

The image features a close-up, high-angle view of several metal LED assembly components. These components are arranged in a grid-like pattern, showing numerous small, circular LED chips mounted on a substrate. The components are interconnected by a complex network of fine metal traces and leads. The lighting is dramatic, highlighting the metallic surfaces and the intricate details of the assembly process. In the top-left corner, there is a yellow rectangular box containing the company name 'LEDiL' in white, bold, sans-serif font. In the bottom-left corner, there is another yellow rectangular box containing the text 'Advanced linear solutions for mid-power LEDs' in yellow, bold, sans-serif font. In the bottom-right corner, the website address 'www.ledil.com' is written in a smaller, yellow, sans-serif font.

# LEDiL

Advanced linear solutions for  
mid-power LEDs

[www.ledil.com](http://www.ledil.com)

# LEDiL

- ✓ LEDiL Oy was Est. 2002
- ✓ 2004 production of customer moulds & products
- ✓ 2006 first LEDiL standard product family was launched
- ✓ 2014 Over 4000 standard products in a line card
- ✓ Production in Finland, China and Poland
- ✓ Design in Finland- team of 30+ engineers.
- ✓ Today LEDiL is a world leading supplier of standard and customized LED Secondary optics with strong expertise in High Power LED optics
- ✓ 2014 - now mid power optics



## Characteristics of mid power LEDs

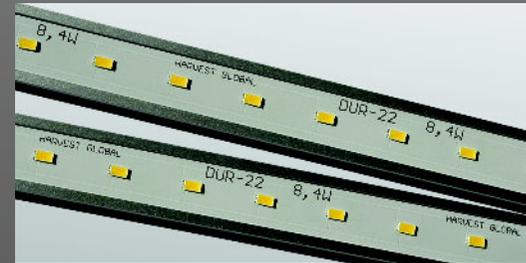
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## Mid Power Leds

- Have excellent Lmn / €
- Cheaper than '1W' leds, have more led die
- Less lumens per Led- fewer 'very bright' point sources.
- Florescent replacement - Low Bay, High Bay applications, 600x 600- MR 16 replacement. Some street lights
- 'Lower quality phosphor coating of the led die' lead to more color quality issues in general

## Optical Design :-

- Control the light
- Reduce Colour Separation



XH-G LED



LG  
Innotek



## Mid Power Leds

- Mid Power Leds- Optical Design
- Special color mixing surface structures on the optical component can be used to reduce the color quality problems in the light distribution
- LEDiL RZ-surface
- Note - Colour separation detail can only be designed in Molded parts rather than extruded.

## Led Design Considerations

- LEDs designed for high lumen/€ or Lmn/W efficacy may have more colour issues
- Older generation mid power LEDs.



Color distortion



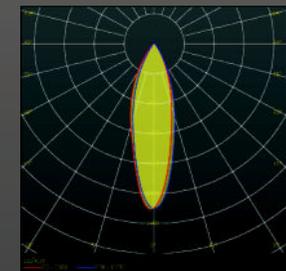
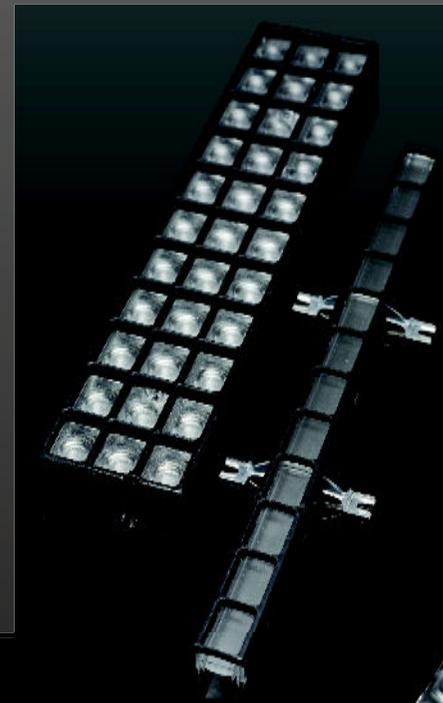
Good quality COB

How to make color quality with mid power LEDs

# LEDiL

## Florence 3R

- ✓ 33 Mid Power led optic array
- ✓ Suited for a range of mid-power LEDs
- ✓ Uniform color rendition with patented RZ-surface
- ✓ LEDiL's patented optical structure reduces point sources and improves lit effect of the optic array
- ✓ Better efficiency than with diffused surfaces.
- ✓ Emphasis on glare reduction
- ✓ Better control of beam
- ✓ Zhaga book 7 compliant modular solution



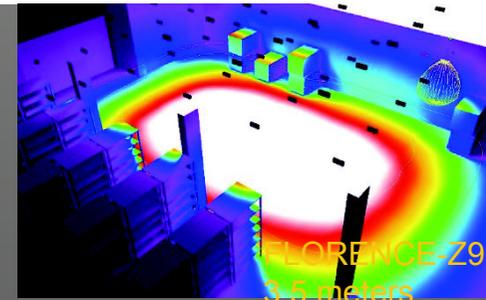
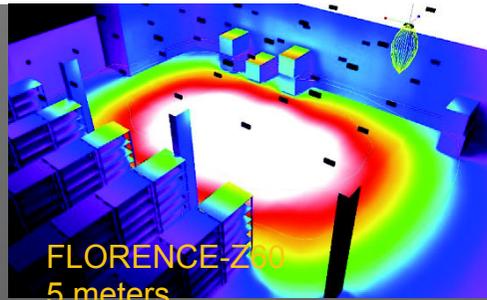
FLORENCE-Z30



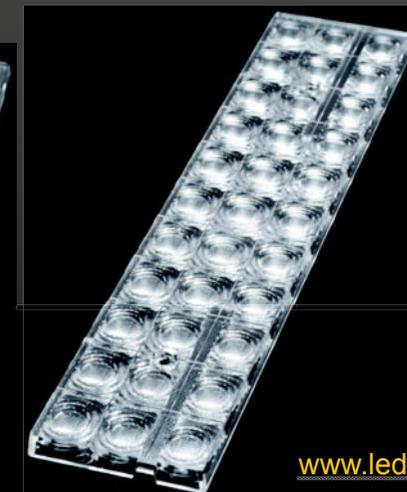
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## Three-row (3R) solutions

# LEDiL



- ✓ Z60(60deg) and Z90(90deg) provide uniform and low glare light distribution in advanced low bay environments with >90% efficiency.
- ✓ No light wasted on the ceiling and walls
- ✓ Suggested installation heights in industrial applications:
  - Z90 ~3...5 meters
  - Z60 ~4...6 meters
- ✓ Substantially lower W/m<sup>2</sup> achievable



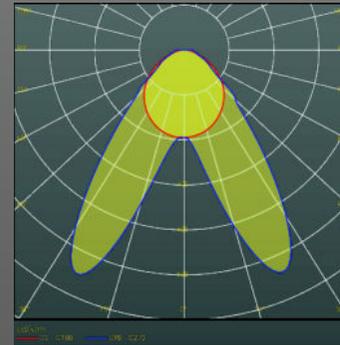
## Three-row (3R) solutions

FLORENCE-Z60 and -Z90

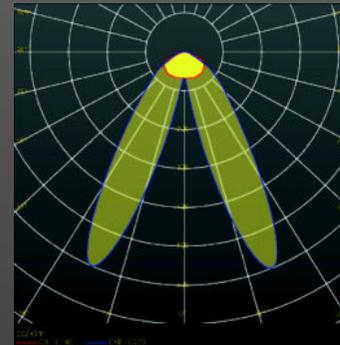
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# LEDiL

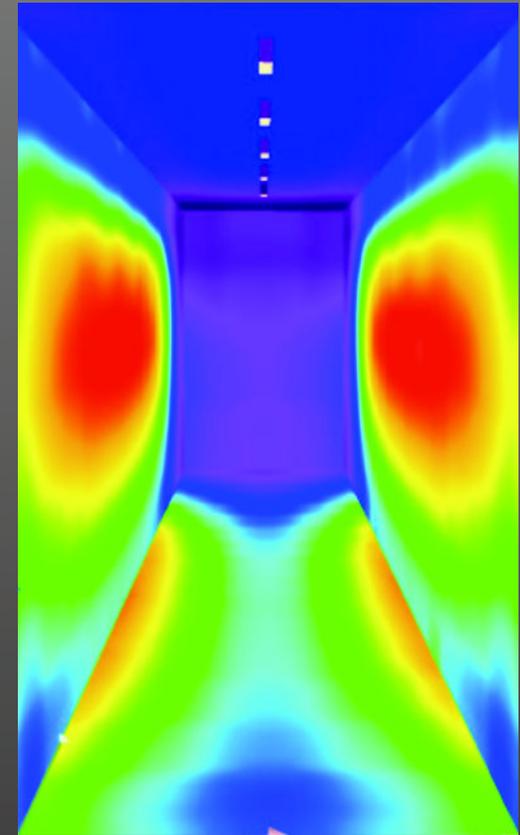
- ✓ ZT25 for double sided store environments with items on shelves both sides of the aisle.
- ✓ Provides uniform double sided oval beam with some intensity in the aisle center as well.
- ✓ Simplified assembly example; 1.5m distance between lamps, height 3.2m, aisle width 2m



FLORENCE-Z2T25



FLORENCE-ZT25



5 pcs Philips Fortimo LED Line 1100 lm modules with FLORENCE- ZT25 optics installed

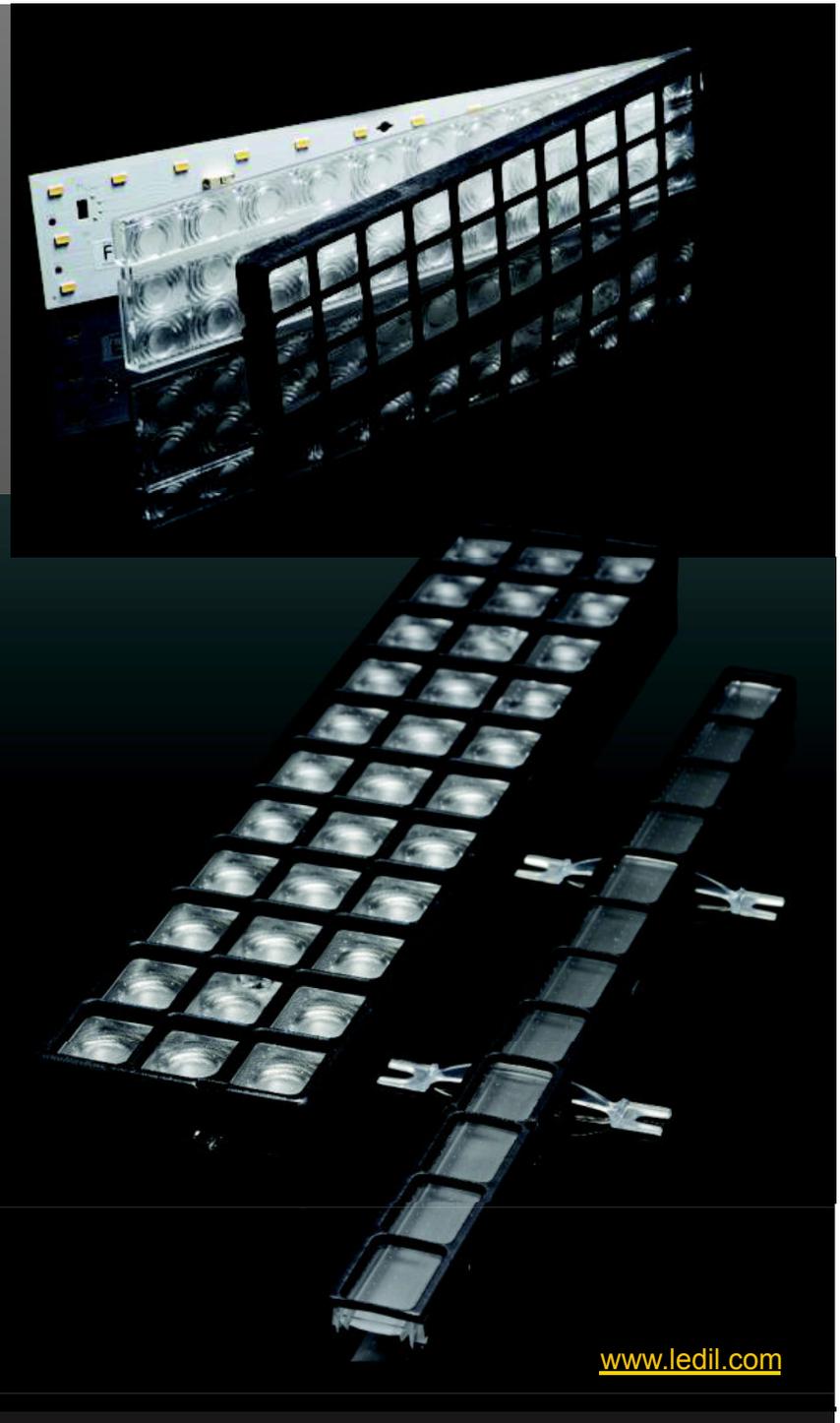


**Three-row (3R) solutions**  
FLORENCE-ZT25 and -Z2T25

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## Florence 3R- Glare control

- ✓ FLORENCE-1R and -3R are designed for the best possible efficiency
- ✓ Designed with minimal glare in mind
- ✓ On their own UGR rating can be too high for office lighting
- ✓ With the addition of shades UGR below 19 is achievable
- ✓ Easy to use clip-on design
- ✓ Standard color Aluminium Grey and Black
- ✓ Custom colors available
- ✓ Compatible with all available FLORENCE-1R / -3R lenses and installation clips



Glare control for indoor solutions

## Single row molded lense vs extruded lens comparison

- ✓ Molded lense can be made from PMMA, extruded parts made of PC
  - increased efficiency
  - UV Stability
- ✓ Possible to design extra detail into Molded parts
  - better beam control
  - colour separation reduction
  - individual led control
- ✓ Not possible to effectively cut PMMA
- ✓ Molded parts - Longer lengths not possible to run

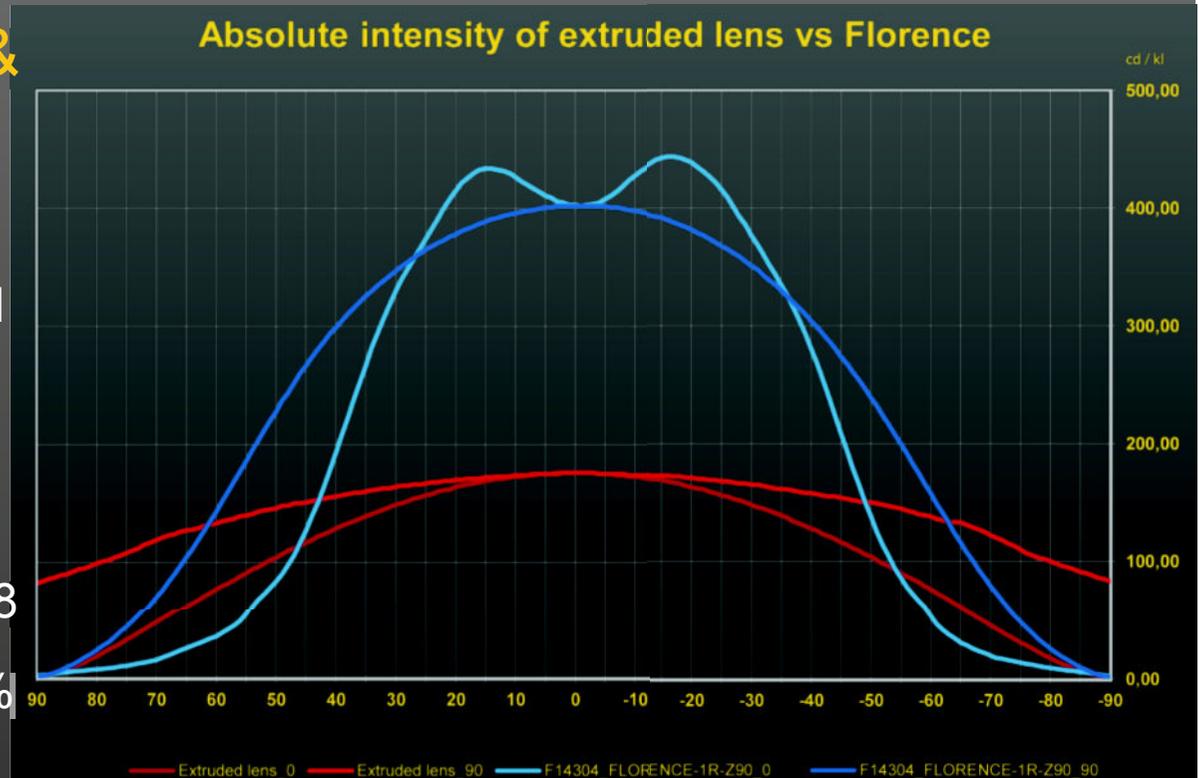


## Why FLORENCE?

Extruded vs. molded

## Single row Florence & extruded lens comparison

- ✓ Measured under identical conditions
- ✓ TepComp PCB w. Nichia 757
- ✓ Lmax (cd/lm) 0.44 vs 0.18
- ✓ Absolute efficiency 93.4% vs. 73.7%



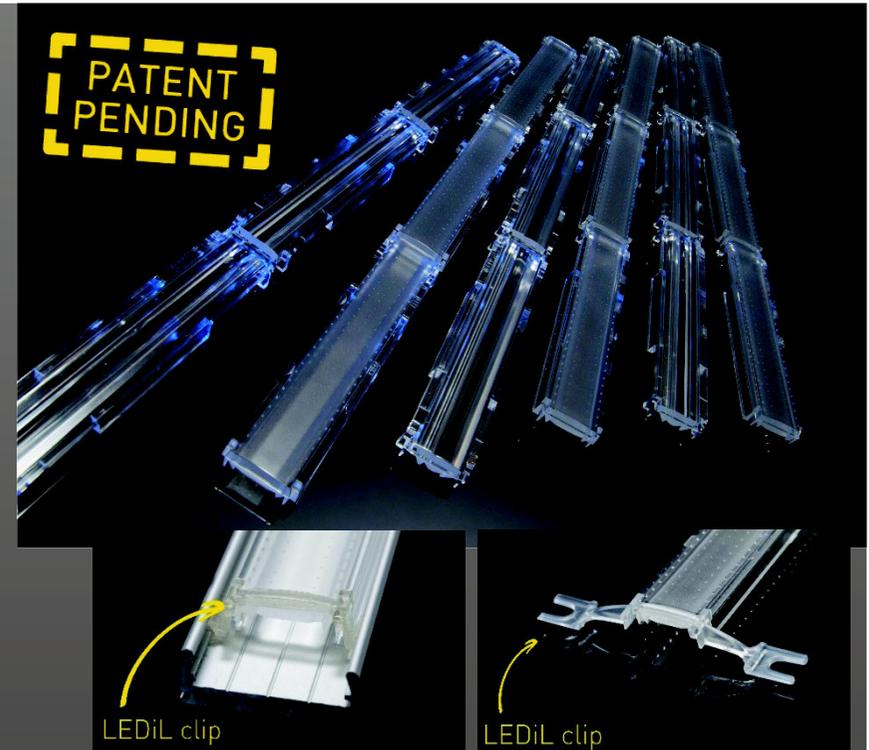
## Why FLORENCE?

Extruded vs. molded

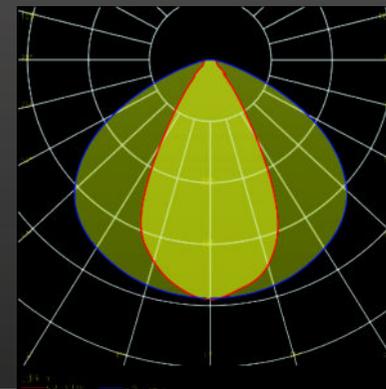
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## Florence 1R

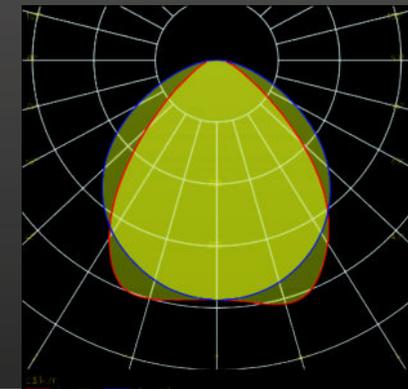
- ✓ Single row FLORENCE with same advantages than FLORENCE-3R
- ✓ Dimensions: 285.4 x 19.5 x 7 mm
- ✓ Lens can be easily snapped into three smaller 95 mm long pieces
- ✓ Linear design works with any LED pitch
- ✓ Easily customizable retaining clips connecting lenses into a continuous row



F14468\_FLORENCE-1R-Z60



F14304\_FLORENCE-1R-Z90



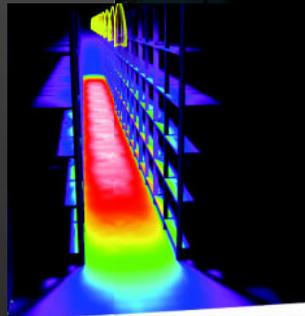
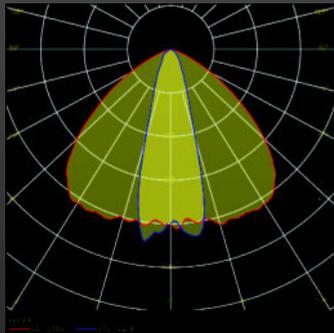
## Single row (1R) solutions

FLORENCE-1R-Z60 and -Z90

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## C14454\_FLORENCE-1R-O

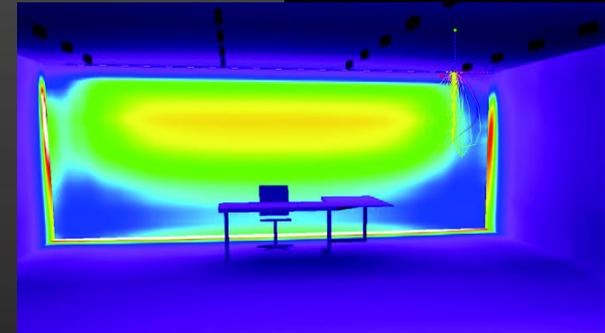
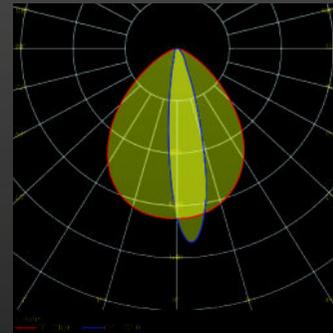
- ✓ Single row Florence with same advantages than Florence-3R
- ✓ Dimensions: 285.4 x 19.5 x 7 mm
- ✓ Optimized for corridor lighting in industrial & warehouse applications
- ✓ Oval distribution - Light not wasted on the top of shelves
- ✓ Linear optical design scales easily



## F14487\_FLORENCE-1R-MAXI-WG

Unique wall grazer optic in Florence dimensions

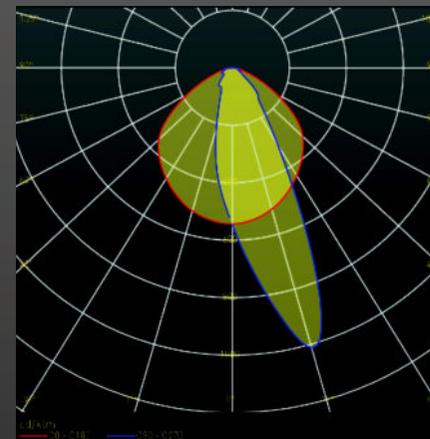
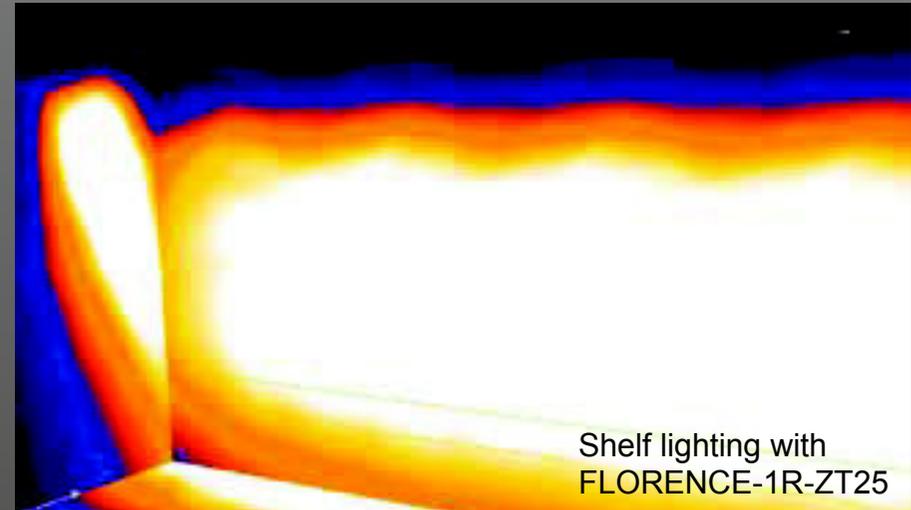
- ✓ Linear optical design scales easily into different lighting needs
- ✓ Good colour balance over entire wall height
- ✓ High candela peak for optimal vertical depth of illumination
- ✓ Oslon SSL80
- ✓ Typical installation 10-20cm from wall



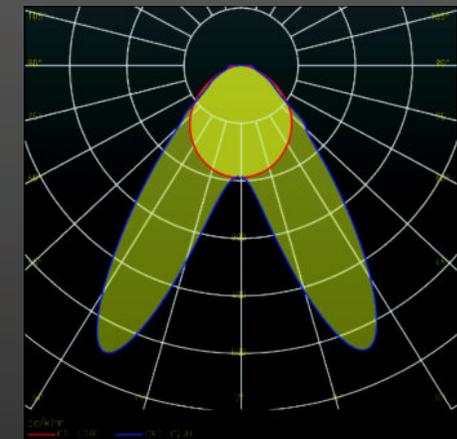
**Single row (1R) solutions**  
FLORENCE-1R-O and -MAXI-WG

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- ✓ Single sided asymmetric tilted beam (-1R-ZT25)
- ✓ Double asymmetric beam (-1R-Z2T25)
- ✓ Typical applications include retail lighting, shelf lighting



FLORENCE-1R-ZT25



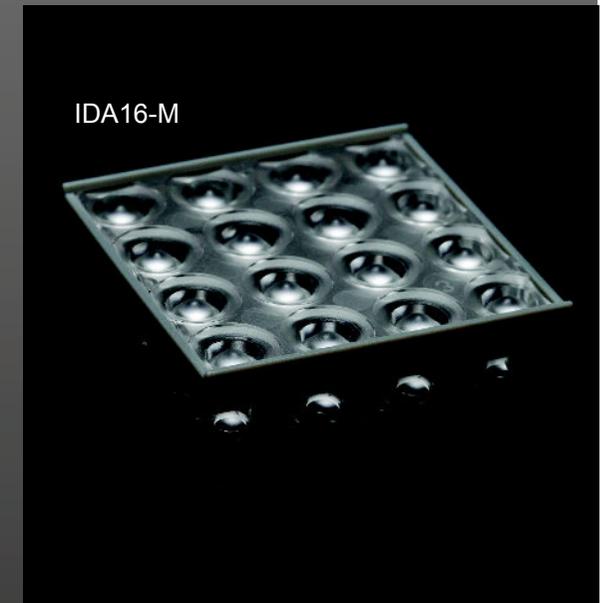
FLORENCE-1R-Z2T25

**Single row (1R) solutions**  
FLORENCE-1R-ZT25 and -Z2T25

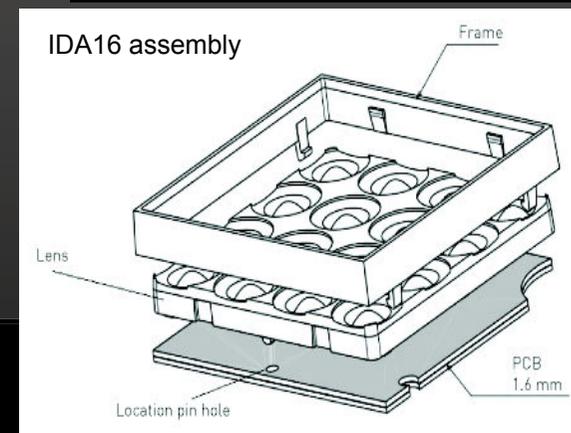
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## Future Mid Power Led Products

- ✓ More Beam angles
- ✓ IP rated products.
- ✓ Mid Power lense arrays
- ✓ 50 x 50 x 6.3 mm 16-up lens array with optional clip-on frame
- ✓ Modular system: optics held in place with installation frame
- ✓ Optional frames with integrated shades (UGR) planned
- ✓ Lens has two location pins in bottom for exact assembly to light engine.

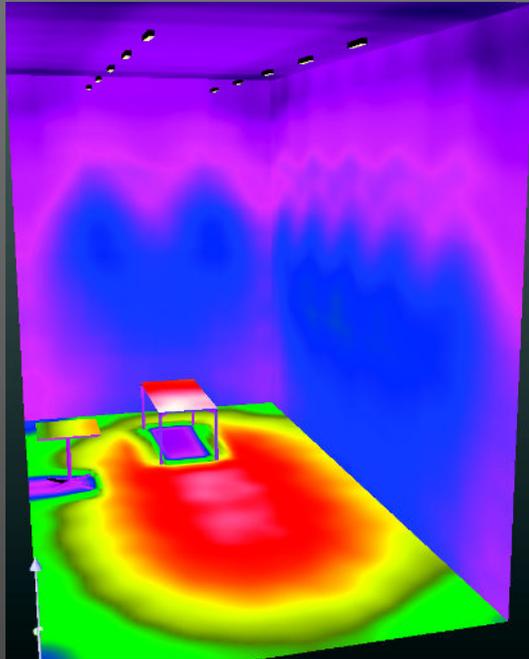


Code	Beam type	Sim. FWHM	Sim. Eff.
IDA16-M	Narrow	37°	95%
IDA16-W (Batwing)	Very Wide Flood	68°	95%
IDA16-O	Oval	90°+36°	95%



**LEDiL's new IDA**  
16-up module family for mid-power LEDs

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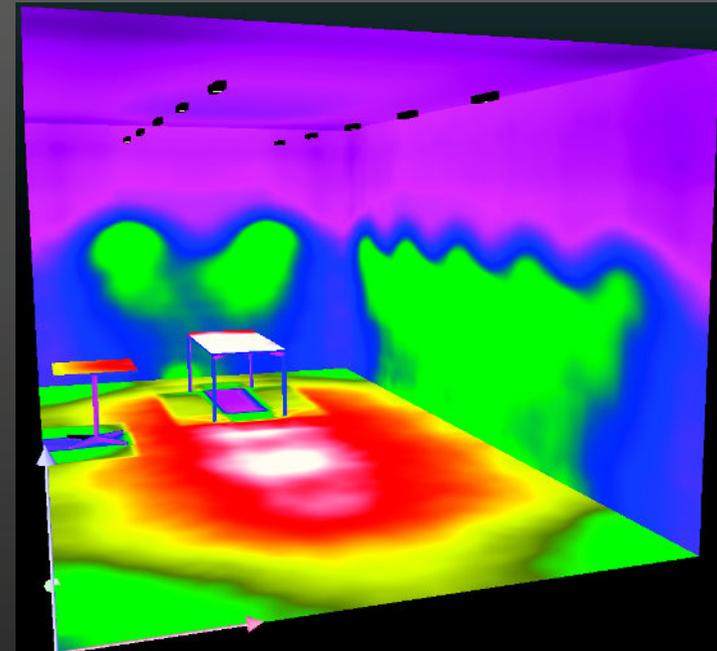


## IDA16-M

- 4 x 8 m room, 5 m high
- Task area 500 lx
- 7 pcs IDA16-M optics per fixture
- 10 fixtures installed 1.5 m spacing
- 2114 lm each fixture
- Eav: 463 lx
- Emax: 614 lx

## IDA16 Batwing

- 4 x 8 m room, 3 m high
- Task area 500 lx
- 7 pcs IDA16 Batwing optics per fixture
- 10 fixtures installed 1.5 m spacing
- 2135 lm each fixture
- Eav: 522 lx, Emax: 705 lx



**LEDiL's new IDA**  
16-up module family for mid-power LEDs

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