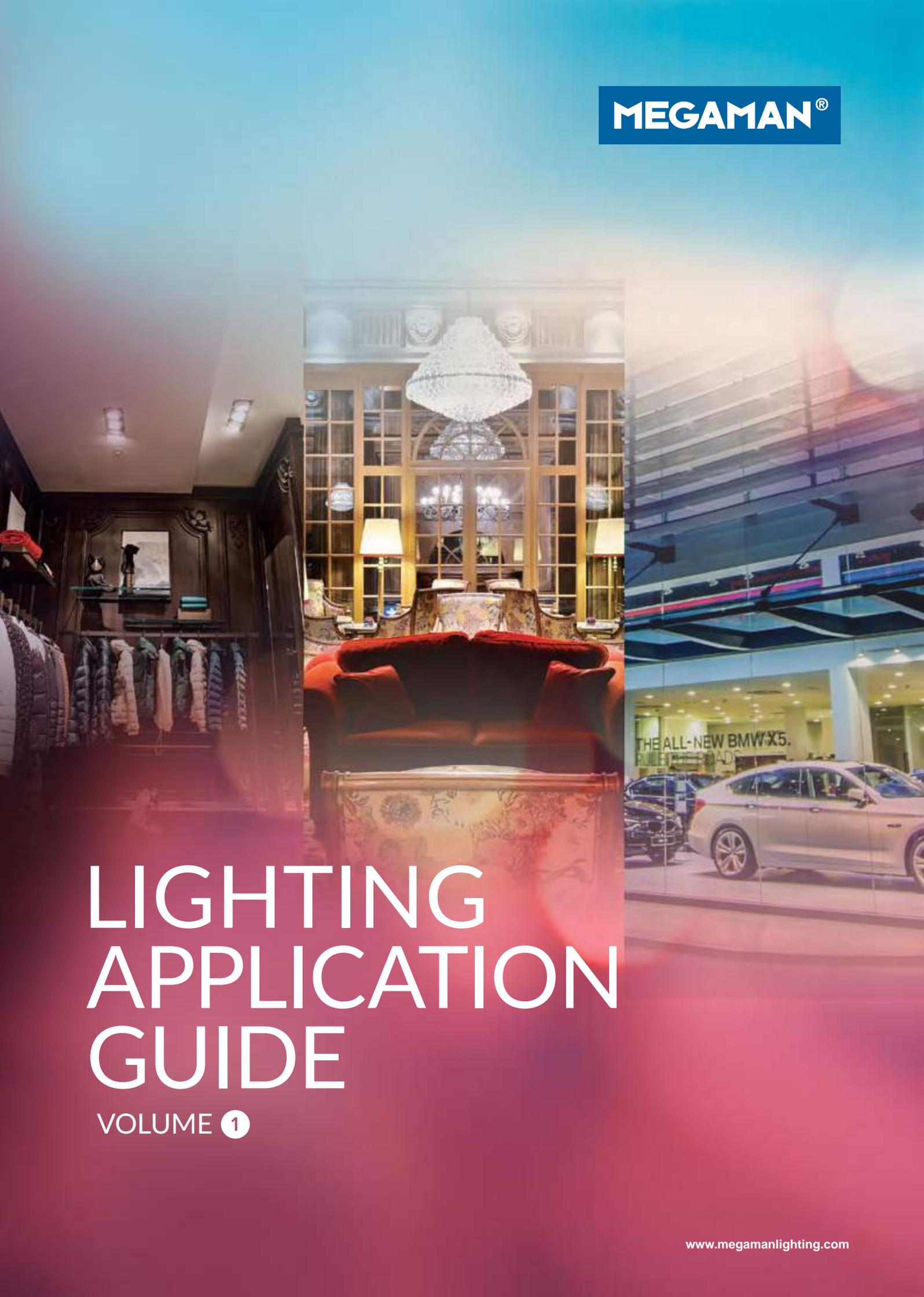


MEGAMAN®



# LIGHTING APPLICATION GUIDE

VOLUME 1



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# Leading the World in Energy Saving Lighting Solutions

Specifiers and designers have the latest in high performance LED and Compact Fluorescent light sources for a variety of applications, thanks to MEGAMAN®'s continuous commitment to innovation and sustainability.

Artificial light enhances the way we live and work. It brings us safety, comfort and productivity. MEGAMAN® is committed to providing light in a way that is truly sustainable, energy-saving and of such a quality that it brings a positive difference into the lives of all who use the company's innovative LED light sources.

MEGAMAN® is proud to be the only major brand to have exclusively manufactured low-energy lighting products throughout its entire history, offering more than 20 years of industry expertise and innovation to the lighting market.

Beginning in 1994 with the highly successful production of CFL light sources, MEGAMAN® has evolved to become a complete low-energy lighting solutions provider. MEGAMAN® has built a reputation for producing high-performance LED light sources that offer lighting designers and specifiers a true replacement for traditional metal halide and halogen equivalents.

MEGAMAN® is now applying its market-leading experience to an even wider range of lighting solutions including revolutionary Smart Lighting control, a full range of components and a suite of low-energy fixtures.

- MEGAMAN® lamps sell in over 90 countries across Europe, Asia-Pacific, the Middle East, Africa, Central and South America, the USA and Canada
- The MEGAMAN® range now includes over four hundred different, high-quality light sources, including MEGAMAN® LED Reflector Series - the world's first true low-energy replacement for halogen lamps
- MEGAMAN® now offers Smart Control with *INGENIUM*® BLU and *INGENIUM*® RF - providing further energy saving potential by giving users full lighting control via their smart device
- MEGAMAN® now offers a full suite of lighting solutions with the addition of several new fixture lines, for both indoor and outdoor lighting.
- MEGAMAN®'s TECOH® Light Engines and Modules range provides low-energy serviceable solutions for fixture makers worldwide
- MEGAMAN® is committed to innovation and the environment
- MEGAMAN®'s advanced research and development facilities ensure a continuous supply of new, exciting, energy-saving light sources come to market every year.

- 2014** Smart Control - *INGENIUM*® BLU and *INGENIUM*® RF Dim-to-Warm technology introduced  
Perfect White technology introduced  
LED Classic with 360° illumination
- 2013** TECOH® LED Modules: RDx and FLx
- 2012** TECOH® LED Modules and Light Engines: MHx, CFx  
First Zhaga certification  
T8 Professional for even light distribution
- 2011** R9 technology  
LED Classic Dimmable feature  
Regional Headquarters opens in Latin America
- 2010** LED Non-Directional Lamps  
LED Reflector Series  
International office for Professional Marketing opens in Europe
- 2009** Patented PowerLens technology  
LED Reflector Series with TCH technology  
NVLAP Lab Certification
- 2008** Industry First Plug-in lamp with integral ballast – PLI  
Amalgam is employed in full series CFL
- 2007** DIMMERABLE® technology introduced for linear dimming lamps
- 2005** DorS technology introduced for step dimming lamps  
Industry First RoHS compliant CFL  
MEGAMAN® goes global, selling lamps in over 90 countries
- 2004** *INGENIUM*® technology introduced - CFL
- 2002** Industry First CFL GU10 Reflector  
Silicone Protection technology
- 1999** Patented Cooling-Tube technology
- 1997** Industry First Candle-shaped CFL
- 1996** Industry First Classic-shaped CFL
- 1994** MEGAMAN® incorporated

Innovation





# SPECIAL APPLICATIONS

Special Application  
Heritage

# Basilica Nuestra Senora Del Socorro



# Special Application

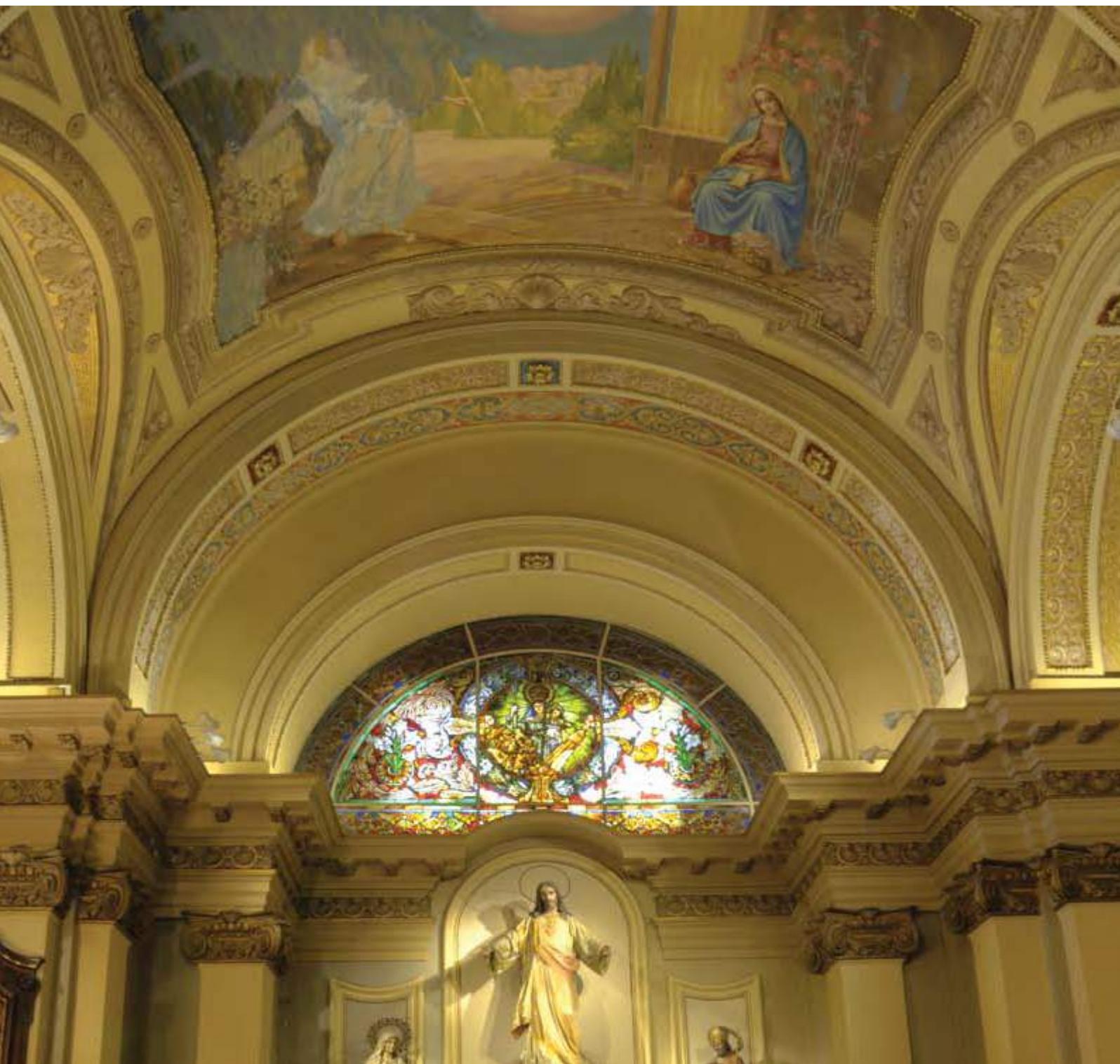
Heritage

Location [Buenos Aires, Argentina](#)  
Lighting Designer [Estudio Diz](#)



Special Application  
Heritage

# Basilica Nuestra Senora Del Socorro



Location [Buenos Aires, Argentina](#)  
Lighting Designer [Estudio Diz](#)

# Special Application

## Heritage

Location **Buenos Aires, Argentina**  
Lighting Designer **Estudio Diz**



## Argentinian Basilica uses MEGAMAN®'s LED technology with dramatic effect

When Basilica Nuestra Senora Del Socorro (Basilica of Our Lady of Help), Buenos Aires, Argentina needed a lighting refurbishment, internationally renowned lighting designer, Ernesto Diz, founder of Estudio Diz, was called in to advise on the scheme. As well as bringing a new vibrancy to the rich religious history displayed throughout the Basilica, Ernesto had to ensure that the lighting met the daily needs of the Basilica's congregation. Following the installation of over 270 MEGAMAN® LED lamps, the end result is both beautiful and energy efficient, with savings of €1,882 in electricity costs and 28,977 kg in CO<sub>2</sub> emissions per year compared to halogen equivalents\*.

Ernesto Diz, renowned for his lighting of Teatro Colón, the main opera house in Buenos Aires and previously a professor of lighting design at the Buenos Aires University, comments: "I wanted the majesty of the interior of the Basilica to

really stand out. The aim was to light the masterpieces discretely, yet lead the worshipper's eye up the aisle to the central altar. With this in mind I used tight angles to spotlight key pieces and then wider angled warm colours to wash the columns with light, framing the altar and its magnificent sculptures. It is the first time that I have used MEGAMAN® LED lamps and I have to say that the results I had with using them exceeded all of my expectations."

As well as providing superior spotlighting and colour rendering, the latest in LED lamp technology needed to also ensure that the ancient masterpieces were not damaged by heat or light radiation. With high quality light intensity and colour rendering, but with no UV and negligible IR light radiation or residual glare, MEGAMAN®'s LED AR111 and PAR30L lamps were the ideal 21st Century solution for lighting a space of such historic, as well as spiritual value, as the Basilica Nuestra Senora Del Socorro.

Mr Sebastian Serra from Artelum S.A, leading provider of professional lighting solutions across Argentina and a distributor of MEGAMAN® LED lamps, supported Ernesto Diz on the project and comments: "the Basilica's halogen

and metal halide light sources were replaced with MEGAMAN®'s AR111 and PAR30L LED lamp technology. Thanks to the variety of beam angles available in MEGAMAN®'s LED Reflector Series, Ernesto Diz was able to use the lamps to 'paint with light' throughout the Basilica."

Built on land donated by a Spanish devotee of 'Our Lady of Mercy' in 1750, the Basilica has a long and rich history. From the marble onyx baptismal font, frescoes on the ceilings and gold leaf on the altars, to the sculptures of the patron saint of Buenos Aires, San Martín de Tours, the Basilica Nuestra Senora Del Socorro is a place of both beauty for visitors and worship for the local community.

Father Gustavo Boquin, Basilica Nuestra Senora Del Socorro comments: "We have been following a programme of refurbishment at the Basilica for many years and the lighting was an area that needed an upgrade. We have many works of art, frescoes and sculptures within the walls of the Basilica and we wanted to bring out the beauty of the individual pieces, as well as reduce the yearly cost of lighting the space."

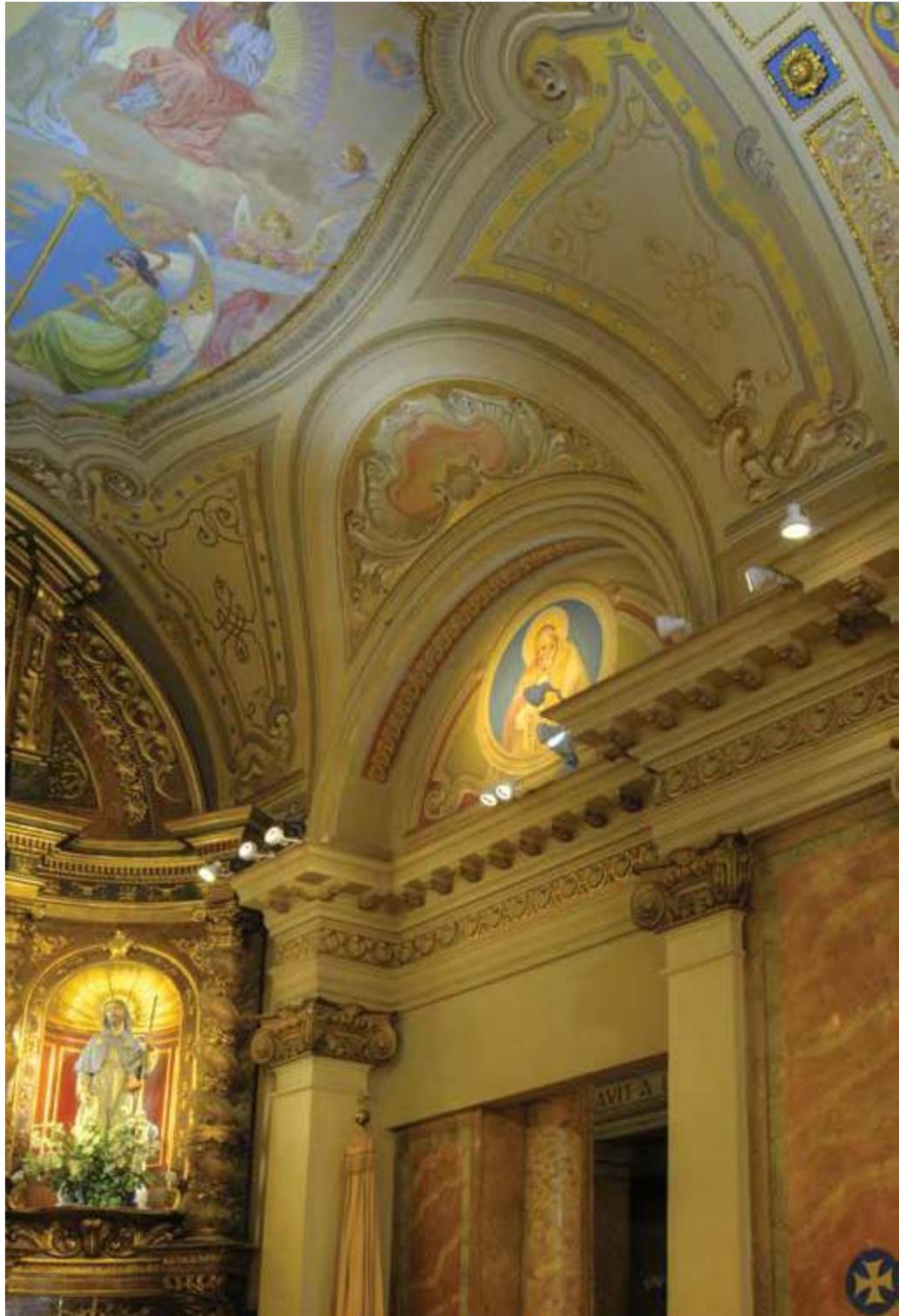
## Special Application Heritage

# Basilica Nuestra Senora Del Socorro

Part of MEGAMAN®'s LED Reflector Series, MEGAMAN®'s LED AR111 range lasts up to eight times longer and uses 80% less power than halogen equivalents. Within Basilica Nuestra Senora Del Socorro, 244 of MEGAMAN®'s AR111 10W, 2800K LEDs were used in a range of 8°, 24° and 45° beam angles, for spotlighting as well as wall washing key areas. In addition 28 MEGAMAN® PAR30L 15W, 4000K 25° and 45° LEDs were used to light the ceiling frescoes.

The end result is such a dramatic improvement on the original that worshippers at Basilica Nuestra Senora Del Socorro initially thought that the sculptures and frescoes had been repainted, rather than just re-lit.

As well as the dramatic visual improvement of the scheme, the use of MEGAMAN®'s AR111 LED low energy replacements for halogen reflectors has pleased the Basilica's administration office. Father Gustavo Boquin comments: "As well as improving the aesthetics with new lighting, we have also made the church office administrators very happy! Running costs have been significantly reduced with regards to the lighting and all for €1,888 a year less in energy costs than the halogen alternative."



Location [Buenos Aires, Argentina](#)  
Lighting Designer [Estudio Diz](#)

# Special Application

## Heritage

Location [Buenos Aires, Argentina](#)  
Lighting Designer [Estudio Diz](#)



\* Based on calculation of:  
244 x LED 10W AR111 (running 12 hours/day, 7 days/week) compared to 50W halogen lamps  
28 x LED 15W PAR30L (running 12 hours/day, 7 days/week) compared to 50W halogen lamps

Special Application  
Heritage

# Cardiff Castle



# Special Application

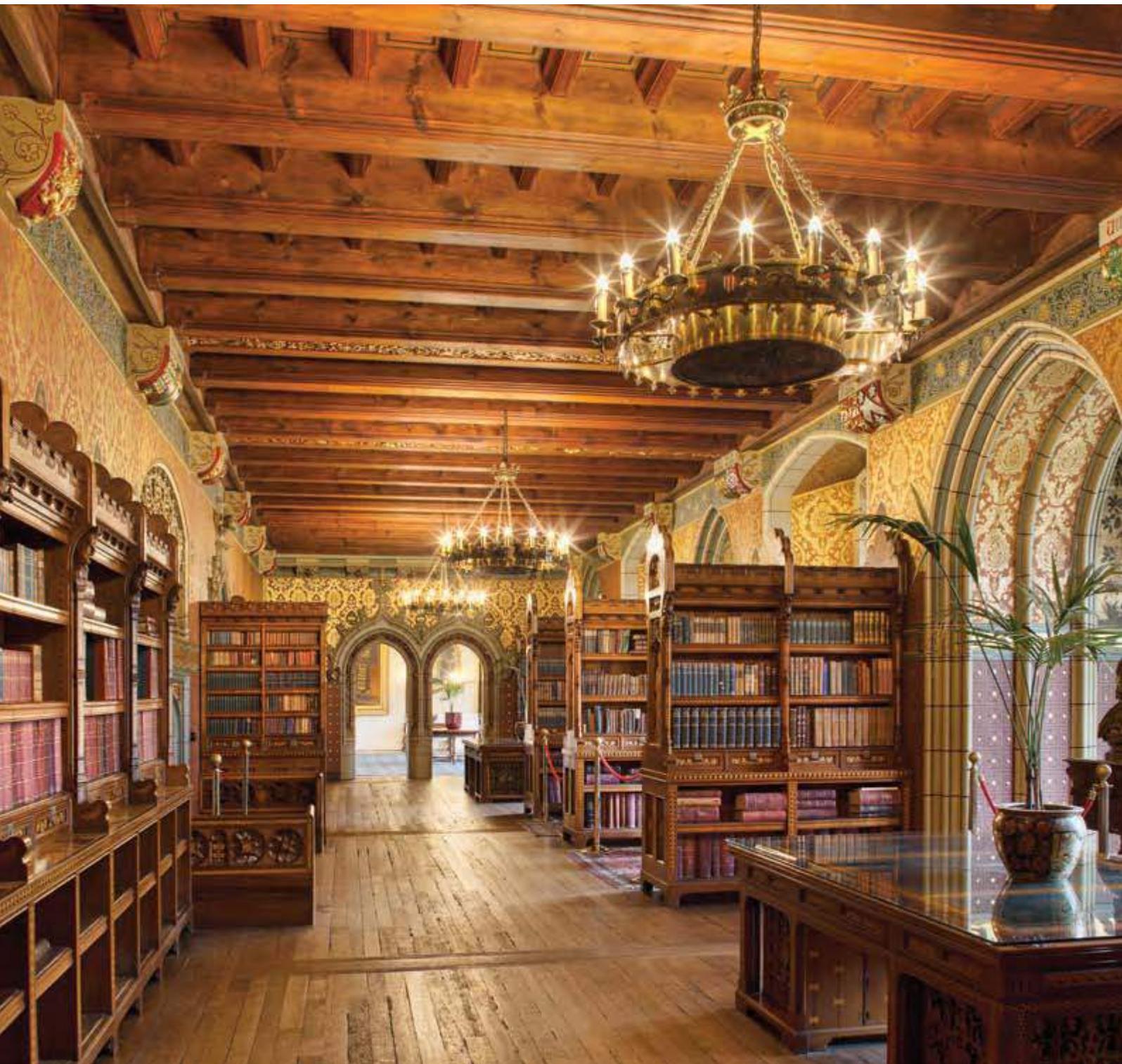
Heritage

Location Cardiff, United Kingdom



Special Application  
Heritage

# Cardiff Castle



Location [Cardiff, United Kingdom](#)

# Special Application

## Heritage

Location [Cardiff, United Kingdom](#)



## Cardiff Castle is one of Wales' leading heritage attractions and a site of international significance

Located at the heart of the capital, the Castle is surrounded by beautiful parklands and has a history that spans 2,000 years. Now one of Wales' most popular visitor attractions, Cardiff Castle is open throughout the year and visitors can experience the lavishly decorated Castle Apartments, the Norman Keep, Battlement Walk and Wartime Shelters amongst other things.

Established as a Roman fort around the time of 50 AD, the Castle has since been used as a Norman stronghold and added to in Victorian times to become a gothic masterpiece. Presented to the

city of Cardiff by the Bute family in 1947, the Castle has since been an ongoing conservation project. The project is valued at about €9.8 million and has been supported by a €7 million grant from the Heritage Lottery Fund, whilst additional financial support has been received from CADW and Visit Wales.

The conservation work ranges from the consolidation of Roman masonry to repairs and refurbishment within the lavishly decorated House. As part of Cardiff Council's ongoing commitment to improving the energy efficiency and sustainability of all its non-domestic buildings (with a Council-wide commitment to achieve a 60% cut in carbon dioxide for the council's non-domestic buildings by 2018), the Castle's staff and the Council's energy management team looked at ways to improve the Castle's energy credentials.

Following a review of the Castle's lighting, it became apparent that replacing all of the lamps within the building with energy

saving compact fluorescent (CFLs) and LED alternatives would achieve significant cost and energy efficiencies. Cardiff Council's principal concern was that the new lighting fit in with the historic interiors and presented the Castle's architectural features and artworks in the best possible light. With 117 lamps in the Banqueting Hall chandeliers and 415 in the main Castle house, making the switch to energy efficient alternatives was a major step for the energy management team. With a guaranteed lifespan of at least three years (up to 25 times longer than traditional incandescent lamps) and the additional benefits of high quality light output, low maintenance, low heat emissions and negligible UV and IR output, MEGAMAN®'s lamps were a perfect match for the Castle's aesthetic, energy efficiency and sustainability requirements.

MEGAMAN® supplied a combination of 5W LED Clear Candle lamps, 8W GU10 LEDs, 15W AR111 GU10 LED's and 18W CFL Classic lamps for use throughout the

## Special Application Heritage

# Cardiff Castle

project. MEGAMAN®'s 5W LED Candle Series lamps deliver 270 lumen light output and a high CRI of 80; all at a size equivalent to a 24W incandescent candle. Its ability to generate a similar sparkling effect to traditional candle lamps makes it a favourite for use in heritage installations.

In addition, MEGAMAN®'s directional lamps have been used to bring drama and high quality light intensity to the historic interiors and works of art. MEGAMAN®'s 8W GU10 dimming PAR16 LED's and 15W AR111 LED Reflector Series lamps are the perfect replacement for 20W and 50W halogens respectively. With excellent colour rendering (Ra80 for the 8W GU10's and Ra92 for the 15W AR111's) and an impressive lamp life, these directional lamps will ensure that Cardiff Castle's House is well lit for many years to come.

The end result is not only a warm, inviting lighting scheme that has significantly reduced the County Council's annual energy costs, Castle maintenance costs and downtime, but by using MEGAMAN® lamps, the final installation will save €17,500 and over 108,800 kg CO<sub>2</sub> per year\*. The end result has been so well received in fact that Cardiff Council is now considering replacing traditional lamps throughout its historic building estate with the latest in MEGAMAN® LED and CFL lamp technology.



Location [Cardiff, United Kingdom](#)

# Special Application

## Heritage

Location Cardiff, United Kingdom



\* Based on Energy Costs of €0.09895/kWh and 0.616 kg CO<sub>2</sub> emission/kWh

Special Application  
Marine Hospitality

# Variety Voyager



# Special Application

Marine Hospitality

Location [Greece](#)  
Interior Designer [Lally Poulias](#)



Special Application  
Marine Hospitality

# Variety Voyager



Location [Greece](#)  
Interior Designer [Lally Poulas](#)

## Special Application

### Marine Hospitality

Location [Greece](#)  
Interior Designer [Lally Poulias](#)

## Variety Voyager benefits from MEGAMAN®'s range of highly efficient, reliable LED lamps

With luxury yacht sales buoyant despite the global economic downturn, ship builder S.N. Dassiras, Greece, has completed the latest in a line of state-of-the-art yachts. Thanks to the inclusion of MEGAMAN® lamp technology, the yacht is assured a saving of €19,450 and 125,080 kg CO<sub>2</sub> per year\*.

The 66-metre luxury superyacht has 36 cabins for 72 passengers and is also capable of carrying 32 crew members. From the outset, the owners wanted Variety Voyager to have a warm and inviting interior that ensured the ultimate in relaxing holiday experiences for the

yacht's guests. As well as combining a cleanly lit, minimalist scheme in the public areas with luxurious, warmly lit cabins, the owners wanted the lighting scheme to be as energy efficient as possible and require minimal maintenance. With interiors designed by Lally Poulias and lighting fixtures by A. Mallios - S. Tsoukatou, the end result is the ultimate in contemporary, energy efficient chic.

### Luxurious lines

Variety Voyager's sleek lines and ample deck space combined with the interior's warm fabrics, rich marble and wood panelling and highly professional service ensure guests have the ultimate cruise experience. As well as ensuring that the lighting solution was discrete and complimented the sophisticated interiors of the yacht, the lighting scheme also had to frame rather than distract from the unobstructed sea views throughout both Variety Voyager's public and private spaces.

Antonis Maravelias, electrical engineer at Technomare Technology, marine

custom integration specialists, explains further: "Working closely with Lally Poulias and the fixture designers, we had to keep in mind the owners requirements for a warmly lit space that was energy efficient, with lighting that was easy to maintain. Having used MEGAMAN® lamps on other yachting installations, they were the obvious choice as their light quality is a true replacement of the warmth that we are used to from halogen light sources. In addition, MEGAMAN®'s reflector technology means that there is no glare from the lamps and their strong construction means that they are built to last."

To maintain the clean lines within the yacht's public and private spaces A. Mallios - S. Tsoukatou designed all of the bespoke lighting fixtures to lie flush with Variety Voyager's walls and ceiling, and illuminated glass murals were incorporated into the main salon area. MEGAMAN® lamps were used to light not only the cabins that are arranged over three decks of the yacht, the main



## Special Application Marine Hospitality

# Variety Voyager

lounge that incorporates an internet and library area and interior and exterior dining spaces, but all of the yacht's corridors, stairwells and crew service areas as well. In addition, they were also used within Variety Voyager's spa, gym and beauty rooms and on the spacious exterior deck space as well.

The scheme includes 800 MEGAMAN® LED PAR16 7W, GU10, warm white reflectors with 35 degree beam angle throughout the corridors and cabins, that deliver 600 cd of beam power. An additional 150 dimmable versions of MEGAMAN®'s LED PAR16 7W, GU10 lamps with 15 degree beam angle and 180 MEGAMAN® LED PAR16 7W, GU10 dimmable lamps have been used in the restaurant and bar areas and 80 MEGAMAN® LED AR111 15W, GU10 lamps have been used throughout the terrace area.

Thanks to the close working relationship between Technomare Technology, S.N. Dassiras, Lally Poulias Designs and MEGAMAN®, the end result is a luxurious yacht that combines aesthetics with the latest in energy saving lamp technology to provide significant energy efficiency, beautifully.



Location [Greece](#)  
Interior Designer [Lally Poulias](#)

# Special Application

## Marine Hospitality

Location [Greece](#)  
Interior Designer [Lally Poulias](#)



\* Based on energy costs of €0.14/kWh and 0.9 kg CO<sub>2</sub> emission/kWh



# HOSPITALITY LIGHTING

## Know-how



When considering lighting for hospitality applications, creating the right first impression is critical. The technologies used to light these spaces and therefore the way we light them, has changed in recent years with the advancement of Solid State Lighting (LED) capabilities.

Spaces should be welcoming and attractive with a warm ambience that makes you want to return again and again. This should be the case whether you are an overnight business customer or a family on a two week vacation. When we first enter a bar, restaurant or hotel we immediately survey our surroundings and are liable to make instant judgements in those first few seconds.

From increased kerb appeal, through striking yet well thought out exterior lighting to welcoming public areas and comfortable, well lit rooms, lighting is

integral to creating the right mood and atmosphere in hospitality environments.

### Exterior Lighting

When lighting the outside of a building we should always be conscious of the local environment. Lighting should be striking but not necessarily imposing. Signage and branding should be evenly and effectively lit for distance recognition.

The façade itself can be illuminated using in-ground or wall mounted uplighters with a variety of beam choices for best effect.

We should however, avoid unnecessary glare, light spill and light penetration into the rooms themselves.

Grounds and pathways require even illumination for both customer

orientation and safety. In-ground uplighters, bollards or wall mounted exterior luminaires can provide effective solutions whilst adding to the overall aesthetic of the installation.

Ornamental features such as trees and fountains etc can be brought to the fore with accent lighting. Here we can use different colour temperatures (CCT) with dramatic effects and alter the appearance of the night landscape.



# Hospitality Lighting



## Lobbies and Receptions

'First impressions count!' At the end of a busy day of meetings, trade fairs or shopping! We all want to be greeted with a welcoming environment when we first enter our hotel.

A good level of general lighting from recessed downlights, wallwashers or uplighters etc allow for easy customer orientation. This lighting should be controllable in order to reflect the time of day and with the addition of side lighting

and table lamps for example, the lighting levels can be lowered in the evening to create a warm and inviting ambience. Drama can be added with the inclusion of decorative lighting statement pieces that can enhance the company's brand image and design ethos.

Reception desks are essentially a place of business where transactions are taking place. Lighting should reflect this and your eye should be guided here upon entry. Lobby and reception lighting are often in

24/7 operation and in these applications where maintenance and rising energy costs are crucial factors, the long life and greatly reduced power consumption of LED's make them an ideal choice.

## Know-how



### Bedrooms

Whether our stay is long or short, our haven at the end of a busy day is our Hotel room. It is 'our' space and so should be welcoming and inviting.

General, or ambient lighting should be accessible on entry and blend well with the additional task and accent lighting within the room. We are demanding more control over our lit spaces to create the right atmosphere for working, reading or relaxing.

Task lighting should provide a good quality of light for shaving or make up application for example whilst bedside lights need to offer glare free controllable lighting for reading. No two guests will be the same, nor will their lighting requirements. Flexibility is key.

To finish the room, accent lighting should be incorporated where appropriate to either highlight certain areas or architectural features, or to introduce or remove shadowing to create and enhance mood and atmosphere.



### Bars and Restaurants

As with reception areas, the success of bars and restaurants relies on creating the right mood.

Our aim is to entice residents to choose the hotel facilities rather than venturing elsewhere. Here lighting controls can assist in creating the right atmosphere: full light levels for cleaning, preparation and breakfast, calming levels for lunch and the latest LED technologies such as Dim-to-Warm for creating cosy and intimate settings for evening meals and private functions.

Once again, these areas if used for multiple purposes during the day can be an area of high energy usage, however the quality and flexibility of the light are equally important considerations when making your final selections.

# Hospitality Lighting



## Meeting and Conference Rooms

When lighting multi-use spaces it is often difficult to get the right balance. Lighting controls and the integration and control of natural daylight are essential. Meeting rooms will require full light for general working and reduced lighting levels for presentations etc.

Panels, downlights and wallwashers can provide controllable general lighting but a conference room may also require decorative elements to meet the needs of corporate events during the day and weddings and functions in the evening.

## Health and Wellbeing

Health and fitness suites within hospitality environments also require careful thought when looking at lighting schemes.

Gymnasias need to be well lit to ensure the safe use of equipment whereas Health Spas are tranquil places where lower lighting levels are favoured – and we may even go back to candle light! Good colour rendition and warmer tones help to enhance skin colour and create a greater sense of personal wellbeing.

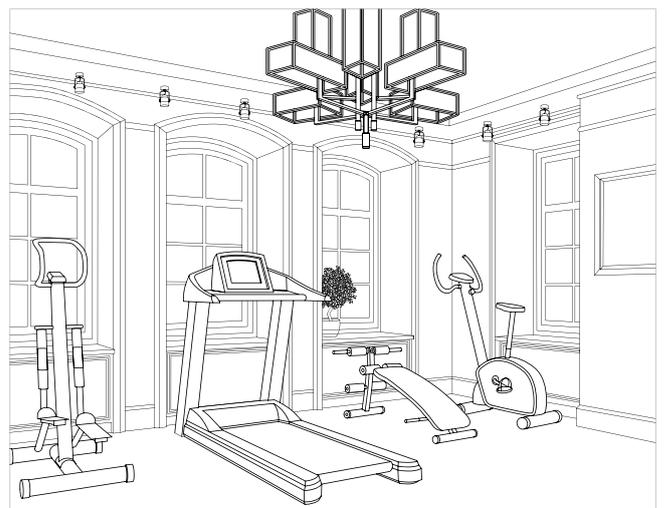
Areas of high moisture such as pools and steam rooms require fittings with the appropriate IP protection.



## Corridors and General Circulation areas

Long and seemingly endless corridors can appear threatening if poorly lit and difficult to navigate. Corridors should be well lit with close attention paid to ensure that room numbers, directional signage and escape routes are clearly indicated.

Corridors, walkways and lobbies are often areas where usage is high and may well be lit 24 hours a day and so here, lifetime is an important issue both in terms of energy savings and lamp maintenance.



Hospitality Lighting  
Restaurant & Bar

# Zurriola · Kyo-Shun · Tapagria



# Hospitality Lighting

## Restaurant & Bar

Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)



Hospitality Lighting

Restaurant & Bar

# Zurriola · Kyo-Shun · Tapagria



Location [Hong Kong, China](#)

Designer and Architect [Aedas Interior Ltd](#)

Lighting Designer [Firefly Lighting Design](#)

# Hospitality Lighting

## Restaurant & Bar

Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)

## Stunning LED lighting scheme in Hong Kong hotspot delivers savings and style

Perched on the 18th floor of Hong Kong's tallest retail complex, The One is a 'three in one' dining experience. It was created by Hong Kong-based Chinese actress, Carina Lau, and Aedas Interior Ltd's award-winning designer, Ira Imerlishvili, whose signature resort and hotel projects span five continents. As well as being one of the most visually stunning places to eat in Hong Kong, by choosing the latest in LED lamp technology from MEGAMAN®, The One's restaurants will deliver a combined saving of €5,100 in electricity costs and 37,827kg in CO<sub>2</sub> emissions per year compared to traditional equivalents\*.

Taking their inspiration from as far afield as Kyoto and Barcelona, two of the three restaurants offer fine-dining experiences and the third is a glamorous tapas and sangria bar. Each of the venues has been designed to suit the themes of the country they represent. The lighting, designed by Peter Veale and his team at UK consultancy Firefly Lighting Design, has created an individual look and feel to each of the three spaces, yet used only two types of LED lamps in the various downlights.

Peter Veale comments: "It was extremely important to use lighting to create three very different dining experiences and yet have a consistency to the scheme that tied them together. As all three restaurants have floor-to-ceiling glazed expanses that deliver dramatic views across Victoria Harbour in common, we chose to unify them with concealed lines of light along the blinds, and by using only two types of MEGAMAN® LEDs

throughout, were able to keep the colour temperature consistent as well."

### A spotlight on fine dining

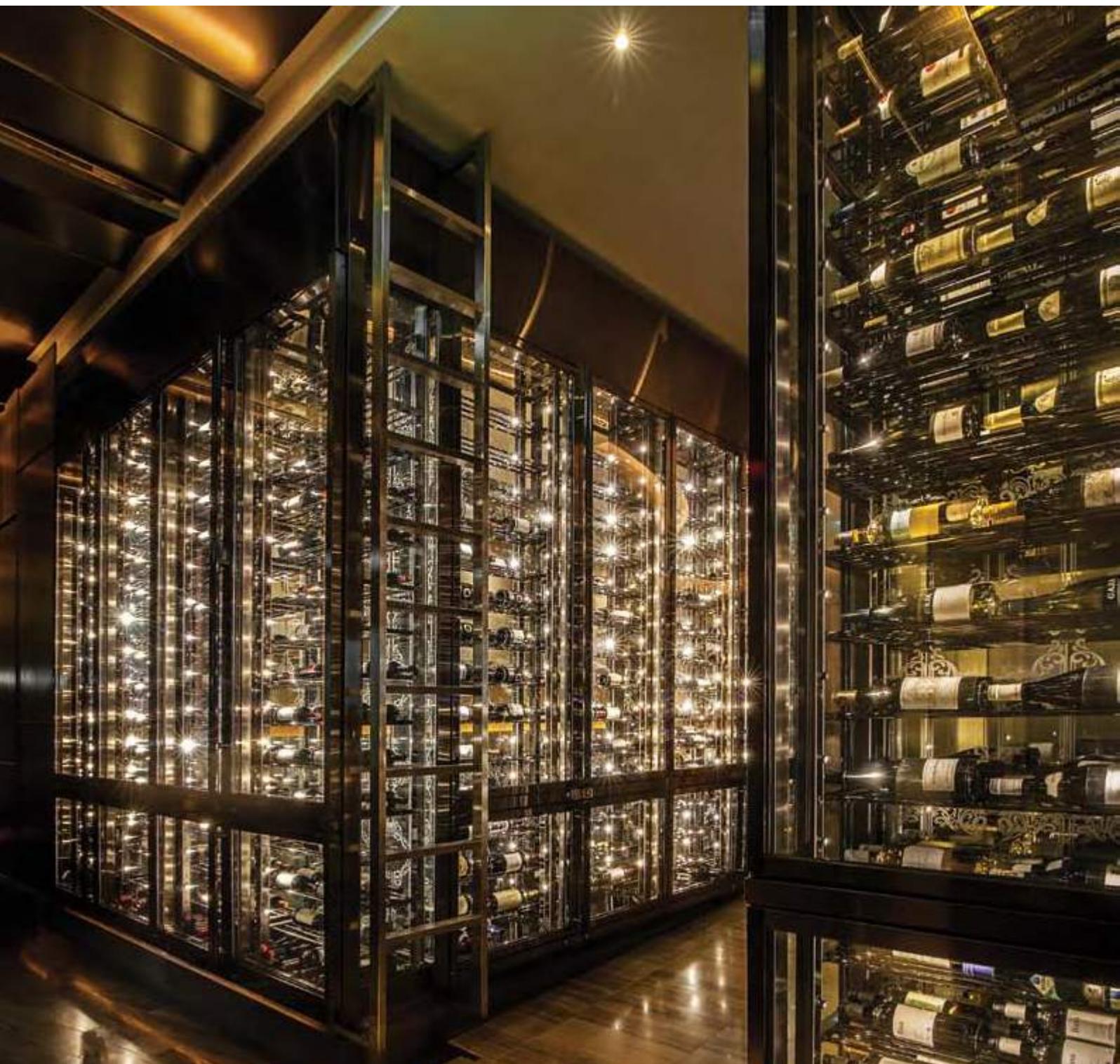
Zurriola, the Spanish-inspired fine dining experience within The One, uses large-scale works of art to create drama and bring the vitality of Barcelona to its diners. As well as accenting these pieces, Firefly Lighting Design also decided to make a feature of Zurriola's floor-to-ceiling wine display. Using MEGAMAN®'s 10W LED AR111 lamp technology to light the artwork, Firefly also chose to use MEGAMAN®'s 8W MR16 28° and 36° narrow beamed LED reflector lamps to highlight the bottle labels in the wine racks. By accenting the artworks and wine racks, the end result is a sophisticated lighting scheme that brings drama to Zurriola, without causing any residual glare to the seated diners.



Hospitality Lighting

Restaurant & Bar

# Zurriola · Kyo-Shun · Tapagria



Location [Hong Kong, China](#)

Designer and Architect [Aedas Interior Ltd](#)

Lighting Designer [Firefly Lighting Design](#)

# Hospitality Lighting

## Restaurant & Bar

Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)



## Hospitality Lighting Restaurant & Bar

# Zurriola · Kyo-Shun · Tapagria

### A taste of the Orient

Kyo-Shun, the Japanese restaurant within The One serves Kaiseki cuisine, a traditional multi-course Japanese dinner. The space has been designed to include a main dining area that overlooks an outdoor Japanese garden, as well as a sushi bar and teppanyaki tables. The lighting within the space is a mix of both the functional and dramatic. Firefly Lighting Design has incorporated integral lighting through edge-lit glass walls. The technique of 'wall grazing', dispersing light across wall surfaces, has also been used throughout and creates particular drama on the lowered ceiling in the teppanyaki dining area, using MEGAMAN®'s 10W AR111 and 8W MR16 lamps.



Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)

# Hospitality Lighting

## Restaurant & Bar

Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)



Hospitality Lighting  
Restaurant & Bar

# Zurriola · Kyo-Shun · Tapagria

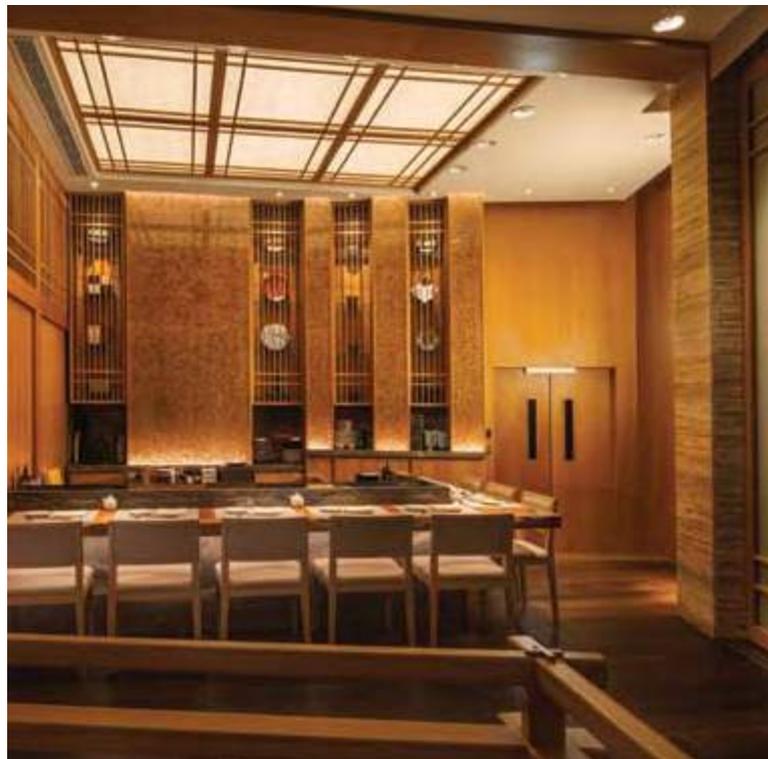


Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)

# Hospitality Lighting

## Restaurant & Bar

Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)



Hospitality Lighting  
Restaurant & Bar

# Zurriola · Kyo-Shun · Tapagria



Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)

# Hospitality Lighting

## Restaurant & Bar

Location [Hong Kong, China](#)  
Designer and Architect [Aedas Interior Ltd](#)  
Lighting Designer [Firefly Lighting Design](#)

### From siesta to sunrise

The glamorous Tapagria tapas and sangria bar in The One is a dining destination during the week that is transformed into a nightclub for the weekend. Designed using tailored timber and wood interiors to mirror the Spanish head chef's authentic cooking style, this dramatic scheme is all about contrast. The feature walls within Tapagria have been lit using MEGAMAN®'s AR111 lamps, to create the illusion of an animated water effect for a more vibrant night-club feel.



### Making connections

More indirect forms of lighting have been used to connect the three restaurants together. Concealed lines of MEGAMAN® AR111 lamps have been run along the wall and ceiling panels throughout the corridor that connects the three restaurants and the restrooms to the main lift. The only direct lighting used in this space highlights the names of each restaurant to visitors on their arrival.

MEGAMAN®'s AR111 and MR16 LED reflectors are ideal for use in locations that have long operating hours, due to the patented Thermal Conductive Highway™, which uses a unique "heat drain" design across the reflectors to allow efficient dissipation of heat and prevent deterioration of the LED and other components. In addition, with their linear dimming function, the MEGAMAN® reflectors allow designers to maximise savings by incorporating them into a lighting control solution that manages artificial and natural light, as well as creating a variety of pre-programmed scenes.

With its creative approach to lighting, Firefly has created a stunningly lit range of eating experiences that maximise drama, yet minimise maintenance and energy costs for the owners of The One for many years to come.

\* Based on calculation of:  
Operation hours: 12 hours per day, calculated based on 1 year period. Total number of light points: 300 pcs (230 x 10W MEGAMAN® LED AR111's replacing 50W halogen lamps and 70 x 8W MR16 LED reflectors replacing 50W halogen lamps)  
CO<sub>2</sub> emission factor (Hong Kong) = 0.7 kg/kWh

Hospitality Lighting  
Restaurant

# Éclectic



# Hospitality Lighting

## Restaurant

Location [Paris, France](#)

Designer and Architect [Tom Dixon's Design Research Studio](#)

Photographer [Thomas Duval](#)



# Hospitality Lighting

Restaurant

## Éclectic



Location [Paris, France](#)

Designer and Architect [Tom Dixon's Design Research Studio](#)

Photographer [Thomas Duval](#)

# Hospitality Lighting

## Restaurant

### Parisian Chic and MEGAMAN® Technology Bring Style and Efficiency to Éclectic

When critically acclaimed restaurateurs, Fabienne and Philippe Amzalak decided to open a high-end dining experience in Paris, they enlisted the help of design empresario Tom Dixon. The end result is a dramatically lit interior that references the 1970's heritage of the building, yet uses the latest in LED lighting technology to create impact and drama. By using over 120 MEGAMAN® LED Classic 7W lamps, the scheme will also deliver a combined saving of €2,500 in electricity costs per year compared to traditional equivalents\*.

Tom Dixon's Design Research Studio was commissioned to create a scheme that would make the most of the stark concrete interior of the restaurant. Éclectic is located in the Beaugrenelle Centre, a refurbished 1970's shopping complex situated in the 15th Arrondissement, beside the Seine. The shopping centre is now home to many high-end brands and since its opening, the restaurant has become a focal point for midday shoppers and the business community alike.

Using the building's 1970's heritage as a basis for his design concept, Tom Dixon's Design Research Studio created a solution that celebrated the 1970's love affair with all things geometric. The Tom Dixon Cell Pendant was chosen to light

Location [Paris, France](#)  
Designer and Architect [Tom Dixon's Design Research Studio](#)  
Photographer [Thomas Duval](#)

Éclectic, as its structure, constructed from layers of minutely etched brass with a hexagonal cross section, brings 1970's sophistication into the 21st Century.

Clusters of the Tom Dixon Cell pendants have been hung from circular acoustic panels constructed by interiors lighting specialist Chelsom throughout the space. Located in the main dining room and private dining booths, they create a visual backdrop to the breathtaking 3.5 metre diameter chandelier that hangs in the centre of the restaurant. Containing 124 Tom Dixon Cell pendants, the central chandelier looks dramatic yet uses minimal energy, due to the incorporation of MEGAMAN®'s LED Classic 7W lamp.

Tom Dixon, Creative Director for Tom Dixon's Design Research Studio, comments: "Drawing inspiration from the 1970s architecture surrounding the restaurant, the design plays with colour, simple repeat modules and clean geometry. The design intends to soften the hard finishes of the contemporary building; warmth and comfort are the key drivers for the interior finishes, and the concrete is softened with brass, and the whole restaurant is furnished in abundance with custom-designed products. The MEGAMAN® LEDs add warmth and sophistication to the scheme."

Éclectic is a testament to the power of combining quality design with elegant LED lighting. Thanks to the creativity of Tom Dixon's Design Research Studio and MEGAMAN®, energy efficiency and 1970's urban chic have never looked so good!



\* Based on calculation of:  
Operation hours: 12 hours per day, calculated based on 1 year period. Total number of light point: 124 pcs (124 x 7W MEGAMAN® LED Classic used instead of 40W incandescent lamps).

Hospitality Lighting  
Hotel

# Forsthofalm Hotel



# Hospitality Lighting

Hotel

Location Salzburg, Austria



Hospitality Lighting  
Hotel

# Forsthofalm Hotel



Location [Salzburg, Austria](#)

# Hospitality Lighting Hotel

Location Salzburg, Austria



## MEGAMAN® sets the perfect scene for Austrian Alpine hotel

As a way of celebrating the amazing environment in which it is located, the beautiful Forsthofalm hotel, set 1,050 metres above sea level in the Austrian Alps, is the first timber hotel to be built in Salzburg, Austria. Now, with the latest in LED lighting technology from MEGAMAN® used throughout the hotel, the entire 1200 m<sup>2</sup> floor space delivers savings of €38,973 in electricity costs and 120038 kg in CO<sub>2</sub> emissions per year compared to traditional equivalents\*.

The Forsthofalm hotel originally began life as a small restaurant in the mountains in the 1970s. Seeing the popularity of its location, the Wiedauer family built on the restaurant's success, adding overnight accommodation. A hotel was then built on

the site, using only locally-sourced timber, and a large extension was completed and opened in late 2013.

With a strong organic and ecological ethic, the Wiedauer family were keen to light the hotel in a way that was sympathetic to the surrounding natural environment. As well as being highly energy efficient, the lighting of the hotel needed to bring out the warmth of the wood's natural grain and provide an inviting, comfortable welcome to Forsthofalm's many guests throughout the winter and summer months.

Working alongside Leopold Rokos Ltd, the Wiedauer family chose to use MEGAMAN®'s range of LED lamp technology in the original hotel as well as the new extension. Markus Wiedauer, owner of the Forsthofalm hotel, explains further: "The original hotel and the extension have both been built on passive construction principles. This means that every step of the way, we and our architects have looked at the

ecological footprint of the construction materials used and chosen those with the least environmental impact. Our choice of MEGAMAN® for the hotel's lighting supports our passion for sustainable, energy efficient materials and technology."

Leopold Rokos, MD of Leopold Rokos, MEGAMAN® lighting distributor, comments: "The architect and the owners of Forsthofalm didn't just want to have a highly energy efficient lighting scheme, they also wanted to ensure that the lit environment was appealing to the guests no matter the time of day or night. They were very keen to show off the natural sheen of the timber and for it not to look artificial. They also wanted low heat emissions from the lamps and there to be minimal lighting glare, so guests could easily see the panoramic views of the 30 mountain peaks from the hotel."

To create a soft, wall wash lighting effect on the timber, 740 MEGAMAN®'s LED PAR16 6W GU10s with a wider 35° beam angle were used, as well as 470

## Hospitality Lighting Hotel

# Forsthofalm Hotel

MEGAMAN® LED Classic Dimmable 11W E27s, throughout the public and private spaces. The entire scheme was linked into a Beckhoff Lichtsysteme light control solution for the ultimate in mood creation and to maximise the energy saving potential of MEGAMAN®'s LED lamp technology. In addition, due to the unique axial geometry and patented Thermal Conductive Highway™ (TCH) built into MEGAMAN®'s lamps, precise light direction was possible, minimising glare on the glazed areas and maximising the exterior viewing experience for guests.

Markus Wiedauer, owner of the Forsthofalm hotel, concludes: "The end result is exactly what we hoped for. We have a stunningly lit hotel that is highly energy efficient, offers guests a warm welcome, yet does not detract in any way from our panoramic views of the Alps."



Location [Salzburg, Austria](#)

# Hospitality Lighting

## Hotel

Location Salzburg, Austria



\* Based on calculation of:  
740 x LED 6W GU10's (running 12 hours/day, 7 days/week) compared to 35W halogen lamps.  
470 x LED Classic 11W E27's (running 12 hours/day, 7 days/week) compared to 60W incandescent lamps

Hospitality Lighting  
Hotel

# Atlantic Hotel



# Hospitality Lighting

Hotel

Location Lübeck, Germany



Hospitality Lighting  
Hotel

# Atlantic Hotel



Location [Lübeck, Germany](#)

# Hospitality Lighting

## Hotel

Location Lübeck, Germany



## Atlantic Hotel replaces high energy lamps with the latest in LED technology from MEGAMAN®

Opened in spring 2010, the Atlantic Hotel in Lübeck, Germany, is the ultimate in style and comfort for the commercial traveller and tourist. Although situated in the heart of the Old Town of Lübeck, the building embraces all things modern.

Alexander Staude, technical manager at the Atlantic Hotel explains further: "After a year of operation, the first of the halogen lamps within the high use areas of the hotel began to come to the end of their life. We realised that this was the ideal opportunity to make an investment in LED technology that would very quickly give us

significant energy savings. We wanted to have the same warm lighting that the halogens had given us, but not their high energy consumption and short lamp life." Working closely with Jens Janke-Postelt, managing director at lighting specifiers Lightspectrum GmbH and electrical contractors, Bodo Wascher, it was recommended that the original MR16 GU5.3 35W halogen lamps throughout the lobby areas, corridors, restaurant and bar be replaced with MEGAMAN® LED 6W GU5.3 12V MR16 2800K reflectors.

MEGAMAN®'s family of MR16-compatible LED reflector lamps offer excellent lighting performance, heat dissipation and lumen maintenance thanks to the company's patented Thermal Conductive Highway™ (TCH) technology. Designed for use in standard MR16 applications, the 6W MEGAMAN® LED MR16 reflector is compact, with a GU5.3-compatible lamp cap and a beam angle of 36 degrees for high quality accent lighting.

"The 6W MEGAMAN® LED MR16 reflectors are very energy efficient lamps", explains Jens Janke-Postelt. "Taking into account the average German electricity rates, over the course of a twelve month period, it is anticipated that such an installation would result in savings of €20,300 in energy costs, and 109,500kg CO<sub>2</sub>\*."

The end result is not only highly energy efficient, but visually stunning as well. Alexander Staude concludes: "We have had very positive feedback on the replacement lamps. Their warm colour temperature has meant that they mimic the warmth of the original halogens exactly, yet use significantly less energy. In fact, performance has been so good that we have ordered the next 700 MEGAMAN® equivalents to replace the halogen MR16s throughout Hotel Atlantic's 135 guest rooms."

\* Based on energy costs of €0.11417/kWh and 0.616 kg CO<sub>2</sub> emission/kWh

Hospitality Lighting  
Casino

# Grand Casino Lucerne



# Hospitality Lighting

Casino

Location Lucerne, Switzerland



Hospitality Lighting  
Casino

# Grand Casino Lucerne



Location [Lucerne, Switzerland](#)

# Hospitality Lighting

## Casino

Location [Lucerne, Switzerland](#)

### The Grand Casino Lucerne hits the jackpot with MEGAMAN® technology

Located in the beautiful city of Lucerne in Switzerland, the Grand Casino Lucerne is housed in one of the most impressive buildings in the region. Built in 1882 on the banks of lake Lucerne, the casino prides itself on blending the building's historic credentials with the latest in gaming sophistication.

Due to the nature of its business, the Grand Casino Lucerne operates almost 24 hours a day, seven days a week. With this in mind, the casino's facilities manager wanted to make the most of the efficiencies offered by LED lighting technology. By replacing its 75W halogen spotlights with MEGAMAN® AR111 LED equivalents, the Grand Casino Lucerne is now set to achieve a combined saving of €8300 in electricity costs and 44680 kg in CO<sub>2</sub> emissions per year compared to traditional equivalents\*.

The Jackpot Casino houses over 250 slot machines that have five different jackpots on offer at any one time. With the casino open daily from midday to 4 am and maintenance and cleaning teams on site after this time, the lighting in the window-less Jackpot Casino is rarely off. As well as lighting the space 24/7, the combination of 250 slot machines and over 130 halogen spotlights means that air conditioning units work overtime to



keep the Jackpot Casino cool. With the guest experience of ultimate importance to the Grand Casino Lucerne, the casino's facilities manager, Mr Sascha Infanger, was tasked with sourcing an energy efficient lighting solution that would not only give dramatic energy and HVAC savings, with short payback times, but which would not negatively impact the look and feel of the Jackpot Casino in any way. He comments: "The lights in the Jackpot Casino are on 24/7. We needed to find a more efficient way of lighting this area that saved energy, yet didn't cause light reflection on the slot machines or impede our surveillance equipment in any way."

Based on a recommendation by Amstein + Walthert, one of the largest engineering companies in Switzerland, MEGAMAN®'s AR111 LED replacement lamps were tested within the Jackpot Casino. Responses were so favourable from guests and staff alike, that a total of

138 75W halogen lamps were replaced with MEGAMAN®'s AR111 15W 2800K, 24° LED lamp. Featuring MEGAMAN®'s unique axial geometry and the patented Thermal Conductive Highway™ (TCH) technology within each lamp, precise beam direction is possible, ensuring an optimised lighting effect on slot machines and guests at all times.

With light quality, beam direction, energy efficiency and HV temperature reduction all key requirements within the lighting brief, MEGAMAN®'s LED AR111 reflector equivalents were the ideal choice for the Jackpot Casino.

\* Based on calculation of:  
138 x LED 15W AR111 (running 24 hours/day, 7 days/week) compared to 75W halogen lamps

Hospitality Lighting  
Heritage Hotel

# Coombe Abbey



# Hospitality Lighting

Heritage Hotel

Location [United Kingdom](#)



Hospitality Lighting  
Heritage Hotel

# Coombe Abbey



Location [United Kingdom](#)

# Hospitality Lighting

## Heritage Hotel

Location [United Kingdom](#)

### Coombe Abbey Hotel finds significant cost and carbon emission savings by using MEGAMAN®'s LEDs

Set in 500 acres of parkland in the heart of rural Warwickshire, Coombe Abbey Hotel was founded as a monastery in the 12th century. The estate became a royal property in the 16th century and for the last twenty years has been a luxury hotel and conference venue. With interiors that are full of rich fabrics and attention to detail, the hotel's private and public spaces are lit with a mix of ceiling, wall and task luminaires to achieve flexible, subtle lighting moods.

Following the review of Coombe Abbey Hotel's existing lighting, Yvonne Scott recommended that the hallways, central lobby, bedrooms and landing areas would benefit most from the replacement of their existing halogen and incandescent light sources with the latest in MEGAMAN® LED lamp technology.

Mood setting was an important consideration because of the historic setting of the hotel and its classic interior décor. With this in mind, MEGAMAN®'s 5W LED frosted SBC/SES Candles were chosen for use in the bedrooms and public areas, MEGAMAN®'s 5W GU10 reflector LED's were used in the down lighters throughout the hotel's public and

private spaces and MEGAMAN®'s 8W LED Dimmable Classics were chosen for the bedrooms.

Throughout Coombe Abbey Hotel MEGAMAN® lamps have been incorporated into existing fittings. Not only has this made the change over to energy efficient lighting quick and easy, it has also ensured minimum disruption to guests during the lighting refurbishment. The end result is stunning in terms of both aesthetics and cost and energy efficiencies. With significantly longer lamp life than their halogen and incandescent equivalents, MEGAMAN®'s LED lamps reduce maintenance costs, run at a fraction of the energy cost and produce a light quality that is second to none.

MEGAMAN®'s LED Candle lamps are not only highly energy efficient alternatives, but offer users the same quality of light you would expect from traditional candle lamps but with a life of 30,000 hours. The LED Dimmable Classics range is an ideal replacement for 60W incandescent light sources and its capacity for linear dimming from 100% to 10%, even light distribution, low energy consumption and long lamp life ensure a quality, highly efficient solution from day one. MEGAMAN®'s LED GU10's are part of the LED Reflector Series and offer end users low energy replacements for halogen reflectors. Lasting up to 13 times longer and using 80% less power than halogen equivalents these lamps are ideal for use where mood lighting and energy efficiency need to work hand in hand.

The end result at Coombe Abbey Hotel is beautiful as well as functional. Yvonne Scott concludes: "We have found

MEGAMAN® lamps to be excellent in quality and appearance producing the lighting effect we required".



Hospitality Lighting  
Hotel

Van der Valk



# Hospitality Lighting

Hotel

Location Dordrecht, Netherlands



Hospitality Lighting  
Hotel

# Van der Valk



Location [Dordrecht, Netherlands](#)

# Hospitality Lighting Hotel

Location [Dordrecht, Netherlands](#)



## A warm welcome at Van der Valk and significant energy savings thanks to MEGAMAN®

When a new Van der Valk hotel was built in Dordrecht, energy efficiency was one of the key elements to the lighting scheme. However, the lighting also needed to communicate the warmth of halogen lighting, to mirror the warm welcome that Van der Valk wanted its guests to receive in one of the company's hotels. By using the latest in LED lamp technology from MEGAMAN®, the end result is not only a warm, welcoming place to stay, but a hotel that is predicted to save €553,585 and 869,830 kg CO<sub>2</sub> over the lifespan of the lighting installation\*.

With 68 hotels in the Netherlands and a further 30 in countries as far afield as the Caribbean and the USA, the Van der

Valk chain is the largest hospitality chain in the Netherlands. Originally begun over 150 years ago by Martien and Rie Van der Valk, the secret of the hotel chain's success is its focus on guests receiving a warm welcome. This warmth needed to be reflected in the modern interiors and lighting scheme at Van der Valk Dordrecht, whilst maximising cost efficiencies.

Working closely with the construction team, The MEGAMAN® Sales Team, advised on the lighting installation at the hotel. By using a mix of MEGAMAN® LED lamps, the end result is a welcoming ambience that is not only highly energy efficient, but has already proved its low maintenance credentials; one year later the maintenance team at Dordrecht had not had to replace a single lamp or driver.

With a welcome so important to Van der Valk, warm white temperature LEDs were chosen for use throughout. Overall, 700 MEGAMAN® LED 10W G53 AR111 8° 2800K dimmable reflectors and 385 MEGAMAN® LED 10W G53 AR111 24°

2800K dimmable reflectors were used in the reception and restaurant areas. In addition 90 MEGAMAN® 4W LED PAR16/20 20° 2800K, GU10 reflectors were used in the dramatic chandeliers in the public areas.

The 8° and 24° beam angled MEGAMAN® LED AR111 lamps were grouped together throughout the Deltalight fixtures in the high ceilings of the reception and restaurant areas to increase the sparkling effect on the surfaces below. Such focused beam angles are only possible, because of MEGAMAN®'s precise light control using a unique axial geometry and patented Thermal Conductive Highway™ (TCH) technology. This focused light management also ensures that glare is minimised. With a lamp life of up to 40,000 hours it will be several years before they need to be replaced and thanks to 100-1% DALI controlled dimming, the AR111s and PAR16s in the reception and restaurant areas have brought lighting mood control as well as longevity to these public spaces.

## Hospitality Lighting Hotel

# Van der Valk

As well as creating flexible, energy efficient lighting within the public spaces, the owners of Van der Valk Dordrecht also wanted to bring quality lighting into the private spaces of this new build hotel. With this in mind, 160 MEGAMAN® LED Classic 8W E27 2800K dimmable lamps were used in the hotel rooms, alongside 90 MEGAMAN® LED 3W, E27 Ping Pong 2800K in the bedside lamps. In the ensuite bathrooms, 90 MEGAMAN® 4W LED PAR16 20° 2800K, GU10 reflectors were used, to bring warmth to even this area of the guest experience.

The end result is not only significant energy and electricity bill savings, but the scheme has been well received by staff and guests alike. The light from MEGAMAN® LEDs is of such a high quality that after installation, the hotel owners were even approached with the request to quote for 'replacing the existing halogen lamps in the hotel with LED lamp technology'. Thanks to the design of MEGAMAN®'s LED reflectors, they provide a true replacement to traditional halogen, metal halide and incandescent solutions. The investment in quality LED lamp technology at the outset has not only paid off in terms of customer satisfaction for Van der Valk Dordrecht, but will bring environmental and cost savings to the owners for many years to come.

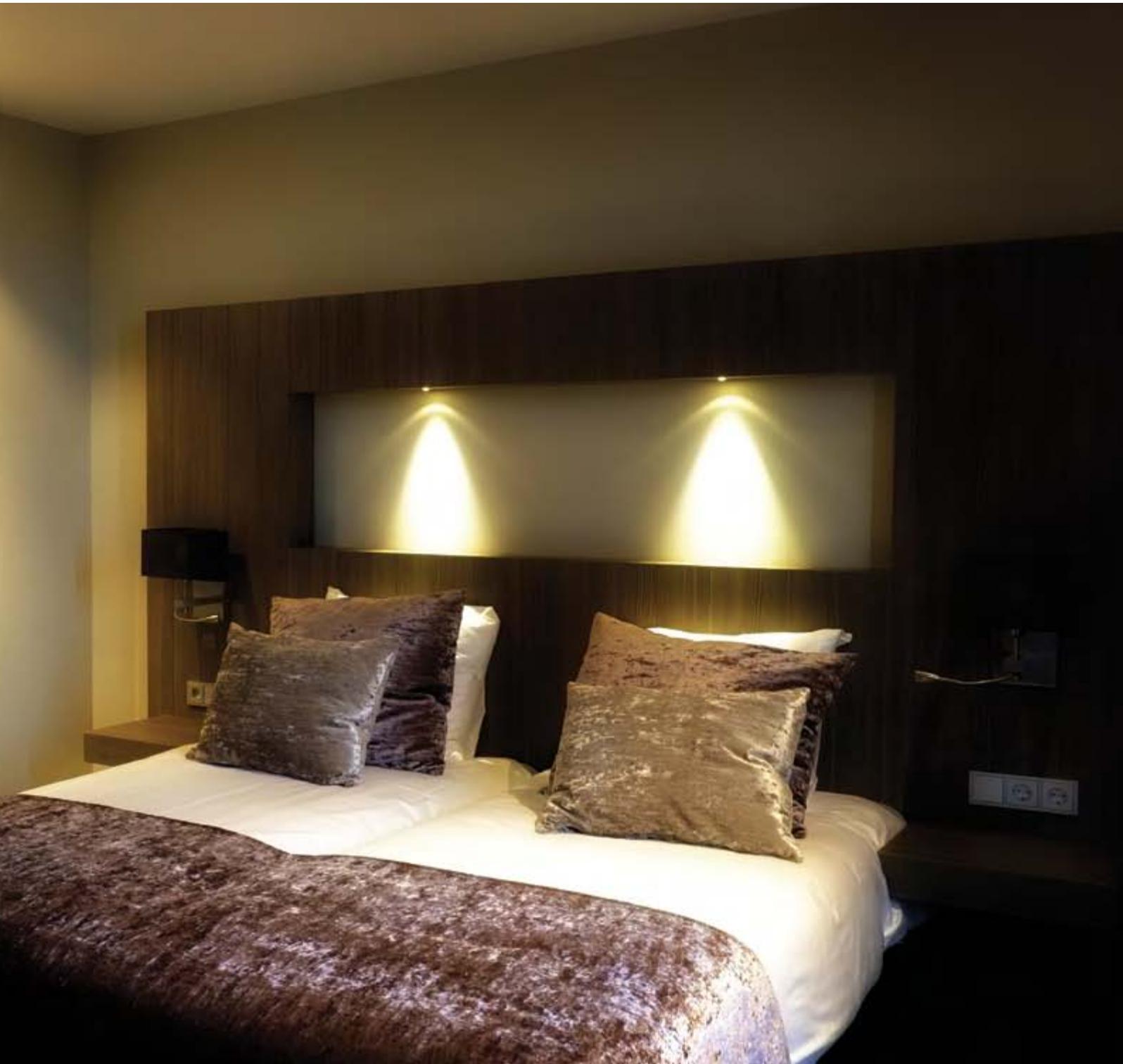


Location [Dordrecht, Netherlands](#)

# Hospitality Lighting

## Hotel

Location [Dordrecht, Netherlands](#)



\* Based on calculation of:  
Replacing 1085 x 50W 12V halogen lamps with LED 10W G53 20V AR111 and 90 x 35W halogen PAR16's with 90 x 4W LED PAR16/20 reflectors running in the lobby, corridors, restaurant and bar areas.  
Replacing 160 x 45W incandescent bulbs with 160 x 8W LED Classic lamps and 90 x 15W Incandescent bulbs with 90 x 3W LED Ping Pongs, running in the bedrooms. Replacing 35W halogen PAR16's with 90 x 4W LED PAR16 reflectors, running in the bathrooms.  
Energy Cost: €0.19/kWh, CO<sub>2</sub> Emissions: 0.43 kg/kWh

Hospitality Lighting  
Brasserie

# De Vierbannen Brasserie



# Hospitality Lighting

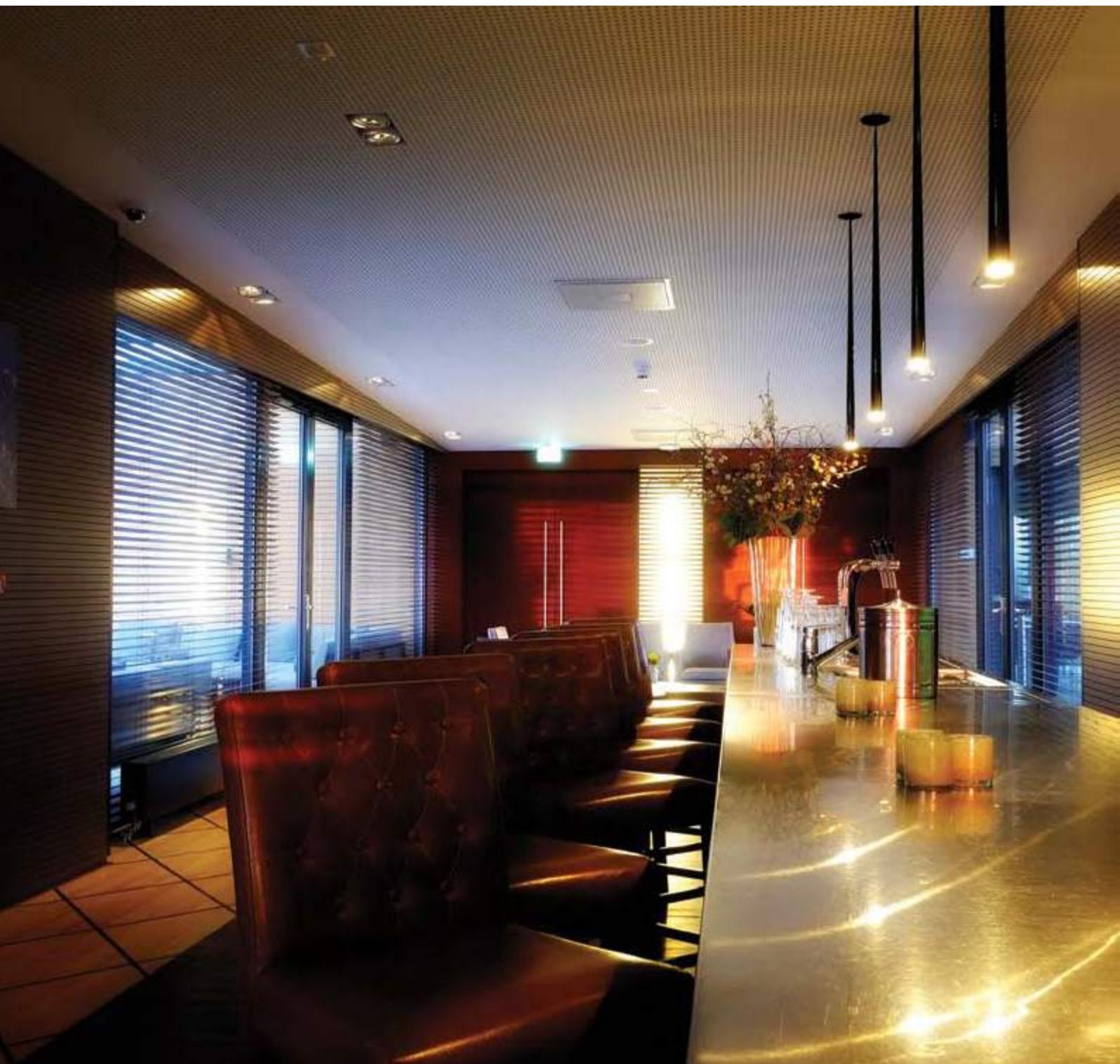
Brasserie

Location [Zeeland, Netherlands](#)  
Lighting Designer [Sight Light BV](#)



Hospitality Lighting  
Brasserie

# De Vierbannen Brasserie



Location [Zeeland, Netherlands](#)  
Lighting Designer [Sight Light BV](#)

# Hospitality Lighting

## Brasserie

Location [Zeeland, Netherlands](#)  
Lighting Designer [Sight Light BV](#)

### A highly energy efficient 'room with a view' due to MEGAMAN®

With 360-degree panoramic views over the Dutch Zeeland's Westernmost point, De Vierbannen Brasserie blends sustainable design and dining, with stunning results. Thanks to its use of the latest MEGAMAN® LED lamp technology, the brasserie will save over €6,160 in energy and 13,950 kg CO<sub>2</sub> per year, which equates to a total saving of €89,300 (including re-lamping costs) and 148,600 kg CO<sub>2</sub> over the lifespan of the lighting installation\*.

The newly built De Vierbannen Brasserie has been designed to give diners both the wonderful vistas of the surrounding coastline and a gourmet menu full of locally sourced foods.

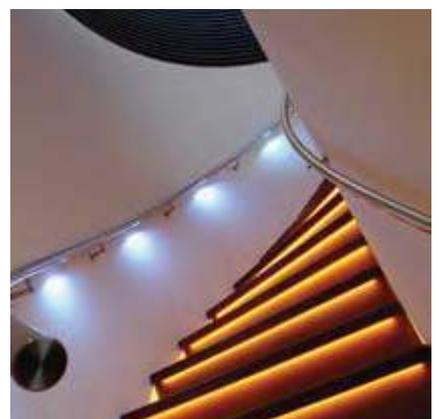
To maximise the surrounding views, De Vierbannen Brasserie installed floor to ceiling glazing. This created both an opportunity and a challenge for the brasserie's lighting designer, Frans Kroonen from Sight Light BV. Frans Kroonen explains: "In most eateries the lighting is focused around maximising the interior dining experience, however at the De Vierbannen Brasserie our remit was to not only produce a highly energy efficient lighting scheme, but maximise the diner's view of the panoramic waterways around both the brasserie and restaurant areas."

With this in mind, Sight Light BV needed to use the most energy efficient lamp

technology available that not only set the mood, but minimised glare on the floor to ceiling glazed areas. By using MEGAMAN®'s unique axial geometry and patented Thermal Conductive Highway™ (TCH) technology, Sight Light BV were able to achieve the desired precise light control with MEGAMAN®'s LED AR111 lamps, which also offer premium lighting performance and superb heat dissipation and lumen maintenance. These were chosen for use throughout the upper and lower bars, restaurant and conference rooms. Lasting up to 13 times longer than halogen equivalents and using 80% less power, MEGAMAN®'s LED AR111 range is ideal for use in retail and restaurant outlets, where high quality light intensity and colour rendering are required.

In total, 216 MEGAMAN® LED 10W G53 AR111 45° 2800K dimmable reflectors were used throughout the brasserie in Orbit Lighting fixtures. With a lamp life of up to 40,000 hours, the energy efficient remit of the lighting brief was achieved. With MEGAMAN®'s high end dimming control, the AR111 can be dimmed down to 1%, ensuring the ultimate in choice in lighting level.

The owners of de Vierbannen are very pleased with the end result. As well as bringing versatile lighting to the brasserie, the lack of radiant heat from the lamps improves the overall diner experience for guests. Whether lit for day or night, de Vierbannen's new lighting scheme is highly energy efficient and does not detract in any way from the panoramic views that surround the De Vierbannen Brasserie.



\* Based on calculation of:  
Replacing 216 x 50W 12V halogen lamps with 216 x LED 10W G53 20V AR111 running 12 hours a day, 6 days a week in the lobby, corridors, restaurant and bar areas.  
CO<sub>2</sub> emission : 0.43 kg/kWh and energy cost : 0.19 €/kWh

# Ponte 16



# Hospitality Lighting

Casino Resort

Location [Macau China](#)



# Ponte 16



# Hospitality Lighting

## Casino Resort

Location [Macau China](#)



## MEGAMAN® energy efficiency and Macau luxury go hand in hand at the Ponte 16 resort

Ponte 16 is a world-class, integrated casino-entertainment resort that is situated in Macau's Inner Harbour, the "Historic Centre of Macau". With a focus on delivering luxury as 'efficiently' as possible, the team at the resort were keen to replace the old lighting scheme with a more energy efficient alternative. Since installing over 5,500 MEGAMAN® energy efficient lamps, the Ponte 16 resort now achieves savings of just under 1,445,701 kWh and 1,012 tons of CO<sub>2</sub> per year and this equates to an electricity bill saving of just under €150,000 annually\*.

Designed to embrace Macau's European, Portuguese and Chinese heritage, the Ponte 16 Resort consists of a five-star hotel, casino, retail complex and unique Michael Jackson Gallery. With luxury and opulence being the priority throughout the resort, any lighting refurbishment needed to maintain the look and feel of this visually stunning building, whilst delivering in terms of energy and maintenance efficiencies.

From the dramatic statement chandeliers and crystal wall fixtures to the recessed spotlights and pendants, the lighting requirements throughout were assessed and MEGAMAN®'s range of energy saving lighting solutions was chosen. These included MEGAMAN®'s dimmable LED Candle, LED Classic, LED MR16 and PAR38 lamps. As well as the superb light quality and longevity of MEGAMAN® lamps, the fact that they could be dimmed was of particular importance to the Ponte 16 Resort team, as a variety of lighting scenes could be created, whilst saving energy during off-peak periods.

### Stunning Chandeliers

With a large majority of the Ponte 16 resort's public spaces lit by dramatic chandeliers and crystal light fittings, significant energy savings were made by replacing the 40W G9 halogens and 25W incandescent lamps with MEGAMAN® 5W to 7W low energy light sources. Thanks to MEGAMAN®'s ability to create lamps that replicate the light quality of halogen, both in terms of sparkle and brightness, this range of low energy replacements has become a firm favourite with staff and visitors at the casino tables. In addition, the immense chandelier at the resort's exterior was fitted with MEGAMAN®'s LED Classic and LED PAR38 reflectors, ensuring maximum drama with minimum energy consumption.

As well as being used in the impressive chandelier at the resort's exterior, hundreds of MEGAMAN®'s LED MR16 4W reflector lamps have been used throughout the VIP Hall. Replacing the 20W halogen originals, the MEGAMAN® MR16's have patented Thermal

## Hospitality Lighting Casino Resort

# Ponte 16

Conductive Highway™ technology that enable them to deliver high luminance levels, with minimum energy output, low heat generation and reflective glare.

Matthew Chu, General Manager, MEGAMAN (HK) Electrical & Lighting Ltd comments: "From the installation of the chiller system, air conditioning and ventilation through to temperature control and the lighting system, Ponte 16 has always adopted a holistic approach to achieving energy efficiency by using as many eco-friendly appliances as possible. By incorporating MEGAMAN®'s range of energy efficient lighting, the resort has significantly benefited in terms of energy reduction, electricity bill savings and CO<sub>2</sub> emissions. Most importantly, all this has been achieved without any negative impact on the overall look and feel of the resort."



Location [Macau China](#)

# Hospitality Lighting

## Casino Resort

Location [Macau China](#)



\* Based on calculation of:  
Operation hours: 24 hours per day, calculated based on 1 year period  
The total number of light point was 5,670 (5,000 of 7W GU9 CFL replaces 40W incandescent lamps , 370 4W LED MR16 reflector replace 20W halogen lamp and 300 5W LED Candle replaces 25W incandescent lamps)  
CO<sub>2</sub> emission factor (Hong Kong) = 0.7 kg/kWh

Hospitality Lighting  
Hotel

# Kulm Hotel



# Hospitality Lighting

## Hotel

Location St Moritz, Switzerland



Hospitality Lighting  
Hotel

# Kulm Hotel



Location [St Moritz, Switzerland](#)

# Hospitality Lighting Hotel

Location [St Moritz, Switzerland](#)



## A statuesque hotel embraces MEGAMAN® LED lighting with stunning results

The luxurious 5 Star Kulm Hotel, located above Lake St. Moritz, Switzerland, is the ultimate in tradition, elegance and innovation. The first hotel in the country to open its doors to electric lighting in 1878, the Kulm Hotel St Moritz has now introduced MEGAMAN® LED lighting technology throughout, to deliver substantial cost and energy savings and ensure that this statuesque hotel is lit to the highest standard for years to come.

As well as creating the first 'winter season' in the Alps in 1864, the Kulm Hotel St Moritz has led the way with innovations such as hydraulic lifts and a warm air heating system. Now, at over 150 years old, the hotel has embraced the benefits

of energy efficient lighting and over 1,600 lamps from MEGAMAN®, leaders in LED lamp technology, are now installed throughout the hotel's public and private spaces.

On entry to the Kulm Hotel St Moritz, guests are reminded more of the lobby of a historic ocean-going liner than of a hotel. Although modernised to ensure the ultimate in luxury, the original hotel building is still clearly visible; including the wide doors through which weary travelers would arrive on their horse-drawn sleighs! With such tradition a driving force for the hotel's owners, Kurt Buchegger, electrical and lighting consultant at Kurt Buchegger Ltd recommended that the hotel trial MEGAMAN®'s range of 2800K (warm white), dimmable and non-dimmable LED Classic lamps, to ensure that its traditional feel be maintained throughout.

Kurt Buchegger comments: "When replacing the original lighting with LED lamps at such a prestigious venue, we had to run tests to ensure that the staff,

guests and hotel owners were happy with the changes. Although power reduction and extended maintenance cycles were of great interest, the aesthetics of the lighting were of paramount importance."

The testing of the MEGAMAN® LED dimmable and non-dimmable lamps was well received by staff and guests alike at the hotel and over 1,600 MEGAMAN® energy efficient lamps have since been provided. These include MEGAMAN®'s LED A60 Classic E27, 2800K, Dimmable and Non-Dimmable in 7W – 11W for use throughout the hotel's public and private spaces and MEGAMAN®'s LED Reflector Series PAR16 7W, 2800K, GU10 for the hotel's corridors and other public areas.

These lamps have also been interspersed with a range of other MEGAMAN® lamps, including dimmable LED PAR16's and MR16's in warm white, to ensure that the Kulm Hotel St Moritz is lit to perfection. By incorporating MEGAMAN®'s lighting technology throughout, the Kulm Hotel St Moritz has maintained its warm,

## Hospitality Lighting Hotel

# Kulm Hotel

welcoming environment, whilst delivering significant energy efficiencies and extended re-lamping maintenance cycles. Lit to perfection, the hotel has embraced 21<sup>st</sup> Century lighting technology, without sacrificing any of its character in the process.

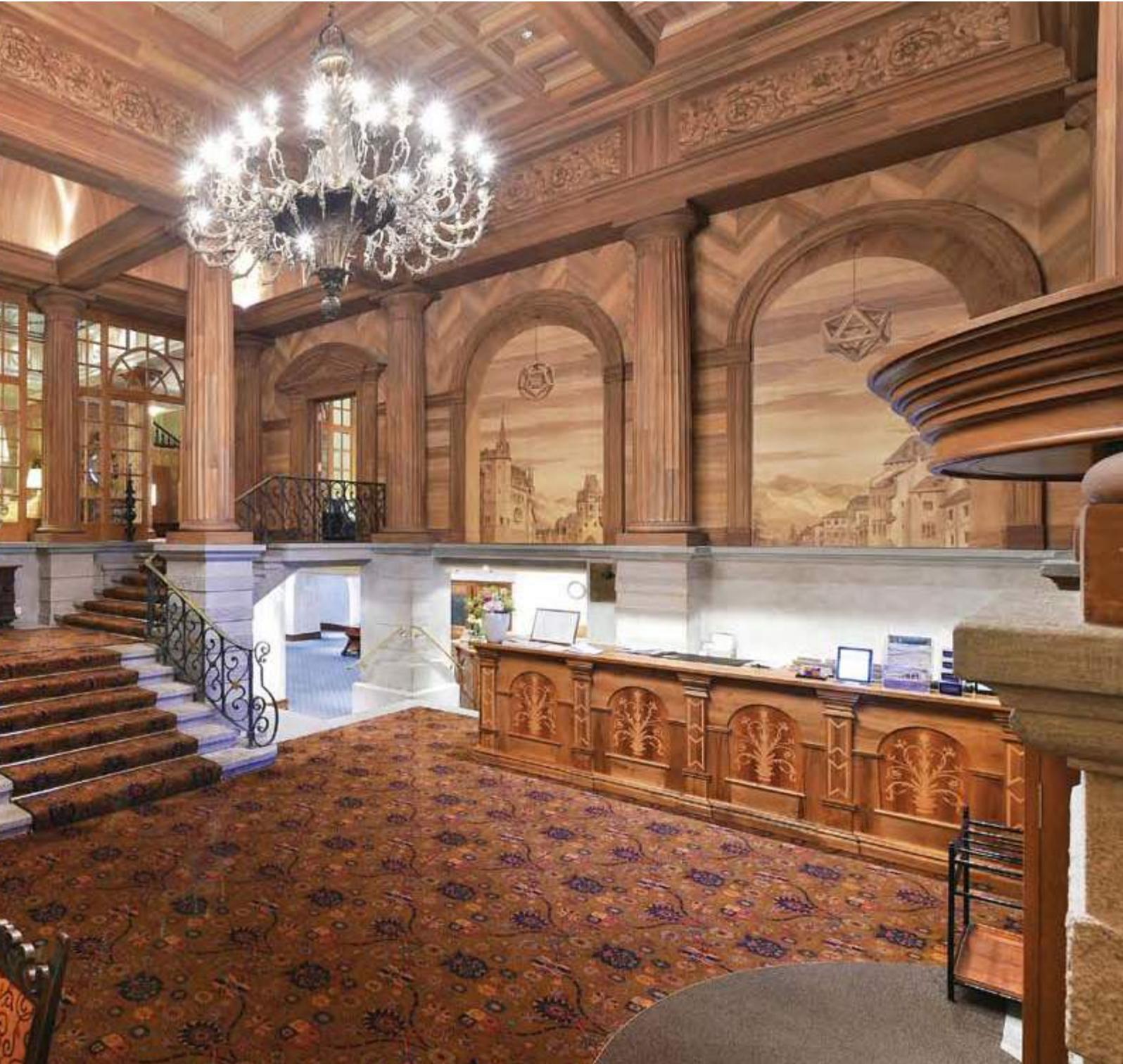


Location [St Moritz, Switzerland](#)

# Hospitality Lighting

Hotel

Location St Moritz, Switzerland





# RETAIL LIGHTING

## Know-how



Here, we will explain how the latest lighting solutions, including MEGAMAN®'s range of LED reflectors, modules and integrated fixtures, can enhance your retail application.

### Why is retail lighting important?

#### 1. Attracting Customers

Lighting plays a crucial role in winning a customer's heart, and designers are increasingly using it to enhance the experience of shoppers, especially for high-end retail shops.

#### 2. Setting the Mood

Lighting affects customers' mood and energy levels. It also provides guidance and orientation. This contributes to the creation of a welcoming, comfortable and enjoyable environment, lengthening customer visits and influencing their buying habits.

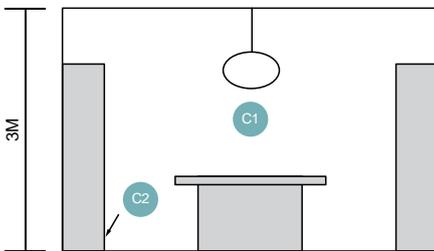
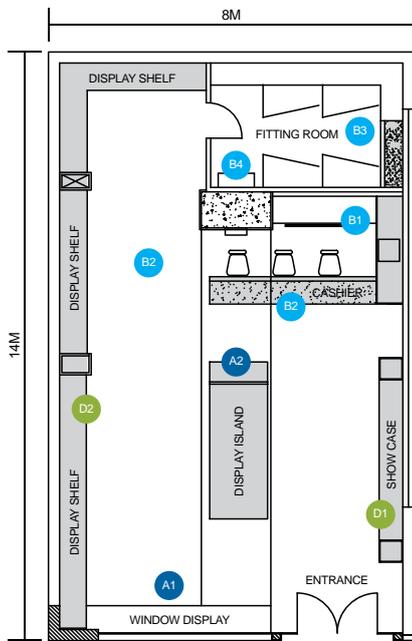
#### 3. Enhancing Product Appearance

A quality lighting scheme can make a BIG difference in a retail setting, by helping products stand out and enhancing their visual appeal in terms of colours, shape and texture. Used effectively, lighting can provoke more interest in your product displays. For example, MEGAMAN® Perfect White technology excites fluorescent whitening agents, making white products stand out from the crowd.

#### 4. Creating a Desirable In-store Experience

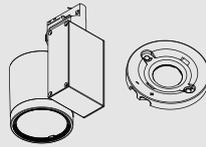
Many luxury retail stores use a combination of ambient lighting, accent lighting and decorative lighting. The deployment of lighting varies throughout the entire store.

## Harnessing the power of LED lighting



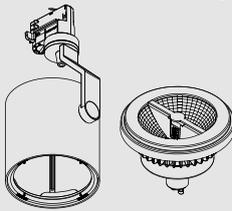
SECTION LAYOUT

### A) Accent & Display Lighting



**A1) Window Display Tracklight for TECOH® RDx**  
Luminaires: MEGAMAN® MODENA

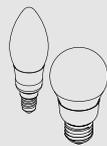
Delivers a powerful light output with an efficacy of 90lm/W, only 50W power consumption and in 25° or 45° beam angles – ideal for welcoming accent lighting.



**A2) Display Island Tracklight for LED AR111**  
Luminaires: MEGAMAN® ALDA

LED AR111 with GU10 lamp provides dramatic accent lighting to highlight the shape and texture of the products.

### C) Decorative Lighting



**C1) Ceiling/Pendant Incanda-LED**

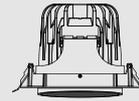
Sparkling 'point-source' lighting effect means the Incanda LED range enhances the beauty of chandeliers and crystal light fittings to give your retail space an elegant finish.



**C2) Under Shelf Skirting LED Strip**

Built-in diffuser to deliver uniform light distribution and colour temperature, continuous lighting effect, perfect for concealed lighting.

### B) General Lighting



**B1) Wall Washer on brand logo Recessed Downlight for TECOH® MHx**  
Luminaires: MEGAMAN® CARLO



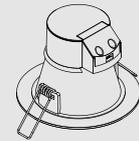
TECOH® MHx LED module delivers up to 3000lm with only 24W power consumption, - the perfect replacement for 35W metal halide lamps.



**B2) Task Lighting in Shop & Cashier Recessed Downlight for LED PAR16**  
Luminaires: MEGAMAN® VERONA



8W LED PAR16 delivers up to 25,000 hours service lifetime, and combines perfectly with MEGAMAN® VERONA for use in conventional recessed applications.



**B3) Ambient Lighting in Fitting Room Integrated LED Recessed Downlight**  
Luminaires: MEGAMAN® SIENA

Offers superior uniform and even light distribution that provides a comforting and inviting ambience.



**B4) Serving Counter in Fitting Room LED Panel**  
Luminaires: MEGAMAN® BERTO

Perfect energy saving solution that produces up to 88lm/W and is a direct replacement for 3x18W T8 and 3 x 24W HE T5 fluorescent modular fittings

### D) Shelf and Showcase Lighting



**D1) Showcase LED MR11**

Ideal energy saving replacement for halogen MR11 – delivering a halogen-like light beam while generating far less heat.



**D2) Display Shelf LED GX53**

Slim profile for narrow surface-mounted luminaires and recessed fittings.

# Know-how



## Recommended Lighting Strategies

### Ambient Lighting

A general and uniform illumination that comes from all directions in a room which has no visible source. Ambient lighting is often used as a basic source of light for customers to see and examine the merchandise and for sales staff to perform their duties.

### Showcase and Shelf Lighting

This kind of lighting puts your personal treasures in focus. Small or miniature light sources are located very closely to the objects being displayed, while hidden out of customers' sight.

Importance of Design Factors for Retail Lighting				
	Accent	Ambient	Decorative	Shelf and Case
Colour Rendering Index / Colour Temperature	■	■	■	■
Accent / Contrast / Highlight	■	■	■	■
Daylighting Integration	■	■	■	■
Direct / Reflected Glare	■	■	■	■
Style or Image	■	■	■	■
Objects / Shadows	■	■	■	■
Visual Priority / Store Architecture	■	■	■	■
Quantity of Light on Vertical Displays	■	■	■	■
Quantity of Light Horizontal Surfaces	■	■	■	■
Flexibility of Accent Lighting	■	■	■	■

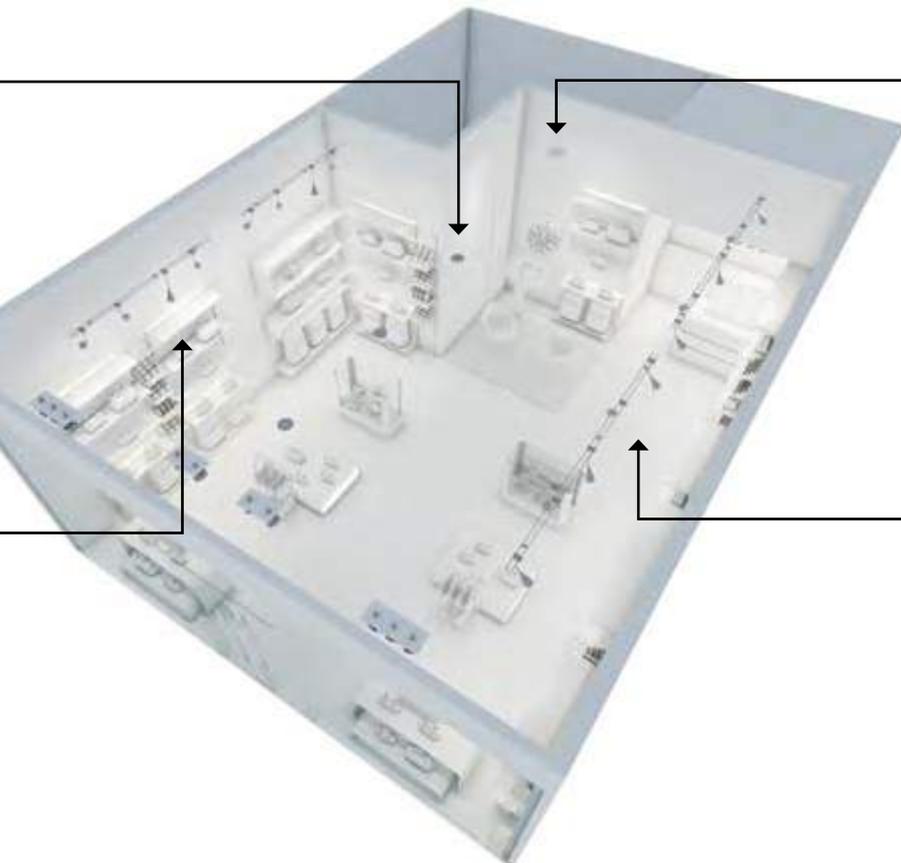
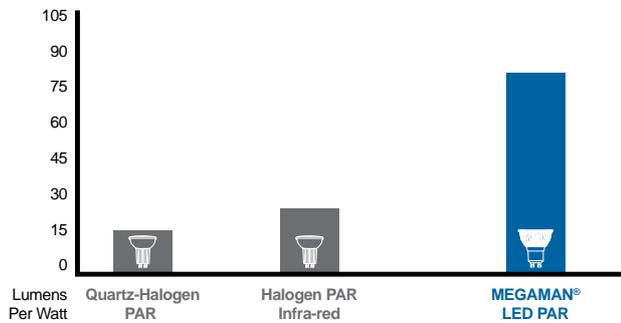
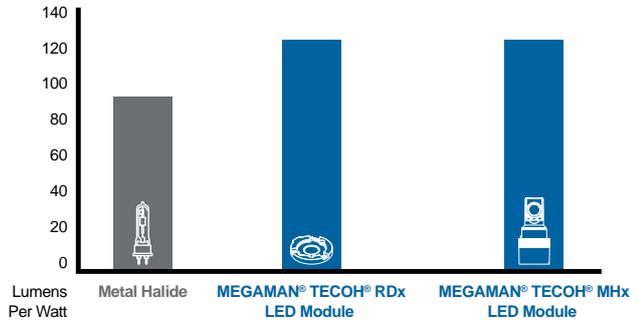
\* Adapted from the Lighting Design Guide IESNA Lighting Handbook

■ Very Important ■ Important ■ Least Important

# Retail Lighting



## Lamp Efficacies



### Decorative Lighting

Primarily used for decorative effect or as a focal point, such as in a chandelier or crystal luminaire. Concealed lighting is also often used for decorative effect, for example the use of LED strips in under-shelf skirting to create a halo effect is a common application.

### Accent and Display Lighting

Also known as spotlighting, accent lighting is used to highlight key objects and focal points in relation to their surroundings. It emphasises the importance of the objects by creating contrast and visual impact on the forms, structures, textures and colours of the specific objects.

Retail Lighting  
Car Showroom

# BMW Showroom



# Retail Lighting

## Car Showroom

Location Sabah, Malaysia



Retail Lighting  
Car Showroom

# BMW Showroom



Location [Sabah, Malaysia](#)

# Retail Lighting

## Car Showroom

Location Sabah, Malaysia



## MEGAMAN® delivers dramatic lighting for BMW in Malaysia

When a new BMW dealership wanted to make a stunning first impression in Sabah, Malaysia, the showroom had to deliver in terms of style, its consumer experience and long-term energy savings. Now, with the latest in LED lighting technology from MEGAMAN® used throughout, this stylish 53,500 sq ft new build showroom delivers drama and customer impact while minimising energy costs and CO<sub>2</sub> emissions.

Located in Lido, Jalan Penampang, the FM Autohaus owned showroom is the first in the state to be an authorised dealer of the company's BMW, Mini and BMW Motorrad brands. Designed by Daniel Koh, Principal at Arkitek Daniel Koh, the dealership includes a world-

class showroom that has eight display areas, two service receptions - including a rooftop lounge - six repair bays and two diagnostic bays, as well as a BMW Premium Selection section for pre-owned vehicles.

Spread over four floors, the remit for the showroom was for it to reflect the quality of the iconic BMW brand whilst guaranteeing long-term energy efficiencies. To achieve both the required levels of drama and significant energy and cost savings, Mr Koh chose to replace the proposed 150W metal halide lamps in the project with MEGAMAN® AR111 and PAR38 LED lamps. Renowned for their powerful, directional beams, the MEGAMAN® lamps were combined, in a range of beam angles, so as to draw prospective customers' eyes towards the cars and signage throughout the showrooms.

In addition, the lamps were also used to create a welcoming environment in the dealership's rooftop lounge, bring drama

to the colourful fins on the showroom's exterior façade and bring focused lighting to the customer reception areas. A range of MEGAMAN® LED lamps were used throughout the BMW dealership, including MEGAMAN® PAR38 20W 25° 2800K, and MEGAMAN® AR111 15W 2800K and 4000K LED lamps in 8°, 24° and 45° beam angles. With energy consumption and its reduction one of the key requirements within the lighting brief, MEGAMAN®'s LED AR111 and PAR38 reflectors were the ideal choice for the downlight, surface mounted and track mounted fittings; delivering both in terms of performance and cost. Due to their unique axial geometry and the patented Thermal Conductive Highway™ (TCH) technology of MEGAMAN®'s lamps, precise light direction was possible, minimising glare throughout, whilst maximising impact for showroom visitors.

Mr Syed Faiz, Dealer Principal and Chief Executive Officer of FM Autohaus, concludes: "The new FM Autohaus facility is now well placed to deliver total

## Retail Lighting Car Showroom

# BMW Showroom

satisfaction and provide customers in Sabah with the outstanding premium ownership experience which they deserve. It is equal to any BMW facility anywhere in the world.”



Location [Sabah, Malaysia](#)

# Retail Lighting

Car Showroom

Location Sabah, Malaysia



# Central/Central



# Retail Lighting

## Shopping Mall

Location [Hong Kong](#)  
Lighting Designer [TinoKwan Lighting Consultants Ltd](#)  
Designer [Steve Leung Designers Ltd](#)



Retail Lighting  
Shopping Mall

# Central/Central



Location [Hong Kong](#)  
Lighting Designer [TinoKwan Lighting Consultants Ltd](#)  
Designer [Steve Leung Designers Ltd](#)

# Retail Lighting

## Shopping Mall

Location [Hong Kong](#)  
Lighting Designer [TinoKwan Lighting Consultants Ltd](#)  
Designer [Steve Leung Designers Ltd](#)



## An exciting new shopping experience in the heart of Hong Kong's financial and commercial district

Central, is turning heads thanks to its array of designer stores, lit with the latest in highly energy efficient MEGAMAN® lamp technology.

CENTRAL/CENTRAL, a retail concept developed by GRI, Asia's leading international apparel and accessories brand-management and retail-distribution company, brings together the company's portfolio of brands under one roof for the first time. Names in the 18,000 square feet retail space include Anne Klein New York, Carolinna Espinosa, Easy Spirit, EQ:IQ, Joan & David, Karen Millen, Nine West and Steve Madden. With the use

of MEGAMAN® LED reflector technology, the end result is not only the ultimate in visual lighting drama, but in energy savings as well.

To create this stylish mall, GRI commissioned Steve Leung Designers Ltd to design a flowing space that accommodated each brand's outlet with fluidity, but also allowing for individual expression. Working alongside renowned lighting designer, Tino Kwan, founder of TinoKwan Lighting Consultants Ltd, the result is a stunning white shopping canvas within which each 'art collection', or brand, is presented.

Tino Kwan explains: "CENTRAL/CENTRAL is a holistic shopping experience, and with this in mind, it has been divided into nine areas, eight shops and one private relaxation area, each with its own style and character of light fitting. Each of the shops reflects the individual personality of the international designer represented within it and has been designed with the two-fold aim of showing

off the beauty of the products within, as well as positively impacting sales."

While the design of each of the stores aims to offer the maximum flexibility for merchandising, the lighting technology used throughout has been chosen with visual impact, customer comfort and energy efficiency in mind. Tino Kwan chose to use MEGAMAN® LED Reflector Technology due to the lighting performance of the lamps, the variety of directional beam angles available and the sustainable credentials of MEGAMAN® as a company. Within CENTRAL/CENTRAL, over 750 MEGAMAN®s LED AR111 10W dimmable 8, 24 and 45 degree light sources and MEGAMAN® LED MR16 10W dimmable 24 degree lamps were used, to create the right balance of drama and ambience within each of the stores, whilst reducing heat and energy consumption.

Apart from its energy saving potential and light quality, LED technology is of interest in retail installations due to the reduced

# Central/Central

heat output of the lamps and their ability to be positioned near to items on display.

Part of MEGAMAN®'s LED Reflector Series, MEGAMAN®'s AR111 and MR16 ranges of LED low energy replacements for halogen reflectors incorporate the company's patented Thermal Conductive Highway™ (TCH) technology, which has superb heat dissipation, lighting performance and lumen maintenance. As a result the MEGAMAN® LED AR111 and MR16 ranges last up to 13 times longer and use 80% less power than halogen equivalents. With the same high quality light intensity and colour rendering of traditional AR111 and MR16 spotlights (colour rendering of up to Ra92), but with no UV light radiation, negligible IR radiation or residual glare, the LED AR111 and MR16 ranges are ideal for use in any retail outlet.

CENTRAL/CENTRAL is a prime example of what can be achieved when the latest in high quality LED lighting technology is used to its maximum effect. Thanks to the long lamp-life and superior light performance of MEGAMAN®'s LEDs, CENTRAL/CENTRAL will not only look good for many years to come but save significant amounts of energy and over 297,000 kg CO<sub>2</sub> per year\*.



# Retail Lighting

## Shopping Mall

Location [Hong Kong](#)  
Lighting Designer [TinoKwan Lighting Consultants Ltd](#)  
Designer [Steve Leung Designers Ltd](#)



\* Based on 0.616 kg CO<sub>2</sub> emission/kWh

# Morpheus



# Retail Lighting

## Bedroom Furniture Showroom

Location Utrecht, Netherlands



# Morpheus



# Retail Lighting

## Bedroom Furniture Showroom

Location [Utrecht, Netherlands](#)

### MEGAMAN® LED technology shows homewares and bedding store in a whole new light

When upmarket bed and homewares specialist, Morpheus, decided to upgrade the store's lighting scheme in Utrecht, Netherlands, the transformation led to multiple benefits. Not only did the refurbishment with the latest in MEGAMAN® LED lamp technology significantly reduce the store's electricity bill, but it brought the store's dramatic colour scheme to life. The high light quality and energy efficiency of MEGAMAN®s LED lamp technology means that Morpheus will save €92,190 (including re-lamping costs), and 123,270 kg CO<sub>2</sub> over the lifespan of the lighting installation\*.

Named after Morpheus, the god of dreams in Greek mythology, this family-owned chain of Dutch specialist bed and homeware stores has built its business on giving its customers the best night's sleep possible. As David Minco, Morpheus comments: "Although we take the business of sleep very seriously, we like to make our showrooms as accessible and welcoming as possible to a wide range of customers. Our aim is to create aspirational, yet welcoming room layouts that demonstrate the design potential of bedrooms and guestrooms." With this in mind, the owners were looking for ways to revitalise and refresh the look and feel of the store in Utrecht. Whilst commissioning an interior design

upgrade at the store local light specialists from REXEL explored the possibility of upgrading the lighting to more energy efficient alternatives.

David Minco, Morpheus comments: "We were concerned that any lighting upgrade needed to maintain the warmth and drama that we have in our stores. Also, we have a wide range of soft furnishings that need to be lit with minimal UV impact to avoid them discolouring." The solution came in the form of MEGAMAN®s LED AR111 reflector range which harnesses Thermal Conductive Highway™ (TCH) technology to ensure that its lamps have superb heat dissipation, lighting performance and lumen maintenance, last up to 13 times longer than halogen equivalents and use 80% less power. In addition they are ideal for use in any retail environment as they have excellent colour rendering up to (Ra92) and no UV light radiation.

#### Speed of installation

Using the existing luminaires and lighting tracks, over 200 MEGAMAN® LED AR111 11W G53 24° 2800K reflectors were used to replace the original, inefficient 50W halogen light sources. Because MEGAMAN®s LED AR111 range can be used with the majority of AC/DC12V halogen transformers, the installation team were able to minimise store down-time by using the existing transformers and simply replacing the lamps.

#### Shown in the best possible light

Part of the new showroom design scheme incorporated black features walls. Lighting an interior with such extremes of dark and light can have its problems however the unique

axial geometry of MEGAMAN®s LED reflectors meant that no residual glare or shadows were created on the walls. In addition, by choosing a warm white colour temperature, the lighting scheme draws people in to the store, as well as bringing Morpheus' range of dramatically coloured homewares and bedding to life. "MEGAMAN®s LED AR111 lamp's excellent colour rendering and similar light intensity to traditional non-LED AR111 spotlights creates a space bathed in light that invites people to come in and browse" comments Rolf Ibsen of MEGAMAN®.



\* Based on calculation of:  
Replacing 210 x 50W halogen lamps with 210 x LED 11W AR111

Retail Lighting  
Goldsmiths and Jewellers

# Michgelsen



# Retail Lighting

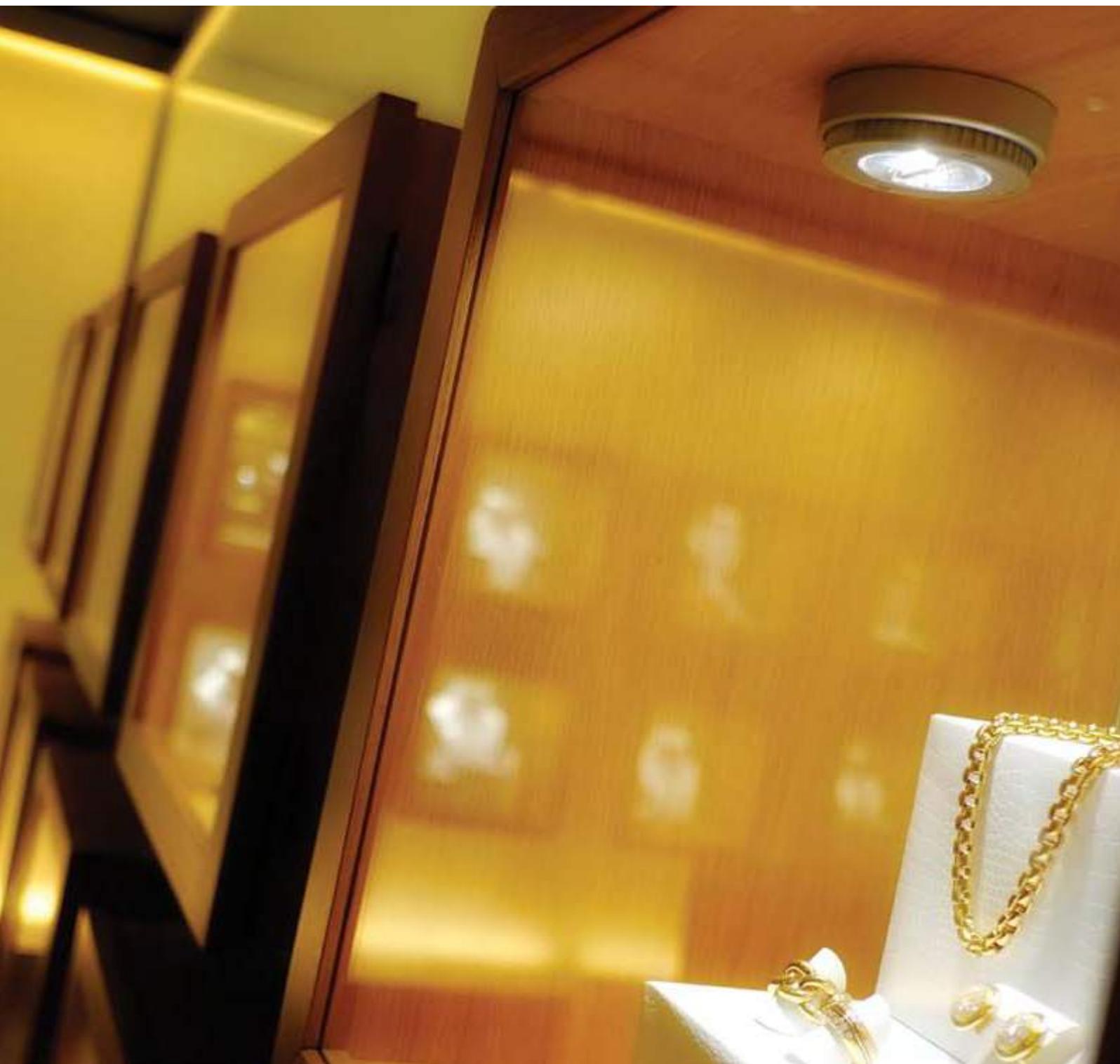
Goldsmiths and Jewellers

Location Soest, Netherlands



Retail Lighting  
Goldsmiths and Jewellers

Michgelsen



Location [Soest, Netherlands](#)

# Retail Lighting

## Goldsmiths and Jewellers

Location [Soest, Netherlands](#)

### Michgelsen jewellery given 'Brilliant' shine by MEGAMAN®

One of the most exclusive goldsmiths and jewellers in the Netherlands, Michgelsen in Soest, has been refurbished with the latest in MEGAMAN® LED lamp technology, with stunning results. Not only does the new scheme show off the workshop's bespoke jewellery and watches in the best possible light, but it will also save over €2,155 and 4,875 kg CO<sub>2</sub> per year. This equates to savings of €26,650 (including re-lamping costs), and 38,958 kg CO<sub>2</sub> over the lifespan of the lighting installation\*.

Founded 25 years ago by Joost Michgelsen, this exclusive goldsmith and jewellers has become renowned for its bespoke jewellery commissions and range of exclusive Parmigiani and Breitling watches. With a viewing gallery for clients and a workshop area for the goldsmiths, silversmiths, gemologists and diamond setters, the owners of Michgelsen wanted to improve the lighting within the spaces to bring out the features of the gems, precious metals and diamonds.

With this in mind, key lamps from MEGAMAN®'s LED range were chosen to bring out the warmth and sparkle. Joost Michgelsen explains why: "At Michgelsen we offer our customers the ultimate in luxurious, bespoke jewellery and Parmigiani and Breitling watches.

Although the existing lighting was fine, it was not exceptional. By replacing the lighting with MEGAMAN®'s LED lamps, we were able to draw out the best qualities in the gems and watches to ensure that a visit to Michgelsen is one that will never be forgotten."

#### Coming out of the shadows

The four jewellery display cases in the workshop's main area were the first to be relit. They house the workshop's rings, necklaces and bracelets and needed to be lit to maximise the sparkle of the jewellery. Twenty MEGAMAN® GX53 LED 5W 30° 4000K reflectors were fitted within MEGAMAN® Planex fixtures and thanks to precise light control using a unique axial geometry and patented Thermal Conductive Highway™ (TCH) technology, no residual glare or shadows were created on jewellery. The end result is stunningly lit pieces that show off the sparkle of the precious metals and gems to maximum effect.

As well as the display cases, the viewing area where clients try on their commissions was also relit. It was essential in this space that the jewellery be seen at its best. With this in mind, eight of MEGAMAN®'s Brilliant Tone lamps, that utilise 5500K illumination to produce the ultimate in shine and sparkle, were chosen. MEGAMAN®'s GU5.3, LED 10W 24° 5500K reflectors, with TCH technology for ultimate precision lighting, are capable of linear dimming from 100%-10% and with a rated lamp life of up to 30,000 hours will ensure stunning results in the main client area for many years to come.

#### Warm and welcoming

In addition new lighting was added to the Parmigiani and Breitling watch display cases. Due to the warmer feel required in these cases, MEGAMAN®'s LED High R9 Professional Series reflectors were chosen. MEGAMAN® R9 LED light sources have a high red colour rendition and offer retailers a high quality lighting intensity, colour richness and superb performance. Twelve MEGAMAN® LED R9 10W G53 AR111 24° 2800K dimmable reflectors were used in the display cases to draw out the warmth of the watch straps and wood inlaid case interiors, resulting in luxurious, yet inviting displays.

As well as showing off the luxurious jewellery and watches in tailor-made lit environments, there has also been an unexpected benefit to the new MEGAMAN® lighting scheme. Thanks to the low heat output of the LEDs, 85% less heat is emitted and clients find that the showroom temperature is more comfortable and they spend more time there. Joost Michgelsen concludes: "The added benefit of the new lighting scheme is that clients spend more time with us than they did previously – the longer they stay, the more they can't resist buying!"



\* Based on calculation of:

Replacing:

80 x 35W halogen lamps with 80 x LED 5W GX53 (12 hours/day, 6 days/week)

8 x 50W halogen lamps with 8 x Brilliant Tone 10W GU5.3 MR16 (12 hours/day, 6 days/week)

8 x 35W halogen lamps with 8 x Brilliant Tone 10W GU5.3 MR16 (12 hours/day, 6 days/week)

12 x 35W halogen lamps with 12 x Brilliant Tone 10W GU5.3 MR16 (12 hours/day, 6 days/week)

# Sei Unica



# Retail Lighting

## Boutique

Location [Zürich, Switzerland](#)  
Lighting Designer [Wolfgang Kucher](#)



Retail Lighting  
Boutique

# Sei Unica



Location [Zürich, Switzerland](#)  
Designer and Architect [Wolfgang Kucher](#)

# Retail Lighting

## Boutique

Location **Zürich, Switzerland**  
Designer and Architect **Wolfgang Kucher**



## Sei Unica uses the latest in MEGAMAN® LED reflector technology with dramatic results

In Alstetten, a suburb of Zurich, Switzerland, this is a visionary new redevelopment of a former packaging site.

Wolfgang Kucher, designer and architect for Sei Unica AG, explains further: "The Sei Unica boutique is part of the prestigious CONNECT project in Alstetten. A former packaging plant, the site has been developed based on the vision of combining work, living, sports, leisure and cultural facilities in one place. It centres around a restaurant and retail zone on the ground floor piazza, and the whole complex has been built to the Swiss MINERGIE® sustainability standard\*.

We wanted to support the ethos of MINERGIE® within Sei Unica, and with this in mind, carefully researched the best lighting technology for use within the store that would support a high-quality look and feel, but be as energy efficient as possible."

The end result is a dramatic combination of the latest in MEGAMAN® LED lamp technology and use of space, to create a boutique that not only looks stylish and sophisticated but saves over €1,500 a year in energy consumption and 7,723 kg of CO<sub>2</sub> emissions\*\*.

Working closely with Jean-Luc Mosch, from M.Schonenberger AG, the possibility of using LED lamp technology within the boutique was explored. Apart from its energy saving potential, LED technology was of interest because of its reduced heat output and ability to be positioned near to items on display. In consultation with MEGAMAN®, Mr Kucher chose to use MEGAMAN®'s LED AR111 GU10, 10W and 15W light sources, along with

MEGAMAN® LED 5W Candle, to create the right balance of drama and exclusivity within the store, whilst reducing heat and energy consumption.

Part of MEGAMAN®'s LED Reflector Series, MEGAMAN®'s AR111 range of LED low energy replacement for halogen reflectors incorporates the company's patented Thermal Conductive Highway™ (TCH) technology, which has superb heat dissipation, lighting performance and lumen maintenance. As a result the MEGAMAN® LED AR111 range lasts up to 13 times longer and uses 80% less power than halogen equivalents. With the same high quality light intensity and colour rendering of traditional AR111 spotlights (colour rendering of up to Ra92), but with no UV light radiation, negligible IR radiation or residual glare, the LED AR111 range is ideal for use in any retail outlet.

### Maximising the advantages of LED

As well as lighting a mix of central display pods, which have been constructed on wheels, to be repositioned during

## Retail Lighting Boutique

# Sei Unica

a fashion show, Mr Kucher wanted customer's eyes drawn to the impressive showcases around the sides of the boutique. One of the main challenges faced when lighting Sei Unica was obtaining the correct balance of light within these tall showcases. Mr Mosch, explains: "Compared to halogen and HID, LED lighting is a much newer technology and we are still in a learning process when it comes to making the most of it. Unlike halogen lamps, which produce a yellowish light, the LED light sources required slightly more experimentation to get the correct effect under daylight conditions, due to their more neutral white light."

"However, the end result was well worth the learning curve, as not only does the neutral white light from MEGAMAN® LED AR111's show the creations in their accurate colours, but we have been able to position the lamps close to the exhibited dresses for maximum impact - something that would have been impossible to achieve with halogen sources." Mr Kucher, concludes: " Thanks to MEGAMAN®'s LED solution, we haven't yet had to use the air-conditioning system once, despite experiencing a minor heat-wave here in Zurich. The eco-design of the building and MEGAMAN®'s LED technology complement one another perfectly. I am very impressed!"



Location [Zürich, Switzerland](#)  
Designer and Architect [Wolfgang Kucher](#)

# Retail Lighting

## Boutique

Location [Zürich, Switzerland](#)  
Designer and Architect [Wolfgang Kucher](#)



\* MINERGIE® is a sustainability brand for new and refurbished buildings. It is mutually supported by the Swiss Confederation, the Swiss Cantons along with Trade and Industry and is registered in Switzerland and around the world.

\*\* Based on energy costs of energy costs of €0.12/kWh and 0.616 kg CO<sub>2</sub> emission/kwh

Retail Lighting  
Audio Equipment Showroom

# McIntosh



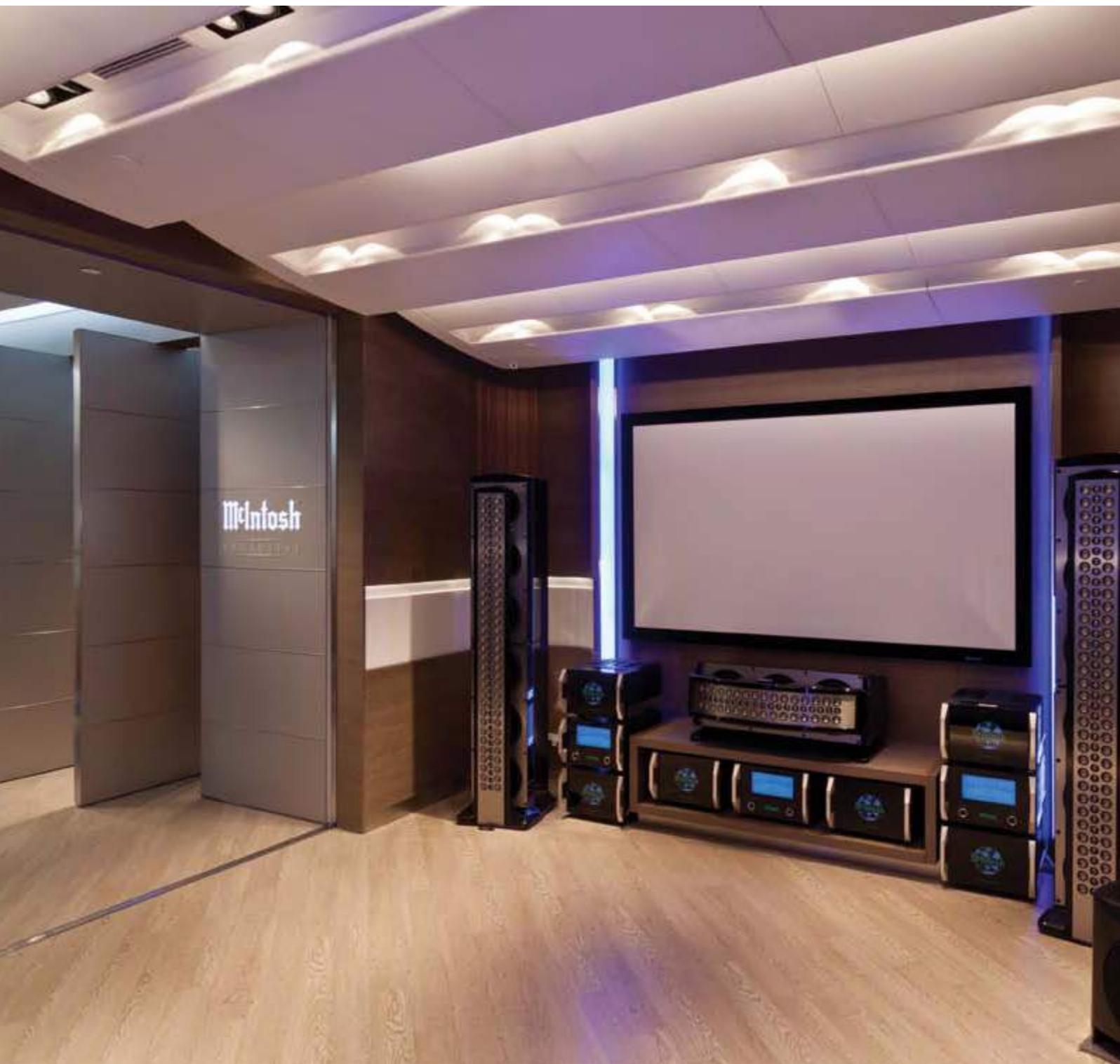
Retail Lighting  
Audio Equipment Showroom

Location [Shanghai, China](#)  
Interior Designer [PplusP Designers Ltd](#)



Retail Lighting  
Audio Equipment Showroom

# McIntosh



Location [Shanghai, China](#)  
Interior Designer [PplusP Designers Ltd](#)

# Retail Lighting

## Audio Equipment Showroom

Location [Shanghai, China](#)  
Interior Designer [PplusP Designers Ltd](#)

### MEGAMAN® lights elite audio brand to perfection

Attention to detail is the driving force behind every McIntosh handcrafted prestige audio product. It is no surprise therefore that the latest McIntosh Labs store, located in Plaza 66, Shanghai, has been designed with perfection in mind. Created by innovative PplusP Designers Ltd and lit using the latest in MEGAMAN® LED lamp technology, the end result is a statement in exclusive retail lighting that also delivers savings of €3,535 in electricity costs and 24,000 kg in CO<sub>2</sub> emissions per year compared to traditional equivalents\*.

Housed within the prestigious Plaza 66, alongside the likes of Hermès, Cartier, Bvlgari and Louis Vuitton, the McIntosh Labs store is targeted at middle and upper class consumers looking for that exclusive sound system experience. PplusP Designers created an interior for the 1,600 sq-ft store that supported McIntosh's brand leadership position. As well as the store's centre-piece, a statement 'Time Tree' that illustrates historic moments in the company's history, a range of more intimate spaces have been developed that are linked together using black stainless steel, marble and wood.

With so many reflective surfaces used throughout the store, the lighting had to be carefully chosen to create drama, warmth and intimacy whilst minimising glare. MEGAMAN®'s range of LED AR111 reflectors were ideal as their unique axial geometry and patented Thermal

Conductive Highway™ (TCH) technology deliver precise light direction, minimise glare and focus consumer attention on the stunning McIntosh audio systems. As well as creating focused beams of light with the MEGAMAN® LED AR111 15W 8° and 24° lamps, wall washes of colour were also achieved using the MEGAMAN® LED AR111 15W 45° lamp. Used to replace 75W halogens, the MEGAMAN® AR111 LED equivalent not only delivers in terms of light quality and energy efficiency, but with a lamp life of 50,000 hours (L70) it is also an ideal lamp for any retail, gallery or hospitality application.

MEGAMAN®'s 8W LED Classic lamps were also used throughout the store to deliver ambient lighting that mirrored the warmth of the wood panelling and created contrast to the sleek lines of the audio systems. Thanks to the low heat dissipation of MEGAMAN®'s lamps, they were able to be safely used within close proximity to the McIntosh systems.

The end result is a stunningly lit retail experience that draws customers into the store and supports the McIntosh brand's luxury ethos, all whilst delivering significant energy and cost savings.



\* Based on 172 total light sources (MEGAMAN® 8W LED Classic and 15W LED AR111) running 10 hrs per day

# Liverpool Stores



# Retail Lighting

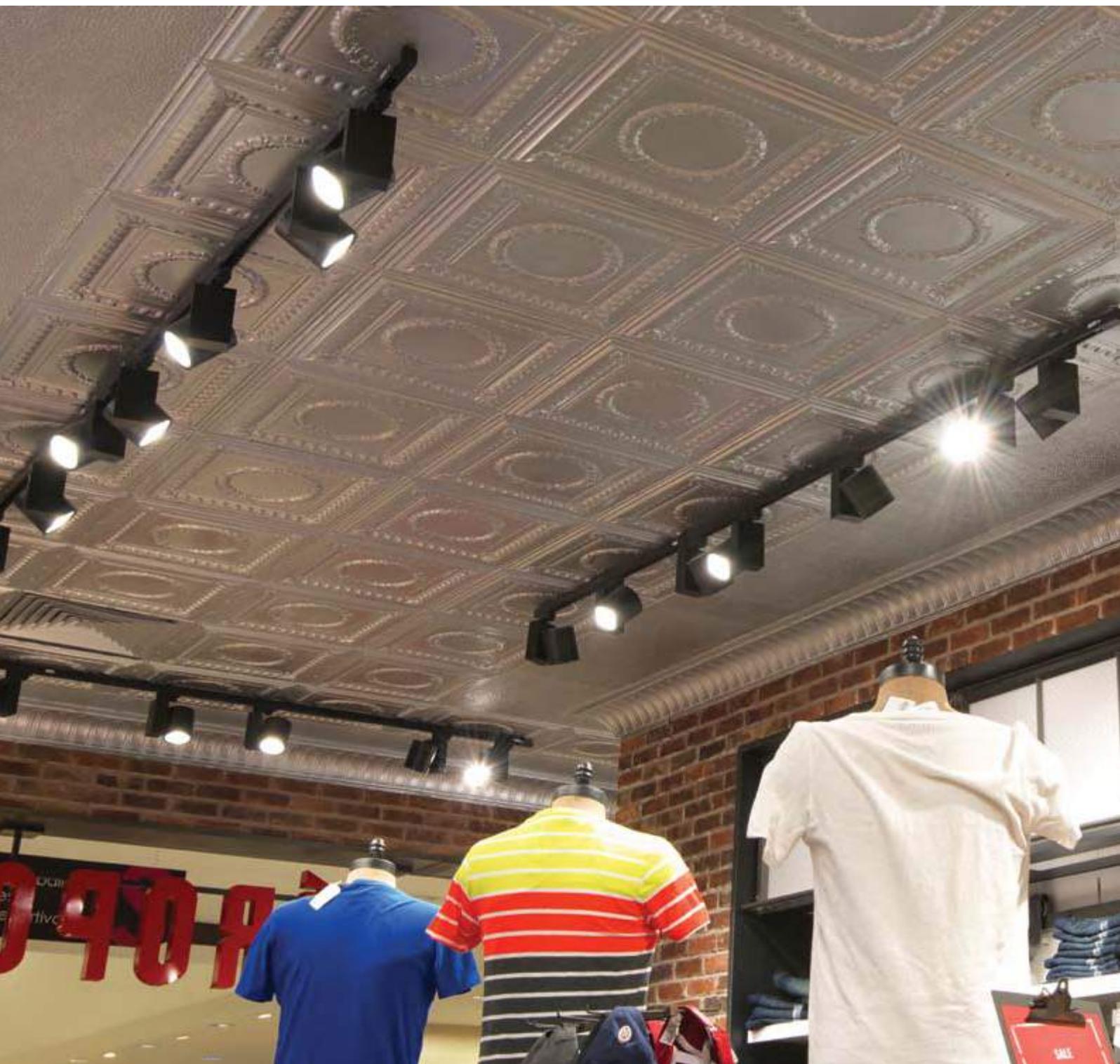
## Shop-in-Shops

Location [Mexico](#)  
Photographer [Juan Diaz Infante](#)



Retail Lighting  
Shop-in-Shops

# Liverpool Stores



Location [Mexico](#)  
Photographer [Juan Diaz Infante](#)

# Retail Lighting

## Shop-in-Shops

Location [Mexico](#)  
Photographer [Juan Diaz Infante](#)



## Liverpool stores in Mexico install the latest in MEGAMAN® LED technology

With over 13,000 fittings provided by Paviom, containing MEGAMAN® TECOH® MHx LED modules, Mexico's largest department store completed one of the largest LED retail lighting projects the country has seen to date.

Aeropostale Inc., a popular US specialty retailer of casual clothing for teenagers, announced plans back in July 2013 to launch the Aeropostale brand in Mexico. To facilitate the move of the US specialty retailer into Distribuidora Liverpool, S.A. de C.V., known as "Liverpool", the department store chain has refurbished its shop-in-shop's to the latest in LED lamp technology.

The shop-in-shop refurbishments created a significant opportunity for Liverpool's in-house design team to develop an interior scheme that reflects the vibrancy of the incoming US brand to its Mexican teenage consumers.

As long-term provider of lighting to Liverpool stores, Mexican lighting provider Lightmex was brought in to develop a possible lighting solution for the new interiors. Working alongside UK architectural lighting company Paviom, Ignacio Ashby Aranda, President of Lightmex and Ignacio Ashby Alatríste, CEO and Simon White, general manager at Paviom, created an LED lighting solution to fit the client's brief for vibrant, energy efficient lighting.

To date, 24 double corner shops within shops and 8 boutiques have been opened and 6,000 Fittings with MEGAMAN® TECOH® MHx modules installed; once the full 13,000 fittings have been installed, Liverpool is expected to benefit from savings of €102,500 in energy and 450,965 Kg CO<sub>2</sub> per year\*.

### LED versus metal halide store testing

Simon White explains the LED testing process with Liverpool stores: "We were invited by Lightmex to demonstrate the potential energy savings and effectiveness of LED lighting to their client, Liverpool stores. We decided to combine Paviom's Domena F25343TK track lighting solution with MEGAMAN®'s 24W R9 TECOH® MHx LED modules, to achieve the vibrant, directional lighting that this scheme required. Following a demonstration of the lighting track to Eumir Salgado, Boutique division manager at Liverpool, we were asked to prepare a store mock-up to show the lighting in-situ."

The store mock-up was carried out in Liverpool's Mexico City store and included ten Paviom Domena fittings alongside existing metal halide lighting. Ignacio Ashby, Lightmex, continues: "We put the LED and metal halide fittings side by side. The items lit with MEGAMAN®'s TECOH® Generation 2 MHx 24W R9 (3000K/4000K) LED modules were

# Liverpool Stores

significantly brighter than those lit by the existing 35W metal halide lighting. In fact, the new LED lighting actually made the clothing lit by the metal halides look drab by comparison. I think we were all surprised by the difference and within a matter of minutes, the team from Liverpool stores had decided that the light quality of the LEDs was worth the investment.”

## Choice of R9 LED modules

MEGAMAN® TECOH® Generation 2 MHx R9 LED modules have a high colour rendition value of R9 ( $\geq 76$ ), as well as high values for regular CRI of 94 and other 'saturated' colours R10 and R14. This mix ensures a well-balanced, high quality light that is perfect for display lighting applications where a sense of freshness and richness is required.

Simon White comments: “Paviom is known for providing good quality, reasonably priced fixtures. By incorporating the MEGAMAN® TECOH® MHx modules into our Domena fitting, we have helped Lightmex to deliver a display lighting solution that offers excellent 'light where you want it', whilst making the most of the energy efficient benefits that LED lamp technology offers.”

With plans to open further shop-in-shops throughout the Liverpool stores chain across Mexico, the cost and CO<sub>2</sub> savings look set to be significantly greater over the long-term.



# Retail Lighting

## Shop-in-Shops

Location [Mexico](#)  
Photographer [Juan Diaz Infante](#)



\* Based on calculation of:  
13,000 24W (27W System Wattage) TECOH® MHx, replacing 35W (42W System Wattage) metal halides running 12 hours/day, X 6 days/week

# TECOH® LED Series

The New Mega Fashion Footwear



# MEGAMAN® TECHNOLOGY

# Serviceable Solutions



## MEGAMAN® is committed to 'Building a Better Tomorrow' by making eco-friendly products which:

- Offer better energy efficiency
- Create the least environmental impact
- Avoid hazardous substances
- Have increased product life expectancy
- Use recycled content and are recyclable

Throughout its LED product development, in replacement lamps, modules\*, light engines\*\* or fixtures, MEGAMAN® has chosen to focus on serviceable LED solutions. This decision has multiple benefits. Not only can MEGAMAN® LED light sources be serviced and upgraded to the latest LED technology, but by using serviceable solutions, existing luminaires can be retained, minimising the environmental impact of progress. This approach

overcomes some of the inflexibility previously experienced by end users, of completely integrated LED solutions.

MEGAMAN® also recognizes that some basic light fixtures have such a low carbon footprint that engineering for replacing the LED may not always be viable and it can be greener to replace the whole fixture. MEGAMAN® fixtures in this category are 100% recyclable with component parts that can easily be dismantled and separated. They are still designed with serviceability in mind so have commonly used fixings or sizes for easy replacement long into the future.

For MEGAMAN® LED modules, light engines and fixtures it is recommended that the installation and servicing is performed by a qualified and competent expert.

The MEGAMAN® LED product range offers the highest degree of design freedom for lighting designers, both in terms of addressing future advances in LED technology, as well as offering a wide range of colour and output choices.

\* LED Module is a unit supplied as a light source. In addition to one or more LEDs it may contain further components, e.g. optical, mechanical, electrical and electronic components, but excluding the control gear.

\*\* LED Light Engine is the combination of one electronic control gear, integrated or remote, and one or more LED modules.



# Lumens ‘where you want them’

## MEGAMAN®’s unique approach

MEGAMAN® has 3 different methods of controlling light but none involve the multiple lens arrays favoured by many manufacturers to direct light output. MEGAMAN® uses;

- Dual axially mounted LED using a parabolic reflector with TCH™ technology.
- Single LED plus optical reflectors for precise beam control where space is limited using total internal reflection within a clear solid form.
- LED plus prismatic controller for basic halogen equivalents.

This approach with all the associated advantages of precise beam control allows lumens to be where they are wanted with less glare.

In order to reproduce the superior light control you get from parabolic reflectors, MEGAMAN® position their dual LED using a unique axial geometry both replicating the traditional approach and allowing the optimum thermal control with MEGAMAN® TCH™ technology.

There are many reasons for using parabolic reflectors including:

- Better glare control with a clear cut off angle, compared to multiple lens arrays, because the source is better shielded outside of the beam.
- The use of a glare shield in combination with a parabolic reflector reduces uncontrolled light and ensures the light is precisely controlled.

- The parabolic reflector over many years has been proven to be the most efficient method for directing the light from a point source, so that maximum control is made of the lumen output.
- LED spotlights with parabolic reflectors are more aesthetically pleasing and conform to the expected appearance of a spotlight.
- The glass covers used on MEGAMAN® LED reflectors do not control the light but purely protect them from collecting dust. As such the covers can be very thin and thermally more efficient as they trap less heat compared to lenses.

### Multiple lens arrays, glare & visual noise.

- Multiple Lens arrays over LED chips create uneven edges with striations, compromising the effect of the lighting.
- To give light levels similar to halogen, a multiple lens system uses several lenses in an array overlapping the output to try to create an even distribution of light within the beam, however in the process this produces a lot of side glare.
- Multiple lens arrays also create ‘visual noise’ due to each lens making its own slightly separate shadow, resulting in a fuzzy edge to any shadow cast.

Single parabolic reflectors using dual axial LED create a soft but precise beam and eliminates visual noise.

### True replacement for existing halogen lamps

- All of the MEGAMAN® methods allow better thermal management, smaller heat sinks and true size retrofit profiles across the whole lamp range for direct replacement of traditional light sources which consume considerably more energy.
- When replacing halogen spotlights with LED spotlights MEGAMAN®’s unique approach provides the same light distribution, so the lighting does not need to be reconfigured.

Making optimum use of the lumen output through precise optical configuration, MEGAMAN® LED delivers the performance that lighting designers and their clients expect from spotlights.

MEGAMAN® goes even further achieving colour tolerances of just 100K and offers linear dimming from 1% - 100% with the designated driver and standard DC1-10V dimmer.

MEGAMAN®’s unique approach with axial LED geometry, parabolic reflector, glare shield and patented TCH™ thermal control offers the best solution for precise comfortable low energy lighting for accent and display applications.

## How to compare light sources and their efficiencies:

### Non-directional light sources

Since non-directional light sources emit equal light levels in all directions, a good measure for the efficiency of the product is its luminous flux (lm) and overall lamp efficacy (lm/W).

The luminous flux, expressed in lumen (lm), is the total quantity of light emitted from a lamp in all directions. Since the human eye is not equally sensitive to all wavelengths within the visible spectrum, the emitted spectrum is weighted by the eye sensitivity curve and integrated over the visual wavelengths 380 – 760 nm.

Although wavelengths below (UV) and above (IR) the 380 – 760 nm range are not taken into account as they do not contribute to the visual spectrum, they can still have a damaging impact in sensitive applications such as museums, art galleries or food illumination. Paying attention to visible light and the consumed electrical power, the higher the efficacy number, the more efficiently the product converts electrical power into visible light.

### Directional light sources

However, the efficacy measurement used for non-directional light sources cannot be transferred to directional ones, as unwanted light needs to be taken into account; glare from the edges of a beam of light, although often not useful light, does contribute to a higher efficacy number. So, with directional light sources an alternative form of measurement is required to show how well a lamp is directing light where it is wanted. The measurement for showing the power of a directional source is luminous intensity (cd). Luminous intensity quantifies the light emitted in a particular direction per solid angle and characterizes the output for a directional light source but this is not easily comparable to lumen per watt. So, EU directive 1194/2012 has defined a method to easily compare the efficacy of directional light sources and asks for a declaration by manufacturers of the useful light being light within a 90° cone measured in lumens, this is declared on the packaging and is a simple way to remove stray light from the efficacy number.

Luminous intensities in different directions, measured by means of a goniometer are plotted in polar diagrams. These show the light distribution of the directional light source and enable the beam angle to be determined. The beam angle of a directional light source is defined as the angle at which the luminous intensity is half of the maximum value. The maximum luminous intensity can also be obtained with the use of a lux diagram, since the maximum luminous intensity equals the lux level at a distance of 1 metre. MEGAMAN®'s LED range of products emit negligible output in both the UV & IR parts of the electromagnetic spectrum and are therefore the preferred choice in UV/IR critical applications.

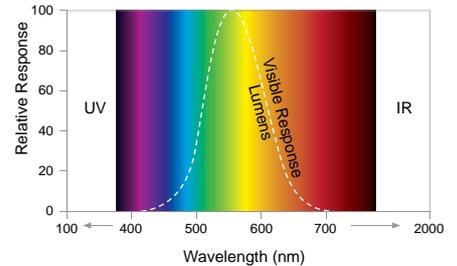
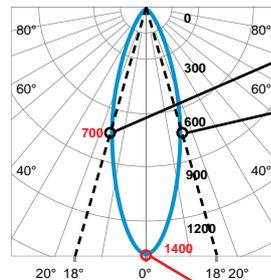


Diagram 1: Spectral Response Curve

m	Lux	Ø cm
0.5	5600	32
1	1400	65
1.5	622	97
2	350	130

Beam angle = 36°

The Max Luminous Intensity is taken from the Lux reading at 1 metre, e.g. 1400cd



On the Polar diagram, locate the number which is half the maximum value, e.g. 1400/2= 700.

- To establish the beam angle of a polar curve:
  - Draw a line from the origin of the curve, along the radius on each side, making sure it crosses the curve at the value which is half the Max Luminous Intensity
  - Note the angle from the 0° point each side
  - Add each side together to get the full beam angle, i.e. 18° + 18° = 36°

Max Luminous Intensity= 1400 cd

Diagram 3: Polar diagram

Diagram 2: Lux diagram

# Thermal Considerations

## Temperature

To maximise the reliability and performance of LEDs, proper thermal management is essential. If the LED's maximum operating temperature is exceeded, light output drops and lumen maintenance decreases and as such the useful lamp life is shortened. Therefore it is essential that validation of an LED's temperature is undertaken by means of temperature measurements to ensure optimum performance.

In general, manufacturers define an LED's maximum operating temperature at the semiconductor level ( $T_j = T$  junction). To ensure this limit is not exceeded, temperature measurements are necessary. Although the critical temperature to measure is the junction temperature  $T_j$ , the inaccessibility of this point has led to the creation of an additional measurement – the  $T_c$  temperature. There can also be a designated  $T_p$  point (performance) where more than one value of  $T_p$  is allowed if it affects the lifetime and performance claim.

This separate  $T_c$  or  $T_p$  temperature measurement point is chosen as such that it has a direct relation to the  $T_j$  junction temperature and must not exceed the specified limit. If the measurement of this  $T_c$  or  $T_p$  temperature is below or equal to the specified limit then the stated life and luminous flux of an LED will be

achieved. Exceeding the limits set for  $T_c$  or  $T_p$  will negatively impact the initial product performance as well as its useful product life. All measurements must be performed by means of thermocouples that are correctly fixed to the  $T_c$  or  $T_p$  points. Where a  $T_p$  point has more than one value, if the lower one is exceeded then the next higher is regarded as the limit and the corresponding lifetime, performance claim applies.

The MEGAMAN® retrofit LED solutions have an integrated heat-sink to drain the heat away for the LED's. When integrating such retrofit products into a luminaire a final temperature measurements at  $T_c$  point is advised to ensure that  $T_{c,max}$  is not exceeded when operated inside the luminaire. Unlike retrofit solutions the majority of LED modules and light engines placed on the market are not self-cooled and do not have an integrated heat-sink. Therefore cooling needs to be integrated in the luminaire by means of a heat-sink or thermally suitable fixture body. Again the thermal heat drain capacity of the system is to be validated by the  $T_c$  or  $T_p$  temperature measurement in reference to  $T_{c,max}$  or  $T_{p,max}$ . For LED modules and light engines additional thermal interface parameters (such as, but not limited to, max. thermal power at the thermal interface, max. thermal resistance of the luminaire) can be defined. These parameters can be used, for products

designed in line with Zhaga specifications, to ensure interchangeability.

## Thermal management

Temperature and its control have a significant impact on the quality and lifespan of an LED. To ensure LEDs operate at their optimum capabilities, effective thermal management is essential.

The principal role of thermal management is to extract the heat from the LED module and dissipate it into the surrounding air. This can be done through conduction, convection and radiation and different approaches are being taken to this issue across the industry, with varying degrees of success.

Optimum thermal management is achieved when the number of thermal conductive interfaces between the LED and its heat sink are reduced and the thermal resistance between these interfaces is minimized. In addition, careful consideration needs to be given to the heat sink material, its surface area, geometry and roughness as well as the management of airflow around the LED as a whole.



### MEGAMAN®'s unique approach

MEGAMAN® has 3 different methods of controlling light but none involve the multiple lens arrays favoured by many manufacturers to direct light output since amongst other things (see page 134-135) these tend to trap heat, meaning a larger heat sink is required.

MEGAMAN® uses; parabolic reflectors with dual axial LED and Thermal Conductive Highway™ (TCH) technology (see below), single LED plus optical reflectors for precise beam control where space is limited or simply LED plus prismatic controller for basic halogen equivalents. All of these methods allow better thermal management, smaller heat sinks and true size retrofit profiles across the whole lamp range.

### Thermal Conductive Highway™

MEGAMAN®'s patented Thermal Conductive Highway™ technology uses a unique design of 'heat drain' across the reflector to dissipate heat efficiently from the dual axial LED to prevent deterioration of the chips and other components. The technology also gives the lamps a longer life.

Thanks to careful thermal management, MEGAMAN®'s LED lamps all combine the higher efficiency, lifetime, and reliability benefits of LEDs, with comparable output levels of many conventional light sources at only a fraction of their power consumption.

### New display opportunities

With MEGAMAN®'s advanced thermal management technology, all of its LEDs can be positioned in areas not traditionally possible with hotter halogen equivalents. MEGAMAN® lamps can be placed close to the objects they are lighting, with no risk of heat, UV or IR degradation. This makes them ideal for sensitive display areas, such as food halls, museums or galleries. MEGAMAN® light sources can also be located in access areas close to the general public, with comparable output levels of many conventional light sources at only a fraction of their power consumption.

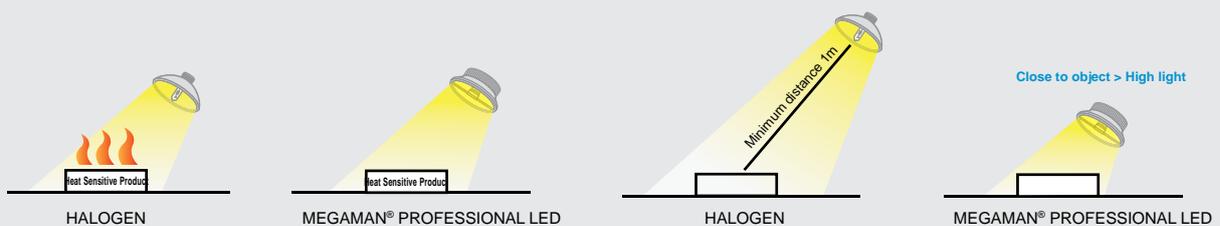


Diagram 1: Heat from Halogen Lamp versus LED in relation to Heat Sensitive Products

Diagram 2: Heat from Halogen Lamp versus LED in relation to distance from lit product

# Colour Consistency

## MacAdam Ellipses and Colour Temperature

As with more traditional light sources, the colour temperature of an LED will dictate whether it emits a warm or cool light. The higher the LED's colour temperature, the cooler the resultant light effect. So, a cool white light has a colour temperature of 4000K, whereas a warmer light effect will have a colour temperature of 2800K.

## Hot and cold colour temperatures

The colour temperature of a light source is taken from the temperature of a perfect black-body radiator that radiates light of a similar appearance to that of the light source. It is measured in units of absolute temperature; Kelvin (K). Interestingly, although red is associated with being a hot colour and blue a cold one, on the black body curve (also known as the Planckian Locus, see diagram 1), blue occurs at higher temperatures than red. A more visual example of this apparent colour temperature contradiction can be seen in candlelight, which emits a warm red orange glow, but in fact has a low Kelvin temperature of 1850K. Therefore higher colour temperatures (5000K more) are called cool colours (bluish white); lower colour temperatures (2700 – 3000K) are called warm colours (yellowish white to red).

## Colour measurement of LEDs

LED and discharge lamps have negligible thermal radiation, so do not follow the form of a traditional black body spectrum. However, as with any colour, they can be represented on a so-called 'colour space' using the CIE 1931 (x,y)-chromaticity diagram (see diagram 2). Every colour is uniquely defined by one (x,y) point in this space. The colour points of thermal

radiators lie on one curve in this space, the black body locus. The colour points of LED and discharge lamps for general lighting are located outside, but close to, this curve. Although a colour temperature can only be attributed to points on the black body locus, these light sources are also assigned a colour temperature: correlated colour temperature (CCT). The CCT is the colour temperature of a black body radiator which, to human colour perception, most closely matches the light of the source i.e. the point on the black body locus that lies closest to the colour point of the source.

## Colour consistency

The key to creating an LED lighting scheme, that looks good for years to come is in ensuring that, over their lifespan, all of the lamps are performing within an acceptable tolerance in terms of colour deviation. To define 'acceptable tolerance' from lamp to lamp, LED manufacturers have adopted the MacAdam ellipse and SDCM (Standard Deviation of Colour Matching) measurement of colour consistency.

## MacAdam ellipse

The MacAdam ellipse is a system of colour measurement. It measures how much colour variation is possible around these axes, before the human eye detects a colour change. A series of ellipses can then be drawn around any target colour, and the closer any given lamp is to the target, the less colour deviation will be experienced when these lamps are placed side by side in an installation.

The distance from the target point in each ellipse is measured in SDCM. An SDCM of 1 step means that there is no colour

difference between LED chips, 2-3 SDCM means that there is hardly any visible colour difference. Colour consistency of 6-7 SDCM is accepted by the market and in line with the European EcoDesign - US Energy Star requirements.

## MEGAMAN® Performance

Thanks to MEGAMAN®'s control of the phosphor/LED blend, MEGAMAN® LED professional light sources have a colour consistency of 3-5 SDCM



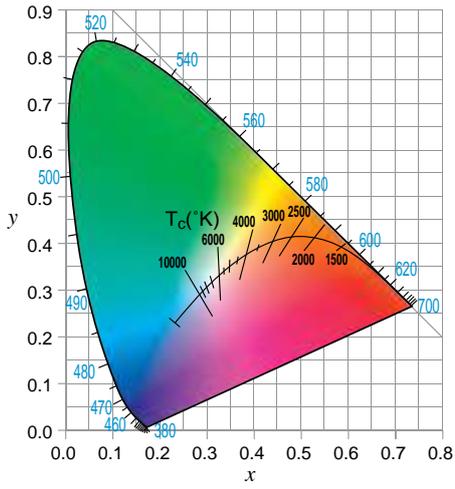


Diagram 1: Planckian Locus

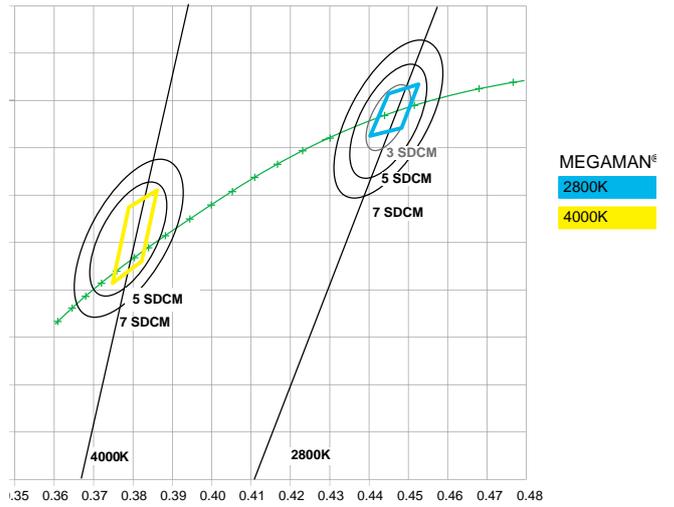


Diagram 2: CIE 1931 x,y Chromaticity Diagram illustrating MEGAMAN® Professional Series

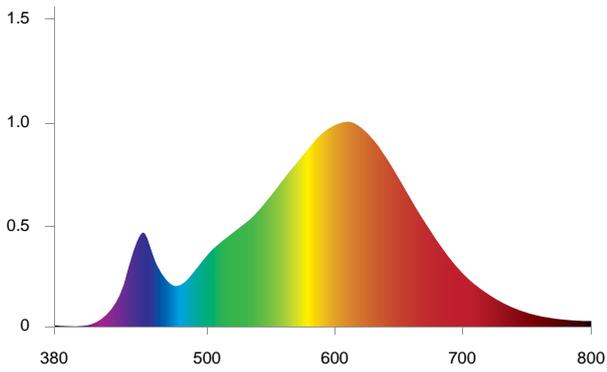


Diagram 3: MEGAMAN® 2800K Spectral Response Curve

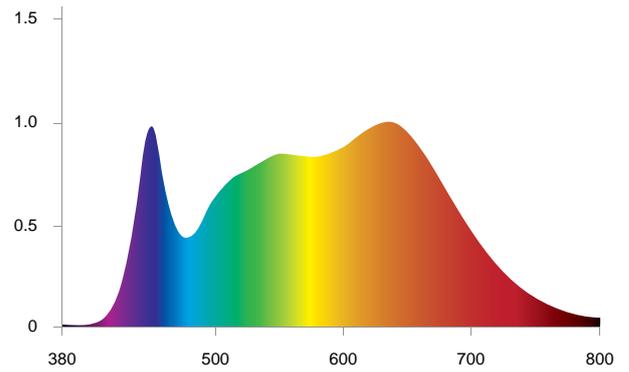


Diagram 4: MEGAMAN® 4000K Spectral Response Curve

# Colour Rendering

Since 1931, when the first system of measuring colour rendering was formalised by the CIE (Commission Internationale de l'Eclairage = International Commission on Illumination), the lighting industry has been able to communicate the quality of its light to specifiers and end users alike.

– 760nm), the better the colour rendering properties of the source, however a high CRI measurement intrinsically means lower efficacy (as less efficient wavelengths are also represented in the spectrum).

The Colour Rendering Index (CRI or Ra) is a quantitative measure, which rates a light source's ability to reproduce the colours of objects faithfully. In order to objectively compare the colour rendering properties of any light source, the CIE's standardised measuring method operates on a scale from 0 to 100 (poor to excellent). The colour change of 14 standard colours is calculated when an object is exposed to a specific light source and then this is compared to a reference illuminant of the same colour temperature (a black body\* is used for colour temperatures up to 5000K and daylight above that). The CRI for a pair of light sources can only be compared if they have the same colour temperature.

The first eight, non-saturated colours (R1 – R8), are used to calculate the general CRI and the remaining 6 saturated colours (R9 up to R14) supply additional information about the colour rendering properties of the light source with respect to the more vivid, saturated colour.

The CRI scale is chosen so that an ideal black body source, such as incandescent or halogen lamps, is by definition a CRI rating of 100. For light sources emitting a discrete spectrum, like LED and discharge lamps, the CRI can be anywhere between 0 - 100. As a rule of thumb, the more the spectrum is filled at all wavelengths (380

**Colour Rendering Index (CRI) Table (ISO CR)**

<b>R1</b>	Light greyish red	
<b>R2</b>	Dark greyish yellow	
<b>R3</b>	Strong yellow green	
<b>R4</b>	Moderate yellowish green	
<b>R5</b>	Light bluish green	
<b>R6</b>	Light blue	
<b>R7</b>	Light violet	
<b>R8</b>	Light reddish purple	
<b>R9</b>	Strong red	
<b>R10</b>	Strong yellow	
<b>R11</b>	Strong green	
<b>R12</b>	Strong blue	
<b>R13</b>	Light yellowish pink	
<b>R14</b>	Moderate olive green	

\* A black body is a theoretical object that absorbs all incident electromagnetic radiation and due to its ability to absorb at all wavelengths, is the best possible emitter of thermal radiation. It radiates a continuous spectrum that depends on the body's temperature.



# Enhanced Colour Applications



## Dim-to-Warm Series

MEGAMAN® is proud to be the first manufacturer to introduce a wide range of LED products incorporating Dim-to-Warm technology.

As these lamps are dimmed from 100% to 10%, their colour temperature changes from 2800K (2700K) to 1800K - perfectly simulating the characteristics of incandescent and halogen lamps.

Unlike many products on the market which use multiple lens arrays, MEGAMAN®'s Dim-to-Warm lamps contain a unique single circuit chip level technical solution, allowing them to have the same compact profile as incandescent and halogen lamps while also replicating their warmth and dimming curve.

The MEGAMAN® Dim-to-Warm LED range offers:

- True replacement for traditional incandescent and halogen equivalents in terms of looks, lighting performance and lighting effect
- The first LED Candle, LED Classic P45, LED MR16, LED AR111 and Integrated LED Downlight with Dim-to-Warm feature
- Colour temperature changes from 2800K to 1800K for reflectors and luminaires, and 2700K to 1800K for non-directional lamps when dimmed from 100% to 10%
- The same compact profile as the traditional incandescent and halogen lamps
- The ability to create moods and set the ambience using different dimming levels
- A range of LED lamps is available to cater for different applications
- Energy saving and lower maintenance costs
- Long-rated life of up to 35,000 hours
- High lumen maintenance





LA  
TTE  
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RA  
ME  
  
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LASS  
TIVO  
M EST  
  
BLACK FORE  
ANGOSPEN  
ROCCHINO  
NO  
  
AMARETTO  
RAPPE

# Enhanced Colour Applications



## Perfect White Series

In retail applications, the right lighting can make a substantial difference to the customer experience, translating directly to a positive impact on a store's bottom line.

MEGAMAN® Perfect White technology is a solution that offers retailers a distinct advantage enhancing textiles by bringing whites to life while still offering superb efficacy and energy efficiency, compared to traditional light sources. It is ideally suited for retail lighting as well as other accent and display applications.

The Perfect White range produces a high quality light that mimics the effect of daylight on white objects, giving them a natural vibrancy that makes them stand out from the crowd. The technology behind the effect modifies the spectrum in the near visible range to make the object appear to stand out more from the background with increased contrast and adds a clean, cool feel to the object itself.

### So how does it work?

Traditionally, LED development has mainly focused on efficiency. In order to achieve the highest lumen per Watt output, light sources have been designed with maximum luminosity in mind. All of the power generated by the LED therefore has traditionally been focused on the colours in the visible spectrum, to ensure no energy was 'wasted' on the parts the human eye doesn't detect.

However, MEGAMAN® 's Perfect White introduces violet light with a peak at 410nm in the near visible, non-harmful part of the spectrum - also found in natural sunlight - to provide an output that closely mimics the effect of natural daylight on white objects.

How does MEGAMAN® achieve this? Many white objects and especially textiles found in retail stores contain Fluorescent Whitening Agents (FWAs) which, when excited, fluoresce – giving the object a brighter and livelier appearance. This is why clothes often look better when shown in natural daylight. Importantly the violet element within MEGAMAN®'s Perfect White technology, leaves the rest

of the spectrum unchanged - so other colours maintain their vibrancy too. The violet just excites the FWAs, producing a 'Perfect' white finish that not only makes the product leap out from any background but increases contrast. As a result retail shops, in particular fashion stores, will find their merchandise more attractive and convincing when exposed to Perfect White's light source.

MEGAMAN® Standard 2800K LED Spectral Response Curve

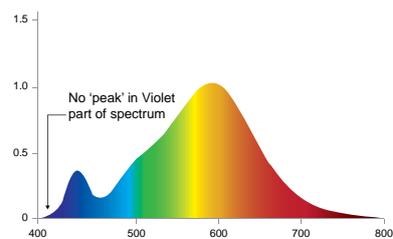


Diagram 1: MEGAMAN® Standard 2800K LED Spectral Response Curve

MEGAMAN® Perfect White LED Spectral Response Curve

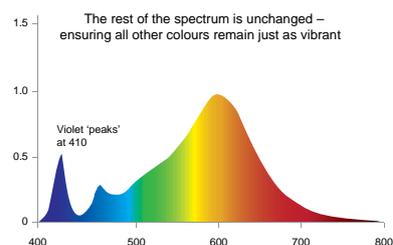


Diagram 2: MEGAMAN® Perfect White LED Spectral Response Curve



# Enhanced Colour Applications

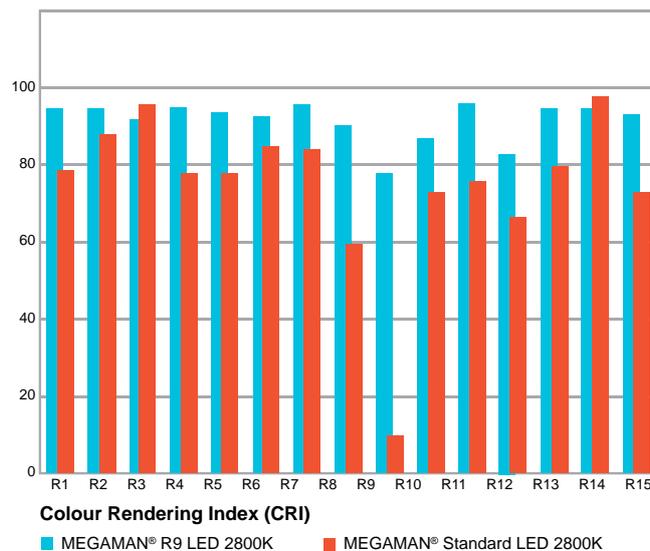
Next to the traditional light colours 2800, 3000, 4000 etc. MEGAMAN® offers a range of special colours R9, Mellotone and Brilliant Tone all tailored to specific applications.

## R9 Series

maximises the visual impact of meat, fresh fruit and vegetables by increasing the product's red colour rendition. Thanks to MEGAMAN®'s innovative design and patented technology, R9 series offer retailers high quality lighting and superb performance. Easier to control than their high-pressure sodium equivalents, the MEGAMAN® LED R9 Series of lamps are the best alternative to traditional halogen in this type of application.

The LED R9 Series outperforms metal halide products, which are traditionally weak in red rendition. Furthermore they are quick and simple to turn on and off, providing instantaneous, colour- perfect luminance, not having the long warm-up or restart time associated with existing metal halide and high pressure sodium technology.

MEGAMAN® R9 LED light sources not only have a high red colour rendition value of R9 of  $\geq 76$ , but also have high values for regular CRI (CRI=94) and the other "saturated" colours R10 to R14. This means that the MEGAMAN® LED R9 Series creates well-balanced and high quality light, making it the perfect light source for food and other display lighting applications, where a sense of the freshness and richness of the product's red colours are needed.



## Mellotone Series

is designed to deliver warm and harmonious illumination that creates the mood and sets the ambience. With its warm colour temperature of 2400K a warm and cosy environment is created. When used in a room with wooden walls or furniture, a comfortable and inviting environment is achieved. The Mellotone Series will make specific commercial environments such as spas, hotels, restaurants, antique and furniture stores even more attractive and inspiring for their customers.

The MEGAMAN® Mellotone Series is also popular for bakery lighting as it presents a cosy shopping environment and vibrant pastries and breads.



## Brilliant Tone Series

utilizes 5500K illumination to produce crisp and dazzling light effects. It is the ideal light choice to demonstrate the beauty of jewels, crystals and diamonds. The bright and vivid light colour unfolds the detail of the merchandise and gives the displayed jewellery an extra sparkle to attract everyone's attention and help drive the purchase.



# Life and Lumen Maintenance

Traditionally the rated lamp life of light sources is defined as an average rating, in hours, for the time it takes 50% of a large group of the lamps to fail (called C50\* as defined by IEC 62717). However, this rating is purely based on survival and does not take into account lumen depreciation. An additional way of measuring life is therefore required for LEDs, which can have extremely long lives but dim gradually over the life of the lamp.

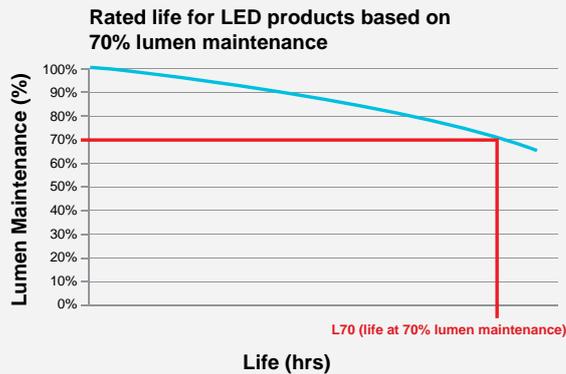
To measure the lumen depreciation, an LED is tested under normal operating conditions and the lumen output of the lamp is measured at 6,000 hours. This measurement is then compared to the initial output of the lamp and the depreciation of lumen output calculated- see Energy Star table. This is then extrapolated on a lumen maintenance curve- see graph.

The resultant curve shows the amount of remaining luminous flux output- expressed as a percentage of the initial output- at any selected elapsed operating time. This data then makes it possible for manufacturers to provide a relative lumen output calculation over a lamps' life and, importantly, to be able to indicate the point at which an LED will be operating at an output level that is not considered viable in terms of light quality. This point is called the useful life (Lxx for LED modules) and shows the elapsed operating time at which a specified percentage of lumen maintenance is reached - this is expressed in hours. To illustrate this, if an LED module has a useful life of L70(B10\*\*) at 40,000 hours, (B10 means only 10% of working LEDs have failed to

reach the 70% maintenance), then after 40,000 hours operation the lumen output will still remain at 70% of its initial output level for at least 90% of the working LED.

MEGAMAN® quotes this L70 number for all LED products which is the expected time when used in normal and open conditions for the unit to reach 70% lumen maintenance and the end of useful life. MEGAMAN® also tests all LEDs in the most onerous conditions, for example to simulate use in enclosed fixtures, and calculates a combined useful life including abrupt failures, both this and the L70 life are quoted.

MEGAMAN® has an ongoing program for long term life test of professional LED's. Test measurements of lumen output are taken regularly to verify the projections of lumen maintenance and life. For this reason life claims may change and the website should be referenced for the latest information. IEC 62612 & 62717 published during 2014 will go through an implementation phase and some of the definitions and declarations will change as all countries come into line. ([www.megamanlighting.com](http://www.megamanlighting.com))



6,000-Hour Lumen Maintenance Thresholds Table from Energy Star

Minimum lumen maintenance at end of 6,000 hours (% of initial lumens; -3% tolerance)	Maximum L70 Life Claim (hours)
86.7%	15,000
89.9%	20,000
91.8%	25,000
93.1%	30,000
94.1%	35,000
94.8%	40,000
95.4%	45,000
95.8%	50,000

\* C for catastrophic failure, no light output  
 \*\* B for parametric failure, output below certain level



### Special Application of MEGAMAN® LED R9 series

The MEGAMAN® LED R9 series is a high-performance lighting solution designed for demanding applications. It features advanced LED technology that provides exceptional brightness and energy efficiency. The series is particularly well-suited for environments where high-quality illumination is critical, such as retail displays, museums, and industrial settings. Its compact design and long lifespan make it an ideal choice for modern lighting installations.



# Controlling an LED

MEGAMAN® offers a range of tailor made LED converters to optimise the performance of its LED reflector products and modules.

Please visit [www.megamanlighting.com/LEDdimmers](http://www.megamanlighting.com/LEDdimmers) for the latest list of compatible dimmers and general dimming guidelines.

The current/voltage characteristic of an LED is similar to other diodes, in that the current is dependent exponentially on the voltage; a small change in voltage can cause a large change in current. If the maximum voltage rating is exceeded by a small amount, the current rating may be exceeded by a large amount, potentially damaging or destroying the LED.

To avoid this scenario, MEGAMAN® uses constant current drivers with all of its LED lamps, to ensure their stable operation. By controlling the current through the LED in this way, the light output of the LED is equally regulated and no differences in light output are observed.

Additionally, MEGAMAN® offers LED reflectors for operation on AC/ DC12V. These products have an integrated constant current driver which allows operation directly on 12V AC/DC transformers. When halogen transformers are used to drive LED products care should be taken that the transformers can cope running on low load - that means one lamp on one transformer may not provide enough load to keep it running.

All MEGAMAN® converters have a long service life of 50,000 hours and offer multiple benefits :

- Flicker free operation with stable output even with fluctuations of the supply voltage
- Automatic restart capability when short-circuit or overload is absent
- Equipped with harmonics filter to reduce main harmonics
- Ambient temperature range -30°C to + 40°C
- Power factor >0.9
- Protection class II
- Compliant with international standards with respect to electromagnetic interference

Additionally the constant current converters allow linear dimming (100%-1%) with any DC1-10V dimmer.

### Total dimming solution

The MEGAMAN® LED dimming series comes in two forms:

- Linear dimming (for LED using conventional\* Dimmer Switches)
- Linear dimming (DC1-10V) (for LED with external drivers DC1-10V dimming)

### Linear dimming for LED using conventional\* Dimmer Switches

This provides a smooth dimming experience similar to that obtained with traditional incandescent and halogen lamps connected to a leading edge dimmer.

To dim, turn the knob to achieve the required brightness level from 100% to 10%.

### Linear dimming for LED with External Drivers

Linear dimming facilitates a smooth dimming experience comparable to traditional lamp sources.

The brightness level can be seamlessly dimmed from 100% down to 1% when the lamp is connected to a DC1-10V dimming driver and DC1-10V dimmer.

### INGENIUM® Smart Lighting

MEGAMAN® also offers *INGENIUM®* Smart Lighting solutions which give you full control, via your smart device or remote control, of the on/off, dimming and scene setting of your environment. Its ease of use, installation and scalability makes *INGENIUM®* perfect for an endless list of applications.

Please visit [www.ingenium.cc](http://www.ingenium.cc) for the latest information on this fast evolving technology.



\* There is no standard for dimmer switches therefore we cannot guarantee performance on every dimmer switch. Please visit [www.megamanlighting.com/LEDdimmers](http://www.megamanlighting.com/LEDdimmers) for the latest list of compatible dimmers and general dimming guidelines.



# Sustainability

## Building a Better Tomorrow

As the world's leading manufacturer of energy saving lamps, sustainability not only means designing and producing environmentally friendly products to MEGAMAN®, but also includes its commitment to minimising the environmental impact arising from all aspects of its business.

### Sustainable product innovation

From product development to disposal and recycling, MEGAMAN® prioritises environmental management and strives to:

- Implement pollution-free processes in the entire product life cycle
- Use renewable or recyclable materials to minimise the use of resources
- Comply with environmental legislation and industry codes of practice
- Promote environmental protection awareness among staff and business partners

MEGAMAN®'s environmental policy 'Building a Better Tomorrow' guides the company to produce eco-friendly products which offer better energy-efficiency with low environmental impact, increased product life expectancy and utilizing recycled content.

### Environmental education

MEGAMAN® established the first LED lighting showroom in its head office in Hong Kong in September 2010. The 600 m2 showroom comprises five business and retail environments where the overall design and idea is to show low-

carbon, eco-friendly concepts through the demonstration of the versatility and energy efficiency of LED lamps. Visits to the showroom can be arranged for business partners, schools, NGOs and other stakeholders, to show how innovative LED lighting can be maximised to save energy.

### The future of the environment is in our hands

The focus of MEGAMAN®'s sustainability initiatives is to reduce resource consumption and environmental impact and have a harmonious relationship with stakeholders, while running a profitable business.

MEGAMAN® completed its carbon audit in 2013, quantifying its emissions and carbon footprint, including emissions related to the fuel and electricity usage, transportation and refrigeration usage in production plants in mainland China. Its target for 2020 is to reduce carbon emissions by 20% as compared to 2012.

### Sustainability Report 2013-2014

MEGAMAN® will launch its third Sustainability Report, showing the company's commitment to sustainability development in Q2 2015. The report also serves as a platform to promote and facilitate dialogue with the company's stakeholders on sustainability performance in economic, environmental and social aspects.

To view the Sustainability Report, please visit [www.megamanlighting.com/sustainability-report](http://www.megamanlighting.com/sustainability-report).





# Rigorous Quality and Management



All of MEGAMAN®'s LED lamps are designed, tested and produced in our own factories in Xiamen, China. Standards have been implemented factory-wide to ensure MEGAMAN®'s manufacturing processes deliver innovative, reliable and safe products with high quality standards now and in the future.

To ensure that MEGAMAN® products comply with the highest quality standards, the company's manufacturing plants are equipped with latest assembly lines. The in-house laboratory is ISO 17025 certified by CNAS and NVLAP, and is also eligible to perform on-site testing for UL, SEMKO and TUV marks.

MEGAMAN®'s business is run under the most stringent management and quality

systems, so that the green elements of the production process are maximised, that employee welfare is prioritised and that the company is socially responsible to the local community. To continually develop these areas, MEGAMAN® has undertaken a range of international accreditations. These include:

### Quality Management System

MEGAMAN® lamps are manufactured to ISO 9001:2008, ISO 14001:2004, ISO 14064-1:2006, OHSAS 18001:2007, SA8000:2008 and IECQ QC 080000:2012 certified manufacturing plants.

### Corporate Social Responsibility

MEGAMAN® has received OHSAS 18001:2007 and SA 8000:2008, confirming the level of care for employees

and reinforcing the company's pledge to being socially responsible.

### Controlling use of hazardous substances

MEGAMAN® plants are QC 080000 certified. Underlining the fact that the company's manufacturing processes are closely monitored to ensure ultimate control of hazardous substances. MEGAMAN® lamps are made using premium quality materials and innovative technologies within stringent control measures, to deliver maximum performance and energy efficiencies.



CNAS



ISO 14001



ISO14064-1



NVLAP



OHSAS 18001



SA 8000



ISO 9001



QC080000

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**MEGAMAN®**

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