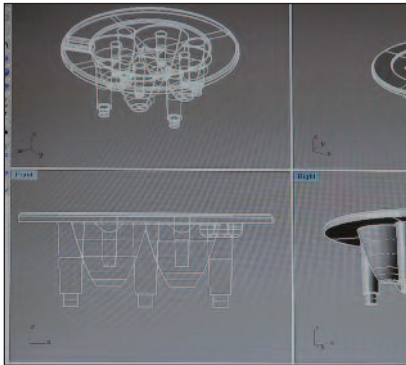
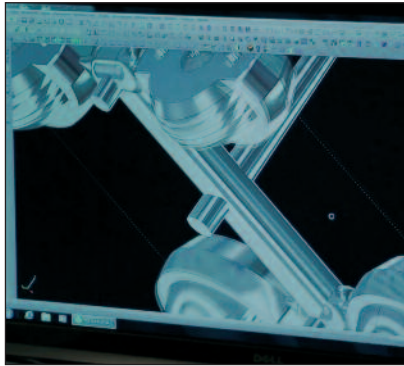
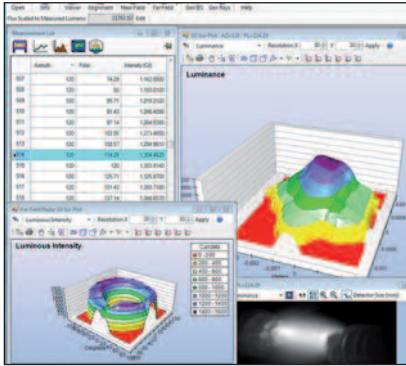


KHATOD[®]

Optical Solutions for LED Lighting

Milano 1985

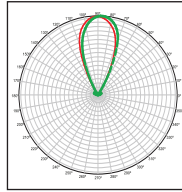
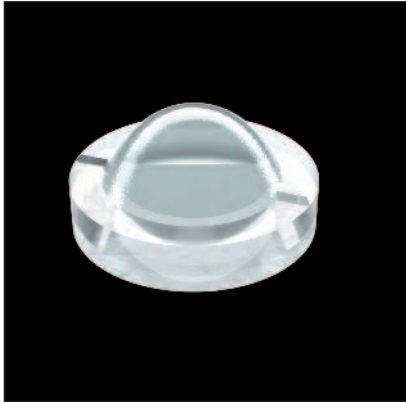
Khatod: Advanced Technology, Unique Projects, Ready-to-Use



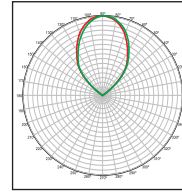
Khatod optics enable to realize your most demanding applications in LED Lighting. **Pioneer of SILICONE LENSES, unique to OPTICAL SYSTEMS, forerunner of new-concept REFLECTORS, skilled developer of CUSTOM OPTICS.** To its customers, Khatod makes available its newest industrial area – 30,000sqm of advanced technology - free of charge technical support, fast deliveries from HQ, corporate sales offices around the world and global distributors of the industry.

- **Standard products:** over 6500 models from stock – optics, optical systems and reflectors – for most popular LEDs, for any kind of applications in LED Lighting. Made from top quality materials – optical grade PMMA for HT, PC HT, ULTRA-CLEAR SILICONE (LSR) – by using exclusive manufacturing processes and superior finishing.
- **Custom Optics:** Khatod started as manufacturer of custom optics when LED Lighting was in its early days. Since then, our lenses have been developing alongside the newest LEDs. Who can offer better expertise than Khatod? The answer is easy: nobody. Unique on the international scene, Khatod develops the entire product process 100% in-house, Milano-Italy. No outsourcing. For your new projects, do not hesitate to contact Khatod. You will find not only a manufacturer of optics, but a real partner in your project.

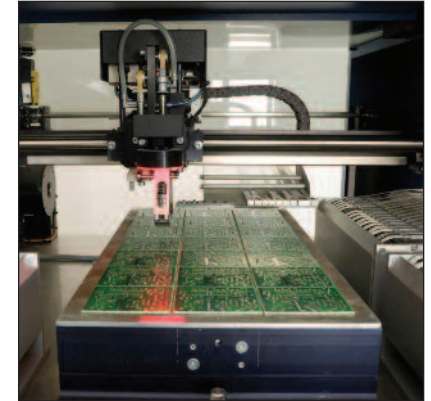
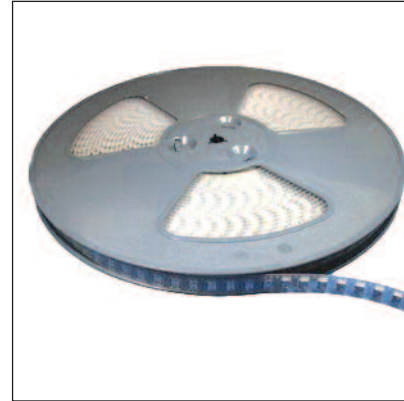
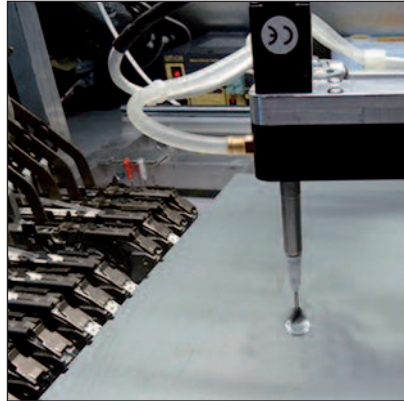
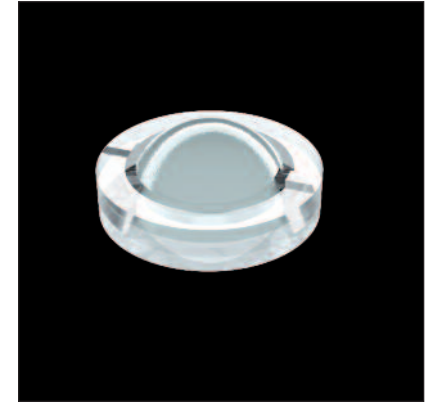
Since 1985, from Project to Object. 100% Made in Khatod, Italy.



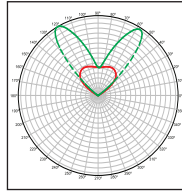
PLL2080EW
 - Full angle at 50% from maximum: ~ 60°
 - Full angle at 10% from maximum: ~ 75°



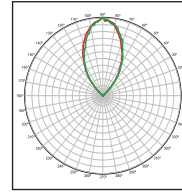
PLL2080UW
 - Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 110°



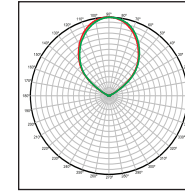
Single microlenses for most popular MID-POWER LEDs, 0.5W. Round shape - Ø 11.95mm - different beam angles. Mounted on reels and compatible with the most popular Pick and Place Machines for SMD Components. Designed for street lighting, REELENSES are perfect for all those applications where the management of light is essential. Made of PMMA. Beam angles: 60° FWHM; 90° FWHM; 3 new beam angles coming soon. Lighting efficiency: over 85%.



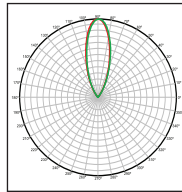
- PLL2059AXKH**
- Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 105°



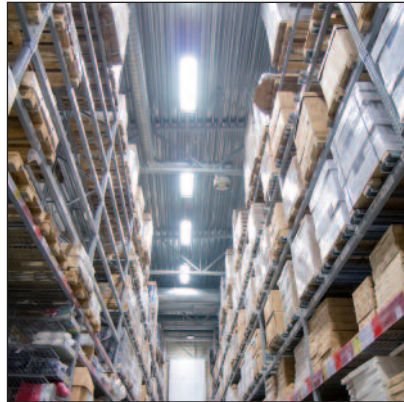
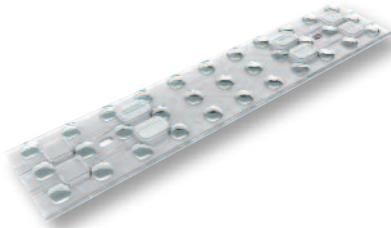
- PLL2059EWKH**
- Full angle at 50% from maximum: ~ 60°
 - Full angle at 10% from maximum: ~ 90°



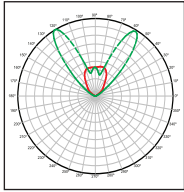
- PLL2059UWKH**
- Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 120°



- PLL2059WIKH**
- Full angle at 50% from maximum: ~ 33°
 - Full angle at 10% from maximum: ~ 64°

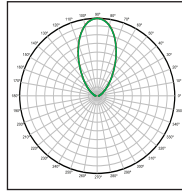


11x3 optics panels, made of PMMA, designed for most popular Mid-Power LEDs. Excellent optical solutions for lighting systems used in rooms with high ceilings and industrial frame. Ensure high efficiency and energy saving. Easily replace conventional lighting in existing light fixtures, enabling immediate conversion from old technology to new energy-efficient systems. Beam angles: Ultra Wide, Asymmetrical, Double-Asymmetrical. Designed to comply with ZHAGA mounting dimension specifications.



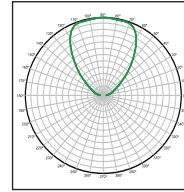
PLL2061AXKH

- Full angle at 50% from maximum: ~ 90°
- Full angle at 10% from maximum: ~ 105°



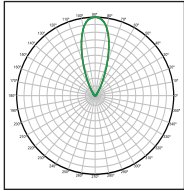
PLL2061EWKH

- Full angle at 50% from maximum: ~ 60°
- Full angle at 10% from maximum: ~ 90°



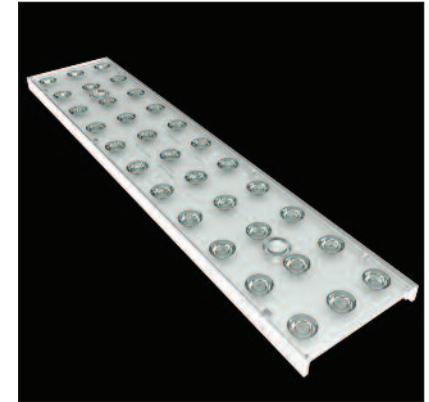
PLL2061UWKH

- Full angle at 50% from maximum: ~ 90°
- Full angle at 10% from maximum: ~ 120°



PLL2061WIKH

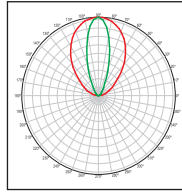
- Full angle at 50% from maximum: ~ 33°
- Full angle at 10% from maximum: ~ 64°



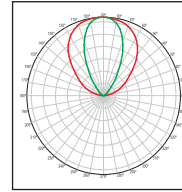
Designed for any Lighting System using MID-POWER LEDs. The module edge is as high as the height determined by the lenses forming the array - 7.17mm to 12.07mm - giving the module a box shape. This makes Stock & Shop even more compact, robust and efficient while enabling the housing to be extremely flat. All STOCK & SHOP models feature excellent solutions to realize any kind of luminaires using MID-Power LEDs – recessed, surface-mounted and pendant – thanks to the high optical engineering content and to the design enabling to meet the most various lighting requirements. Made of PMMA. Dimensions: 286.00mm x 60.00mm side; 7.17 mm to 12.07mm height. Lighting efficiency: over 85%.



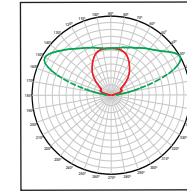
Length = 285,9mm



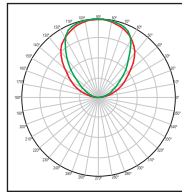
PLL2026A
– Full angle at 50%:
30°



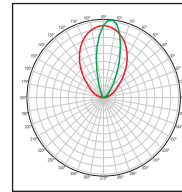
PLL2026B
– Full angle at 50%:
60°



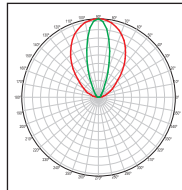
PLL2026L
– Full angle at 50%:
145°x90°



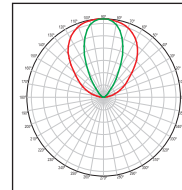
PLL2026C
– Full angle at 50%:
90°



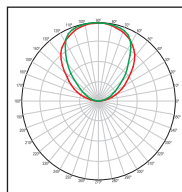
PLL2026D
– Full angle at 50%:
asymmetric



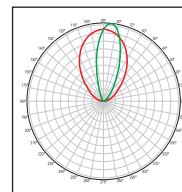
PLL2026E
– Full angle at 50%:
30°
for Fortimo LED



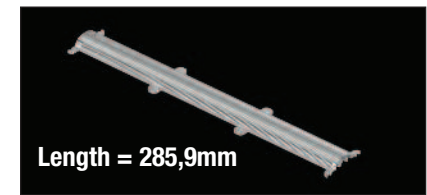
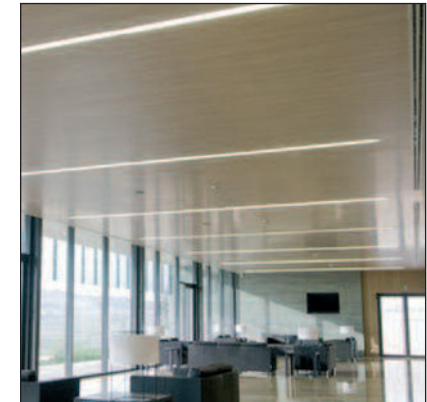
PLL2026F
– Full angle at 50%:
60°
for Fortimo LED



PLL2026G
– Full angle at 50%:
90°
for Fortimo LED

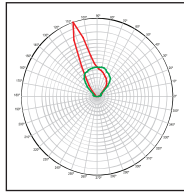


PLL2026H
– Full angle at 50%:
asymmetric
for Fortimo LED

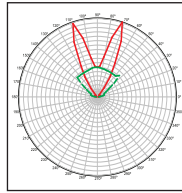


Length = 285,9mm

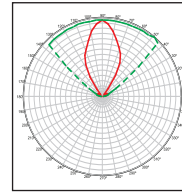
Engineered for mid-power LED strips. Made of optical grade PMMA; -40° ~ 90° temperature resistant. Available in 4 optical beams - 30°, 60°, 90°, asymmetric - fit for standard PCB, 20mm wide – and 4 optical versions for Fortimo LED Strip systems. **Offer exclusive installation also in continuous rows made of limitless number of parts by simple fastening with screws.** Ideal for use in narrow width luminaire designs, in architectural and decorative applications. **286mm long.**



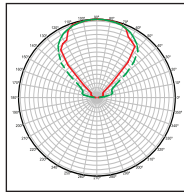
- PLL2091ASSNP**
- Full angle at 50% from maximum: ~ 30°
 - Full angle at 10% from maximum: ~ 90°



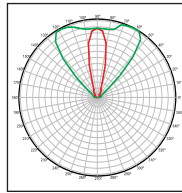
- PLL2091AXSNP**
- Full angle at 50% from maximum: ~ -30/+30°
 - Full angle at 10% from maximum: ~ 90°



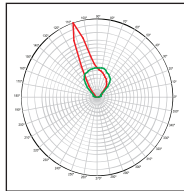
- PLL2091EWSNP**
- Full angle at 50% from maximum: ~ 60°
 - Full angle at 10% from maximum: ~ 100°



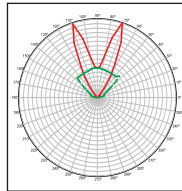
- PLL2091UWSNP**
- Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 100°



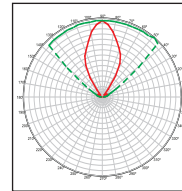
- PLL2091WISNP**
- Full angle at 50% from maximum: ~ 30°
 - Full angle at 10% from maximum: ~ 90°



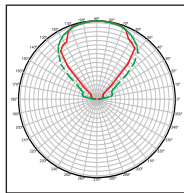
- PLL2091AS**
- Full angle at 50% from maximum: ~ 30°
 - Full angle at 10% from maximum: ~ 90°



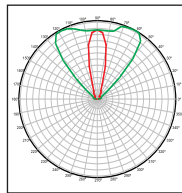
- PLL2091AX**
- Full angle at 50% from maximum: ~ -30/+30°
 - Full angle at 10% from maximum: ~ 90°



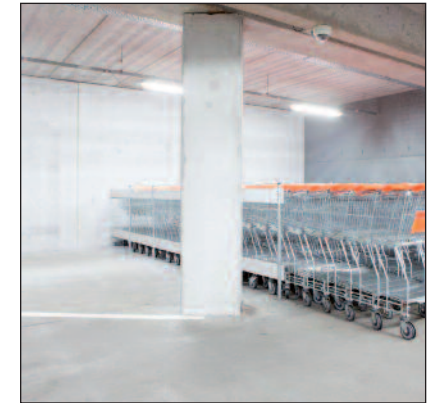
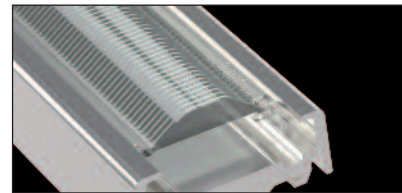
- PLL2091EW**
- Full angle at 50% from maximum: ~ 60°
 - Full angle at 10% from maximum: ~ 100°



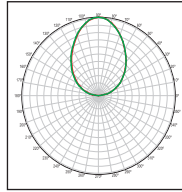
- PLL2091UW**
- Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 100°



- PLL2091WI**
- Full angle at 50% from maximum: ~ 30°
 - Full angle at 10% from maximum: ~ 90°

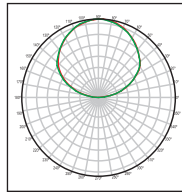


SUPERLINEA are the newest STRIP LENSES from Khatod. **LINEAR TIR LENSES 40mm x 284mm**. They ARE NOT extrusion process manufactured. Designed for MID POWER LEDs assembled in linear arrays, they are optimized for the most popular Zhaga mid-power 20 and 24 mm wide PCBs. Made of Optical Grade PMMA, offer many symmetrical and asymmetrical beam options. Perform uniform luminance, homogeneous light flux and smooth light distribution. Achieve 89% Lighting Efficiency. The special surface texture enables enhanced control of glare, making SUPERLINEA LENSES excellent in any application requiring a substantial reduction of glare. Extruded aluminum profiles and plastic plugs to close the end part of the assembled construction are available on request. SUPERLINEA LENSES are provided with clips enabling either direct assembly onto the PCB or onto the profiles.



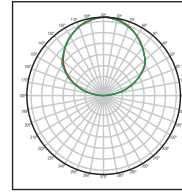
**PLL120002SR
IESNA Type V**

- Full angle at 50% from maximum: ~ 150°
- Full angle at 10% from maximum: ~ 165°



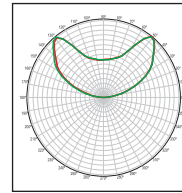
**PLL129003
IESNA Type II**

- Full angle at 50% from maximum: ~ 80°x150°
- Full angle at 10% from maximum: ~ 130°x160°



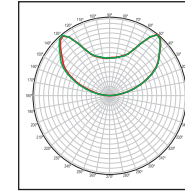
**PLL120003SR
IESNA Type II**

- Full angle at 50% from maximum: ~ 80°x150°
- Full angle at 10% from maximum: ~ 130°x160°



**PLL129004SR
IESNA Type III**

- Full angle at 50% from maximum: ~ 130°x150°
- Full angle at 10% from maximum: ~ 145°x160°



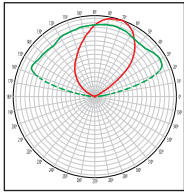
**PLL120004SR
IESNA Type III ME3a**

- Full angle at 50% from maximum: ~ 130°x150°
- Full angle at 10% from maximum: ~ 145°x160°

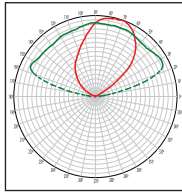


NACTUS 6x2 modules, made of Ultra-Clear LSR (Liquid Silicone Rubber), 173 (l) x 71.4 (w) x 12 (h) mm, 12 optics, with 25.40mm lens pitch. Beams: IESNA Type II, IESNA Type III - ME3A, IESNA Type V.

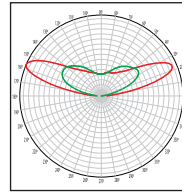
Offer total compatibility and countless opportunities to customize your lighting fixtures. High optical efficiency; extreme temperature resistant, -40°C to 150°C, with peaks up to 200°C. UV-resistant, non-yellowing. Designed to comply with **IK10** and **IP65** ratings.



PLL240001 - IESNA TYPE II MEDIUM CUT OFF
 - Full angle at 50% from maximum: ~ 145° x 75°
 - Full angle at 10% from maximum: ~ 165° x 110°



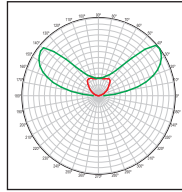
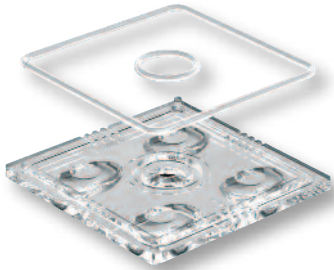
PLL240002 - IESNA TYPE II MEDIUM CUT OFF
 - Full angle at 50% from maximum: ~ 145° x 75°
 - Full angle at 10% from maximum: ~ 165° x 110°



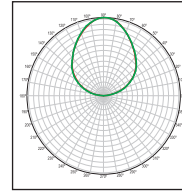
PLL240003 IESNA TYPE V
 - Full angle at 50% from maximum: ~ 150° x 150°
 - Full angle at 10% from maximum: ~ 170° x 170°



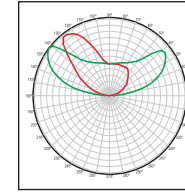
NACTUS modules - 173(l)x71.4(w)x12 h)mm – 24 optics. Available in IESNA Type II – Medium Cut off - IESNA TYPE V. Further beam configurations coming soon. Made of PC, -40°C ~ 120°C, are optimized for CREE XPE2 and NICHIA 219B. On request, available with certified LSR silicone gasket enabling IP65 rating. Ensure high lighting efficiency and offer new exclusive opportunities to realize your lighting fixtures.



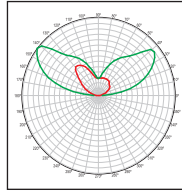
KNAC0406A - IESNA TYPE: I Medium
 - Full angle at 50% from maximum: ~ 153°x107°
 - Full angle at 10% from maximum: ~ 174°x139°



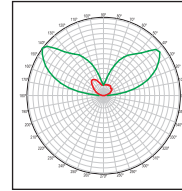
KNAC0407A - IESNA TYPE: VS Short 90° SYMM
 - Full angle at 50% from maximum: ~ 85°x85°
 - Full angle at 10% from maximum: ~159°x159°



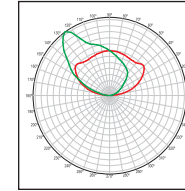
KNAC0410A - IESNA TYPE: II Medium / EN13201: ME3a
 - Full angle at 50% from maximum: ~ 158°x110°
 - Full angle at 10% from maximum: ~ 167°x152°



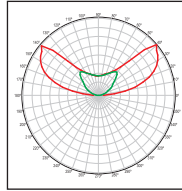
KNAC0412A - IESNA TYPE: III Medium
 - Full angle at 50% from maximum: ~ 160°x112°
 - Full angle at 10% from maximum: ~ 174°x155°



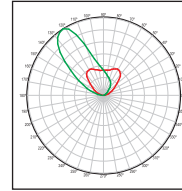
KNAC0413A - IESNA TYPE : IV Medium
 - Full angle at 50% from maximum: ~ 162°x116°
 - Full angle at 10% from maximum: ~ 176°x166°



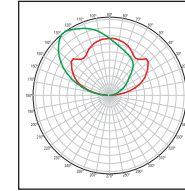
KNAC0415A - ME3a With customers' glass
 - Full angle at 50% from maximum: ~ 165°x110°
 - Full angle at 10% from maximum: ~ 180°x170°



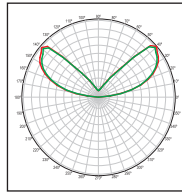
KNAC0416A - IESNA TYPE : I Medium
 - Full angle at 50% from maximum: ~ 145°x115°
 - Full angle at 10% from maximum: ~ 170°x150°



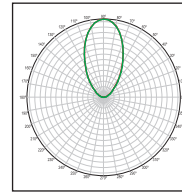
KNAC0417A - IESNA TYPE : II Short
 - Full angle at 50% from maximum: ~ 110°x80°
 - Full angle at 10% from maximum: ~ 130°x150°



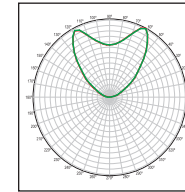
KNAC0418A - IESNA TYPE : III Short
 - Full angle at 50% from maximum: ~ 145°x120°
 - Full angle at 10% from maximum: ~ 175°x180°



KNAC0419A - IESNA TYPE : V Medium
 - Full angle at 50% from maximum: ~ 135°x135°
 - Full angle at 10% from maximum: ~ 145°x145°

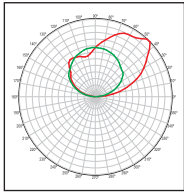


KNAC0420A 45/50° FWHM
 - Full angle at 50% from maximum: ~ 47°x47°
 - Full angle at 10% from maximum: ~ 110°x110°



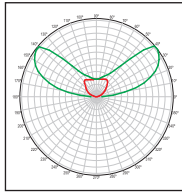
KNAC0421A 90° FWHM - Square
 - Full angle at 50% from maximum: ~ 90°x90°
 - Full angle at 10% from maximum: ~ 125°x125°

Square module – 55.88mm side - consisting of 4 optics, with 27.94mm lens pitch. Made of optical grade PMMA; on request, PMMA-HT (-30°C ~ 110°C) and designed to comply with **IP65. 15 versions available**, for any application in street lighting, wide area lighting and general lighting. Meet EN13201, IESNA and EN 62471:2010 (photobiological safety of lamps and lamp systems) requirements.



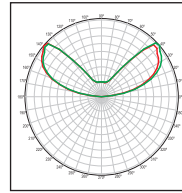
**KNAC0401ASM
Asymmetric**

- Full angle at 50% from maximum: ~ 135°x101°
- Full angle at 10% from maximum: ~ 167°x164°



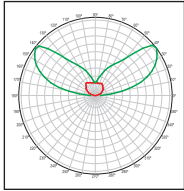
**KNAC0403ASM
IESNA TYPE I**

- Full angle at 50% from maximum: ~ 106°x146°
- Full angle at 10% from maximum: ~ 157°x158°



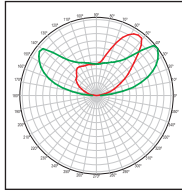
**KNAC0404ASM
IESNA TYPE Vs**

- Full angle at 50% from maximum: ~ 130°x130°
- Full angle at 10% from maximum: ~ 152°x152°



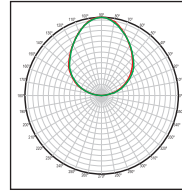
**KNAC0405ASM
IESNA TYPE I**

- Full angle at 50% from maximum: ~ 148°x107°
- Full angle at 10% from maximum: ~ 185°x168°



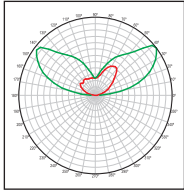
**KNAC0406ASM
IESNA TYPE II**

- Full angle at 50% from maximum: ~ 158°x110°
- Full angle at 10% from maximum: ~ 167°x152°



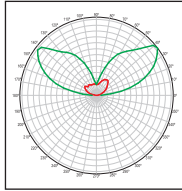
**KNAC0407ASM
IESNA TYPE V**

- Full angle at 50% from maximum: ~ 90°
- Full angle at 10% from maximum: ~ 160°



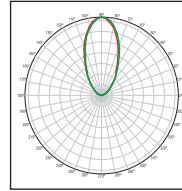
**KNAC0412ASM
IESNA TYPE III**

- Full angle at 50% from maximum: ~ 160°x130°
- Full angle at 10% from maximum: ~ 175°x180°



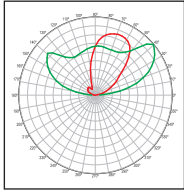
**KNAC0413ASM
IESNA TYPE IV**

- Full angle at 50% from maximum: ~ 160°x120°
- Full angle at 10% from maximum: ~ 180°x185°



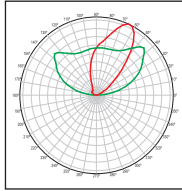
**KNAC0420A
IESNA TYPE V**

- Full angle at 50% from maximum: ~ 50°
- Full angle at 10% from maximum: ~ 115°



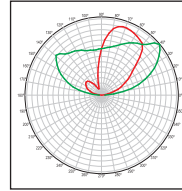
**KNAC0424ASM
IESNA Type II / III**

- Full angle at 50% from maximum: ~ 150°x160°
- Full angle at 10% from maximum: ~ 160°x110°



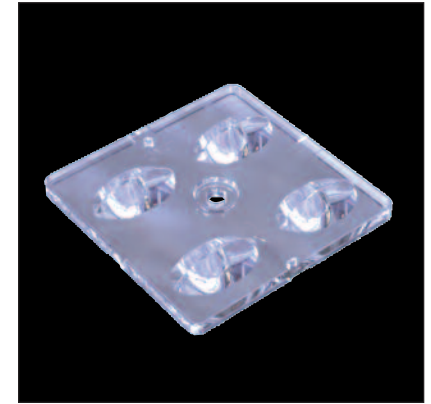
**KNAC0425ASM
Type II**

- Full angle at 50% from maximum: ~ 145°x155
- Full angle at 10% from maximum: ~ 150°x120°

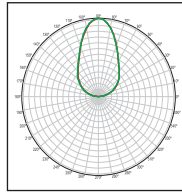


**KNAC0426ASM
IESNA Type III**

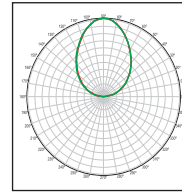
- Full angle at 50% from maximum: ~ 150°x110°
- Full angle at 10% from maximum: ~ 155°x140°



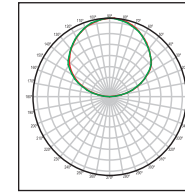
Square module – 50.00 mm side - consisting of 4 optics, with 25.40mm lens pitch. Made of optical grade PMMA; on request, PMMA-HT (-30°C ~ 110°C). **16 versions available**, for any application in street lighting, wide area lighting and general lighting. Meet EN13201, IESNA and EN 62471:2010 (photobiological safety of lamps and lamp systems) requirements.



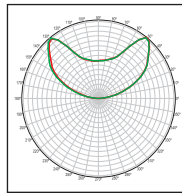
**PLL120001
60° FWHM**
– Full angle at 50% from maximum: ~ 60°
– Full angle at 10% from maximum: ~ 160°



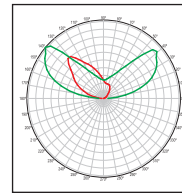
**PLL120002
90° FWHM**
– Full angle at 50% from maximum: ~ 85°
– Full angle at 10% from maximum: ~ 165°



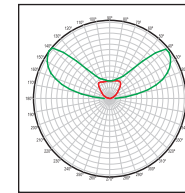
**PLL120003
120° FWHM**
– Full angle at 50% from maximum: ~ 130°
– Full angle at 10% from maximum: ~ 165°



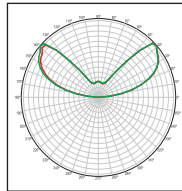
**PLL120004
130° FWHM Square**
– Full angle at 50% from maximum: ~ 120°x120°
– Full angle at 10% from maximum: ~ 165°x165°



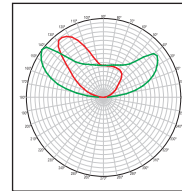
**PLL120005
IESNA Type III**
– Full angle at 50% from maximum: ~ 146°x106°
– Full angle at 10% from maximum: ~ 157°x152°



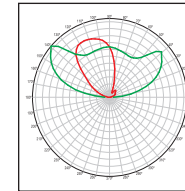
**PLL120403
IESNA Type I**
– Full angle at 50% from maximum: ~ 155°x110°
– Full angle at 10% from maximum: ~ 170°x150°



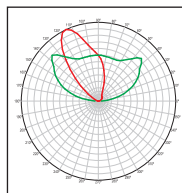
**PLL120404 - IESNA
Type V - 120° FWHM**
– Full angle at 50% from maximum: ~ 140°
– Full angle at 10% from maximum: ~ 155°



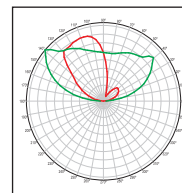
**PLL120406 - IESNA
Type II - ME3A**
– Full angle at 50% from maximum: ~ 160°x115°
– Full angle at 10% from maximum: ~ 170°x140°



**PLL120424
IESNA Type III**
– Full angle at 50% from maximum: ~ 150°x68°
– Full angle at 10% from maximum: ~ 165°x130°



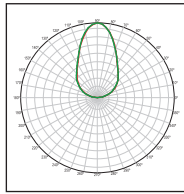
**PLL120425
IESNA Type II**
– Full angle at 50% from maximum: ~ 140°x58°
– Full angle at 10% from maximum: ~ 150°x105°



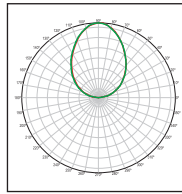
**PLL120426
IESNA Type III**
– Full angle at 50% from maximum: ~ 150°x120°
– Full angle at 10% from maximum: 165°x145°



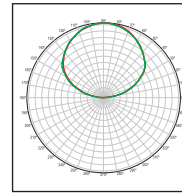
NACTUS 6x2 modules - 173 (l) x 71.4 (w) x 12 (h) mm – with 25.40mm lens pitch. Offer total compatibility and countless opportunities to customize your lighting fixtures. Made of optical grade PMMA; on request, PMMA-HT (-30°C ~ 110°C). **11 versions available** from stock. On request available with **certified LSR silicone gasket for IP65**. Meet EN13201, IESNA and EN 62471:2010 (photobiological safety of lamps and lamp systems) requirements.



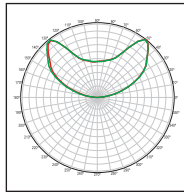
PLL080001
60° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



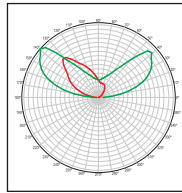
PLL080002
90° FWHM
 – Full angle at 50% from maximum: ~ 85°
 – Full angle at 10% from maximum: ~ 165°



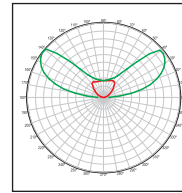
PLL080003
120° FWHM
 – Full angle at 50% from maximum: ~ 130°
 – Full angle at 10% from maximum: ~ 165°



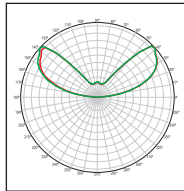
PLL080004
130° FWHM Square
 – Full angle at 50% from maximum: ~ 120°x120°
 – Full angle at 10% from maximum: ~ 165°x165°



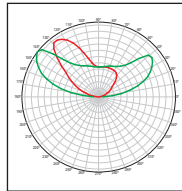
PLL080005
IESNA Type III
 – Full angle at 50% from maximum: ~ 146°x106°
 – Full angle at 10% from maximum: ~ 157°x152°



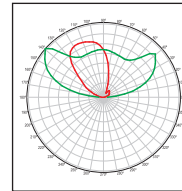
PLL080403
IESNA Type I
 – Full angle at 50% from maximum: ~ 155°x110°
 – Full angle at 10% from maximum: ~ 170°x150°



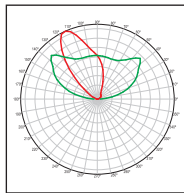
PLL080404 - IESNA Type V - 120° FWHM
 – Full angle at 50% from maximum: ~ 140°
 – Full angle at 10% from maximum: ~ 155°



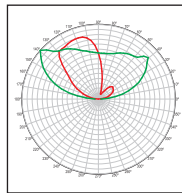
PLL080406 - IESNA Type II - ME3A
 – Full angle at 50% from maximum: ~ 160°x115°
 – Full angle at 10% from maximum: ~ 170°x140°



PLL080424
IESNA Type III
 – Full angle at 50% from maximum: ~ 150°x68°
 – Full angle at 10% from maximum: ~ 165°x130°



PLL080425
IESNA Type II
 – Full angle at 50% from maximum: ~ 140°x58°
 – Full angle at 10% from maximum: ~ 150°x105°

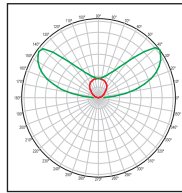


PLL080426
IESNA Type III
 – Full angle at 50% from maximum: ~ 150°x120°
 – Full angle at 10% from maximum: ~ 165°x145°

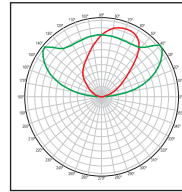


EXCLUSIVE FROM KHATOD. TOTALLY NEW-CONCEPT OPTICAL SYSTEM.

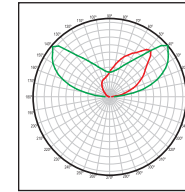
NACTUS 4x2 modules - 118.8 (l) x 71.4 (w) x 12 (h) mm – with 25.40 mm lens pitch. Khatod is first to deliver modules realized with a totally new configuration concept which offers the opportunity to customize your lighting fixtures just according to the lighting pattern you have in mind. Made of optical grade PMMA; on request, PMMA-HT (-30°C ~ 110°C). **11 versions available** from stock, for any application in street lighting, wide area lighting and general lighting. On request, available with **certified LSR silicone gasket for IP65**. Meet EN13201, IESNA and EN 62471:2010 (photobiological safety of lamps and lamp systems) requirements.



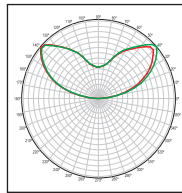
- KMF1201M
IESNA TYPE I**
- Full angle at 50% from maximum: ~ 155°x110°
 - Full angle at 10% from maximum: ~ 175°x145°



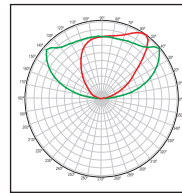
- KMF1202M
IESNA TYPE II**
- Full angle at 50% from maximum: ~ 160°x100°
 - Full angle at 10% from maximum: ~ 170°x130°



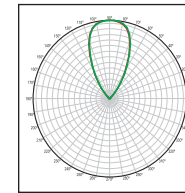
- KMF1203M
IESNA TYPE III**
- Full angle at 50% from maximum: ~ 150°x105°
 - Full angle at 10% from maximum: ~ 160°x145°



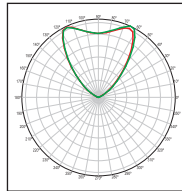
- KMF1205M
IESNA TYPE V**
- Full angle at 50% from maximum: ~ 155°
 - Full angle at 10% from maximum: ~ 180°



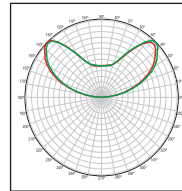
- KMF12M3A - ME3A
IESNA TYPE II**
- Full angle at 50% from maximum: ~ 155°x95°
 - Full angle at 10% from maximum: ~ 170°x135°



- KMF1260A - 60°
Symmetrical**
- Full angle at 50% from maximum: ~ 60°
 - Full angle at 10% from maximum: ~ 75°



- KMF1290A - 90°
Symmetrical**
- Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 97°

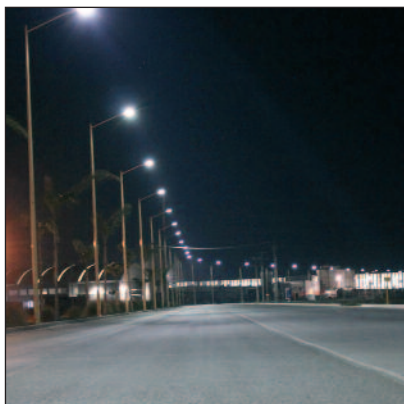


- KMF12SQA
120° Square**
- Full angle at 50% from maximum: ~ 135°
 - Full angle at 10% from maximum: ~ 165°



High precision injection molded optical modules designed for most popular LEDs. Their unique shape - **round module, 110mm** \varnothing , made of 12 optics - offers a real alternative to the traditional systems. You can create lighting fixtures made of a single module or by combining a number of modules of the same type or by mixing different models together. Optical efficiency over 85%. Easy fastening with four screws.

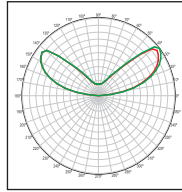
On request, available with silicone gasket for IP65. Meet EN13201, IESNA and EN 62471:2010 (photobiological safety of lamps and lamp systems) requirements.



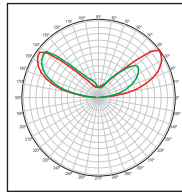
Ready-to-use optical multi-lens arrays, from 4 to 72 optics. Hundreds of standard layouts available from stock. First and unique optical system using 10 different core optics with different geometries in the same system. This makes virtually possible to customize any application. Made of optical grade PMMA, UV protected, optical efficiency over 85%. No need to develop any photometric analysis. Easy assembly with screws. Preset for the housing of sensors. On request, available with silicone gasket for IP65.

Applications: street lighting and any application in general and wide area lighting, indoor and outdoor.

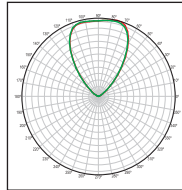
Meet EN13201, IESNA and EN 62471:2010 (photobiological safety of lamps and lamp systems) requirements. **Patented.**



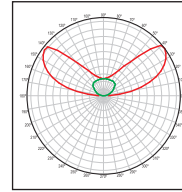
**PL1764SR
Type V Medium**
 - Full angle at 50%:
 ~ 155°x155°
 - Full angle at 10%:
 ~ 165°x165°



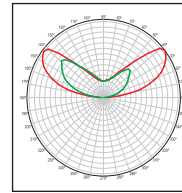
**PL1771SR
Type IV**
 - Full angle at 50% :
 ~ 150°x155°
 - Full angle at 10% :
 ~ 165°x165°



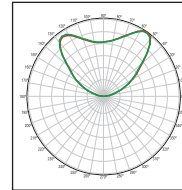
**PL1824SR
Type V**
 ~ 60°



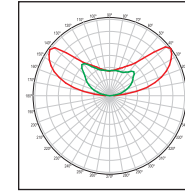
**PL1765SR
Type I**
 - Full angle at 50%:
 ~ 150°x135°
 - Full angle at 10%:
 ~ 145°x160°



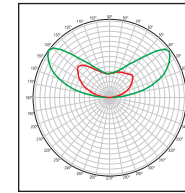
**PL1772SR
Type IV**
 - Full angle at 50%
 ~ 140°x155°
 - Full angle at 10%:
 ~ 150°x165°



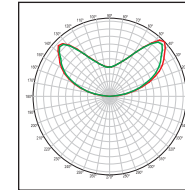
**PL1825SR
Type V**
 ~ 90°



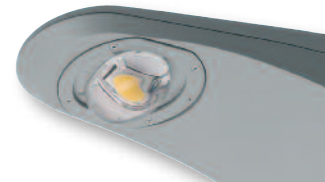
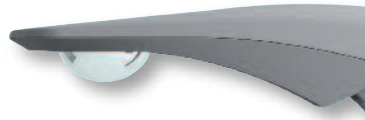
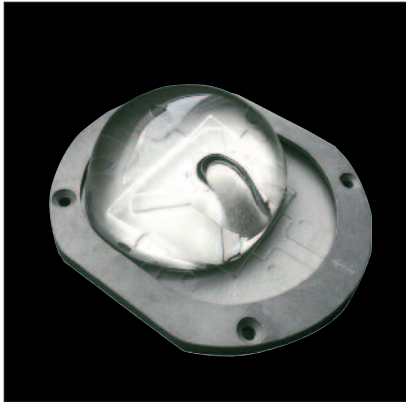
**PL1766SR
Type II**
 - Full angle at 50% :
 ~ 145°x155°
 - Full angle at 10%:
 ~ 170°x165°



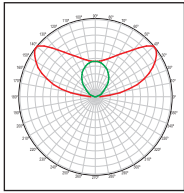
**PL1772SR_075
Type III**
 - Full angle at 50%
 ~ 140°x155°
 - Full angle at 10%
 ~ 150°x165°



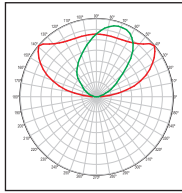
**PL1845SR
Type Vs - Square**
 ~ 120°



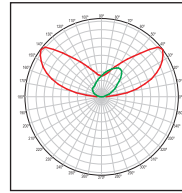
130mm diameter, made of Ultra-Clear LSR (Liquid Silicone Rubber). Optimized for COB LEDs with LES 19mm to 30mm; high optical efficiency; extreme temperature resistant, -40°C to 150°C, with peaks up to 200°C. UV-resistant, non-yellowing. Designed to comply with **IK10** and **IP68**. Available with aluminum ring. **Patent Pending.**



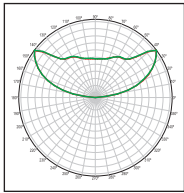
PLL2056SR11
– IESNA Type I Beam



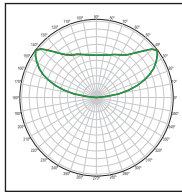
PLL2056SR22
– IESNA Type II Beam



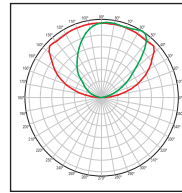
PLL2056SR33
– IESNA Type III Beam



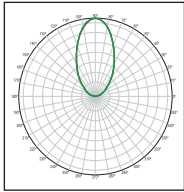
PLL2056SR44
– IESNA Type V Beam



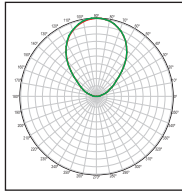
PLL2056SR55
– IESNA Type V Square Beam



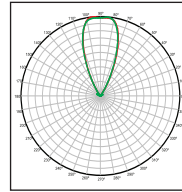
PLL2056SR66
– ECE ME3a Beam



PLL2056SR77
– Rotosymmetric Beam 60°



PLL2056SR88
– Rotosymmetric Beam 90°



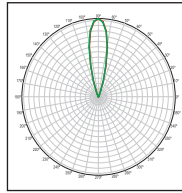
PLL2056SR99
– Rotosymmetric Beam 45°



Ø 90mm

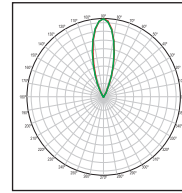


New diameter 90mm, made of Ultra-Clear LSR (Liquid Silicone Rubber). Optimized for COB LEDs with LES 9 to 23mm. The rotosymmetric versions work well also with COB LES of 23mm. Boast the well-known performances of the silicone lenses from Khatod: excellent transparency, high optical efficiency, resistance and flexibility in a wide temperature range, UV-resistant, etc. Fastening with screws. Allow easy fit to the final applications.



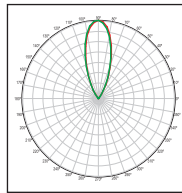
KEPLL1994NASR
12° FWHM

- Full angle at 50% from maximum: ~ 12°
- Full angle at 10% from maximum: ~ 24°



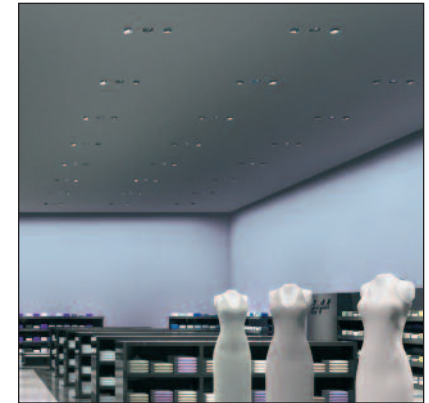
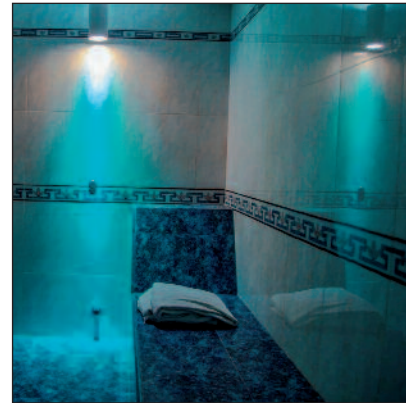
KEPLL1994MESR
28° FWHM

- Full angle at 50% from maximum: ~ 28°
- Full angle at 10% from maximum: ~ 45°

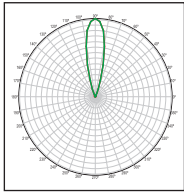


KEPLL1994WISR
40° FWHM

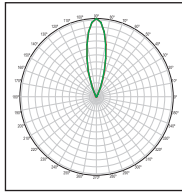
- Full angle at 50% from maximum: ~ 40°
- Full angle at 10% from maximum: ~ 55°



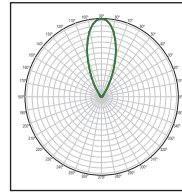
TIR LENSES, 50mm Ø, made of Ultra-Clear LSR (Liquid Silicone Rubber), optimized for COB LEDs with **LES ranging 6-9 mm diameter**. Low absorption of light, high optical efficiency, 89% with picks of 91%; UV-resistant, non-yellowing. Equipped with holder.



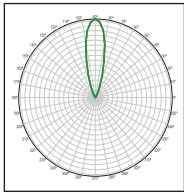
PLL2010NA
13° FWHM
 – Full angle at 50% from maximum: ~ 13°



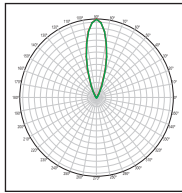
PLL2010ME
28° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



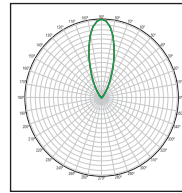
PLL2010WI
42° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



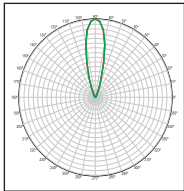
PLL2009NA
13° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



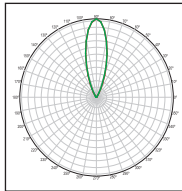
PLL2009ME
28° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



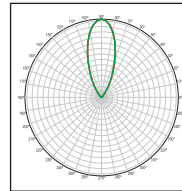
PLL2009WI
42° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



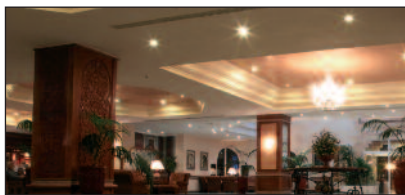
PLL2008NA
13° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



PLL2008ME
28° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



PLL2008WI
42° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 160°



Low profile lenses - 50mm-70mm-90mm Ø - made of optical grade PMMA, with a very thin lateral profile. Conceived for COB LEDs with LES ranging 6-22mm Ø. Available with holder made of clear PC. Also allow standalone mounting by using the mechanical parts of the lighting fixture. Indoor applications: Shop light, track light, downlights and recessed lights. Meet MR16, PAR30, AR111 requirements.

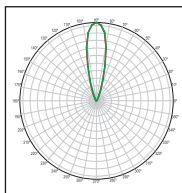


Secondary reflector



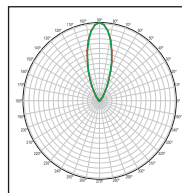
Primary reflector

Available for most popular connectors



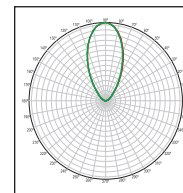
KCLP1856CR
50mm Narrow Beam

- Full angle at 50%: ~ 12°
- Full angle at 10% : ~ 32°-37°



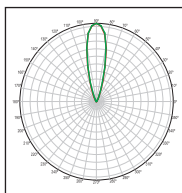
KCLP1856ME
50mm Medium Beam

- Full angle at 50%: ~ 34°
- Full angle at 10%: ~ 63°



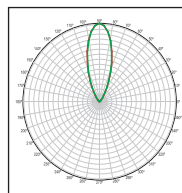
KCLP1856WI
50mm Wide Beam

- Full angle at 50%: ~ 51°
- Full angle at 10% ~ 97°



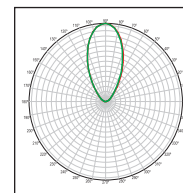
KCLP1857CR
50mm Narrow Beam

- Full angle at 50% ~ 12°
- Full angle at 10%: ~ 32°-37°



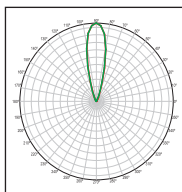
KCLP1857ME
50mm Medium Beam

- Full angle at 50%: ~ 34°
- Full angle at 10%: ~ 63°



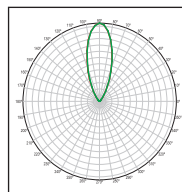
KCLP1857WI
50mm Wide Beam

- Full angle at 50%: ~ 50°
- Full angle at 10% ~ 97°



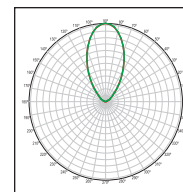
KCLP1858CR
72mm Narrow Beam

- Full angle at 50%: ~ 12°
- Full angle at 10% ~ 32°-37°



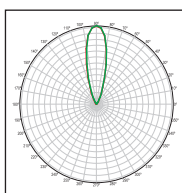
KCLP1858ME
72mm Medium Beam

- Full angle at 50%: ~ 34°
- Full angle at 10%: ~ 65°



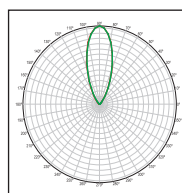
KCLP1858WI
72mm Wide Beam

- Full angle at 50% : ~ 54°
- Full angle at 10%: ~ 105°



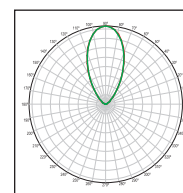
KCLP1859CR
110mm Narrow Beam

- Full angle at 50% : ~ 12°
- Full angle at 10%: ~ 32°-37°



KCLP1859ME
110mm Medium Beam

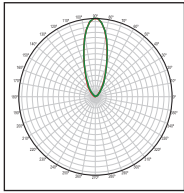
- Full angle at 50%: ~ 35°
- Full angle at 10%: ~ 65°



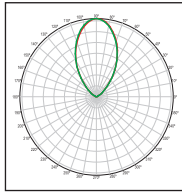
KCLP1859WI
110mm Wide Beam

- Full angle at 50%: ~ 55°
- Full angle at 10%: ~ 95°

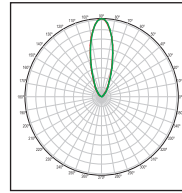
Hi-tech reflectors, **50mm-72mm-110mm** Ø, made of PC; aluminum coated; conceived for COB LEDs with LES ranging 9-19mm Ø. Made of two elements assembled together by a simple snap-in operation, ensure **easy assembly** in final applications. Optional clear cover lenses available. **Patent Pending.**



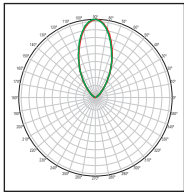
- KESQ1909CR**
- Full angle at 50% from maximum: ~ 24°
 - Full angle at 10% from maximum: ~ 71°
 - **Diam. 35mm**



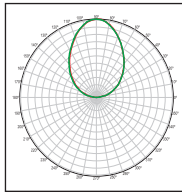
- KESQ1910CR**
- Full angle at 50% from maximum: ~ 55°
 - Full angle at 10% from maximum: ~ 99°
 - **Diam. 35mm**



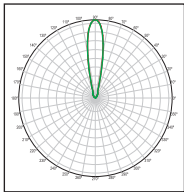
- KESQ1912CR**
- Full angle at 50% from maximum: ~ 30°
 - Full angle at 10% from maximum: ~ 75°
 - **Diam. 35mm**



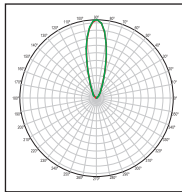
- KESQ1933CR**
- Full angle at 50% from maximum: ~ 42°
 - Full angle at 10% from maximum: ~ 90°
 - **Diam. 35mm**



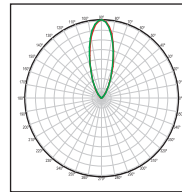
- KESQ1911HW**
Material: PC HT High Reflectance White
- Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 140°
 - **Diam. 35mm**



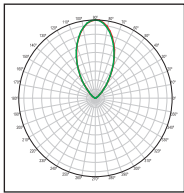
- KESQ1934CR**
- Full angle at 50% from maximum: ~ 12°
 - Full angle at 10% from maximum: ~ 21°
 - **Diam. 50mm**



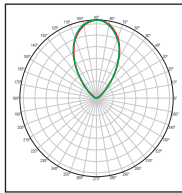
- KESQ1935ST**
- Full angle at 50% from maximum: ~ 18°
 - Full angle at 10% from maximum: ~ 40°
 - **Diam. 50mm**



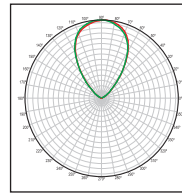
- KESQ1936ST**
- Full angle at 50% from maximum: ~ 30°
 - Full angle at 10% from maximum: ~ 70°
 - **Diam. 50mm**



- KESQ1937ST**
- Full angle at 50% from maximum: ~ 52°
 - Full angle at 10% from maximum: ~ 92°
 - **Diam. 50mm**



- KESQ1938ST**
- Full angle at 50% from maximum: ~ 68°
 - Full angle at 10% from maximum: ~ 100°
 - **Diam. 50mm**



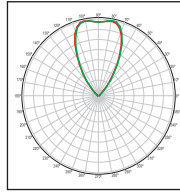
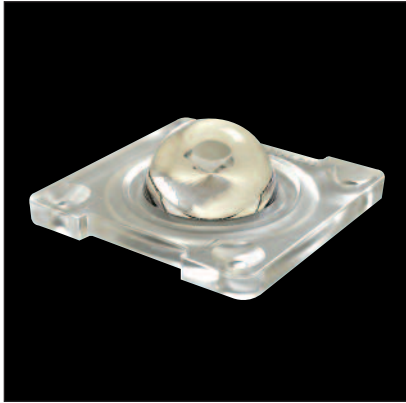
- KESQ1939ST**
- Full angle at 50% from maximum: ~ 75°
 - Full angle at 10% from maximum: ~ 100°
 - **Diam. 50mm**



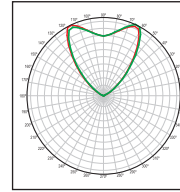
Single reflectors made of optical grade PC specific for high temperature resistance, up to 120°C.

High-performing, multi-functional, easy to use. Available in three diameters: 32.39mm, 34.99mm, 49.91mm. Fastening with adhesive tape.

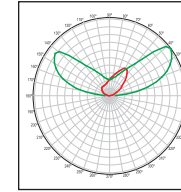
Perform an excellent luminous flux and uniform light distribution. Engineered for most diverse general lighting applications, from high-bay and industrial or commercial lighting to specific work areas, table and floor lamps, task lighting. Come with pressure-sensitive adhesive tape for fastening.



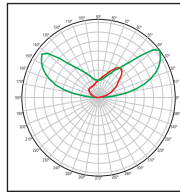
PLAL0111
60° FWHM
 – Full angle at 50% from maximum: ~ 60°
 – Full angle at 10% from maximum: ~ 75°



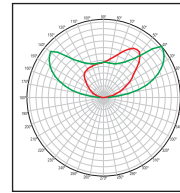
PLAL0122
90° FWHM
 – Full angle at 50% from maximum: ~ 90°
 – Full angle at 10% from maximum: ~ 95°



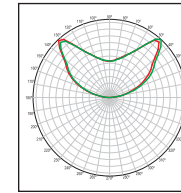
PLAL0144
IESNA Type II
 – Full angle at 50% from maximum: ~ 160°x120°
 – Full angle at 10% from maximum: ~ 175°x145°



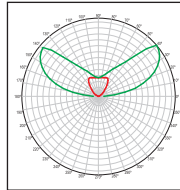
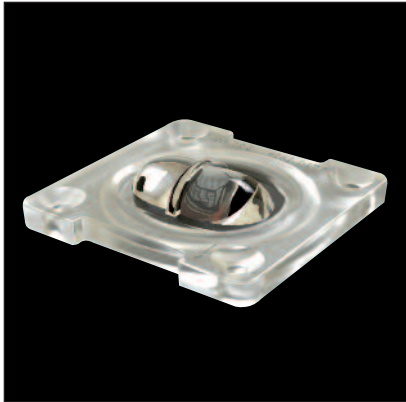
PLAL0155
IESNA Type III
 – Full angle at 50% from maximum: ~ 160°x130°
 – Full angle at 10% from maximum: ~ 175°x155°



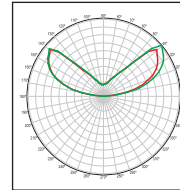
PLAL0177
ME3A
 – Full angle at 50% from maximum: ~ 155°x120°
 Full angle at 10% from maximum: ~ 165°x140°



PLAL0188
120° Square
 – Full angle at 50% from maximum: ~ 120°
 – Full angle at 10% from maximum: ~ 130°



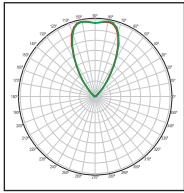
PLAL0133
IESNA Type I
 – Full angle at 50% from maximum: ~ 150°x90°
 – Full angle at 10% from maximum: ~ 160°x100°



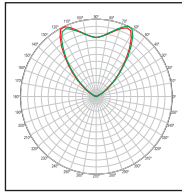
PLAL0166
IESNA Type V
 – Full angle at 50% from maximum: ~ 145°
 – Full angle at 10% from maximum: ~ 155°



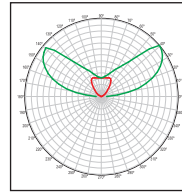
Single lens modules - **49,96 mm side** – made of **PMMA-HT** resistant up to 125°C . New addition to the Gaia Optical Systems family. Created to meet the requirements of LED Lighting users for high efficient single lenses enabling great illuminance in small footprint applications. On request, available with gasket for **IP65**.



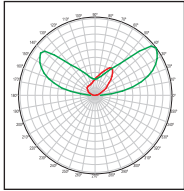
**PL0311
60° FWHM**
 - Full angle at 50% from maximum: ~ 60°
 - Full angle at 10% from maximum: ~ 75°



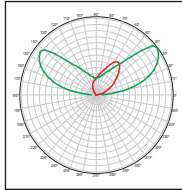
**PL0322
90° FWHM**
 - Full angle at 50% from maximum: ~ 90°
 - Full angle at 10% from maximum: ~ 95°



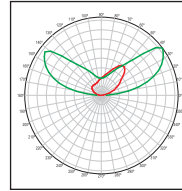
**PL0333
IESNA Type I**
 - Full angle at 50% from maximum: ~ 150°x90°
 - Full angle at 10% from maximum: ~ 160°x100°



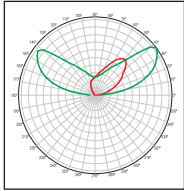
**PL0344
IESNA Type II**
 - Full angle at 50% from maximum: ~ 160°x120°
 - Full angle at 10% from maximum: ~ 175°x145°



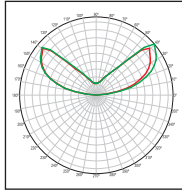
**PL0344 +
KCLP1900ST**
 - Full angle at 50% from maximum: ~ 160°x80°
 - Full angle at 10% from maximum: ~ 170°x140°



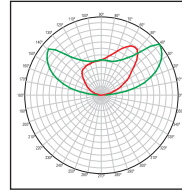
**PL0333
IESNA Type I**
 - Full angle at 50% from maximum: ~ 150°x90°
 - Full angle at 10% from maximum: ~ 160°x100°



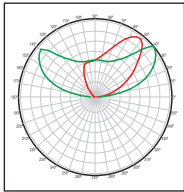
**PL0355 +
KCLP1900ST**
 - Full angle at 50% from maximum: ~ 160°x90°
 - Full angle at 10% from maximum: ~ 175°x110°



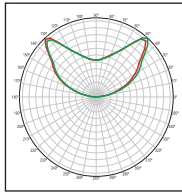
**PL0366
IESNA Type V**
 - Full angle at 50% from maximum: ~ 145°
 - Full angle at 10% from maximum: ~ 155°



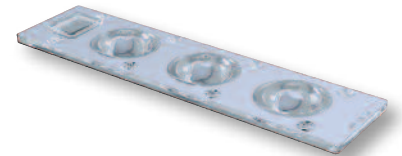
**PL0377
ME3A**
 - Full angle at 50% from maximum: ~ 155°x120°
 - Full angle at 10% from maximum: ~ 165°x140°



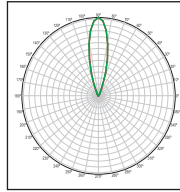
**PL0377 +
KCLP1900ST**
 - Full angle at 50% from maximum: ~ 155°x90°
 - Full angle at 10% from maximum: ~ 160°x130°



**PL0388
120° Square**
 - Full angle at 50% from maximum: ~ 120°
 - Full angle at 10% from maximum: ~ 130°

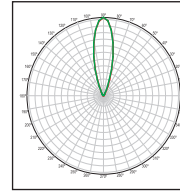


Arrays consisting of 3 Free Form Lenses, made of **PMMA-HT** resistant up to 125°C, for multichip LEDs, 1000 to 5000 lm. Optical efficiencies in a 90% range. On request, available with a reflector for greater efficacy in streetlights, and with a silicone gasket for **IP65**.



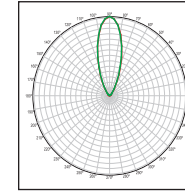
PL1758NA - NEMA 2 NEMA 3

- Full angle at 50% from maximum: ~ 14.5°
- Full angle at 10% from maximum: ~ 27°



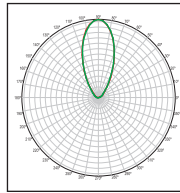
PL1758ME - NEMA 3

- Full angle at 50% from maximum: ~ 18°
- Full angle at 10% from maximum: ~ 35°



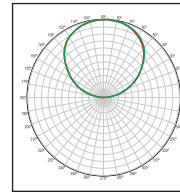
PL1758WI - NEMA 4

- Full angle at 50% from maximum: ~ 28°
- Full angle at 10% from maximum: ~ 55°



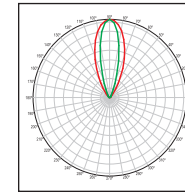
PL1758EW - NEMA 5

- Full angle at 50% from maximum: ~ 45°
- Full angle at 10% from maximum: ~ 84°



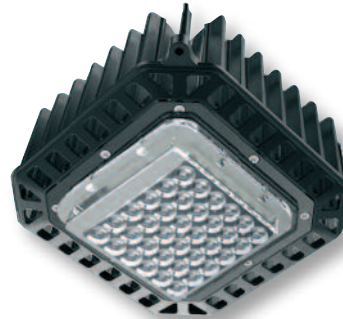
PL1758CV - NEMA 7

- Full angle at 50% from maximum: ~ 111°
- Full angle at 10% from maximum: ~ 156°

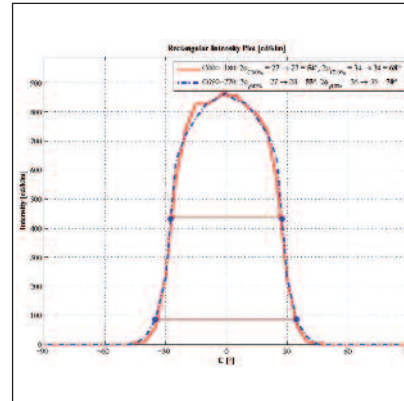
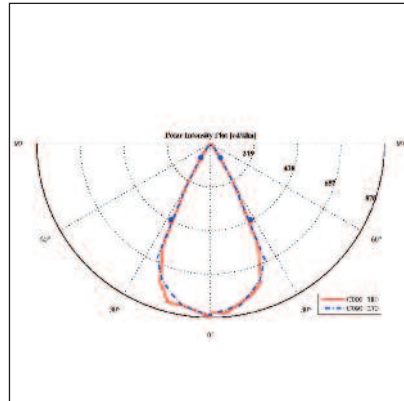
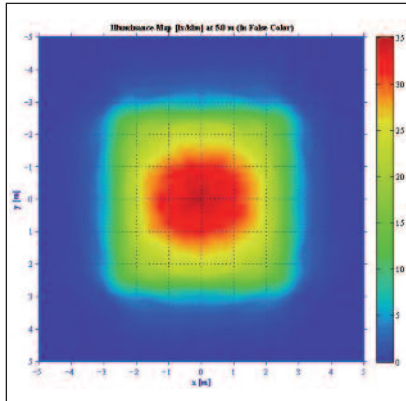
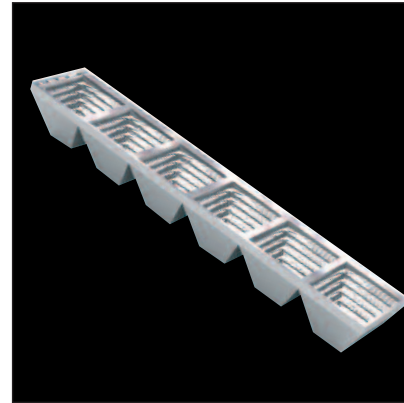


PL1758EL 15°X40° FWHM

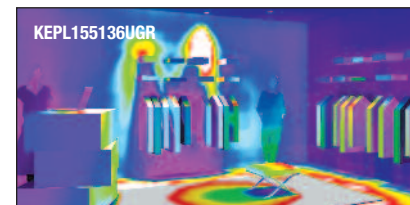
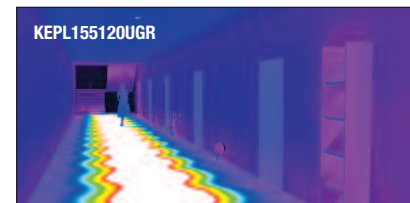
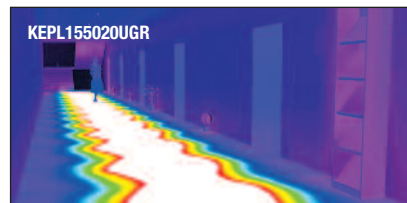
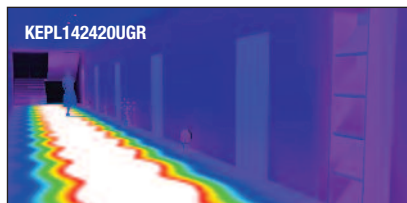
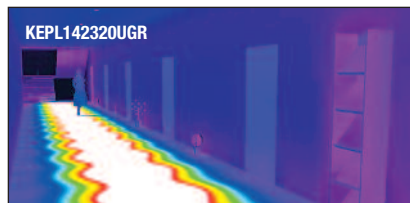
- Full angle at 50% from maximum: ~ 15°x40°
- Full angle at 10% from maximum: ~ 40°x65°

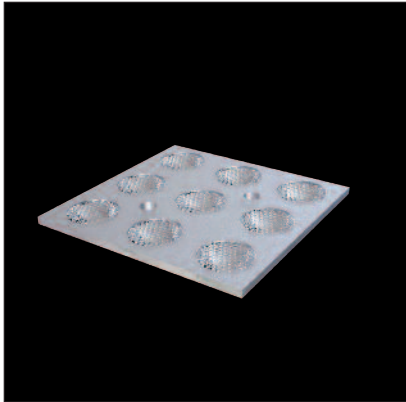
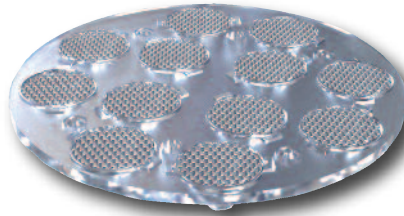
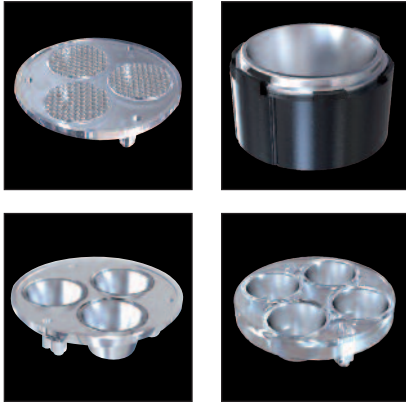


Ready-to-use panels, 110 mm (w) x 120 (l) x 9,51 to 12 mm (h), made of optical grade **PMMA HT**. Outstanding light quality, anti-glare, meet NEMA 2 – 3 – 4 – 5 – 7 standards; Engineered for arena/stadium/event lighting, are also excellent for road and urban works. Designed to comply with **IK08** and **IP65**.



Multi-reflecter arrays, consisting of **6 to 12** square-shaped reflectors, made of PC. Typical square beam angle; high performance with warm white LEDs. Positioning pegs enable easy assembly. Allow multi-module configurations by placing the arrays side by side. Any application in wide area, architectural and street lighting. Excellent for billboard applications.



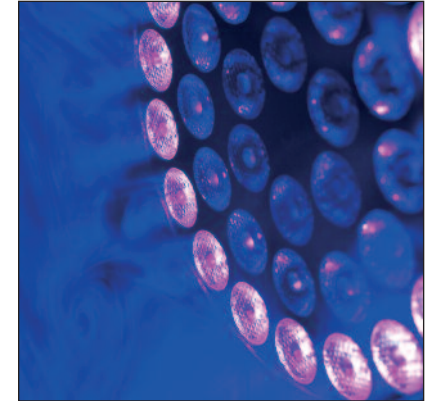


Modular systems based on a variety of holders from **1 to 16** housings, available with round, square and linear shape able to accommodate reflectors and lenses of different beams. Allow diverse configurations and offer a "plug-and-play" functionality whereby MODULARIS is ready for use within **few seconds**. Any applications in general lighting.

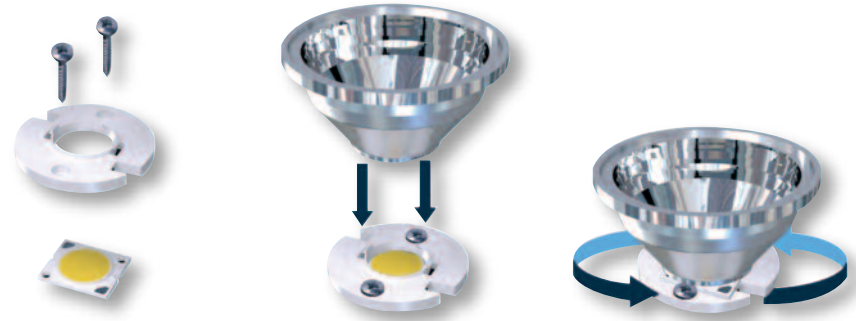
Color Mixing & Single Lenses

over 6300 Models Available

FROM 9
TO
220MM Ø



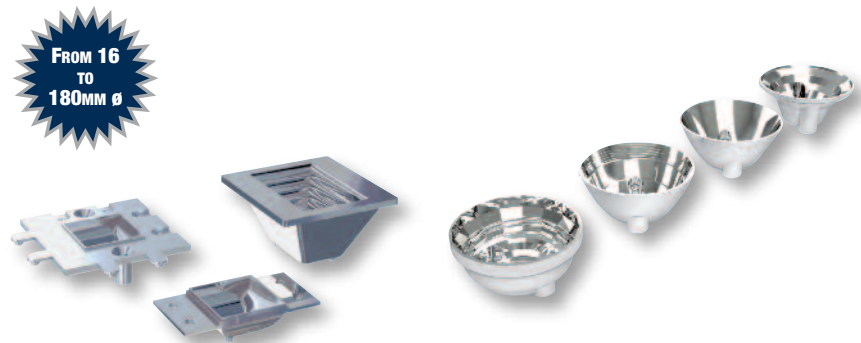
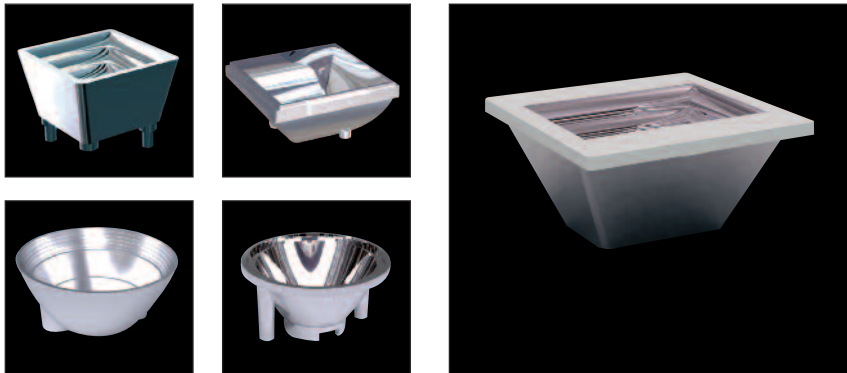
The widest range for any application in LED Lighting, optimized for most popular LEDs. Lenses of any size, shape, technology, performance. From conventional solutions to the most advanced hi-tech creations.



Optical solutions for Zhaga compliant mounting, made of PC, available in two versions: • Reflectors: aluminum coated, metalized or embossed finish. Available in **65mm, 90mm and 110mm** \varnothing . On request, top covers for light-diffusing effect are available. • Diffusers: Perform uniform **soft light**. Available in spherical and hemispherical shape and various finish: gloss white, milky white, clear frosted, milky white top and silver bottom, etc. LYRA families boast exclusive easy fastening: after fixing the adaptor with two screws, twist & lock the reflector on it by a simple rotation.

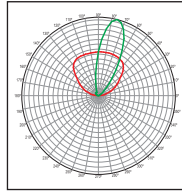
FOR POWER LEDs

REFLECTORS

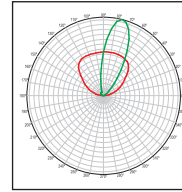


STRIP LENSES

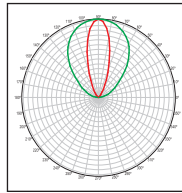
FOR MID-POWER LEDs



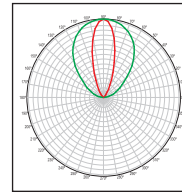
PL1629AS
– Asymmetric beam



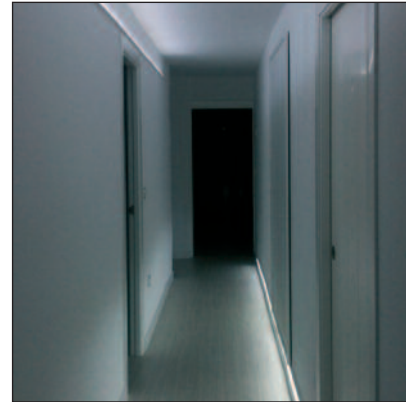
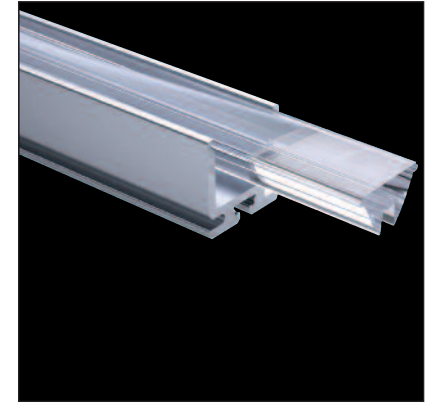
PL1629ASST
– Asymmetric beam
frosted



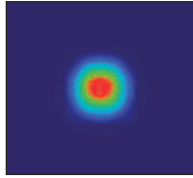
PL1629NA
– Narrow beam



PL1629NAST
– Narrow beam
frosted

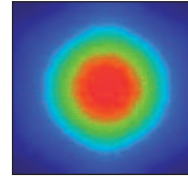
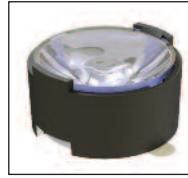


Optimized to build long strips, perform an excellent light flux both with white and color LEDs. Unique on the market, Khatod Strips are REAL TIR LENSES made of optical grade PMMA, **manufactured by injection-moulding**. Perform precise symmetric and asymmetric beam angles. Aluminum holders are available on request. For use in general Lighting, are perfect in architectural and decorative applications.



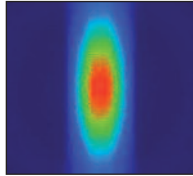
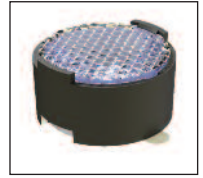
KESQ1169NAUV

- Material = **PMMA Clear for UV range**
- Full angle C0-C180 at 50% from maximum: ~ 12°
- Full angle C0-C180 at 10% from maximum: ~ 34°



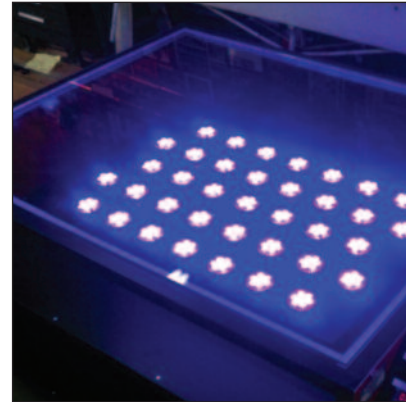
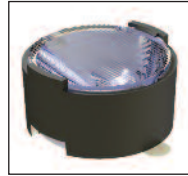
KESQ1169WIUV

- Material = **PMMA Clear for UV range**
- Full angle C0-C180 at 50% from maximum: ~ 30°
- Full angle C0-C180 at 10% from maximum: ~ 60°



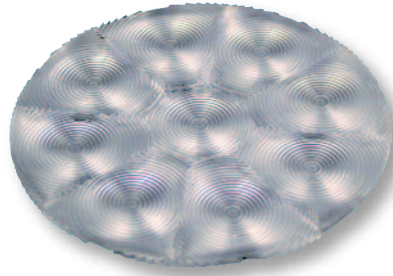
KESQ1169ELUV

- Material = **PMMA Clear for UV range**
- Full angle C0-C180 at 50% from maximum: ~ 19x54°
- Full angle C0-C180 at 10% from maximum: ~ 34x80°



Single Lenses with Self-Adhesive Tape for UV LEDs with Black Holder. Range UV-A : 315-400nm 21.7mm Ø, with self-adhesive Tape.

FRESNEL Lenses - Autofocus



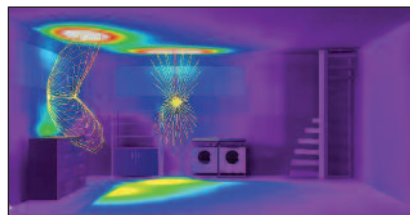
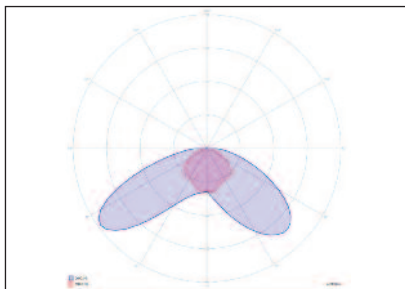
Fresnel: Refractive optics; special design: two off axis Fresnel lenses fixed together in one piece, through an only molding process. Avoid to perceive the real image of the light source while allowing to just see a perfect round beam. Available in many models for use with one LED or multiple LEDs. Realized with different diameters.

Autofocus: full range of Color Mixing Optics, equipped with moving lenslet array, \varnothing 45mm, to be mounted on top of the lens. Allow ZOOM and AUTOFOCUS applications in a range of beam angles from 11° to 45° . Preserve a perfect color mixing and a high optical efficiency in the full range of the beam angles.

PLL2102UW

- Material = **PC Clear**
- Full angle C0-C180 at 50% from maximum: ~ 117°x140°
- Full angle C0-C180 at 10% from maximum: ~ 160°x175°
- Dimensions: 172,98 X 71,38mm

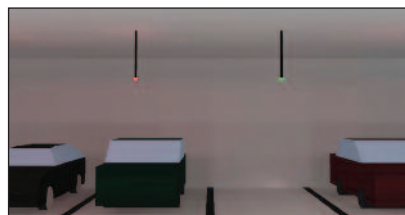
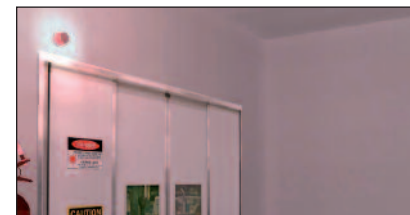
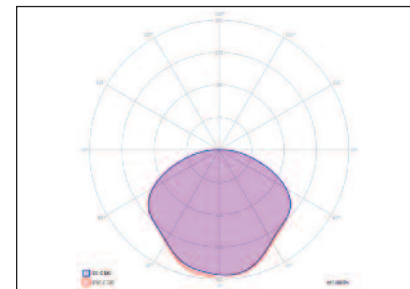
Wall light for indoor applications, made of polycarbonate. The mechanical mounting system matches the dimensions of Nactus 6x2 module from Khatod.

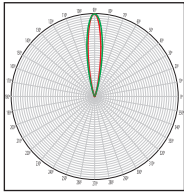


PLL2112

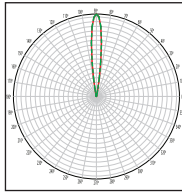
- Material = **PC Clear**
- Full angle C0-C180 at 50% from maximum: ~ 130°
- Full angle C0-C180 at 10% from maximum: ~ 170°
- Diameter: 91.98mm

Lens for visual alarm / warning device, made of polycarbonate, designed to signalize emergency or danger. The optics are versatile and fitting for different luminous sources, such as COB LEDs or Power LED arrays.

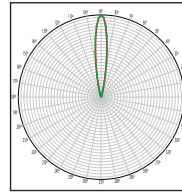




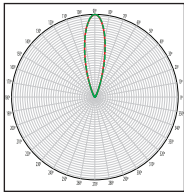
PL1672
35,00mm diameter
21,45mm height
Clean Rectangular Beam
Lens
MR11 Standard



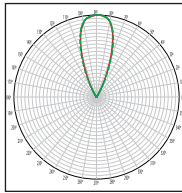
PL1672UN
35,00mm diameter
20,71mm height
**Ultra Narrow Punch
Beam Lens**
MR11 Standard



PL1672NA
35,00mm diameter
20,71mm height
Narrow Beam Lens
MR11 Standard



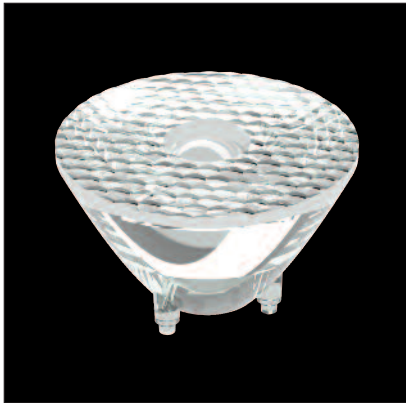
PL1672ME
35,00mm diameter
20,71mm height
Medium Beam Lens
MR11 Standard



PL1672WI
35,00mm diameter
20,71mm height
Wide Beam Lens
MR11 Standard



KE1672
Holder for PL1672 Series
Available on request with
self-tape



Single Lenses for Power LEDs, 35,00mm diameter - 20,71mm height - MR11 Standard

MATERIAL: PMMA

BENEFITS: LED Chip Projection on target totally eliminated; Clean Spot, Efficiency > 89%; Optical Grade PMMA; 3 Pins provided for precise and robust mounting; CBCP (Center Beam Candle Power) = 150 cd/lm; Smallest Shape Factor Lens (Diameter × FWHM / ChipSize)

Khatod, leader manufacturer of Optical Solutions for the major world Producers of LEDs, caters to design engineers and customers by delivering What's Next in Lighting: Optical Systems for Street light, Outdoor/Indoor Lighting; Reflector Systems; Optics for HB, COBs applications; Modular Systems; Silicone Lenses; Free Form Lenses; Great capability in custom optics. Your project is our project.

From project to object, 100% in house

LED manufacturers & PCB partners



Connectors manufacturers



We Manufacture Solutions



HEAD QUARTER

Via Alessandrina 25, Cusano Milanino, (Milan) Italy

Phone +39 02 66013695 • Fax +39 02 66013500

khatod@khatod.com • www.khatod.com

Sales Offices & Stock



khatodusa@khatod.com



khatodindia@khatod.com



khatodbrasil@khatod.com



khatodrussia@khatod.com



khatodnordic@khatod.com



khatodasia@khatod.com

