

Guggenheim Museum, Bilbao, Spain



The architect and lighting designer of the internationally acclaimed Guggenheim Museum in Bilbao, Spain, selected Lutron's GRAFIK 6000® preset lighting control system to precisely and reliably enhance the beauty of the museum's inner structure as well as the artwork displayed there. The result: A museum that succeeds in form and function. The museum makes a bold statement and is a wonderful showplace for the art inside.





THE CHALLENGE:

Design a lighting control system for the 23,225 m² Guggenheim Museum Bilbao that would both showcase the beautiful artwork in the "best" light as well as protect these valuable treasures from potentially harmful ultraviolet rays.

PROJECT REQUIREMENTS:

- A flexible lighting control system that will maximise the effect of changing exhibitions
- A system able to handle various lighting sources and loads to maintain a clean design that would not detract from the internal architecture or the artwork
- The operation of the lighting control system should be simple to use and automatic

Opening with an unprecedented storm of media coverage, the \$100 million Guggenheim Museum Bilbao in the Basque region of Spain captured the attention, and the imagination, of the world. In art and architectural circles, and way beyond, the Guggenheim Museum Bilbao has received international acclaim

Since then, its designer, Frank O. Gehry, has received many awards including the coveted Gold Medal from the American Institute of Architects which cited the Guggenheim Museum Bilbao at the top of his significant body of work...so far.

Inside there are exhibit areas of varying sizes which make the Guggenheim Museum Bilbao exceptionally versatile. There are small intimate spaces that can accommodate special shows, monumental spaces that can house over-sized works and larger temporary exhibitions, and many other galleries strung together that display the encyclopaedic wealth of modern art that is in the museum's permanent collection.

Lighting is, of course, one of the major elements in the design of any building, but perhaps even more important in the design of a museum. In a museum, lighting is key to making the interiors aesthetically pleasing for visitors and to showing off the artwork in its "best light." At the same time, protecting the artwork from potentially harmful sunlight was crucial to Guggenheim officials who are responsible for conserving their precious collection.

Architect Gehry enlisted Lam Partners, a Cambridge, Massachusetts-based lighting design firm which had worked on many previous Gehry projects, to devise a lighting plan that would enhance the beauty of the inner structure as well as the artwork displayed there...and protect that artwork as well.

"I wanted the museum to have a system that would provide precise, reliable control of the lighting, plus a system that is easy to install and program. That was exactly why I insisted on the GRAFIK 6000® from Lutron."



"The building is a behemoth," said Paul Zaferiou of Lam Partners and the lighting designer for the Guggenheim Museum Bilbao. "We wanted lighting that was beautiful and flexible in every area of this colossal structure, and, of course, we wanted to be able to control and vary the lighting at any given time for maximum effect.

"It would have been simply impossible to have fixed lighting," he said. "We were dealing with lighting interior walls that were far from ordinary. They curve and snake around and rise up to incredible heights in the central atrium. We also had to consider lighting a moveable feast of artwork of greatly varying dimensions.

"We also had to consider the effect of daylight throughout because there are windows in most of the 19 galleries." Skylights to provide ambient light in the galleries were always an integral part of Gehry's vision for the museum. Motorized fabric shades were installed below the gallery skylights.

"We were also tasked to design a flexible lighting system that would not disfigure the ceiling with permanent lines of recessed track lighting." And just as critical as the lighting design for the museum was the design of the lighting control system.

"I stressed the concept of controlling the light, not dimming it," Zaferiou said. "Museum officials get nervous when you suggest that you are going to dim the lights because they are concerned that you will be throwing off the true colour of the art. But the fact that I wanted the museum to have a system that would provide precise, reliable control of the lighting, plus a system that is easy to install and program, was exactly why I insisted on the GRAFIK 6000® from Lutron. I knew it would do everything I wanted it to, but the Bilbao electrical engineering and contracting teams were hesitant because they weren't familiar with the system."

So, Lutron invited team members to tour its headquarters and factory in Pennsylvania, USA so they would better understand the GRAFIK 6000 system and what it was capable of doing.

"They came back believers, and Lutron began to plan a customized system for the museum," Zaferiou said. "Of course, the fact that the original Guggenheim in New York has a Lutron system also helped my campaign to have the best in lighting control."

There are close to 2,000 circuits, 1,375 power boxes (two circuits each), and over 80 dimming panels in the museum which are controlled by three GRAFIK 6000 processors, one for each floor. All of the custom dimming panels were built to specification in Lutron's U.S. factory and shipped to the Guggenheim Museum Bilbao prewired and ready for installation.

"By dimming the lights a mere eight percent, we were able to keep colours true in the artwork and effectively double lamp life. That's another big plus - having lighting controls saves enormous maintenance and energy costs."

PROJECT

Architectural
Lighting
Control
for Museum

CLIENT

The Solomon R.
Guggenheim
Foundation
*City of Bilbao,
Spain*

PROJECT ARCHITECT

Frank O. Gehry
Frank O. Gehry &
Associates
*Santa Monica,
CA*

LIGHTING DESIGNER

Paul Zaferiou
Lam Partners,
*Cambridge,
MA*

LUTRON PRODUCTS



3
GRAFIK
6000
Processor
Panels



84
GP
Dimming
Panels



PC
for
set-up
and
operation



65
4-scene
Selection
Controls



"The Lutron GRAFIK 6000 system makes it possible to add layers of light as desired," Zaferiou said. "Initially we were planning to have daylight and ambient light integrated into several of the preset scenes. Then we came up with the preset program as it is now, six different lighting scenes plus control of the daylight on the other two buttons. It's a fantastic number of options, all easy to combine or use separately."

"Most of the interior lamps are halogens and the museum curators were leery of dimming them because it would throw off the colour of the artwork," Zaferiou said. "But by dimming the lights a mere eight percent we were able to keep colours true in the artwork. There is no noticeable colour shift at that level so the museum people are happy, yet by dimming lights just that much effectively doubles lamp life. That's another big plus for this huge space, having lighting controls saves enormous maintenance and energy costs."

The system's built-in astronomic timeclock also saves energy and money. After hours, preprogrammed automatic timeclock events operate the system so lighting throughout the building can be dimmed down to 60 percent when galleries are not in use. At night, the lighting can be dimmed even further, leaving just enough light for security. Or, if a particular area of the museum is shut down for a period of time—to reconfigure the space or set up for a special exhibit—that area's lights can be shut down from the main system and then activated again when the exhibit area is reopened to the public.

Lighting in each gallery can be controlled at the individual wallstation, but all the individual controls are linked to a central computer as well. "The computer-based system makes installation and system operation easy," according to Richard Whitbread, the service engineer from Lutron's London office who oversaw installation of the system. "In fact, so much of the planning and building of the system had been done before the customised system was shipped, installation took only four days."

"The system design and preset scenes setup were accomplished using GRAFIK 6000[®] Windows[™]-based software," Whitbread said. "Once the setup was complete, the computer could then be used for system monitoring and real-time operation. Without changing the presets, any setting can be overridden from the computer or by staff members from the various wallstation controls. And as time passes and needs change, the system can adapt the lighting to various exhibitions and gallery changes."



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