

Lighting
inspirations
and solutions

FUTURE MUSEUM



The beauty of **light**



CONCORD: THE BEAUTY OF LIGHT



As Sylvania's flagship brand, Concord combines Sylvania technology and innovation with the traditional values of the Beauty of Light. Concord is one of Europe's most respected Architectural lighting brands, with strong credentials in Museums, Galleries, Office, Education and Luxury Retail.



Our Concord brand has over 50 years of experience creating beautiful spaces through elegant lighting solutions. It offers an innovative wide portfolio for applications that require the highest standards of lighting performance.



Our Concord portfolio boasts with multi-award winning products designed and crafted in Europe in our Newhaven and St. Étienne factories. Based on in-house expertise and laboratory testing, branded components and carefully chosen materials, Concord offers versatile solutions with high colour rendering, high efficacy, low flicker, excellent glare control, uniformity and comfortable light levels.

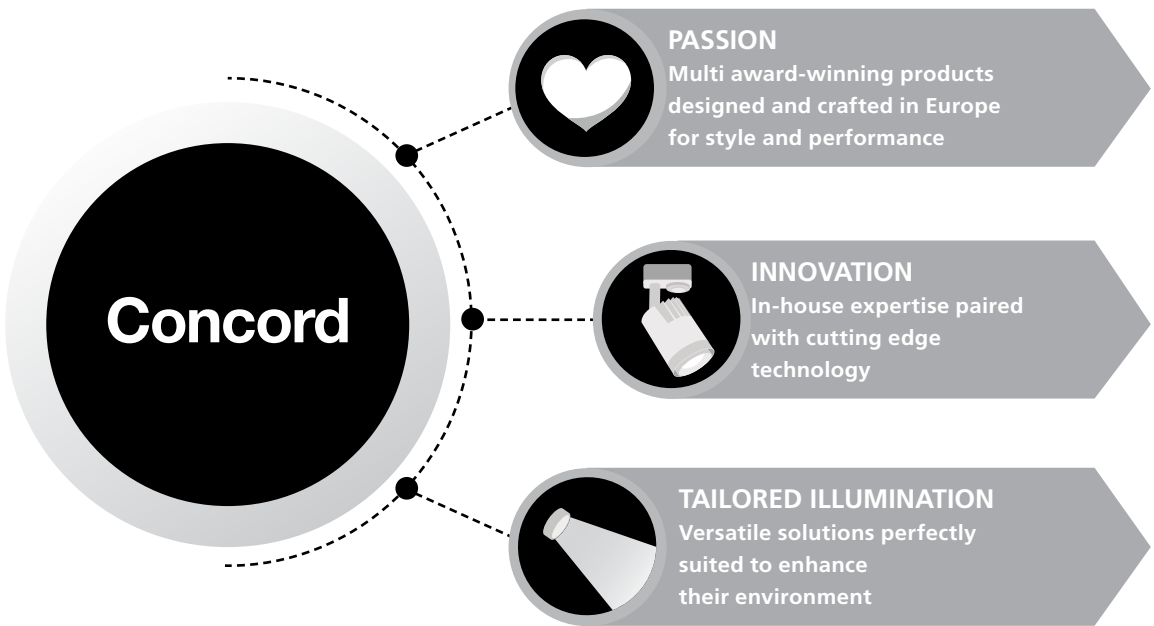
**SYLVANIA:
TECHNOLOGY & INNOVATION**



Over a 100 years of experience in improving the light and life for our customers, enabling them to focus on what they do best by transforming the way they live and work.



Our goal as a company is to bring technology and creative innovation together through products, services and people by increasing energy efficiency, enhancing connectivity, improving well being and promoting sustainability.





With a strong manufacturing base in the UK, Concord is renowned for its strong design ethos, high technical performance and aesthetic form. Concord focuses on bringing lighting solutions to meet the needs of architects, interior and lighting designers.

Concord's innovative portfolio is one of the most comprehensive on the market, encompassing track and spot, downlights, ambient lighting, recessed and linear solutions for a variety of application segments and for spaces that require high performance lighting. Concord provides segment specific lighting application advice; and the entire product range is underpinned by in-house technical expertise, from optical system design through to photometric measurement and testing.

NEWHAVEN FACILITY



- + Size: 5,000 m²
- + Products/Segments: Museum, Retail & Industrial luminaires
- + Brands: Concord and Sylvania
- + Certification: ISO-9001/14001//50001
- + SylSmart: Smart Lighting Innovation Centre

QUALITY CRAFTSMANSHIP



In-house UK & EU manufacture at specialised sites

OPTIMISED DESIGN



Three in-house R&D centres with 3D modelling CAD systems

TESTED AND VERIFIED



Quality control at every stage, in-house laboratory

APPLICATIONS

As an innovation leader, we supply an extensive range of lamps, luminaires and lighting control solutions for various professional lighting application areas.



RETAIL & DISPLAY [1]

Lighting can have a huge impact on the bottom line in the retail environment. From enticing window displays to encouraging customers to spend more time on the shop floor, lighting does so much more than illuminate a product. Done correctly, it can even reduce overheads.

OFFICE & EDUCATION [2]

We know that lighting impacts our health, mood and sense of well-being – and all of those things contribute to our productivity. We take a human centric approach to lighting office spaces, reducing negative elements such as eye fatigue and headaches.

LOGISTICS & INDUSTRY [3]

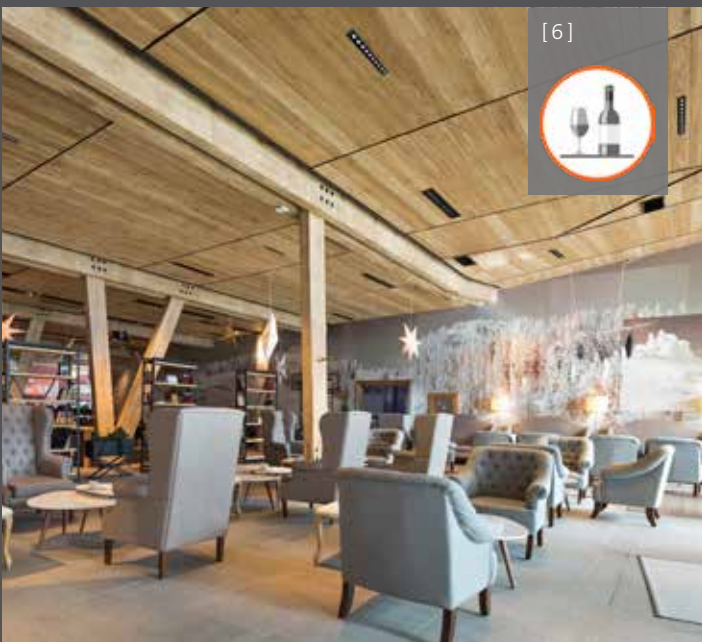
This is a demanding sector with demanding needs. Many of these buildings are running 24/7 and need an intelligent lighting solution that's cost-effective, low maintenance and sustainable. We work with these businesses to determine the total cost of ownership and guarantee a return on investment.

HEALTHCARE [4]

Quality lighting for improved healthcare spaces, combined with high performance and efficiency. Lighting that enables purification and disinfection.



[5]



[6]



[7]



[8]



MUSEUMS & GALLERIES [5]

Lighting has many surprising uses in a museum or gallery. From illuminating exhibits and artefacts to making visitors feel comfortable and welcome, light is a huge part of the overall experience. We have a long and distinguished heritage in museum and gallery lighting.

HOSPITALITY [6]

Ambience and atmosphere are key when it comes to hosting, and nothing impacts those things more than lighting. From hotels and restaurants to clubs and bars, we have a range of lighting solutions that can be tailored to suit any environment while creating unique customer experiences.

CONSUMER [7]

Light is one of the key ingredients when it comes to making a house a home. Whether the challenge is to bring warmth to a sitting room or function to a kitchen, we offer home owners a range of cost-effective solutions based solely on their unique needs.

LANDSCAPE [8]

Due to fluctuations in weather and the changing seasons, outdoor lighting can be a complex challenge. Our outdoor lighting solutions takes all of this into account, providing cost-effective lighting that requires little to no maintenance. For commercial premises, facade lighting can create expressive and memorable architectural lighting experiences.



**MAXIMUM CONTROL.
MINIMUM INSTALLATION.**



SylSmart Standalone

Control the ambiance with SylSmart Standalone an easy to control, plug and play wireless lighting control solution.

SylSmart Standalone is a solution that delivers rapid installation and requires minimum maintenance, yet makes no compromise when it comes to functionality.

We understand that Museums and galleries often have a sensitive infrastructure. Therefore, all our Standalone luminaires have integrated wireless controls and only require mains power. This not only allows the user to control each individual luminaire but also removes the need for a potentially invasive installation of control wiring.

As exhibits change, so do the requirements of your lighting solution. The SylSmart Standalone app enables you to control light levels, scenes, and much more, bringing control and flexibility to the palm of your hand. The core functions of the system can be tailored to your needs and include, scene-setting, scheduling, grouping, occupancy control, and daylight-linked dimming. All of which ensures the user has maximum control.



Set the atmosphere

SylSmart Standalone has dynamic wireless technology embedded in all components:

Wireless luminaire

- + Integrated wireless controls offering seamless plug-and-play compatibility
- + No additional control cables needed
- + Museum, Gallery, Display, Hospitality spaces

Wireless Wall Switch:

- + Switch between scenes and adjust dim level
- + Energy harvesting – no wires or batteries required
- + No maintenance required
- + Ultimate flexibility to place the switch where needed

Effortless App setup

- + Set up all luminaires easily via the app
- + Set the mood with dynamic scenes and animations
- + Create energy-efficient profiles
- + Set up wall switch
- + Set timers
- + Intuitive and fast
- + Future proof - the system can be updated automatically with wireless updates

Sensor – PIR & Daylight (Optional)

- + Automatically controls luminaires based on presence or available natural light
- + Only mains wiring required
- + Highbay and lowbay



Easy setup & intuitive programming

Plug & play design. Set scenes, create groups and make changes at the touch of a button.



Dynamic and flexible light

Easily configurable scenes, schedules and groups allow you to tailor the light to the needs of your space. If your space changes, no complex re-wiring or re-programming needed.



High energy efficiency & cost effective

Customisable energy saving features based on time, occupancy and daylight. App driven maintenance and minimal disruption.



Secure

High encryption by the Bluetooth mesh. Select access levels by user: sharing, administrator only, password protected & open network.



Future proof

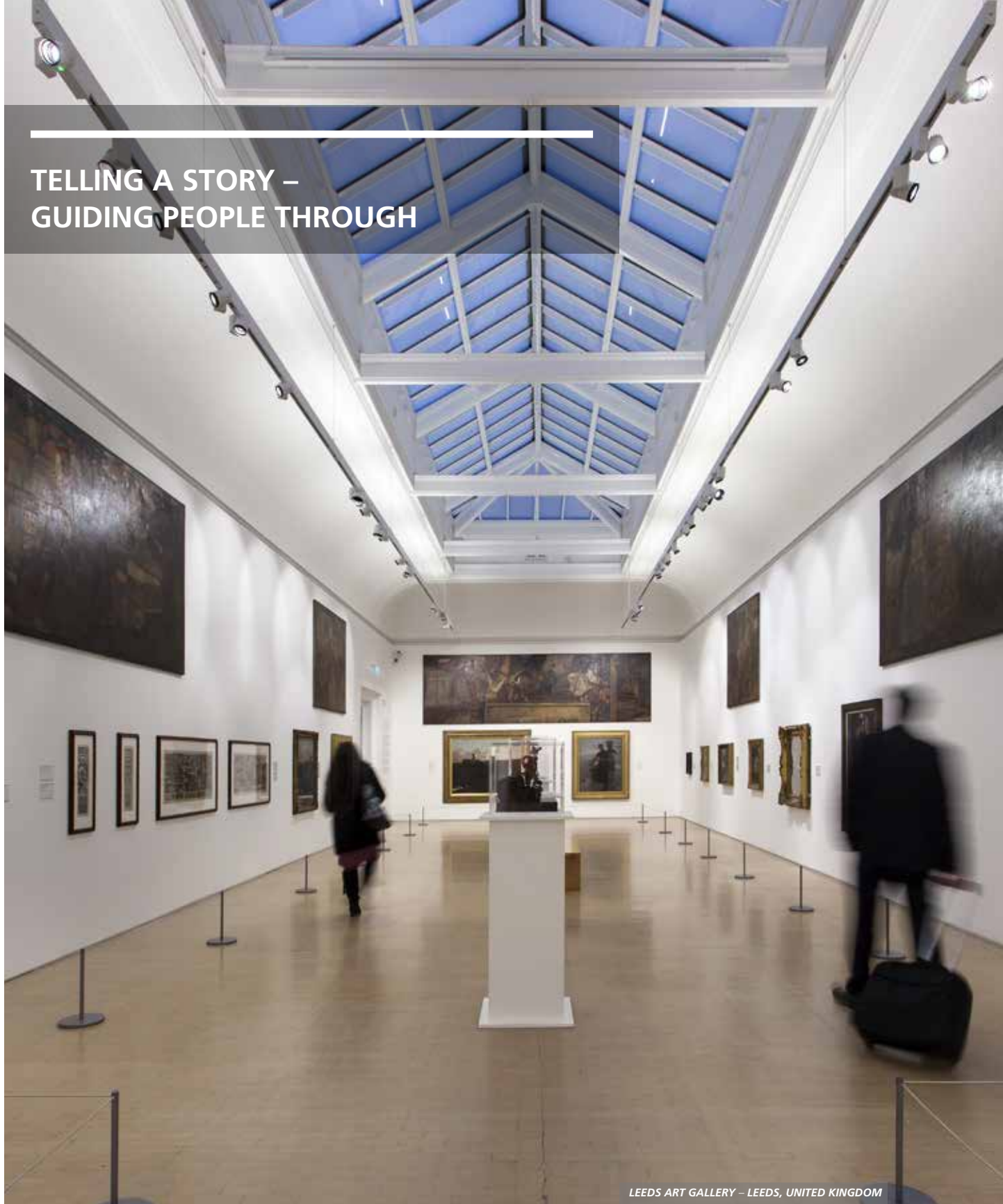
With wireless updates, the system can be updated automatically to ensure your controls are always up-to-date and running smoothly, all you need is a smartphone with an Internet connection.

THE IMPORTANCE OF MUSEUMS

"We preserve the past, define the present and educate for the future. Our collections present the material evidence of the creativity of humankind and the riches of the natural world; they inspire, enthrall and enlighten."¹

- 37% of UK adults, over 17 million people, visit museums or galleries at least once a year; one of the highest proportions in Europe
- The UK's museums are custodians of over 170 million objects and natural specimens
- The Louvre in Paris is the world's most visited museum, with 9.3 million visitors annually
- Access to culture [*in the European Union*], tends more and more to be recognised as a basic right, in the same way as education, health and other fundamental rights"
- The three most visited exhibitions in 2014 were in the National Palace Museum, Taipei, followed by the Centro Cultural Banco do Brasil in Rio de Janeiro. The Musée d'Orsay in Paris was the top European exhibition at number 15

TELLING A STORY – GUIDING PEOPLE THROUGH



LEEDS ART GALLERY – LEEDS, UNITED KINGDOM

**“FORM ONLY EXISTS THROUGH
LIGHT AND OUR PERCEPTION
OF THE WORLD AROUND US IS
TOTALLY DEPENDENT ON IT”**

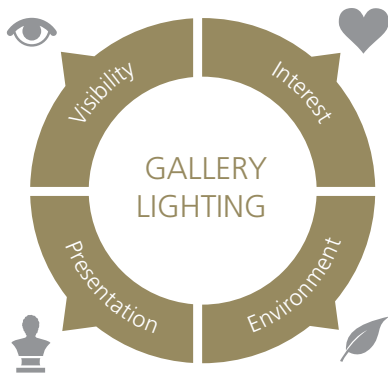
Claude Monet

Lighting plays a vital role in guiding visitors through their museum or gallery experience; the moment a visitor sees the exterior façade, the journey has begun. From creating anticipation on arrival to communicating drama or contemplation within the exhibition space, lighting has a key role to play:

- It can be used to alter the mood of the exhibition space
- It can be used to draw the eye to stunning artwork and sculptures
- The subtle play of light and dark can be used to guide the visitor's journey from entrance to exit

THE CHALLENGE

The lighting challenge faced in today's museums and galleries is to achieve a balance between the quality of the lit environment – no matter what is being displayed – and the level of energy used during the life of the installation. The 'display lighting mantra' detailed here shows the balance that is needed between visibility, interest, preservation and environmental considerations.



LEEDS ART GALLERY – LEEDS, UNITED KINGDOM

Like all successful lighting projects, the key to a winning museum or gallery design is a good brief.

"YOU NEED TO KNOW WHAT THE MUSEUM IS DISPLAYING, HOW OFTEN THEY CHANGE THEIR DISPLAYS AND TO SIT DOWN WITH THE CURATORS TO FIND OUT WHAT THEIR REQUIREMENTS AND PRIORITIES ARE"

explains Jeff Shaw, Associate Director, Lighting at Arup



MUSEO THYSSEN – MADRID, SPAIN

ACCENT ON DISPLAY

RIJNLAND OFFENSIEF
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RHEINLANDOFFENSIVE

FREEDOM MUSEUM – GROESBEEK, THE NETHERLANDS
LIGHTING DESIGN: LICHT – JOOST DE BEIJ
PHOTOGRAPHY: MIKE BINK PHOTOGRAPHY

The lighting of museums and gallery spaces needs to highlight and accentuate the texture, colour and shape of exhibits, whether they are historic artefacts, modern art, 2D paintings or 3D sculptures.

The play of light and dark can be used to great effect in display environments. Dramatic tension can be created in a darkened exhibition space thanks to narrow beams of light cutting through the darkness, drawing the visitors' gaze to the pieces on display.

LIGHTING TECHNIQUES:
LIGHTING SCULPTURE / OBJECTS / ARTEFACTS



By avoiding the spill of light onto surrounding walls, items can be framed for maximum impact. Static objects can be made to look as if they are 'shining out', demanding the visitors' attention within a space. Larger wall displays benefit from even, uniform wall washing and this can be used to communicate a more meditative mood within the exhibition. To achieve uniform wall washing, luminaires must be correctly positioned to minimise the risk of visitors casting a shadow and also to avoid reflective glare.



MUSEE SAINTE CROIX - POITIERS, FRANCE



MUSEE SAINTE CROIX - POITIERS, FRANCE

For sculptures to be lit in way that enhances the visitor experience, the contrast between light and shadow needs to be managed for maximum impact. The optimum angle of illumination for sculptures is 30°, to ensure that no shadow is cast by onlookers. By using a range of lower and higher intensity narrow beams, arranged at this optimum angle of incidence, the natural beauty of the exhibit can be brought to life and allowed to shine.

"I THINK LIGHT IS AN ACTIVE, CALCULATED COMPONENT OF ARCHITECTURE. LIGHTING SHOULD BE SUBORDINATE TO ARCHITECTURE AND SHOULD ENHANCE THE EXPERIENCE OF PEOPLE WITHIN THE LIT SPACE."

Martin Lupton, Light Collective

LIGHTING TECHNIQUES: CONTRAST RATIOS



The intensity of contrast between bright and dark regions dictates the atmosphere within the exhibition space. Stark contrasts of light and dark, using accent lighting, causes the focal point to shine out, drawing all eyes to the object in question. Traditionally the contrast ratio usually suggested for museums is 6 to 1 between the brightest and the dimmest objects in the field of vision and 2 to 1 for galleries.

THE DESIGN MUSEUM – KENSINGTON, SOUTH LONDON, UNITED KINGDOM

LIGHTING TECHNIQUES: ACCENT VS WASH



Narrow beam accent lighting brings high illuminance to sculptures and paintings, leaving the visitor in no doubt of what is the centre of attention in the space.

A variety of beam diameters can be used to suit the size of the item being lit. Wall washing however is of particular interest in lighting larger artwork and brings a

spacious aspect to the room, allowing visitors a chance to step back and reflect on the piece in a more contemplative manner. By arranging wide beam angle light sources so that the beams intersect along the length of the vertical space, a uniform light distribution is achieved.

"A SPACE CAN BE MADE TO APPEAR WELCOMING AND INTERESTING BY ILLUMINATION OF THE PERIMETER WALLS OR BY HIGHLIGHTING A TEXTURED SURFACE."

*Ralph Peake,
Professional Lighting Design*

EXHIBITION FRA BARTOLOMMEO – MUSEUM BOIJMANS VAN BEUNINGEN – ROTTERDAM, THE NETHERLANDS
PHOTOGRAPHY: LOTTE STEKELENBURG



LIGHTING TECHNIQUES: HIGHLIGHTING



Making the artefact the centre of attention should be the key aim of all museum lighting. Highlighting plays a vital role in drawing out an object's natural beauty and bringing it to life before the visitor's eyes. The use of directed light gives deep contrast between light and dark on the exhibit and, if complimented by a lower intensity light, the level of contrast can be managed to maximum effect. By using a mix of higher and lower intensity point light sources, the surface of an exhibit, as well as its shape and texture can be enhanced, bringing out its natural resonance and brilliance.

Additional drama can be achieved in the exhibition space with the use of Gobo projection and framing. Gobos, or structured lenses, can be used to project specific images or patterns onto 2D or 3D surfaces, bringing increased theatre to the exhibit. Framing is also useful when a sharp-edged beam is required to make a specific 2D object seem to 'jump off the wall'. Thanks to the precision of the beam, it gives the appearance that the image is glowing from within itself, rather than from being externally lit.

BEAM ANGLES

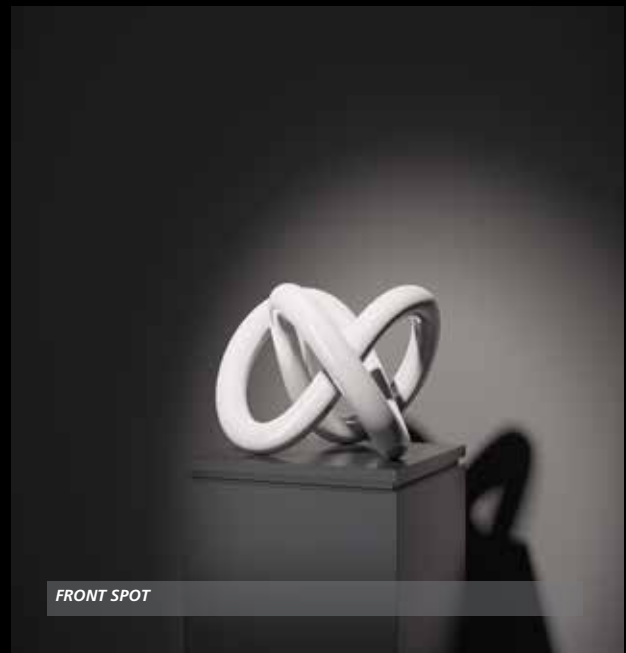
Thanks to the wealth of beam angles available, designers and curators can create any desired effect, be it the accentuation of a small object on a plinth or the illumination of a large sculpture or installation.

Narrow spots deliver high intensity light over greater distances and have a beam angle of $<10^\circ$.

- Spotlights with a 10° - 20° beam angle are particularly useful for accent lighting 3D shapes
- Flood lights, with a beam angle of 25° - 35° and wide floods with a beam angle of $>45^\circ$ are flexible tools for creating uniform light across large surface areas

When your display or exhibition changes, your lighting may no longer be suitable. A delicate object on a plinth requires different lighting than a large sculpture or installation therefore different beam angles are essential to create a variety of effects, and easily adjustable beams meet changing needs.

Spotlights with adjustable beam angles enables the end-user to manually adjust the beam from a wide flood down to a tight spot; without the need of any additional lenses or reflectors.





ROCKOXHUIS MUSEUM – ANTWERP, BELGIUM



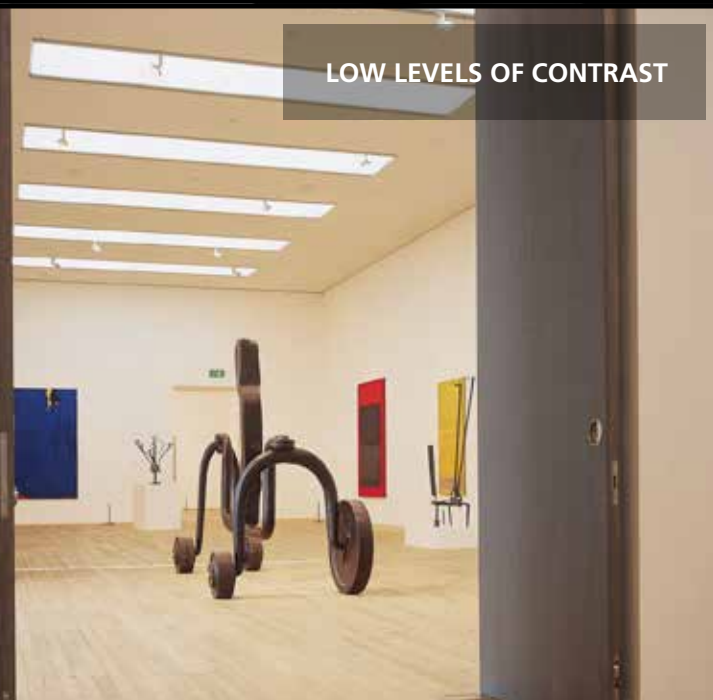
DRENTS MUSEUM – ASSEN, NETHERLANDS



THE SERGIEV POSAD STATE HISTORY AND ART MUSEUM PRESERVE – MOSCOW, RUSSIA

LIGHTING EFFECTS

- Group dimming creates a subdued mood that draws the visitor closer to the object being displayed
- Individual dimming draws the visitors eye to a specific object but also gives the highlighted object context and depth
- Low levels of contrast are ideal for creating a bright and airy space to draw in the visitor and allow them to explore the area as a whole
- High levels of contrast direct the visitor to key focal points within the space and create a more 'theatre like' experience



INTEGRATION WITH NATURAL DAYLIGHT

Putting daylight into a space provides a connection to the outside world and the fact that it is dynamic helps the visitor to interpret the architecture of the space, feeling more comfortable within it.

In terms of quality of light, daylight is unique; its colour rendering is superb, however the potential damage direct sunlight can cause in terms of UV radiation and heat has to be taken into account. Daylight can still be used within museum and gallery spaces, as long as it is controlled and diffused, to avoid direct contact with 2D and 3D exhibits.

In addition, daylight colour temperatures change throughout the day, season and year. To manage these continual fluctuations, designers often split lighting into two elements: ambient and focused, with daylight used for ambient lighting at certain points throughout the day and artificial lighting brought in when light levels drop.



ÉLÉPHANT PANAME – PARIS, FRANCE

“ABOUT 30 YEARS AGO THERE WAS A HUGE MOVEMENT FOR THE BLACK BOX CONCEPT IN GALLERIES AND MUSEUMS AND CUTTING EVERYTHING OFF FROM THE OUTSIDE WORLD, BUT WE ARE NOW BOTH METAPHORICALLY AND LITERALLY OPENING THE CURTAINS”

Mark Sutton Vane, principal of Sutton Vane Associates Lighting Design



ASHMOLEAN MUSEUM – OXFORD, UNITED KINGDOM

SELECTING THE RIGHT LUMINAIRE FOR THE TASK

When lighting a space or exhibition, the lighting designer or curator has a wide range of lighting tools and techniques to choose from:

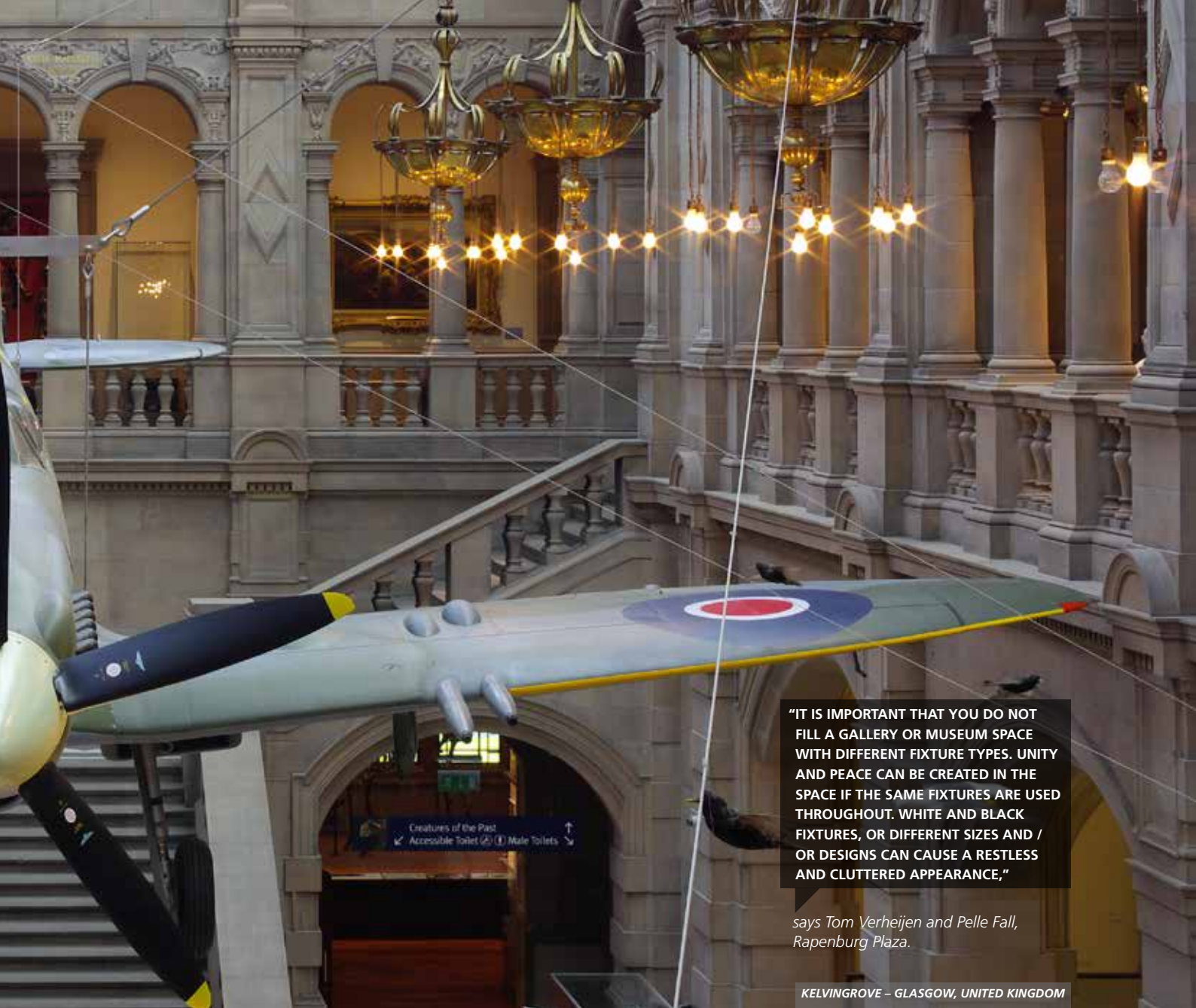
- Varying light beam angles e.g. Narrow Spot, Spot, Flood and Wide Flood
- Framing heads and Gobos
- Wallwashing
- Mounting height – especially with large objects or high ceiling voids
- Prevention of Light Spill
- Dimming on the spotlight and via the circuit with DALI
- Use of track for total flexibility of where light is shone or positioned



DEUTSCHES MUSEUM – MÜNCHEN, GERMANY



MUSEE D'HISTOIRES NATURELLES – LILLE, FRANCE



"IT IS IMPORTANT THAT YOU DO NOT FILL A GALLERY OR MUSEUM SPACE WITH DIFFERENT FIXTURE TYPES. UNITY AND PEACE CAN BE CREATED IN THE SPACE IF THE SAME FIXTURES ARE USED THROUGHOUT. WHITE AND BLACK FIXTURES, OR DIFFERENT SIZES AND / OR DESIGNS CAN CAUSE A RESTLESS AND CLUTTERED APPEARANCE,"

says Tom Verheijen and Pelle Fall, Rapenburg Plaza.

KELVINGROVE – GLASGOW, UNITED KINGDOM



ULSTER FOLK & TRANSPORT MUSEUM – HOLYWOOD, NORTHERN IRELAND

THE HARMFUL EFFECTS OF LIGHT

Light is a common cause of damage to library and archival collections. Paper, bindings and media (inks, photographic emulsions, dyes and pigments) are especially sensitive to light.

Traditional lamps, even with protective filters, can damage exhibits in museums very quickly. LED technology however, does not create IR and UV light and is therefore ideal for sensitive environments such as galleries and museums.

Material/Exhibit	Sensitivity	Recommended Lux Level
Costumes and other textiles, fur and feathers, dyed leather, prints, drawings, watercolours, stamps, manuscripts, coloured, old photographs, miniatures, transparencies, and unprimed thinly coloured paintings on canvas	High	50 Lux
Oil and tempera paintings, lacquer ware, plastics, wood, furniture, horn, bone, ivory, undyed leather, minerals and modern black and white photographs	Medium	100 Lux
Stone Ceramic, Glass and Metal	Low	300 Lux



**PROLONGED
EXPOSURE
TO LED LIGHT**

**PROLONGED
EXPOSURE
TO IR AND
UV LIGHT**



DISPLAY LIGHTING – COLOUR RENDERING AND TEMPERATURE

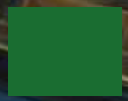
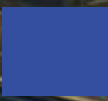

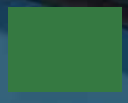




Colour rendering is an important factor to take into account when lighting museums and galleries. The Colour Rendering Index (Ra) gives a general indication of the rendering ability of a light source. A CRI of 100 is 'best or true', whilst those over 80 are considered good.

The aim for any curator is to have an object appear as 'natural' as possible when lit. However LEDs traditionally create white light by combining blue light with a yellow phosphor, making them better at lighting blues than reds in the colour spectrum. The end result can be washed out reds and skin-tones, reduced visual impact, meaning the visitors don't get the best possible viewing experience of the collection. To avoid this, LEDs with a CRI of >90 are best for galleries and

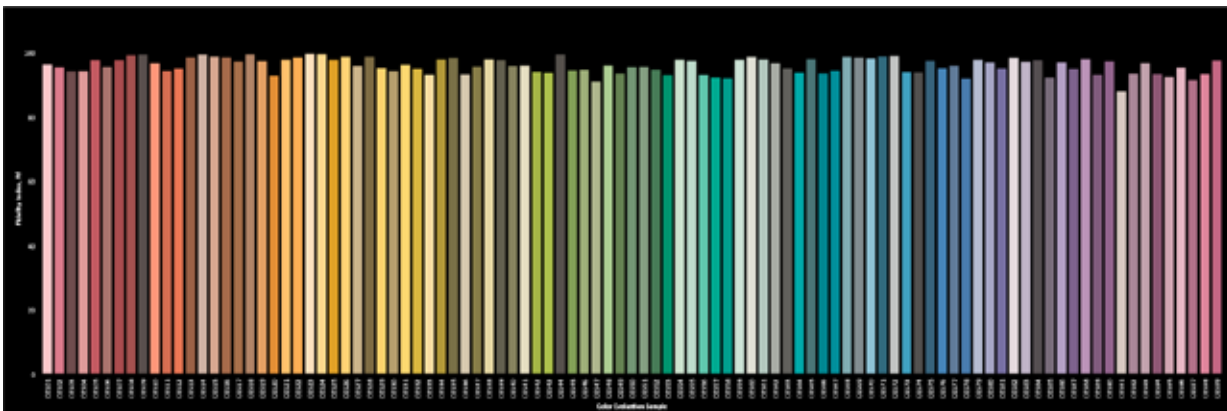
museums, to ensure punchy, vibrant reds. CRI is calculated by how well a luminaire reproduces 8 colours out of the complete range of hues. Luminaires that are concentrated on these 8 test points can achieve an artificially high CRI value but with unnatural lighting as a result.

An alternative measurement method of colour rendering is TM-30-15. This method uses 99 colour samples, representing the entire range of hues and different saturations of colour.

Museums and galleries need magnificent colour reproduction across the entire spectrum and this can be ensured by luminaires with high CRI and close to perfect high score across the TM-30-15 measurement.

Ra: 90-100			
Ra: 70-80			
Ra: <70			

ROCKOXHUIS MUSEUM – ANTWERP, BELGIUM



COLOUR TEMPERATURE

The colour temperature of an LED will dictate whether it emits a warm or cooler 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.

The colour temperature used to light an exhibit will not only affect the colour appearance of the object or space, but the mood communicated to the visitor. A cooler white will make the exhibit appear crisper and more modern, whereas a very warm colour temperature, such as 1600K (akin to candlelight) will make the space feel cosier.

The advent of colour tunable LEDs has increased the versatility of mood creation available to curators and designers. Now the same light source can be dimmed from midday light levels (3000K) to the warmer, softer tones of evening light (1600K), whilst still maintaining its superior light quality and beam control.

"FOR THE COLOURS OF AN ARTEFACT TO COME INTO THEIR OWN, GOOD COLOUR REPRODUCTION IS ESSENTIAL. ADDITIONALLY, VISITORS WILL NOTICE IF THE LIGHT FREQUENCIES ARE NOT QUITE RIGHT AND SOMETHING IS NOT 'COMPLETE'; THIS IS WHAT AN ORDINARY VISITOR MIGHT DESCRIBE AS AMBIENCE."

says Tom Verheijen and Pelle Herfst, Rapenburg Plaza

3,000K











4,000K

5,000K



LED V HALOGEN

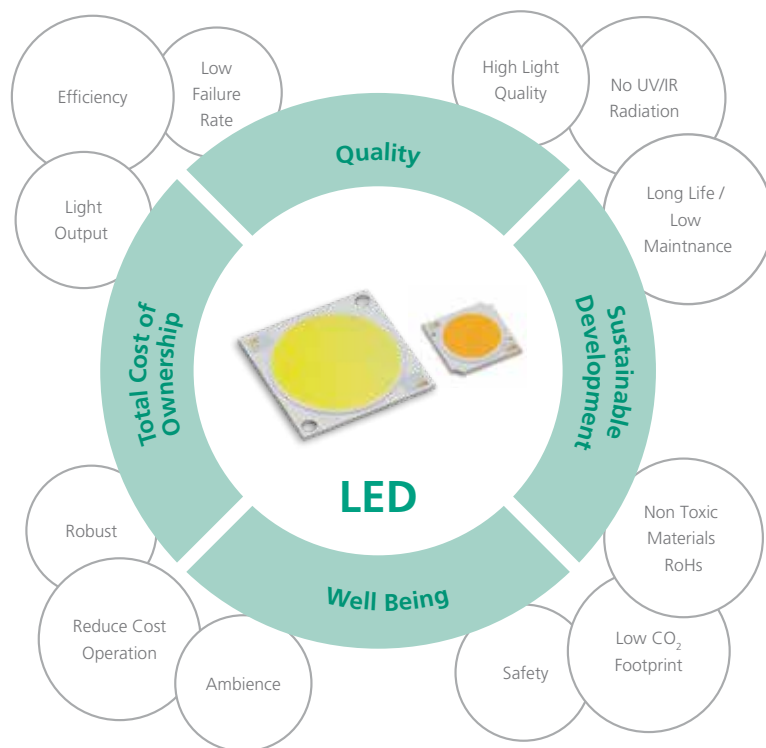
- LEDs are much more energy efficient than incandescent and halogen lamps
- LEDs deliver significant running cost savings compared to halogens
- Thanks to the reduced heat emissions of LEDs, air conditioning running costs are less than with halogens
- LEDs have long lamp-life, reducing maintenance costs and lamp replacements
- LEDs don't create UV or IR light, unlike halogens
- The colour rendering of LEDs doesn't change when they are dimmed (unless colour tunable light sources are used), providing colour consistency to the lit objects at all times
- Coloured filters can be used with LEDs leading to increased design flexibility and cost savings (halogens require dichroic glass due to UV and heat emissions)
- Filter diffusion can be used on LEDs to spread the light (halogens require expensive lenses)
- LEDs are more expensive than halogens initially, but capital payback is quick thanks to energy and maintenance savings
- LEDs can fade out reds and skintones, so ensure lamps have a CRI of >90 for vibrant reds
- LEDs are cold start capable (down to -40 °C) resulting in high efficiency in colder environments
- LEDs are more environment-friendly, since the light source does not contain mercury or lead

Features	Performance	Key:
Energy Efficiency		LED up to 90% more efficient
Life		LED can last up to 50 times longer
Colour Rendering		Choose CRI90+ LED to replicate halogen performance
Lumen Maintenance		LED degrades faster than halogen but over a much longer time
UV/IR		LEDs emit very little UV/IR, protects sensitive objects
Heat Generation		LED generates less heat, meaning less heat in the space and less air conditioning needed = more energy saving
Dimmability		For LED check dimmer compatibility first – Good LED = 80%+ compatible
Initial Cost		LED = higher initial investment
Cost Over Life		Rapid payback in as little as 6 months owed to energy and maintenance saving
Secondary Optical Cost		Optical control with LED is relatively easy and low cost Halogen optics and filters are expensive

WHY CHOOSE LED?

LEDs deliver significant energy savings compared to traditional light sources, no/negligible UV and IR radiation, emit less heat than halogens and have a long, high quality lamp life. With advancements in LED technology ensuring that they deliver high colour rendering, a range of narrow to wide flood beam

angles and colour temperature options from 1600K to 4000K, LEDs have indeed come of age for museums and galleries. In addition, technology based on digital lighting, such as visible lighting communication (VLC), is set to enhance the gallery and museum visitor experience still further in the coming years.



"LED LIGHTING OFFERS MORE THAN ONLY LIGHT, IT OFFERS A NEW WAY OF WIRELESS COMMUNICATION AND INFORMATION. AT THE MOMENT EXPERIMENTS ARE TAKING PLACE IN MUSEUMS, WHERE INFORMATION IS BEING OFFERED TO VISITORS THROUGH LIGHT. THE GRID OF FIXTURES CAN TELL EXACTLY WHERE A VISITOR IS SITUATED AND CAN BROADEN THEIR EXPERIENCE USING A MOBILE DEVICE. NOT ONLY CAN THEY RECEIVE IN DEPTH INFORMATION ABOUT A WORK OF ART BUT ONE CAN ALSO SEE A FILM, HEAR MUSIC OR GET LINKS TO RELATED OBJECTS"

says the Beersnielsen lighting designers

Other benefits of LED

General

- Much longer life (up to 50K hours)
- Reduced maintenance costs
- More energy efficient than incandescent and Halogen lamps
- No UV or IR radiation
- Highly efficient PC optics

Architectural/Design

- Design flexibility, small size
- Vivid saturated colours – without filters
- Directed light for increased system efficiency
- Robust, vibration proof, solid state lighting
- Lower light pollution, due to better optical control

Unique LED advantages

- Fully dimmable without colour variation
- Instant on, full colour, 100% light
- No efficiency loss due to filtering
- Install and forget

Environment

- No Mercury in the light source

Safety/low temperature

- Cold start capable (down to -40°C)
- Low voltage DC operation <50V
- Highly efficient in cold environment





SUCCESSFUL LIGHTING PROJECTS

AL SHINDAGHA MUSEUM – DUBAI, UNITED ARAB EMIRATES

Set along the historic waters of Dubai Creek, Al Shindagha Museum shows the proud story of the UAE's traditions. The museum is a state-of-the-art multimedia experience that guides visitors through the area's incredible development over centuries.

The project is located in the Shindagha Area in Dubai Creek where the first area is opened to the World with trade-in Emirati culture. Opening the museum made Dubai Creek the venue of one of the largest open-air museums in the world. The museum promises visitors a fascinating insight into the rich past of the UAE and expecting millions of visitors per year.

Al Shindagha Museum has several main galleries and several stages and 17 different theme pavilions with the cinema experience. It has several exhibition houses: Governance and Society, Creativity and Well-Being, and Living off the Land and Sea. There's also a Children's Pavilion and a dedicated section for education and public programming.

The Perfume House exhibition is one of the fabulous parts of the museum and gives visitors the opportunity to travel back in time to ancient Arabia to follow the fragrant route and history of how traditional oils, perfumes, and incense were made.

PURPOSE OF THE PROJECT

The exhibition, consists of several main galleries and an interactive cinema experience showcasing the story of Dubai Creek and its people.

PRODUCTS

Beacon Muse spotlights have been installed throughout the museum highlighting art pieces and architectural details with soft and accurate beams of light, revealing colour and texture of each material.





"THE OPENING OF AL SHINDAGHA MUSEUM COMMEMORATES THE HISTORICAL CITY OF DUBAI AND OUR ANCESTORS' FOOTPRINTS TO ENSURE THEY CONTINUE INSPIRING FUTURE GENERATIONS, STRENGTHENING THEIR SENSE OF PRIDE IN THEIR COUNTRY AND HERITAGE"

Abdul Rahman Al Owais, Chairman of Dubai Culture.

DISTRICT MUSEUM IN TORUŃ, POLAND



SYLVANIA BREATHES NEW LIFE INTO ONE OF THE OLDEST POLISH MUSEUM

Perfectly blending the old with the new, Sylvania has delivered a lighting upgrade with wireless controls at one of Poland's oldest and largest museums, The District Museum in Toruń. The new scheme provides dynamic accent lighting from Concord Beacon Muse II spotlights combined with SylSmart Standalone to selectively highlight individual works of art and give the museum the ability to configure the ambience of the room.

Located in the Ratusz hall of Toruń, the museum's 300 m² Grand Hall is home to the country's largest and most prominent collection of 16th, 17th and 18th-century bourgeois portraits and coats of arms, 'The gallery of burgher's portraits'. Displayed across the hall's vast pillars between set back windows, the museum needed a

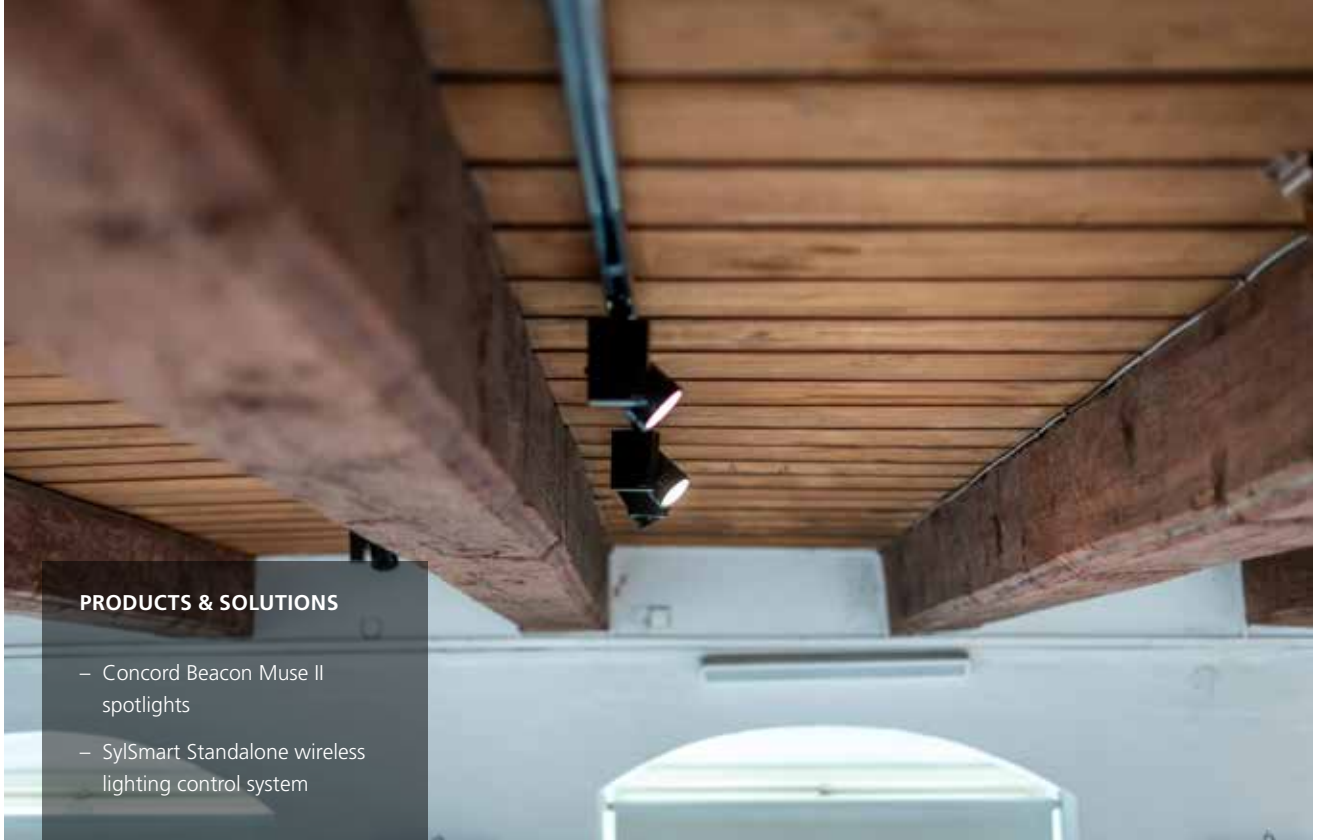
flexible lighting system that would enable them to highlight individual paintings or the whole collection for the rising number of high-profile events they were hosting. During the lighting scheme upgrade 30 Concord Beacon Muse II spotlights and SylSmart Standalone wireless lighting control system were installed.

All SylSmart enabled Beacon luminaries can be controlled by a wireless sensor, and by tailoring contrast, colour, warmth and tone via an intuitive app, the lighting setup can be customised based on the museum's needs.

Replacing traditional and complex systems, the SylSmart Standalone Scene can be easily and quickly retrofitted, and offers ultimate flexibility to control each and every luminaire but without the burden of the cost.

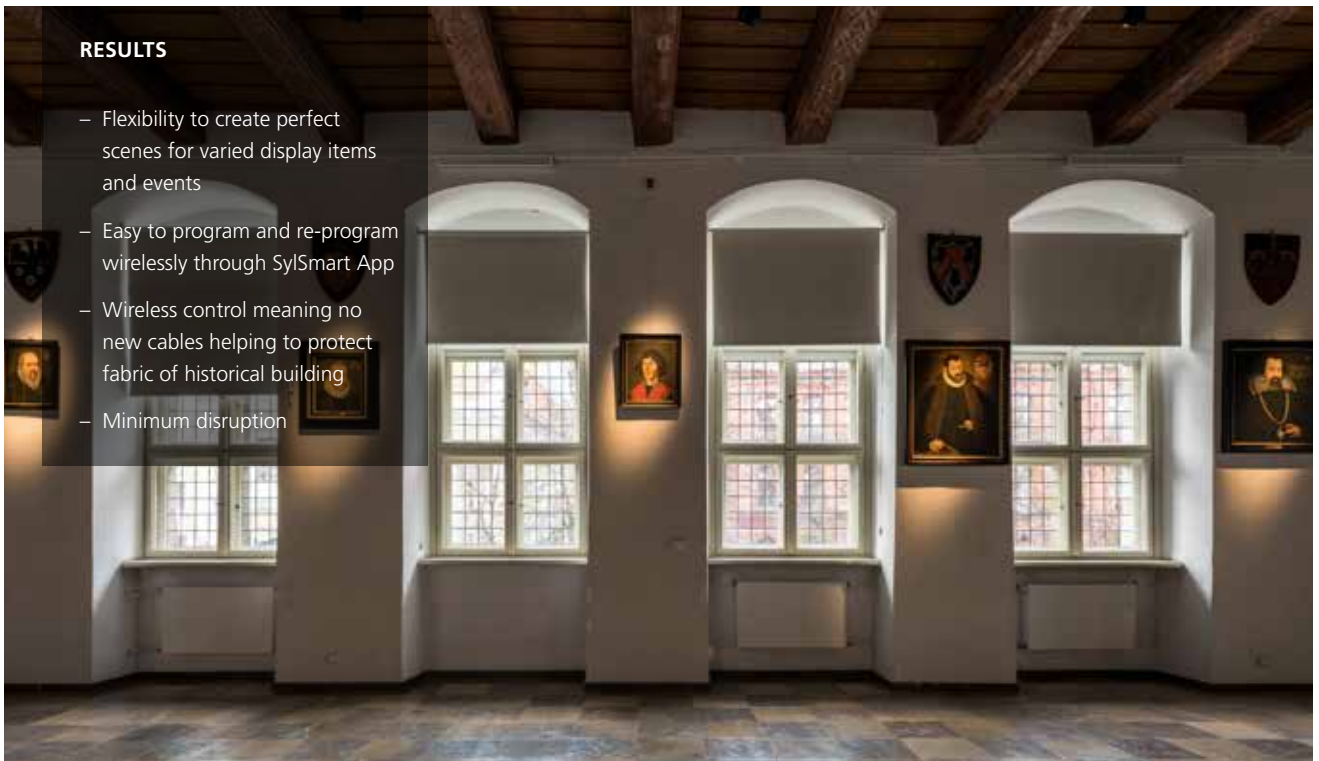
PURPOSE OF THE PROJECT

Displayed across the hall's vast pillars between set back windows, the museum needed a flexible lighting system that would enable them to highlight individual paintings or the whole collection for the rising number of high-profile events they were hosting



PRODUCTS & SOLUTIONS

- Concord Beacon Muse II spotlights
- SylSmart Standalone wireless lighting control system



RESULTS

- Flexibility to create perfect scenes for varied display items and events
- Easy to program and re-program wirelessly through SylSmart App
- Wireless control meaning no new cables helping to protect fabric of historical building
- Minimum disruption

"SYLVANIA HELPED US TO DELIVER UNIQUE AND MEMORABLE EXPERIENCES FOR OUR VISITORS BY GIVING US THE ABILITY TO CONFIGURE AND ACTIVATE TAILORED LIGHTING SCENES AT THE TOUCH OF A BUTTON, ALL WITH MINIMAL DISRUPTION TO MUSEUM OPERATION."

Agnieszka Tybus-Bugajska, Deputy director of organization and administration District Museum in Toruń

CHÂTEAU DE CHAMBORD – CHAMBORD, FRANCE

Placed on the first list of Historical Monuments in France in 1840, UNESCO World Heritage since 1981, Chambord is one of the most astonishing constructions of the Renaissance. Far from being a residential palace or even a hunting lodge, Chambord embodies a true utopia: it is a brilliant work of art that has not finished revealing all its secrets. Utopia was the watchword of the 500 years and the very spirit of the Renaissance. In Chambord, you will discover an ideal place, made of harmony and modernity.

Installers: Ménage Electricité et Pellé Electricité



PURPOSE OF THE PROJECT

Long-standing partnership between Sylvania and the Château de Chambord for renovations or new projects.



PRODUCTS & SOLUTIONS

- Beacon Projector
- Beacon Muse
- Beacon XXL
- Global Track
- Audit of the installation
- Lighting studies



TRIUMPH MOTORCYCLES – HINCKLEY, LEICESTERSHIRE, UNITED KINGDOM

TRIUMPH MOTORCYCLES

Concord has brought its lighting expertise to Triumph motorcycles new factory visitor experience

Triumph, the iconic British motorcycle brand, is taking visitors on an immersive new tour around its innovative factory in Hinckley, Leicestershire. The new Triumph Factory Experience delivers an engaging journey that tells the full story of the brand and showcases Triumph's historic and modern achievements in design, engineering, racing and popular culture. To ensure every element of the tour is showcased to its

fullest, over 200 Concord Beacon spotlights have been installed throughout the space. The project has been nominated for a 2018 Scottish Design Award.

Spread across eight distinctly-themed areas, the exhibition showcases rare original models from the brand's 115-year history including legendary Triumph movie bikes; from Steve McQueen's original Great Escape movie bike, not seen since filming completed in 1962, to Tom Cruise's Mission Impossible 2 Speed Triple. These valuable memorabilia require careful consideration when it comes to putting them on display, especially in terms of the lighting.

PURPOSE OF THE PROJECT

To protect memorabilia from harmful radiation and ensure they look the best they can for visitors to the tour.





PRODUCTS

- Beacon Accent
- Beacon Muse with accessories



RESULTS

- Beacon Accent spotlights with low glare and dark-light detail for increased accentuation and visual comfort perfectly highlight the variety of exhibits.
- Beacon Muse luminaires take focussing to the next level to ensure the most intricate of details are accentuated.



"WE SELECTED THE CONCORD BEACON RANGE AS IT IS A GOOD QUALITY TRACK SPOTLIGHT WITH 90+ CRI RATING. WE UNDERTOOK EXTENSIVE TESTING OF THE LED ENGINE PERFORMANCE, AS WELL AS LOOKING AT THE VARIOUS BEAM ANGLES TO ENSURE THE PRODUCT COULD GIVE US THE LEVEL OF OPTIONS AND CONTROL WE NEEDED TO SET UP THE LIGHTING THROUGHOUT THE EXHIBITION SPACE."

Scott Ferrier – LightMedium Director
(lighting scheme design)

ANNE FRANK HOUSE – AMSTERDAM, THE NETHERLANDS

LIGHTING DESIGN: HANS WOLFF & PARTNERS B.V.
PHOTOGRAPHY: JOEP JACOBS

PURPOSE OF THE PROJECT

To create an even wallwash effect on the wall, and accent lighting on the objects.

The Anne Frank House is a writer's house and biographical museum dedicated to Jewish wartime diarist Anne Frank. During World War II, Anne Frank hid from Nazi persecution with her family and four other people in hidden rooms at the rear of the 17th-century canal house, known as the Secret Annex.

She did not survive the war but her wartime diary was published in 1947. The museum opened on the 3rd May 1960. It preserves the hiding place, has a permanent exhibition on the life and times of Anne Frank, and has an exhibition space about all forms of persecution and discrimination.

In 2013 and 2014, the museum had 1.2 million visitors and was the 3rd most visited museum in the Netherlands.

PRODUCTS

- Beacon Wallwash
- Beacon Muse II with snoot and honeycomb, all on-board dim

RESULTS

- Well lit walls with the Wallwash spotlights and perfectly accent lit objects with Muse II
- Zoom lens and nice projection create the desired effect
- Snoot and honeycomb accessories make sure visitors are not blinded by luminance.

A woman wearing a red knit hat and a dark, heavy coat is seen from behind, looking out of a large window. Through the window, a group of people in formal attire are gathered in what appears to be a gallery or museum setting. The scene is dimly lit, with light coming from the window and another window to the right.

MADE BY US FOR YOU

We hate to see our planet's precious resources go to waste, which is why we strive to work as efficiently as possible. We maximise the energy-efficiency of all our products for the benefit of the environment and customers.

Unlike other lighting providers, we are a global company with local manufacturing and operations hubs strategically placed across the globe. This means we're able to deliver our services quickly and efficiently to all our customers, wherever they are, and with a personal touch. We're proud of our business model which enables us to work in smart and ecological ways to minimise our impact on the environment and maximise the benefits for our customers.

THE PRODUCTS THAT TELL THE STORIES



BEACON MUSE XICATO® AND XL MUSE XICATO® – Magnificent colour reproduction

- Precise, accurate and natural colour rendering to meet the highest requirements placed on museum lighting
- Highly efficient, cost effective lighting with excellent colour reproduction: CRI98 - close to the highest possible score across all colours
- Easily adjustable beam from a wide flood (52° / 72°) to a tight spot (8° / 10°) without additional lenses or reflectors
- IR and UV free light to prevent the colours of art applications from fading



BEACON MUSE TUNE II – Fully adjustable spotlight with tunable colour temperature

- Combines cutting-edge technology and ancient lens principles to create a fully adjustable spotlight enabling the end-user to manually adjust the beam from a wide flood (41°) down to a tight spot (7°)
- Tunable colour temperature from a warm 1,800K to a cool 6,500K
- Produces a tailor lit effect for any exhibition or gallery display space requirements
- On-board dimming potentiometer, DALI or SysSmart Standalone versions available



BEACON MUSE II AND BEACON XL MUSE II – Multi beam adjustable spotlight

- Fully adjustable spotlight using cutting edge LED technology and adjustable lens
- Adjustable optics provides wide flood 55° which can be adjusted to 8° spot without the need for additional lens and reflectors
- IR/UV free light source without heat radiation
- Up to 1150 lumen output and CRI minimum typical 97 ideal for museums and galleries



BEACON PROJECTOR – Framing

- High output 26W cutting-edge LED
- High colour rendering index, typical Ra97
- Fully dimmable from 100% to 3% using discrete onboard dimming (DALI 0%)
- IR/UV – free light source without heat radiation



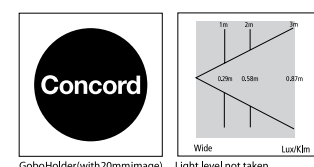
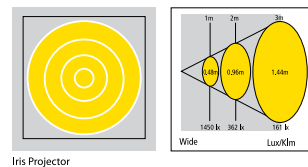
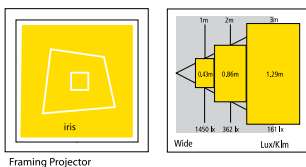
BEACON PROJECTOR – Iris

- Manual lens and high output 26W LED
- Circular 10° or less beam for pin pointing small objects i.e. a diamond in a crown
- High colour rendering index, typical Ra97
- Fully dimmable from 100% to 3% (DALI 0%)
- IR/UV – free light source without heat radiation



BEACON PROJECTOR – Gobo

- Ideal for guiding visitors or pointing out items of interest
- 3 types of Gobo material can be inserted: Acetate / Metal / Glass
- IR/UV – free light source without heat radiation



Beam Angles



BEACON ACCENT – A timeless contemporary spotlight

- Energy efficient light source with far superior luminous flux per watt than existing Low Voltage Halogen
- Dimmable versions with on-board dimming from 100-3% output
- Fresnel lens for collimating narrow beam for accent lighting
- Available in 10° spot, 37° medium and 52° flood options
- Up to 1578 lumens and CRI97



BEACON XL ACCENT – High powered spotlight – class leading optics

- This impressive LED spotlight provides up to 2668 lumens at 33W
- High colour rendering CRI97 typical with R9 at 90
- Available with on-board dimming
- Available with 33° medium or 44° flood lens
- Available in 3,000K or 4,000K colour temperatures



BEACON WALLWASH – Utilizes a specially adapted asymmetric lens to provide high quality wallwashing effect

- Uniform ceiling to floor vertical illuminance up to 4m height and 4.5m horizontal spread
- Wash large tapestries or objects at their very best
- Available in 3,000K and 4,000K colour temperatures
- Non-dimmable, on-board dimming and DALI dimmable versions
- Total light output of up to 4916 lumens at a highly efficient 102lm/W



ASCENT 100 II – Efficient and decorative downlights

- Designed for small apertures of 120mm and 160mm
- CRI90 version delivers good colour rendering with efficiency up to 120lm/W
- LumiNature models are available with CRI95-99 in 3,000K and 4,000K, and in Human Centric Lighting Tunable White version with SylSmart Standalone
- A wide range of accessories to match perfectly to your design and lighting needs



FLEX PRO AND PROFILES – Flexible LED solution for decorative lighting

- A flexible range of LED strips with various drivers and high quality aluminium profiles
- Offers high quality, CRI>90 and SDCM≤3 LED strips with uniform colour and good light quality
- Profiles of different dimensions and shapes to address your needs
- DALI and SylSmart Standalone models available

Concord

by **SYLVANIA**

Although every effort has been made to ensure accuracy in the compilation of the technical detail within this publication, specifications and performance data are constantly changing. Current details should therefore be checked with Feilo Sylvania International Group Kft.

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