

Facts and figures

New connected Philips LED lighting at the Allianz Arena

- The architectural design of the Allianz Arena is unique and its façade is covered by the world's largest outer membrane – over 35 meters high and with an external surface area of 29,000 m². The Allianz Arena celebrates its [10th anniversary](#) in 2015.
- Philips has been FC Bayern Munich's official lighting partner since mid 2014. In October 2014 work commenced to install the new LED lighting on the façade, and it took approximately 100 days to complete.
- The system makes the Allianz Arena Germany's first and Europe's largest stadium to feature a dynamic and colorful light display on its entire façade.
- The illuminated area is equivalent to an area of 26,000 m², which is also the part of the façade membrane that is visible to fans and passers-by. That means the LEDs illuminate an area approximately the size of 3.5 playing fields.
- Instead of the three colors (red, blue, white) that have been available in the past, the palette for the new lighting has been expanded to include 16 million colors. This makes it possible to create even the most subtle color nuances and sequences.

Installation

- The extremely homogeneous and three-dimensional exterior conceals more than 300,000 LEDs on some 6,500 Philips ColorGraze luminaires. This amounts to about 285 LEDs on seven or eight luminaires for each inflatable section of the façade membrane.
- A total of 45 tons of material was used. This included luminaires, several hundred control components (data enablers) plus more than 5,000 meters of network cable. The total weight of materials exceeded the weight of 100,000 footballs.
- The LED luminaires and system components were fitted at heights of up to 25 meters by Austrian mountaineers.
- The installation took place in sections - each week some 250 luminaires were delivered and installed.
- The individual modules and their mounting brackets were assembled in the corridors within the Allianz Arena before being winched up to the height at which they were to be installed. They were then fitted by mountaineers who climbed the façade and then connected the modules to the surrounding equipment.
- Specially designed saber-tooth-shaped mounting brackets made it possible to aim the linear ColorGraze luminaires precisely at the diamond-shaped inflatable cushions, many of which vary slightly in shape.
- The luminaires were mounted on the underside of the façade membrane and fitted with special optics. The lenses of these optics ensure that the light falls on the surface of the façade membrane in precisely the required way.
- The team involved in the installation included lighting designers, product and software designers as well as architects, electrical engineers, assembly assistants, and mountaineers to climb the façade.

Technology

- The previous lighting was based on analog technology with conventional fluorescent lamps. Philips replaced this solution with a complete digital system comprising digital LED lighting connected to intelligent control software.
- [Philips ColorGraz](#) [MX4 Powercore](#) luminaires with various optics were installed. If they were all joined together they would cover a distance of about 7.5 kilometers. Philips has already installed more than 200 kilometers of these luminaires around the world, which is equivalent to the distance from Munich to Stuttgart.
- The LEDs installed have an average lifetime of 80,000 hours, which reduces the need for maintenance and is equivalent to the duration of about 53,000 league matches with no extra time.
- The new Philips lighting is about 60 percent more efficient than the technology previously used. It saves approximately 100,000 kilowatts of electricity and 362 tons of CO₂ on an annual basis.
- The lighting system installed here is extremely robust and can withstand even the most severe weather conditions with temperatures as low as -50 degrees Celsius when it is operational and -80 degrees Celsius when it is not in use.
- Philips ColorKinetics is using systems based on the technology used to light architectural landmarks all around the world, from the [Empire State Building](#) in New York, the [London Eye](#) and the [Bosphorus bridge](#) in Istanbul to the [Gateway of India](#) in Mumbai.

Digital control and maintenance platform

- The digital controls can set the 300,000 or more light points in 16 million colors, enabling even the most subtle color nuances, intensities and sequences. Refresh rates of up to 40 images per second guarantee smooth motion sequences.
- [Philips ActiveSite](#) simplifies the operation as well as the monitoring and maintenance of the system. The cloud-based platform serves as a central cockpit for overseeing the main functions. Its content-management system simplifies content creation and control. It also provides extensive tools for analysis and maintenance: from hardware management, real-time reports and e-mail alerts to detailed system diagnostics.

Lighting concepts

- The concepts for the new lighting were designed by the Swiss architects Herzog & de Meuron, who also designed the Allianz Arena itself. The color dynamics are focused on creating a sense of calm and elegance and, just like the static illuminations, they create a direct association with football.
- Elegant color dynamics in red, white and blue are planned for days when no matches are being played. For this purpose Herzog & de Meuron has designed twelve dynamic interim scenarios that fall into four different categories: form-based waves, pixel-based clouds, column-based sequences as well as line-based sequences.
- Different lighting scenarios are possible to suit the stadium activity at the time: on evenings when no matches are being played standard dynamic lighting effects are planned. The concept provides static lighting effects for home and away matches, and individual programs can be created for special events.