LEDiL

Guide for office lighting optics

V1-0 / 2022

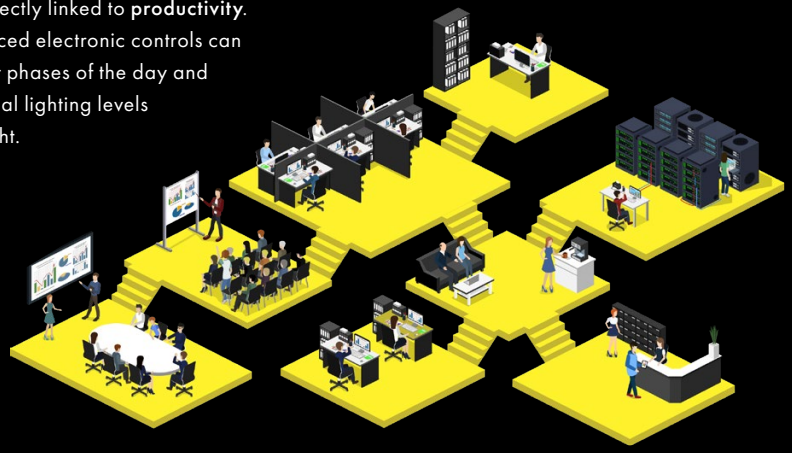
Office lighting in a nutshell

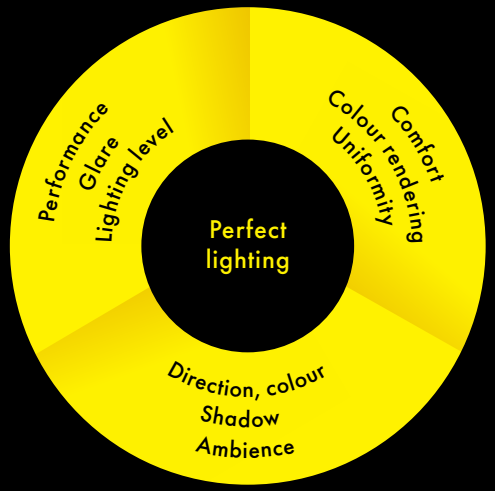
Offices consist of many different types of rooms and areas: work areas, public areas, hallways, meeting rooms, showrooms, kitchens, places for relaxation – each requiring a different kind of lighting. Some spaces must follow specific criteria while other areas can be illuminated with much more freedom.

Besides visual comfort, people's wellbeing and safety are important considerations and lighting can also be directly linked to **productivity**. Today's advanced electronic controls can follow different phases of the day and balance artificial lighting levels with natural light.

Using warmer tones and low intensity at the beginning and end of the day can lower stress, and using cooler tones during the day can be energizing.

This is all part of **Human Centric Lighting** philosophy and is very important, even vital, especially indoors where we spend many hours a day in artificially lit environments.

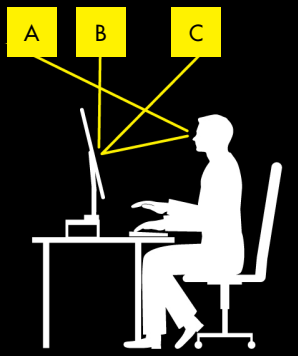




Take visual performance, visual comfort and visual ambience into account to achieve the right light for specific space.

Glare

Glare is the sensation of visual discomfort caused by areas that are too bright within the field of vision, such as lit surfaces, parts of luminaires, windows and/or ceiling. Glare should be limited to avoid fatigue, discomfort and accidents.



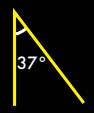
Types of glare

Direct (A):	Bright lamps – measurable and has a clear affect to performance
Reflected (B & C):	Reflection of light on specular high gloss surfaces
Disability:	Affects visual performance – can be measured
Discomfort:	Subjective evaluation; feels uncomfortable but doesn't necessarily affect visual performance

UGR
Discomfort glare criterion

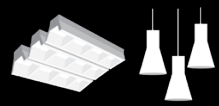
	13 Barely perceptible	19 Barely acceptable (for average eye tasks)	25 Barely comfortable (for simple eye tasks)
<10 Imperceptible	16 Perceptible (for accurate eye tasks)	22 Unacceptable (for moderate eye tasks)	>28 Uncomfortable

How to reduce glare

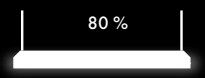


Beam
Limit light intensity above potential glare angles

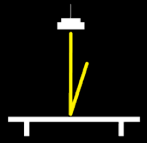
Surface
More uniform surface luminance with same lumen output



Visibility
Shading and shielding



Output
Decrease light output (might require adding more luminaires)



Placement
Avoid glare on task area and increase ambient light

Ambient light
Less contrast ▶ Eyes adapt to brightness more easily

5 Tips for modern and pleasant office lighting

1 Aim high

Studies show that good office lighting increases **productivity and wellbeing** as well as **boosting creativity**. They also show that people place great value on good workplace lighting and many are unhappy with their current office lighting. Controlling lighting to replicate natural daylight patterns helps peoples natural circadian rhythm improving overall wellbeing, motivation and productivity.

2 Design for the environment

Applying the traditional room-related lighting concept of a 500 lux blanket no longer meets the needs of the modern office or the modern worker, both of which require variety and contrast. Thanks to LED technology, office lighting can be designed to **enhance atmosphere and décor** as well as **create contrasts and different moods**. This in turn allows much greater flexibility when designing the overall office layout than would be possible with a traditional 500 lux blanket.

3 Dark light, bright surface, or indirect?

Many offices are lit with bright surface luminaires. This is often perfectly adequate in spaces that have a lot of natural day light and light-coloured décor. However, in many cases this type of lighting is not ideal as it also creates unpleasant glare.

Well-shielded dark light luminaires on the other hand are discreet, and the distracting light source cannot be seen, even when they are on.

Dark light creates a much more **pleasant and natural working environment** by eliminating distracting bright luminaires that often dominate the workspace.

Indirect light can be used to **create different moods and effects** depending on requirement and task. However in many environments it is ideal to combine indirect light such as **wall washers** and **up-light** with **direct lighting**. This will create a bright and **airy atmosphere** while reducing glare from bright luminaires.

4 Luminaire placement

Luminaires in a typical open office are often placed next to walls to achieve sufficient lighting levels on the walls. However, when desks are placed in the office lighting is not always a consideration, and some employees might find they are subjected to direct and indirect glare. A good office and lighting design plan is essential to ensure light can be **adjusted** according to the task and the individual.

5 Miniaturization

LEDs enable smaller, modern and fresh designs for a lower cost. However such designs can be too bright and cause glare if suitable optics designed for office environments are not used. Miniaturized designs with a full range of beams gives you the tools to **be more creative than ever.**

3 Linear office lighting setups

Details

1 Room related lighting concept with recessed direct light

2 Task related lighting concept with suspended luminaires

3 Task related office lighting with freestanding luminaires

DAISY

PATENTED

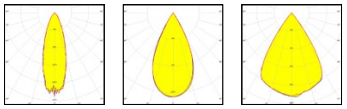
Premium class office lighting with highly efficient lenses and a seamless shade that eliminates glare.

- Discreet direct light for recessed, surface mounted and suspended office luminaires.
- High efficiency >85 % (even with the shade)
- Available in black, white and metal with gloss or matt finish

Sizes:

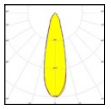
MINI:	280 x 21 mm
4X1:	180 x 40 mm
7X1:	280 x 40 mm
8X1:	(12") 305 x 40 mm
28X1:	1140 x 40 mm
2X2:	79.4 x 79.4 mm

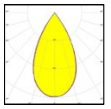
Compatibility: Optimized for 2835 and compatible with up to 5630 size mid-power LED packages


MINI-M

MINI-W

MINI-WW


7X1/8X1-M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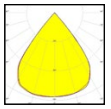
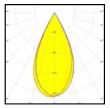

XXX-WW

XXX = 4X1, 7X1, 8X1, 28X1 or 2X2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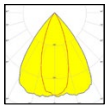
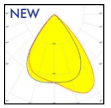
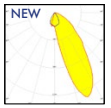
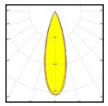

7X1-O


NEW
7X1-FT


NEW
7X1-WAS

FLORENTINA

- Discreet direct light for meeting rooms, receptions, task lights and down lights.
- Part of LEDiL's Dark Light (UGR <16) product family.
- A hybrid design of black reflector and lens for high visual comfort in various shapes.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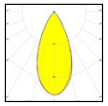
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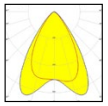
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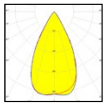
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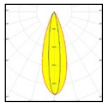
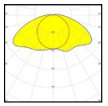

O

LINDA

Seamless linear extrusion lenses with excellent optical control and innovative installation.

- Compatible with single row mid-power up to 24 mm wide Zhaga PCBs.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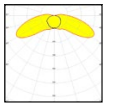
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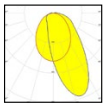
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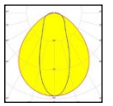
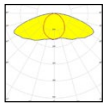

OVAL

LINNEA

For direct lighting in corridors and warehouse areas. For ambient up-light and wall-wash effects.

- 285 x 40 mm linear lenses with integrated clip fixing optimized for the most common Zhaga mid-power 20 and 24 mm wide PCBs.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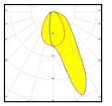
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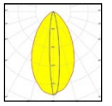
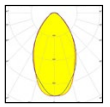

WG

FLORENCE-3R

FLORENCE – For general office lighting with high level of ambient light.

FLORENCE2 – For direct lighting in common areas, corridors and warehouses.

- 3-row (Zhaga book 7) linear lenses with market leading colour uniformity.
- Wide selection of beams and accessories compliant with a range of mid- and high-power LEDs and LED clusters.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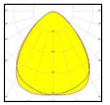
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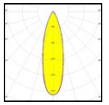
Single lenses & reflectors

In addition there are lots of different single lenses and reflectors available for downlighting.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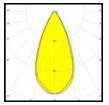
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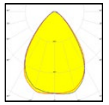
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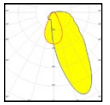
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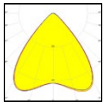
BW*

* RONDA-REC-60 and -90

Typical office luminaires

Direct lighting
Recessed or surface mounted

Indirect lighting
Suspended luminaire

Direct / indirect lighting
Suspended luminaire

Task lighting
Track light, downlight or free standing

Wall-washing
Recessed, surface mounted or cove light

Technical support

- Simulations to show optic performance in real applications
- Guides and tips for installations
- Thermal analysis for luminaire designs

Contact our tech support experts:

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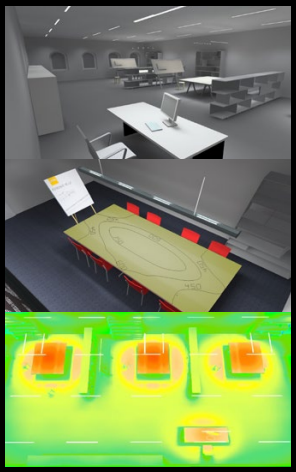
North America
tech.support.us@ledil.com



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