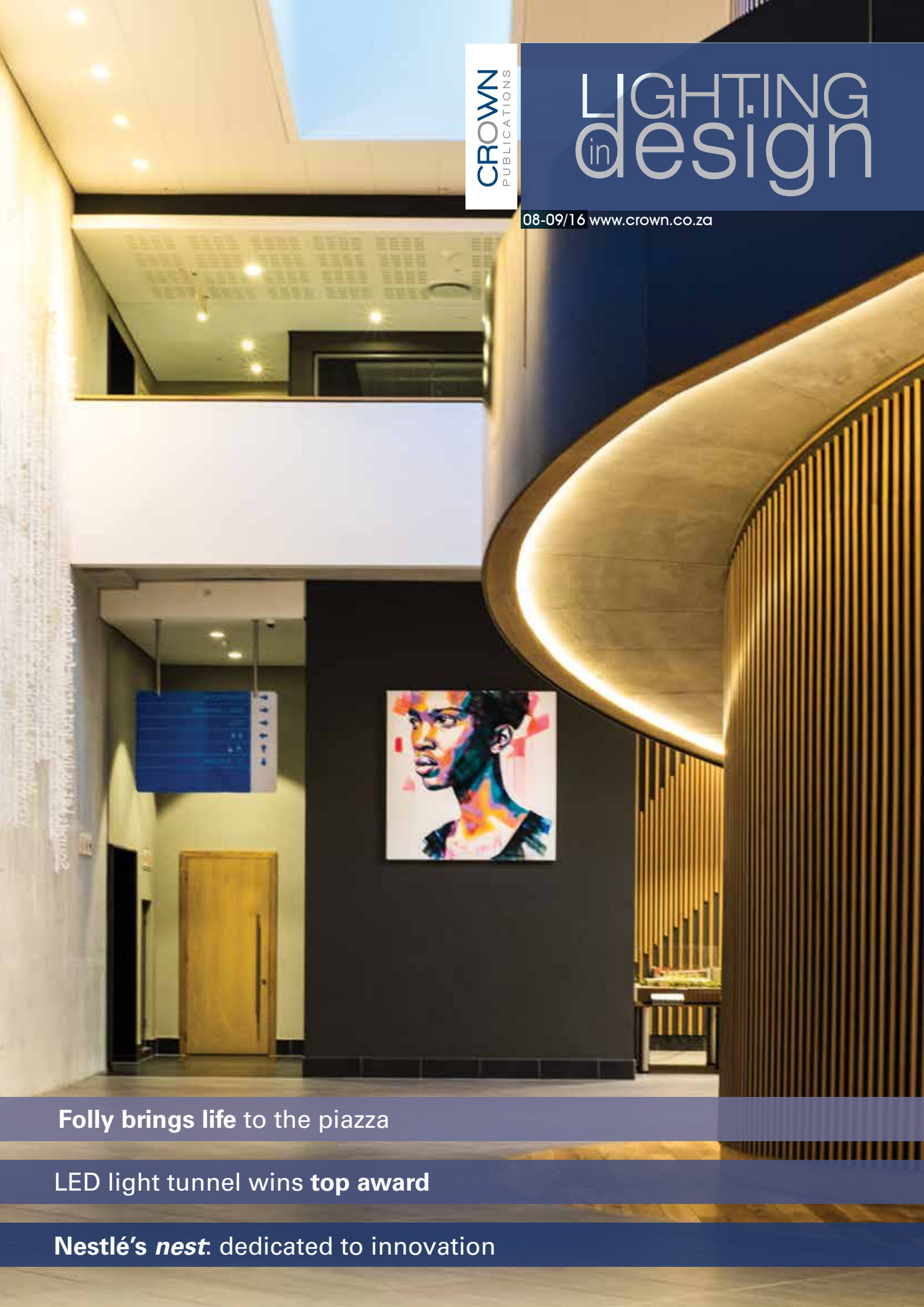

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EdSpace

Henk Rotman, in his article 'Increased freedom in lighting design', notes that although LEDs are installed in almost all new projects these days, we still have a lot to learn about the advantages of this digital technology and translating them into value added benefits. One of these benefits is running the LEDs at different operating currents to achieve customised solutions for light levels and energy consumption. It is this feature of LEDs that offers flexibility in the design of luminaires and in the lighting design of projects. Designers no longer need to specify more luminaires or luminaires with more lamps to adjust light levels; they can alter the level of light up or down as required by changing the operating current and manage energy use at the same time. To change the operating current of an LED, however, a programmable driver is required and here the technology is evolving fast.

Modern drivers are exceptionally slim, offer excellent thermal characteristics and are easily dimmed. They are traditionally programmed via an interface such as DALI but these days the settings, including the operating current of the LEDs, can be programmed wirelessly via a near field communication interface. Near field communication is especially convenient in instances where the use of a space changes i.e. office to store room or where the colours of carpets or walls are altered. Simply by reprogramming the driver the light levels can be altered. Like coming to terms with and using the features of a new laptop or smartphone, lighting designers and maintenance managers constantly have to understand and apply the ever-changing technology attached to modern LEDs in order to imagine and achieve the greatest advantage from them.

On the topic of implementing imaginative concepts and technology, in this issue of *Lighting in Design* we look at the project created to celebrate the 150th anniversary of Nestlé, the world's largest food company. Over 100 Dutch designers, engineers and builders worked with Tinker, a Dutch experience design bureau, to design the scenography for *nest*, an open house located close to where Henri Nestlé opened his first factory in 1866. Visitors traverse five zones ranging from the start of Nestlé to current global challenges in food production. As Erik Bär, one of the founders of Tinker imagineers, explains, the lighting design throughout this glorious project clearly outlines the relevance of light to great experience design. Light directs, creates and focuses attention of the visitors to *nest* and, along with technology, is used in a way that contributes to the authentic feel of the entire experience.

Other articles in this issue include the illumination of two urban squares, one in Cape Town's Century City and the other in Sandton, Johannesburg. We also look at the lighting installation in Mall of the South, a recent retail development in, as the latter part of the name suggests, the south of Johannesburg.

Till next time …

Karen

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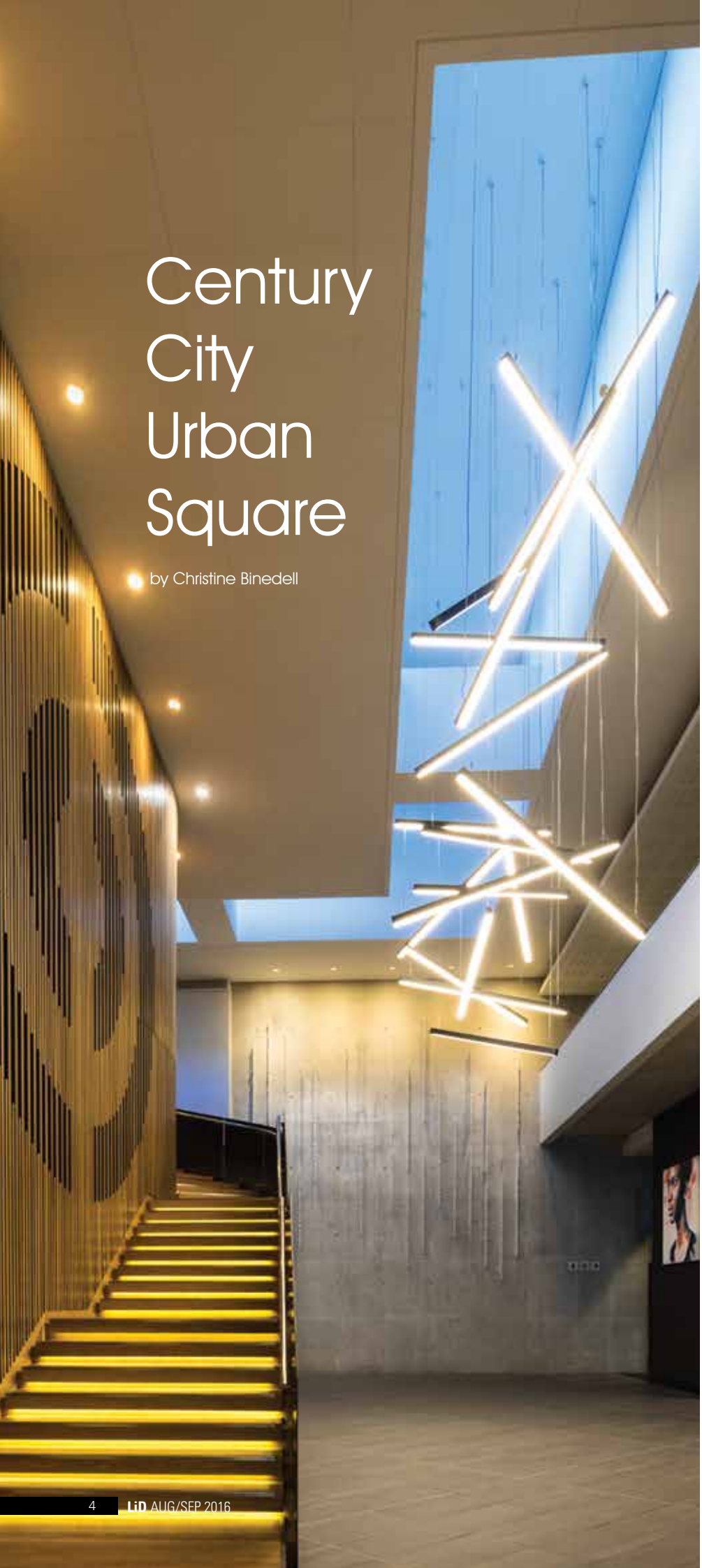
INside ...

Century City Urban Square

by Christine Binedell



Century City Urban Square (CCUS) is a mixed-use development in the heart of the Bridgeways Precinct in Cape Town. The development, by the Rabie Property Group, consists of the Century City Conference Centre, Century City Hotel, the Apex offices, the Matrix mixed-use building (retail space, offices and residential), a structured, multi-level parking facility and a super basement, which connects all the buildings above.

QDP Lighting & Electrical Design was responsible for the lighting design for the Conference Centre (internals and associated external facades) and the external precinct lighting (Energy Lane, the Piazza, the surrounding canal), and for the concept designs for the façade lighting on the other buildings. The company was also appointed as the Electrical Consultant for the Conference Centre, structured parking and super basement.

The entire precinct is to be submitted to GBCSA in the hope of achieving the first ever GBCSA Green Star custom mixed-use Four Star rating. The lighting to all areas therefore had to be designed in accordance with the relevant green star requirements.

Conference centre

The conference centre accommodates up to 1900 guests across 20 different venues. Each of these spaces had a different architectural composition, a range of functional requirements and respective lighting prerequisites. As with all multi-purpose spaces, a series of challenges and design requirements had to be considered and more importantly, in terms of green building, adhered to.

The ground floor houses a pre-function area, four large conference halls and general seating areas. Both the pre-function area and conference halls spaces have to accommodate a range of functions varying from car launches, product expos and corporate functions to training sessions,

gala dinners and concerts. The first floor has a series of smaller meeting rooms and a buffet/lounge type seating space. The compulsory flexibility of the spaces and the varying light scenarios required for each were driving factors when selecting the fittings and control system and, with the Green Star in mind, energy efficiency was key.

The entire internal lighting design, with the exception of a few high level wall washers, makes use of LED fittings (for both functional light and feature light). Even the high level spaces of up to 5 m were illuminated by LEDs. Various moods and scenes were achieved using a combination of recessed downlighters, linear LEDs, cove lighting and track lighting in conjunction with feature elements accentuating the perimeter walls and custom made suspended lighting elements. With these fitting types and layouts, the control system allows users to choose from a series of pre-set lighting scenes, each taking the various activities of the relevant areas into account and, in the case of the conference halls, the ability to customise scenes and create new ones via a wireless device.

Being the point of arrival and welcome for visitors to the centre, the lighting for the external undercover walkway and the *Porte Cochére* were given particular attention and every attempt was made to integrate the fittings into the architecture, acknowledge the repetition of the structural design of the building, make the internal and external spaces read as one, and create obvious links to other buildings in the precinct. To emphasise this link and to create a sense of continuity and a holistic approach throughout the precinct, the same external fittings and designs, also with LED as the source, were used for all the buildings.

The façade lighting posed the biggest challenge to green building requirements. Since the building has no roof overhang or cap, uplighting was prohibited. The final concept, installed on the Conference Centre façade, enhances the architecture while adhering to green building requirements. On the piazza side, high level narrow beam fittings have been installed, accentuating the strong vertical lines created by the glazed panels whilst highlighting the texture and the façade brickwork. This concept was repeated on the hotel façade, which overlooks the square, and together they form a strong L-shaped enclosure, which 'holds' the square behind the piazza and the glass Apex building.

On the Kinetic Way façade, the lighting is more playful to break the flat brickwork panels. The custom designed and manufactured LED fittings create a feature during the day, with their play of shadows

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on the façades, and at night when the fittings create individual glows, with slight pin prinks of light sparkling off the façade.

On the other façades where low level uplighters were installed, custom 'spill light covers' were designed and manufactured to angle the light back onto the facades and thus conform with the green building requirements.

Precinct

The main objective for the precinct was to create a public gathering space for day and night time use. To achieve this at night, lighting was critical and had to be inviting without being overpowering, provide a sense of security, be dynamic, and link the precinct to the larger Century City. The circulation routes around the precinct are clearly defined by well-lit walkways. These wrap around most of the buildings and outline the piazza perimeter. The actual links between the precinct and the surrounding area are depicted by a series of timber decks, highlighted by low level LEDs racking across the decks and defining the pedestrian exit/entry points. The piazza itself has a slightly lower level of light and relies primarily on the perimeter spill light to create contrast between the spaces. Standing in the centre of the piazza, the vibrancy of the perimeter spaces is accentuated by the lower light levels of the piazza. The warm light levels of the precinct lighting are offset by a blue glow over the water body of the canal along the main perimeter road side. The blue light is created by LEDs under the overhanging decks and the single blue light in each bollard, which creates a repetitive line along the water's edge. The bollards were modified especially for the project to have three warm white LEDs and one blue LED.

Nestled between the piazza and canal, and confined between two pedestrian access points, is the 'Folly', aka 'The Language Pavilion'. The concept behind this structure was developed by the project architects. In short, there are eleven woven circles, each depicting one of the languages spoken in South Africa, relative to its population percentage. The lighting to this pavilion was critical. Since the Folly is a visual focal point and a stage for Square events, and it is seen from surrounding buildings, the lighting had to complement the design concept of the pavilion. Also, the Folly, which comes to life at night, is the element that creates the dynamic aspect of the precinct.

Lighting to the Folly is mostly automated to ensure minimal user interface.Allowance has been made for user intervention, should a specific lighting setup be required for a special function on the piazza. Once again, only LEDs were specified for the feature lighting elements. The Folly starts to bring life to the piazza just before sunset, at which time the static white low level LED modules come on, creating a glowing circular effect under each pod. The high level colour change circles around each pod also turn on to a soft white. The circles at top and bottom thus define each language and create depth to the Folly platform. Just after sunset the high level colour change circles start to morph slowly between a range of colours, adding to the vitality of adjacent restaurants. Within each pod there are also high level LED downlighters which highlight the rope weave from the inside, linking the high level and low level glowing circles to formalise each language representation. This cycles for a predetermined time and then reverts to the soft white setting, switching off just prior to sunrise.

All in all, the lighting purpose for the numerous areas of the Century City Urban Square was effectively achieved and both the internal and external spaces are enhanced by the lighting design, the various fittings and the installation. LiD

Dutch design for Nestlé's *nest*

On the occasion of the 150th anniversary of the world's largest food company, Tinker imagineers designed the scenography for the family experience *nest* in Switzerland. An open house with a floor area of 6626 m² (3500 m² exhibition space), *nest* is located close to Lake Geneva, where Henri Nestlé established his first factory in 1866.

More than one hundred Dutch designers, engineers and builders worked together on the scenography for *nest*. Tinker involved many other creative companies in the project, including Bruns (engineering and production) and Mansveld (AV and lighting technics). The Swiss Concept Consult Architectes renovated the industrial heritage site and covered it with a magnificent glass roof and steel construction. Underneath, Tinker imagineers designed a large, floating, organic world made up of white, flowing forms.

Nest opened to visitors on June 15. The idea behind the project was simply to show what Nestlé stands for in a transparent and inspiring way. Visitors are able to take an interactive and personal look behind the scenes, while embarking on an entrepreneurial journey through the past, present and future across five different zones, ranging from a timed experience based on 19th century film techniques to a forum space that explores current global challenges in mass food production. An eye-catching feature is the flowing world Tinker designed underneath the glass roof – this light, open and playful space is completely dedicated to innovation.

Overview of the piazza (photo credit Mike Bink).

Visions by night (photo credit Mike Bink).

The five zones are: the Piazza, where visitors are welcomed to *nest*; Fondations, which takes visitors back to when the company was established in the 19th century; Zeitgeist, which is devoted to 150 years of history; the present-day Forum, which uses interactive ways to make visitors conscious of social challenges in nutrition and health; and Visions, the grand finale of *nest*. It consists of a spectacular world under the glass roof and symbolises the future.

Special attention was paid to the light design throughout *nest*. Visions, the spectacular, organic, flowing world, is made out of Barisol, onto which lights and video images are projected. "We sought to create something iconic, a grand gesture from behind the glass façade that would draw attention day and night, and would pique curiosity," says Erik Bär, creative director of Tinker imagineers. During the day, it creates a white, light world that symbolises the future. Ten interactive exhibits have been ingeniously integrated in the organic setting. "We wanted to paint with light on white," explains Bär, "Letters are projected subtly with white light onto the fabric to indicate the themes of the exhibits. At night, the platform turns from green, blue, red and yellow to various other colours, adaptable to the nature of an event".

Piazza by night (photo credit Mike Bink).

While the light design for Visions is primarily used to create a specific futuristic atmosphere, lighting literally takes centre stage in the storytelling of the Forum space. The state-of-the-art Forum uses interactive technology to raise the visitors' awareness of the social challenges faced in nutrition and health, and to appeal to our collective responsibility. The actions of the visitors directly influence the amazing light installation at the table in the heart of the room. Plexiglass figures in the middle of the installation are lit by RGB LED-spots. Around this centre, a 'sushi belt' presents plexiglass icons representing various social issues, which visitors may put next to their touch screens. When the animation starts, the interaction with the subject matter produces lit-up colour patterns.

Kinect game 'The bodyscan' helps people to understand the impact of certain foods on the human body (photo credit Mike Bink).

Detail of the light installation at Forum (photo credit Mike Bink).

The actions of the visitors influence a surprising light installation at the heart of Forum (photo credit Mike Bink).

Fondations is a further example: this authentic, timed attraction takes visitors back to the 19th century, when the company was founded. The innovation here lies in the use of early cinema (and lighting) techniques developed during the same industrial age. By combining shadow play, magic lanterns, *ombres Chinoises* and more, illusion becomes reality. Light designer Pelle Herfst (Rapenburg Plaza) brought the various spaces to life. "It is a true play, albeit without actual actors. Along with technology that reflects the spirit of the age, light is used in a way that contributes to the authentic feel of the experience," says Tinker.

Fondations: By combining shadow plays, lanterns and ombres Chinoise*, illusion becomes reality (photo credit Tinker imagineers).*

Henri Nestlé's old laboratory with ombres Chinoise *scene (photo credit Mike Bink).*

Welcome desk at the Piazza (photo credit Mike Bink).

The lighting design throughout *nest* clearly outlines the relevance of light to great experience design. When all senses are stimulated, visitors are immersed in another world and come out of it with a different mindset. "Light allows us to direct the visitors' eyes in the right direction, create a 'total experience' (Visions), or focus attention on the content (Forum and Fondations). The *nest* experience gave us the opportunity to create five completely different zones in which all of these facets were expressed," Bär concludes.

Tinker imagineers, established by Erik Bär and Stan Boshouwers, is an experience design bureau that will celebrate its 25th anniversary in 2016. A team of 40 consultants, designers, producers, content and multimedia developers realises musea, visitors centres and experiences for business and community organisations and has a broad national and international portfolio. LiD

***Tinker:** www.tinker.nl/en/work/nest-experience-switzerland*
***Nestlé:** www.nestle.ch/de/media/nest/press_releases*

Life-size tree composed of 1200 handmade flowers (photo credit Tinker imagineers).

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Increased freedom in lighting design

by Henk Rotman, Philips Lighting

Although the transition to LED lighting is in full swing and the lighting industry is increasingly implementing this technology in the products and services it offers to the market, we are still learning to use the benefits of this digital technology and translate them into value added offerings. One of the benefits is the fact that LEDs can be operated with different operating currents to allow a tailor made project solution for light levels and energy consumption. A characteristic of LEDs is that the operating current determines the light output as well the efficacy, with a lower operating current generating a lower light output but with a higher efficacy, while a lower operating current has a positive impact on lifetime.

In a sense, LEDs can be compared to cars: you can drive a car at different speeds; however, if you drive your car at the highest speed possible, your fuel consumption and wear and tear will be high. If you drive the same car at a moderate speed, your fuel consumption and wear and tear will be significantly lower. The same principle applies to LEDs; changing the operating current of an LED has an impact on light output and efficacy (see Figure 1) and the impact of operating current on lifetime is clear (see Figure 2).

The fact that LEDs are operated with different operating currents is what offers flexibility in the design of luminaires and projects. This flexibility did not exist with traditional lamp technologies and was often a constraint in lighting design when designers found themselves in a position where the design proposal just fell short of meeting the main design requirements, such as light levels and uniformity. They were then frequently forced to look at more efficient (and often more expensive) luminaires, increase the number of luminaires, or choose a luminaire with more lamps or lamps of a higher wattage (e.g. from a 2 x T5 28 W to a 3 x T5 28 W, or from an HPS 150 W to an HPS 250 W), thus pushing up energy-use.

LEDs, however, offer the option of increasing the light output of the luminaire in situations where light levels are not met. Or, the light output can be decreased when light levels are too high thereby reducing energy consumption, an important factor where the requirement is for a certain installed

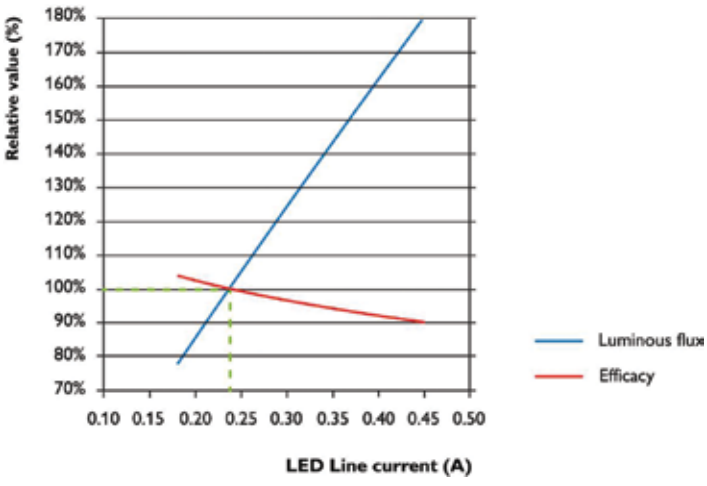

Figure 1: Current versus flux and efficacy.

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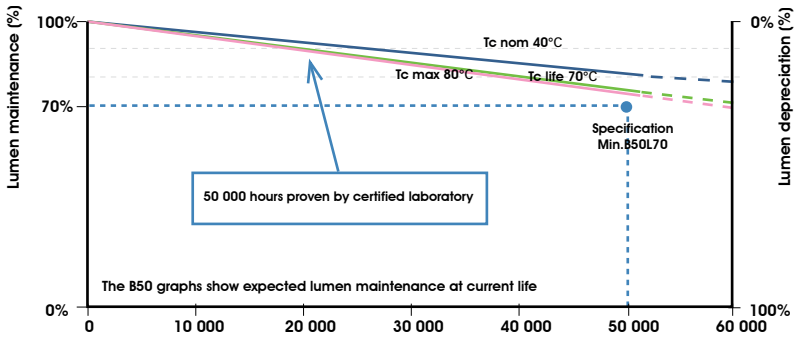


Figure 2: Temperature versus lumens and lifetime.

W/m^2. This all can be done by changing the operating current of the LEDs. For lighting designers, the major benefit of this characteristic of LEDs is increased design freedom; it allows lighting designs to be much more closely aligned to project requirements such as light levels and energy-consumption.

Programmable LED drivers

In order to have the option of changing the operating current, so called 'programmable LED drivers' must be used. Programmable drivers (also known as 'window drivers') are able to operate the LEDs within all points of a so-called operating window. Adjusting the current of a programmable driver can be done in various ways. Two of them are via a resistor used outside the driver or via dip switches at the driver. Both options have advantages and disadvantages.

Using dip switches is the easiest method and one advantage is that the settings can be altered at a later stage. The major disadvantage of using dip switches is that only a limited number of settings is available and it is important to ensure, during installation, that the settings cannot be changed by non-authorised persons as this could lead to non-compliance. The optimal way of programming is to use a software tool. This offers the widest selection of settings and (depending of the type of programmable drivers) it offers more possibility for differentiation, e.g., Xitanium outdoor Full Programming drivers from Philips offer the option to program:

- Dimming schedules (allowing dimming in the quiet hours of the night, an additional way to reduce energy use for outdoor lighting).
- Constant light output (compensating depreciation of LEDs over their lifetime by slightly increasing the operating current).
- Adjustable start up time (light output of luminaires will increase gradually after switch on ['soft start'])
- Module temperature protection, this ensures protection of the LED system against over-heating (prevention of early failures) and increases overall reliability.

Luminaire producers gain a number of benefits by using programmable drivers. A major one is that they can use the same hardware (luminaire) for different projects, simply by changing the operating current.

Latest developments in programmable drivers

The technology around programmable drivers is evolving fast. The latest innovation is wireless programming, where the operating current of the LED drivers, in addition to other settings, can be programmed via a technology called 'Near Field Communication', where the driver can be programmed (or re-programmed) simply by placing a special device close to the LED driver. This makes programming during production more time-efficient, and allows the drivers to be re-programmed in the field (where the driver is accessible). This is especially convenient where the use of a space changes, e.g., where an office space is converted into a pause area where people can have a coffee or tea break and where the required lighting level is significantly lower.

Re-programming the LED driver ensures that the lighting level is aligned with the use of the space while minimising energy-use. Another example where late programming or re-programming can be beneficial is last minute changes in an office, such as the colour of the walls or carpets. Lighting designs are based on assumed reflection factors linked to use of certain colours and a major last minute change in used colours can result in significant deviations in realised lighting levels. Late- or re-programming of LED drivers can be an option for re-aligning light levels with requirements.

The first 'sensor ready' LED drivers are available. These will allow LED drivers to be (re-) programmed via build-in sensors in the luminaire. This gives the opportunity for the 'last minute' programming of LED drivers, e.g., when luminaires are already installed in an office and after the furniture etc., has been moved in. It also allows for easy re-programming of already installed LED luminaires.

Conclusion

Programmable LED drivers are evolving fast and making use of the unique features of LED technology to offer many benefits to luminaire producers, lighting designers, specifiers and architects alike. LiD

Renovation and renewal at Nelson Mandela Square

by Leigh Darroll

The renewed lighting scheme at Nelson Mandela Square in Sandton formed part of the overall renovation of this retail, hospitality and office complex and the public open space of the square itself.

It is already more than 20 years since the mixed use precinct was established, adjoining Sandton City and creating a civic space linking Sandton City to the Sandton Public Library and other civic buildings. Originally known as Sandton Square, it was designed to provide two levels of retail space, with restaurants fronting directly onto the square, as well as office space in the south and west towers. The name change came in the mid-1990s when the statue of former president Nelson Mandela, standing more than three metres tall, was erected overlooking the square.

Central Sandton has seen substantial development over the years and, as this growth and development continue, Nelson Mandela Square has drawn increasing foot traffic. It has become a landmark meeting place where business, shopping, entertainment and leisure intersect.

When the property owner, Liberty, together with property manager, Liberty Properties, decided that a renovation was due, to update the complex and bring Nelson Mandela Square onto par with the revamped and extended Sandton City, they approached Bentel Associates International. The architectural firm had been involved as retail specialists in the professional team that designed the precinct originally.

Graham Smith, Executive Senior Associate at Bentel Associates explains that at the time, Sandton Square was conceived as a "themed" centre, typical of trends in retail development in the early 1990s. Modelled on an Italianate piazza, it was designed as a neo-classical square with careful attention given to the scale of the square and the balance, harmony and proportions of the buildings surrounding this civic space.

With the recent renovation, Bentel Associates has taken care to retain the neo-classical façades of the buildings as far as possible. The renewal has focused mainly on the modernisation of the interior retail mall to create a lighter, brighter and more contemporary environment without altering the established structure.

Another important aspect of the brief was to support an integrated experience, enhancing fluid movement between Sandton City and Nelson Mandela Square and ensuring continuity via clear and cohesive links to the component and adjoining spaces – The Michaelangelo Hotel, The Legacy Hotel and Legacy Corner, among others – which form part of the precinct.

Lighting design

Regarding the new lighting design Smith says that as well as taking account of the specifics of budget and the requirement for minimal disruption to tenants and visitors during the renovation, the approach was first to identify the different areas of the precinct and then to analyse specific lighting needs per area.

A number of broader considerations were also factored into this analysis: the different requirements for outside and inside spaces, and finding the right balance between the relatively lower light levels appropriate to the open square – as a civic space and overlooked by the surrounding buildings – and the brighter light required for the interior retail mall, with a softer, warmer light for the restaurants and hospitality venues aligned along the edges of the square.

Specific areas addressed included:

- The square itself as a civic space.
- The restaurants aligning the square.
- The Theatre on the Square.
- Entrances to the retail mall, to provide a transition between outside and inside spaces.
- Mall walkways and the interface with individual shops.
- The multi-volume atrium of the west wing.

Above: *Computer-controlled LED lighting allows for multiple colour variations in the fountain.*

Right: *Tall boxed lamps at the wide stairways frame the access routes.*

- Links to office floors in the west and south towers and to the adjoining components of the precinct.
- The bridge to Sandton City.

Lighting requirements were then considered for each area, in terms of:

- Function and focus of the space to be lit, specifications for performance and effect.
- Lumens or light levels, the brightness or relative softness of the light required.
- Efficiency in respect of performance to purpose, energy usage and life expectancy, with provision for monitoring, control and management.
- Effect, to create the required mood or ambience using specific types and colours of light.
- Controlling glare and limiting spillage.
- Accessibility for maintenance and safety.

While the same or similar considerations would be taken into account in the design of any lighting scheme Smith emphasises that it's important to work through all the factors that will influence the finished effect.

Above: *Lighting, light levels and energy efficiency are controlled in the square.*

A new entrance canopy for the theatre has the effect of bringing the theatre into the square, aligning the entrance with the restaurants along the northern edge.

The square

On the square itself one of the main challenges was that over time the restaurants had encroached onto the public open space, erecting ostensibly temporary structures such that the square had come to resemble a "tented city". "We needed to contain and manage this accretion of public space to private use," says Smith, "to re-establish the square as a public space and to restore respect for the formality and proportions of the neo-classical buildings framing the square."

This was not an easy balance to resolve, but the property owner and project team decided on a system of bolt-on steel-framed glass boxes. These are uniformly fixed to the buildings at ground level and extend the restaurants' space into the square within a uniform and fixed limit.

Restaurant signage on the square has also been standardised to a prescribed size and positioning and while interior fit-outs vary, lighting, light levels and energy efficiency are controlled and power usage per tenant is monitored and managed. (Design standards, guidelines and controls have been developed for all tenants at Nelson Mandela Square and form part of the lease agreement.)

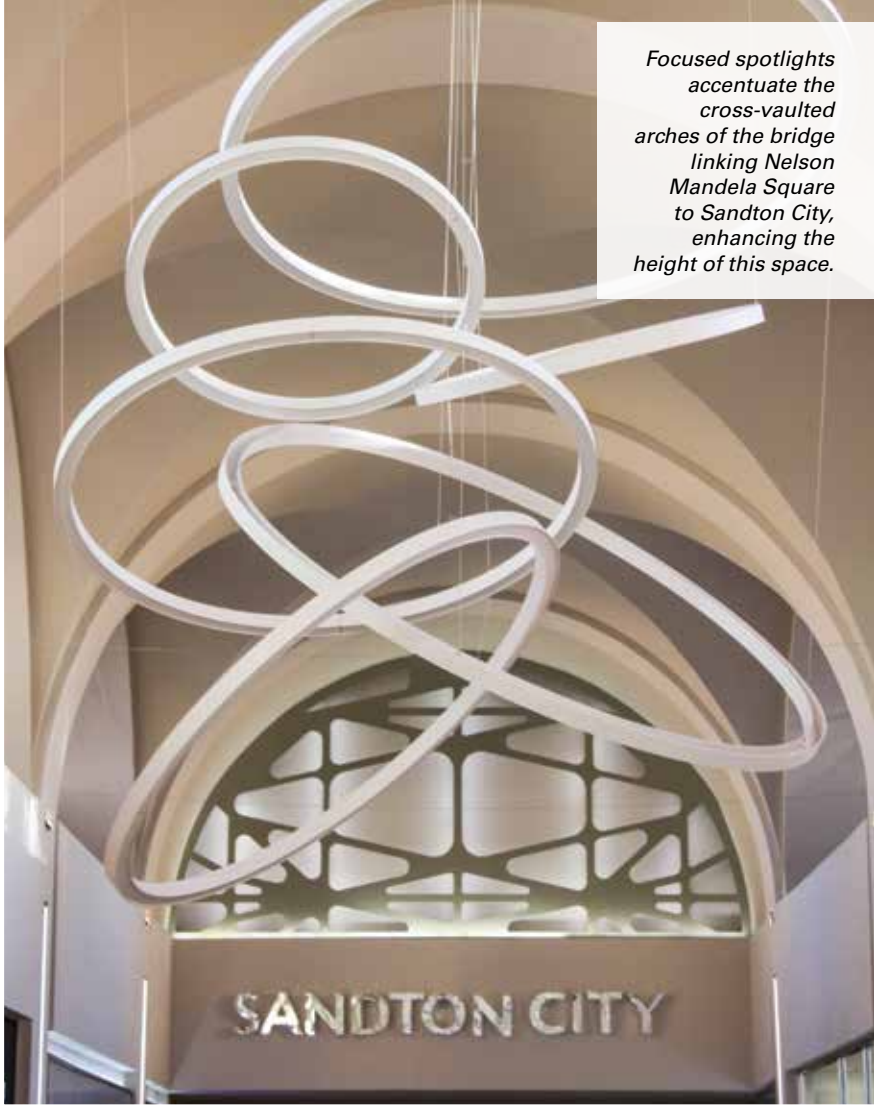
Further interventions on the square have been minimal, allowing the patina of time to contribute to the making of this space, as was originally intended. Even the paint used on the buildings has been left untouched.

New paving introduced was specified to match the old paving where this has been retained to create a simple, uninterrupted stretch of open space. This strengthens the sense of freedom and movement of the square and is sympathetic to the surrounding buildings and soft on the eye for people using the square or overlooking it.

Planting has been retained along the northern edge where the trees are well established and form a softening screen between the square and the restaurants along this edge.

The lighting of the square has also been kept much as it was. A number of considerations influenced this decision: principally, a respect for the square as a public civic space. In addition, as an open space, the square enjoys natural daylight and any night-time lighting should not be too bright; it should be warm, welcoming and safe, but should not interfere with the view from hotels and offices overlooking the square nor the restaurants surrounding the square. As a public space, the square also hosts special events from time to time and while power is available for specific lighting for these functions, the ambient lighting of the square does not detract from such events.

The original, big, square, boxed uplighters mounted at first floor level to light up the façades of the buildings have been remade to match the original lights. Mercury vapour lamps are used in these



Focused spotlights accentuate the cross-vaulted arches of the bridge linking Nelson Mandela Square to Sandton City, enhancing the height of this space.

fittings for the warm, yellow light they produce.

The fountain, which falls virtually level with the square, has been refurbished and the new fountainheads installed are each embedded in a ring of LED lights, mounted flush with the base of the fountain. The water jets and lights are computer controlled using a program that allows for multiple variations in water height and rhythm as well as light intensity and colour.

The statue of Nelson Mandela, standing at the western end of the square, is not specifically lit as it was considered to be commanding enough in itself. However, tall boxed lamps stand at the wide stairways to each side of the statue and at the entrances to the mall, in effect framing the access routes. These boxed lights, about a metre high and 500 mm^2 at base, have been made anew to replace those that were there before. This is another example of the way in which the renovation has, where appropriate, worked with what was already in place.

Like the boxed uplighters which focus on the façades of the buildings surrounding the square, the tall standing boxed lights were designed and manufactured by Regent Lighting. Made of translucent white acrylic sheet in a steel frame, these 'tower' lights are fitted with low level LED lamps which provide the warmer light preferred for this application. The same design is carried through, at smaller scale, to the interior mall, a marker of continuity between outside and inside.

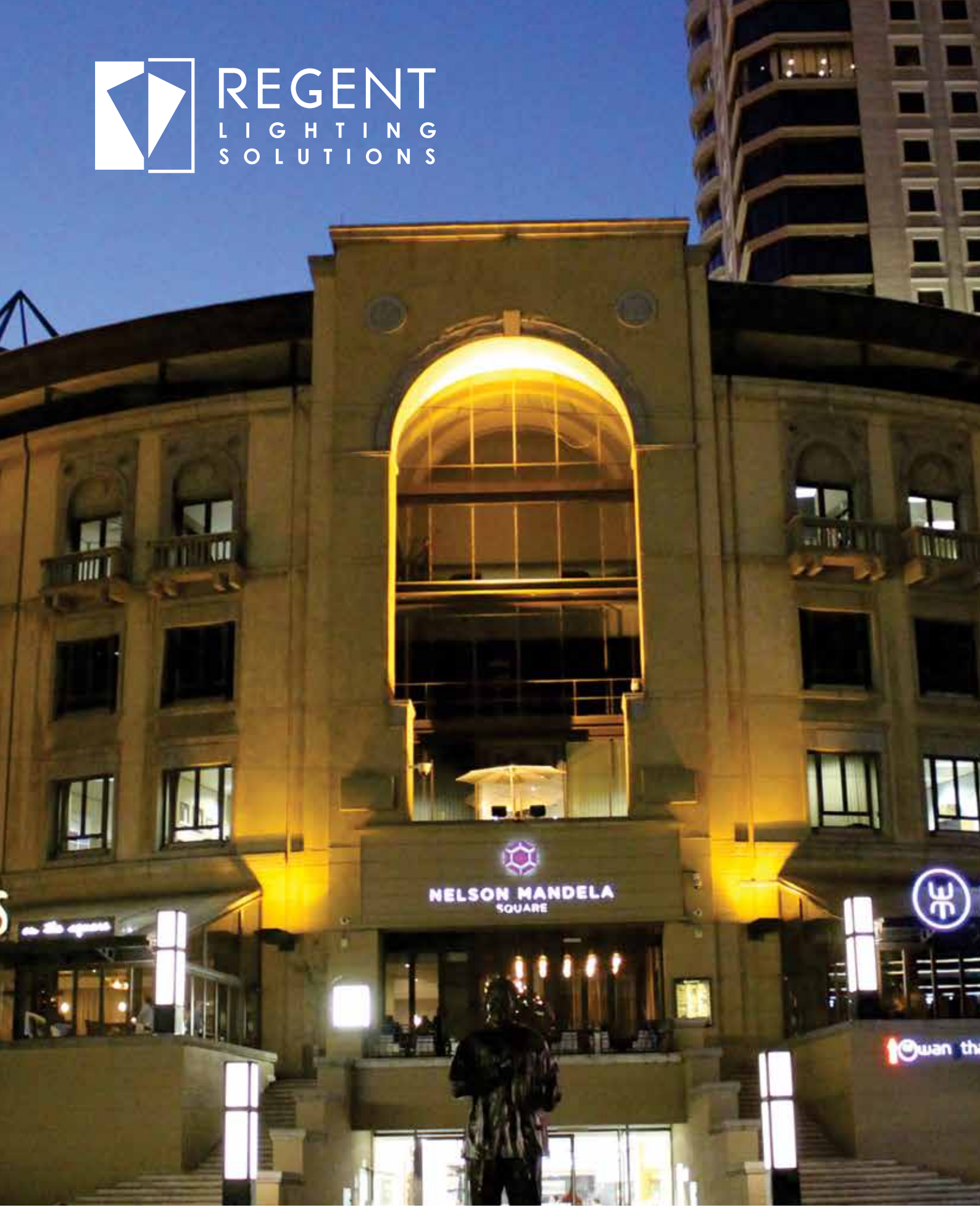
The Theatre on the Square

Located at the north east corner of the square, the theatre was rather tucked away, adjacent to the access route that leads up via West Street from the Sandton Gautrain station and across the way from the public library which forms the east end of the square. With the renovation, a new entrance canopy has been installed, extending the entrance to the theatre to align with the restaurant edge and, in effect, bringing the theatre into the square. A simple structure of translucent white acrylic sheeting mounted on narrow steel columns, the canopy more clearly demarcates the entrance to the theatre and provides a sheltered walkway for theatre patrons. The same aluminium-framed acrylic sheeting box lights, at the smaller scale as used in the retail mall, are repeated here, mounted to the steel columns.

The retail mall

Internally, the modernisation of the ground and first floor retail levels has introduced new, lighter finishes to the floors, walls and ceilings, moving away from the previous darker finishes which had been in keeping with the old themed concept. New lighting was specified to enhance the feeling of spaciousness and openness. Another step in this direction has been the lifting of the arcaded shopfronts on the ground floor to full four-metre height (first floor level) and this will be extended to all shopfronts as new tenants move in.

The multi-volume atrium of the west wing benefits from the natural daylight that streams through the tinted sheeting of the arched roof. The newly repainted walls and lighter interior finishes enhance this uplifting space. Tumbling mobiles of



South African luminaire manufacturer and lighting solutions provider.

regentlight.co.za

One of the tumbling mobiles suspended in the multi-volume atrium of the west wing.

Photographs courtesy of Bentel Associates International and Regent Lighting.

simple, shaped discs in a range of light-coloured translucent hues and of varying diameters are suspended from the roof, with the effect of lifting the eye and at the same time bringing the soaring space to a human level.

The extent of natural daylight reduced the requirement for supplementary daytime lighting at the retail levels of this wing and thus contributes to overall energy efficiency. Surface-mounted stage lights, fitted with metal halide lamps, were specified to project light across the suspended mobiles. They introduce focused light across the gallery space, without imposing on office floor levels above the retail mall.

At the retail levels, small-diameter LED spotlights are fitted flush with ceilings and bulkheads, producing focused downlight and preventing glare. Wall-mounted box lights, the smaller-scale replicas of the tall standing box lights on the square, provide further supplementary light. The same lighting is continued through the links to the adjoining retail zones of Legacy Corner and The Michaelangelo mall and towards the bridge linking Nelson Mandela Square to Sandton City.

Although the light levels in the mall walkways are higher and brighter than previously, they are managed to allow the shops – the primary focus – to stand out. The design of the mall includes a control zone, about one metre deep, which, although not distinctly demarcated, accommodates a transitional space between the walkways and the shops themselves.

As with the restaurants on the square, while tenants are free to develop their own interiors the design standards and guidelines applicable to all tenants ensure a degree of control over the lighting and light levels in the shops, managing energy efficiency and power usage per tenant.

Smith notes that where the restaurant wings interface with the retail mall internally, an intermediate level of lighting has been accommodated to soften the transition between the brighter light of the retail spaces and the relatively lower light and warmer tones used in the restaurants.

The renovation implemented at the retail levels is now being extended to the lift lobbies and office floors of the west and south towers at Nelson Mandela Square, to establish seamless links and provide for easy transitions between these different zones within a cohesive overall design.

The bridge

The bridge which carries the retail link between Nelson Mandela Square and Sandton City has been comprehensively revamped, clearing away much of the clutter that belonged to the original complex, opening up this thoroughfare to natural light and carrying through the lighter floor tiles, walls and ceilings that were newly introduced in the retail levels of Nelson Mandela Square. Focused spotlights accentuate the height and design of the cross-vaulted arches of the bridge and narrow vertical strips of LED lights, recessed into wall panels between shops, contribute to a much cleaner, brighter and more inviting space.

Energy management

All the lighting across the mixed use precinct of Nelson Mandela Square is controlled by a C-Bus system. This microprocessor-based wiring system provides for automatic switching on and off of lights, the adjustment of light intensity in response to changing natural light levels and efficient energy management, among other functions.

Lighting suppliers

Smith gives credit to Regent Lighting, supplier of all the light fittings and systems in the renovation project. He says Regent is always helpful, responsive to requests and innovative when it comes to finding the best solution to any lighting challenge. "It is one of few lighting suppliers that is ready to design lighting to suit a given need, if a suitable standard product is not otherwise available, and to manufacture fittings as required." LiD

Light is comfort

ULTRAFLAT DALI LED drivers for ultraflat luminaires

The new, just 11 mm flat OTi DALI LED drivers (35 W and 75 W) stand out due to their ultra-flat design while still retaining the excellent thermal characteristics which you already know from the 21 mm high OTi DALI drivers.

Product benefits

- Ultra-flat housing (11 mm height) for innovative luminaire designs and applications
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- Very high efficiency and reliability
- Protection of the system thanks to thermal management and Smart Control
- Higher quality of light thanks to low output ripple current

Light is OSRAM

OSRAM

Photograph courtesy Vivid Architects.

Mall in the south of Jozi

Situated in Aspen Hills south of Johannesburg, Mall of the South is a 65 000 m^2 shopping mall located on a major intersection for maximum visibility and ease of access. Vivid Architects were the architects and Quad Africa Consulting the electrical engineers for this upmarket Zenprop Property Holdings shopping centre.

The mall was conceptualised as a double-level retail centre, with convenient well-located parking, predominantly accommodated within a parking structure. The building design makes use of a 16 m level change across the site, optimising a balanced cut-and-fill building platform.

According to Peter Bruyns of Vivid Architects, the key design features are simplicity of the retail layout, excellent sight lines and connectivity between the retail levels, hard wearing good quality finishes, a contemporary 'un-themed' design aesthetic, design longevity, efficiency of space, superior landscaping and the inclusion of green areas on the parking decks and entrances to the building.

With the inclusion of the active external retail edge of the main façade, the architects provided a sense of openness, connectivity and activity along the main façade adjacent to the parking structure. "On the upper level, two central restaurants spill out onto the parking area with seating and landscaping," says Bruyns. "Other restaurants along the façade have views across the parking area to the horizon and landscape beyond."

Lighting Innovations supplied the lighting for the shopping centre, the parking areas and parkade, the façade and the outdoor areas – in fact, everything except the shops themselves. Tino Botha, branch manager of Lighting Innovations Johannesburg, oversaw the company's involvement in the project.

A glazed façade and skylights provide extensive natural light to the mall. Lighting Innovations' brief was to deliver additional energy efficient, illumination with good quality lux levels. Botha explains how this was achieved, "We used 4000 K (cool white) LED as the source throughout the shopping centre. Linear LED


mall of the south

Photograph courtesy Vivid Architects.

light fittings, up to 3 m in length, supply much of the light, but attractive circular pendants 2.5 m in diameter and designed by Peter Bruyns, which we manufactured, are a striking feature throughout the mall and are used in the restaurant 'promenade' to great effect to create a warm, friendly environment where people can enjoy a meal or an evening drink".

The skylights, though very effective during daylight hours, created something of an illumination challenge at night. "During the day, says Botha, "they provide light onto the lower levels of the centre, but for night time illumination to the floor we had to install downlighters just beneath the openings. In order to create even illumination and avoid dark patches on the centre floors, we spent a considerable amount of time ensuring there was a balance of direct and angled light; it looks good now though."

In addition to the downlights and recessed linear LEDs, about 7.5 km of strip LED cove lighting was installed in the centre and coloured LED lighting at the entrance to the mall from each parking level matches the coloured fluorescent within the parking area, clearly guiding visitors and making the parking garages simpler to negotiate.

The outer and inner edges of the cantilever on the external façade of the building are illuminated by LED strips, encased in 'neon LED flex' for maximum flexibility. The orange-coloured accent cladding on the inside of the cantilever contrasts with the silver outer edge and, with the light from inside the centre, creates an exceptionally appealing night time lighting scheme, which is enhanced by the custom made bollards and orange beacons on a number of the pole lights.

While DALI has been installed throughout the centre for future management of light, at this stage only the restaurants walkway is linked to the control system to provide scheduled prefixed scenes. Dimming starts at 17h00 and by 19h00 the scene is set for a suitable ambience. Since the restaurants all have different lighting designs – with fittings ranging from chandeliers to downlights – each restaurant is able set its own schedule. The final management setting will take all this information into account and will also mark separate scenes for summer and winter.

'It was a great project to work on," says Botha. "The restaurant walkway of the centre is particularly appealing and will, I'm sure, become a favourite meeting place for people who live in the area. LiD

Photographs courtesy Mall of the South unless otherwise stated.

Q'Dos interior reflects quality lighting

Magnet supplied a range of light fittings for the newly refurbished Q'Dos fashion outlet at the Gateway Theatre of Shopping in Umhlanga.

"The design objectives of this project required special lighting to accentuate the distinct styles, textures and colours of the exclusive Q'Dos clothing collection and to create an enchanting ambience," says Kaylen Reddy, Magnet's lighting solutions engineer. "The installation encompassed four different types of light fittings, with high luminous flux, to suit the area illumination of the environment. The fittings include downlights, recessed and surface ceiling lights, and strip lights.

"SLV fittings – chosen for their design and the latest LED technologies – create an ideal lighting effect. The SLV SUPROS range consists of three downlights, one surface-mounted rotatable downlight, a recessed downlight and a pendant option, which was not used in this design."

The luminaires, which contain built-in LED lamps, have a colour rendering index of >80 Ra, an emitting angle of 60 degrees and a luminous flux of 3000 lm. The expected service life of these ceiling lights is approximately 50 000 hours. The driver-on-board technology in all fittings of this series allows direct connection to the 230 V supply.

This energy efficient lighting range has been designed with flexibility for personal styling. Integrated and wide flooding reflectors can be

exchanged for reflectors with smaller beam angles, without the need for any tools. LED solutions and dimmable products with retrofit lamps, as well as devices with integrated dimmable LEDs, are also available.

Magnet's understanding of lighting systems, coupled with design and installation services, in-house testing facilities and experienced lighting engineers, ensures enhanced aesthetics and optimum energy efficiency in diverse industries.

SLV's technical and decorative interior and exterior lighting devices are available in South Africa exclusively from Magnet. The company supports this comprehensive product range with a technical advisory, installation and maintenance service.

Glenn Rogers of Partners in Design, the interior designers on this project, said that from the company's first meeting at the Magnet showroom, Kaylen Reddy approached each lighting challenge with ingenuity and a thorough technical assessment. "We were impressed with his attention to detail and professional attitude throughout. The finished interior of Q'Dos certainly reflects the quality of lighting design and quality fittings required," he said.

SLV's energy efficient lighting devices, with the latest technologies and coloured lighting effects, accentuate the distinct styles, textures and colours of the exclusive Q'Dos clothing collection and create a sophisticated ambience. LiD

Local lighting for Century City's urban square

As part of Century City's commitment to sustainable development, Century City Urban Square (CCUS) was developed along on green principles. In line with this, LED was chosen as the light source for the outdoor lighting of the area.

BEKA Schréder was awarded the contract to supply the exterior lighting for the square and internal roads. The ambience on the square is enhanced, therefore, by the locally designed and manufactured LEDpost 23 W LED bollard luminaire. One quadrant of the bollard uses blue LEDs to complement the water feature and create a repetitive line along the water's edge, and the rest use white LEDs. The distinct design of the LEDpost shields pedestrians and drivers from glare and prevents spill light from being emitted above the horizontal. To maximise the reliability of the LEDs and ensure that the photometric performance is maintained over time, the photometric engine is completely sealed to IP 66. Electronic temperature monitoring prevents overheating of the LEDs and power supply. It has been designed for energy saving and low maintenance applications.

The high-performance LEDlume-mini 36 W LED streetlight on 5 m mounting-height glass fibre reinforced polyester (GRP) poles illuminate the road. Both are locally designed and manufactured, ensuring that they withstand the harsh coastal climate. The LEDlume-mini forms part of the LEDlume family, which sets a new benchmark in LED lighting with performance and flexible solutions that lead to a shortened payback time. With its efficiency, long lifespan and limited maintenance requirements, the LEDlume range enables users to minimise Total Cost of Ownership.

There are many advantages to using BEKA Schréder GRP Poles, including the fact that they are non-corrosive and maintenance free, and their high bending strength ensures they can withstand the wind pressure of the Cape. They are sustainable –the manufacturing process is kinder to the environment than metal or timber products – and vandal resistant; and their light weight saves handling, transport and erection costs during installation.

BEKA Schréder locally develops and manufactures LED lighting products, designed and suitable for local conditions. The company is proud to be associated with Descom and QDP Lighting & Electrical Design in providing a sustainable lighting solution for this project.

BEKA Schréder: +27 (0)21 510 8900 or r.bubb@beka-schreder.co.za

Above: *The LEDlume-mini and BEKAPOLE illuminate the road at Century City Urban Square.*

Left: *The ambience on CCUS is enhanced by the locally designed and manufactured LEDpost.*

Hemmesphere launches in SA

The Hemmesphere lighting range from Massow Design combines beautifully crafted wood, bare light sources and shadows. Japanese-inspired, the range uses clean lines that create a peaceful energy and demonstrate a bold statement around each lighting piece. Conceived in London in 1997, the Hemmesphere range has had significant success in that city and is now officially launching in South Africa.

Hemmesphere Lighting is a UK-based bespoke lighting design company owned by Barend Massow Hemmes of Massow Design. Previously an interior designer, Hemmes' work is influenced by his design experience and his products, which maximise the play of light and shadow, combine functionality with aesthetics to produce a stylish end-product.

An exclusive range, Hemmesphere Lighting is proud of its bespoke nature and aims to cultivate individual relationships with its customers – from designers to architects to the end-buyer – in order to customise fittings, where possible, to suit each environment's exact needs.

As a company that defines energy design, Hemmesphere Lighting is familiar with new technologies that allow the designers to interpret designs using algorithms and harnessing parametric design. Constantly thinking out of the box, the company is deliberate about lowering the waste of manufacturing whilst providing a quality and contemporary product through a process that results in aesthetic qualities that question people's interpretation of form and structure.

The fittings are designed to be ceiling or wall-mounted, or to provide floor lighting from the ground up that will enhance any space with a lattice of light and shade, all creatively styled in soft wood and copper, and customised to fit its space.

Hemmesphere Lighting:
www.hemmesphere.co.za

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25 years in the business

For 25 years, Eurolux has been pivotal in bringing the latest lighting innovations to South African businesses and consumers. What started out as a modest Cape Town operation has flourished to become an impressive company with a nationwide footprint, links into Africa and the Middle East and, above all, an innovative approach to business.

"Anybody can sell a product, but throughout Eurolux's existence, our focus has been – and always will be – on adding value. We constantly challenge ourselves to offer our customers excellent products and the technical know-how and knowledge they need to make informed lighting decisions," says Shaun Bouchier, director at Eurolux.

The company's entrance into the project lighting arena highlights Bouchier's point. "A few years ago we recognised a demand for quality project lighting in SA so we decided to make it one of our focus areas. That saw us importing high bays, floodlights, downlights and top-end decorative fixtures for commercial, retail and manufacturing environments. But we did more than just sell these products, we also made our technical teams available to assist customers where needed. It is part of the Eurolux ethos, we do everything we can to ensure we deliver outstanding service."

Specialising in imports and distribution, Eurolux depends on strong relationships with its business partners to get its products to the public. With this in mind, all distributors and the general public can view its products at lifestyle showrooms in Johannesburg and Cape Town. "Our 1 500 m² Cape Town showroom encompasses housing designs from the European brands FontanaArte, Slamp, Lombardo, Ivela, Manooi, Inarchi, Iris Cristal, Panzeri, Karboxx, Eglo and SG. We are thrilled to have partnered with local icon Carrol Boyes. She has designed an exclusive range for us, which we believe will become very popular," says Bouchier.

In an effort to gain a larger footprint in the electrical market, Eurolux sold 60% of the company to ARB Holdings in 2011. Eurolux's well-branded range of high quality lamps and lighting products augments ARB's extensive range of electrical products and is sold into a complementary, rather than overlapping, customer base.

Customer demand led to another innovative concept – the lighting technology workshops. "Industry professionals we engage with expressed the need to better understand emerging lighting technologies and their application within particular fields. To answer this demand, we turned to lighting specialists Blair Hammond & Associates, who plan and conduct the courses for us," says Bouchier. The workshops are designed to enable architects, consulting engineers and lighting practitioners to make informed decisions regarding professional lighting design and application. The 2016 sessions have offered new content, as well as the opportunity for professionals to earn their annually required Continuous Professional Development (CPD) points.

Bouchier concludes. "We have a tremendous team of people at Eurolux, who make all the difference and give us great hope for our future."

The recent release of the latest Eurolux Luminaire catalogue officially marked 25 years within the local lighting industry.

Eurolux +27 21 528 8400

Ultraflat DALI LED drivers

Osram's new, 11 mm flat OTi Dali LED drivers (35 and 75 W), which stand out for their ultra-flat design, still retain the excellent thermal characteristics of the 21 mm high OTi Dali drivers. They can be dimmed down to 1% of their luminous intensity; comply with the upcoming Dali Ed.2 standard; and can be programmed via the Dali interface or even wirelessly via an NFC interface. In addition to their large output current range, they provide an efficiency of more than 92%, low standby of less than 0,25 W, a service life of up to 100,000 h/Tc -10 K, and bear the EL mark. Typical applications include ultra-flat standing luminaires, suspended luminaires as well as surface-mounted ceiling fixtures in office, hospitality and healthcare applications. Design-in examples and the first pilot systems are available and ultra-flat light/presence sensors will be available soon.

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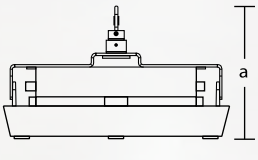
Application: Warehouse, workshop, supermarket, etc.

PRODUCT SIZE(mm)



WATT	a	b	c	d
100W	175	300	90	400
150W	193.8	400	100	450
200W	193.8	400	100	450

Sunlit Technologies (Pty) Ltd
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031 7001988 | www.sunlit-tech.co.za

Ledvance: LED luminaire portfolio for professionals

Ledvance, a legislatively independent subsidiary of Osram, offers a portfolio of needs-based LED luminaires for professional use.

The new portfolio of LED luminaires for professional applications currently consists of eight product families Downlight, Spot, Damp Proof, Linear, High Bay, Panel, Surface Circular and Floodlight. As direct replacements for luminaires with compact fluorescent lamps or halogen lamps, the approximately 60 products feature luminous efficacy to 120 l/W, various colour temperatures, a rated service life of up to 50 000 hours and attractive cost-benefit ratios. Ledvance also provides a guarantee of up to five years.

Simply by exchanging traditional luminaires with conventional compact fluorescent lamps (2 x 18 W, 2 x 26 W), the Downlight simultaneously provides up to 60 percent in energy savings. The external driver improves flexibility during mounting and the luminaire, thanks to its standard dimensions, fits into existing cut-outs of the same size. The Spot from the same range directly replaces conventional halogen spotlights (35, 50 and 75 W) and is able to save up to 90 percent in energy costs.

The Ledvance Panel replaces conventional luminaires equipped with 4 x 18 or 4 x 14 W fluorescent lamps. These LED luminaires have a flat housing (10.5 mm) and distribute homogeneous light – the models with a UGR (Unified Glare Rating) value of <19 are also suitable for computer screen workplace lighting. Ledvance provides a five-year guarantee on products from the Panel and Damp Proof ranges.

The round Surface Circular luminaires with diameters of 35 or 40 cm can be installed as wall or ceiling luminaires and can also be used in damp rooms thanks to IP44 protection. They are available with motion or daylight sensors. The highly uniform light in colours of 3 000 or 4 000 K has a beam angle of 120 degrees and the basic version saves up to 55 percent in electricity overheads.

The compact Linear luminaires are available in four different versions with lengths ranging from 300 to 1 500 mm. The luminaires can illuminate long rooms – up to ten units can be mounted in a row – and are offered in light colours 3 000 or 4 000 K, with or without a switch.

Ledvance: +27 (0)11 207 5600

Can (designed) LED lighting boost retail sales?

The answer, according to Clifford Graff, a director at Relight Energy, can be yes and no.

If no, it is because too many retail stores in South Africa are badly illuminated. Whether by (bad) design, no design or an accumulation of different lighting technologies to combat electricity increases, store lighting remains fairly inadequate across the board. Throw into the mix poor quality LED luminaires and the 'woeful index' climbs exponentially.

Individuals tasked with energy reduction initiatives are bombarded daily with the 'supposedly' latest, most efficient LED replacement tubes, lamps, floods, troffers, hibays, lowbays, spots and wallwashers and they are likely to take the bait and the plunge - once.

When the promise of 50 000 light hours (the snake-oil salesman's favourite number) does not materialise, they will only go that route again once the "technology is proven". Plus, they say, all they got for their energy reduction initiative was less light which is great if you're a nightclub, less so if you're selling product.

The quality of the light (CRI) is crucial, yet many retailers have installed such poor lighting products that they wash out any vestiges of a colour palette and replace it with a dystopian grey haze. Retailers seem to be convinced that they're not changing to LED until Eskom relieves them of an even greater portion of their monthly expenses.

On the positive side, retailers will get the full benefit of a superior lighting installation, with a substantial energy reduction, by implementing a designed lighting upgrade. A customer's first impression of a store is directly influenced by the store's lighting. Good lighting, they enter. Bad lighting, they're hesitant.

A properly designed lighting installation starts with an appropriate balance of ambient and accent lighting. It takes into consideration the different requirements in colour temperature required for meat, fish, bread, vegetables, clothing, jewellery and so on. It understands the lux level requirements for the different retail zones. No lumen is wasted.

There is, to the best of my knowledge, no industry study of the actual percentage increase a well designed lighting installation achieves over a standard "put it in until its bright enough" installation. There are examples of independent studies. One UK designer changed the lighting in one of two competing stores located diagonally opposite each other (one owner) and has empirical data from the owner that the store with the LED lighting upgrade has had a 27% increase in sales since the changeover.

Back to the question: Can (designed) LED lighting boost retail sales? Yes, but only if the benefit of the reduction in energy is married to the correct light levels (with five plus year warranties against failure and colour shift taken for granted).

Clifford Graff: cliff@relight.co.za

Lighting Innovations: a company profile

Good lighting enhances the mood and desirability of spaces and contributes to a general sense of well-being. Lighting Innovations, a technical architectural lighting company which offers its customers access to modern designs, innovative technologies and energy efficient solutions, is fully aware of this and the company boasts a team of dedicated and knowledgeable professionals who are able to add value to any lighting requirement.

Studies show that quality of light affects people in numerous ways. Office worker satisfaction and productivity can be positively affected by well-designed illumination and negatively affected by poor lighting. Building owners and managers have the potential to add value, reduce costs and enhance performance through the application of good lighting. People are attracted to well-lit public facilities, commercial shopping malls, displays, showrooms and work environments. Security is greatly increased by light. Although light is often perceived as a single entity, it is in fact a collage of components that affects everything. Through variations in strength, colour, angle and other techniques it is possible to provide the right lighting for every application; something with which Lighting Innovations is very familiar.

Established in 1989, Lighting Innovations has become a leading manufacturer and supplier of customised lighting in southern Africa, with branches in all main centres in South Africa. In 2013, the company moved its production and design facilities from Johannesburg to Port Elizabeth where it employs the latest manufacturing equipment in its manufacturing process. In July of 2015, a sale agreement was signed with Swedish lighting company Fagerhult for the purchase of 100% of Lighting Innovations.

More recently, the company moved to new premises in the Kramerville design precinct near Sandton. Illuminated entirely by locally designed and manufactured LED luminaires, the functional, welcoming space allows clients to view a vast range of fittings to best effect, while illustrating the competency of Lighting Innovation's manufacturing facility. The offices are mostly separated by glass walls to facilitate interaction and there is a high level of natural light, which further enhances the mood and desirability of the work space. Customers are also invited to use the facilities for meetings with their own clients so they can view the fittings *in situ* and appreciate the effectiveness of the solutions on offer.

Lighting Innovations specialises in office lighting, shopping malls and retail lighting. Its expertise further allows it to offer high quality products and

designs for specialised areas such as clean rooms, vandal proof, stadiums and sports fields, hospitals and healthcare, and warehousing.

The company also offers a systems integrator for lighting and building management solutions using sensor and control technologies from renowned partners and leaders in their fields.

For further information call +27 (0)11 444 1168 or visit www.lightinginnovations.co.za

Bring true colours to life

Sometimes colours need to be seen as nature intended. "For example," says Warwick Webber, technical director of Aurora, "in certain decorative, residential, commercial and retail applications, artificial light needs to render fabrics, merchandise, jewellery and art in their true colour potential."

Enlite has introduced a new specification range of GU10 LED lamps that have been designed for applications where quality of light is critical. Called the ICE+ range, these LED lamps with a CRI level of Ra 90 bring out the true colour of objects and their surroundings.

The ICE+ range incorporates advanced electronics that maintain a high power factor to improve energy efficiency and reduce power consumption, enabling users to showcase and illuminate those colourful spaces while achieving maximum energy savings and reliability. "So, when choosing replacement lamps for these environments, look for those with a high colour rendering index (CRI) that will help illuminate colours to look their best," says Webber.

The CRI of a light source is measured on a scale of 0 to 100 so the higher the rating on a product, the more accurately it can 'render' colours for the human eye. ICE+ specification LED lamps' advanced electronics deliver a high 0.8 power factor so electrical power is used effectively. Power factor ranges between 0.0 and 1.0 and "the higher the number, the better".

ThermoTec technology combines a highly efficient LED light source, aluminium heat sinking and thermoplastic material for longer life and consistent performance. The EnFiniti edge-to-edge multi-faceted polycarbonate lens creates low glare and a halogen-like appearance. A wide 60° beam angle delivers increased light distribution.

ICE+ GU10 5 W lamps are available at colour temperatures of 2 700 K, 3 000 K and 4 000 K, in dimmable and non-dimmable options and will deliver up to 88 lm/W to L70 25 000 hours. There is also 1.5 kV surge protection and a three year warranty.

The colour enriching ICE+ range of specification LED lamps can be found in the Enlite Edition 4 catalogue. To download the catalogue, visit www.enlitelighting.com.

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Photo credit: Eisenmann.

Tunnel with LED lighting wins top award

Eisenmann, a leading global provider of industrial solutions and services for surface finishing, material flow automation, thermal process technology and environmental engineering, has received the prestigious Red Dot Award: Product Design 2016 in the industry, machinery and robotics category.

The 41 judges, including designers, university professors and journalists from around the world, praised the advanced design of the VarioInspect, an LED light tunnel that supports quality control in paint shops. Overall, 5 214 products were entered in the international competition's 31 categories. They were assessed in terms of innovation, formal quality, functionality, and ecological compatibility.

VarioInspect is the first LED light tunnel to be developed by Eisenmann, and was launched in 2015. "We are extremely proud to have received this award for our product," said VarioInspect project leader, Jan Hammermann.

The light tunnel's layout creates a pleasant and ergonomic working environment, and reduces noise levels and echoes. The LED lighting is adjustable from warm white to cool white, and can be tailored to the specific challenge, such as the paint colour and gloss level of the body. The lighting makes highly effective surface quality inspections possible. This is essential as OEMs and consumers regard the slightest blemish in paintwork as unacceptable. The LEDs' low power consumption and long service life minimise operating costs.

"Red Dot award winners have demonstrated exceptional design skills. Their achievements highlight the central role of design in the development of innovative products," said Professor Peter Zec, initiator of the Red Dot Awards and CEO of the company that organises the competition.

Eisenmann:
www.eisenmann.com/en.html

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