

# LIGHT FOR ART AND CULTURE



ZUMTOBEL



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Intelligent lighting solutions  
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lighting quality and energy efficiency.

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ART MUSEUM LIECHTENSTEIN, VADUZ / L  
AUSTRIAN CULTURAL FORUM, NEW YORK / USA  
AUSTRIAN GALLERY, BELVEDERE PALACE, VIENNA / A  
BANAMEX PALACE OF CULTURE, MEXICO CITY / MEX

## LIGHT FOR ART AND CULTURE REFERENCE LIST

Our lives are enriched by art. Through art we expand our horizons and enter new worlds. That is why buildings designed for art and culture are at the centre of public interest. The architecture and type of lighting used in these spaces have a far-reaching influence on their identity. In a museum space, daylight and artificial light are of fundamental importance because they guide people emotionally. The lighting makes it possible to illuminate all the facets of the artwork and to structure exhibitions.

BMW MUSEUM, MUNICH / D  
DANISH RADIO, COPENHAGEN / DK  
DANISH THEATRE, COPENHAGEN / DK  
DORNIER MUSEUM, FRIEDRICHSHAFEN / D  
DORTMUND THEATRE, DORTMUND / D  
FESTIVAL AND CONGRESS HOUSE, BREGENZ / A  
FOLKWANG MUSEUM, ESSEN / D  
FRIEDER BURDA MUSEUM, BADEN-BADEN / D  
GANA ART GALLERY, SEOUL / ROK  
GERMAN HISTORICAL MUSEUM, BERLIN / D  
GETTY CENTER, LOS ANGELES / USA  
GRÜNES GEWÖLBE (GREEN VAULT), DRESDEN / D  
HOLOCAUST MEMORIAL, BERLIN / D  
HOUSE FOR MOZART, SALZBURG / A  
KUNSTHAUS BREGENZ / A  
KUNSTHAUS ZÜRICH, ZURICH / CH  
KUNSTHISTORISCHES MUSEUM, VIENNA / A  
LANGEN FOUNDATION, NEUSS / D  
LE GRAND LOUVRE, PARIS / F  
LENTOS ART MUSEUM, LINZ / A  
LEÓN MUSEUM OF CONTEMPORARY ART, LEÓN / E  
LIEBIGHAUS, FRANKFURT / D  
LUCERNE CULTURE AND CONGRESS CENTRE, LUCERNE / CH  
LYON MUSEUM OF FINE ARTS, LYON / F  
MAMbo – BOLOGNA MUSEUM OF MODERN ART, BOLOGNA / I  
MAXXI\_NATIONAL MUSEUM OF XXI CENTURY ARTS, ROME / I  
MUSEUM DER MODERNE, SALZBURG / A  
MUSEUM OF TECHNOLOGY, VIENNA / A  
MUSEUM OF WORLD CULTURE, GOTHENBURG / S  
MUSEUM QUARTER, VIENNA / A  
NATURAL SCIENCE AND ZOOLOGICAL MUSEUM, TURIN / I  
NEUSCHWANSTEIN CASTLE, ANSBACH / D  
PALACE OF ARTS, BUDAPEST / H  
PAUL KLEE CENTRE, BERNE / CH  
PETTER DASS MUSEUM, ALSTHAUG / N  
RIETBERG MUSEUM, ZURICH / CH  
ROYAL MUSEUM OF FINE ARTS, ANTWERP / B  
SAM – SWISS ARCHITECTURE MUSEUM, BASEL / CH  
SENSATION SCIENCE CENTRE, DUNDEE, SCOTLAND / GB  
SOLOMON R. GUGGENHEIM MUSEUM, NEW YORK / USA  
STEDELIJK MUSEUM, AMSTERDAM / NL  
STEIFF MUSEUM, GIENGEN AN DER BRENZ / D  
TATE MODERN, LONDON / GB  
TOPKAPI, ISTANBUL / TR  
TYROLEAN STATE MUSEUM FERDINANDEUM, INNSBRUCK / A  
ULLENS CENTER FOR CONTEMPORARY ART, PEKING / RC  
UNIVERSE OF WATER, ST. PETERSBURG / RUS  
UPPER AUSTRIAN MUSEUM, LINZ / A  
VALDEPENAS MUNICIPAL MUSEUM, CIUDAD REAL / E  
WEISHAUPT ART GALLERY, ULM / D  
WIENER STADTHALLE, VIENNA / A  
WILHELM HACK MUSEUM, LUDWIGSHAFEN / D  
ZEICHHAUS MANNHEIM / D



DORNIER MUSEUM | Friedrichshafen / D



MUSEUM OF TECHNOLOGY | Vienna / A



ARCHAEOLOGICAL INSTITUTE OF THE UNIVERSITY OF ZURICH | Zurich / CH



MUSEUM OF ISLAMIC ART | Doha / Q



M MUSEUM | Louvain / B



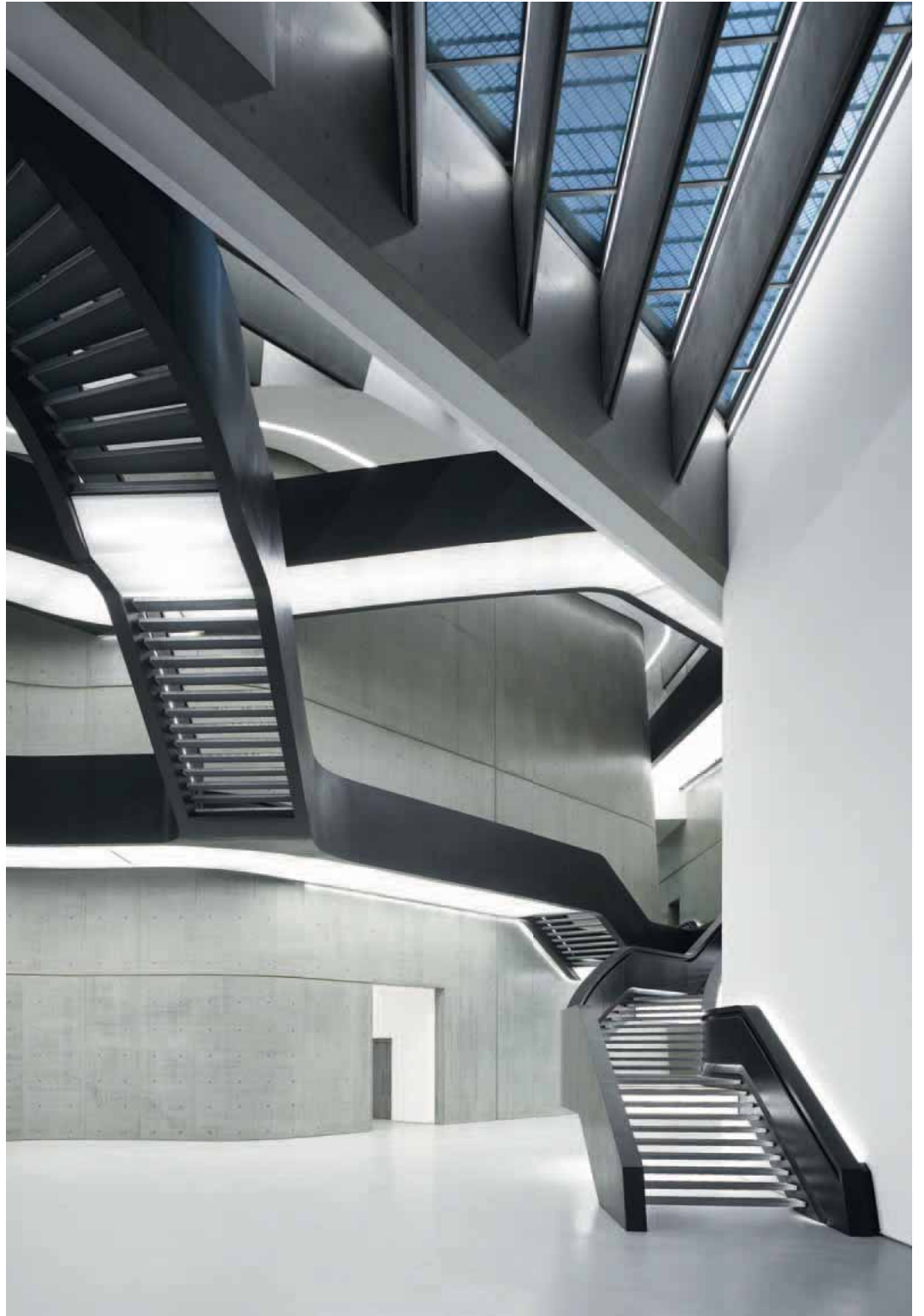
CITÉ DE L'ARCHITECTURE ET DU PATRIMOINE | Paris / F



DANISH RADIO | Copenhagen / DK



TEXTILE MUSEUM | Prato / I



**MAXXI – National Museum of XXI Century Arts, Rome / I (see also photo on front cover)**

Architecture: Zaha Hadid and Patrik Schumacher, London / GB

Lighting design: Equation Lighting, London / GB

Lighting solution: LUXMATE Professional Lighting Management System, TECTON continuous-row lighting system, VIVO spotlight, ZE individual batten luminaire, PANOS downlight system, MIREL T16 FEW recessed luminaire, RAIN moisture-proof batten luminaire

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# The diversity of light

## Light in Art and Culture

**Use of daylight** Intelligently used daylight makes first-class architecture stand out and enhances any building. Daylight is about more than just achieving a “feel-good” ambience, it can also help save energy by reducing the amount of artificial light used to a bare minimum. Besides excellent lighting quality, conservation aspects, in particular, must not be overlooked in buildings for art and culture. Intelligent lighting control systems are indispensable in this respect. They make it possible to precisely determine the amount and intensity of daylight and artificial light.



Petter Dass Museum, Alstahaug / N

**Creating scenes** Soft (diffuse) light is an essential ingredient of lighting in museums, art galleries and exhibitions. It creates little contrast and few or even no shadows. The larger the light-emitting surface area is relative to the viewing area, the softer the light will be perceived (because there are no shadows). Innovative lighting management by Zumtobel makes it possible to simulate this natural form of light amazingly realistically while also allowing effective combinations of natural light and artificial light. Intelligent control systems and appropriate luminaires can be used to make sure that brightness and colour temperatures are always adjusted to suit the needs of particular exhibitions.



M Museum, Louvain / B



**Creating accents** In the case of lighting for art and culture, effective but gentle accent lighting which does not produce damaging UV/IR radiation is especially important. Thanks to their compact size, LED spotlights and fibre optic products allow pinpoint accent lighting and three-dimensional modelling – they can be placed closer to exhibits without disrupting the overall visual look and without producing damaging thermal radiation. Even fine details come to the fore, and shadows cast by details create an impression of three-dimensionality – excitement is guaranteed.



Friedenstein Castle, Gotha / D

**Setting the lighting stage** Light Art installations are integral lighting solutions built exactly according to the artist's specifications. Zumtobel often develops completely new solutions in response to fascinating ideas, the aim being to use light to evoke emotions and stimulate the viewer's senses. James Turrell, one of the foremost contemporary lighting artists of his generation, describes the experience of becoming immersed in a mysterious, scenic world of light as "feeling with one's eyes". LED technology, especially when paired with intelligent control systems, provides huge extra scope for using light in art and using light as art. Innovative LED products show off their strengths to full effect by producing an interplay of surfaces, colours and spaces and creating an atmosphere which totally envelopes and enthrals the onlooker.



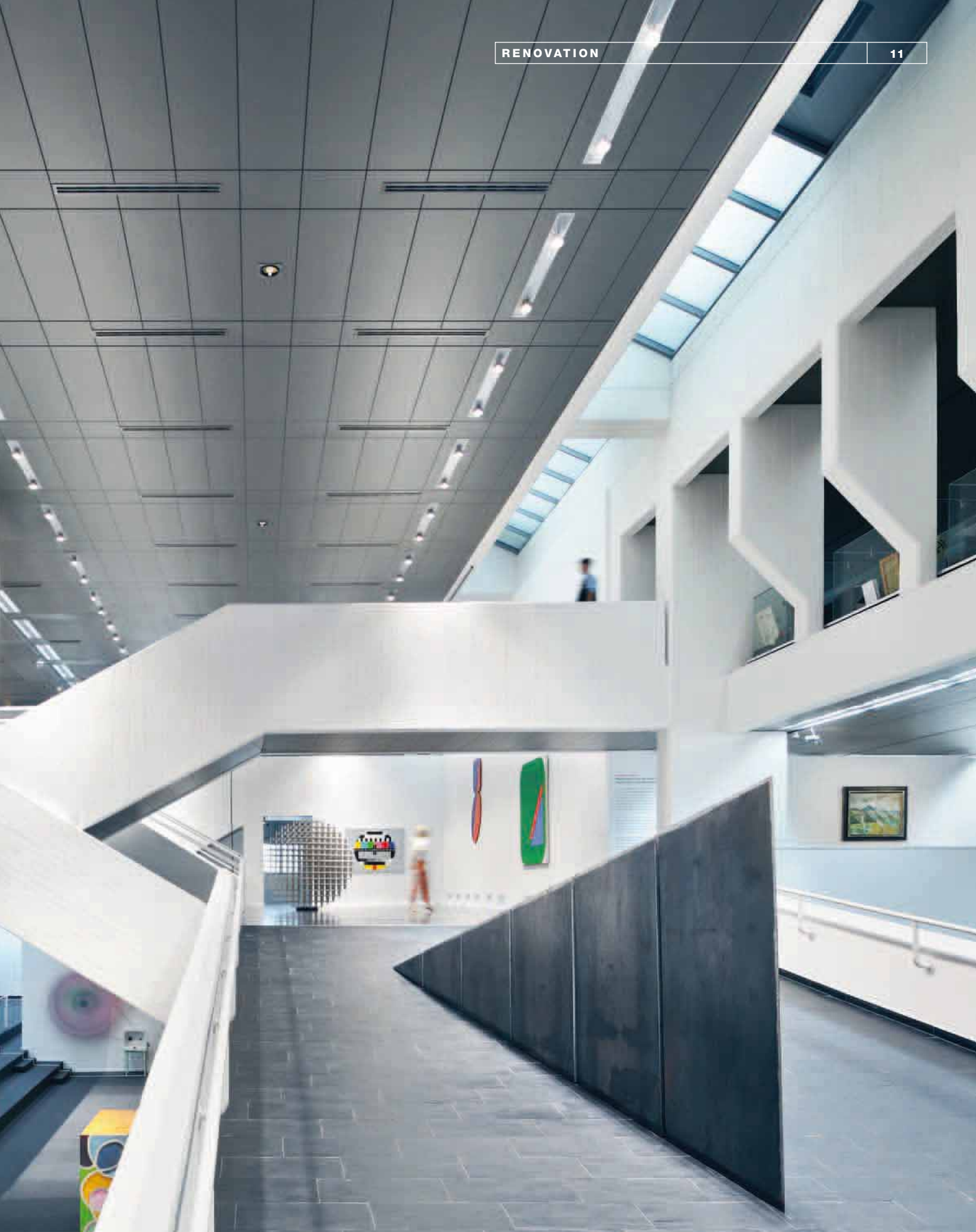
Kunstmuseum Wolfsburg, Wolfsburg / D

## **Saving energy – an art in itself**

### Wilhelm Hack Museum

After its comprehensive renovation, the Wilhelm Hack Museum in Ludwigshafen has turned into a paragon of energy efficiency. The museum's energy costs have been slashed by as much as 70 %. Depending on lighting conditions and requirements, the lighting can now be controlled using scenarios; each luminaire can also be dimmed individually. This ensures optimal illumination of exhibits and also ensures that extremely old, precious objects are protected from heat and UV radiation. Ambient lighting is provided by wide-angle luminaires offering highly uniform lighting even with ceiling heights up to 8 m. Additional accent lighting is provided by spotlights from the LIGHTTOOLS range.





**Wilhelm Hack Museum, Ludwigshafen / D**

Architecture (renovation): Kühn Malvezzi, Berlin / D

Electrical consultants: Balck + Partner Facility Engineering, Heidelberg / D

Lighting solution: LIGHTTOOLS lighting channel system, MIREL recessed luminaires, SLOTLIGHT II recessed luminaires

# Efficient lighting solutions for technical exhibitions

## Vienna Museum of Technology

The Vienna Museum of Technology is the only national museum in Austria which is devoted to the history of engineering and natural sciences. The entire lighting system in the Museum of Technology was upgraded as part of a project called "Light & Climate". The museum's installed load has been reduced by 70 % due to renovation. The new lighting concept provides a combination of direct and indirect lighting designed to improve lighting quality in the museum. The indirect lighting is housed in architecturally sophisticated lighting channels and achieves 40–50 lux on the actual object illuminated. The lighting is dimmable. Additional accent lighting is provided by ARCOS spotlights fitted with 20 W or 35 W HIT lamps. Impressive energy savings were realised here compared with the previous lighting system, which used 100 W halogen spotlights. A total of 1,400 ARCOS spotlights have been installed over the three floors of the Museum of Technology. One major advantage of the new lighting is that it produces less heat; this improves room climate conditions drastically, especially in summer.



### Museum of Technology, Vienna / A

Lighting design: Pokorny Lichtarchitektur, Vienna / A

Electrical installations: Brüder Gros, Vienna / A

Lighting solution: ARCOS spotlights, MML miniature batten luminaire (special design),

LUXMATE Professional Lighting Management System



**Vienna Museum of Technology:** before renovation



**Vienna Museum of Technology:** after renovation

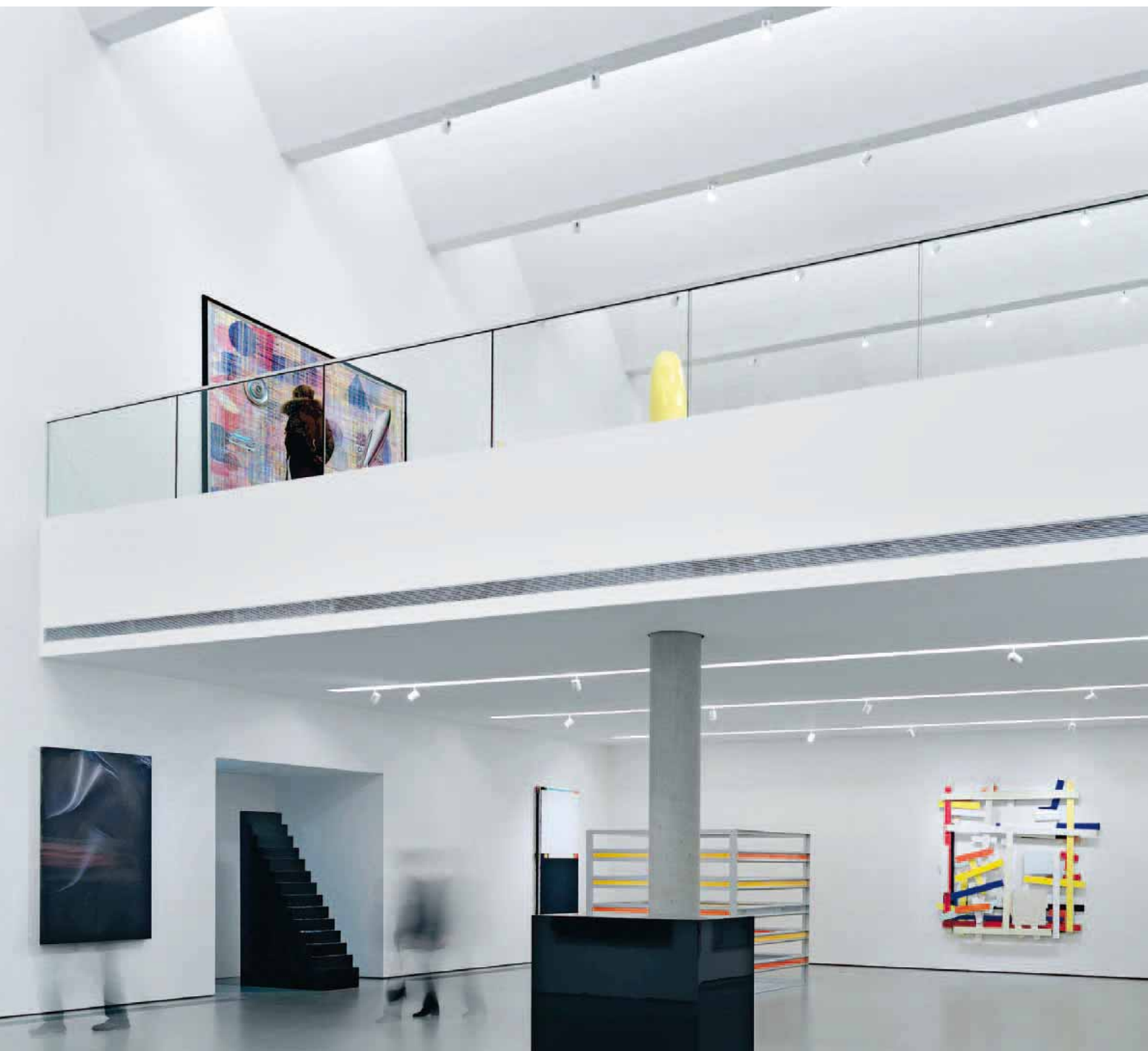
“Energy-efficient, significantly improved exhibition lighting, what could be better? The renovation project enabled us to exceed our energy saving targets and, at the same time, gave us more flexible lighting to cope with our constantly changing exhibitions.”

Klaus Walland, Technical Director VMT

## Intelligently linked-up daylight and artificial light

### Weishaupt Art Gallery

Construction of the impressive new Weishaupt Art Gallery building marked the successful completion of the city centre redevelopment project. When it came to architectural choices, client Siegfried Weishaupt felt that it was important that art and not architecture remained the focus of attention. The whole city is delighted with the building. At the opening ceremony for the new building, the mayor of Ulm referred to it as “an auspicious occasion for the city”. A cross-section of the Weishaupt family’s collection is on show in the two-storey art gallery. The inaugural exhibition featured around 80 works, taking up a total floor space of 1,270 m<sup>2</sup>. The main attraction was a large number of international classic exhibits spanning the second half of the 20th century up to the present day.



During development of the lighting concept, considerable importance was attached to achieving a lighting system which was unobtrusive but efficiently integrated into the architecture of the building. Emphasis was placed on the preferred strategy of using daylight which could be supplemented by artificial light as needed. To achieve this, the commissioned lighting design firm, a.g Licht, developed a special sawtooth roof design for the hall in cooperation with architecture firm wwa – Wöhr Heugenhauser Architekten. Daylight is predominantly screened out so that the amount of incident natural light can be controlled at all times.



Artificial lighting was implemented using TECTON Tetris light ribbons with open light distribution; these were built into the sawtooth roofs. In providing indirect illumination of the sawtooth roof areas, the luminaires produce indirect light that approximates the effect of daylight. As twilight falls, a lighting management system is used to gradually switch and intensify the artificial light; as soon as it is dark, it takes over the general lighting completely. Indirect general lighting is supplemented by accent lighting of the artworks using VIVO spotlights. The combination of diffuse general lighting and accent lighting creates an exciting interplay of light, setting the works of art perfectly centre stage. The lower level imitates the lighting concept of the sawtooth roof by means of roof slots, indirectly lit by TECTON Tetris light ribbons. VIVO spotlights have been integrated into the roof slots for accent lighting. This way, the lighting effect remains uniformly restrained over both floors, thus giving the viewer plenty of space to focus on the exhibition.



**Weishaupt Art Gallery, Ulm / D**

Architecture: wwa – Wöhr Heugenhauser Architekten, Munich / D

Lighting design: a.g Licht, Bonn / D

Lighting solution: TECTON-Tetris continuous-row lighting system, VIVO spotlights





“We feel that designing artificial lighting and daylight is an integral part of the architecture and a task which should preferably be started early at the initial design stage.”

Wilfried Kramb, lighting designer

# Modern architecture in a historical setting

## Petter Dass Museum

The Petter Dass Museum primarily tells the history of baroque poet Petter Dass, one of the nation of Norway's most important and best loved authors. The challenging project brief was to sensitively add a new modern building to a historic setting – the 18th century vicarage and a very well preserved medieval church, the oldest parts of which date back to 1200. Architect Snøhetta's team decided to make a cut in the landscape to create a new site; this cut allowed a freestanding building whose volume matches the amount of rock removed. The linear shape of the new museum, in conjunction with its glazed flanks, provides an unobstructed vista that gives visitors a completely new perspective; now they can contemplate the church at one end and the sky and water at the other end. Continuous SLOTLIGHT light lines in the ceiling break up the width of the museum, which is only 11.5 m wide, and visually expand it. This provides a straightforward, effective way of avoiding shadows on exhibits, which are illuminated by compact, discreet VIVO spotlights.





**Petter Dass Museum, Alstahaug / N**  
Architecture: Snøhetta, Oslo / N  
Lighting design: Snøhetta, Oslo / N  
Lighting solution: SLOTLIGHT II light lines, VIVO spotlights

## Intelligent daylight-based control adds value

Frieder Burda Museum



### Frieder Burda Museum, Baden-Baden / D

Architecture: Richard Meier & Partners, New York / USA

Lighting design: Lichtimpulse, Höchst / A

Lighting solution: PANOS downlight system, PASO II recessed floor luminaires, LIGHTTOOLS lighting channel system (special solution), TECTON-Tetris continuous-row lighting system, LUXMATE Professional Lighting Management System, special design with dual wallwashers

Almost as soon as it was opened, the museum (built according to New York architect Richard Meier's plans) became a place of artistic pilgrimage – not just for lovers of art and architecture but also for those with an interest in lighting and control. The endless requests for tours explaining the “Lighting solution for the Burda collection” and the many tours already given show that exemplary engineering that amazes experts in the lighting industry has been applied here in the management of natural and artificial lighting. An innovative sun screening and light directing system, which keeps light inside the building at a constant level, is used to allow daylight to flood into the building without compromising compliance with permissible limits. In the large hall that houses the collection, four light ribbons with two light colours are used to mimic nature's seasonal changes inside the building and, in addition, emphasise the dominating colour of a storey. The wallwasher system developed specifically to illuminate the 11 m high walls in the large hall is installed laterally in the floor area of the free-standing mezzanine. If a curator decides that additional partitions are required, the lighting channel system with its soft light distribution can be installed in all possible areas and positions. Spots can be fitted between the lighting channels to highlight pieces of art as required. All the luminaires – except the high-intensity discharge lamps – can be addressed and controlled individually via DALI electronic ballasts.



“The architecture made provision for the interior to receive as much daylight and transparency from outdoors as possible. At the same time, we were faced with the challenge of adequately protecting exhibits, some of which are extremely fragile, against the damaging effect of daylight, and meeting the conservation requirements which apply in an art museum.”

## Gentle lighting for precious textiles

### Textile Museum

The museum houses a spectacular exhibition of textile art and textile technology from all over the world dating back to the Middle Ages. Some exhibits are simply fragments whereas other objects such as garments, liturgical vestments and decorative items can be viewed intact. For museums that house precious historic exhibits such as these, excessive daylight in a museum has extremely dire consequences in terms of conservation. In this collection, daylight is completely excluded and ambient lighting is minimised – textiles and oil paintings can tolerate no more than 50 lux and 150 lux respectively. Very stringent restrictions are also placed on artificial lighting here in relation to exposure to IR and UV radiation. In applications like these, LED technology has distinct advantages because it produces IR- and UV-free light. Antique textiles are precious cultural artefacts and are kept in showcases and display cabinets, which are gently highlighted by ARCOS dimmable spotlights and compact SUPERSYSTEM LED spotlights.



#### Textile Museum, Prato / I

Architecture: Guicciardini e Magni architetti, Poggibonsi / I

Lighting design: Lumen, Bettolle / I

Lighting solution: ARCOS spotlights, SUPERSYSTEM lighting system

## Historical exhibits carefully set centre stage

### Museum Boijmans Van Beuningen

The Boijmans Van Beuningen Museum accommodates around 126,000 paintings and sculptures and is Rotterdam's largest art museum. The archives are located directly alongside the exhibition area and are only separated from it by a 25 m long backlit glass partition. The shelving and archiving systems where many precious exhibits are stored are clearly visible. Both these areas share the same access. Works can be exhibited on special presentation displays directly behind the glass partition on request. ARCOS spotlights are used to light the access area. In addition, light reflected from the display cabinets and the lighting in the adjacent glazed archives supplement illumination of the exhibition areas. Because the exhibits on show here are extremely fragile, the display cabinets are fitted with safety glass and equipped with the wallwasher version of the ARCOS spotlight with a protective UV filter. The spotlights can also be dimmed individually because the paintings must not be exposed to brightness in excess of 50 lux. The glass slopes at just the right angle to prevent distracting reflections on display cabinets; this slope angle was determined especially for this particular exhibition.



**Boijmans Van Beuningen Museum, Rotterdam / NL**  
Architecture: Molenaar & Van Winden Architecten, Delft / NL  
Lighting design: Immen Consultancy, Molenschot / NL  
Lighting solution: ARCOS spotlights

## Old art in a new light

### The “Türkische Cammer” – Dresden Royal Palace

The “Türkische Cammer” is one of the largest and most impressive art exhibitions featuring Ottoman treasures in Germany. After more than 70 years, it is once more possible to marvel at these magnificent exhibits, which include coats of mail, helmets, riding gear and banners as well as intricately worked harnesses, oriental weapons, garments and many other precious textile objects which have been reunited in one place as a permanent exhibition. All the various areas of the “Türkische Cammer” have a midnight blue colour scheme; ambient lighting immerses them in a light which creates a nocturnal moonlight scene. This scene is created by using TEMPURA LED spotlights set to a light colour of around 6,000 K and dimmed to produce illuminance of approximately 25 lux. This reduced brightness ensures there is sufficient brightness for visitors to find their way around but is still gentle on delicate textiles. All the precious objects in the display cabinets and the interior lighting in the magnificent Ottoman tents are set centre stage with delicateness and





discrimination using the STARFLEX fibre optic system. Central light engines with light sources that deliver colour temperatures of 3,000 K feed light into high-grade fibre-optic bundles. A large number of variable and diverse optics fitted at the ends of these fibre bundles ensure that light is guided with maximum flexibility. Linear illumination is used for colourfully adorned spears, ornately crafted arrows, fearsome guns and elaborately decorated swords. Clean accent lighting emphasises details particularly clearly, and exhibits become palpably more three-dimensional. Individual free-standing exhibits in the room and pictures on walls located in the “night-time” peripheral area of the exhibition are selectively highlighted by spotlights of the ARCOS range.



“Bringing the enchantment of a ‘night in the Orient’ to the Dresden Royal Palace was a huge challenge. Thanks to the new lighting solution, it is now possible to experience the huge fascination which Ottoman art held for the Electors of Saxony from the 16th to the 18th century in a unique manner.”

Prof. Dr. Dirk Syndram, Museum Director

**Dresden Royal Palace, Dresden / D**

Architecture: Peter Kulka Architektur, Dresden / DE

Electrical consultants: Ingenieurbüro Rathenow BPS GmbH, Dresden / D

Lighting solution: STARFLEX fibre-optic system, ARCOS spotlights, TEMPURA LED spotlights

## Precision illumination – innovative, flexible and efficient

### Museum of Islamic Art

An artificially reclaimed island some 60 m from the seaside promenade in Doha with a palm-fringed approach road emphasises the extraordinary status of the unique Museum of Islamic Art. The rather reserved and self-contained exterior surprises the visitor with an amazing openness inside. Perfect illumination of the treasures of Islamic art in the spacious halls and galleries is achieved using a customised solution developed by the lighting designers in conjunction with Zumtobel. The tall, slender glass display cabinets and their precious exhibits are precisely accent lit by optical fibres and special light outlets. UV-free light provided by Starflex also guarantees especially gentle lighting



“If you want people to come and stay, then you must create space for them and exciting pathways through these spaces.”

Leoh Ming Pei, architect

#### **Museum of Islamic Art, Doha / Q**

Architecture: Leoh Ming Pei, New York / USA

Lighting design: Isometrix, London / GB

Lighting solution: special STARFLEX fibre-optic system solution, 100 W QT12 (special design)

Spotlights for tracks, 100 W QT12 spotlights with innovative pivotable system

for delicate exhibits. The small spotlights which supplement the display cabinet lighting as required and also show the way around are not tied to the display cabinets and are therefore as flexible as possible. The decision was made to dispense with additional ambient lighting in order to retain an atmosphere which is as exciting as possible. The low-voltage spotlights here are special motor-driven versions, which can be aligned via a touch panel and dimmed using DMX control.



## Effective, gentle lighting

### Liebieghaus Frankfurt

The existing luminous ceilings in many rooms were replaced in order to modernise the lighting in the exhibition spaces. This made it possible to achieve uniform ambient lighting; not only that, objects are now individually illuminated by compact high-grade controllable and extremely energy-saving LED superspots mounted on a peripheral TREN track system. Thanks to the miniaturisation made possible by LED technology, the sculptures can now fully express their three-dimensionality in a focused manner. More than 2,000 LED spotlights are used to highlight the sculptures. The LED superspots are grouped together in sets of three and can be adjusted perfectly to suit the particular circumstances of a specific exhibition. The entire lighting installation is controlled by a LUXMATE Professional Lighting Management System. It is possible to control the brightness and colour temperature of the luminous ceilings at all times; control can be adjusted at any time to suit the time of day by using time-based programming. The LED superspots can also be grouped together in sets and controlled via the lighting management system, thus making it possible to adapt them to suit the particular circumstances of specific exhibitions.



#### Liebieghaus, Frankfurt / D

Architecture: Kühn Malvezzi, Berlin / D

Lighting design: Supersymetrics, Widnau / CH

Lighting solution: SUPERSYSTEM lighting system, TECTON continuous-row lighting system (to backlight the luminous ceilings), LUXMATE Professional Lighting Management System



“As far as we are concerned, the lighting concept is the ideal solution, not least in aesthetic terms, because its elegant design is self-effacing and does not upstage the sculptures.”

Max Hollein, Museum Director



## Sharp outlines – even in high-ceilinged rooms

Landesgalerie at the Upper Austrian Museum in Linz

A sophisticatedly dramatic chiaroscuro concept with precisely set contrasts using high-power framing spotlights produces an extraordinary exhibition experience. Rooms with accent lighting ranging from green and slate blue to red – glare-free and surrounded by a subtle aura – also help convey a sense of space perfectly. Exhibits (photo below and top right: “Toulouse-Lautrec exhibition: An Intimate Look”; photo bottom right: “The Forum Design case”) are precisely delineated and lit by ARCOS framing spotlights to minimise the illuminated wall surface area and turn each individual work of art into a gleaming island in its own right. The accent spotlights are DALI dimmable; this allows fast setting of and strict compliance with specified illuminance levels to conserve exhibits that are sensitive to radiation.





**Landesgalerie at the Upper Austrian Museum in Linz, Linz / A**

Lighting design: Upper Austrian Museum, Linz / A

Electrical installations: Gadermeier GmbH, Lohnsburg / A

Lighting solution: ARCOS spotlights, LUXMATE Professional Lighting Management System

**LED technology for dynamically staged lighting**

Archaeological Institute of the University of Zurich





The renovation concept placed particular emphasis on the best possible lighting quality and exploiting every opportunity to save energy. Those responsible for the decision making process quickly realised that Zumtobel's Tempura LED spotlight offered the perfect solution. Besides the facility to precisely define colour temperatures in the white spectrum from 2,700 K to 6,500 K, it is also possible to set the colour to any point in the colour triangle. The luminaire's incredibly long service life of around 50,000 hours minimises maintenance costs and, at the same time, takes full advantage of potential energy savings. A DALI control option allows precise and extremely convenient colour-temperature adjustment in the white spectrum and setting of any colour within the colour triangle. The LUXMATE Emotion Lighting Management System, which allows accurate remote colour-temperature setting to within a degree, is used to achieve this.

"We aim to enhance our visitors' enjoyment of art as much as possible. LED spotlights enable us to illuminate these historical relief slabs and sculptures in a multifaceted, highly appealing manner. The fact that these LED spotlights do not produce any UV radiation, which could harm valuable exhibits, is an equally important consideration."

PD Dr. Elena Mangoe, curator of the Collection



**Archaeological Institute of the University of Zurich / CH**

Electrical consultants: Step Stiefel, Zurich / CH

Electrical installations: Supratrade AG, Zurich / CH

Lighting solution: TEMPURA LED spotlights, SUPERSYSTEM lighting system (with indirect T16 fluorescent lamps), ONLITE ECOSIGN escape sign luminaires, LUXMATE Emotion Lighting Management System

# In the labyrinth of art

## M Museum



### **M Museum, Louvain / B**

Architecture: Stéphane Beel Architecten, Ghent / B

Electrical consultants: RCR Studiebureau cvba, Herent / B

Lighting solution: special solution with TC-L 36 W wallwashers, SUPERSYSTEM lighting system, SUPERSYSTEM lighting system (special solution with RESCLITE LED emergency light), TECTON continuous-row lighting system, TEMPURA LED spotlights, SLOTLIGHT II recessed luminaires, PERLUCE closed lighting system

The balance between the historic and the modern parts of the building emphasises the important cultural role which the museum plays in the life of the city. Architect Stéphane Beel's firm came up with an exciting complex which slots impressively into the fabric of the existing building for the ambitious M Museum project in Louvain (Belgium). Special functions such as the exhibition space, auditorium, archive, library, art shop etc. were housed in new and sometimes extrovertly designed areas of the building. Well balanced vertical lighting made it possible to achieve harmonious transitions between rooms with high ceilings and rooms with low ceilings – a combination of special T16 wallwashers and recessed tracks is used in some rooms with high ceilings; in contrast, only spotlights which provide dramatic accent lighting of objects and expressive illumination of paintings are used in other rooms. The facility to adjust the TEMPURA spotlight's colour temperature over the range from 2,700 to 6,500 K allows flexible adaptation to cope with extremely diverse exhibition requirements.



“Our objective was to make the museum a place where art can flourish, where it can be enjoyed rather than locking art away.”

Stéphane Beel, architect

# Using light to achieve vision and interaction

## BMW Museum Munich

Visitors enter the foyer on the ground floor and start walking around the new museum area which accommodates a permanent exhibition. Ramps leading downwards take the visitor to a fictitious city that seems to be built out of light. The BMW Museum provides a fascinating opportunity to experience and interact with new media – visitors can opt to visit any of the exhibition houses to familiarise themselves with the topics and exhibits dealt with in each of them. Each house is characterised by an individual identity with a specific appearance and appropriate lighting design. The museum is located below ground; downlights convey an impression of daylight and are supplemented by light from internally lit presentation cubes which use DMX-controlled LED technology.



### BMW Museum, Munich / D

Architecture: Atelier Brückner, Stuttgart / D

Lighting design: Delux AG, Zurich / CH

Lighting solution: PANOS downlight system, XENO spotlight special design

TECTON-Tetris continuous-row lighting system (special design), special design LED with DMX multichannel dimming control

“What fascinates me is the idea of letting architecture get into motion creating different atmospheres beyond the functional necessities ...”

Uwe R. Brückner, architect



### BMW Baureihen. Heckansichten. BMW model lines. A view from the rear.

Seit den sechziger Jahren weisen schlichte Zahlen und Buchstaben am Heck von BMW Automobilen darauf hin, um welches Modell es sich handelt. Diese Modellbezeichnung wird in den siebziger Jahren einer allgemeingültigen Regel unterworfen. Nun kann man alle BMW Automobile einer bestimmten Klasse zuordnen: 3er steht für Mittelklasse, 5er für obere Mittelklasse, 6er für die großen Coupés und 7er für die Oberklasse. Das einheitliche System wird weiter entwickelt und durch die M, Z und X Modelle ergänzt. Es legt den Charakter jedes BMW Automobils fest und gibt zudem Aufschluss über die Größe des Hubraums. Weitere Basisinformationen über Motor, Antriebsart oder Karosserieform vermitteln zusätzliche Buchstaben. BMW wird an diesen charakteristischen Emblemen auch in Zukunft festhalten.

Ever since the 1960s, BMW car models have been identifiable from a combination of numbers and letters on the hood lid or tailgate. In the 1970s, a new, universal model numbering principle was adopted. All BMW cars were designated in such a way as to indicate the model line to which they belonged: 3 for midsize cars, 5 for the upper midsize category, 6 for the large coupés and 7 for the large luxury models. This standardised system was developed further and the M, Z and X models added, so that the model designation conveys the character of the BMW car as well as the size of its engine. Additional suffixed letters relate to the type of engine, driveline and body style. BMW intends to retain this characteristic form of model designation for the foreseeable future.



The various areas are themed differently – from technically inspired, breathtakingly dynamic through to nostalgic flair – in an attempt to turn our fascination with the car into a feeling which can be a total experience. The substantive concepts are always underlined by appropriate lighting. The dimmable XENO HIT spotlight is new; it has an output of 150 W and its dynamic performance shows the exhibits in the right light. The architects have toyed with the many visual relationships created by the permanent exhibition's various ramps and levels. This produces interdependencies and conceptual links – things already seen and familiar objects disappear, reappear and are presented in a new light. Overarching topics are the Company, Design, the Motorcycle, Technology, Motor Sport, the Product Range and the Brand. These are interlinked in various size rooms and emphasised by a light show which features dynamic transitions.



## Architecture and light art – an inspiring symbiosis

### Dornier Museum

The Dornier Foundation was able to secure the services of American lighting artist James Turrell to stage the exterior facade of the Dornier Museum in Friedrichshafen. For James Turrell, himself a passionate pilot, this was a special commission: coloured cones of light are supplemented by light lines, creating an impressive composition which transforms the museum entrance into a luminescent art installation. Individual lighting sequences of various intensities and colours alternate in a mysterious rhythm – an incorporeal scenario that casts its spell over the onlooker, setting the scene for a fabulous dream: the dream of flying, becoming weightless and slipping the bonds of gravity. This sensual experience is implemented by spotlights and flood lights made by Space Cannon, a Zumtobel company which specialises in exterior lighting.







**Dornier Museum, Friedrichshafen / D**

Architecture: Allmann Sattler Wappner Architekten, Munich / D

Lighting design: Belzner Holmes, Heidelberg/D; façade lighting art: James Turrell, Los Angeles / USA

Lighting solution: OLYMPUS RGB+W spacecannon facade spotlights, MAYA RGB spacecannon recessed downlights, HILIO RGB+W LED light lines, SLOTLIGHT II light lines, Simes FOCUS spotlights, Robe scanners, VIVO spotlights, TECTON continuous-row lighting system, VITRA LE spots I, MLL batten luminaires, ZE individual batten luminaires

# Light creates new worlds

## Kunstmuseum Wolfsburg

American lighting artist James Turrell produced his largest installation ever shown in a museum as part of the Wolfsburg Project. Visitors to the Ganzfeld Piece experience unique sensory perceptions in this homogeneous visual field. While the light manifests itself, referring to nothing but itself, an interplay between surfaces, colours and space is produced, creating an atmosphere that completely envelopes the audience and their senses. Viewers plunge into a mysterious, yet scenic world made of pure light. The artist himself calls this experience “feeling with one’s eyes”. Lighting installations of this type demand technical capabilities which have only recently become a practical reality. Installations like this are simply not possible without modern LED technology and advanced control technology. The Ganzfeld Piece uses 250 Zumtobel HILIO LED light lines and 24 OLYMPUS LED spotlights fitted with more than 30,000 LEDs. DMX control technology makes it possible to control more than 65,000 brightness gradations and millions of colour hues. The solution deployed here really is absolutely state-of-the-art.

“I try to relate the corporeal to the incorporeal, the visible to the invisible – my works do not deal with light, they are light.”

James Turrell, lighting artist

### **Kunstmuseum Wolfsburg / D**

Architecture: Schweger Associated Architects, Hamburg / D

Lighting art: James Turrell, Los Angeles / USA

Lighting solution: HILIO LED light lines, spacecannon OLYMPUS LED spotlights, DMX control system



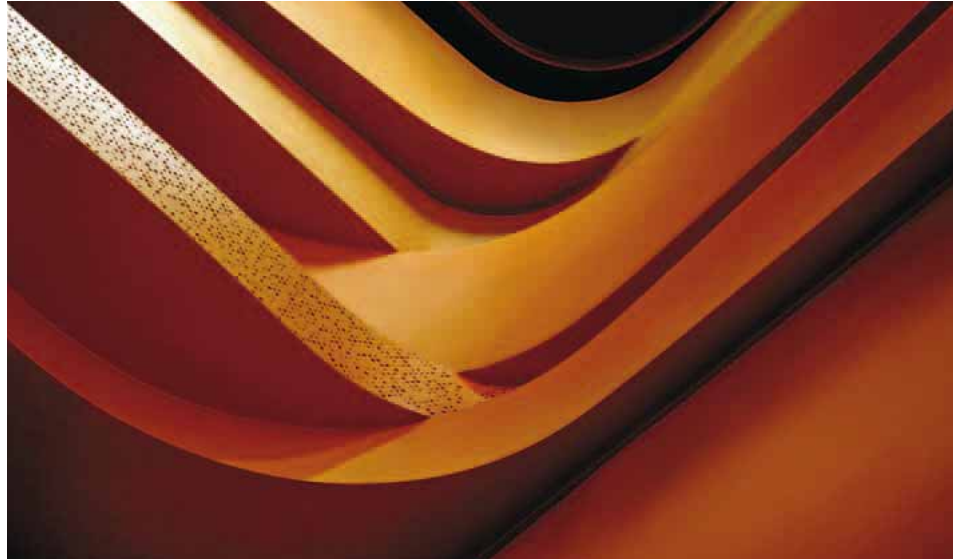


## Light for a superlative concert hall

Danish Radio

The concert hall welcomes visitors in like some new world in its own right, with walls clad in warm wooden hues and the seat coverings in various earth shades. Here, architecture is the backdrop and space is the landscape. Rows of seats are arranged around the stage like terraced slopes. Everything is bathed in majestically subdued lighting, initially like that of the evening sun; then, as the concert begins, like candlelight. Specially developed recessed floor luminaires light the walls of the balconies and flood them with soft light. Along the upper edge of the room, a light ribbon simulates the entry of daylight, while at the same time providing exactly the right lighting for the huge mural by Alain Bony and Henri Labiote which represents a stylised sunset. Indirect floodlights on the gigantic acoustic reflection sail in the centre of the room flood the hall with majestic halogen light. The desired lighting scenes were composed from a total of over 800 individually controllable lights or lighting groups in the concert hall using the LUXMATE Lighting Management System.





“Architecture is like music; it is made to move and delight us.”

Jean Nouvel, architect



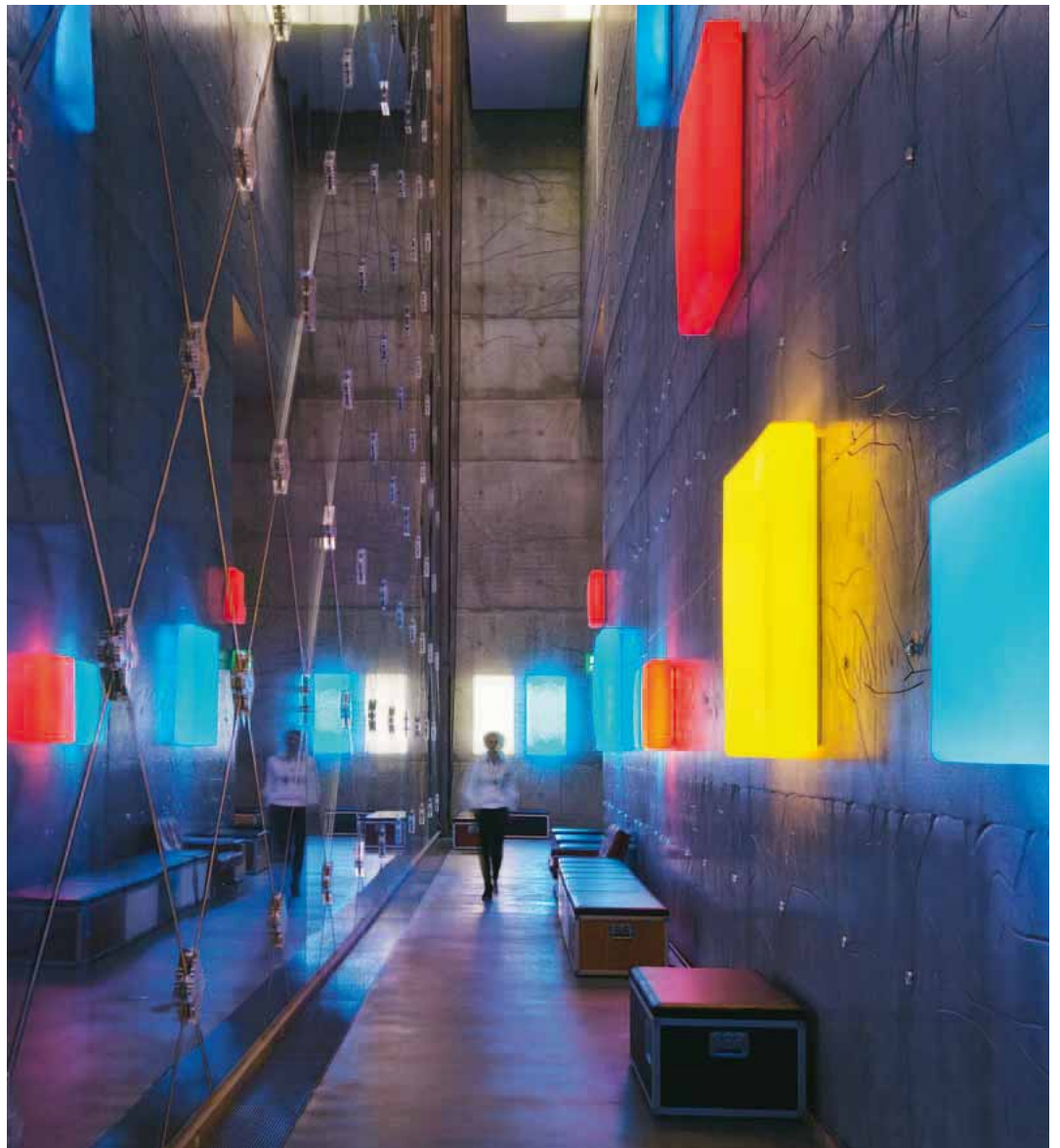
**Danish Radio, Copenhagen / DK**

Architecture: Ateliers Jean Nouvel, Paris / F

Lighting design: Atelier Yann Kersalé, Paris / F

Lighting solution: CONCRETE LIGHT light cushions, ZIG-ZAG light lines, recessed floor luminaires, gobo projectors, ALW light fields, PIANO lights, KAREA free-standing and wall-mounted luminaires, 2LIGHT mini-downlights, PANOS downlights, LED starry sky with 1,600 LEDs, escape sign luminaires, LUXMATE Professional Lighting Management System

Whereas the large concert hall is dedicated to the great works of music, the three smaller auditoria provide a suitable ambience for all conceivable musical categories and niches – both visually, through three quite different design themes, and acoustically through adjustable acoustic reflection characteristics. All four auditoria have one thing in common – probably a uniquely high standard of technical equipment.



## Dealing sensitively with historic structures

Cité De L'Architecture Et Du Patrimoine Paris

The entrance to the central Bibliothèque d'Architecture in Paris is a light-flooded space with vertical narrow bands of windows. Several installations uniting historical and modern architecture with the cultural heritage of France have been gathered in these prestigious premises which offer views over Paris. The lighting design of the spacious entrance hall of the Cité on the ground floor imparts this area with a clear structure, enhancing visitor orientation and centralising access to the various areas. The light lines set in the ceiling trace the main axes of the hall along the monumental columns while simultaneously marking the system of access routes. Opposite the entrance and ticket counters, the large hall opens out onto the restaurant terrace. At right angles to the terrace, ribbons of light in an east-west direction highlight the way to the Gallery of Plaster Casts and the stairs leading to the upper floors.







**Cité de l'Architecture et du Patrimoine, Paris / F**

Architecture (alteration and renovation): Agence Bodin, Paris / F

Lighting design: Agence Bodin, Paris / F

Lighting solution: SLOTLIGHT II light lines, TECTON continuous-row lighting system, TECTON-Tetris continuous-row lighting system

## Fibre optic systems for sensitive lighting

Friedenstein Castle



### Friedenstein Castle, Gotha / D

Architecture: Homann Güner Blum – Visuelle Kommunikation, Hanover / D  
Lighting design: Homann Güner Blum – Visuelle Kommunikation, Hanover / D  
Lighting solution: STARFLEX fibre optic system



Friedenstein Castle was built in the 17th century, and its “Kunstkammer” (Art Chamber) was reopened to the public in 2009 after extensive renovation work. Wall mounted display cabinets were specially developed in order to protect the precious exhibits while, at the same time, making them clearly visible and freely accessible to visitors. These were the only components without a history. Unique parquet and marble floors as well as magnificent stuccoed ceilings also needed to be showcased. One light engine for each display cabinet provides sufficient light not only for the exhibits, but also for the artfully restored ceilings and splendid floors. Light can be directed in any direction using flexible fibre-optic bundles and focused at any time using special lenses. Because the light engines used are 70 W HIT models, a fan-free version can be used to minimise distracting noise.



“Letting visitors see the art treasures through our eyes: that is important to us. This requires not only appropriate exhibition design with excellent display cabinets but, increasingly, intelligent use of light to guide visitors. Only light lets us guide the viewer’s eye and draw attention to the fine details of the hallmark on gold work.”

Dr. Martin Eberle, Director of the Friedenstein Castle Association

## Traditions reinterpreted

### Open Church of St. Clare

The Church of St. Clare appears small and unprepossessing from outside, but its interior reveals a lofty barrel vault. "Clarity" was the keynote of the project to redesign the church as far as architects Brückner & Brückner were concerned. An intriguingly purist church space which is strikingly, carefully and modestly lit by usual church standards awaits the visitor. In accordance with the style brief, no luminaire unit apart from the decorative glass pendant luminaires was to be visible. Special recessed CARDAN SPIRIT units were integrated into the ceiling structure to ensure that they remained appropriately inconspicuous. As the vault is a double shell structure, the luminaires can now be maintained from above – this means that relamping can be carried out without having to use awkward and expensive scaffolding or lifting platforms.



#### Open Church of St. Clare, Nuremberg / D

Architecture: Brückner & Brückner Architekten, Würzburg / D

Electrical consultants: Burghart Ingenieure GmbH, Nuremberg / D

Lighting solution: TECTON-Tetris continuous-row lighting system, UNO 55 spotlights,

SOLARTRON special design, cylindrical glass pendant luminaire (special design),

CARDAN SPIRIT modular lighting system (special design)



The Lady Chapel, whose entrance is in the right hand aisle of the Church of St Clare, provides an interesting contrast with the spaciouly proportioned church space. The statue of the Virgin Mary stands in a walk-in "chamber", whose slender walls consist of layered strips of precision CNC machined glass and wood. Light from indirect TECTON-Tetris continuous row luminaires reflected by the ceiling in the main space pierces the glass strips and gives this "room in a room" a fascinatingly sacred feel.



## State-of-the-art technology in harmony with historic architecture

### Church of St Francis of Assisi

The interior of the church, which was completed in 1265, is a spacious open area with wide-spanned arcades. In order to provide lighting which did this venerable structure justice, sets of eight TEMPURA spotlights were assembled to produce seven large “chandeliers” – this built a very interesting, photometrically accomplished bridge between the Romanesque and the modern style; Romanesque traces are still clearly apparent in the form of the large round-arch portal. The chandeliers were spaced a precise distance apart in order to make sure that the rows of seats for the congregation were illuminated as uniformly as possible. Mounted directly on the sombre looking roof of the nave, the lighting therefore takes second place to the overall appearance of the church, is never intrusive and discreetly emphasises the linear lines of the sacred building and the benches for the congregation. The LUXMATE Emotion Lighting Management System makes it possible to adjust the colour temperature and quantity of light individually.





**Church of St Francis of Assisi, Brescia / I**

Lighting design: Studio Tecnico – Piergiorgio Sala, Brescia / I

Electrical installations: ASM Distribuzione Elettricità S.r.l., Brescia / I

Lighting solution: TEMPURA LED spotlights (special solution), LUXMATE Emotion Lighting Management System

# Intelligent lighting solutions in all areas

## Brandhorst Museum

What the client wanted was a daylight-based museum, built in line with the latest energy efficiency know-how, but without windows. Architect's Sauerbruch Hutton therefore developed an architectural solution which allows vertical daylight to enter the building on all three building floors. "Thanks to daylight ceilings, the light is distributed uniformly. Light from artificial light sources can either be added, if required, or it can entirely replace daylight. This ensures optimum lighting conditions for the precious exhibits, depending on time of day, weather and needs" commented the architects, explaining their concept. All the galleries comprise a total area of 3,200 m<sup>2</sup> and are fitted with white walls and solid Danish oak board flooring. This is the muted backdrop against which the artworks – most of which hang on the walls – can be viewed. An average ceiling height of nine metres creates space for the art to exert its effect. A gentle culmination is achieved by translucent textile ceilings on the upper floor, where daylight can enter unimpeded. Visitors enjoy the subtle interplay of ever-changing daylight, which makes the exhibits' many facets shine out in a completely natural way.

"Thanks to daylight ceilings, the light is distributed uniformly. Light from artificial light sources can either be added, if required, or it can entirely replace daylight. This ensures optimum lighting conditions for the precious exhibits, depending on time of day, weather and needs."

Sauerbruch Hutton Architects, Berlin





**Brandhorst Museum, Munich / D**

Architecture: Sauerbruch Hutton, Berlin / D

Electrical consultants: ZWP Ingenieur-AG, Munich / D

Lighting solution: TECTON continuous-row lighting system, TEMPURA LED spotlights, LED light lines (special design)

# Ideal light sources for art and culture

## Advantages of using LEDs

**Energy-saving** The light projected by ARCOS LED spotlights rated at 12 to 30 W makes them suitable replacements for spotlights with halogen incandescent lamps rated 30 to 60 W. Energy consumption over the entire service life is cut by as much as 1,500 kWh. Similarly, they are already capable of replacing compact fluorescent lamps in terms of overall system efficiency in modern downlights such as PANOS Infinity. The reduced heat dissipation of LEDs also has a positive impact on operating costs: the loads placed on air-conditioning systems are significantly smaller and such systems can therefore be scaled down.



**Gentle lighting/conservation aspects** Dramatic lighting enhances prestigious premises but, at the same time, the lighting must not damage precious objects. Innovative LED technology is the long-term answer to such needs. The latest LED luminaires meet the exacting requirements of museum management staff in every respect. LEDs are the only light source where the IR/UV component of light can be ignored without having to use additional filters and protection. Even when a LED luminaire is positioned close to an object to achieve maximum effect, it delivers more gentle lighting than conventional luminaires. This significantly reduces the risk of colours fading or sensitive materials being damaged.



**Colour temperature change** A simple change of colour temperature is an ideal way of achieving sensitive lighting solutions which are perfectly attuned to any art era and exhibition concept; quality of perception can also be selectively influenced this way. The previously set colour temperature is accurately maintained even when the LED luminaire is dimmed and materials retain their natural appearance. A lighting solution that offers modifiable colour temperatures in the white light spectrum allows exhibition designers to underscore the attributes of an objet d'art emotionally and emphasise content and substance succinctly.



**New dimensions** LED luminaires can be used to create thrilling highlights and heighten the viewer's attention level. Pinpoint accent lighting: the way that LEDs are designed means that they are necessarily aligned straight ahead, tightly focused and therefore perfect for efficient accentuation and preventing scattered light. This makes LEDs ideal for emphasising details or setting the surfaces of materials centre stage. Miniaturised designs such as SUPERSYSTEM blend seamlessly into the architecture.



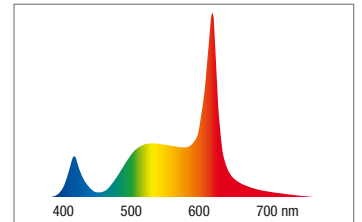
**Service life & maintenance** Because of their extremely long service life (50,000 hours before residual luminous flux is reached in the case of Zumtobel products), LEDs allow longer maintenance intervals. The long life expectancy of Zumtobel LED luminaires minimises expensive maintenance work – especially in situations where relamping requires considerable effort. Museums with high ceilings or elaborately protected and secured display cases containing valuable exhibits are just two examples where a durable LED luminaire soon pays for itself. ZUMTOBEL LED spotlights are designed for optimal thermal management and feature either active cooling with innovative fan technologies or passive cooling using a heat dissipation solution.



**Using colours to set the stage** Colour changing RGB LED light raises onlookers' attention levels. This tool makes it possible to create special lighting scenes and scenarios in an exhibition relatively effortlessly. For persons responsible for design, this opens up enormous creative scope to deliver emotional and functional added value. It is in existing projects where the lighting technology is to be upgraded or extended that LED spotlights with colour changing RGB light really reveal their technical advantages. If the spotlights are also integrated into a lighting management system, this provides a comprehensive toolkit for lighting sceneries. Light colours can be defined in shade increments small and precise enough to produce sequences which the human eye perceives as flowingly dynamic.

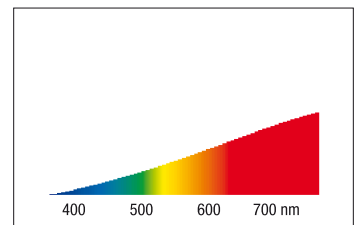


**LED** The luminous efficiency of latest-generation LEDs is far higher than that of halogen incandescent lamps and is currently 40–80 lm/W depending on colour temperature. The focused light produced by LEDs is absolutely perfect for accent lighting. From a conservation viewpoint, LEDs are highly recommended because they produce negligible UV and IR radiation. Other unique selling points of LEDs include simple dimmability and a long service life (50,000 hours until luminous flux drops to 70 % in case of Zumtobel products, ignoring small numbers of failures).



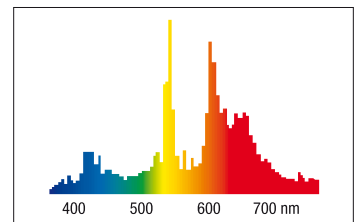
Spectrum curve: LED with 2,700 K and Ra > 90

**Low-voltage IRC** Size for size, the service life of low-voltage IRC (Infra Red Coating) light sources is twice as long as that of standard halogen lamps, and they need up to 30 % less energy to produce the same amount of light. They provide brilliant, warm light, similar to that of incandescent lamps, with good colour rendition – this is especially important when it comes to showing colour details realistically.



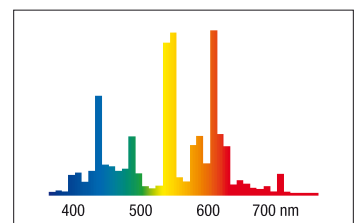
Spectrum curve: low-voltage halogen lamp

**Compact HIT lamps** Metal halide lamps have good luminous efficiency and good to very good colour rendition characteristics (Ra up to > 90). HIT lamps with a ceramic discharge tube achieve excellent colour stability and especially good energy efficiency (80–100 lm/W) but are usually not dimmable. When used with electronic ballasts, HIT lamps achieve an average service life of up to 15,000 hours (with a 50 % failure rate and drop in luminous flux of up to 20 %).



Spectrum curve: HIT LF 930 metal halide lamp

**Fluorescent lamps** Modern fluorescent lamps are characterised by high luminous efficiency, good to very good colour rendition (Ra up to 96) and a long service life (typically 20,000 hours when used with an electronic ballast). The fluorescent material converts most UV radiation into visible fluorescent light so that only small, harmless amounts of damaging UV components are emitted. Fluorescent lamps can be used to obtain economically efficient wide-area lighting.



Spectrum curve: LF 840 fluorescent lamp

## Products for art and culture



[www.zumtobel.com/supersystem](http://www.zumtobel.com/supersystem)

### **SUPERSYSTEM** | MULTIFUNCTIONAL LIGHTING SYSTEM



The SUPERSYSTEM modular lighting system is fascinatingly compact and offers numerous combination options – from conventional through to LED lighting modules. Compact LED spots are suitable for gentle, accurate accent lighting, even over long distances, and T16 lighting modules can be used to obtain uniform ambient lighting; they take up extremely little space.

[www.zumtobel.com/linaria](http://www.zumtobel.com/linaria)



### **LINARIA** | INDIVIDUAL BATTEN LUMINAIRE AND LIGHT LINE

Its extremely slender body makes LINARIA the ideal luminaire for prestigious applications. LINARIA has no enclosure and is supplied with light seamlessly right to the very end of the luminaire. When the luminaires are mounted next to each other, they create a seamlessly continuous light line.

[www.zumtobel.com/slotlight](http://www.zumtobel.com/slotlight)



### **SLOTLIGHT II** | RECESSED, SURFACE-MOUNTED AND PENDANT LUMINAIRE

Soothingly pure light in uniformly illuminated lines makes SLOTLIGHT II the perfect design feature. Instead of displaying a luminaire unit, the new light line focuses on outstanding lighting technology.

[www.zumtobel.com/lighttools](http://www.zumtobel.com/lighttools)

### **LIGHTTOOLS** | MULTIFUNCTIONAL LIGHTING CHANNEL SYSTEM



Thanks to the ease with which it can be modified, the LIGHTTOOLS lighting system allows considerable design independence. LIGHTTOOLS makes any kind of lighting possible: accent, wide-area, ambient and wall lighting. The corresponding lighting modules can be inserted and moved without the use of any tools – in a unit just 100 mm wide.

DOWNLIGHT SYSTEM | **PANOS**

[www.zumtobel.com/panos](http://www.zumtobel.com/panos)  
[www.zumtobel.com/panosinfinity](http://www.zumtobel.com/panosinfinity)

Zumtobel's new PANOS Infinity LED downlight range makes tomorrow's lighting quality, efficiency and design available today. Its pared-down design vocabulary and a system luminous efficiency of up to 77 lumens per watt together with a colour rendition index in excess of 90 make this system the perfect answer in situations where economical but upmarket ambient lighting is called for.



SPOTLIGHT SYSTEM | **ARCOS**

[www.zumtobel.com/arcos](http://www.zumtobel.com/arcos)

The compact dimensions and straight-line design of ARCOS spotlights and wallwashers complement the well-balanced proportions of the spotlight range perfectly. The spotlights are available in four different sizes with a unique choice of optics, sources (including LEDs) and accessories.



MODULAR FIBRE OPTIC SYSTEM | **STARFLEX**

With its practical modular design, the STARFLEX fibre optic system offers plenty of scope for creative lighting applications. Diffuse ambient lighting is just as feasible as sensational accent lighting. A large number of pivoting optics ensure maximum flexibility.



MODULAR LUMINOUS CEILING | **CIELOS**

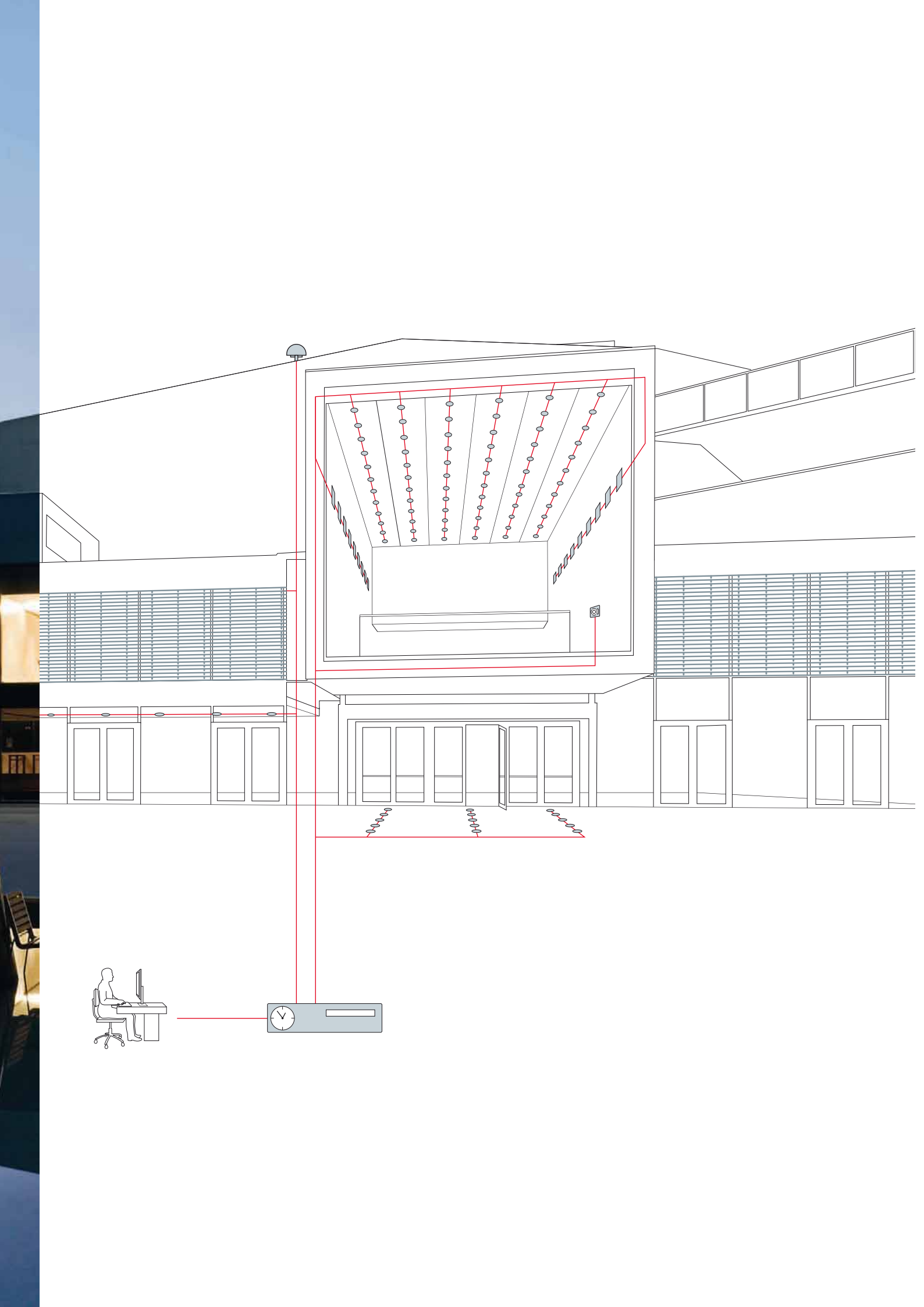
[www.zumtobel.com/cielos](http://www.zumtobel.com/cielos)

Square CIELOS lighting modules can be used to form any surface area as required and support multifunctional, animated lighting applications. Besides wide-area colour control, CIELOS MOVE also offers the facility to adjust each of its lighting points individually.



## Lighting control for art and culture







#### Integration and monitoring

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Central monitoring using the LUXMATE LITENET server makes maintenance tasks child's play. Burn time management, lamp failures and the setting of parameters from a central location are dealt with quickly and straightforwardly. Industry-standard interfaces such as OPC and BACnet allow integration into building management systems.



#### Daylight-based control

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Daylight is the best and most pleasant light. Intelligent daylight-based control only adds just the right amount of artificial light needed to obtain optimal illuminance. This produces energy savings of up to 70 %.



#### Blinds

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Direct sunlight is the most pleasant and most natural light. However, with precious exhibits it is especially important to control the amount of sunlight precisely. An automatic blinds control system does this and also helps stop buildings from heating up uncontrollably.



#### Control of artificial light

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A large variety of different types of luminaires and lamps are usually used in a building. Integrating all components across the board provides the basis for an intelligent lighting solution.



#### Operation

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Different activities and events demand different lighting situations. With modern control units, one intuitive keypress is enough to adapt the lighting situation in a room.

**LUXMATE LITENET – highly flexible central lighting control** The innovative LUXMATE System makes it possible to integrate daylight in museum buildings perfectly without compromising compliance with conservation requirements. In addition, LUXMATE allows lighting to be adapted flexibly to suit various conditions of use and monitored from a central location (lamp defects, burn times, maximum lux levels). Another plus: the size and functionality of the lighting control system can be adapted to suit the needs of specific customers.





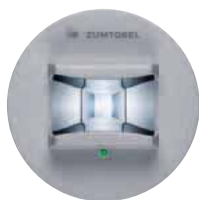
# Inconspicuous in day-to-day life – reliable in an emergency

ONLITE emergency lighting for art and culture



M Museum, Louvain / B: RESCLITE special solution on 3-phase track

**Emergency lighting for art and culture** Luminaires that are not suitable for integrated emergency lighting due to their construction, design or light source are often used for art and culture. Nevertheless, emergency lighting in conformity with applicable standards must also be ensured in such locations, making sure that escape routes are precisely illuminated with sufficient illuminance.



## RESCLITE escape

LED emergency luminaire for escape route lighting according to EN 1838.

Maximum luminaire spacing:  
up to 23 m > 1 lux



## RESCLITE anti-panic

LED emergency luminaire for anti-panic lighting according to EN 1838.

Maximum room illumination:  
up to 170 m<sup>2</sup> > 0.5 lux



## RESCLITE spot

LED emergency luminaire for display lighting according to EN 1838.

Maximum display lighting:  
Ø up to 3 m > 5 lux

## ONLITE RESCLITE – maximum safety with an inconspicuous design

RESCLITE LED emergency luminaires blend seamlessly into modern architecture thanks to their compact size and discreet design. Three different lens types offer maximum performance for every application. This means that a smaller number of luminaires is enough to ensure perfect viewing conditions even in an emergency and to far exceed the requirements laid down by the standards. And the best thing about it: it is absolutely independent from general lighting and lighting management systems. The very low installed load of LED luminaires together with the reduced number of lighting points needed make it possible to use very small power supply systems. This saves additional costs and the scaled-down battery packs save the environment.



M Museum, Louvain/B

**High-tech and design** The extensive range of available ONLITE LED escape sign luminaires made of high-quality materials and featuring top-notch design means that they blend into the architecture exceptionally well and inconspicuously. Excellent LED lighting technology ensures uniform illumination of pictographs and hence an upmarket look as well as optimal orientation in an emergency. This luminaire product range is rounded out by a comprehensive choice of power supply systems.



**ONLITE PURESIGN**  
LED escape sign luminaire  
Designed by EOOS



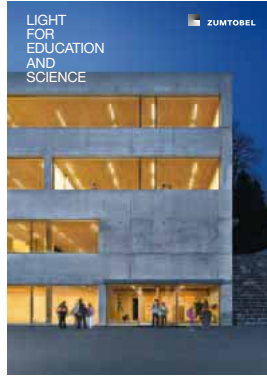
**ONLITE ARTSIGN**  
LED escape sign luminaire  
Designed by Matteo Thun



**ONLITE central CPS**  
Emergency lighting systems  
with central power supply



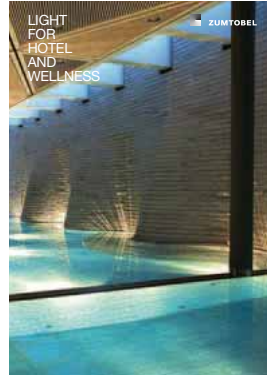
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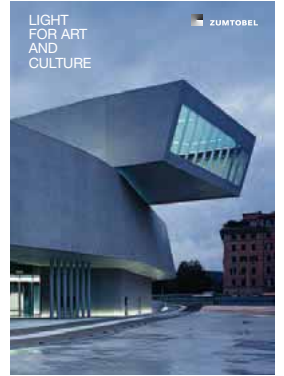
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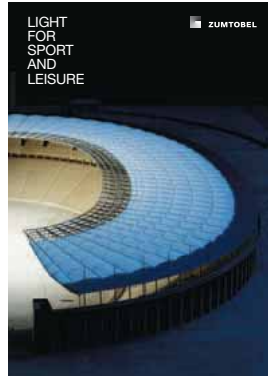
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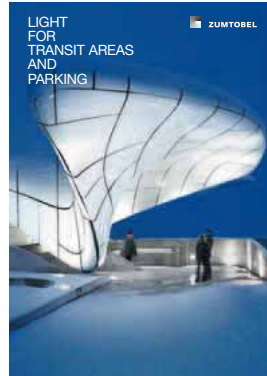
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