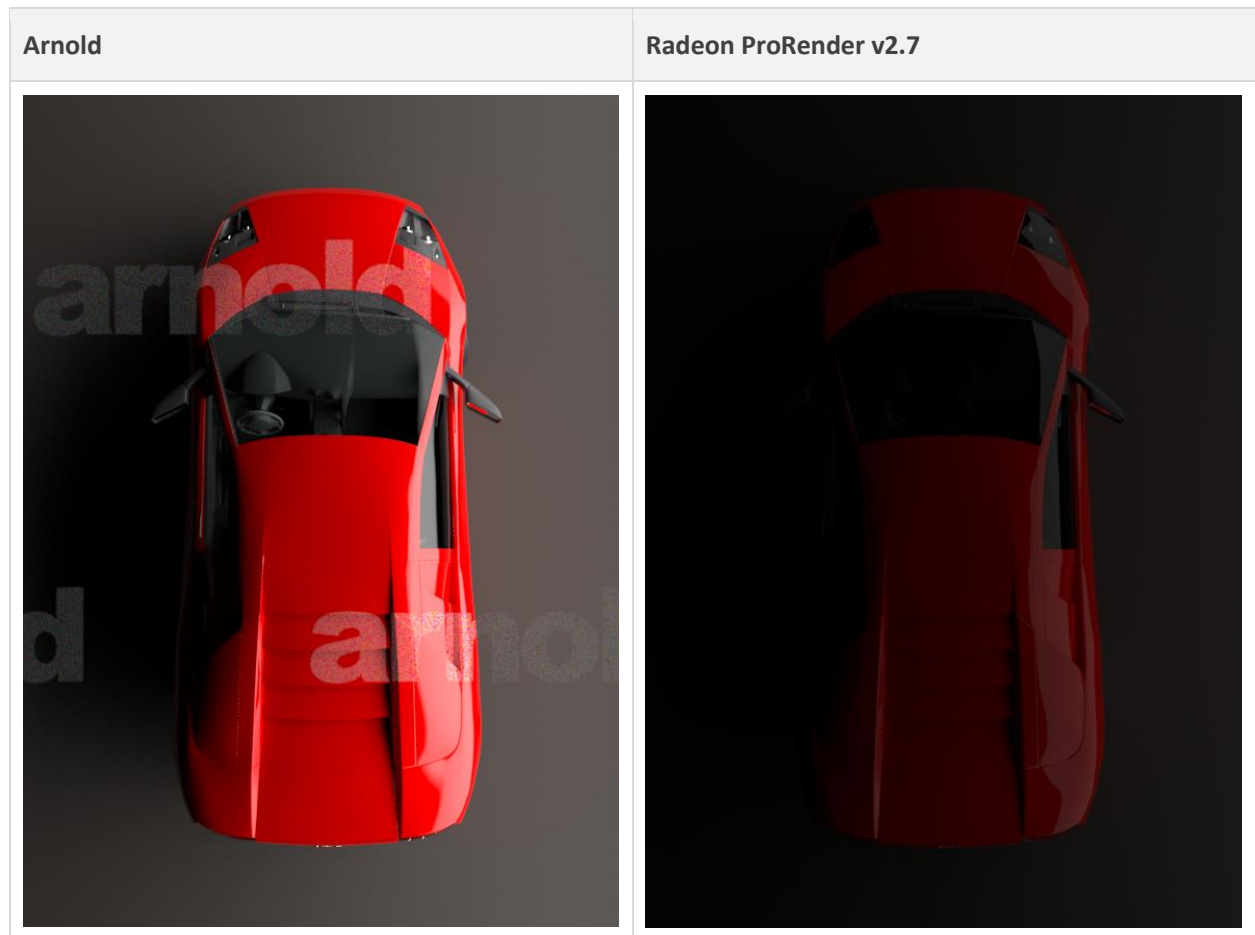
Light conversion error/invalid RPR parameters.

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

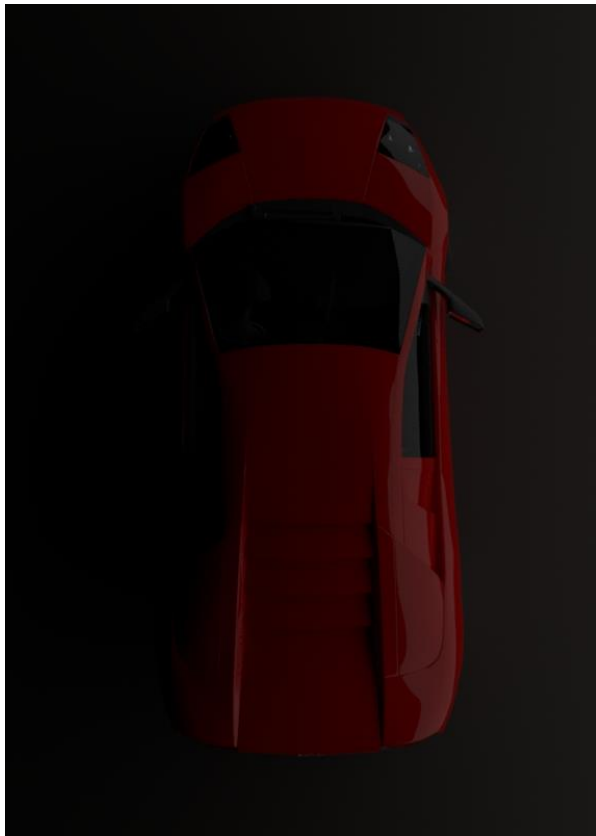
Scene 12

Car_Top scene.

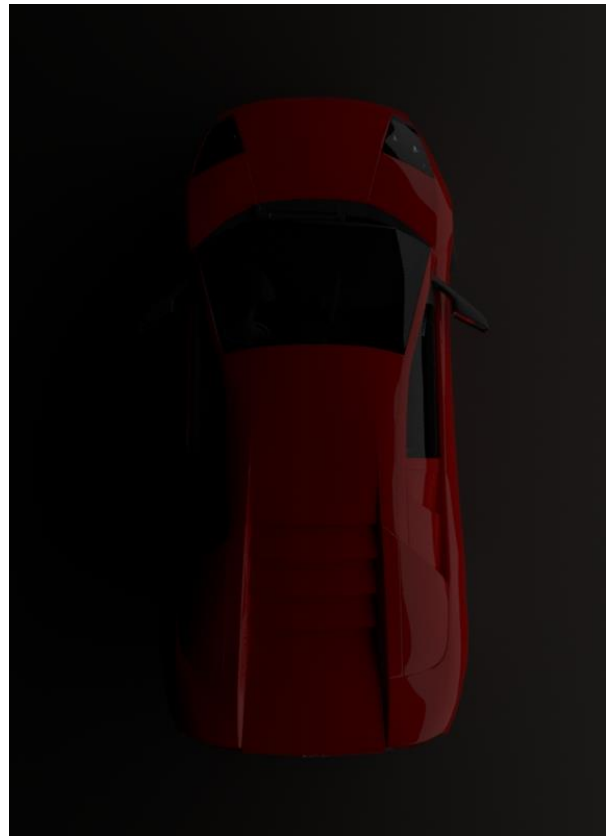
In the scene, we found out that the area light and IBL both have a Maya Ramp node connected to them which is making the image darker. As far as we know we have no support for this in the plugin with Maya. We would need to add lights in the Hypershade and add a color wheel connection to IBL.



Radeon ProRender v2.6



Radeon ProRender v2.7



Scene 13

Mercedes scene.

A scene using aiNormal and ailmage files nodes. A combination of emissive, metal, and glass materials. Added to the scene a new feature – aiCarPaint material.

Currently, there is no way to convert aiCarPaint flakes. A work around is that users will have to create their own custom texture map for flakes.

- [\[RPRMaya-887\]](#)

Arnold	Radeon ProRender v2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 14

Bump scene.

Bump and displacement scene using aiNormal, Maya 2d bump, ai2dBump, and Displacement to SG node.

Looking to improve displacement as we did with 2dbump nodes. But will have some issues due to the way ProRender displacement gives bad results with artefacts.

Arnold displacement gives clean results no matter what polycount is: an object can have only 1 face 1 subdivision in displacement, and it will render with zero artefacts. We cannot replicate this because of the way our displacement works in ProRender, we can only transfer the values over to the material. For anything lower than 4 subs, users will have to increase the subdivision level to 4 or higher, and possibly increase the polycount of the object.

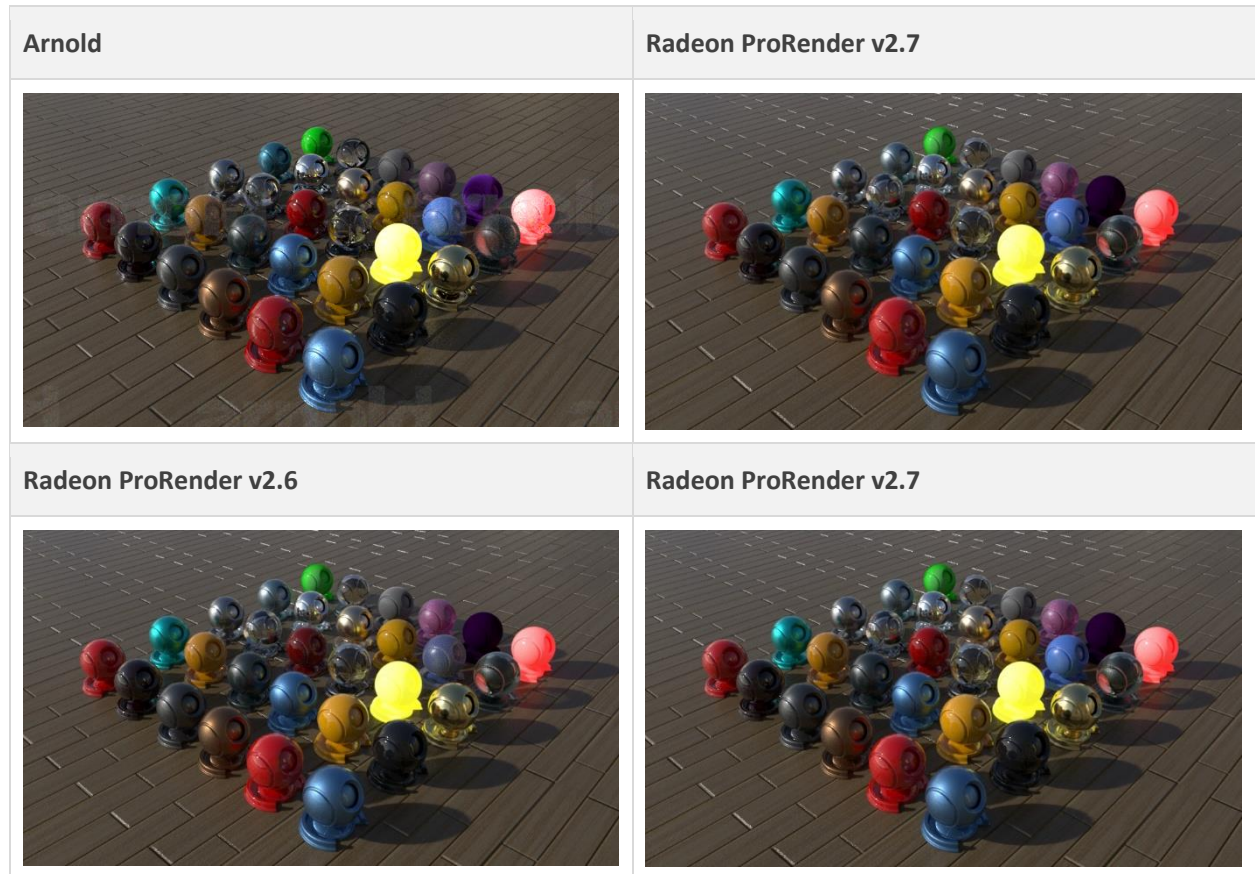
- [\[RPRMAYA-329\]](#)
- [\[RPRMAYA-965\]](#)



Scene 15

Complex materials scene.





Material test scene using aiCarPaint and aiStandardSurface. A variety of different material setup from SSS glass and emissive materials. Bump values with 2d bump and ai 2d bump were improved to get better results.



Scene 16

Curvature Mustang scene.

A car scene featuring the aiCurvature utility node. Using ProRender Ambient Occlusion node. (Note that users may have to tweak the RPR AO node to get better results).

Arnold	Radeon ProRender v 2.7
	
Radeon ProRender v2.6	Radeon ProRender v2.7
	

Scene 17

Volume scene.

Currently, there is just no way to fully replicate atmosphere environment volumes. We could really use a feature like this specifically for Volume lighting. At the moment, we are using a volume material. And with a volume material we are getting correct results. Arnold volume material works like ours but has more control. However they don't use a volume material for volume lighting as it will take away any background images such as an IBL. The benefits of having an Atmosphere is to allow users to have a scene with volume lights.

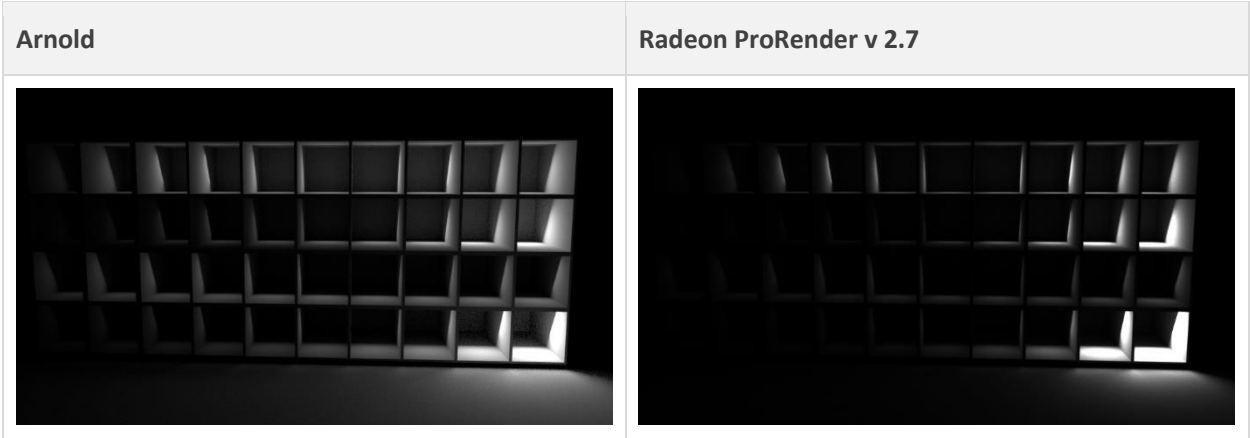
- [\[RPRMAYA-967\]](#)



Scene 18

Lights scene.

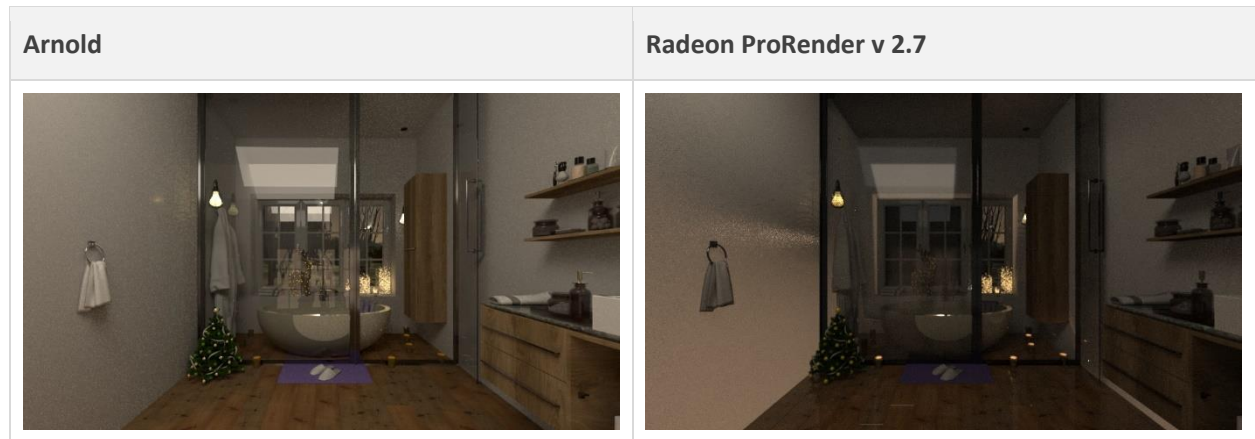
Scene with Maya area lights and ai area lights using different intensity values.



Scene 19

Bathroom scene.

Bathroom scene with many lights emissive, IES, use of substance plugin in Maya.



TEST REPORT LINK

For detailed comparison of rendered scenes, see [Test Report](#). The report includes 174 scenes.

Note that this is still the Alpha version of the report. The render process was run on two machines, with AMD and Intel CPUs.

CONVERSION STATUS BY NODE GROUP

Node Group	Total Nodes	Convertible	Partially Convertible	Not Convertible	Research is Needed	Details
Environment	4	0	4	0	0	Link
Files	5	5	0	0	0	Link
Filters	4	0	0	4	0	Link
Lights	4	1	3	0	0	Link
Materials	18	5	6	7	0	Link
Textures	7	1	5	1	0	Link
Utilities	68	19	6	43	0	Link
Total	110	31	24	55	0	Link