

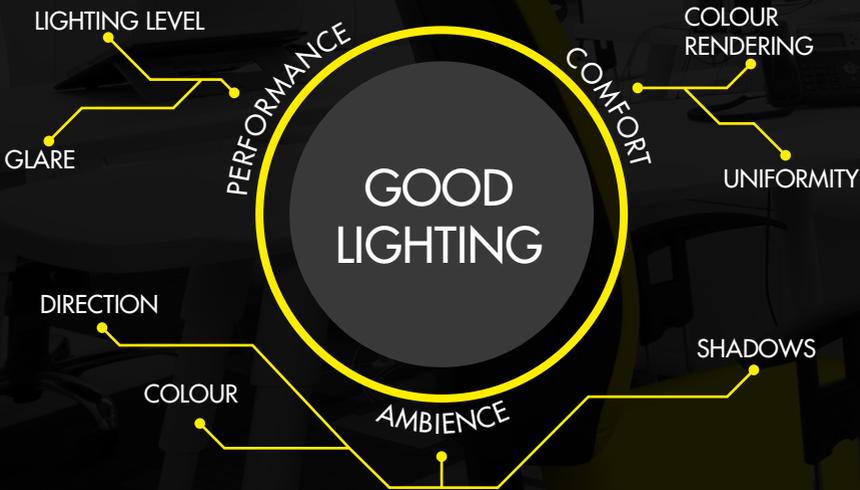
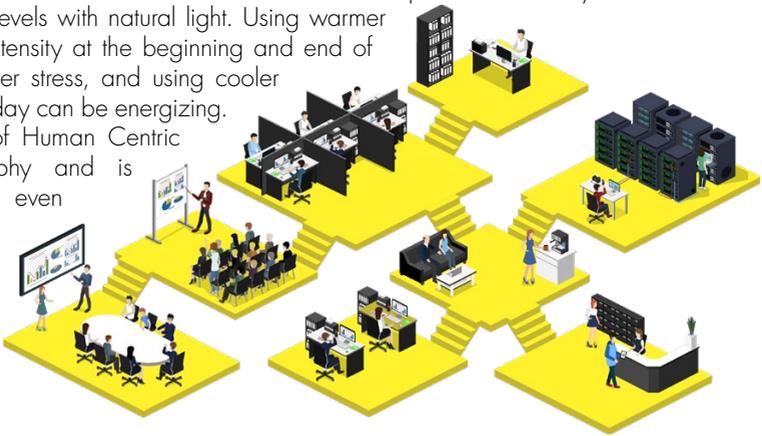
LEDiL®

GUIDE FOR OFFICE LIGHTING OPTICS



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

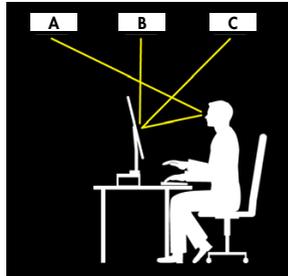
Glare is the sensation of visual discomfort caused by areas that are too bright within the field of vision, such as lit surfaces, parts of luminaires, windows and/or ceiling. Glare should be limited to avoid fatigue, discomfort and accidents.

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 does **not necessarily** affect visual performance

UGR

Discomfort
Glare Criterion

UGR	Discomfort Glare Criterion
10 and under	Imperceptible
13	Barely perceptible
16	Perceptible (suitable for accurate eye tasks)
19	Barely acceptable (suitable for average eye tasks)
22	Unacceptable (suitable for moderate eye tasks)
25	Barely uncomfortable (suitable for simple eye tasks)
28 and over	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



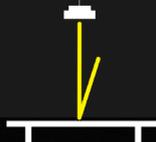
OUTPUT

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



TIPS FOR MODERN AND PLEASANT OFFICE LIGHTING

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.

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.

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.

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.

MINIATURIZATION

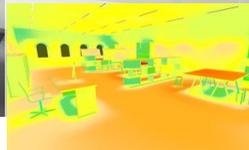
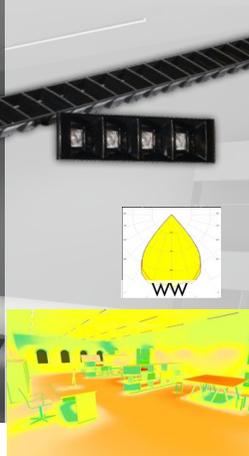
LEDs enable smaller, modern and fresh designs for a lower cost. However such designs can be too bright and cause glare if suitable optics designed for office environments are not used. Miniaturized designs with a full range of beams gives you the tools to be more creative than ever.



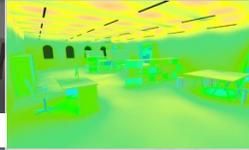
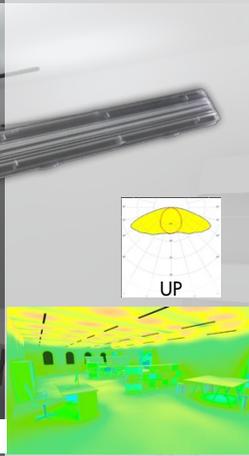
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TIPS FOR BETTER OFFICE LIGHTING

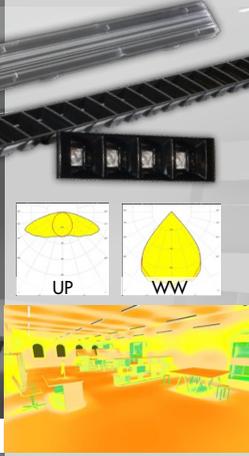
3 LINEAR OFFICE LIGHTING SETUPS



SURFACE MOUNTED DOWNLIGHT – DAISY-WW



SUSPENDED UPLIGHT – LINNEA-UP



SUSPENDED UP- AND DOWNLIGHT – LINNEA-UP & DAISY-WW

DAISY

DARE NOT TO GLARE

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.

FEATURES

Two lengths:

4X1: 180 x 40 mm

28X1: 1140 x 40 mm

Two beams:

WW and W

UGR < 19

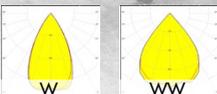
High efficiency >85 %
(even with the shade)

Available in piano black
and coming in white

COMPATIBILITY

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

Compatible with
up to 4ft long PCBs



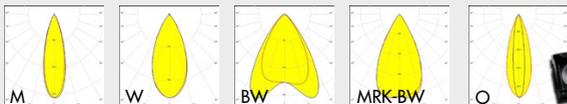
FLORENTINA

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.

BEAMS FOR OFFICE LIGHTING



FLORENCE-3R

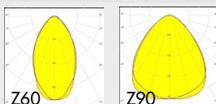
FLORENCE – For general office lighting with shade or high level of ambient light

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.

BEAMS FOR OFFICE LIGHTING



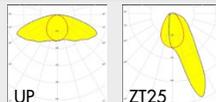
LINNEA

For direct lighting in corridors and warehouse areas.

For ambient up-light and wall-wash effects.

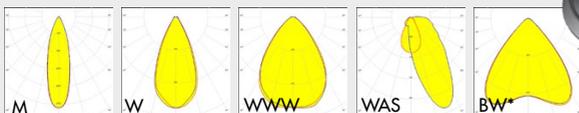
285 x 40 mm linear lenses with integrated clip fixing optimized for the most common Zhaga mid-power 20 and 24 mm wide PCBs.

BEAMS FOR OFFICE LIGHTING



SINGLE LENSES & REFLECTORS

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



*RONDA-REC-60 and -90

TYPICAL OFFICE LUMINAIRES

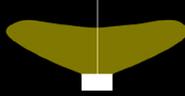
DIRECT LIGHTING

Recessed or surface mounted



INDIRECT LIGHTING

Suspended luminaire



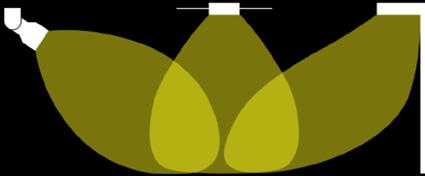
DIRECT / INDIRECT LIGHTING

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

Installation guides and tips

Thermal analysis for luminaire designs

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