



The right projector for the right image

Helping church decision makers get the best projector

BenQ

The right projector used correctly can draw people together with immersive compelling images that help people grasp what cannot be physically seen with the eye. But the wrong projector could have the opposite effect. Here are some of the problems that churches face with a mis-matched projector.



Top Five Mistakes Churches Make Buying Projectors

- 01** Buying a less expensive projector that requires budget busting replacement lamps that become a burden in the future.
- 02** Choosing a projector model that requires regular filter cleaning and replacement, requiring church staff to climb tall ladders or rent expensive lifts.
- 03** Not cleaning a projector filter often enough and having warning messaging show up during a service.
- 04** Installing a projector where the LCD panels and polarizers begins to turn yellow over time, requiring premature replacement.
- 05** Selecting a projector that doesn't have good color accuracy, so pictures of people and nature don't look right which becomes distracting.

The purpose of this projector guide is to help church decision makers to understand the different types of projector technologies and how to avoid making these major mistakes for either a replacement projector or a new build.

SECTION 1: Projector Basics for Buyers



If you are tasked with selecting, purchasing, funding, or maintaining a projector, we've put together the basics of many of the key parts of what makes one projector different from another, and why it may be important in your decision.

Projector Imaging Technology

The way a projector creates an image is split between two technologies, LCD and DLP. This is like the split between gas and diesel engines for cars and trucks which look the same on the outside but use different technology on the inside.

LCD or 3LCD

The earliest projectors were made using small liquid crystal display panels, and the design hasn't changed much over the years. They use three different LCD panels to mix primary colors to create the picture. But because all these parts need to be cooled, it makes it harder to seal the projector against dust. In 2023, over 90% of LCD projectors sold require filters.



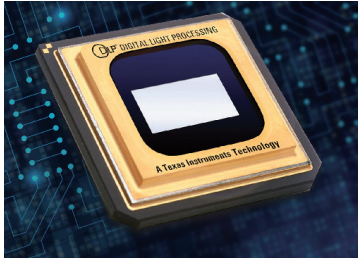
Figure 1- LCD projectors use 3 separate panels to control the light to create an image.

One of the biggest concerns with LCD projectors in churches is durability. Many LCD models have daily or hourly usage limitations in the warranty, so if you plan to use the projector in a multi-use facility or for signage, be sure and check the warranty of the specific model prior to purchase if you expect heavy use. Many LCD projector models have warranties that include an "excessive use" exclusion that can void the warranty coverage.

Liquid crystal technology is also no longer used for commercial digital cinema projectors due to the components of the imaging system wearing out and causing the projector to turn yellow. When an LCD projector begins to turn yellow, the cost of repairing typically becomes greater than the replacement cost. It's difficult to gauge the risk of an individual model, since many brands don't disclose which type of LCD panel is used in the projector itself.

DLP or Digital Light Processing

Digital Light Processing (DLP) technology was created by Texas Instruments and uses a special semiconductor chip with tiny movable mirrors to create an image that is magnified through the projector lens. It is the main technology used in commercial cinemas for its sharp images and color accuracy.



While a high-powered digital cinema projector will have three DLP chips, most church projectors only need one DLP chip to create an image.

DLP technology is the most popular imaging technology used in laser and LED projectors and is immune from wearing out and turning yellow over time. In North America, most DLP projectors sold have a dust-proof sealed design that eliminates filter cleaning, and there are many models that are rated for 24/7 use.

Figure 2- DLP projectors have an advanced chip with microscopic mirrors that create the image on the screen.

Projector Imaging Technology Comparison

Projector Type	Light Source	Advantages	Disadvantage
LCD	Lamp / Laser	More efficient with mercury lamps, less expensive	Most models require filter cleaning. Difficult to find 24/7 rated models
DLP®	Lamp/Laser/LED	Sharp image, more solid-state light options, filter free, and doesn't turn yellow	Higher initial cost than LCD, fewer mercury lamp models

BenQ DLP Projector

Non-DLP Projector

Projector Lamp Technology

The light source of a projector has changed a lot in the last five years. Here are the three most popular light sources for projectors, along with their advantages and disadvantages.

Mercury Lamps

Mercury projector lamps have been the standard light source for projectors for over 20 years, but they are now being phased out due to governmental regulation and the popularity of newer light sources such as laser and LED,

The primary advantage of a mercury lamp projector is that they offer the least expensive way to get a bright projector. But these lamps lose brightness faster than LED or lasers and need to be replaced after a few thousand hours.

Also, because they use mercury, it's a hazard if one breaks. But the biggest issue is since they have been banned in 2025, you may find it difficult or expensive to purchase a replacement lamp in the future. Here are some examples of what a replacement lamp costs in 2024.

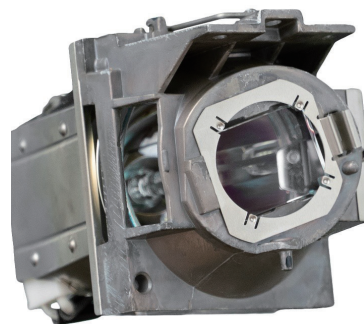


Figure 3 - Mercury lamps are being phased out of many projector models due to new environmental regulations.



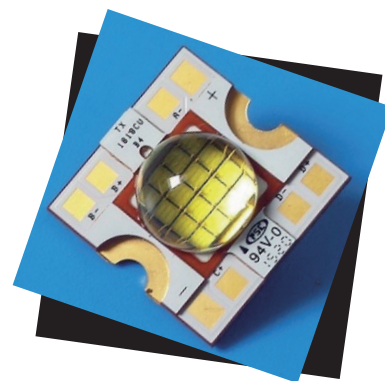
Projector	Hitachi CP-WU8700B	NEC PA653U	InFocus IN5544	Sony VPL-FW65
Brightness	7000 Lumens	6000 Lumens	6500 Lumens	6300 Lumens
Rated Lamp Life	2000 Hours	4000 Hours	2000 Hours	3000 Hours
Replacement Lamp Cost	\$364	\$280	\$684	\$477

One other important thing is that it is especially important that a projector lamp be replaced with an OEM lamp and not a less expensive generic lamp. Generic lamps can create big problems for a projector and can void many manufacturer warranties. OEM lamps cost more than generic but can save you from replacing your projector prematurely.

LED Powered Projectors

For lower brightness projectors under 5000 lumens, the best alternative to mercury lamps are projectors powered by LED chips. These projectors are about 15% more expensive than similar mercury lamp models but deliver far better color performance and a much longer life. A quality LED projector will last between 20,000 and 30,000 hours, the equivalent of four replacement mercury lamps.

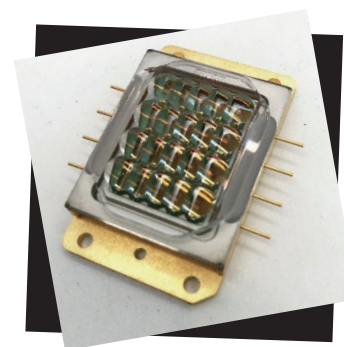
The most exciting advantage of an LED powered projector is the color performance. LED projectors offer the highest color saturation of any light source and can leverage color improvement technologies found in televisions. This means that you don't need as many ANSI lumens to generate a rich red or verdant green on the screen as a mercury lamp. LED powered projectors often come with a sealed engine, and many models are rated to run 24/7, making them well suited for heavy use such as multipurpose areas or digital signage.



Laser Powered Projectors

For church projectors brighter than 4000 lumens, laser projectors are the primary light source. These projectors are about 50% more expensive than mercury lamp models but deliver the highest brightness levels and typically last 20,000 hours or longer. Color performance is typically better than lamp projectors, and there are now many models that have a Rec.709 color specification up to 10,000 lumens. Previously, you could only get this in an digital cinema rated projector.

One key thing in a laser projector is that it must be protected from dust. Dust inside a laser projector can be vaporized by the laser and end up damaging components over time. In 2024, about 50% of laser projectors sold have filters that need to be regularly cleaned, some as often as every month. Many laser projectors now offer completely sealed laser engines and are certified under industry standard IP5X dust tests. If you are going to mount your projector in a high location, consider a sealed laser projector instead of one that uses a filter.



Projector Light Source Technology Comparison

Light Source	Advantages	Disadvantages
Mercury Lamp	Lowest initial cost	Short life, Expensive to replace, may be difficult to find once banned
LED	Low cost, best color performance, long life	About 15% more expensive than lamp models, limited to 5000 lumens
Laser	Very high brightness, long life, good color performance	Sensitive to dust, most expensive light source

Leading Projector Brands

In the last five years, many of the larger projector brands have disappeared, while new ones have emerged. What are the most popular brands for church projectors and what makes them different? Here are the most popular projector brands according to Futuresource in 2024.

EPSON

Epson is the largest projector brand worldwide, and the manufacturer of projector LCD panels that it sells to other brands. All Epson projectors use LCD panels, Epson is the leading provider of mercury lamp powered projectors, and the market leader in lower resolution projectors such as XGA classroom projectors.

In 2024, nearly all Epson church projectors use either a mercury lamp or laser engine and nearly every model uses a paper filter to keep dust out of the projector.

BenQ

BenQ is the second largest projector brand, and all models use DLP chips. BenQ uses mercury lamps, LED, and laser light sources for its projectors. BenQ is the market leader in high brightness (+5000 lumens) 4K UHD models, and a leader in high brightness LED projectors that can run 24/7.

In 2024, nearly all BenQ church projectors use either an LED or laser light engine and every model is sealed to prevent dust contamination. This enables a BenQ church projector to be maintenance free, so you don't need a ladder to remove and clean any filters every three months.

Projector Brand Comparison

Here are the top worldwide brands of projectors according to Futuresource Consulting in 2024.

Rank	Brand	Imaging Technology	Light Source Technologies	Sealed Projectors
1	Epson	LCD Panels	Mercury Lamp Laser	No
2	BenQ	DLP Chips	Mercury Lamp Laser LED 4LED	Yes
3	ViewSonic	DLP Chips	Mercury Lamp Laser LED 4LED	Yes
4	Optoma	DLP Chips	Mercury Lamp Laser LED 4LED	Yes
5	Panasonic	LCD Panels DLP Chips	Laser	Varies by Model

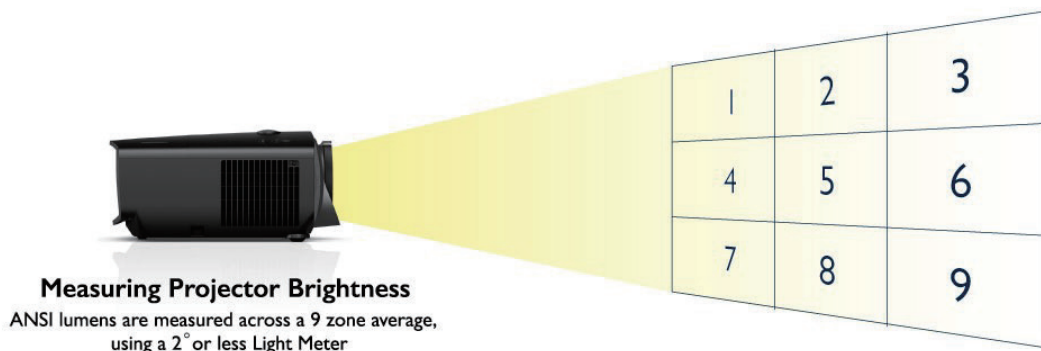
SECTION 2: Key Features for Church Projectors

Brightness

When selecting a church projector, determining the right brightness on the screen is essential to ensure that images are clear and visible under various lighting conditions. Brightness in projectors is measured in ANSI lumens, and the appropriate lumen output can ensure the effectiveness of your presentations in worship settings.

What are ANSI Lumens and why are they important?

For the last 20 years, the brightness standard for projectors has been ANSI lumens. ANSI stands for American National Standards Institute, a non-profit organization that creates measurement standards for many other products. The ANSI lumen measurement is the toughest test because it measures the brightness of the entire screen.



ANSI Lumens vs. other lumen measurements

Some brands use non-ANSI lumen measurements to market their projectors to achieve a higher lumen rating. For example, the ISO 21118 lumen measurement standard is a simpler measurement focusing on the center of the screen and generates a higher lumen number than the ANSI measurement. Some projector brands use this measurement instead of ANSI lumens to market their projector. Here are some examples from specification sheets of popular projectors that are available in 2024.



Projector Model	BenQ LU9800	Optoma ZU860	Sharp NP-P525WL	Epson EB-PU1006W
Marketed Lumens	10,000 Lumens	9600 Lumens	5200 "Center Lumens"	6000 ISO 21118 Lumens
ANSI Lumens	10,000 Lumens	8500 Lumens	Not Specified	Not Specified

In 2024, it's a little harder to compare projector brightness since some models use a the more liberal ISO 21118 measurements instead of the traditional ANSI lumens. While it may vary from model to model, the difference seems to be around 10%-15%, so be sure and check which type of lumens are used on the specification sheet so you have enough brightness in your projector.

Beware of inexpensive projectors that just show "lumens" or "lux" without using "ANSI" or "ISO 21118" in the specification. For example, in 2024, one projector model was advertised at 9500 lumens, but the company admitted that using an industry standard measurement, it only generated around 95 ANSI lumens.

BenQ has been using the ANSI lumen standard on all projector models and one of the few brands that combine both the ANSI lumen and color accuracy specifications on high brightness church projectors. Here are some guidelines on projector brightness levels by type of projector.

Projector Brightness Requirements

Projectors can be used in various locations in a church, such as youth rooms, classrooms, and overflow rooms. Here is a helpful guideline on the common brightness levels for several types of projectors.

Portable Projectors – 200-500 ANSI Lumens

Want to put a big image in a place you would least expect it? Portable projectors now are bright enough to light up smaller screens and have integrated sound systems perfect for small groups and youth camp outs. These are typically powered by LED light sources and can stream content from phones or directly from the internet. The best models offer integrated batteries that can last as long as 2-3 hours with 1080p resolution.

Portable Projector Models




Model	Brightness	Resolution
BenQ GV11	200 ANSI Lumens	480P
BenQ GV30	300 ANSI Lumens	720P
BenQ GV50	500 ANSI Lumens	1080P

Classrooms and Standard Screens – 2500- 5000 ANSI lumens

Most churches have classrooms and other gathering areas where projectors are used for teaching slides and videos. Typically, these are used with the lights on, so depending on the screen size, an LED powered projector at 2500 lumens is an inexpensive solution, or upgrade to a higher brightness laser or LED model if there is a bigger screen or in a room with windows.

Classroom Projector Models




Model	Brightness	Resolution
BenQ LW600ST	2800 ANSI Lumens	WXGA
BenQ LH650	4000 ANSI Lumens	1080P
BenQ LU930	5000 ANSI Lumens	WUXGA

This brightness level is also ideal screens placed in the rear of the church for the worship leader to see from the stage, without being a distraction in a darkened room.

Main Screen – 4000 - 6000 ANSI lumens

The main sanctuary projector screen size is the central focus point for many aspects of the service, so it needs to be bright. Here you can use a projector ranging from 4-6000 lumens, and if more brightness is needed for a larger screen, the projectors can be easily stacked to double the brightness. Depending on the model, this can be a less expensive approach than buying a single higher brightness projector.

Main Screen Projector Models






Model	Brightness	Resolution
BenQ LH730	4000 ANSI Lumens	1080P
BenQ LK935	5500 ANSI Lumens	4K UHD
BenQ LU935	6000 ANSI Lumens	WUXGA

Large Main Screen – 6000 – 20,000 ANSI lumens

Churches with large auditoriums and screens over 25 feet high often require very bright projectors. The most popular approach is a single 10,000 lumen model (which can be stacked if needed), and for those with enough budget, the three chip digital cinema models are used to deliver amazing images as you would see in a movie theater.

Large Main Screen Projector Models

	Model	Brightness	Resolution
	BenQ LU9800	10,000 ANSI Lumens	WUXGA
	Barco G100	17,000 ANSI Lumens	WUXGA
	Christie M 4K RGB Series	25,300 ANSI Lumens	4K UHD

Stacking Projectors for Brighter images

Let's say you have a large 300-inch screen that you want to fill with a 4K UHD image for your main stage. Typically, a screen this size will require about 10,000 lumens to fill the screen. So, while you can purchase a single 10,000 lumen projector, you can also stack two 5000 lumen projectors that are properly aligned to generate the same screen brightness at less cost. Here is an example of how a church can save money using this method using BenQ's special church pricing.

Model	Total Brightness	Resolution	Projector Cost (est.)	Lens Cost (est.)	Total Cost
(2) Stacked BenQ LK935	11,000 ANSI Lumens	4K UHD	\$7986	Included	\$7986
Christie 4K10-HS	10,000 ANSI Lumens	4K UHD	\$23,995	\$2500	\$26,495
Barco I600-4K10	10,000 ISO Lumens	4K UHD	\$19,200	\$3120	\$22,320

Color Accuracy in Church Projectors

With the growth of specialized worship software that incorporates images and video into song lyrics, and the increasing popularity of using projectors in visual events complex images and projection mapping, color accuracy is now a key requirement in selecting the right church projector.

But until recently, getting a color accurate projector was an expensive proposition. The key requirement to look for in a church projector is the Rec. 709 color specification. Here are some models at various brightness levels that are specified to the Rec.709 color space, which ensures that the pastor on a remote projector broadcast looks the same as he does in real life.



Higher Brightness Color Accurate Projectors

Here are some different projector models that have high color accuracy at various brightness levels. While this is not a complete list of all color accurate projectors, you can check the specification sheet or product review to see if a projector is color accurate. If there is no Rec. 709 specification, there is a risk the projector may struggle with certain colors.



Model	Brightness	Rec. 709 Accuracy
BenQ LH730	4000 ANSI Lumens	98% Rec. 709
BenQ LK935	5500 ANSI Lumens	92% Rec. 709
Barco F80	7000 ANSI Lumens	100% Rec. 709
BenQ LU9800	10,000 ANSI Lumens	95% Rec. 709
Christie 4K13-HS	14,800 ANSI Lumens	100% Rec.709

Resolution and Aspect Ratios

Choosing the right resolution is essential for clear and detailed images, especially when displaying detailed content such as nature scenes and people. Higher resolution projectors provide sharper images, which can enhance the overall experience during services and events.

Resolution and Pixel Density in Church Projectors

How clear an image looks directly affects how congregants perceive text, video, or live feeds. The easiest way you can measure this is using the same metrics that we use on a smart phone – pixel density.

If you are planning to use larger screens (over 100-inch diagonal) then you will want to consider the pixel density of the image. While smart phones and flatscreens will measure pixels per square inch (PPI²) in the thousands, a large screen matched with a lower resolution projector can only generate 10% of the pixel density compared to a typical TV. This can make your images look rougher and smaller text harder to read. Here is a chart of how pixel density works on different size screens. While 1080p and WUXGA are acceptable at smaller screen sizes, you can see the difference that the extra pixels of a 4K UHD make to create a smooth clear picture on larger screens.

Device Resolution	Pixel Count	Pixel Density (PPI ²) 100" Screen	Pixel Density (PPI ²) 200" Screen
1080P (16:9)	2 million	485	121
WUXGA (16:10)	2.4 million	513	128
4K UHD (16:9)	8.3 Million	1,981	485

Screen Aspect Ratio Based on Content Type

For churches that utilize high-definition videos or detailed graphical content in their services, a 16:9 aspect ratio is best, especially compared to the traditional 4:3 or 16:10 WUXGA resolutions. This aligns better with current media formats and offers a broader display surface.

Some high brightness projectors using 16:9 chips can also adapt to other aspect ratios. New models of projectors now have an ultra-wide 21:9 mode that can be displayed in portrait or landscape mode for a unique impact in a church environment.



Figure 4- BenQ church projectors can be blended together to create an immersive space

Unique Aspect Ratios for churches

In 2024, many higher brightness projectors can support several types of eye-catching aspect ratios to create unique and compelling visuals.

1:1 Aspect Ratio

Want to show a square image? Several new BenQ projectors have native support to enable you to create a completely square 1:1 image using a projector to catch and hold the eye of your congregation. This is especially effective in the lobby where you can redeem unused space.

Portrait Orientation

Instead of the standard 16:9 orientation, most BenQ laser projectors can support portrait display. Just turn the projector sideways and set up your graphics card for portrait orientation.

Blending Projectors

One easy way to create a larger oversized image is to use multiple projectors that are blended together to create a seamless giant image. BenQ makes special color accurate projectors that are designed to work together where you can't tell where one projector stops and the other one starts. These are used to create immersive spaces – such as a flight simulator, but can be used by a church to transform a stage or other larger space.

SECTION 3: Mounting and Maintaining Projectors

Projector Throw Distance

Understanding Throw Distance in Projector Setup

Projectors require specific distances to properly fill the screen, which is called either “throw ratio” or “throw distance.” Most projectors have an integrated lens that determines how far back the projector needs to be mounted, while other projectors are sold with optional lenses that enable you to choose a specific lens for that will fit a specific mounting location. Projectors with optional lenses are typically brighter and more expensive than those with regular lenses.

The easiest way to determine how much distance a particular projector needs is to use an online projector calculator such as the Projector Central calculator. This will tell you the distance needed, and whether the projector is bright enough to fill your screen.

Here is an example of the BenQ LK935 4K UHD projector on a 10-foot-high screen. With its zoom lens, it requires between 24 and 38 feet to fill the screen and produces enough brightness for a typical church environment.

The screenshot displays the Projector Central calculator interface. At the top, the 'Lens' is set to 'Standard Lens' with a 'Throw Ratio' of 1.36 - 2.18, f/1.8 - 2.1. The 'Aspect Ratio' is set to 16:9, and the 'Units' are set to feet. The 'Throw Distance' is set to 29'-8" on a scale from 0'-0" to 72'-10". The 'Image Size' is set to 17'-9" width on a scale from 0'-0" to 33'-5". Below the scales is a diagram showing a projector on the left and a screen on the right. The screen is 10'-0" high and 17'-9" wide. The throw distance is labeled as 29'-8". The zoom range is set to 1.30x on a scale from 1x (Telephoto) to 1.6x (Wide Angle). The 'Screen Gain' is set to 1. The estimated image brightness is 29 fL, with a note: 'Recommended image brightness for rooms with low ambient light'. There is also a 'Ceiling Mount' checkbox.

Types of Projectors and Their Throw Ratios

Standard Throw Projectors:

This is the most common and least expensive type of projector. The throw ratio is typically between “1” and “3” and nearly every projector has some level of zoom to enable you to have some flexibility on exactly where you will place it.

Short Throw Projectors:

These models enable you to mount the projector closer to the screen. A short throw projector has a lens like a wide-angle lens on a digital camera. It can dramatically reduce the distance between the screen and the projector. For example, in the Projector Central example above with a regular lens BenQ LK935 projector, the projector requires about 30 feet of space for a 10-foot-high main screen. With the short throw version of this projector, the BenQ LK936ST, it only requires about 15 feet of distance.

The interface includes several interactive elements: a 'Lens' dropdown set to 'Standard Lens' with a throw ratio range of 0.81 - 0.89 and focal length of f/1.8 - 1.9; an 'Aspect Ratio' dropdown set to 16:9; a 'Units' button; a 'Throw Distance' slider set to 15'-1" with a range from 0'-0" to 29'-7"; an 'Image Size' section with a width slider set to 17'-10" and a height of 10'-0"; a 'Zoom Range' slider set to 1.05x, ranging from 1x (Telephoto) to 1.1x (Wide Angle); an 'Estimated Image Brightness' bar set to 28 fL, with a note 'Recommended image brightness for rooms with low ambient light'; and a 'Screen Gain' dropdown set to 1. A 'Ceiling Mount' checkbox is also present.

Projectors with short throw lenses tend to cost a little more, and have a smaller zoom ratio, so you'll need to plan your mounting location carefully.

Short throw projectors are often used with rear projection setups where the projector is mounted behind the screen to reduce the impact of ambient light.

Ultra-Short Throw Projectors:

These are wall mounted projectors used in classrooms, sometimes with whiteboards. These are becoming less popular since they cost more than an interactive display.



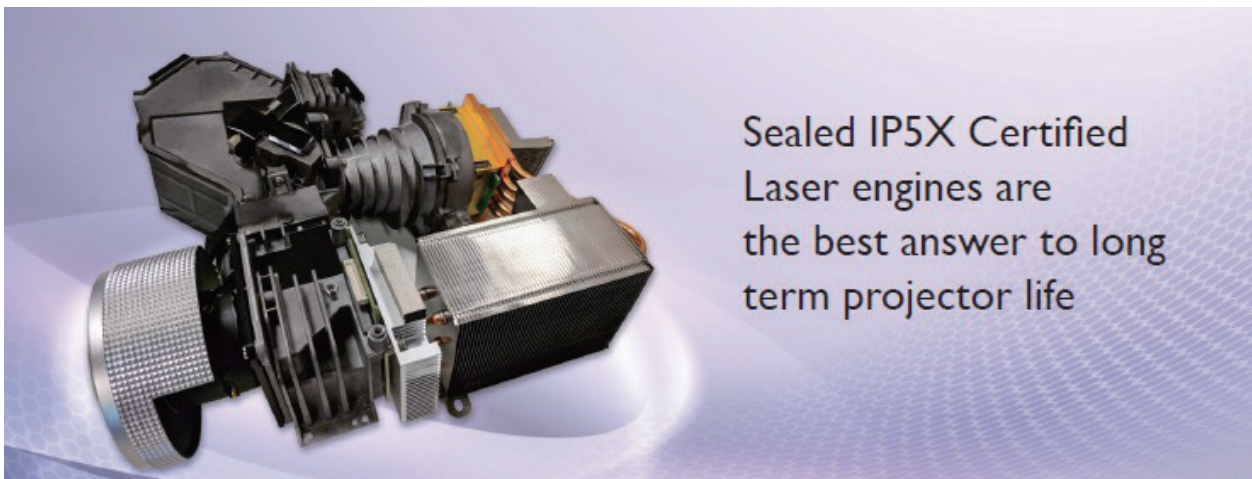
Figure 5- Dust inside a high-powered laser projector can shorten its life if it is not sealed and IP5X certified.

Maintaining Church Projectors

Most church projectors are mounted near the ceiling to avoid being a visual distraction. However, this can make it difficult to perform maintenance on the projector, requiring rental lifts or long extension ladders to safely reach the projector. Fortunately, there are new options for churches to that can reduce the time and safety risks of maintaining a projector.

Maintenance Free Sealed Projectors

In 2024, there are new laser and LED projectors that don't require any filters or regular cleaning. These projectors have special casing around the key components that remove heat and keep dust and damaging materials out of the light engine, so you don't have to worry about the projector image degradation or overheating due to dust. The best projectors are IP5X rated to ensure that they can last for 20,000 hours under intense dusty conditions. This is a standardized test used for smart watches, construction equipment, and other products to ensure that they can operate efficiently in a dusty environment.



All BenQ Worship Vision projectors use sealed engines and don't require any scheduled maintenance.

Projectors that use filters

Most older LCD projectors used in churches have a design that uses filters that need to be regularly cleaned. Most models have a filter timer that will turn on and overlay the screen after a certain number of hours. Churches need to stay ahead of the maintenance to avoid a distracting message during the middle of the service.

These filters need to be cleaned when they get dusty, which can be as often as every month in some environments. Some models have extra optional paper filters to ensure that dust doesn't damage the projector by dust getting on the components and degrading the image.

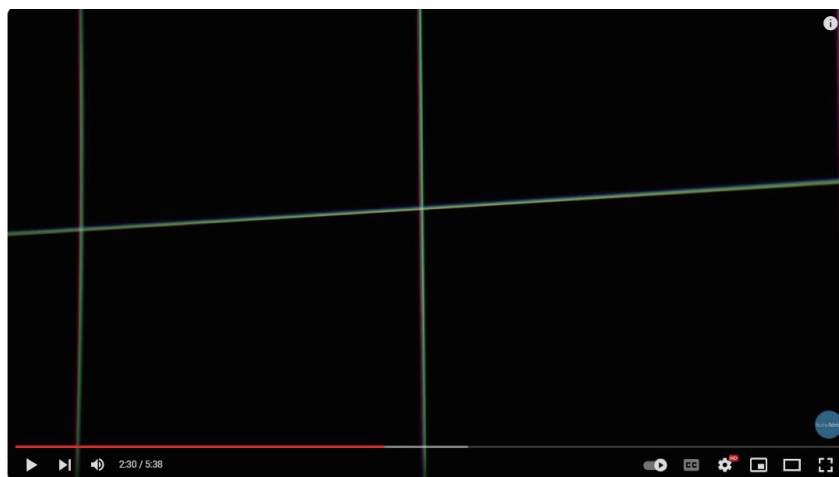
The type of cleaning may vary, either washing and drying the filter, or using a special IT vacuum to remove dust from the filter. These projectors have special warning lights to remind you to change the filter – so you'll need to watch this carefully, so it doesn't pop up during a sermon.

Here are some popular LCD projectors that use filters, and the cost for replacement filters.

Projector Model	Optional External Air Filter	Filter Cleaning Method	Replacement Filter Cost
Epson EB-PU1006W	Yes	Special Vacuum Cleaner	\$43 per Filter \$350 for External Filter
Panasonic VZ580	No	Wash, Rinse, and Dry	\$73 per filter
Sony VPL-PHZ61	No	Vacuum Cleaner	\$60 per filter
Ricoh -PJ WUL6760	No	Vacuum with attachment	\$40 per filter

3LCD Projector Panel Alignment

If you are considering an LCD projector, one often overlooked maintenance item is the panel alignment. If the three panels become misaligned over time, the picture will lose its sharpness and you'll start to see the individual colors. This can be resolved in most models using a 12-step process for each color to get the three panels back into alignment. There's a YouTube video that details this process. DLP projectors use only one chip and cannot become misaligned.



Projector Panel Alignment | How To Align RGB Panels on Your Projector

Figure 6 - LCD panel misalignment can be fixed using a 12-step process shown in this video. DLP projectors have only one chip, so they cannot get misaligned.

Connectivity Options

Overview of Connectivity Types

There are a lot of ways to connect the projector to your sources. Here's a detailed look at the primary types of connections:

HDMI

HDMI is the most popular way to connect a projector. Most modern projectors will have at least two HDMI connectors and the main advantage is that this single cable can handle both high-definition video and audio transmission. Almost any source today can output HDMI to a projector with the right cable and adapter.

The biggest challenge that churches face with HDMI cables is when you have a big distance between the source and the projector. A typical HDMI cable has a range of about 15 feet depending on what resolution you are using, so many churches need to install HDMI extenders that convert the signal into another form that can be transmitted over a longer distance, then reconverted into HDMI.

AV over IP

If you want to send a signal a long way, or to a lot of different projectors, many churches use a system that converts the HDMI signal into a data stream that can be sent over an unlimited distance using standard ethernet cable. For example, you can connect your video source to IP encoder that's connected to your local area network. This will send the data over your network switch to a decoder located near the projector that converts it back to the original HDMI format that is sent to the projector. The advantage of an AV over IP system is that it is fast, and less expensive than traditional proprietary AV switchers. There is no current industry interoperability standard for these types of devices, so you usually must stick with one brand to ensure everything works properly.

HDBaseT

Another way to get a long-distance signal to a projector is to use a system called HDBaseT. This works in a comparable way to AV over IP by converting the HDMI signal with an encoder but uses a proprietary cable and switchers to extend the signal. The typical maximum distance is about 300 feet. One advantage of HDBaseT is that some projectors like the BenQ LU935 have the HDBaseT decoder built in, so all you need to do is plug in the HDBaseT cable to the projector. HDBaseT will support resolutions up to 4K but may have a lower refresh rate and slower response than some IP based systems.

Wireless HDMI Transmitters

Running cable of any type can be expensive, especially if you must feed it through a floor or wall. One approach is to use a wireless presentation system such as the BenQ InstaShow VS20 to transmit the HDMI signal from your source to a projector. The best systems are designed for commercial use and have an integrated wireless router that enables the projector to be about 60 feet from the source even in crowded wireless environments. You simply connect the transmitter button to your source, then tap it to activate it. One advantage of these types of systems in churches is the ability to display multiple sources at the same time, such as a camera feed on one half of the screen, and with the message points on the other half. There are also less expensive consumer screen mirroring systems, but these can be less reliable or subject to other types of wireless interference.



USB-C Cable

Most notebooks today use the USB-C port for video output as well as data functions. If you are using a portable projector such as the BenQ GV31, you can plug in directly to your device using a standard USB-C cable and stream video. In 2024, you can expect to see this feature start to move to mainstream models.

VGA

The long-lasting VGA cable is an analog connection and doesn't support any higher resolution than 1080p. Most projectors have a VGA port, but many devices today have dropped VGA connectors in favor of USB-C. However, these cables are less expensive, and you can run longer lengths than HDMI, so this makes it a valid option if you are on a tight budget.

Projector Control Options

What are the best ways to manage a church projector?

Controlling a projector not only means turning it on and off, but also more time sensitive tasks such as switching sources, blanking the screen, and fine tuning the picture. Here are the alternatives to using the standard IR remote to control your projector.

Device Management Software

The best practice for most church projector installations is to use projector management software to manage the projector over the network. Nearly all projectors have either a LAN port or RS-232 port that can be used to control the projector, and HDMI extenders such as AV over IP and HDBaseT can transmit control signals to the projector using the same cabling used for audio and video.

The first advantage of this software is that you can create groups of projectors to manage. You might have a group of projectors for the main stage, another for the lobby signage, and a third for the back wall. From a single computer, you can change content sources with a single click. This can enable you to switch from digital signage content in the lobby before the service starts to the main camera feed during the service.

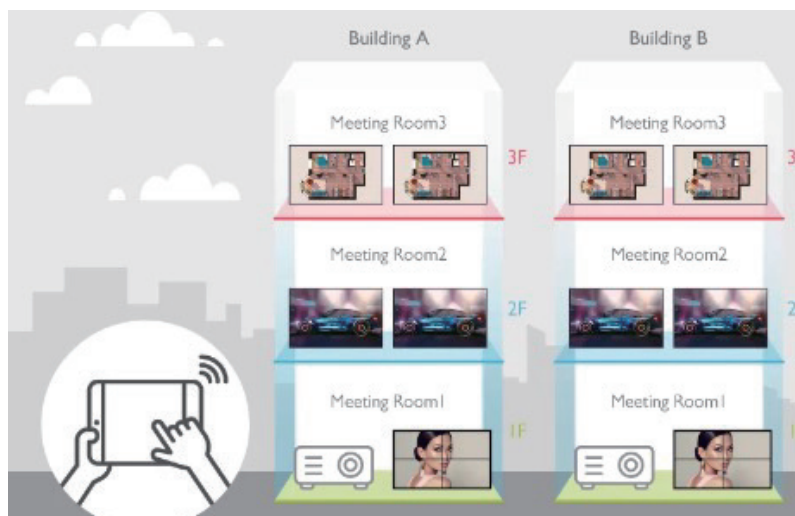


Figure 7- BenQ Device Management software enables you to group projectors for easy control using a network or RS-232 connection.

The other advantage of these systems is the ability to schedule and control turning the projectors on and off to save power and lamp life. This automation removes a simple task that can take a lot of time before and after the service compared to using remotes and can reduce the power bill as well.

The best projector management programs also can support multiple brands of projectors. While some brands offer software to support their own projectors, BenQ offer device management platforms that enable a church to have support for any BenQ projector as well as other brands such as Epson, Hitachi, NEC, and others that use the standard PJ Link protocol. This keeps you from being locked into a single brand of projector. The BenQ DMS software is free.

Wired Remote Control

While nearly every projector comes with an infrared remote control, some church projectors can be controlled by a wired remote control that is directly connected via a small wire. Besides creating a more reliable connection, it also solves the problem when you have multiple projectors of the same brand, where you can point a remote at one projector and end up controlling another projector that is “listening” to the remote. The maximum length of a typical wired remote is about 30 feet.

Budgeting and Costs

Budgeting effectively for a church projector system requires understanding the various costs involved, from the initial purchase to long-term maintenance. This section provides a detailed breakdown of these expenses to help churches plan their expenses for a projector.

Initial Cost Considerations

The cost of a projector depends on the brightness, color accuracy, lens type, and other factors. For example, a higher resolution laser projector that is sealed will typically cost over twice as much as a lower resolution lamp projector with filters. The BenQ Worship Vision pricing program is one way you can reduce your initial purchase cost while minimizing the various maintenance costs that come with a projector. Here is an example of how much churches can save on a projector using this program.



	BenQ LH650 Laser Projector	BenQ LH730 LED Projector	BenQ LU930 Laser Projector	BenQ LK935 Laser Projector	BenQ LU9800 Laser Projector
Lumens	4000	4000	5000	5500	10,000
Resolution	1080p	1080p	WUXGA	4K UHD	WUXGA
MSRP	\$1499	\$1699	\$3199	\$4999	\$17,999
Worship Vision Price	\$977	\$1013	\$2173	\$3993	\$10,967

Key Operating Costs of a Projector

Outside of power usage, the biggest operating expenses for a projector are the cost of replacement lamps, filter cleaning, and replacing a projector that is turning yellow. These can be avoided by purchasing a new sealed laser projector that uses DLP technology. However, if you are going to purchase an older used projector, or receive one as a donation, here are some estimates of what the operating costs could be with an older LCD projector that requires lamps and filters.

1. Replacement Lamps

If you purchase a projector with a less expensive mercury lamp light source, you will need to budget for replacement lamps. Here are some examples of the replacement lamp costs for different higher brightness projectors. These prices do not include installation costs.

2. Replacement Filters & Cleaning

Just like the filters on your air conditioning system, a projector with a paper filter needs to be cleaned regularly. Some models have a timer or sensor that will need to be reset to avoid a warning light coming up on your screen.

The filters on a projector require either the filter to be washed and dried before replacing, or a special low powered vacuum to avoid damaging the filter. A typical projector replacement filter costs between \$40 and \$60. While some projectors can be reached by ladders, many church projectors are mounted on high ceilings. In Texas, a 19-foot rental lift costs about \$200, but if you have higher ceilings a 40-foot lift will cost around \$400 per day to clean your filters.



SUMMARY

We hope this guide can help you understand the key elements in purchasing projectors for churches.

Have any Questions?

BenQ wants to help you get the right projector that you can afford and has experts on hand that can help you with all the technical details, including drawings, at no cost.

Can I trust BenQ projectors for my church facility?

While BenQ is one of the largest projector brands worldwide, technology editors in the US have consistently recognized BenQ projectors as highly innovative products that provide a great value for the price. Here are just a few of the awards BenQ projectors have won in North America over the last few years.



2019 Commercial Integrator Best Awards
Best Audio/Video Products:
Conference/Classroom Projectors
BenQ LK953ST Laser Projector



Tech & Learning Awards of Excellence 2023 – Best for Back to School Secondary
BenQ LH730



TCEA 2020 Best of Show Awards
BenQ EW800ST Short Throw
Wireless Smart Projector



Spaces4Learning New Product Award 2023 – K-12 and Higher Ed
BenQ LH730



Sound & Video Contractor 2020 Innovative Product Award
BenQ LU/LH Series BlueCore



AV Technology Best in Market 2023 Award
BenQ LK935 Business Projector



ProjectorCentral 2021 InfoComm Best of Show Award
BenQ LK936ST Golf Sim Laser Projector



Tech & Learning Awards of Excellence 2023 – Best for Back to School Higher Ed
BenQ LH730



Residential Tech Today Innovation Awards 2021
BenQ LU935ST Sim Theater



SmartBrief Innovation Workplace Awards
BenQ LK935



The 2021/2022 THE Journal and Campus Technology New Product Awards
BenQ LK936ST Laser Projector



The EdTech Awards – Cool Tool Winner 2023
Hardware for Education Solution –
BenQE620 Smart Projector



Sound & Video Contractor 2022 Innovative Product Award
BenQ LK936ST 4K Short-Throw Blue
Core Laser Projector



2024 Sound & Video Contractor Innovative Product Award
BenQ LK935 4K Laser Conference Room Projector



Sound & Video Contractor Best in Market 2022
BenQ LU9800



Spaces4Learning 2024 Reader's Choice Award
Technology – A/V Equipment (Higher Ed)
BenQ LH730

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