

LIGMAN
AUSTRALIA

microVos™

NEVER OUTSHONE

MICROVOS™ TECHNOLOGY 01.23





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ELS

From our unique landscape to our modern cityscapes, Australia is a land of outdoor beauty. There is no better way to shine a light on this beauty than with Ligman Australia, one of the world's premier outdoor luminaire brands.

Ligman Australia products combine contemporary architectural lighting design with modern lighting technology to deliver quality aesthetic enhancing lighting, whilst ensuring energy efficiency and sustainability goals are met. Ligman Australia is exclusively distributed by Australia's own leading luminaire company ELS.

At ELS, we do more than distribute, we bring over 30 years of custom design and manufacturing experience to Ligman Australia. This enables us to respond to uniquely Australian design and specification briefs on behalf of clients to find their perfect exterior luminaire solutions. Through our local manufacturing capability, we customise and fully assemble the Ligman Australia product to meet each client's specific needs. We then rigorously test to ensure both compliance and performance capability to Australian standards.

Ligman Australia, one of the world's best exterior luminaire brands, powered by ELS, Australia's leading luminaire company, will amplify the beauty of any outdoor space.

QUALITY & WARRANTY

Quality is the basis for which the longevity of Ligman luminaires can be determined. The Ligman factory in Thailand carries ISO-9001 QMS certification, which gives us the confidence that all luminaires are manufactured to the highest standards. To back this quality, Ligman houses their own SMT lab to provide assurance that all LED components are manufactured exactly to specification. Ligman produces all fabricated and die-cast components on-site along with all die-cast tooling in its state of the art toolmaking facility, ensuring exceptional quality of all components from beginning to end.

Our Brunswick assembly operation leverages these solid principles of quality management to ensure that all luminaires are thoroughly inspected and tested after assembly, for both physical and electrical operation before despatch. This ensures they will operate in all conditions long after our extensive warranty has passed. The ELS Quality Management System is based on the solid principles of ISO-9001, albeit not certified.

With this in mind, ELS performs various quality inspections before, during and post assembly to verify that all luminaires dispatched to a customer conform to their various requirements. This includes all locally produced and overseas sourced components. Electrical and visual inspections are carried out in 100% of products, so that no products leave without being individually tested and inspected. ELS also maintain a Non-Conformance Register along with associated quality documents to track, investigate and resolve issues when and if they arise. Through this commitment to quality of manufacture, Ligman Australia feel confident in offering an industry leading 10-year warranty to the Australian market.



microVos™

Ligman Australia's MicroVOS™ (Micro Variable Optical System) is our unique technology enabling customers to specify tailored optics for all fixtures where you see the MicroVOS™ logo.

This allows for fully customised lighting distribution solutions to overcome otherwise tricky lighting designs. With the use of photometric testing equipment at our Brunswick facility, we can quickly provide photometric files to any custom distribution to assist the lighting design process. A range of the most typical standard distributions are always available for these products such as Type-1, Type-2, Type-3, Type-4, Type-5 and ME.

Typical standard MicroVOS™ optics (shown at right)

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Type-1



Type-2



Type-3



Type-4



Type-5

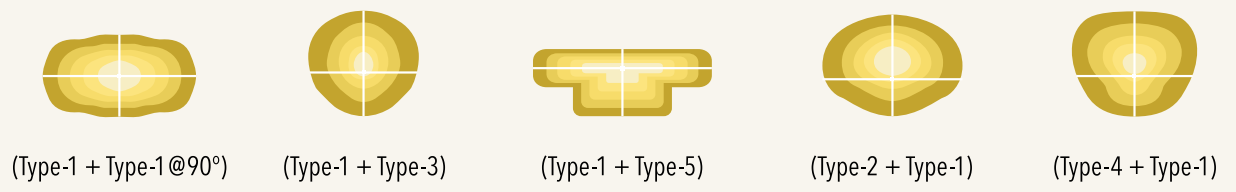


ME

If the need is for something more specific and unique to these, Ligman Australia can offer custom optics to suit the precise project lighting distributions required. With MicroVOS™ technology, Ligman Australia can combine optics to create custom solutions as well as offer additionally specialised optics. If additional cut off angles are desired to tackle obtrusive light spill, or there is a need to have optics rotated 90°, 180° or 270°, this can be easily accommodated. The opportunities are near limitless with the MicroVOS™ customisable optical system.

Listed to the right are some examples of what can be possible, but for the full MicroVOS™ service please contact your local sales representative with your project needs and we'll evaluate the best solutions for your specific requirements.

Combination optic examples



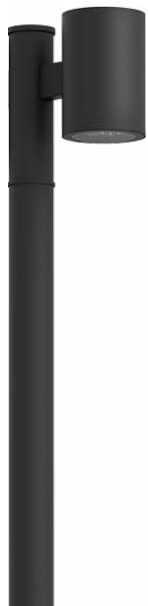
Special solution optic examples

<p>Type-2m</p>	<p>Type-4b</p>	<p>LAO1</p>	<p>FW</p>
<p>IESNA Type 2 medium beam with excellent backlight control, illuminance uniformity and cutoff</p>	<p>Wide IESNA Type 4 forward throw beam for wide area lighting such as car parks</p>	<p>Type II/III (long) beam for very wide pole to pole distances. Ideal for pedestrian paths and residential roads AS/NZS 1158.3.1 P-Classes</p>	<p>Beam with wide light distribution and good illuminance uniformity for residential street lighting and staggered pole setups</p>



STANDARD DISTRIBUTIONS

Through MicroVOS™ technology, Ligman Australia provides a wide variety of optical light distributions suitable for all architectural, roadway and area lighting applications, for example, VN: very narrow, N: narrow beam, M: medium beam, W: wide beam, VW: very wide beam: E: elliptical beam, plus Type II, III, IV and ME classification from IESNA/EN.



DISTRIBUTION TYPE I (T1)

Type I distributes a very lineal shape. It is the optimal choice for applications such as one or two-lane roadways, walkways, paths or sidewalks. With a preferred lateral width of 15°, it is suitable for lighting streets or pathways that have a width of up to two times the mounting height.



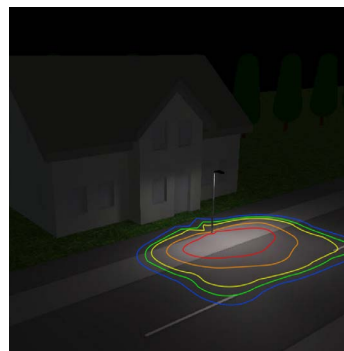
DISTRIBUTION TYPE II (T2)

Ideal for wider walkways, entrances, roadways, bike paths and other long and narrow lighting applications. Intended to be located near the side of a roadway, approx 1.15 MH. Half-maximum candela trace on the street side is beyond the 1 MH LRL but not beyond the 1.75 MH LRL.



DISTRIBUTION TYPE III (T3)

Ideal for roadways, general parking, and other lighting applications. Half-maximum candela trace on the street side is beyond the 1.75 MH LRL but not beyond the 2.75 MH LRL.



DISTRIBUTION TYPE IV (T4)

Especially suited for wall mounting or area applications and for illuminating the perimeter of parking areas. Half-maximum candela trace on the street side is beyond the 2.75 MH LRLMH LRL.



DISTRIBUTION TYPE V (T5)

Type V distributes a circular pattern (there is also a Type VS that produces a square distribution with a more defined angle). Having the same distribution at all lateral angles, it is perfect for general area lighting -the ideal choice if you are looking to do parking lots or intersections.



DISTRIBUTION TYPE ME

For motorised vehicles on traffic routes. Some countries apply ME classes from ME1-ME6, with ME1 defining the strictest requirements. For wet road conditions the MEW classes go from MEW1 to MEW6.

LIGMAN AUSTRALIA TANGO STREET & AREA LUMINAIRES INSTALLED AT NW METRO STATION NSW

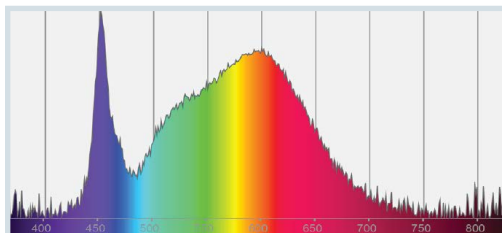
SPECIALTY OPTICS

AMBER CORRECTIONS LENS

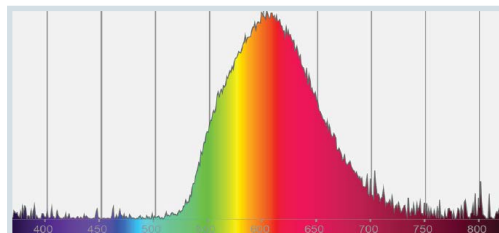
There is a growing body of research from around the globe that is pointing to the harmful effects of short wavelength blue light on both humans and animals. In humans, these blue wavelengths can disrupt our natural circadian rhythm, however in some nocturnal and migratory animals the effect can be even worse. Long wavelength amber LED has proved the best solution for these specialty areas.

For many areas where a reduction in blue wavelength is desired but the compromises presented by amber LEDs can't be tolerated, Ligman Australia has an option of either various low blue wavelength CCTs or the MicroVOS™ lens system. With our new amber correction lenses, the spectral area that contains blue light can be significantly reduced while maintaining a good level of optical performance and providing safe nighttime movement. By eliminating these wavelengths, the amber correction lens is also limiting light pollution and therefore skyglow, allowing easier observation of the stars above. The Ligman Australia correction lenses can be fitted to most MicroVOS™ products.

01 Ligman Australia
4000K wavelength



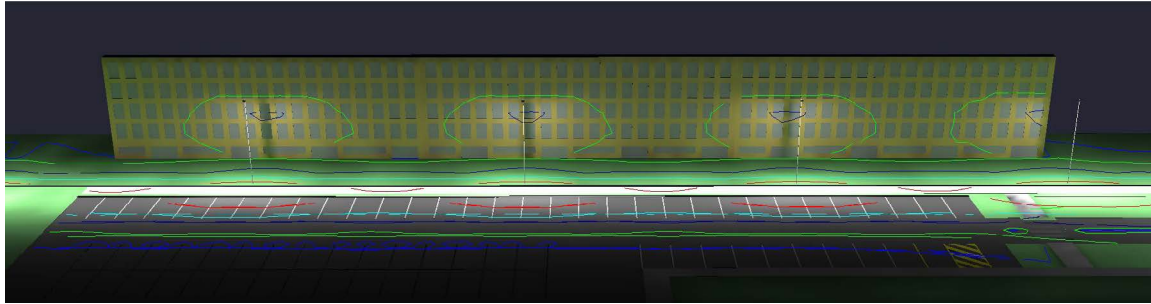
02 Ligman Australia
Colour Correction Lens wavelength



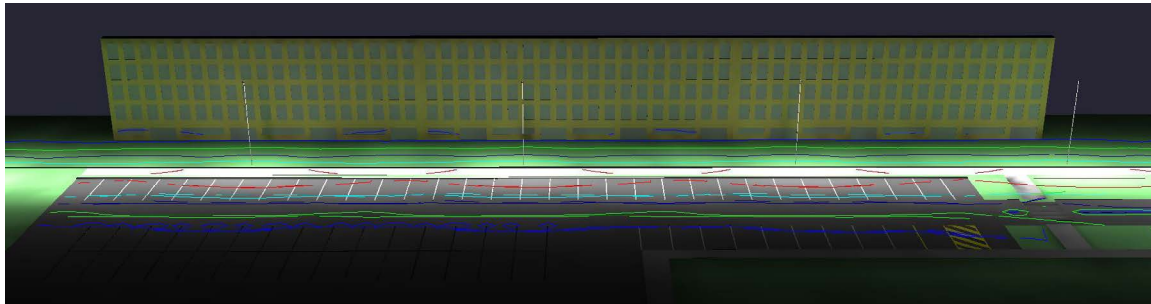
MICROVOS AMBER LENS

MICROVOS BACK SPILL





UNSHIELDED LUMINAIRES



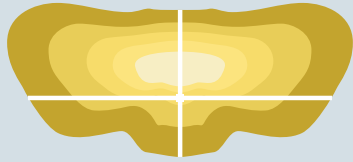
LUMINAIRES WITH MICROVOS™ BACKSPILL SOLUTION

BACKSPILL LENS

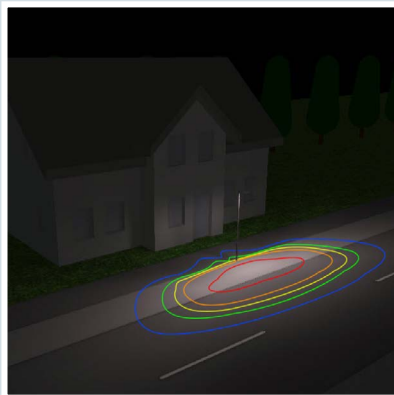
The backspill lens is a revolutionary tool when designing for areas that require high level illumination, targeted distributions but also consideration for unwanted backspill. Ligman Australia's integrated glare technology can be fitted to most MicroVOS™ products and provide unparalleled backspill control of obtrusive light while still providing targeted optics and output to meet P categories.



LIGMAN AUSTRALIA BILLUND STREET & AREA LUMINAIRES INSTALLED AT ANGLICARE MINTO GARDENS NSW



LAO1 OPTIC



DISTRIBUTION TYPE LAO1

Type II/III (long) beam for very wide pole to pole distances. Ideal for pedestrian paths and residential roads. AS/NZS 1158.3.1 P-Classes.

INTRODUCING OUR NEW OPTIC **LAO1**

Designed specifically to address the requirements of Australian P Classifications, the LAO1 optic from the Ligman Australia MicroVOS™ offering provides exceptional results for pedestrian paths and residential roads in line with AS/NZS 1158.3.1 P-Classes. The Ligman Australia LAO1 optic can achieve up to 35% greater spacings when compared to the same luminaire fitted with a T2 optic, thus substantially reducing the number of luminaires required.

Maximum pathway spacing in metres

LUMINAIRE	AS/NZS 1158.3.1:2020	PATHWAY WIDTH			
		2.0 m		3.0 m	
		MH 4.0m	MH 5.0m	MH 4.0m	MH 5.0m
LIGA-BIU-90041-700-LAO1-8030	PP1 LIGHT CAT	16.3	19.8	16.2	19.6
	PP2 LIGHT CAT	19.5	24.5	19.4	24.5
	PP3 LIGHT CAT	23.9	29.5	23.8	29.7
	PP4 LIGHT CAT	26.2	33.4	26.3	33.4
	PP5 LIGHT CAT	29	37.8	29.1	37.8

MAINTENANCE FACTOR - 0.8. OFFSET FROM PATH EDGE - 0.5m. Spacing table to be used as a guide. Figures are based on parameters set out in AS/NZS 1158.3.1:2020 - Table 3.4.



EXAMPLE OF SPACING TABLE FOR PATHWAY LIGHTING AS/NZS 158.3.1:2020 - TABLE 3.4





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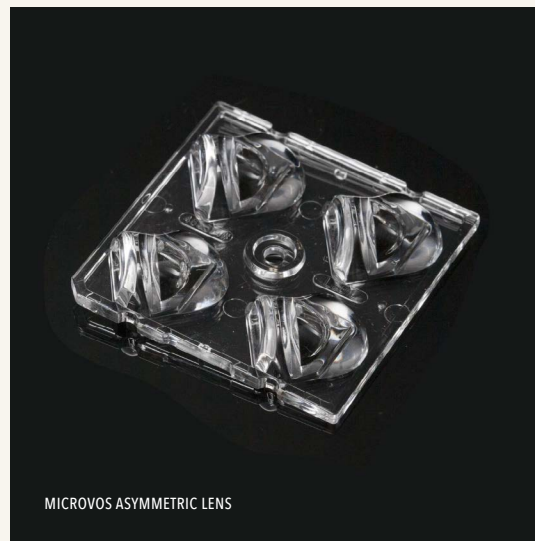
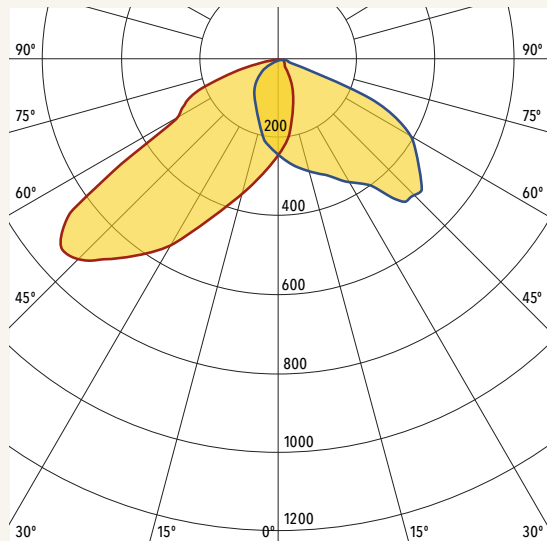
LIGMAN AUSTRALIA MACARON STREET & AREA LUMINAIRES INSTALLED AT PAINE RESERVE VIC

CASE STUDY

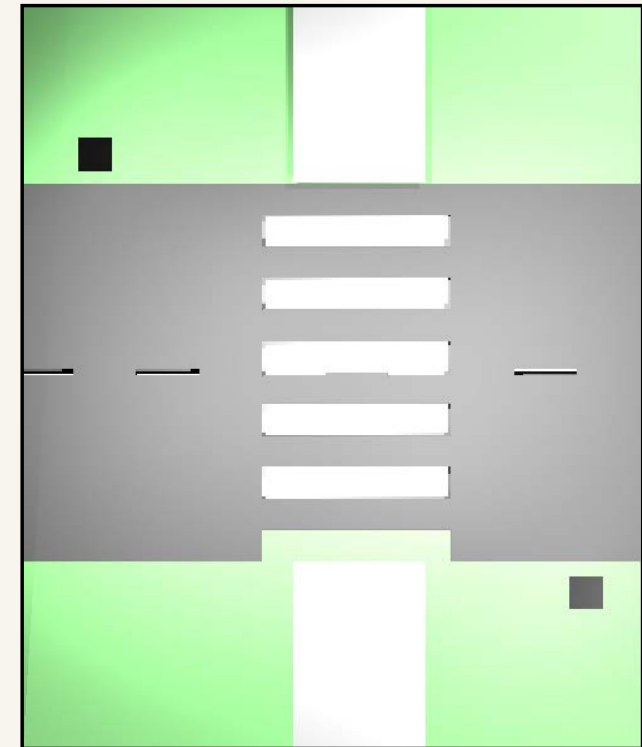
CUSTOM ASYMMETRIC OPTIC

The rigorous and sometimes difficult standards of Pedestrian Crossing Sub Category PX3-AS/NZS 1158.4 TABLE 3.2, can be easily achieved through the use of one of the custom Ligman Australia MicroVOS™ optics. Utilising a specifically designed custom asymmetric optic with offset luminaire mounting, all parameters can be met.

FULLY ASYMMETRIC BEAM designed to highlight pedestrian crossings for left side traffic.



Pedestrian Crossing PX3 AS/NZS 1158.4 2015



CATEGORY

Pedestrian Crossing Sub Category PX3
AS/NZS 1158.4 2015 TABLE 3.2

PRODUCT SPECIFICATION

Billund BIU-90044-PXL-W40 - 5MTR MH

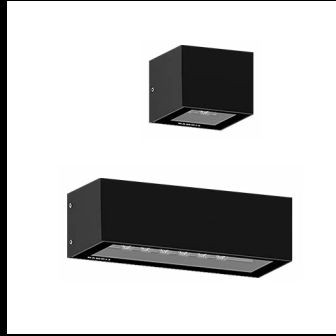


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KIOS



LEEDS



MARVIK



ROBUST



VEKTER



LIGHT LINEAR PT



MACARON



STEAMER



TANGO

SOME EXAMPLES FROM LIGMAN AUSTRALIA MICROVOS TECHNOLOGY RANGE

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