



Christie Xenolite® lamps and Christie Solaria™ Series projectors

Usage best practices

CHRISTIE®

Optimize your Christie digital cinema system

Christie Xenolite® lamps can produce remarkable brightness and color consistency with excellent resistance to flicker, ignition difficulty and explosion. With this superior performance comes great economy. Here are some usage guidelines that can be applied to get optimum performance from the Christie Xenolite lamp and Christie Solaria™ Series projector combination. If you need technical support to help you with this, please do not hesitate to contact Christie technical support.



How to calculate the amount of light required

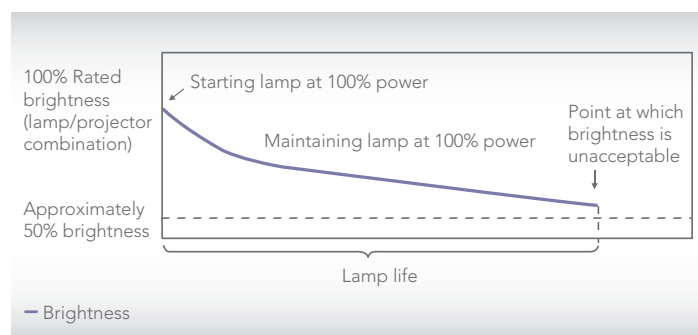
The basic formula to calculate this theoretical light requirement is:

- Lumens (L) = Average Screen Brightness desired (average fL) X Screen Area (sq ft)**
 - Given a good light distribution, the "Average Screen Brightness" can be estimated by multiplying the center brightness desired by 0.95. Generally accepted practice for the target center brightness is: 14fL for 2D and 4.5fL for 3D (light measurement taken through 3D glasses).
- After you have the "Lumens" number you would divide it by all significant system efficiencies. Some examples would be:
 - Screen gain: 1.0 to 2.4. Silver screens are 2.4. This is a very important part of this equation and care should be taken to make sure this number is accurate. If the screen in question is not new then the overall gain should be measured properly. Any degradation or debris on the screen will reduce the screen gain.
 - Port window efficiency: 96% efficiency is typical for good port glass.
 - Loss due to color correction required for meeting DCI color specifications: 97% efficiency is typical.
 - 3D system light efficiency: this number can be anywhere from 10% to 30% efficiency depending on the 3D system used.
 - Other effects like down angle and screen curve do make a difference for light distribution but they only effect these calculations if they are excessive.
- Calculation: Lumens Required (L) = Lumens (L) / (Screen Gain X Port Window Efficiency X Color Correction Efficiency X 3D Efficiency)**
- The resulting "Lumens Required" number you get would be the "MINIMUM lumen requirement" to meet the desired light levels.

How to select the right projector/lamp combination that will provide enough light to satisfy screen brightness requirements

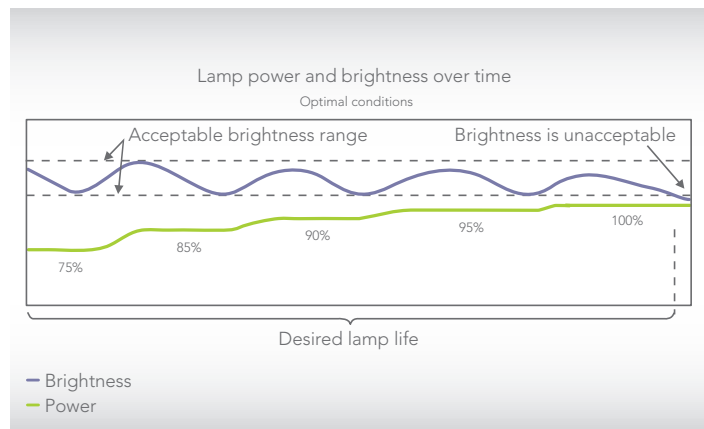
There should be enough brightness available even at the end of the lamp's life to meet your specified center brightness requirement. Your company's lamp changing policy may need to be reviewed to make this decision.

- There is a natural brightness drop-off that occurs with any Xenon lamp during its life. This brightness curve is typically sharp at the beginning of the lamp's life and drops slower after this initial period. Leaving the lamp at 100% power throughout its life would give this typical brightness curve:



- This initial drop-off in brightness is mainly due to the re-shaping of the electrodes inside the lamp. The arc between the electrodes inside the lamp will move slightly during this period. Re-aligning the lamp often can minimize this drop-off. This re-alignment should be done at least every time the equipment is serviced. The more frequent this is done, the more light efficiency can be preserved.
- 100% Rated brightness would indicate the use of a new lamp running at 100% power.

- 4 It is NOT recommended to run a lamp in this way. If this is done then the brightness level will not be maintained for very long and the lamp life will be reduced.
- 5 This chart describes the recommended operation of any Xenon lamp.



- 6 Understanding this brightness curve will help when deciding which projector and lamp to use. It is important to select a lamp that can produce the required brightness at the end of its life. Here is how this is estimated:
 - Select a lamp for an example from the “Lamp Brochure” and reduce its maximum lumen value by about 25% as a starting point. This would be an estimate of the brightness that the lamp can achieve at or near the END of its life at the stated warranty. For higher wattage lamps this value would be more like 30% or 35%. If you intend on running the lamp longer than the stated warranty then you would increase this percentage. Call this resulting lumen value the “maximum aged brightness.”
 - Take the “minimum lumens required” number and select the lamp/projector combination that can cover this with its “maximum aged brightness” value. It is best to be conservative with this selection to make sure the required brightness can be reached.

How to preserve lamp life with the proper projector operating environment

Proper operating environment conditions will preserve lamp life.

- 1 Room temperature: Comfortable room temperature is usually acceptable. Between 50°F and 95°F (10°C – 35°C).
- 2 Room humidity (non condensing): 20% to 80%.
- 3 External exhaust extraction: Use the “Lamp Brochure” to find the proper air flow in CFM that is required:
 - Make sure this air flow is maintained anytime the projector is on. Add this measurement to all routine service visits.
 - Make sure that the air duct system has a damper feature which closes off to the outside air when the system is powered down. This will prevent dirty moist air from being pulled back down into the projector when the system is off.

How to ensure proper lamp house electrical connections to the lamp

Xenon lamps operate at very high current or amperage levels. Because of this, any electrical connections are very critical. When installing a lamp make sure these connections are tight and secure.

- 1 A loose or bad connection can cause the connector to burn which in turn will either break the electrical connection or overheat the end of the lamp causing the seal inside the lamp end to fail. This will result in a lamp that will not ignite.
- 2 Do not use any connectors that are discolored or burnt. Replace any discolored connectors before installing a new lamp.
- 3 Inspect both end connectors for discoloration at every routine service visit.
- 4 Lamps exhibiting burnt or discolored ends are not covered under warranty.

How to determine average expected life

In the “Lamp Brochure” you will find an “Estimated average expected life” number for each lamp/projector combination.

- 1 This number is a guideline to help you determine how long a particular lamp can be operated under optimal conditions as described here.
- 2 If the operating situation is not optimal then a shorter lamp life can be expected.
- 3 Non-optimal conditions would include:
 - Starting the lamp out near or above 100% power and running it this way throughout its life.
 - Not providing adequate air extraction.
 - Poor operating environment.
 - Changing the power level drastically up and then back to accommodate two different light level requirements such as 2D then 3D.

Christie Xenolite® Lamp Champion Warranty

Christie Xenolite® lamps are of very high quality and any failure is unlikely. If a lamp has failed for some reason then a service technician should check the system and operating practices to make sure that the lamp is being used properly. All Christie Xenolite lamps are covered under warranty against any manufacturer defects. The period of time is based on the warranty hours of operation given in the “Lamp Brochure” and a period of one year from invoice date whichever comes first.

- 1 If a warranty claim is required then prompt action must be taken. A “Xenolite Lamp Warranty Claim Form” must be filled out completely and submitted, following the instructions on the form. These forms are in the lamp box or they can be obtained by contacting the Christie office located in your region. Please see contact information on the back of this guide.
- 2 If the request is unusual and it is suspected that the lamp did not cause the failure then Christie will contact the person making the claim to verify the operating conditions. This is to help prevent repeating failures caused by something other than the lamp.

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