

LIGHTING THE MODERN OFFICE

ENHANCING THE WORK ENVIRONMENT FOR PEOPLE
- VISUALLY, BIOLOGICALLY & EMOTIONALLY



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eaglelightingaustralia





**“HUMAN-CENTERED
LIGHTING BRINGS
TOGETHER A DEEP
UNDERSTANDING
OF USER NEEDS,
APPLICATIONS AND
SCIENTIFIC INSIGHTS.”**

THE HUMAN CENTERED APPROACH

We demand more from our workplaces than ever before.

Advancing technology, innovative designs and an endless array of choices are reshaping the world of work. We want the choice to stand or sit, work quietly or next to colleagues, sit in the sunlight or work aided by high-performance task lighting. And we want to spend time in spaces that enhance our productivity and workplace culture, as well as our personal health and wellbeing.

Designers and employers now recognise that better quality lighting, delivered in the right way, influences occupants – visually, biologically and emotionally.

Human-centered lighting brings together a deep understanding of user needs, applications and scientific insights. The benefits are clear:

For building occupants

Well-lit spaces can enhance employee health, mood and performance, reduce absenteeism and help companies to retain staff, all of which contribute to a positive company culture.

For building owners

Carefully designed and selected lighting can give landlords a competitive edge by offering better customer experiences in energy-efficient spaces that require less maintenance and are ready for the next IoT leap forward.



WHAT ARE THE KEY ELEMENTS OF MODERN OFFICE LIGHTING?

1. Helps to establish the culture and identity of the space
2. Positively contributes to the mood and well-being of the occupants
3. Enhances the mood for the task at hand
4. Balance and quality of light required
5. Colour appearance and balance
6. Control of glare and brightness
7. Lighting personalisation through controls.



THE VBE INDEX

Lighting a modern office takes more than a few strategically positioned LEDs.

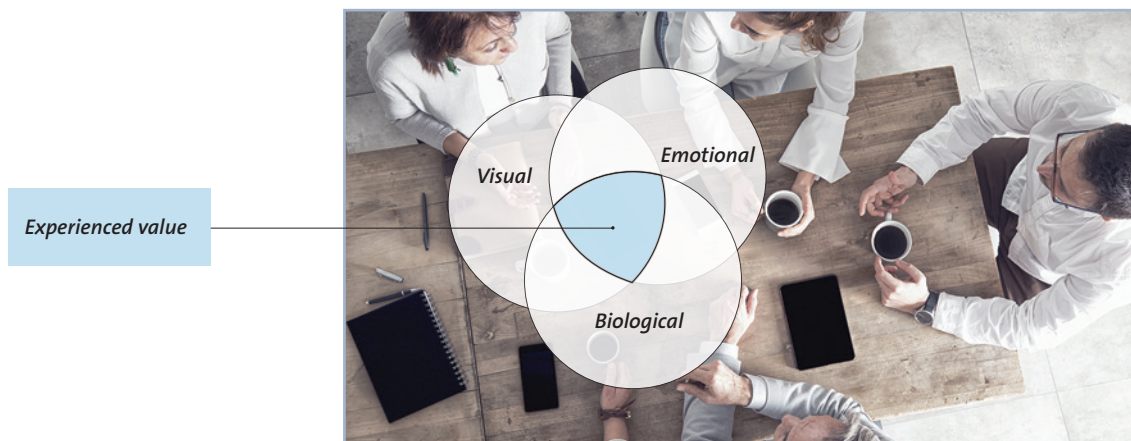
Our lighting specialists consider a host of factors – from efficiency to ambience, and from colour rendering to lighting's influence on circadian rhythms. We understand that good lighting influences occupants visually, biologically and emotionally.

The VBE Index quantifies the beneficial outcomes of lighting systems.

VBE is an acronym for **visual, biological and emotional** – the three ways in which light affects human beings.

In the past, the quality of lighting only considered the illuminance (lux) within a working area and its immediate surroundings. However, a raft of research confirms that ambient lighting – the lighting of walls and the ceiling – influences us both biologically and emotionally. The level of ambient light is important for our alertness and therefore our ability to perform tasks efficiently over time.

The VBE Index is the foundation of our approach to lighting design, as it assesses the subjective lighting experience. Each element – from how the lighting enhances vision to how it affects biology and emotional awareness – is weighted differently depending on the type of room and the activity. The higher the VBE score, the better the lighting.



The VBE Index contains the following elements:

Visual

We consider the visibility of an object, visual comfort, contrast and glare etc over time.

- Performance
- Attentiveness
- Productivity
- Error reduction
- Contrast balance
- Glare limitation

Biological

We consider how lighting influences our biological clock and with it alertness, wellbeing and performance both during the day and in different seasons.

- Melanopic light
- Circadian impact
- Mental health
- Wellbeing
- Alertness
- Awareness
- Improved sleep

Emotional

These are the most subjective elements and include how we perceive the light in a room, the colour of surroundings and the light's colour, dynamic and comfort over time.

- Comfort
- Harmony
- Serenity
- Tranquillity
- Mood enhancement
- Colour enhancement
- Balance

HUMAN-CENTRIC LIGHTING

When office workers spend 90 per cent of their work days indoors, lighting is more than functional. The best lighting is human-centric, enhancing wellbeing while helping building owners to create healthy workplaces.

For millennia, human beings set their body clocks to the sun. Artificial light may have changed the way we work, but it hasn't changed human biology.

Our circadian rhythms – the physical, mental and behavioural changes that follow a 24-hour cycle – are regulated by the levels of light in our surroundings.

When the sun rises in the morning, we naturally receive a dose of light in the blue part of the spectrum which encourages the production and release of cortisol – the hormone which makes us feel alert and alive.

This daytime blue light spectrum makes us feel good and aids our concentration levels which, in turn, makes us more productive and alert.

As the sun sinks in the west, we naturally receive light that is stronger in the red part of the spectrum. This, along with increased illuminance levels, promotes the production of melatonin – the hormone that promotes a better quality of restorative sleep.

A healthy “sleep and wake balance” remains an essential requirement of a happy and productive life. Even if we are indoors – and most office workers spend a third of their time inside – our bodies still crave natural daily cycle of short wave cooler light to long wave warmer light from morning to evening.

When our circadian rhythm is disrupted, we can feel listless during the day, and unable to get a restful night's sleep. This can affect mood, concentration, productivity and general health.

People are generally exposed to too little of the right kind of light in the office during the day and too much blue-rich spectrum light in the evening.

Exposure of more than 1,000 lux is necessary for human health, but most people in offices get less than 500 lux. In comparison, those who work outdoors can be exposed to 100,000 lux.

Human-centric lighting adapts to follow the patterns of normal daylight to address these daily deficiencies. This helps your body's hormone balance to adjust naturally throughout the day so that you feel alert when required and sleepy and relaxed at the right time.

While there are many variables that influence how individuals respond to light experiments show that people say human-centric lighting makes them feel better – more alert, more productive and happier.

On the following pages we consider the key factors of human-centric lighting in more detail.



THE BENEFITS

When you light your premises using the VBE index as a guide you help to create a productive and healthy working environment. The benefits include:

- Enhanced concentration and alertness
- Enhanced cooperative behaviour and creativity
- Faster reading speed
- Vision support for older workers or those with vision impairments
- Reduced lethargy during the day
- Increased self-reported performance
- Increased visual performance.

TUNEABLE WHITE: SUPPORTING THE WELLBEING OF STAFF AND YOUR BUSINESS INVESTMENT

With advances in LED technology, our lighting systems now provide colour performance and flexibility unseen in traditional light sources.

Tuneable white lighting is used in combination with digital controls to mimic our bodies' circadian rhythm responsible for stimulating productivity.

Tracking the natural rhythm of daylight, tuneable white lighting changes from cool to warm to help keep our internal clocks in sync with the natural day/night cycle. to prepare our body clocks for the setting sun.

When we correctly integrate tuneable white, we maintain balance, stabilise moods and promote relaxation. In office environments, this can improve levels of awareness and productivity, and contribute to workers' health and wellbeing.



HOW DOES TUNEABLE WHITE WORK?

LED modules contain a mixture of diodes providing warm or cold light. By mixing the light from these we achieve colour temperatures between warm 2700 Kelvin to cool 6500 Kelvin from a single luminaire.

LED modules are typically controlled by a DALI Device Type 8 and can be managed with different types of interfaces or smart phones. For an automatic dynamic control of colour and intensity, a router system dictates the levels over time.

The colour temperature and intensity of the light is programmed to follow an astronomical clock function that reflects the seasonal changes in daylight conditions outdoors.



A cellular office is the easiest room to apply a tuneable white solution as there is only one user who controls the light according to his or her preferences.

Think of a cool, intense light when you want to activate yourself or a warm dimmed light for conversations, reading and tasks which require concentration.

Using a suspended direct/indirect Combilume, supplemented with Pleiad Wallwasher G3, provides the ambient and task light requirements, with the colour temperature and intensity controlled via a simple panel on the wall.

THE VIBRANT OFFICE

Due to their daylight-mimicking effects, CRI 90+ LEDs not only stimulate occupants' melonopic response but, by providing truer colours, enhance office interior design.

Colour rendering is a measure of how well our lighting reproduces the appearance of objects compared to daylight.

We measure the ability of a light source to faithfully replicate colours using the Colour Rendering Index (CRI) — a scale that ranges up to 100. Full spectrum daylight is the optimum and scores 100. People tend to find light with a high CRI score in either warm or cool colour appearance to be pleasing.

One of the latest developments of LED technology in all Eagle Lighting products is CRI 90+, which means they deliver close to all the available colours, making objects and spaces appear more vibrant.

CRI 90+ LEDs provide increased spectral output in the critical 480nm Teal Blue range of wavelength which is vital for circadian lighting and increased output in the red region for spectral balance and enhancement of colours (See Diagram 1 & 2).

This combination of enhanced spectral output contributes to the overall delivery of quality lighting solutions and wellbeing outcomes, with no adverse implication on the budget bottom line.

All light visible to humans is made up of varying amounts of colours from blues at one end of the graph to reds and everything in between. Choosing a light source with greater quantities of these colours allows us to see better. If red is present in low quantities, then we will not see true reds. Like the latest model televisions compared to the older models, Eagle Lighting's LEDs deliver a better light for people.

CRI80 - SPECTRAL EMISSION DIAGRAM

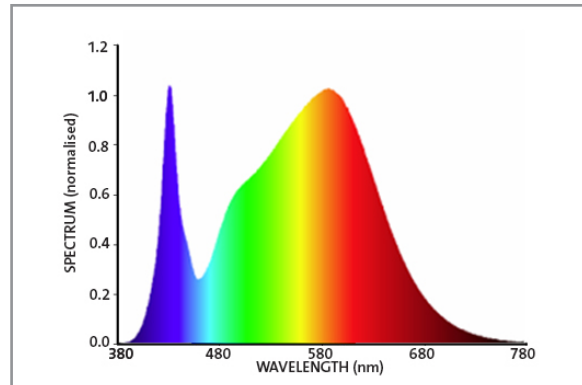


Diagram 1.

CRI90+ - SPECTRAL EMISSION DIAGRAM

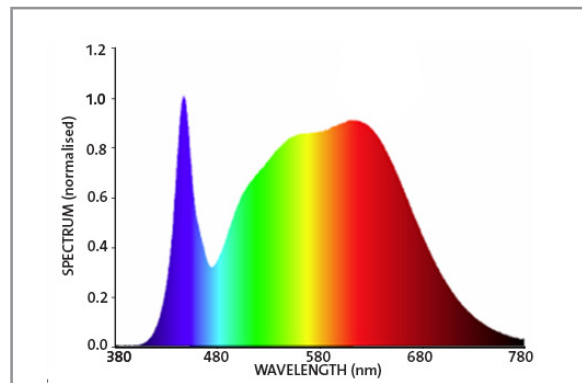


Diagram 2.

Diagram 2 shows an increase in 480nm Teal Blue and increased red spectral emission. Teal Blue is vital for circadian influence while improved red enhances colour balance.



CRI80



CRI90+ — Brings your office interior design to life

WELL: HEALTHY BUILDING DESIGN

Buildings can improve our comfort, boost our productivity and performance and enhance our health and wellness.

The WELL Building Standard is an internationally-recognised system that encourages healthy eating choices and active lifestyles, promotes natural light and fresh air, and is based on scientific, medical and architectural research.

Good lighting can help building project teams achieve a coveted WELL rating. The Eagle Lighting Australia team combine decades of experience in manufacturing, engineering and application of advanced lighting, and can deliver lighting with:

- Horizontal Illuminance and uniformity
- Colour quality
- Increased spacing between luminaires
- Control of light output, colour temperature and dimming
- Relationship between vertical illumination and Equivalent Melanopic Lux (EML)
- Unified Glare Rating (UGR) score
- Limitation of glare through increasing the luminous aperture of luminaire
- Combination, balance and integration of direct and indirect illumination.

SOLUTIONS FOR OFFICES

When you plan office lighting, ask yourself:

- Do the building's occupants have the option to control the lighting?
- Does the lighting complement the various functions of the office spaces and give the room structure?
- How will you balance the lighting with office technology, to minimise screen glare, for example?
- How can you maximise lighting to stimulate productivity and wellbeing?
- How can you boost employee retention rates and reduce absenteeism with the right lighting?



CONTROLS – MORE THAN ENERGY SAVING

Today's best-in-class LED lights deliver impressive energy savings. When enhanced with additional controls such as daylight integration, presence detection and data capture, the outcomes can be spectacular.

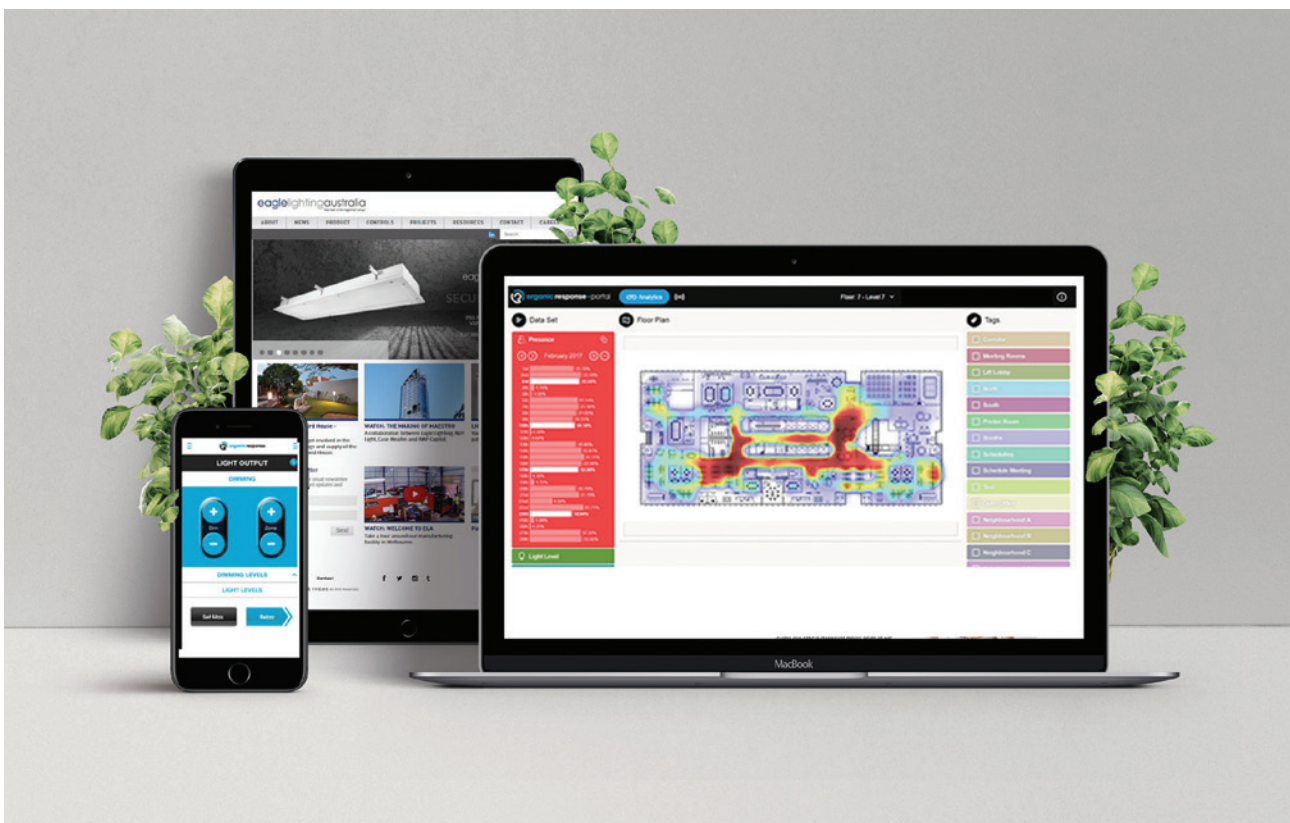
The ability to control and optimise lighting levels is important in the modern office environment.

Intelligent luminaires with advanced technology, such as Australia's Organic Response Technology (ORT), do far more than simply switch lights off or on. They boast additional layers of data capture that can improve day-to-day operations right through to analytics. Building owners can learn occupancy trends and dynamically improve space utilisation.

The new generation of Organic Response sensor nodes, for example, offer an additional layer of mesh communications, better known as the 'IoT landscape'. Think native handset integration, Bluetooth Beacons and other applications that can use this communications backbone.

Building managers can see how a space is used in real time via heat mapping, light sensing and power consumption monitoring. All this from the light fitting!

Intelligent luminaires realise a faster and more tangible rate of return on investment. What's more, your facility is IoT-ready and future proofed to adapt seamlessly to advances in technology, without the higher costs associated with legacy-cabled lighting control systems.



The Organic Response Technologies portal is a simple yet powerful cloud-based data analytics and lighting control platform that captures, archives and analyses data collected from the smart lighting sensor network (i.e. occupancy data), enabling ongoing workplace efficiency improvements and savings.

It also acts as a lighting control platform, allowing remote monitoring and control of lighting assets as well as visibility of fault status.

ABOUT EAGLE LIGHTING AUSTRALIA

Eagle Lighting Australia puts people at the centre of lighting solutions.

We are passionate about collaborating with our clients to help them find the best lighting solution for their unique projects – carefully considering everyone, from the varied project stakeholders through to the end users.

Our high-quality, customisable and innovative lighting solutions, combined with leading-edge research and knowledgeable people, deliver outstanding outcomes for both indoor and outdoor environments.

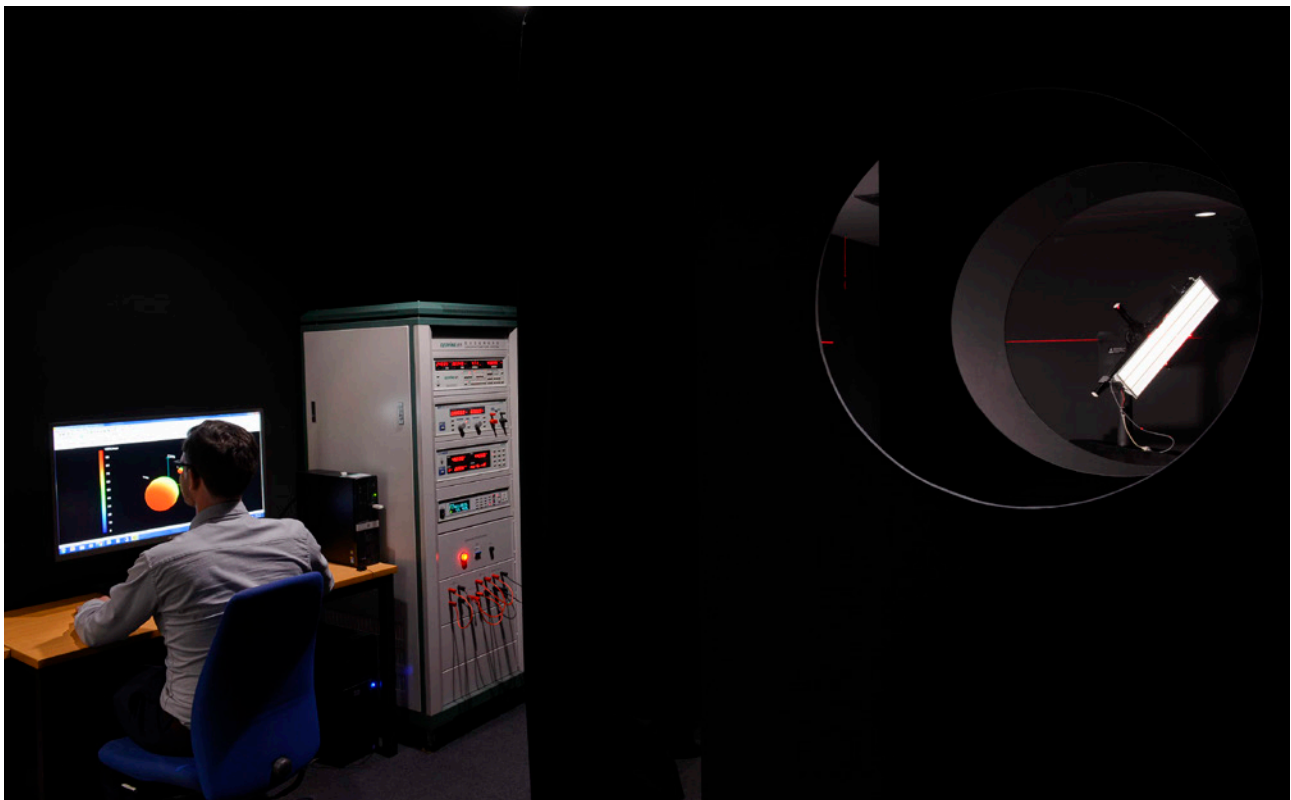
We pride ourselves on our stable of leading global brands, our in-house R&D, testing and manufacture of customisable luminaires, and our state-of-the-art facility in Melbourne.

We understand that providing the best lighting solutions requires expert consultation and lighting design, quality products and outstanding customer service. When you choose Eagle Lighting Australia, you don't just get high quality lighting. You get a high standard of service and ongoing support.



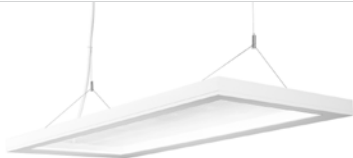

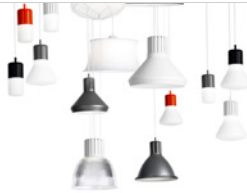






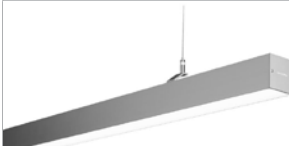

As a proud member of the international Fagerhult Group, our access to global experts and products offers a combined capability that is unmatched in Australia.



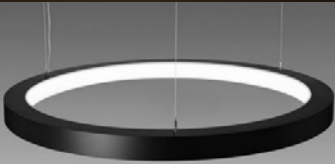





AS A TRUSTED BRAND, WE REMAIN A SPECIFICATION LEADER DUE TO OUR:

- Local engineering support from the people who have designed and tested our luminaires
- Customisation – luminaires locally designed and manufactured for your unique project
- Flexibility – we can adapt to changes made to projects as they progress
- Responsiveness and ability to meet short lead times
- Transparent and collaborative local project management
- Industry-leading technical expertise and local customer service
- Quality products and services coupled with best value
- Deployment of best available technology
























FEATURED PRODUCTS

DECORATIVE & SUSPENDED		
	Appareo	A suspended workplace luminaire with side-emitting LEDs that produce direct/indirect light. Appareo combines uncompromising design with good ergonomics. Available in a round or rectangular version
	Closs LED	The design makes Closs LED a simple choice in projects where you are looking for an effective luminaire with character, small dimensions, and a clean style.
	Combilume 	Combilume is an inventive family of large surface area luminaires available as a wall, ceiling or pendant version. The modern light technology and side-emitting light diodes result in pleasant, even surfaces both for individual office work stations and for large rooms where people come together.
	Dino	By combining different sizes, light outputs, colours and shades Dino offers almost full freedom to get the light and expression you strive for, no matter what kind of project you are working on.
	DTI LED 	A classic that covers the need for work and general lighting in the most varying environments. The new generation DTI LED has been developed for optimal lighting comfort and energy efficiency.
	Lyra 36 Nano 	An elegant lighting solution offering easy mounting options.
	Lyra Eclipse 	A graceful circular LED luminaire with a small round profile of cross section 20mm. Available in 2 diameters.
	Notor 	Fagerhult's classic interior luminaire Notor is available in several versions for suspended, surface mounted or recessed installation. Notor is an obvious choice in circumstances when there is a desire to create long, unbroken lines of light.

DECORATIVE & SUSPENDED		
	Pozzo Scale	Using natural light as a model, Pozzo Scale offers a lighting solution that creates a feeling of daylight. Available in three different sizes the pendant is ideal for combining different dimensions in a cluster. Also available as a surface mounted version
	Scoot 	Scoot provides a beautifully designed yet functional lighting solution for modern offices where one is looking for something beyond the traditional lighting solution. Available with Opal diffuser or Delta microprism louvre in five colours.
	Sweep 	Designed as a cut-off sphere, Sweep provides a contemporary lighting solution for modern offices, today as well as tomorrow. Available with Opal diffuser or Delta microprism louvre in five colours.
	Venus/Venus TC families 	Multi-award winning flexible LED luminaire with a perfectly homogeneous light surface. The 3D version can be bent in 3 dimensions to follow any curves in the architectural design.
	Xoom In / Xoom Out 	It is a floating design object. The light shines inside the ring shape and floods the space with a unique play of light.
	Xootube 	Linear LED pendant luminaire in a round housing.
DOWNLIGHTS		
 	Pleiad G3	A downlight with very good light properties and quick installation. The family contains numerous options for different light distributions, complemented by an extensive range of practical and decorative accessories.
	V-Series	V-series is a new range of LED downlights for use in commercial, retail and other indoor applications.

FEATURED PRODUCTS

RECESSED		
	Aureled 	Aureled is an outstanding solution that delivers an impressive system efficacy whilst maintaining excellent glare control for office environments.
	Enviro Evoline 	With its sleek, minimal and modern look it has one of the best vertical illuminance performances within the ELA family of recessed luminaires.
	Indigo Maestro Beta  	All 3 variants of the family, i.e., Beta, Delta and Zeta, combine the best of high quality LED light sources with masterful optical beam shaping.
	Indigo Maestro Delta  	All 3 variants of the family, i.e., Beta, Delta and Zeta, combine the best of high quality LED light sources with masterful optical beam shaping.
	Linjar  	The next generation Linjar with even lower glare, lower system power consumption and higher efficacy.
	Multifive LED  	The latest generation of the successful Multifive LED is pushing the boundaries of lighting design.
	Multifive LED Air  	Air-enabled version of the Multifive LED
	Vertex 	The next generation is a highly efficient LED luminaire designed for office environments

RECESSED		
	Vertex Air 	Using natural light as a model, Pozzo offers a lighting solution that creates a feeling of daylight. Available in three different sizes the pendant is ideal for combining different dimensions in a cluster. Also available as a surface mounted version
SPOTLIGHT		
	Touch	Touch is a stylish and timeless spotlight range that will fit smoothly into any environment. The family includes both track mounted and recessed spotlight options and is available in a variety of different beam options.
SURFACE MOUNTED		
	Xoocove 	The optimum lighting solution with special mounting accessories for a wide range of cove applications
	Xooline family 	Powerful linear LED luminaire with very small form factor and no visible light gap between luminaire thank to lateral cable routing. Various linear and diffused lens options are available.
WALL WASHER		
	Mars Nano/Mars Wall washer families  	MARS is a stylish linear recessed solution for general lighting, combining minimalist design language with maximum lighting and design effects.
	Pleiad Wall Washer G3 	An asymmetrical downlight for lighting on walls with one light that reaches all the way to the ceiling edge.
	Ray 	The RAY family of linear wallwashers combine the best available technology in LED light sources with superior optics in a compact body that is only 45mm in height.



Organic Response enabled



Tuneable White

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