



Concord

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LIGHTING FOR  
MUSEUMS AND GALLERIES

by FEILO SYLVANIA

早興  
白居易  
晨光出照屋梁明  
初打開門鼓一聲  
夫上階眠知地濕  
身臥窗語報天晴  
半銷宿酒頭仍重  
新脫冬衣體乍輕  
時覺心空思想盡  
近來鄉夢不多成





HELPING YOU  
TELL YOUR STORY  
WITH LIGHT



## 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."<sup>1</sup>

- 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 Musee d'Orsay in Paris was the top European exhibition at number 15

## TELLING A STORY – GUIDING PEOPLE THROUGH



ASHMOLEAN MUSEUM – OXFORD, UNITED KINGDOM

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

*Claude Monet*

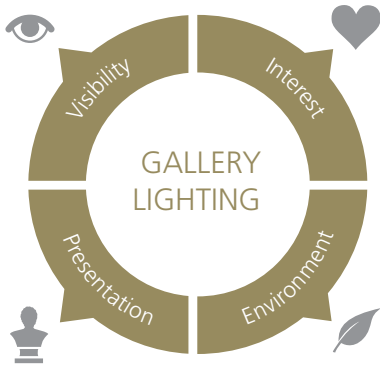
Lighting plays a vital role in guiding visitors through their museum or gallery experience; the moment a visitor sees the exterior façade, the journey has begun. From creating anticipation on arrival to communicating drama or contemplation within the exhibition space, lighting has a key role to play:

- 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

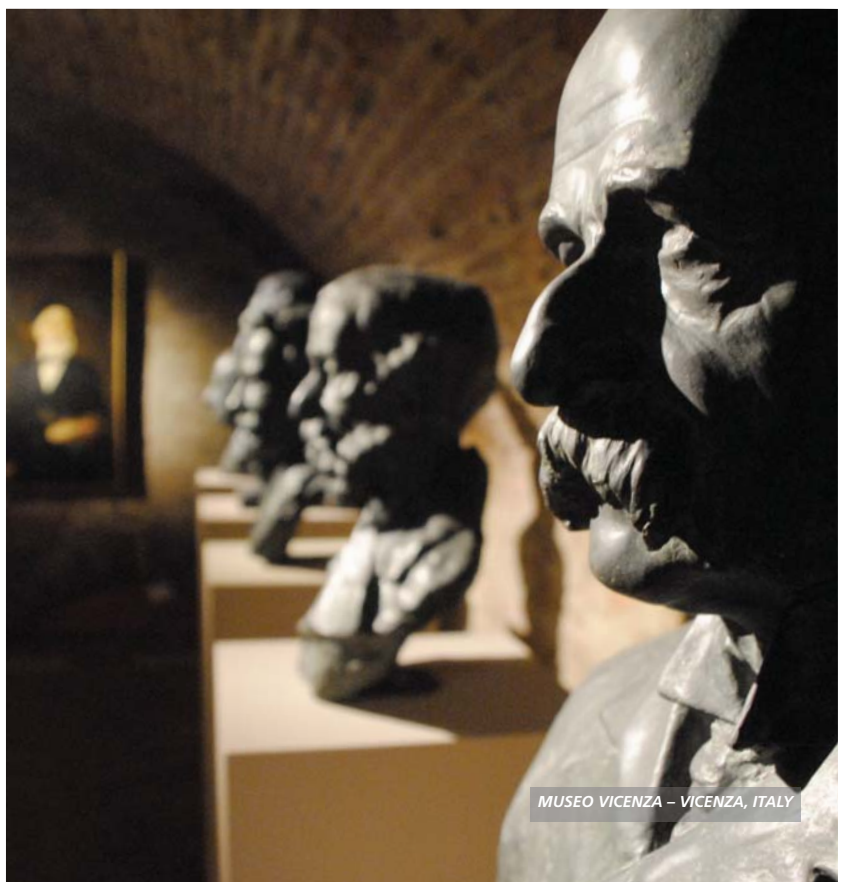
The lighting challenge faced in today's museums and galleries is to achieve a balance between the quality of the lit environment - no matter what is being displayed - and the level of energy used during the life of the installation. The 'display lighting mantra' detailed here shows the balance that is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



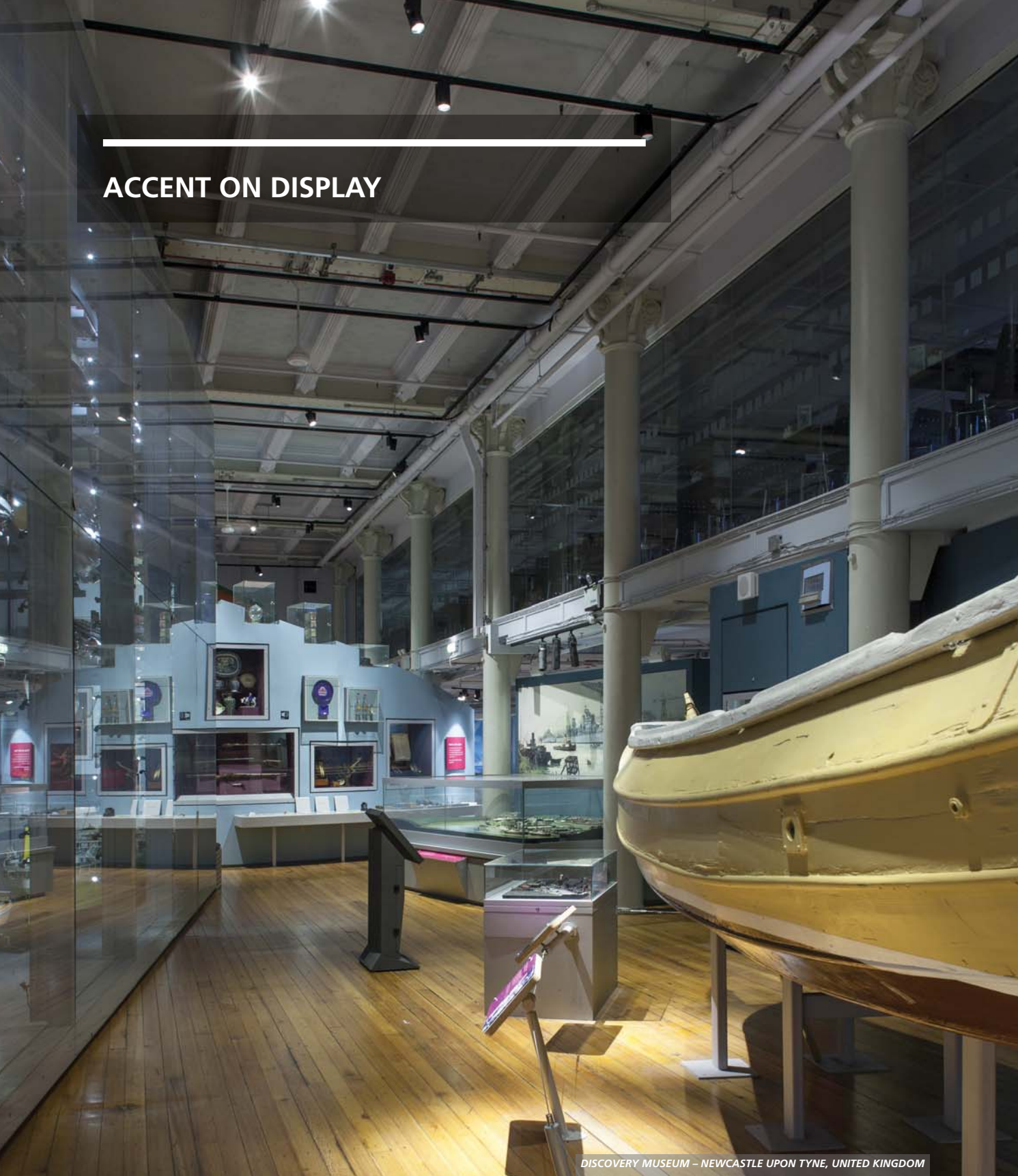
Like all successful lighting projects, the key to a winning museum or gallery design is a good brief.

**"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*



## ACCENT ON DISPLAY



DISCOVERY MUSEUM – NEWCASTLE UPON TYNE, UNITED KINGDOM

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.



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## 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.





MUSEO VICENZA – VICENZA, ITALY

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.



DRENTS MUSEUM – ASSEN, NETHERLANDS



## 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*

KELVINGROVE – GLASGOW, UNITED KINGDOM







## 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.

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







NATURE MUSEUM – TILBURG, NETHERLANDS



DRENTS MUSEUM – ASSEN, NETHERLANDS



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

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## 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*



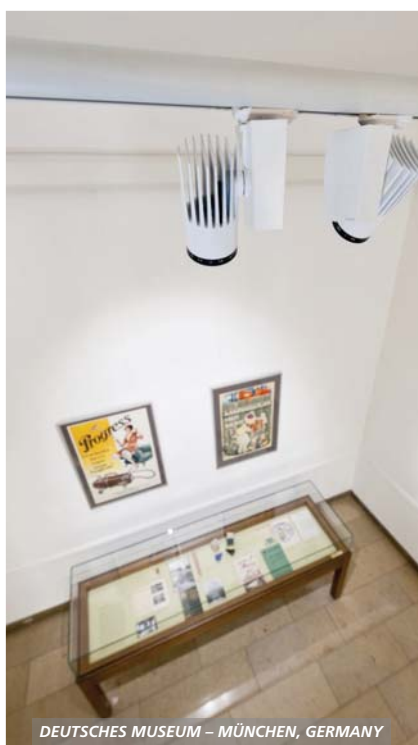
ASHMOLEAN MUSEUM – OXFORD, UNITED KINGDOM



## 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







"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



ÉLÉPHANT PANAME – PARIS, FRANCE

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. To avoid this, LEDs with a CRI of >90 are best for galleries and museums, to ensure punchy, vibrant reds.

Rendering Group	Typical application
100 1A (Ra>90)	<b>Accurate</b> Medical examination, colour printing inspection, art galleries
90 1B (90>Ra>80)	<b>Good</b> Retail, showrooms, restaurants, offices etc
80 2A (80>Ra>70)	<b>Moderate</b> Offices, classrooms, security lighting supermarkets, manual areas etc
60 2B (70>Ra>60)	
40 3 (60>Ra>40)	<b>Poor</b> Street lighting, parking areas etc
20 4 (40>Ra>20)	
	<b>Not important</b> Street lighting





## 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 halogens
- 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

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



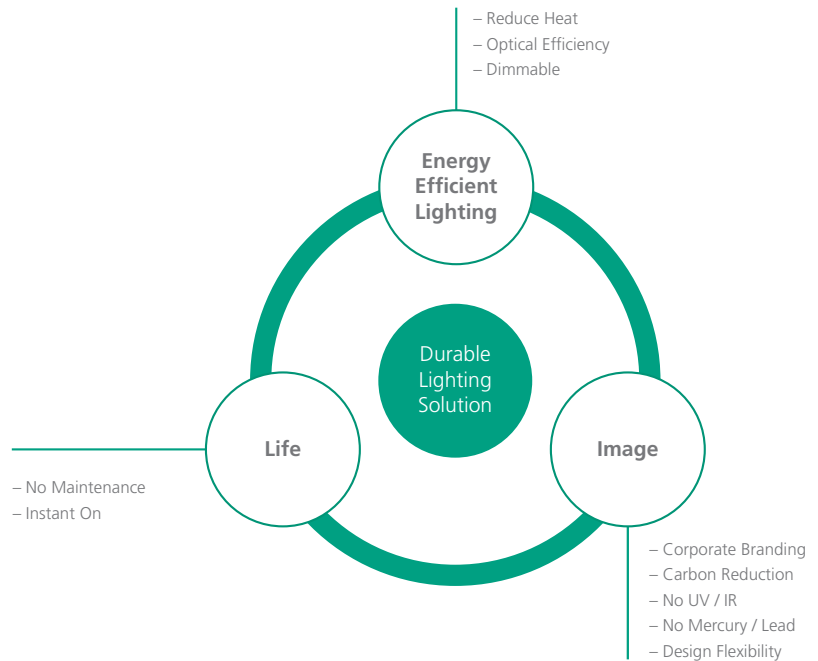
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## LED FEATURES AND BENEFITS

Features	Benefits
Long lifetime	50,000 Hours to 70% Lumen Maintenance
Energy efficiency	100Lm/W
Inherently rugged	LED is a non fragile construction
No warm-up required	Instantaneous light
Directionality	Minimal system losses
No Mercury or Lead	Environmentally sound
Infinitely dimmable	Lighting effects and power saving
Colour saturation	Infinite colour palette

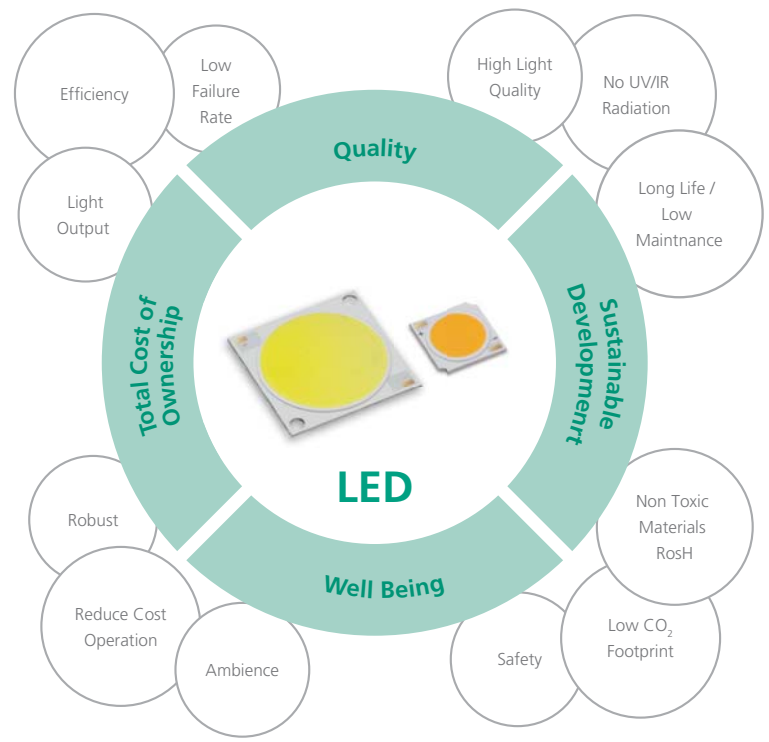
# WHY CHOOSE LED?

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



LONDON- UK:  
CONCORD DESIGN ILLUMINATES  
NEW DESIGN MUSEUM







The Design Museum has now moved to its new home in Kensington, South London. The building is a marvel of modern construction with its stunning interior space designed by John Pawson. The roof of the original 1960s Grade II\* listed building has remained whereas the rest of the building has been remodelled.

The new building will be the world's leading museum of contemporary design and architecture, 'an international showcase for the many design skills at which Britain excels and a creative centre, promoting innovation...' It aims to welcome over 650,000 visitors to the building each year including 60,000 learners to use the Swarovski Foundation Centre for Learning.

With over 2,500 luminaires to light the 10,000m<sup>2</sup> space. The Design Museum houses one permanent collection, two temporary exhibition spaces, 400m<sup>2</sup> of learning spaces along with two shops, one cafe, one restaurant, a member's lounge, a 200 seat auditorium and an event space for launches and events.

Graham Large, Head of Architectural Lighting Design at ChapmanBDSP, comments "We worked with Concord to refine the specification and ensure all the lighting met our initial ideas and goals. We were impressed with the results and found it extremely useful to be dealing with one person on every aspect of the lighting, including all the controls."

The main exhibition and event spaces on the upper basement, mezzanine and first floor use over 800 Concord Beacon Muse 3000k White track mounted spotlight to provide flexibility in beam angle control and light levels. Over 200m of Lumiance Lumistrip has also been installed in the exhibition space to provide indirect light above the exhibition panels whilst the entrances have Mini Continuum with integrated spotlights.

Concord worked with Lutron to provide a DALI control system for the project. The system allows for individual dimming and control of all the luminaires throughout the scheme to ensure the required effect is achieved in each space and it will cater for flexible use during both daylight and night time hours.

In total, there are 1,200 Beacon Muse spotlights installed in the building project mounted onto around 1,000 metres of Lytespan 3 track.



The 200 seat Bakala auditorium has a fully controlled lighting system that features both Mini Continuum and black Beacon Muse luminaires to blend into interior decor.

Across the whole building, the luminaires have been designed to blend into the décor with black trim Concord Ascent 150 downlights, mini continuum and beacon discreetly lighting the Retail spaces by matching the ceiling design, whilst Beacon Muse on drop rod extensions, have been employed to subtly illuminate the space through a wooden beam ceiling design structure.

The lighting scheme is finished off with specialist luminaires for areas such as the Member's lounge and Parabola Café & Restaurant, where the 90 Concord Myriad V downlights have been fitted. These luminaires have a colour tuning engine to take the room from 2,700k as an intimate dining space to 4,500k for functional and service use at other times. For the central parabola ceiling, Concord supplied high output surface mounted and floor recessed LED projectors (by Anolis), to provide accent light to this feature.

For more information visit [www.concord-lighting.com](http://www.concord-lighting.com).

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**ASHMOLEAN – UK:  
CONCORD BRINGS HISTORY  
TO LIFE AT THE ASHMOLEAN**







The Ashmolean, University of Oxford, is the world's oldest public museum and one of Europe's most popular cultural tourist destinations. It is home to Oxford University's collection of art and archaeology and more than 850,000 people visit each year. The building needs constant care and attention to ensure it delivers the welcoming atmosphere upon which the Ashmolean prides itself and keeps up with the demands of visitors. As part of this continuous refresh, the team at the museum has recently upgraded the lighting system in its gallery spaces and installed over 1900 Concord Beacon Muse spotlights throughout.

When it came to redesigning the lighting scheme the aesthetics and performance of the lighting was paramount as Harry Phythian-Adams, Executive Officer, Director's Office at the Ashmolean Museum of Art and Archaeology, explains, "We required a solution that provided the same lit effect as halogen but also delivered a better uniformity of light whilst bringing the vibrant colours in the galleries to life. Concord was able to adapt the Beacon Muse to meet our needs perfectly: it changed the colour temperature of the

spotlight to 2700K warm white with colour rendering index of typical 97 and also provided us with a customised white bezel to better suit our interior décor."

The project was instigated by Robert Gregg, Estate Services for Oxford University, whilst the Ashmolean team worked with Concord to design the fittings, which were installed by Monard Electrical, Oxford and commissioned by Ben Acton at Hoare Lea Lighting, Oxford. Concord Beacon Muse spotlights are installed at a high level within the space and are positioned in such a way as to reveal the forms and details of the diverse collections. The spotlights use warm, high colour rendering LEDs, with the beam angle adjusted according to the lit effect required by each exhibit.

Harry Phythian-Adams: "We are also impressed with the energy savings we have seen. Due to the unique design of the product, in addition to the LED energy savings compared to the previous Halogen lights, less heat is emitted and we have been able to reduce our air conditioning usage and save on our energy costs."

Concord Beacon Muse features an adjustable optic system which can deliver a wide flood 65° beam angle which can be adjusted down to a 10° spot without the need for additional lenses or reflectors. The 10° tight spot is ideal for accent lighting for accentuating the texture, colour and shape of exhibits. Its 65° wide flood distribution can be optimised for uniform vertical and horizontal illuminance and wall washing effects. Also, when used with an elongation lens accessory it can create narrow beam angles for highlighting sculptures, mannequins, logos and shelving.

Available in 2700K (variant version), 3000K and 4000K CCT with a high colour rendering index, Beacon Muse incorporates a discrete on board dimmer that provides control from 100% right down to 0%. There are also track dimming options and a choice of standard and high output models to suit any display or retail lighting application.

For more information visit [www.concord-lighting.com](http://www.concord-lighting.com)

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**PUSHKIN MUSEUM – RUSSIA:  
FROM ARTEFACTS TO FINE ART  
CONCORD'S GOT IT COVERED**







Concord, the leading architectural lighting brand from Feilo Sylvania, has worked with Moscow based lighting consultants, Lumex and the Pushkin State Museum of Fine Arts in Russia to create a striking lighting scheme that is enhancing the visitor experience. Concord fixtures have been installed in several halls of the museum featuring a number of Concord Beacon Muse LED spotlights that enhance the artistic feel of the museum.

The Pushkin State Museum of Fine Arts houses the largest collection of European art in Moscow, located just opposite the Cathedral of Christ the Saviour. Work to construct the museum started in 1898 and was completed in 1912. The museum's name was changed to its current form in 1937 to commemorate Russian Poet Alexander Pushkin and the 100th anniversary of his death. The International musical festival Svyatoslav Richter's 'December Nights' has also been held in the Pushkin museum since 1981.

The museum has a fantastic collection of exhibits, which includes stunning examples of fine art and archaeological and numismatic collections. Its diverse range of objects makes it challenging to design and install a lighting scheme. The large areas of the museum are also constantly illuminated by a combination of natural daylight coming in through the ceilings, recessed light boxes with metal halide lamps in a daylight colour and a wide variety of LED lights.

The Pushkin museum acknowledged that LED lighting was the most feasible solution as long as the luminaires chosen achieved the required colour rendering index of 90+. During the selection process, the Concord Beacon Muse LED spotlight became the favourite due to it being a variable-beam LED dimmable spotlight in a compact body that could easily be adapted and changed according to the museum's requirements.

"Halogen reflector lamps have been the main source of exhibition and gallery spot lighting for many years," comments Konstantin Kubrin – the founder of Lumex Ltd, a lighting consultant in Moscow. "It is often the need to constantly re-lamp and reductions in the lighting equipment's ability to focus that are the main motivators to switch to versatile technology. The Pushkin Museum first trialled LED within the archaeological collection and temporary exhibits though utilising LED technology has now become normal practice for Pushkin museum. Because of their superior performance and longevity, LEDs are steadily replacing halogen lamps in all the halls at the museum."

The award-winning Concord Beacon Muse LED is a fully adjustable spotlight. It can deliver a wide flood 65° beam angle which can be adjusted down to a 10° spot without the need for additional lenses or reflectors. The 10° tight spot is ideal for accent lighting for accentuating the texture, colour and shape of exhibits. Its 65° wide flood distribution can be optimised for uniform vertical and horizontal illuminance and wall washing effects. Also, when used with an elongation lens accessory it can create narrow beam angles for highlighting sculptures, mannequins, logos and shelving.

Available in 3000K & 4000K CCT with a high colour rendering index, Beacon Muse incorporates a discrete on board dimmer that provides control from 100% right down to 0%. There are also track dimming options via DALI and a choice of standard and high output models to suit any display or retail lighting application. The Concord Beacon Muse also has all the energy saving benefits of LED and, with lifetime of 50,000 hours, it is a virtually maintenance free solution.

For more information visit [www.concord-lighting.com](http://www.concord-lighting.com)







## ÉLÉPHANT PANAME – FRANCE: CONCORD SUPPLIES ARCHITECTURAL LIGHTING FOR STUNNING ARTS CENTRE

Feilo Sylvania's architectural lighting specialist, Concord, has supplied 80 luminaires to Éléphant Paname, a centre for art and dance in Paris. As part of the 2015 UNESCO celebrations for the International Year of Light, Éléphant Paname will be hosting an exhibition on the theme of light, sponsored by Concord, in spring this year. Feilo Sylvania is a "Gold Sponsor" of the International Year of Light.

### An historic location

Nestled on rue Volney in Paris, the building is steeped in history having been erected under the reign of Napoleon III. It embodies several architectural feats of the époque, and as such, it is a stunning location for regular exhibitions and events. An exciting player in the art world, Éléphant Paname makes a point of organising extraordinary exhibitions across a variety of themes.

Tiphaine Treins, CEO of the cutting-edge lighting design studio, Temeloy, recommended Concord for Éléphant Paname's new lighting scheme. Tiphaine explains why she looked no further than Concord: "We commissioned Concord to supply the lighting for this very unique and magical venue because the company is renowned for its expertise in delivering high-end, bespoke lighting schemes for

these sorts of projects. Historic venues, galleries, museums and other exhibition spaces such as Éléphant Paname require an extra layer of ingenuity. You want the very best. Concord is an expert in the field of architectural lighting and its Beacon Muse and Projector solutions give us the ability to create very precise lighting designs, thanks to their unparalleled flexibility. The capabilities of the fixtures mean we can be very creative and deliberate in establishing the ambience and focus points in the exhibition space. As an artist, Concord is a brand you are excited to work with. You can "paint" with light, and you often find this magical moment where the vibes evoked by the artwork help dictate how it should be illuminated."

### Equipped with state-of-the-art lighting

The second and third floors of the venue have been kitted out with one of the most elegant models in the Concord range; the Beacon Muse. These spots are ideal for accent lighting and museum displays. The space is transformed and illuminated with a simple adjustment.

Concord has equipped Éléphant Paname with two more of its flagship products: the Beacon Projector Framing and Beacon Projector Gobo spotlights which have the

ability to project images, patterns and text onto a surface, as well as beams of light.

Concord Beacon Muse, Beacon Projector Framing and Beacon Projector Gobo are currently illuminating part of an exhibition on display at Éléphant Paname: La mémoire traversée, which explores the landscapes and faces of the Great War.

While discussing the new lighting, Florence Chollet, Secretary General of Éléphant Paname explained: "We immediately saw the difference! The lighting is much more focused with the Concord luminaires, and the light can be concentrated, framed or distributed evenly across the exhibition areas. The rendering is truly magnificent."

Sophie Houde, Marketing Director for Feilo Sylvania France said: "We are pleased to have participated in the development of this historic site with our spots and projectors. Concord products are acclaimed in the field of museology; for our accuracy and unparalleled light rendering".

### About the Beacon Muse

The spotlight's adjustable optic system provides a wide flood, 65° beam which can be adjusted to a 10° spot without the need for additional lenses or accessories.





This flexibility enables the space to be adapted for various purposes. The beam remains uniform without hot spots, and maintains a perfect homogeneity in terms of the flow and colour temperature.

With a CRI of 95, Beacon Muse is the perfect solution for museums, art galleries and showrooms for creating innovative, efficient and high-quality lighting designs:

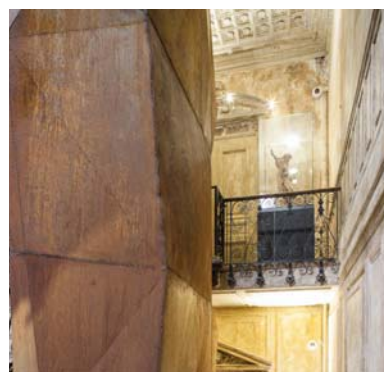
- Minimalist design
- 100% cast aluminium body
- Excellent colour reproduction and contrast (CRI > 95)
- No UV or IR emission
- Non-existent maintenance costs (lifetime expectancy = 50,000 hours)
- Available in two colour temperatures: 3,000K and 4,000K
- Finished in white, silver or black

Concord Beacon Muse has won a number of industry awards since its introduction, including Best Interior Luminaire at the Lighting Design Awards, Commercial Product of the Year at the Lighting Association's annual awards scheme, Interior Luminaire of the Year at the Lux Awards and Lighting Product of the Year at the FX International Design Awards.

An exhibition for the International Year of light

Because 2015 has been designated the « year of light » by UNESCO, Éléphant Paname has decided to organise an exhibition on the same theme: Lumières - Play of Brilliants. The centre enlisted the support of internationally-renowned designers, Light Collective, not only to identify exhibiting artists, but also to gather partner and sponsorship support. Light Collective had been well associated with Concord for several years, and immediately saw an opportunity for them to be a sponsor. Convinced by the proposition, Concord decided to partner on the exhibition, and as a further gesture of the company's commitment to the event, it has equipped the arts centre with 80 new luminaires. These have already been installed, and are a smart match for the beautifully sculpted building.

To find out more about the Beacon Muse, its applications, and how Concord and the wider Feilo Sylvania lighting group could provide bespoke lighting designs for your needs, please get in touch, visit [www.concord-lighting.com](http://www.concord-lighting.com) or follow @SylvaniaUK on Twitter.





MUSEUM BOERHAAVE – BENELUX:  
CONCORD LIGHTS THE HISTORICAL  
EXHIBITION OF NATURAL SCIENCE  
AND MEDICINE



The Anatomical Theatre at the Boerhaave Museum in Leiden, Netherlands required a powerful and energy efficient lighting solution so that visitors could admire the theatre and the special pieces in the collection. To light this impressive room in the best possible way, the museum chose the powerful yet energy efficient Beacon LED spotlights from Concord by Feilo Sylvania.







#### The lighting solution

In the Anatomical Theatre, images of the history of medicine and science are projected through video mapping on skeletons and on the ceiling. This introductory film is the new starting point for those visiting the Boerhaave Museum. In around seven minutes, visitors receive an overview of what they can expect to experience within the museum and its focus on science – it is all about curiosity, courage, creativity and perseverance.

To create the right atmosphere between the projector shows, the impressive space has been lit perfectly with a number of Concord Beacon LED spotlights. The Beacon LED spotlight is a powerful and energy efficient lighting solution, which is perfect for museum & gallery, retail and display applications. It meets the tough demands of these environments perfectly by providing a good colour rendering, zero UV/IR radiation and a reduction in maintenance costs.

Mr. Anjo Kuiper, Owner of De Cirkel, Alkmaar, The Netherlands comments, “without doubt we needed to use a LED fixture for two reasons; the low energy

consumption of the luminaires and the location of the fixtures that is very hard to reach which would make maintenance very expensive. We also required a fixture with a high CRI to create a natural experience of the lit objects for the visitors, a nice narrow beam and a spotlight with a sleek designed. We wanted all of this in a fixture without distracting the visitors’ attention from the objects in the museum. By combining these requirements, I selected the Concord Beacon LED railspot with DALI and LS3 track.”



#### The Anatomical Theatre

Boerhaave Museum in Leiden is a museum for the history of science and medicine. The collections have been curated from around the world and reflect more than four hundred years of the Dutch history of science. The Anatomical Theatre in Boerhaave Museum is unique in the Netherlands and is a replica of the theatre in Leiden in 1954 on the Rapenburg.

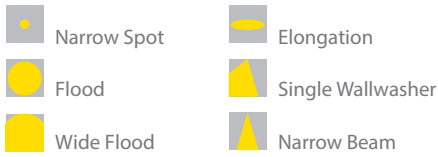
The theatre was a place doctors were once trained and twice a year the congregation donated corpses of hanged criminals to the University of Leiden. These were for the eyes of curious students, surgeons and citizens who wanted to view bodies on the cutting table. As the summer was too hot for the bodies to be examined, the event only took place in the winter.

For more information visit [www.concord-lighting.com](http://www.concord-lighting.com).





Beam Angles



Feilo Sylvania is proud of their strong manufacturing heritage in Europe. For over 100 years, group brands: Concord, Lumiance and Sylvania have manufactured lamps and luminaires in Belgium, Germany, France and the UK. These centres of excellence are our foundation, ensuring innovative design, development and technical performance are aligned with the ever changing requirements of our customers.

Please find below a selection of products which amply illustrate our award winning excellence in museum and gallery lighting.



BEACON MUSE TUNE – Colour tuning adjustable spotlight

- Stylish combination of tuneable colour temperature and adjustable beam angle
- Tuneable white from 4,300K down to 2,100K
- Unique adjustability enables beam control from a tight 8° spot to a 55° flood
- On-board dimming potentiometer, DALI (version 8 protocol) or SylSmart SSC Wireless versions available
- Snap fit accessories (Elongation lens, Honeycomb filter and Snoot)



BEACON MINOR II & BEACON MAJOR II Mains AC 10W & Mains AC 19W - LED spotlight

- Simple mains (AC) voltage LED spotlight perfect for display environments
- Direct connection to line voltage 200-240V, no need for external LED driver (19 Watt)
- Available in Spot (Fresnel lens) and flood options



TIDE – Flexible homogenous wall lighting

- Delivers clean crisp lines of light for ambient effects or illumination of vertical surfaces
- Minature light source for existing track or recessed ceilings
- Asymmetric, Symmetric or Double Asymmetric versions



ASCENT 150 – Wallwasher

- A true economic and efficient replacement for existing CF-L wallwashers
- Complete ceiling to floor uniformity of light
- Suitable for a wide range of applications e.g. museums and display
- Lumen output range: 906Lm - 1557Lm (30 Watt model)



ASCENT PERFORMANCE CONE – Black reflector with sharp cut off angles

- Shielded cut off angle of 40 degree to provide balance between horizontal and vertical illuminance
- Up to 2100 fixture lumens equivalent to 100W low voltage capsule lamp
- 3000K and 4000K versions



LUMISTRIP – Flexible LED solution for indirect and decorative lighting

- An invisible indirect solution that can be placed almost anywhere to high or low light objects or emphasize a particular area or space
- Available in 5 metre lengths – IP20 or fully sealed IP67 for outdoor use
- Choice of colours available to match any interior: amber white (2,700K), warm white (3,000K), neutral white (4,000K) and RGB to totally transform a space

# APPLICATION SECTORS

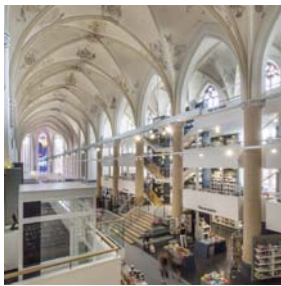
Our expertise extends beyond lighting the art and exhibits, we also cover all aspects of lighting within the museums and galleries sector, for example, the cafes, corridors and retail outlets.

As an innovation leader, Feilo Sylvania supplies an extensive range of lamps, luminaires and lighting control systems for various professional lighting application areas.

## EDUCATION



## RETAIL



## MUSEUMS & GALLERIES



## LOGISTICS & INDUSTRY



## RESIDENTIAL



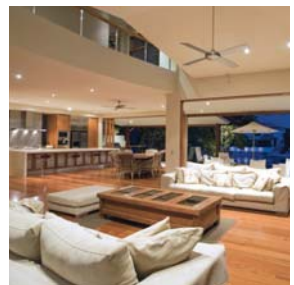
## HOSPITALITY



## OFFICE



## CONSUMER





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## 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.

# Concord

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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 Europe Ltd.

Feilo Sylvania Europe Ltd. September 2017