LEDiL
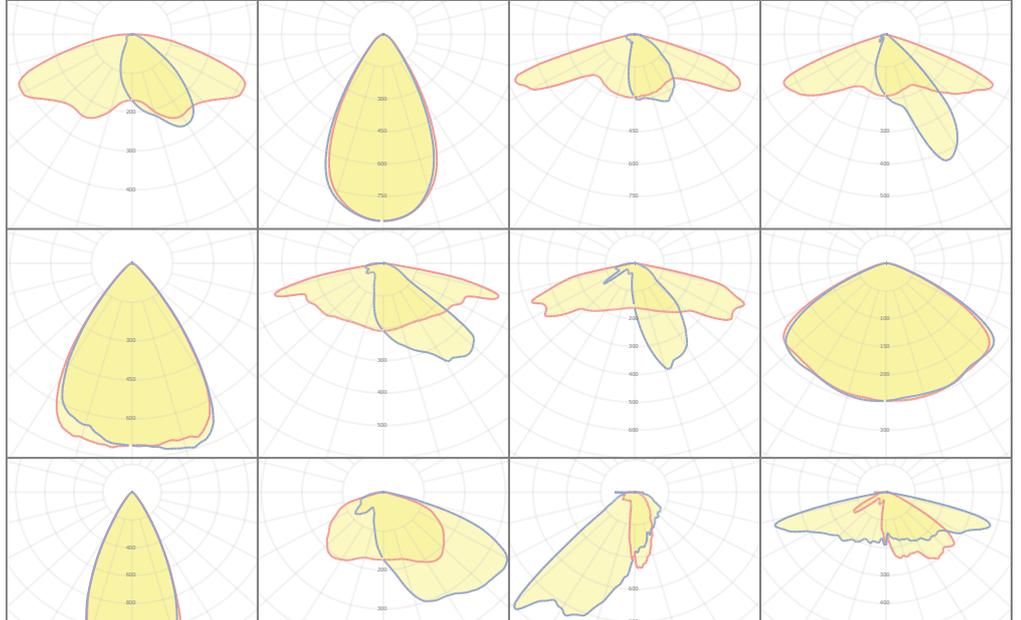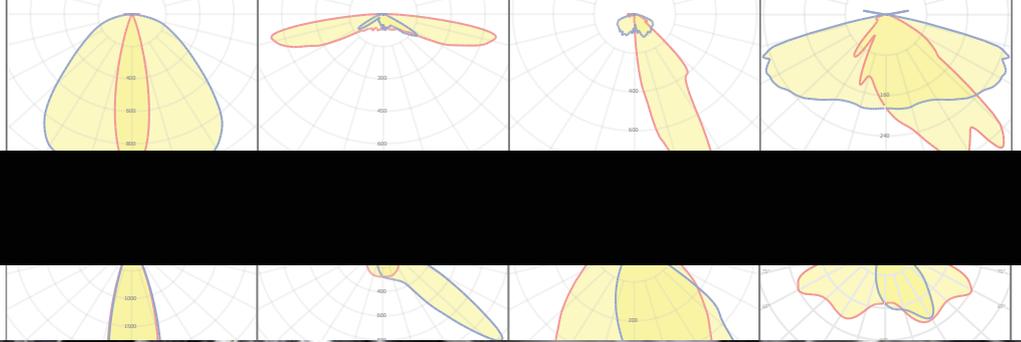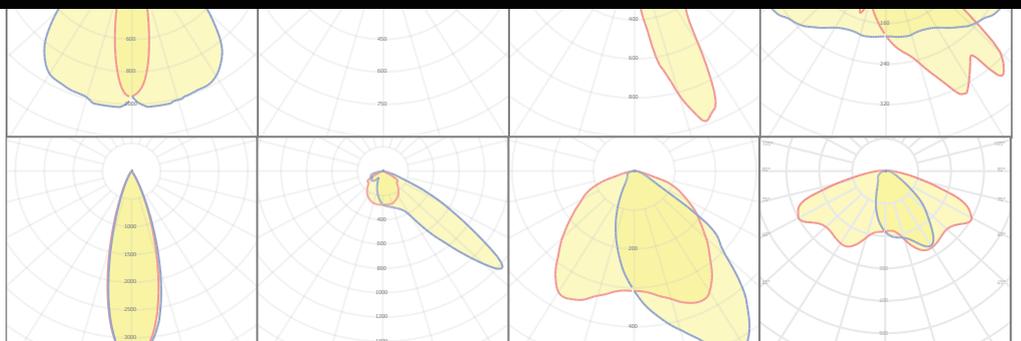
Guide to the LEDiL lens modules

LEDiL STRADA and HB modules

STRADA lenses, originally designed for street lighting applications, are suitable for many other applications as well. Like all LEDiL products STRADA lenses are optimized to provide consistent and predictable results with most of the applicable LEDs and have optimal light distribution with over 90% optical efficiency.

LEDiL has a range of STRADA and HB modules which have multiple lenses in a single array. Lens modules provide an easy and cost effective solution. All the LEDiL standard modules are designed to allow modularization of light engines. They are also future-proof solutions allowing customers to easily adapt into latest generation of LEDs without compromising the design and performance of the luminaire.

Please check LEDiL application notes and datasheets for more detailed information, for example the LEDs applicable to each lens.

STRADA-2X2

STRADA-2X2 modules contain four lenses in two rows, with standardized square-shaped 2" (50 mm) footprint and common LED pitch amongst the lenses.
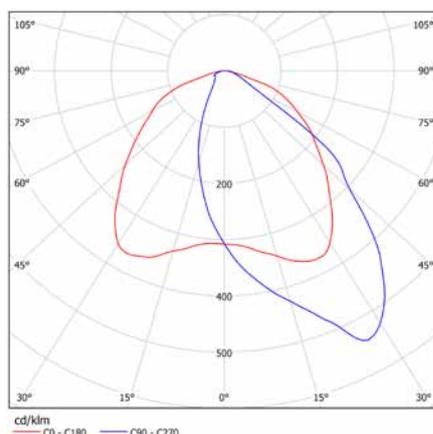
STRADA-2X2-FN

STRADA-2X2-FN is an array of asymmetric lenses with a long narrow forward throwing beam and good cut-off. It is a good choice for flood lighting of large areas like sports fields.
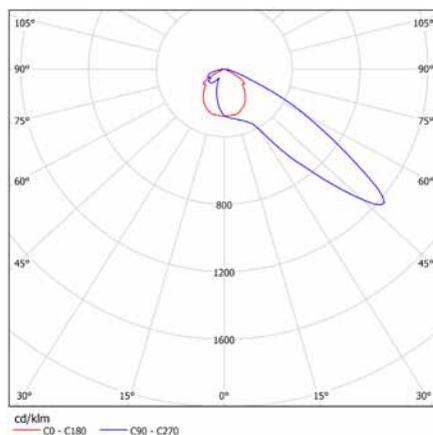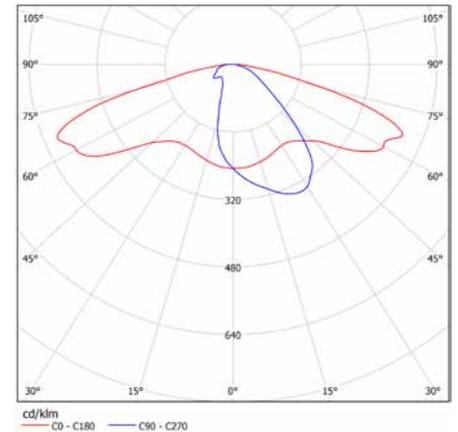
STRADA-2X2-DN

STRADA-2X2-DN is a 2X2 array of asymmetric lenses suitable for area lighting. It has asymmetric forward tilted beam and wider light distribution than -FN version. This makes it ideal for applications with shorter illumination distances and wider area coverage.
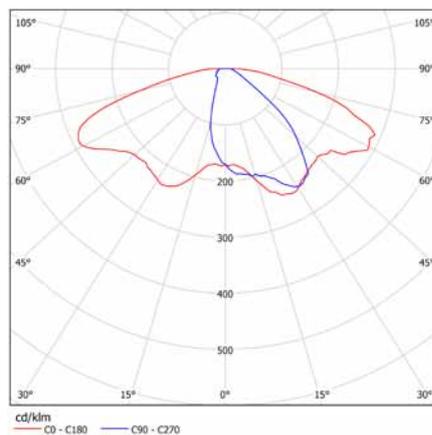
STRADA-2X2-DWC

STRADA-2X2-DWC is designed for roads with longer pole distances. It can be used in street lighting setups where the pole distance is six times up to the pole height. STRADA-2X2-DWC has an asymmetric design, which often negates the need for tilting the lamp head. Also available as STRADA-SQ single lens.
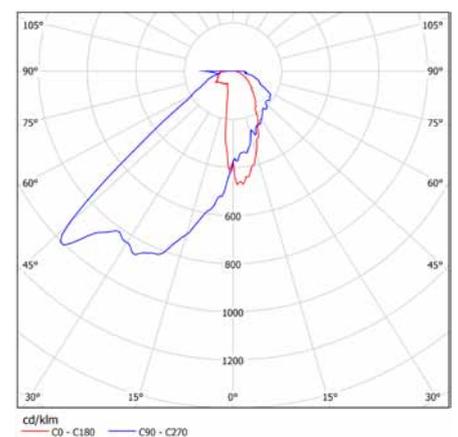

STRADA-2X2-DNW

STRADA-2X2-DNW is designed for roads where the pole height and the road width are similar. STRADA-2X2-DNW has an asymmetric design, which often excludes the need for tilting the lamp head. Also available as STRADA-SQ single lens.
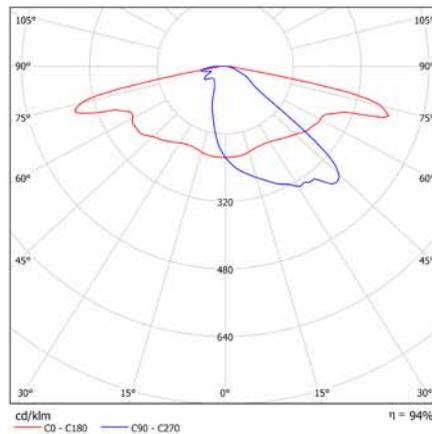

STRADA-2X2-PX

Asymmetric STRADA-2X2-PX is designed for illumination of pedestrian crossings according to the DIN 67 523 standard. Special attention has been put into making an optic with even illumination on the crossing area while avoiding excessive glare to roadway traffic.
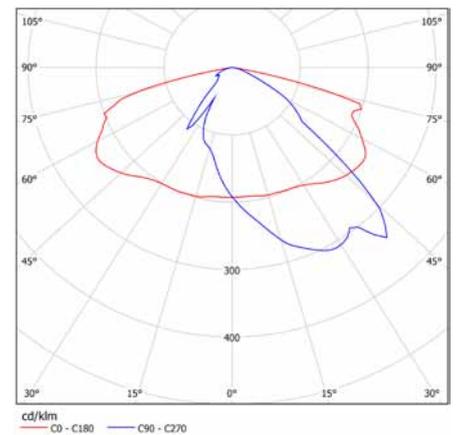
STRADA-2X2-ME

STRADA-2X2-ME is the best in class. It is designed for European and Asian roads requiring good luminance performance. Special care has been taken in low glare (TI) and longitudinal uniformity. Asymmetric design removes the need of tilting the luminaire head. Typical ME4a installations are possible with the ratio of pole distance and height up to 5.5. STRADA-ME is designed to fulfill ME-classes on a roads where width is equal or less to the pole height. Also available as STRADA SQ single lens and silicone sealed STRADA-IP-2X6 module.

STRADA-2X2-ME-WIDE1

STRADA-2X2-ME-WIDE1 is designed for European and Asian roads requiring good luminance performance. Its modified optic structure from the regular -ME allows use on wider roads and higher poles. The same design is also suitable for illumination of pedestrian walkways under the pole. Asymmetric design removes the need of tilting the luminaire head. Typical ME4a installations are possible with the ratio of pole distance and height up to 4.5.

STRADA-2X2-ME-WIDE2

STRADA-2X2-ME-WIDE2 is designed especially for staggered pole setups. Asymmetric design removes the need of tilting the luminaire head. Typical ME4a installations are possible with the ratio of pole distance and height up to 4.5.

LEDiL
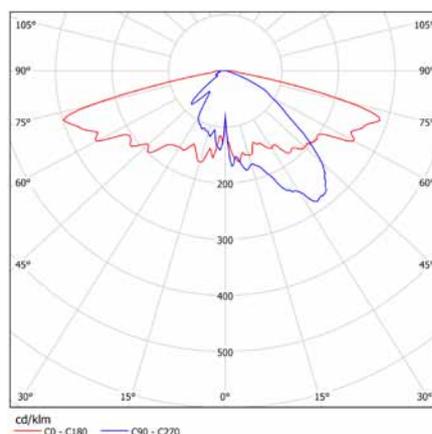
STRADA-2X2-T2

STRADA-2X2-T2 is classified as IESNA type II, optimised for a good mix between luminance and illuminance uniformity. It is also applicable to European S-class standard pedestrian lighting. A new innovative design allows the use of various LEDs while maintaining consistent results. Also available as STRADA-SQ single lens and silicone sealed STRADA-IP-2X6 module.
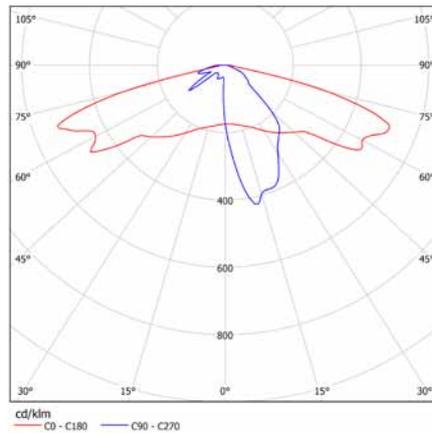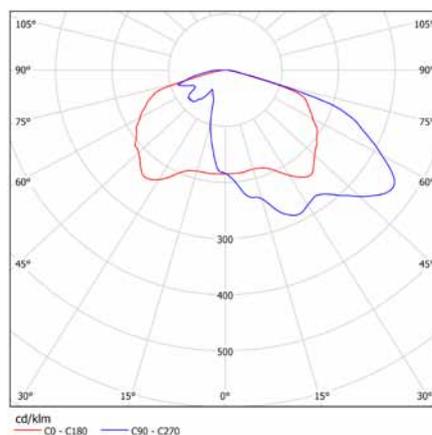

STRADA-2X2-T3

STRADA-2X2-T3 is classified as IESNA type III, with a great mix of luminance and illuminance uniformity. As a result of LEDiL's patented TIR design, various LEDs can be used with consistent results. Also available as STRADA-SQ single lens and STRADA-IP-2X6 module.
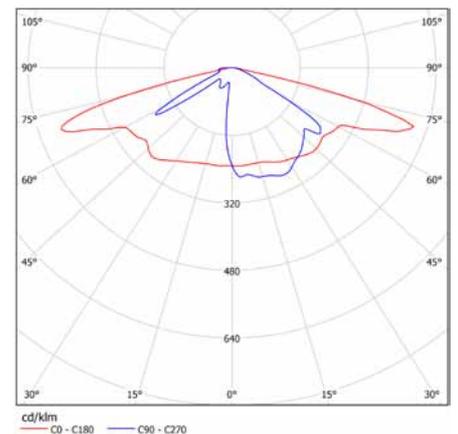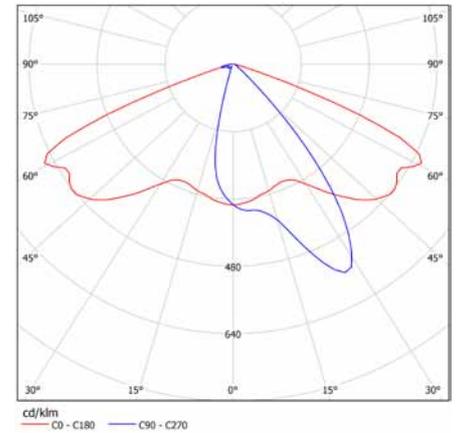

STRADA-2X2-T4

With forward throwing beam STRADA-2X2-T4 is classified as IESNA type IV. Being best suited for area lighting, for example parking lots and yards. It is also an excellent choice for wider roads. STRADA-2X2-T4 provides consistent and predictable results with a range of different LEDs thanks to LEDiL's patented TIR design. Also available as STRADA-SQ single lens.
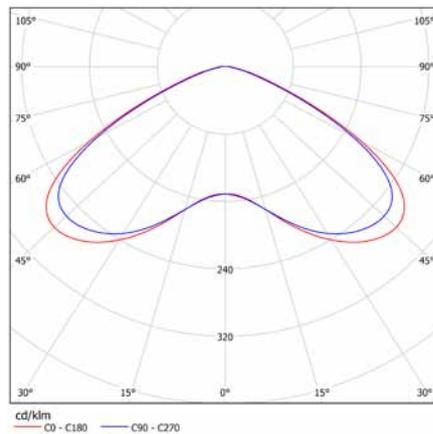
STRADA-2X2-A-T

STRADA-2X2-A-T has asymmetrical Type II light distribution pattern. It is ideal for narrow roads or on high poles, fulfilling global street lighting requirements with ease and efficiency. STRADA-2X2-A-T has high luminance and illuminance performance and with excellent beam control and minimal glare. Also available as STRADA-SQ single lens.
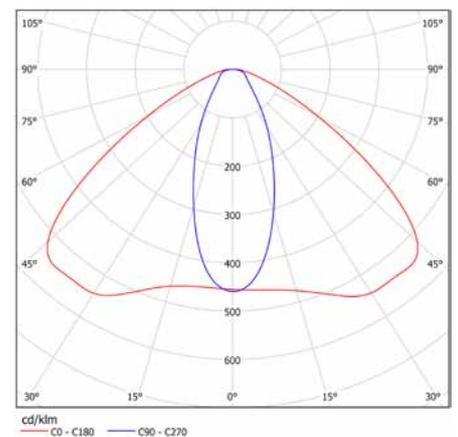

STRADA-2X2-C-STP

STRADA-2X2-C-STP is designed for area and street lighting applications such as park lights and pedestrian walkways. It is also suitable for catenary luminaires.
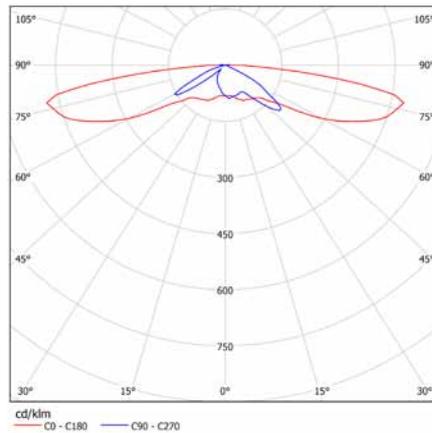

STRADA-2X2-B2-STP

STRADA-2X2-B2-STP is designed for area lighting applications, but is also suitable for applications demanding a moderately wide oval beam pattern.
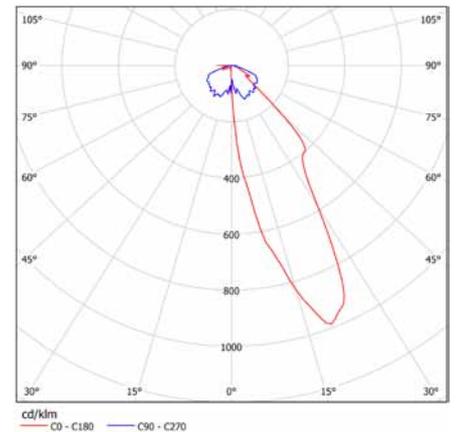
STRADA-2X2-XW

STRADA-2X2-XW provides uniform light with height distance ratio of 1:11 and 5° tilt. With extra wide beam it is especially good for security lighting and wider area coverage applications.
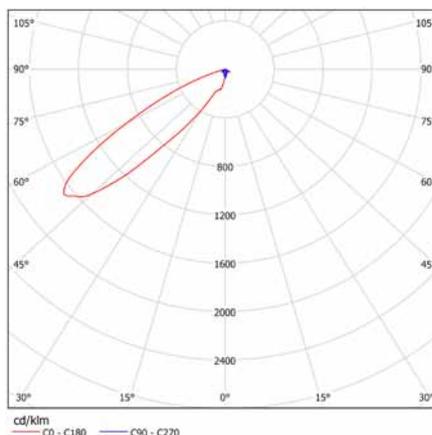

STRADA-2X2-NHS

STRADA-2X2-NHS is an array of asymmetric lenses suitable for urban lighting. The special optical design minimizes light falling on the house side. This makes it particularly suitable for wall-pack and area lighting applications like for example park lights.
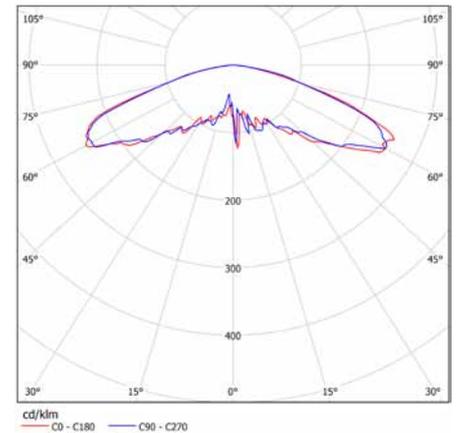

STRADA-2X2-TF

Asymmetric STRADA-2X2-TF is designed especially for tunnel lighting applications. It's strongly directed counter beam produces higher cd/m² efficacy with less lumen, and considerably improves visibility for the driver.

Upcoming STRADA-2X2 products

STRADA-2X2-VSM

STRADA-2X2-VSM is classified as IESNA Type V, with great luminance uniformity. It features symmetrical and wide square-shaped beam, which can be used from street lighting applications to parking lot lights.

STRADA-2X2-CAT

STRADA-2X2-CAT features wide oval beam designed for catenary luminaires especially in ME class. It provides uniform light with low glare and excellent cutoff. The module can also be rotated 90 degrees to illuminate extremely wide boulevards with closer installation distance. Besides street lighting, it is also suitable for tunnel and garage lighting applications.
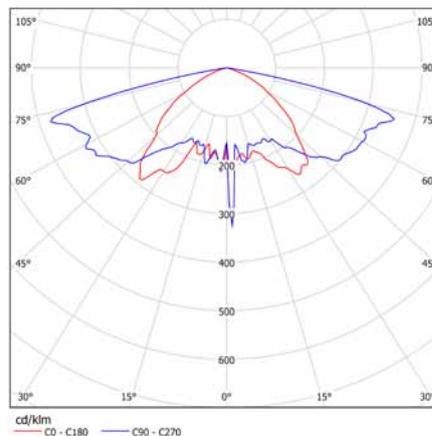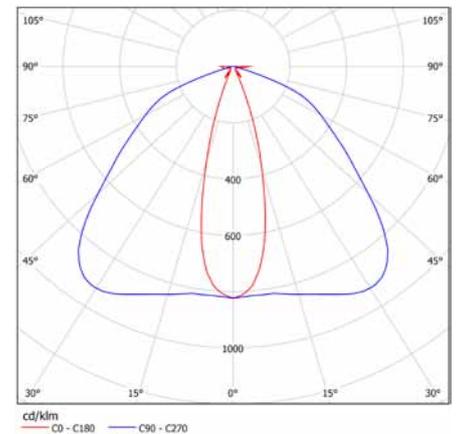
HIGH BAY

LEDiL's 2X2 HIGH BAY lenses are designed for DLC compliant high bay applications where the mounting height of the lighting fixtures is usually over ten meters. In addition, HB lenses can be used in other applications, such as indoor architectural and general lighting. There are different lenses for different lighting situations and mounting heights; generally, the wider the beam, the lower the luminaire can be mounted. Please check LEDiL application notes and datasheets for more detailed information, for example the LEDs applicable to each lens.
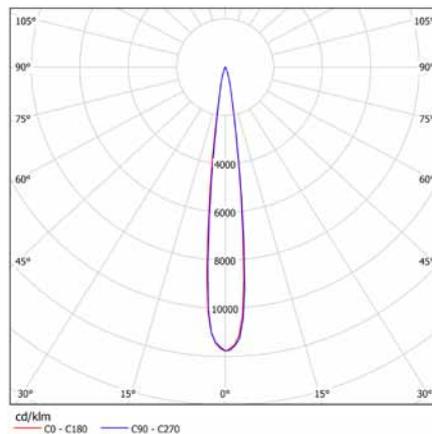
HB-2X2-O

Designed to be used in high bay applications in narrow spaces, for example aisles between shelves. It has an oval-shaped beam with excellent cut-off. The module is easily assembled and sealable, which excludes the need for an glass cover.

HB-2X2-RS

HB-2X2-RS is a high bay suitable spot lens with narrow 10 degrees light beam. It is ideal for high spaces like ice hockey arenas and stadiums.
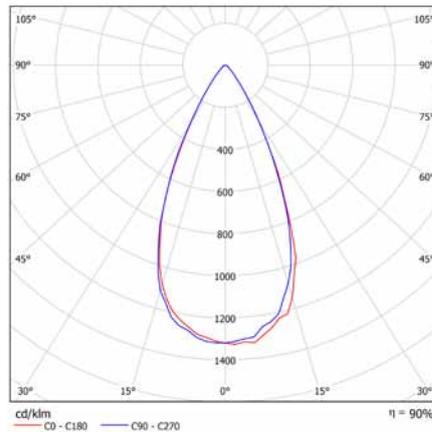
HB-2X2-M

With 25 degrees rounded beam and excellent cut-off, HB-2X2-M has features that makes it stand out in the high bay fields. The standard-size module is quick to assemble and easily sealable, so no glass cover is needed over the lenses.
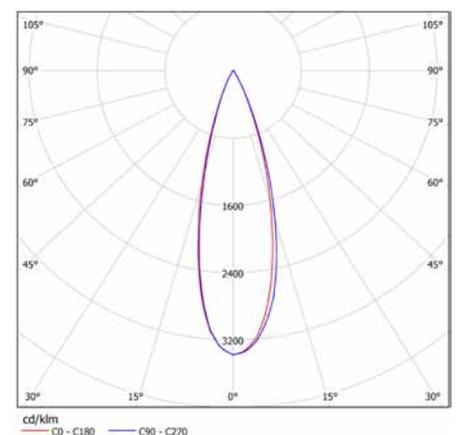
HB-2X2-RW

HB-2X2-RW has a wide 51 degrees rounded beam with excellent cut-off. Its light pattern goes between the HB-2X2-M and HB-2X2-WW, and can be used in both high and low bay applications. The module is easily assembled and sealable, so there is no need for an extra cover over the lenses.
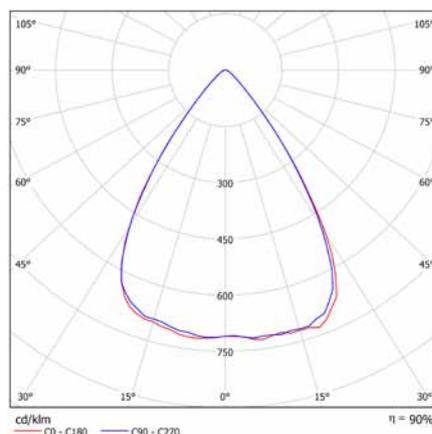

HB-2X2-W

HB-2X2-W meets DLC high bay requirements. It has an optimal light distribution with a wide 53 degrees rectangular light pattern, low glare and excellent cut-off. The module is sealable, so no extra cover is needed over the efficient PMMA lenses. It is also available as a HB-5x1-W and HB-5x1-FLAT-W versions with the same light pattern.
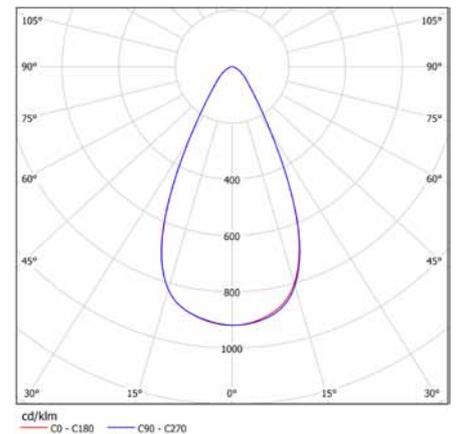
## HB-2X2-WW

HB-2X2-WW is an extra wide version of HB-2X2-W, with a rounded 62 degrees light pattern. Due to its design with low glare and excellent cut-off features it can be used in both high and low bay applications. The module is sealable, so no extra cover is needed. It is also available as HB-5x1-WW module and HB-IP-2X6-WW silicone module. Their light patterns are similar to that of HB-2X2-WW.

STRADA-2X2-CY

STRADA-2X2-CY is designed for illumination of canopy areas in petrol stations and other low bay applications. Beam pattern is specifically designed to provide good and uniform horizontal light while providing enough vertical illumination.
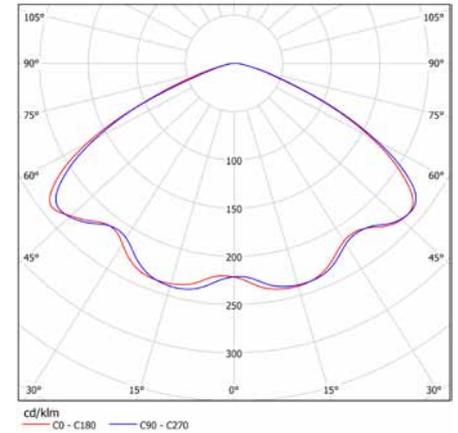
HB-IP-2X6 module

LEDiL's HB-IP module family has integrated silicone gasket allowing it to achieve IP-rating up to IP67.
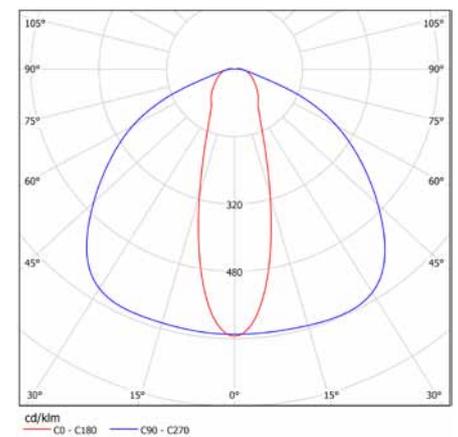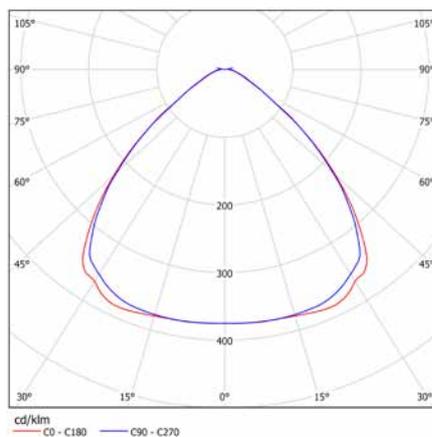
HB-IP-2X6-W

HB-IP-2X6-W meets DLC high bay requirements. It has an optimal light distribution with a wide rectangular light pattern, low glare and excellent cut-off. This lens module is designed for optimal horizontal uniformity.

HB-IP-2X6-WWW

HB-IP-2X6-WWW meets DLC high bay requirements and has an optimal light distribution with a very wide 90 degree rectangular light pattern.

HB-IP-2X6-O

HB-IP-2X6-O has an oval-shaped beam with an excellent cut-off. It is optimized especially for illumination of high racks and warehouse aisles.
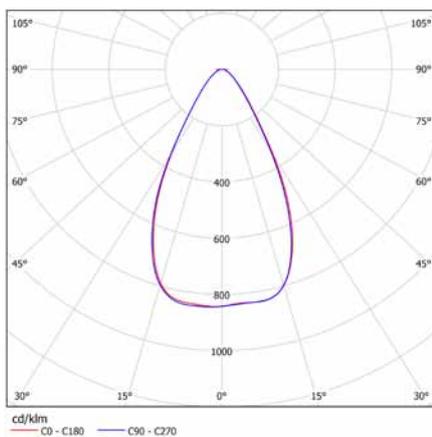

Upcoming HB-IP-2X6 modules

HB-IP-2X6-M
HB-IP-2X6-RS

2X2MX modules for technical and street lighting applications

The 2X2MX platform features standardized 90 x 90 mm square-shaped footprint and same incomparable performance as proven in smaller HB- and STRADA-2X2 modules. Lens modules are based on the same design principle as LEDiL's proven 2X2 module range for high power LEDs. Optical design is optimised to provide consistent and predictable results over a range of super high power multi-crystal LEDs from all major brands. Modular design of the lenses allows adaptation of standard light engines into a range of different applications, whether technical or street lighting. With integrated silicone gasket all modules are protected from dirt and water up to IP67.
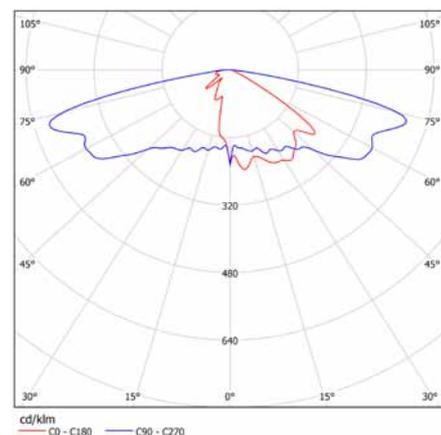
HB-2X2MX-W

HB-2X2MX-W features same proven performance as the existing smaller HB-2X2 module. HB-2X2MX-W has 58° (typ.) beam and typical efficiency of 90%.
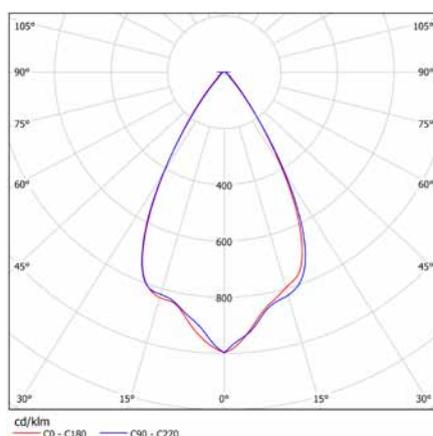
STRADA-2X2MX-DWC

STRADA-2X2MX-DWC features next generation universal DWC beam with more controlled beam shape and improved backlight. STRADA-2X2MX-DWC is optimized for ME3-4 for 2 lane setups with 8 m high poles, and ME1-2 freeway setups at 10-12 m mounting height. It will also work well for ME5-6 with long pole distances. Optimized to fulfill S-class on pedestrian walkways behind the ME roads efficiently.

Upcoming 2X2MX products

HB-2X2MX-M
HB-2X2MX-WWW
STRADA-2X2MX-T2 Type II street lighting
STRADA-2X2MX-T3 Type III street lighting
STRADA-2X2MX-VSM Type V street lighting
STRADA-2X2MX-SCL for S Class lighting applications
STRADA-2X2MX-CAT for catenary street luminaires
STRADA-2X2MX-ANZ-P Australian and New Zealand P road class (pedestrian) lighting
STRADA-2X2MX-ANZ-V Australian and New Zealand V road class (vehicular) lighting

STRADA-6X1 family

STRADA-6X1 modules have six lenses in a linear array. The spacing between the LEDs in the row is 20 mm so 6X1 modules can be used with the same PCB design as first generation STRADA lenses. Minimum side-to-side spacing is 1" (25.4mm).

STRADA-T-6X1-DNW

STRADA-T-6X1-DNW is ideal for European ME standards and can be used to achieve other street lighting standards. Exceptionally good control over longitudinal uniformity means that even ME1 is easy to achieve. Street width should be close to the height of the pole and pole distance can be about 4 times the height of the pole.

STRADA-T-6X1-DWC

STRADA-T-6X1-DWC is optically close to the STRADA-2X2-DWC and works well on longer pole distances of up to 6 times the height of the pole.
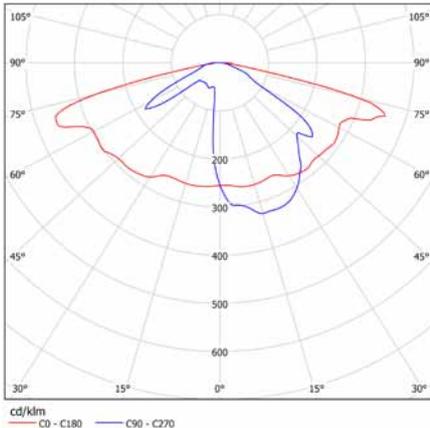
STRADA-T-6X1-ME

STRADA-T-6X1-ME is optimized for European ME road classes especially with longer pole distances.
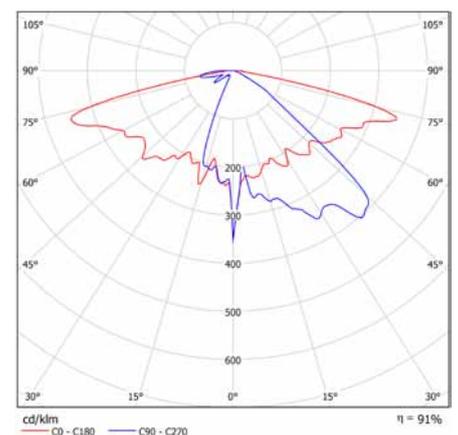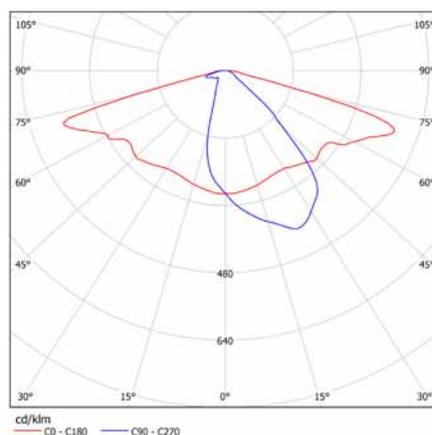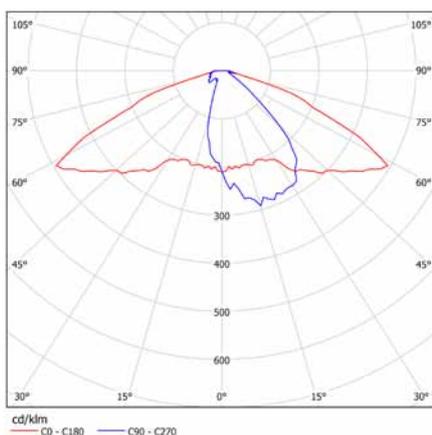
STRADA-IP-2X6 family

STRADA-IP-2X6 modules have integrated silicon gasket to seal the module up to IP67 rating. Modules are based on the same 1 inch array design compatible with rest of the STRADA-modules. This makes it easy to switch between 2x2 and 2x6-IP.
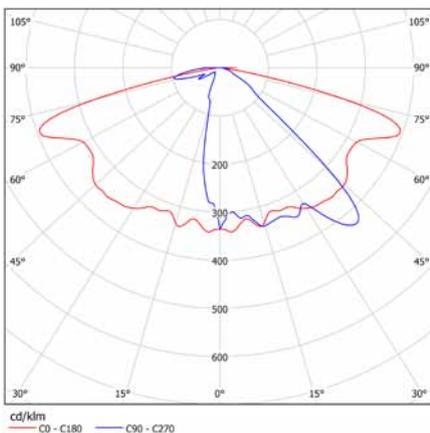

STRADA-IP-2X6-T3

STRADA-IP-2X6-T3 is classified as IESNA type III, with a great mix of luminance and illuminance uniformity. As a result of innovative design, various LEDs can be used with consistent results and uniform high quality.
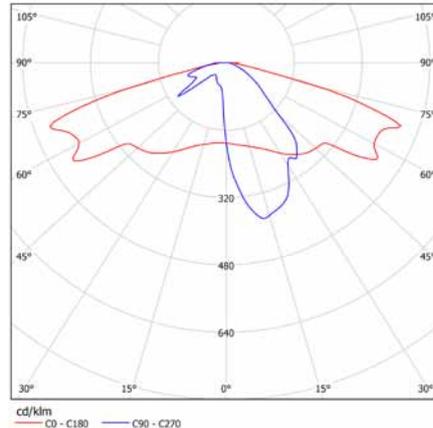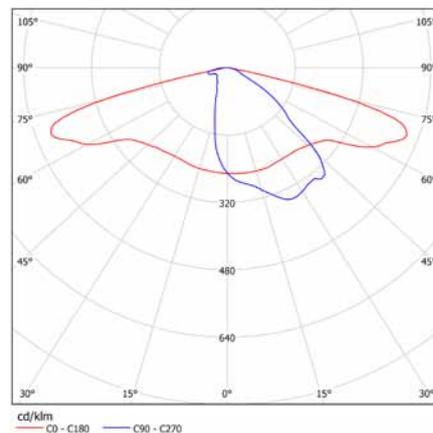

STRADA-IP-2X6-T2

STRADA-IP-2X6-T2 is classified as IESNA type II, with a great mix of luminance and illuminance uniformity. It is also applicable to European S-standard pedestrian lighting. LEDiL's patented TIR design allows the use of various LEDs while maintaining consistent results.
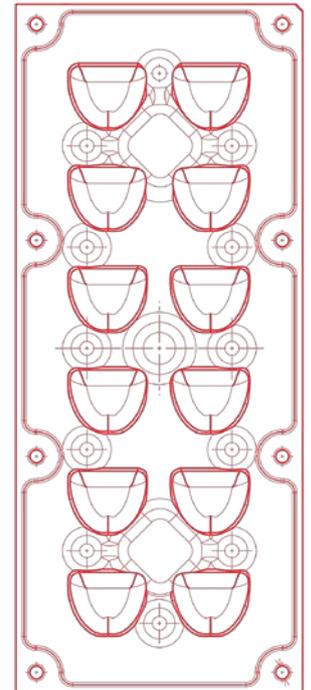

STRADA-IP-2X6-ME

STRADA-IP-2X6-ME is designed for European and Asian roads requiring good luminance performance. Special care has been taken in low glare (TI) and longitudinal uniformities. Suitable from narrow to wide pole spacing installations. Asymmetric design removes the need of tilting the luminaire head which helps to maintain uniform light across the road and reduce glare.
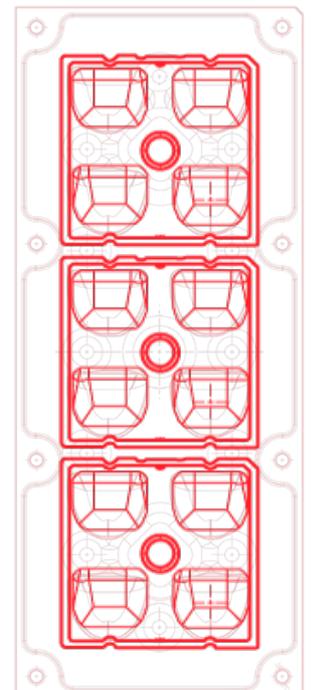

STRADA-IP-2X6-DWC

Optically similar to STRADA-2X2-DWC with asymmetric beam dessign, which often excludes the need for tilting the lamp head.

Also available as STRADA-IP-2X6-DWC-90 with tilted 90 degrees beam.

STRADA-IP-2X6 module

STRADA-2X2 modules

More information:

Application note – Strada IP2X6 Installation guide

Installation of LEDiL modules

All LEDiL optical modules need to be installed properly in order to have product functioning as it's designed. Modules are positioned with pins fitting into holes on the PCB. Both 2X6 and 2X2 modules should be fastened into heatsink with M3 screws tightened to 0,6 Nm.

NOTE: Use of the countersunk screws will break the lens, do not use other than LEDiL specified screws.
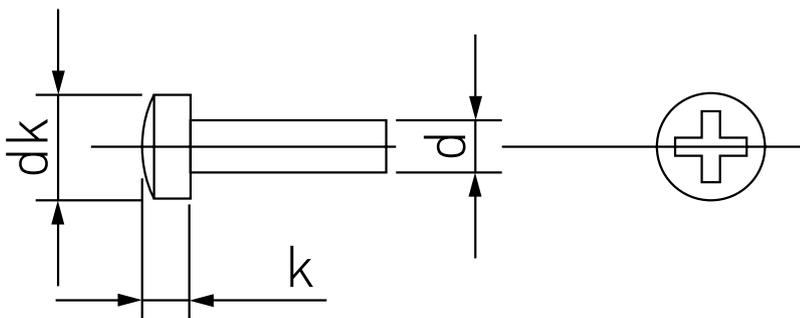
DIN 7985 / ISO 7045 / ISO 14583 TX	
Thread Size	M3
dk	6mm
d	3mm
k max	2,52mm
L	4-22mm

Ingress protection of STRADA modules

STRADA-2X2 modules are designed to be sealed against environmental hazards with commonly available potting compounds. Sealant is applied with dispenser either manually or with automated XY-table. Notice that STRADA-IP, HB-IP and 2X2MX modules have integrated silicone gasket and therefore potting is not needed.
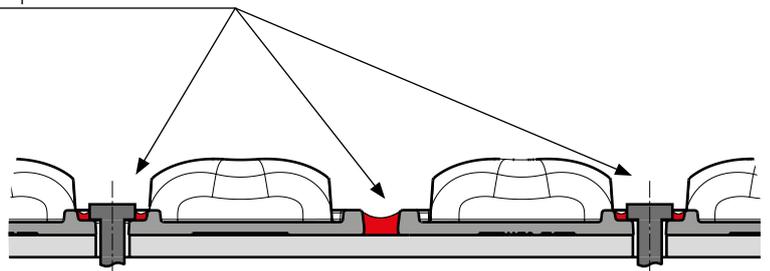
To find out LEDiL recommended sealing compunds/adhesives, visit:
http://www.ledil.com/recommended_materials

Apply potting compund only outside the optical area. Lens is designed with barrier walls to keep the compund out of the lenses.

LEDiL mid-power modules

LEDiL's FLORENCE is family of optic modules compliant with mid-power modules like for example the Philips Fortimo LED Line or similar modules.

FLORENCE-3R family

The FLORENCE-3R family offers 4 patent pending optical versions optimized for efficient lighting in industrial and architectural applications. For for architectural and retail applications where glare may be an issue, UGR can be decreased below 19 with the optional FLORENCE-SHD shades.
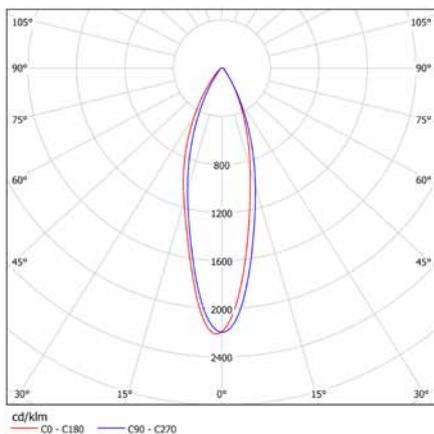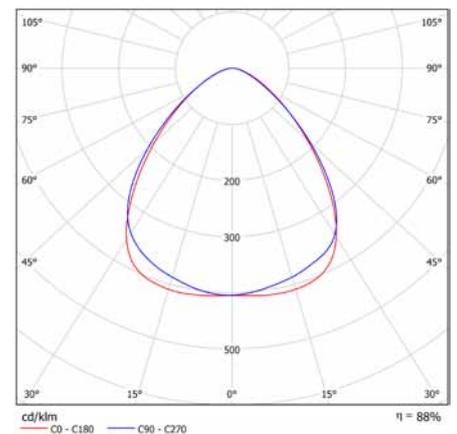

FLORENCE-Z30

Symmetrical 30˚ beam version for mid bay lighting. Provides an uniform light distribution with over 90% efficiency. FLORENCE-Z30 is designed to replace fluorecent lights and it's great choice for office lights especially in higher installations with the optional FLORENCE-shade. Typical assembly height is 7 meters and above.
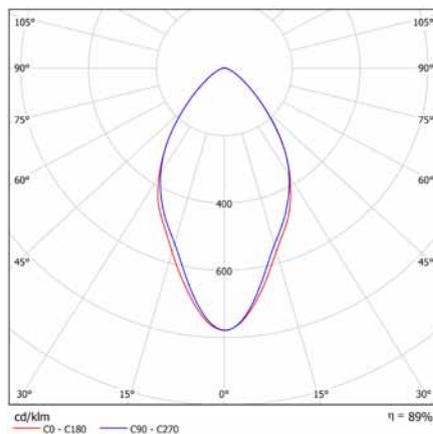
FLORENCE-Z60

Symmetrical 60˚ beam version optimized for low surface luminance providing an uniform light distribution with typical efficiency of 90%. Typical assembly height in industrial applications is 4...6 meters.
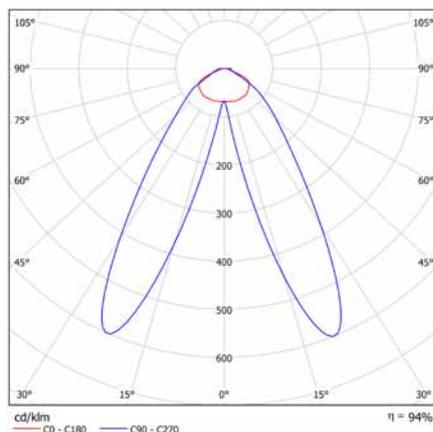
FLORENCE-Z90

Symmetrical 90˚ beam version. Special attention has been paid achieving low surface luminance to reduce glaring. Features typical efficiency of 90%. Typical assembly height in industrial applications is 3...5 meters.


FLORENCE-ZT25

Double asymmetric beam version designed especially for retail environment applications illuminating items on shelves on both sides of the aisle. Provides uniform double sided oval beam with some focused intensity to the aisle center as well. Special attention has been paid to achieve uniform color on the shelves.

FLORENCE-1R family

FLORENCE-1R modules are designed for single row mid-power modules. The modules can easily be snapped apart into single 95 mm pieces. Narrow width of the module makes it easy to achieve sleek and stylish linear luminaire design. Easy installation with optional clips makes manufacturing fast and cost efficient.

Linear optical design is compatible with a range of different LED pitches. Optional FLORENCE-1R-shades available to reduce glare. Besides mid-power LEDs, FLORENCE-1R modules can be used with small high-power LEDs like Luxeon Z from Philips Lumileds.
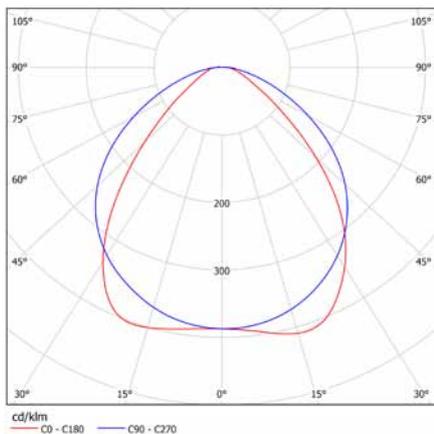
FLORENCE-1R-Z90

FLORENCE-1R-Z90 has wide 90˚ symmetrical beam and is suited for pleasant and efficient overall lighting.
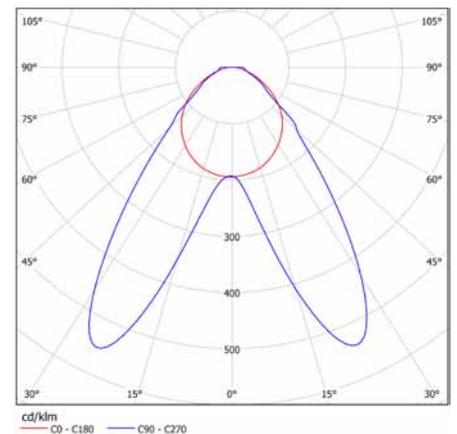
• Retail lighting
• Low bay lighting
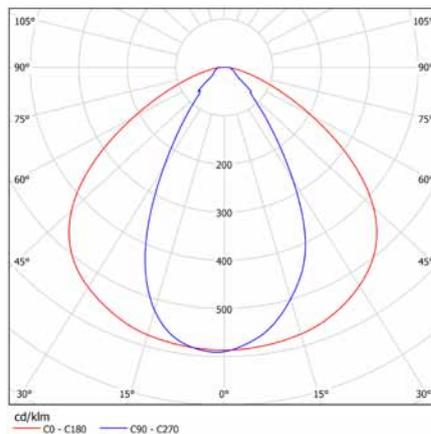
FLORENCE-1R-Z60

FLORENCE-1R-Z90 has medium 60˚ symmetrical beam and is suited for pleasant and efficient overall lighting.

• Retail lighting
• Low bay lighting
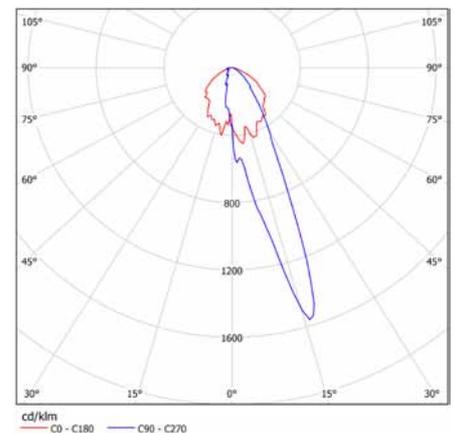

FLORENCE-1R-Z2T25

FLORENCE-1R-Z2T25 features double assymmetric beam similar to it's three row cousin FLORENCE-ZT25.
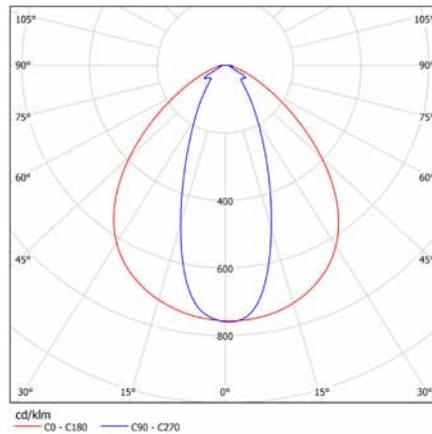

FLORENCE-1R-ZT25

FLORENCE-1R-ZT25 has single sided asymmetric tilted beam making it the lens of your choice for single sided shelf lighting and wall-washing applications.

• Wall-washing
• Shelf lighting

FLORENCE-1R-O

FLORENCE-1R-O is optimized for corridor lighting in industrial and warehouse applications. The oval light distribution allows optimal corridor lighting where the light is not wasted on the top of the shelves.
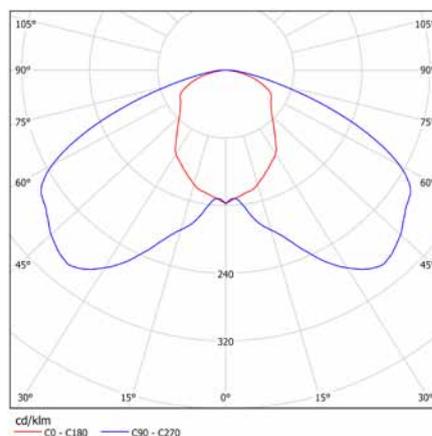

FLORENCE-1R-MAXI-WG

Linear wall-grazing lens designed for interior architectural lighting. It has an asymmetric oval light beam pattern and a very narrow beam with high peak value to maximize light on the wall. The 1R-MAXI-WG features uniform light performance with optimal vertical depth and horizontal wideness with design that allows the illumination to start already from the mounting level. Designed especially for high power LEDs. Linear optical design enables easy scaling for desired lumens per module output.
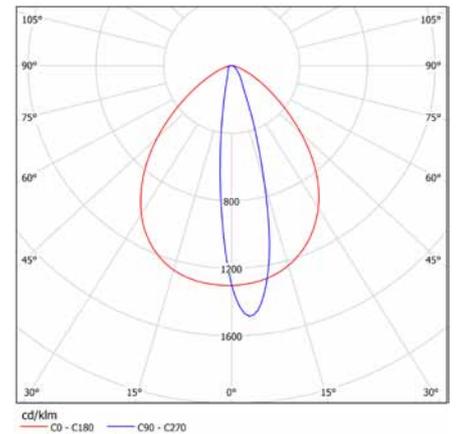
FLORENCE-1R-UP

Wide batwing type beam for uplighting and indirect illumination in pendant lights for office environments. Designed to replace fluorescent lights. By lighting up the ceiling it's possible to lower UGR without decreasing the amount of direct lighting. Mounting into aluminium profile with typical installation distance 20...50 cm from the ceiling.

Installation of FLORENCE-1R modules

- Achieve sleak and uniform luminaire exterior by connecting lenses into continuous row with LEDiL retaining clips
- Fastening options are glue and various LEDiL retaining clips for hooks or screws
- User specific custom retaining clips can be made on request
- **C14353_FLORENCE-1R-CLIP-A** for 40 mm wide PCB´s (like Philips Fortimo) and screw mount

- **C14409_FLORENCE-1R-CLIP-B** fits straight into aluminum profile, no screws needed.
- **C14751_FLORENCE-1R-CLIP-C** for 24 mm wide PCB´s and screw mount

LEDiL clip C14353_FLORENCE-1R-CLIP-A

LEDiL clip C14409_FLORENCE-1R-CLIP-B

ZENIA

Linear optics designed to illuminate backdrop inside the shelves. Also suitable for wall-washing and stair lighting applications. Tilted narrow beam prevents unwanted light spill.

Flat 6 mm design is easy to integrate and modular design with 15 mm intervals allows installation to any width. Designed to be installed as such or into an aluminium profile. ZENIA optics work with any spacing between the mid-power LEDs.
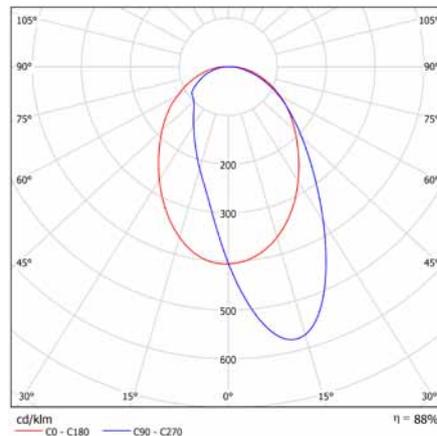
IDA 16-up module

IDA is LEDiL´s new 50 x 50 x 6.3 mm lens array family for mid-power LEDs. One moduöe has 16 lenses with Medium, Batwing or Oval shaped light distributions.

Possibility to use lens by itself or with the installation frame.

Frame

Lens

PCB 1.6 mm

Location pin hole