There are some current limitations when using 3ds Max Photometric lights with MAXtoA. Here is a brief list of what is not supported:

- Some light shapes do not support Spherical distribution.
- Only supports ray traced shadows – other settings are ignored.
- Exclude / Include is not supported.
- Incandescent lamp-color shift is not supported.
- The light shape is not visible to the camera rays.
- Shadow parameters are not used.
- Legacy Atmosphere & Effects are not supported.

Note that the Physical Scale value in the Exposure Control (Environment and Effects) has an influence over how your 3ds Max and Arnold lights render. You may need to Disable or adjust the Physical Scale to get the intensity you expect.

Decay

Arnold does not support constant light decay. However, Arnold’s Quad and Disk area lights have a Spread parameter, that when set to a low value, will give you something similar to a constant fall-off. Similarly, the Spotlight in Arnold has a Lens Radius parameter that, when set to a non-zero value, and coupled with a low angle, has the apparent effect of flattening the decay, like in a Hollywood-style searchlight. Another workaround is to use distant/directional lighting.

There is a generic Arnold Light object where you can select the type of light in a combo and the parameters will change dynamically according to the selected type. This can be found under the lights menu in the create tab.
Choose Arnold from the light list

- Point light
- Distant light
- Spot light
- Quad light
- Disc light
- Cylinder light
- Skydome light
- Photometric light
- Mesh light
- Light filters

3ds Max scenes (particularly architectural scenes) setup for other rendering engines will not necessarily convert well to MAXtoA. Arnold does not currently support physical units for lights, and a conversion process is not straightforward. You may need to adjust **Intensity** and **Exposure** parameters for your lights to match.

**Common Light parameters**

As well as honoring the standard 3ds Max light parameters, the Modify Panel will also show the following Arnold parameters:
Intensity

Intensity controls the brightness of light emitted by the light source by multiplying the color.

Exposure (f-stop)

Exposure is an f-stop value that multiplies the intensity by 2 to the power of the f-stop. Increasing the exposure by 1 results in double the amount of light.

In Arnold, the total intensity of the light is computed with the following formula:

$$\text{color} \times \text{intensity} \times 2^{\text{exposure}}$$

You can get the same output by modifying either the intensity or the exposure. For example, intensity=1, exposure=4 is the same as intensity=16, exposure=0. Note: $2^0 = 1$, not 0.

$$1 \times 1 \times 2^4 = 16$$

$$1 \times 16 \times 2^0 = 16$$

The reasoning behind this apparent redundancy is that, for some people, f-stops are a much more intuitive way of describing light brightness than raw intensity values, especially when you're directly matching values to a plate. You may be asked by the director of photography (who is used to working with camera f-stop values) to increase or decrease a certain light by 'one-stop'. Other than that, this light parameter has
nothing to do with a real camera's f-stop control. Also, working with exposure means you won't have to type in huge values like 10,000 in the intensity input if your lights have quadratic falloff (which they should).

If you are not used to working with exposure in the lights, you can simply leave the exposure parameter at its default value of 0 (since $2^0 = 1$, the formula then simplifies to: color * intensity * 1).

Normalize Energy

If enabled, you will be able to tweak the shadow softness by changing the size (i.e., radius) of the light, without affecting the amount of emitted light. This is very handy for artistic control. Otherwise, if not enabled, the amount of emitted light is proportional to the light's surface area.

Samples

Controls the quality of the noise in the soft shadows and direct specular highlight. The higher the number of samples, the lower the noise, and the longer it takes to render. The exact number of shadow rays sent to the light is the square of this value multiplied by the AA samples.
Noise from lights can sometimes be difficult to diagnose, particularly if the light source is broad in comparison to the scene and the shadows have an extremely wide penumbra. In these cases, it can sometimes be mistaken for indirect diffuse noise. It highlights the necessity for testing noise ray type. This diagram shows how light is traced in Arnold.

The example below shows specular highlights from area light sources. There are four spherical mesh light sources of varying sizes and color temperatures. Underneath are four cubes with Standard shaders assigned to them with varying degrees of specular roughness. Note that more noise is apparent with smaller light sources. Increasing the number of light samples resolves the noise.
If the issue is noise in a specular highlight, you will need to confirm that the source is the direct light and not a secondary ray type (such as specular). This is easy to achieve by turning off global illumination; set the *Diffuse Depth* and *Specular Depth* to zero (this essentially turns off all global illumination). If the noise is still there, we know it is the specular component of the illumination model. If the issue is shadow noise, then we can simply toggle ignore shadows in the Arnold render settings, and the noise will completely resolve.

The key, again, is to modify the sampling and observe the changes. Increasing the number of light samples should have an immediate and quantitative effect on the smoothness of the specular highlight and the shadow. If there is no change, light samples are not responsible for the noise.

Multiple importance sampling (MIS) is enabled by default in Arnold. The images below show the difference when rendering with and without multiple importance sampling.
Volume Samples

The volume samples parameter handles the number of samples used to integrate the in-scattering from direct light. Like the "samples" parameter for surfaces, it is also a squared number.

Volume Samples does not apply to the Atmosphere Volume shader. To improve the quality of the Atmosphere Volume shader, you must increase the Atmosphere Volume samples.
**Shape**

**Type**

The shape of the light. Choose from **Point, Distant, Spot, Quad, Disc, Cylinder Light, Skydome, Photometric** and **Mesh**.

![Types of lights available in MaxtoA](image_url)

**Light Shape Visible**

When enabled, the shape of the light is visible in the render as a self-illuminated object.

**Shadow**

**Cast Shadows**

Enables the computation of shadows cast from the light.
Atmospheric Shadows
Determines if volumetric shadows will be computed. This option is not in Distant or Skydome Lights.

Enabled (default)  Disabled

Shadow Color
Sets the intensity of each color channel for shadows. Normally this would be black.

Black (default)  Red
**Shadow Density**

Sets the shadow density, or strength. This controls how the shadow blends with the material on which the shadow is cast: a value of 1.0 produces an opaque, black shadow, and a value of 0.0 gives no shadow. Normally this would be 1.0.

![0](image1) ![0.5](image2) ![1 (default)](image3)

**Contribution**

Per-light scaling for *Camera*, *Transmission*, *Diffuse*, *Specular*, *SSS*, *Indirect* and *Volume*. Weights scaling the light contribution to each of those components independently. Should be left at 1 to produce physically accurate results.

**Indirect**

The relative energy loss (or gain) at each bounce. This should be left at its default value of 1.0 for
physically meaningful results. Values bigger than 1 make it impossible for GI algorithms to converge to a stable solution.

Max bounces
The maximum number of times the energy from this light will be allowed to bounce in the scene. A Max Bounces value of 0 means that the light will only be part of the direct lighting computations, effectively disabling GI for this light. Note that this value works along with the global ray depth controls, so the default value of 999 bounces per light is just a theoretical maximum; in practice, the global ray depth limits are set much lower.
AOV Light Group

Per-light AOVs are available via a string parameter. Each light has an AOV parameter which writes out the light contribution to a separate AOV with a corresponding name. See also Light Path Expression AOVs.

Light Path Expressions do not currently work in MAXtoA. They are planned for a future release.