A Group Company of MITSUBISHI CHEMICAL

# LED Lighting

## Product Catalogue | 2017

www.verbatimlighting.com

Verbatim™

Nightview of Tokyo

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# History of the Company

## Introduction

### Verbatim - Technology you can trust

From its foundation in 1969, the Verbatim brand has been at the forefront of technological innovation. In its early years, Verbatim focused on data storage and remains one of the most recognisable and respected brands in the industry. The company has a strong reputation as a trusted global supplier providing quality products backed up by fast and reliable service and support.

### Mitsubishi ownership

In 2010, Verbatim entered the lighting industry and married Mitsubishi Chemical's 50 years of experience in developing lighting materials with its own extensive global sales and marketing network. Verbatim LEDs utilize unique technology developed by the Mitsubishi Chemical Group, including innovative optics, patented thermal management and knowledge of key materials to create high quality lighting solutions.

The result is a wide range of high quality LED lamps for professionals and consumers and an expanding portfolio of LED luminaires for daily use. Verbatim's products are designed to offer a high level of visual comfort, exceptional long term reliability and serve a broad range of applications.

Verbatim is deeply committed to serving its customers and continuing to develop market leading innovative solutions by incorporating unique technology developed by its parent company, Mitsubishi Chemical.

# Mitsubishi Lighting Material History

## Development Milestones

**1950**
Phosphor for black & white CRT-TV.

**1961**
Phosphor for colour CRT-TV.

**1967**
Phosphor for fluorescent tubes.

**1971**
GF (Gradient Freeze) GaAs wafer for LED & LD.

GaAsP epitaxial wafer by HVPE for LED.

**1976**
High contrast phosphor for colour CRT-TV.

**1980**
GaAs & GaAlAs epitaxial wafer by LPE for LED.

## 2016

Vx-filter technology to increase CRI and vividness of colours.

## 2017

Launch of MCC developed luminaires.

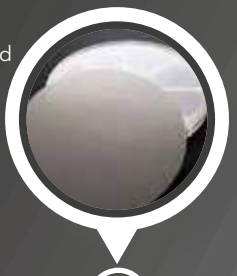
## 2015

Launch of Mirageball optics, GU10/MR16 reflector lamps and unique AR111 with indirect light source.

## 2014

Launch of OLED panel production by wet coating process.

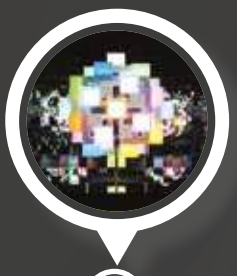
VxRGB technology.



## 2013

LED lamp using GaN on GaN technology.

Establishment of MC Pioneer OLED Corporation, joint venture between MCC and Pioneer.



## 2011

Nitride yellow phosphor for white LED (world's first commercialisation).

Colour tunable OLED (world's first commercialisation).

## 2012

Installed SCAAT™ large reactor.

VxRGB white LED package for lighting.

## 2010

Alliance with Pioneer on OLED lighting business.

## 2006

Encapsulation material for LED.

## 2008

GaN wafer by HVPE.

## 2009

Encapsulation material S-grade for LED.

Start of manufacturing & sales of violet chip LEDs.

## 1982

LEC GaAs wafer for high speed electronic device & LED.

## 1990

Natural colour phosphor for lighting.

Phosphor for PDP-TV.

## 1993

780nm LD epitaxial wafer, chips for storage media.

## 1997

VGF GaAs wafer for LED & LD.

## 1998

980nm LD module for submarine communication.

GaP epitaxial wafer by LPE for LED.

## 2005

Nitride red phosphor for white LED (world's first commercialisation).

# KAITEKI

## Our Philosophy

As part of the Mitsubishi Chemical Holdings Group, Verbatim follows the company's long term strategy and vision, summarized in the 'Kaiteki' Philosophy.

'Kaiteki', which traditionally means 'comfort' or 'ease' in Japanese, represents the global quality of life that will be made possible through sustainable technologies and breakthrough scientific advances in human healthcare.

Sustainability and respect for the environment are key elements of the KAITEKI concept: Verbatim's LED-based solutions help to achieve both.

When considering the sustainability of LEDs, in addition to their low energy use, they also offer benefits in terms of waste reduction, recyclability, the use of materials and resources and the effect on building and design practices. LEDs are mercury-free and very long lasting, which means less frequent replacement and reduced waste.

# Verbatim LED Mission

By combining the research and development strengths of the Mitsubishi Chemical Group with the sales, marketing and distribution infrastructure of the Verbatim organization, we have formed a very powerful entity in the lighting industry.

**Customer-centric organization:** we can adapt quickly to customer needs in the fast changing lighting market.

**Scientific insight:** the Mitsubishi Chemical Group provides deep scientific lighting knowledge to allow us to utilize new proprietary technologies.

**Specialists support:** we benefit from expert groups within Mitsubishi Chemical including colour scientists, physicists, mechanical and optical engineers; Mitsubishi Colour Science focuses on the colour quality of LEDs, and the Mitsubishi Optical Group provides support on various topics including minimizing glare from lamps.

**Worldwide reach:** as a worldwide organization, with subsidiaries on all continents, we possess a powerful global distribution and logistics network that can support all customer needs.

**Corporate governance:** we adhere to Mitsubishi Chemical Holdings strict and ethical approach to business, ensuring that we are a company you can trust for the long term.

**Rigorous quality control:** adherence to strict quality control standards enforced by Mitsubishi Chemical in Japan in close corporation with Verbatim's European quality control team in Germany.

# OUR MISSION:

Provide reliable solutions in lighting technology for daily use.

# Core LED Technology from Mitsubishi Chemical Corporation

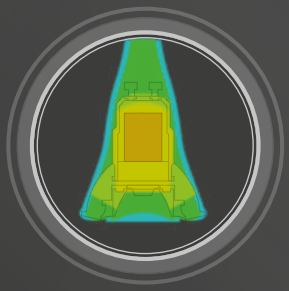
Mitsubishi Chemical's experience and understanding of the four key technical elements of an LED lighting device ensures that the products are highly optimized and deliver the best in terms of efficiency and performance:

## Electronics:

selection of high quality electronics for optimum power consumption, dimmer compatibility, control of light output and control of flicker.

## Optimized thermal management:

maximizing efficiencies through careful choice of materials and unique product designs.

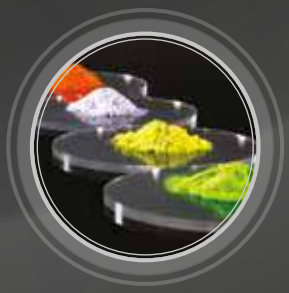


## Unique optics:

beam angle, minimizing glare, visual comfort and light distribution optimized for various applications.

## Key materials:

the Mitsubishi Chemical Group is a provider of premium quality materials including phosphors, engineering plastics, dyes for filters and c-GaN substrates.



LED TECHNOLOGY

*"A key development strategy at Mitsubishi Chemical is to focus on optimizing lumens per gram, thus maximizing the efficient use of materials in keeping with our Kaiteki principles. Verbatim has succeeded bringing to market a true incandescent lamp replacement, developing a world leading thermal management solution by combining an optimal heat sink, uniform light distribution and downsized optical designs resulting in high powered, small and light LED products.*

*We also seek to achieve this through the use of Mitsubishi's advanced raw materials. Every application needs the right mix of vividness, high colour rendering and low glare to deliver light of true quality.*

*Our decade-long dedication to research and science has been rewarded by over 70 patents related to LED lighting devices, establishing leadership in colour science and thermal management.*

*We are committed to continue on this path of launching technology innovations by continuously improving the quality, performance and design of our products. For this reason we are able to offer LED solutions which perfectly match customer requirements and are adapted to individual lighting tasks."*

Akeo Kasakura

空倉 暁夫

**Akeo Kasakura**
General Manager of LED Lighting Development Group
Mitsubishi Chemical Corporation

# Applications

Verbatim LED lighting solutions can be used across a wide range of applications. They are ideal for home and commercial applications including shops, offices, hotels and restaurants.

## RETAIL

Lighting is critical in creating a memorable customer shopping experience and showcasing merchandise appealingly. Creating contrasts with light and shadow, showcasing vivid colours or guiding customer sightlines through the shop are all aspects of professional lighting. Whether ambient or accent lighting, Verbatim LEDs offer high vividness and high colour rendering solutions which help to bring out the best from the colours on display. With long opening hours, retail lighting is in operation for most of the day so in addition to improving the ambiance of the store, significant cost savings can be achieved by retailers investing in LED lighting.

## HOSPITALITY

Providing the best customer experience is a goal in any hospitality environment and setting the appropriate mood for each space is a key requirement. Verbatim products achieve this with a range of high quality lamps and luminaires. Another objective for any business owner is to minimise costs, and by moving to Verbatim LEDs with their long lifetimes and superior efficiency, maintenance and energy bills will be dramatically reduced.

# COMMERCIAL

Workplaces should be comfortable homogeneous environments, delivering optically pleasing lighting solutions. Office workers spend many hours a day exposed to artificial light, making low glare and visual comfort an important influencing factor in their productivity. LEDs offer longer lifetime as well as substantially lower energy consumption compared with conventional lighting making LED installation not only a visually attractive choice, but one with a high return on investment. In addition, our dimmable products give even more flexible lighting options for work spaces.

# RESIDENTIAL

Lighting sets the mood in your home. Our professional dimmable LEDs give you the opportunity to control the light scenes to match the occasion. The simplicity of retrofit solutions makes installation easy. Whether you want to highlight architectural design or create lighting schemes sympathetic to your lifestyle, our LEDs offer maximum flexibility, long life and very low energy consumption.

# Luminaires

Verbatim LED luminaires are suitable for a broad range of professional lighting applications including hotels and restaurants to offices, retail stores and warehouses. Ideal for new lighting installations or upgrade projects, Verbatim's attractive luminaires offer fast and easy fitting with compact housing dimensions, excellent visual comfort, high efficacy and long lifetime.

# LED Ceiling Lights

Verbatim LED ceiling lights offer a uniform light distribution suitable for general lighting application. Available in two colour temperatures and diameters (320mm and 500mm), they feature a perfectly even light-emitting surface with two different diffuser finishes that both pass the 850°C glow wire test.

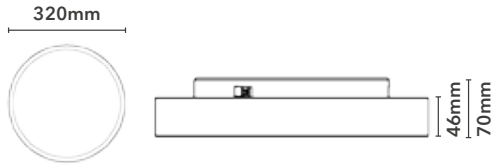
The elegant, flicker-free ceiling light features an optional indirect corona or halo effect (see page 18). The ceiling light can be suspended from the ceiling with the corresponding suspension kit. An option for DALI-dimming is also available.

The protection class of IP40 prevents the penetration of solid objects such as dust or insects. Paired with a long lifetime of 50.000h, the luminaire guarantees low maintenance and cleaning cost. Full metal housing guarantees efficient thermal management. A narrow binning of SDCM<3 and excellent energy efficiency makes it a perfect replacement for ceiling lights with conventional technologies.

## Application

Suitable for general lighting in public and commercial buildings, retail and hospitality.

52290 / 52292 / 52294 / 52296

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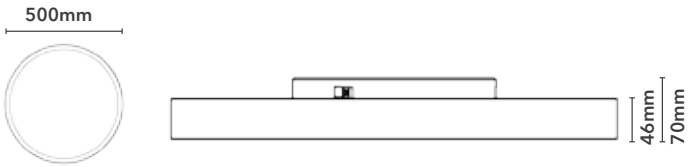


220-240V | DALI | 50 000 Hours | 3000K | 4000K | IP40 | 850 °C | CRI ≥80

| Product Number | Wattage (W) | Luminous Flux (lm) | CCT (K) | UGR | Product Weight (g) |
|---|---|---|---|---|---|
| 52290 | 18 | 1800 | 3000 | >19 | 1845 |
| 52291 | 35 | 3500 | | | 3070 |
| 52292 | 18 | 1850 | 4000 | | 1845 |
| 52293 | 35 | 3600 | | | 3070 |
| 52294 | 18 | 1450 | 3000 | <19 | 1845 |
| 52295 | 35 | 2800 | | | 3070 |
| 52296 | 18 | 1500 | 4000 | | 1845 |
| 52297 | 35 | 2900 | | | 3070 |

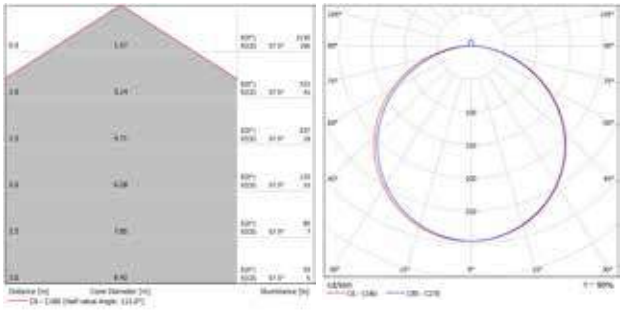
## Accessories

52936 - Verbatim Suspension Kit for LED Ceiling Light

52934 Tridonic LED DALI Driver for 320mm LED Ceiling Light
52935 Tridonic LED DALI Driver for 500mm LED Ceiling Light

## LED Ceiling Lights Photometric Data

52290



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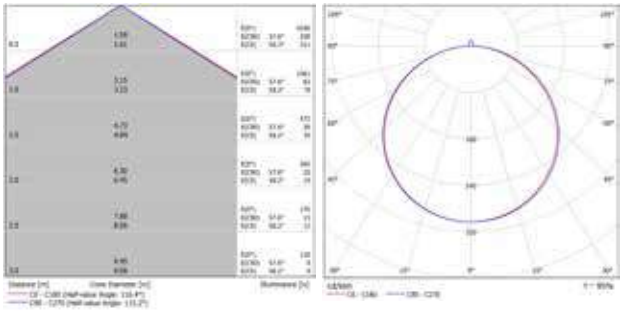

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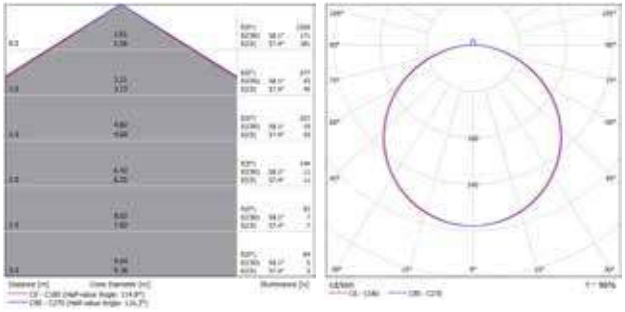

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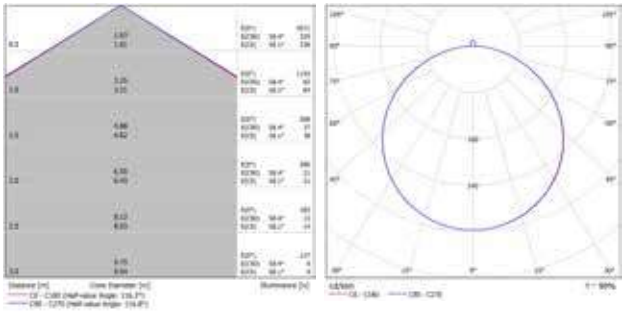

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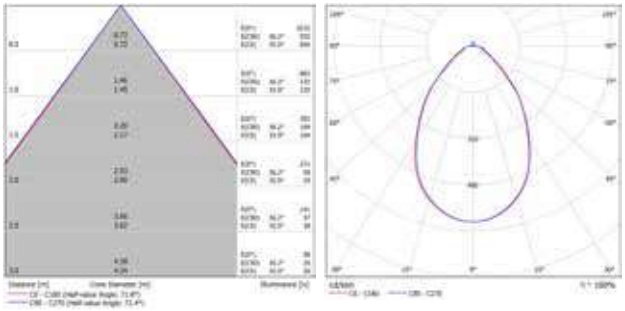
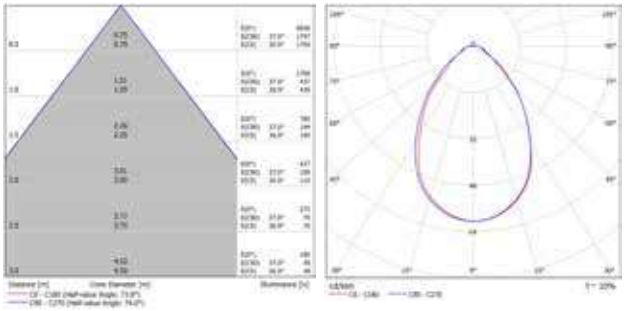


52295



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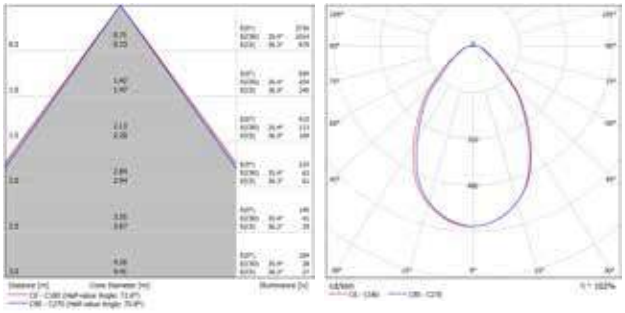

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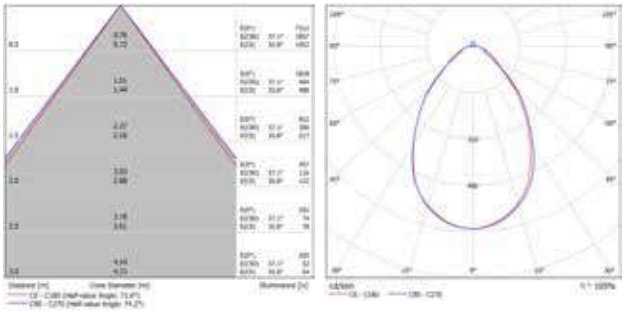


# ADVANCED PRODUCT DESIGN

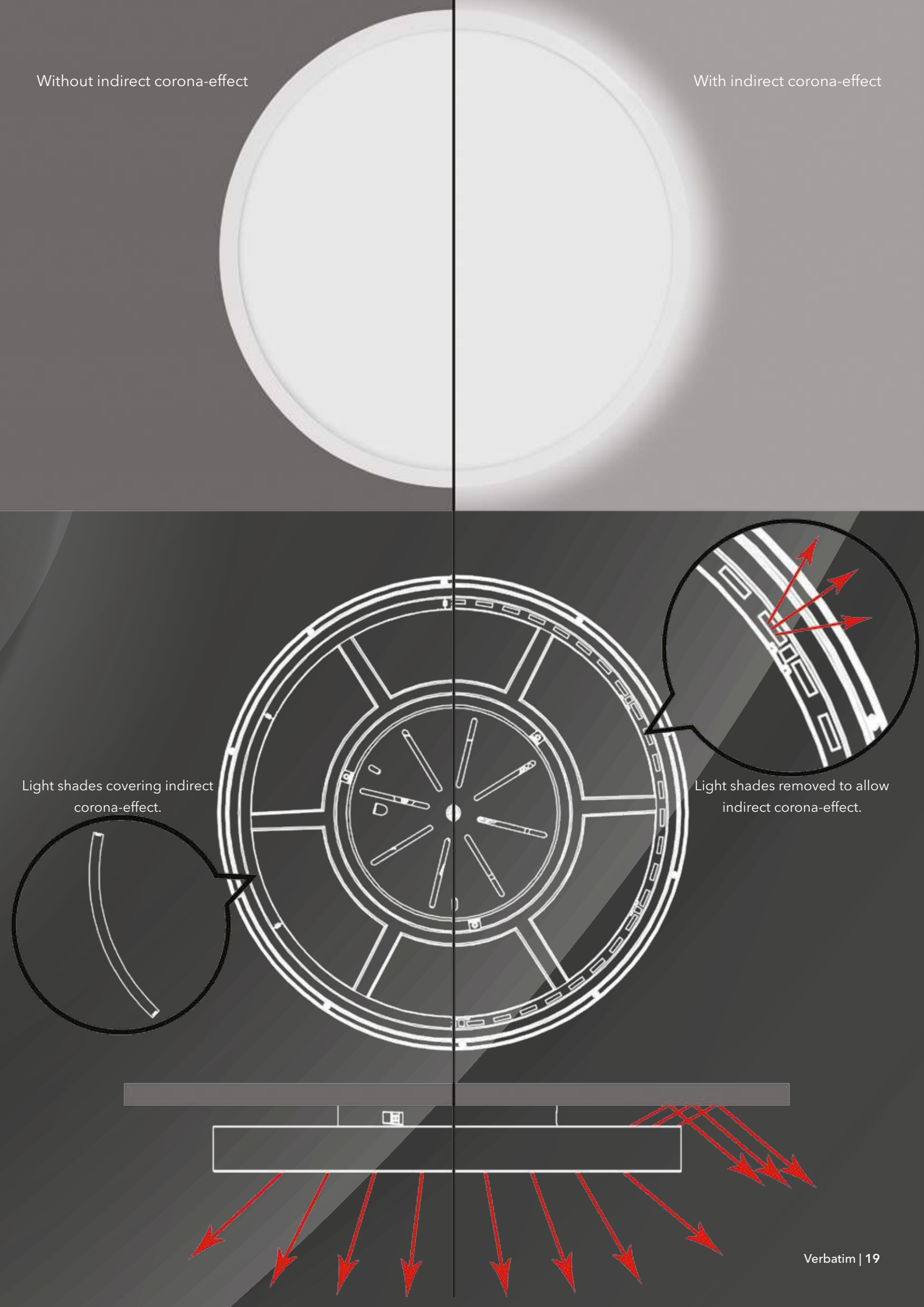
## Indirect corona-effect

The elegant, flicker-free ceiling light features an indirect corona or halo effect that makes the luminaire appear to 'float' on the ceiling, smoothing the contrast between the light-emitting surface and the background or ceiling it is installed onto.

If preferred, the corona effect can be removed by applying the covering magnetic clip system which is provided with the luminaire.

Without indirect corona-effect

With indirect corona-effect



Light shades covering indirect corona-effect.

Light shades removed to allow indirect corona-effect.

# LED Recessed Downlights IP44

A high quality range of LED downlights featuring different diameters and wattages with a maximum luminous flux of 3900lm. The high lumen output makes the downlight especially suitable for environments with ceiling heights of >3m.  As only a small number of luminaires are needed to achieve the required illuminance level, it results in less maintenance cost and reduced installation effort and time.

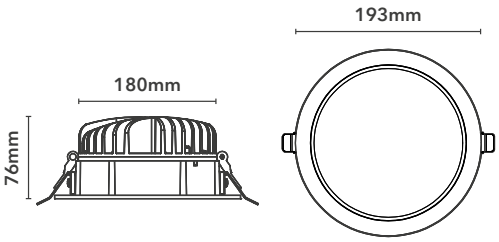
With a protection class rated IP44 the product is equally suitable for more exposed environments such as damp rooms and covered outdoor areas.

A flicker-free, 1-10V dimmable driver together with a solid aluminium heatsink and a deep-recessed white trim combine to create a high spec, attractive downlight.

## Application

A direct replacement for downlights incorporating compact fluorescent lamps. General lighting for corridors, entry halls and retail environments. Especially suitable for spaces with room heights ≥ 3,00m. Suitable for most suspended ceilings with a thickness of ≤ 25mm.

52493 / 52497

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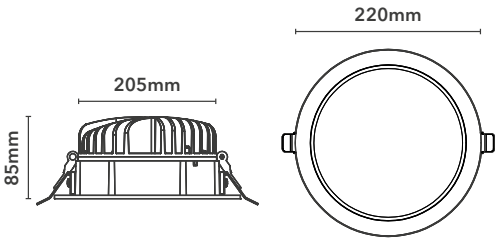
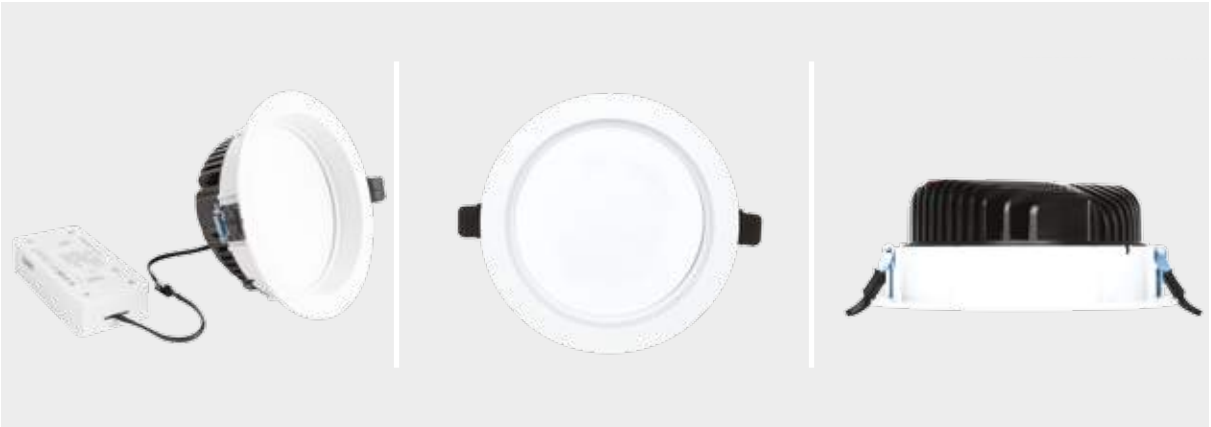


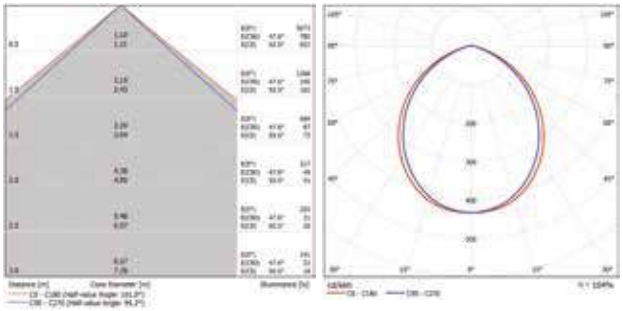



220-240V | 1-10V | 45 000 Hours | 3000K | 4000K | IP44 | 850 °C | CRI ≥80

| Product Number | Wattage (W) | Luminous Flux (lm) | CCT (K) | Product Weight (g) |
|---|---|---|---|---|
| 52493 | 35 | 2900 | 3000 | 1164 |
| 52494 | 40 | 3800 | | 1437 |
| 52497 | 35 | 3000 | 4000 | 1164 |
| 52498 | 40 | 3900 | | 1437 |

## LED Recessed Downlights IP44 Photometric Data

52493



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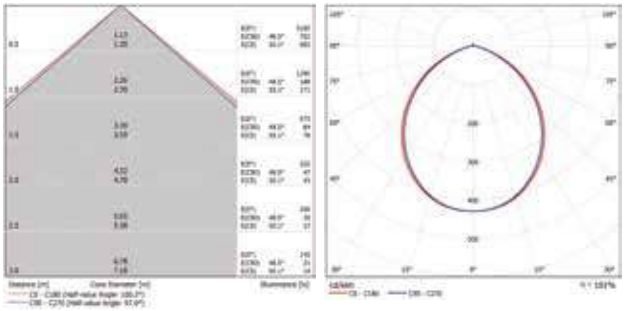

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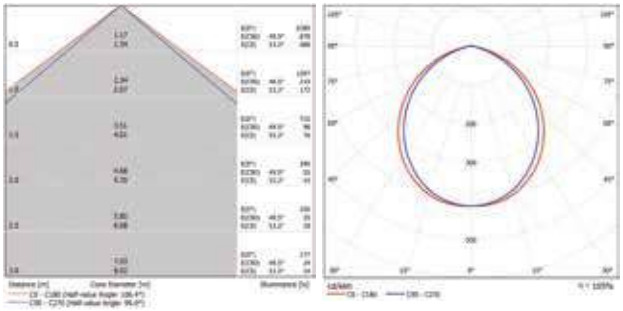

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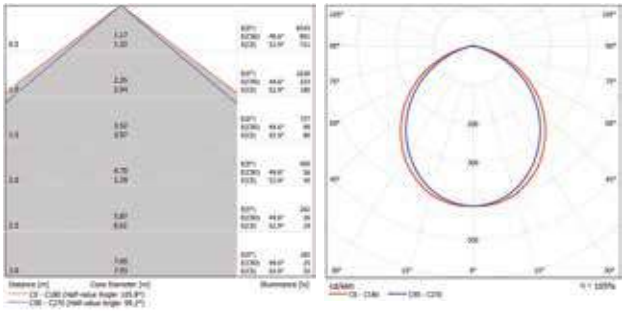


# LED Slim Recessed Downlights

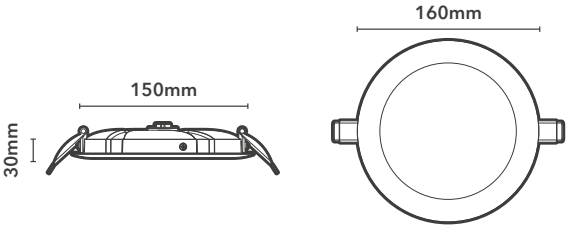
Verbatim LED slim recessed downlights, with their extremely shallow depth (<33mm), are suitable for environments with height restrictions or limited void space. They use a high quality PC-diffuser formulated with evenly dispersed diffusion particles that results in uniform and diffuse general lighting while at the same time passing the 850°C glow wire safety test.

The elegant simplicity in design and white housing enables discreet integration into suspended ceilings. A dimmable driver, 40,000 lifetime, and tool-free installation makes it a perfect replacement for conventional downlights containing compact fluorescent lamps.

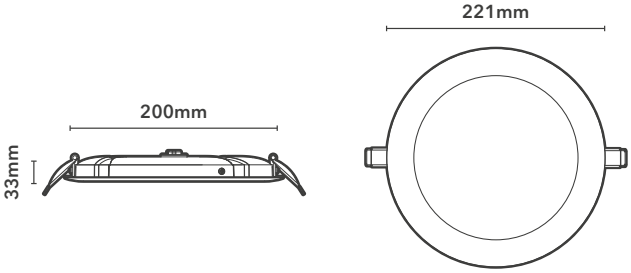
## Application

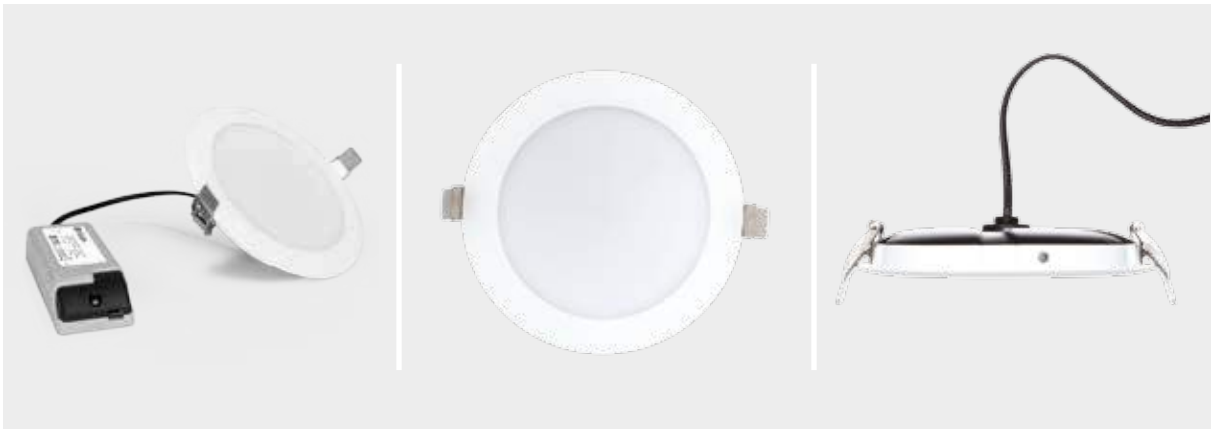
A direct replacement for compact fluorescent downlights. General lighting for corridors, hotels and shops. Suitable for suspended ceilings with a thickness of 5-18mm.

52267 / 52270




52268 / 52271



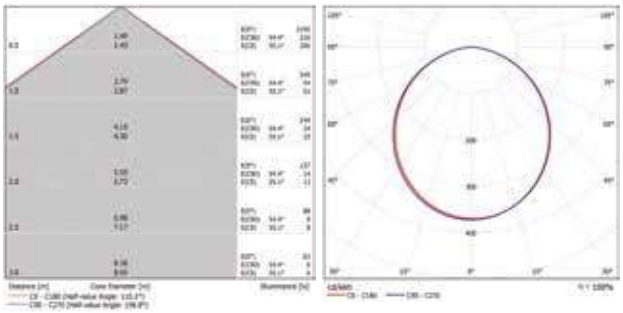
220-240V | Dimmable | 40 000 Hours | 3000K | 4000K | 850 °C | CRI ≥80

| Product Number | Wattage (W) | Luminous Flux (lm) | CCT (K) | Product Weight (g) |
|---|---|---|---|---|
| 52267 | 16 | 1450 | 3000 | 420 |
| 52268 | 25 | 2250 | | 620 |
| 52270 | 16 | 1500 | 4000 | 420 |
| 52271 | 25 | 2300 | | 620 |

Go to www.verbatimlighting.com for dimmer compatibility information

## LED Slim Recessed Downlights Photometric Data

52267



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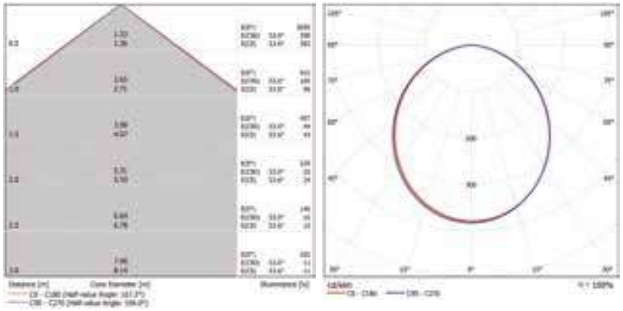

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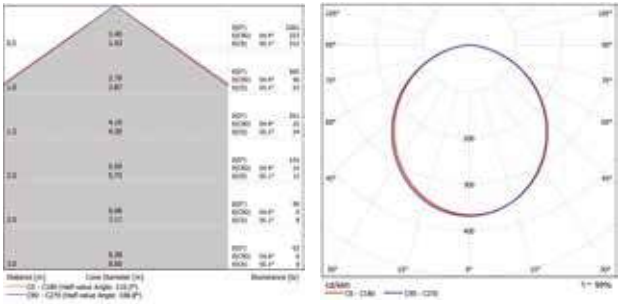
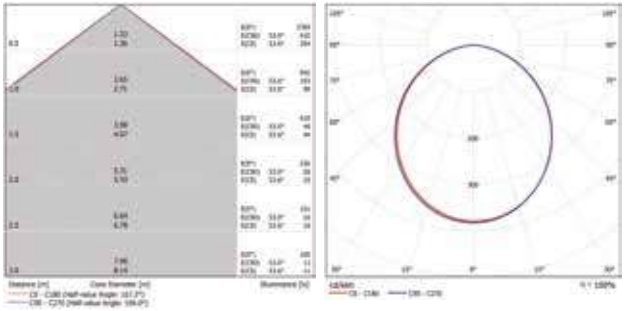


52271



360 Pretoria Ave, South Africa

# LED Recessed Downlights

Verbatim LED recessed downlights for general lighting offer a uniform, homogeneous light distribution. They come in four different diameters and are easy to integrate. They are compact in size and possess an external power supply.  The white housing ensures discreet integration in ceilings.

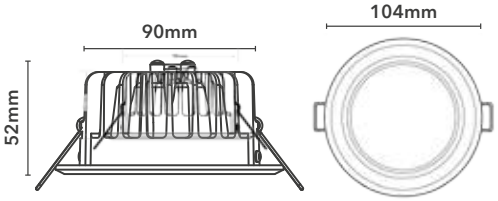
Full metal housing guarantees efficient thermal management. 40,000 hours lifetime and excellent energy efficiency makes it a perfect replacement for downlights containing compact fluorescent lamps.

Dimming options available with corresponding dimmable drivers.

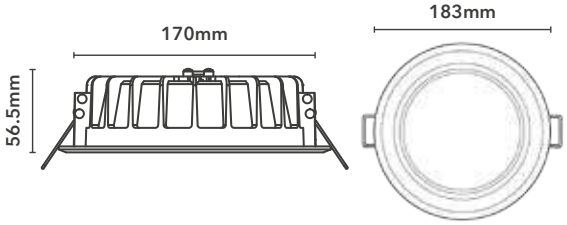
## Application

A direct replacement for compact fluorescent downlights. General lighting for corridors, offices, hotels and restaurants. Suitable for most suspended ceilings with a thickness of ≤ 20mm.

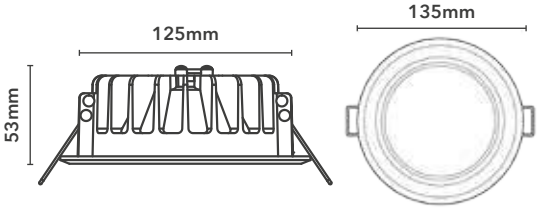
52444 / 52448



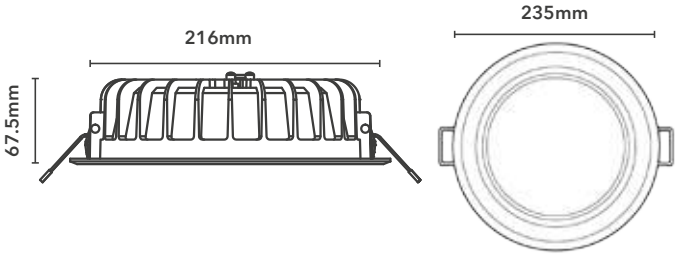

52446 / 52450




52445 / 52449




52447 / 52451




220-240V | 40 000 Hours | 3000K | 4000K | CRI ≥80

| Product Number | Wattage (W) | Luminous Flux (lm) | CCT (K) | Dimmable | Product Weight (g) |
|---|---|---|---|---|---|
| 52444 | 11 | 800 | 3000 | with 52912 | 174 |
| 52445 | 15 | 1200 | | with 52913 | 286 |
| 52446 | 21 | 1800 | | with 52914 | 476 |
| 52447 | 24 | 2050 | | with 52915 | 796 |
| 52448 | 11 | 850 | 4000 | with 52912 | 174 |
| 52449 | 15 | 1250 | | with 52913 | 286 |
| 52450 | 21 | 1900 | | with 52914 | 476 |
| 52451 | 24 | 2150 | | with 52915 | 796 |

## Accessories

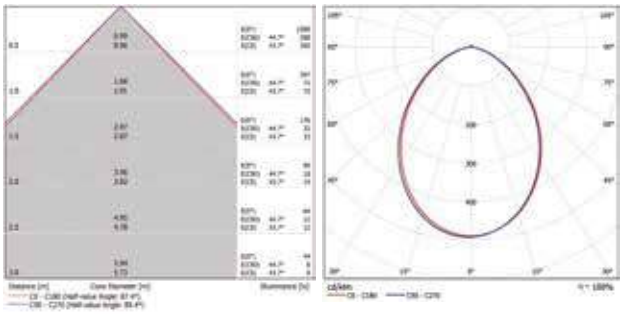
Dimmable* drivers for recessed downlights:
52912 - for 11W
52913 - for 15W
52914 - for 21W
52915 - for 24W

*leading and trailing edge

Go to www.verbatimlighting.com for dimmer compatibility information

## LED Recessed Downlights Photometric Data

52444



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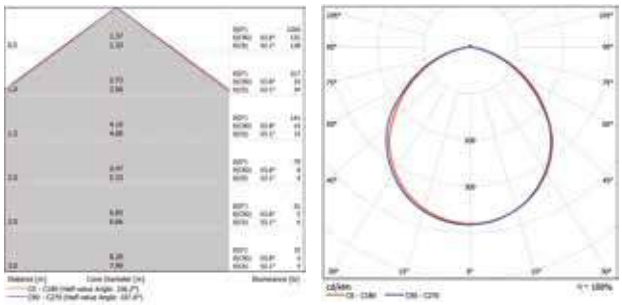

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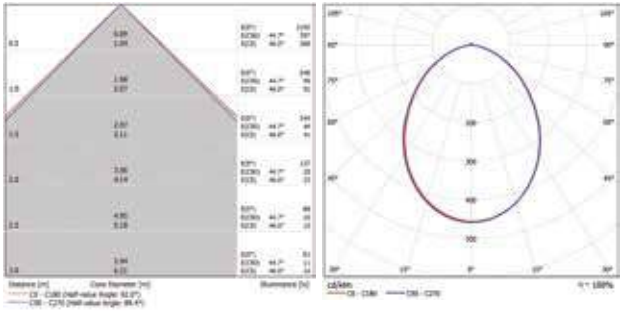

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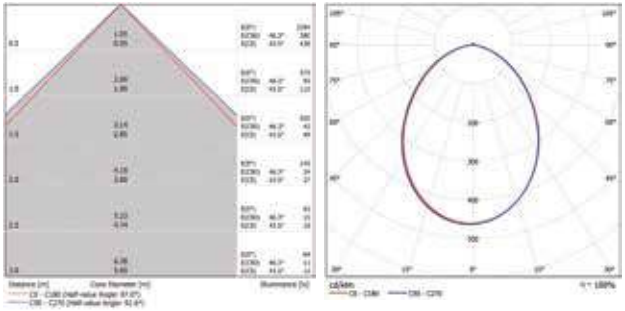

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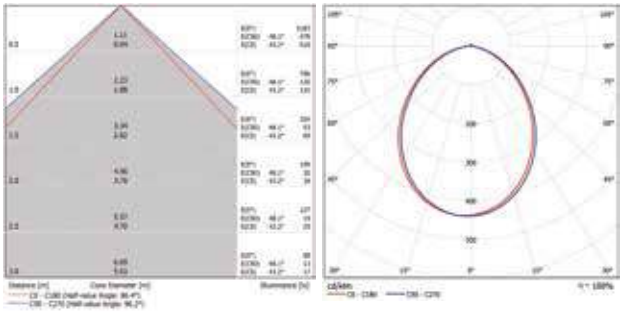

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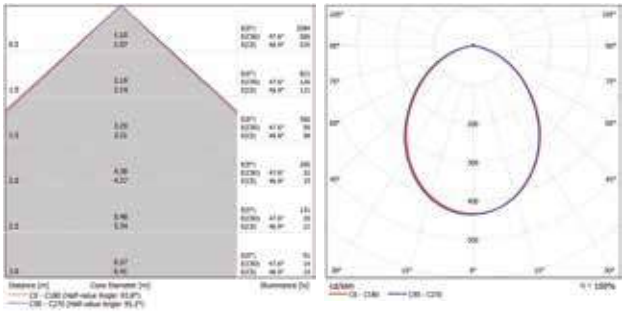

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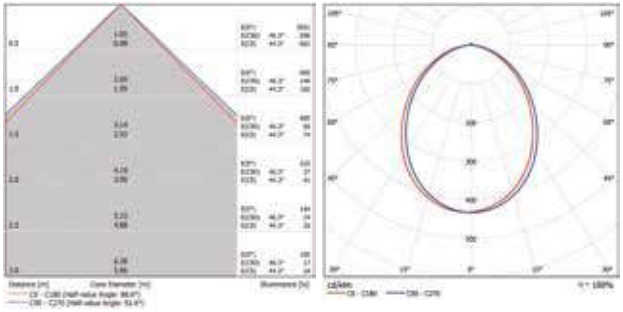

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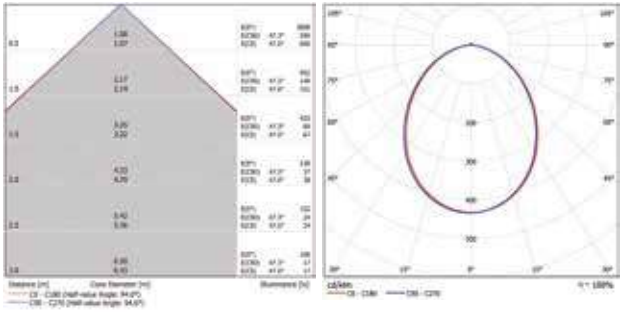
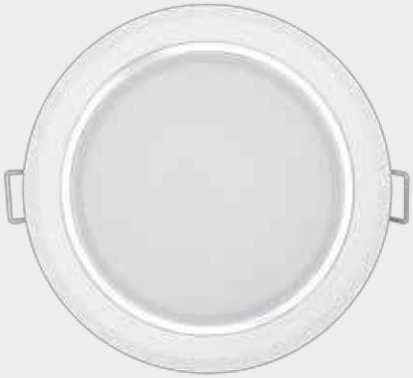


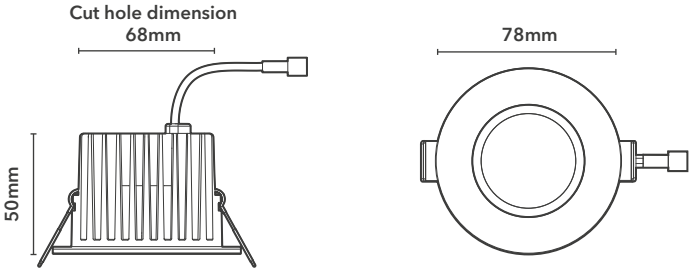


# LED Recessed Spotlights IP44

Verbatim LED recessed spotlights for spot or accent lighting are available in 3000K and 4000K with a beam angle of 40°. The diamond cut optics provide precise and glare free light distribution. Dimmable and easy to integrate thanks to its compact dimensions and external power supply. The protection class IP44 guarantees a broad field of application. Available in two housing colours, white or silver.

## Application

A direct replacement for halogen spotlights. For accent lighting in reception areas, hotels, restaurants as well as damp rooms and protected outside areas. Suitable for most suspended ceilings with a thickness of ≤25mm.



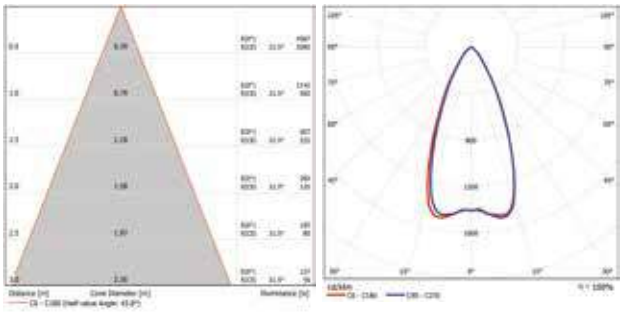
220-240V | Dimmable | 40 000 Hours | 40° | 3000K | 4000K | IP44 | CRI ≥80 | 350g

| Product Number | Wattage (W) | Luminous Flux (lm) | Luminous Intensity (cd) | CCT (K) | Housing Colour |
|---|---|---|---|---|---|
| 52408 | 10 | 810 | 1150 | 3000 | White |
| 52409 | | 840 | 1200 | 4000 | |
| 52410 | | 810 | 1150 | 3000 | Silver |
| 52411 | | 840 | 1200 | 4000 | |

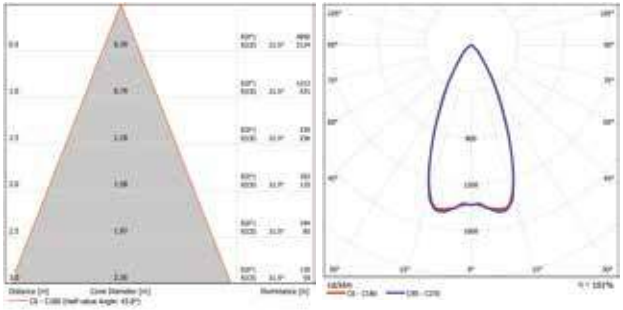
Go to www.verbatimlighting.com for dimmer compatibility information

## LED Recessed Spotlights IP44 Photometric Data

52408 / 52410



52409 / 52411



Bo Concept, Germany

# LED Track Lights

Verbatim LED track lights for accent lighting offer maximum flexibility with 350° rotation and 180° tilting angle. Easy to integrate into three circuit track systems due to its GLOBAL pro track adaptor and compact dimensions.

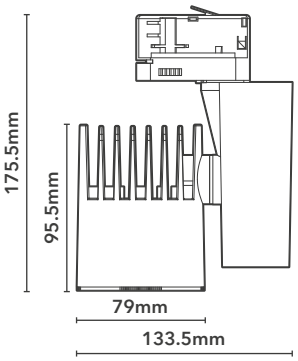
The LED track lights feature different power ranges and colour temperatures for various applications. Spot reflectors are available.

40,000 hours lifetime and excellent energy efficiency makes them a perfect replacement for metal halide lighting equivalents.

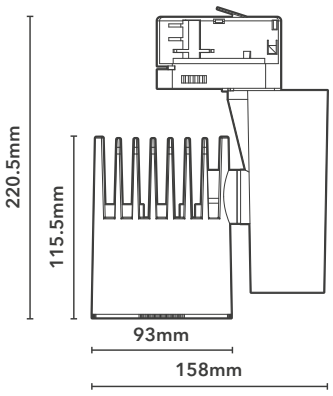
## Application

A direct replacement for track lights using metal halide lamps. For accent lighting in retail environments, museums and galleries. Suitable for GLOBAL pro track systems.

52470 / 52471




52472/ 52473



220-240V | 40 000 Hours | 45° | 3000K | 4000K | CRI ≥80 | 750 °C

| Product Number | Wattage (W) | Luminous Flux (lm) | Luminous Intensity (cd) | CCT (K) | Tilting Angle (°) | Product Weight (g) |
|---|---|---|---|---|---|---|
| 52470 | 24 | 2400 | 3100 | 3000 | 180 / 350 | 830 |
| 52471 | | 2500 | 3300 | 4000 | | |
| 52472 | 35 | 3500 | 7700 | 3000 | | 1360 |
| 52473 | | 3600 | 8200 | 4000 | | |

Black and silver housing available on request

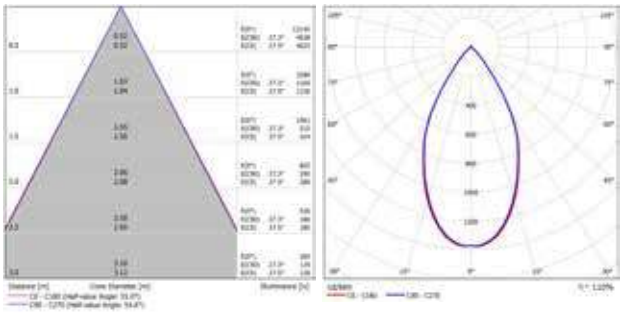
## Accessories

Spot reflectors 20° for LED Track lights*:
52937 - for 24W, 52938 - for 35W

*Please request photometric data for 20° reflectors

## LED Track Lights Photometric Data

52470



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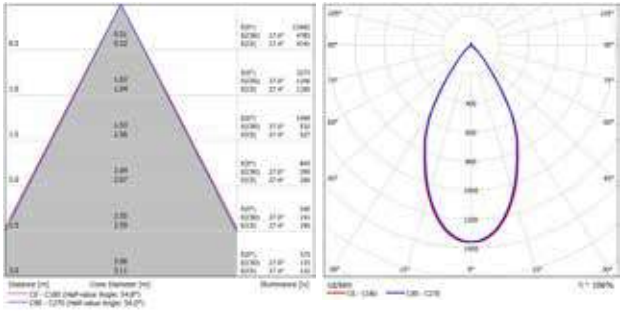

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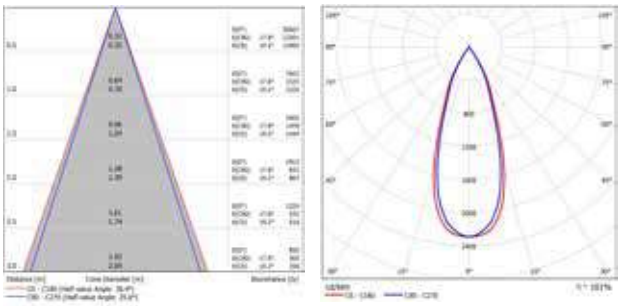

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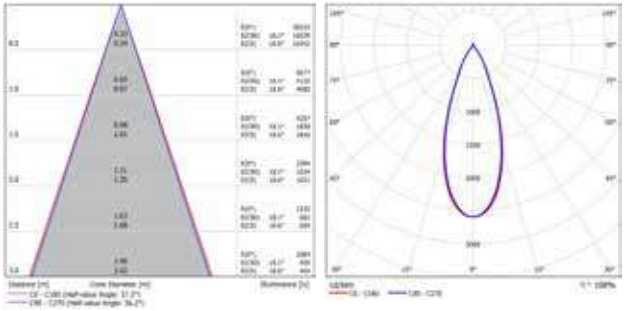


Van Westen Mannen shop, Holland

# LED dimmable Track Lights

LED track lights for accent lighting offering maximum flexibility with 350° rotation and 180° tilting angle. Easy to integrate into three circuit track systems thanks to its GLOBAL pro track adaptor and compact dimensions.

Verbatim LED track lights feature different power ranges and colour temperatures for various applications. Available with spot reflectors as accessory for narrow beam angles.

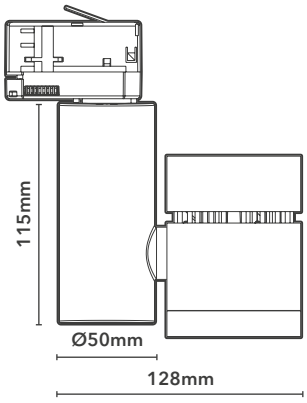
The appealing and discreet design make them suitable for situations in which the luminaire should appear as unobtrusive as possible. 50,000 hours lifetime, excellent energy efficiency and dimming options make them a far better alternative to metal halide lighting equivalents.

Equipped with Mitsubishi Chemical's Vx-filter (see page 44).

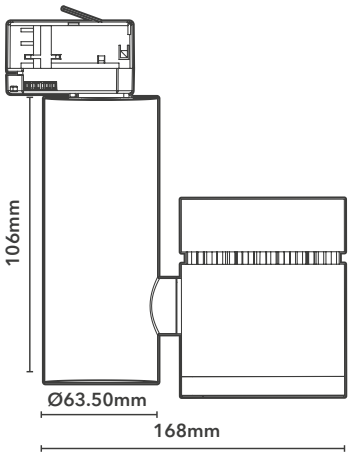
## Application

A direct replacement for track lights using metal halide lamps. For accent lighting in retail environments, museums and galleries. Suitable for GLOBAL pro track systems.

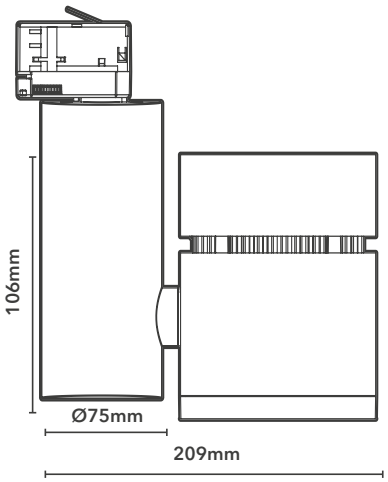
52452 / 52453




52454 / 52455




52456 / 52457



| Product Number | Wattage (W) | Luminous Flux (lm) | Luminous Intensity (cd) | CCT (K) | Tilting Angle (°) | Product Weight (g) |
|---|---|---|---|---|---|---|
| 52452 | 15 | 1200 | 2500 | 3000 | 180 / 350 | 640 |
| 52453 | | 1300 | 2700 | 4000 | | |
| 52454 | 28 | 2400 | 6000 | 3000 | | 1000 |
| 52455 | | 2600 | 6500 | 4000 | | |
| 52456 | 48 | 4100 | 7200 | 3000 | | 1700 |
| 52457 | | 4600 | 8200 | 4000 | | |

Black and silver housing available on request

## Accessories

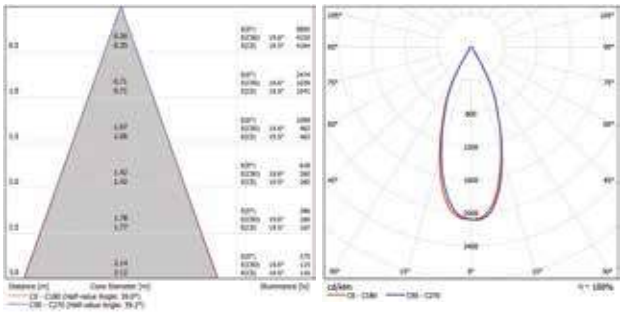
Spot reflectors 20° for LED Track lights*:
52917 - for 15W, 52918 - for 28W, 52919 - for 48W

*Please request photometric data for 20° reflectors

Go to www.verbatimlighting.com for dimmer compatibility information

## LED dimmable Track Lights Photometric Data

52452



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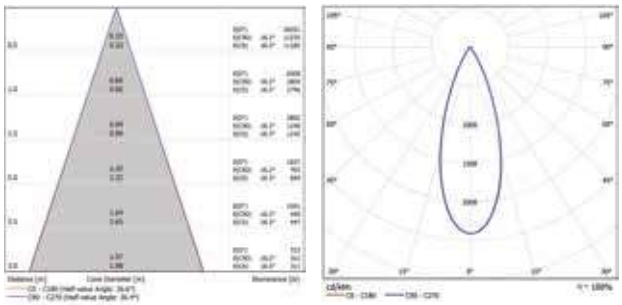

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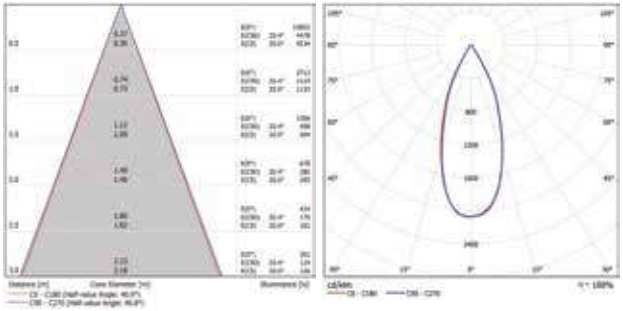

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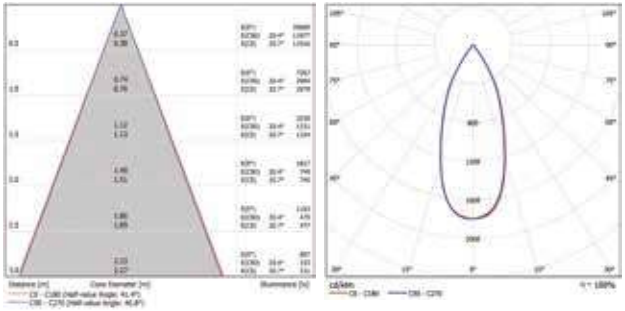

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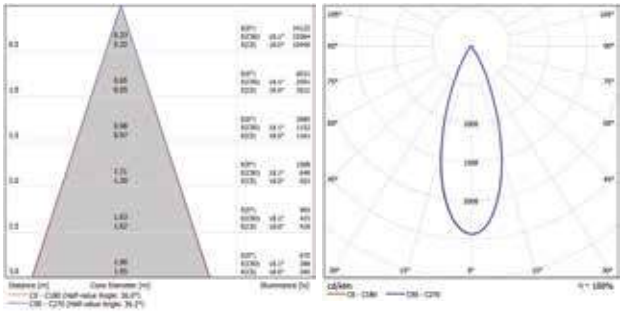

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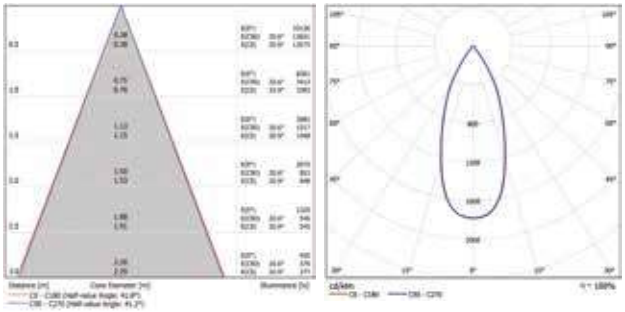
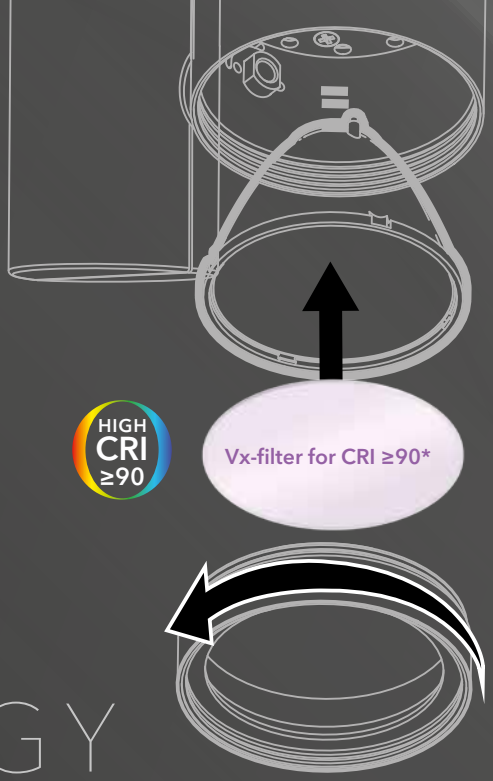


Innenarchitekturbüro stilsache, Fürth




# VX-FILTER TECHNOLOGY

## for Verbatim LED Track Lights

Using proprietary technology from Mitsubishi Chemical, Verbatim's LED track lights (see page 40) are equipped with an innovative filter to simultaneously boost the colour rendering index (CRI) and vividness of colours perceived.

The Vx-filter delivers precise changes to the spectral distribution curve to ensure that colours and finer details of objects appear as they would be perceived in natural daylight. Designed specifically in accordance with the spectral sensitivity of the human eye, this technology delivers truly outstanding visual perception.

Vx-filter technology provides the flexibility to tune Verbatim LED track lights at a later stage to meet the individual requirements of an installation. Equipped with the Vx-filter, they deliver superb colour rendering properties, but a high efficacy option is also available by just removing the filter.

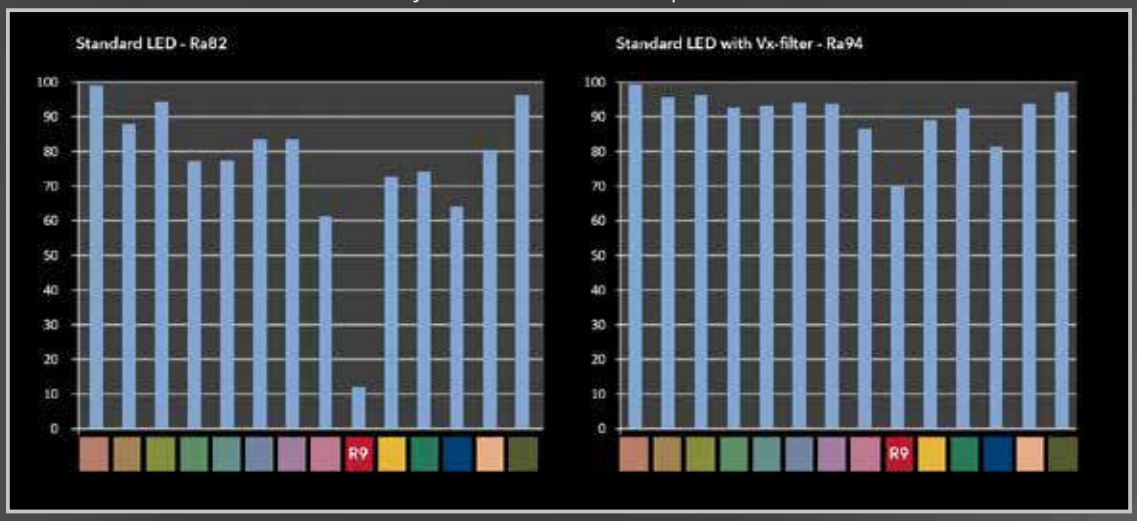
Made from DURABIO™, the bio-based engineering plastic developed by Mitsubishi Chemical, the Vx-filter has excellent optical properties such as high transparency and superb light transmission.

With an exceptional lifetime of 50,000 hours, the accessory also features high heat and excellent scratch and UV resistance.

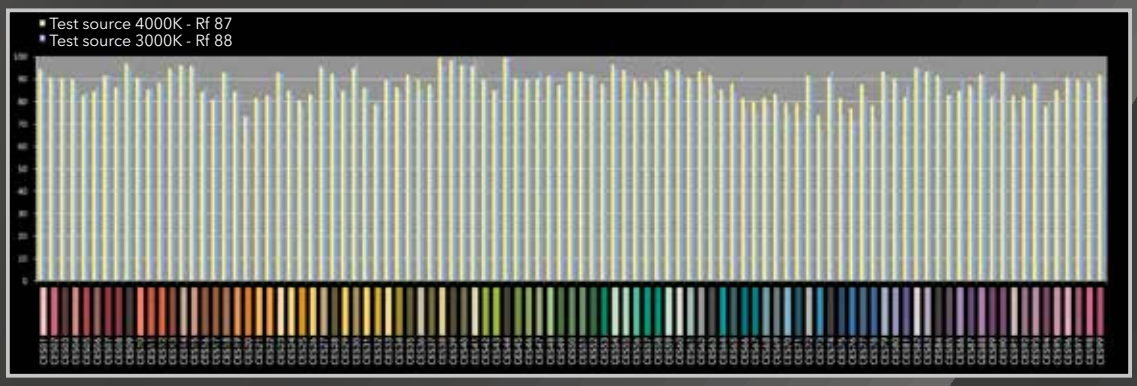
** Luminous Flux (lm) with Vx-filter:~ -20% to -25%*
*Colour Temperature (K) with Vx-filter: ~+10%*
*Colour Rendering Index (CRI) with Vx-filter: ~+10*

The improvement in colour fidelity and vividness is a solution that is particularly useful for retail environments, museums and hospitality venues - in spaces where small differences in colour hues, tints and textures can have a significant impact.

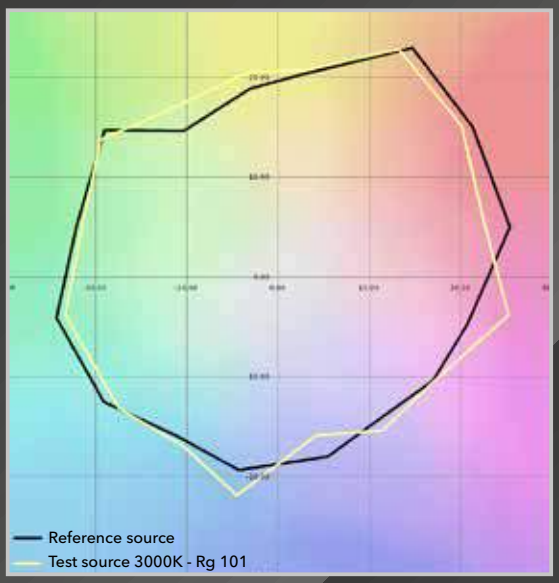
With Vx-filters, the CRI increases by +10, from CRI≥80 up to CRI≥90.

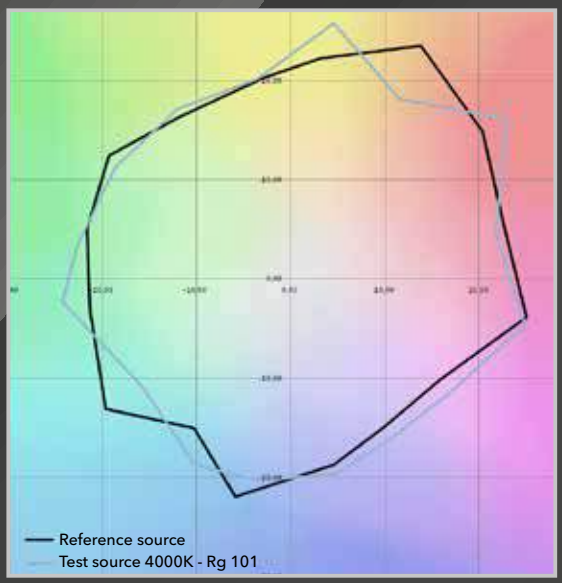



How faithfully colours are rendered with Vx-filter is shown by the 99 colour evaluation samples used to determine TM-30-15. With a Fidelity Index (Rf) of 88 (3000K) and 87 (4000K), an outstanding quality of light is achieved.




Another indicator that determines the saturation of colours and thus the chroma variation with Vx-filters is the Gamut Index (Rg). With a Gamut Index of >100, colours appear more saturated and vibrant as they would do under daylight.



# LED Panels

These energy efficient, flicker-free LED panels benefit from Mitsubishi's technical know-how in plastic materials. They feature Mitsubishi Chemical's light guiding plate which was developed specifically for edge-lit illumination offering superior long path light transmission as key property to achieve luminous efficacies of 100 lm/W, perfect evenness of illumination and excellent homogeneity.

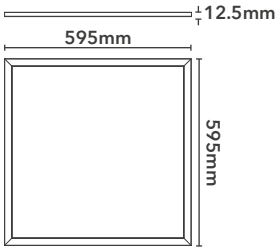
Available in four different sizes and two different types of diffusers, these luminaires do not only offer a solution to avoid uncomfortable glare in workspace areas (UGR<19) but also an option that passes the glow wire safety test at 850°C to meet fire regulations in corridor, hallways and other fire escape routes.

50,000 hours lifetime and a DALI dimming option makes it a perfect replacement for fluorescent lighting equivalents. A broad range of mounting accessories offers flexibility in installation, but they can also be laid directly into gridded ceilings.

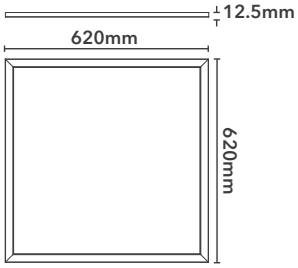
## Application

A direct replacement for panels with fluorescent tubes. For general lighting in offices, schools, universities and other workspaces. Suitable for most ceiling grids.

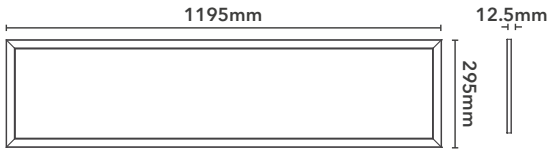
52246 / 52247



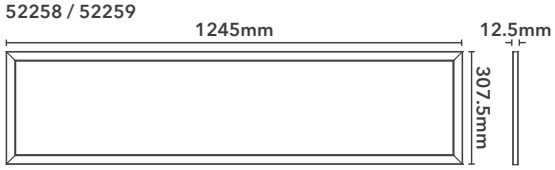

52248 / 52249

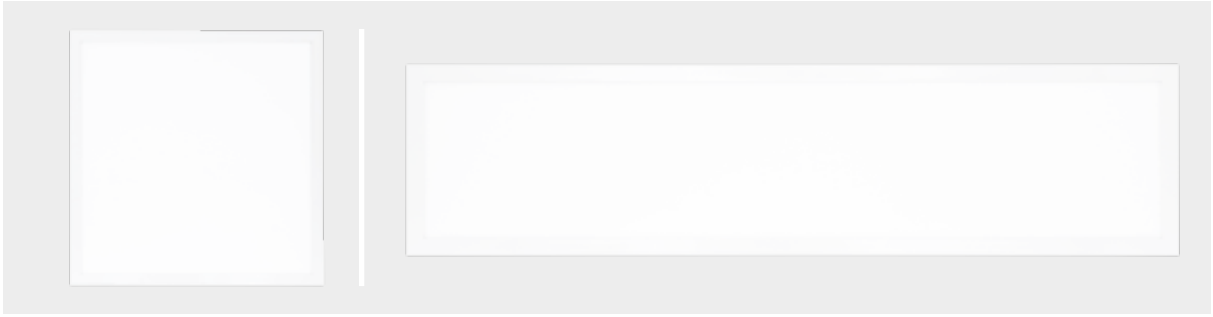



52250 / 52251




52258 / 52259



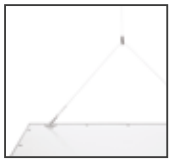
220-240V | DALI | 50 000 Hours | 4000K | CRI ≥80

| Product Number | Wattage (W) | Luminous Flux (lm) | UGR | Glow Wire Test (°C) | Product Weight (g) |
|---|---|---|---|---|---|
| 52246 | 40 | 4000 | >19 | 850 °C | 3000 |
| 52247 | | | <19 | 650 °C | |
| 52248 | | | >19 | 850 °C | 3200 |
| 52249 | | | <19 | 650 °C | |
| 52250 | | | >19 | 850 °C | 3300 |
| 52251 | | | <19 | 650 °C | |
| 52258 | | | >19 | 850 °C | 3500 |
| 52259 | | | <19 | 650 °C | |

## Accessories

52902
Verbatim LED Driver for 40W LED Panel*

52903
Meanwell LED DALI Driver for 40W LED Panel*
Also offers six preset outputs by dipswitch.



52925
Suspension Kit for 40W LED Panel 600x600/625x625

52927
Suspension Kit for 40W LED Panel 1200x300/1250x312.5

52926
Recessed-mounting clips for 40W LED Panel 600x600/625x625

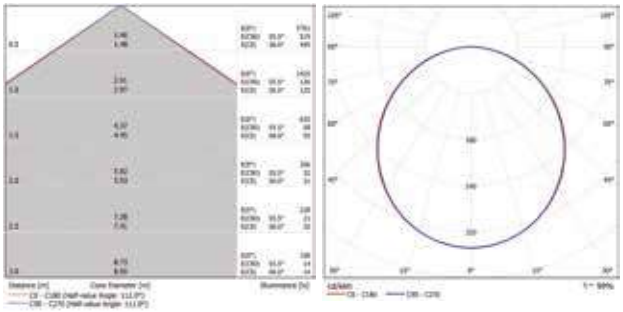
52928
Recessed-mounting clips for 40W LED Panel 1200x300/1250x312.5

52924
Surface-mounting frame for 40W LED Panel 600x600

* Note: drivers to be ordered separately

## LED Panels Photometric Data

52246



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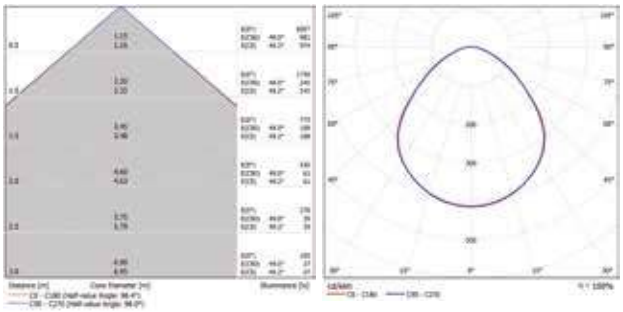

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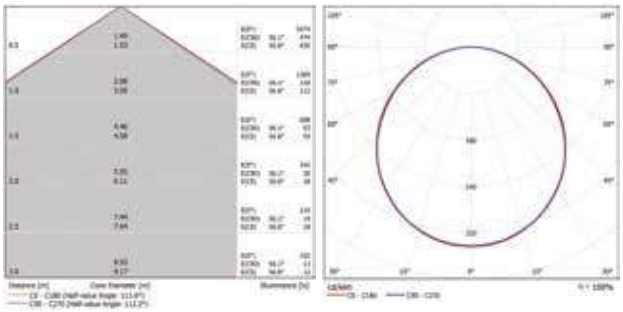

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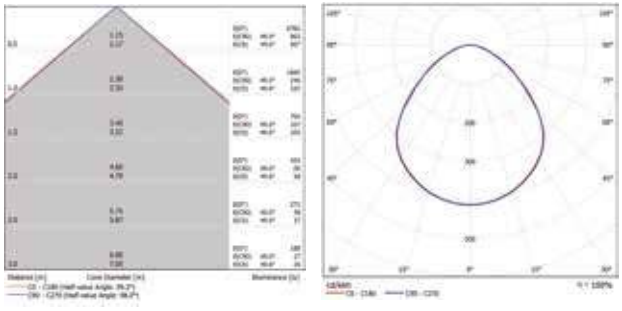

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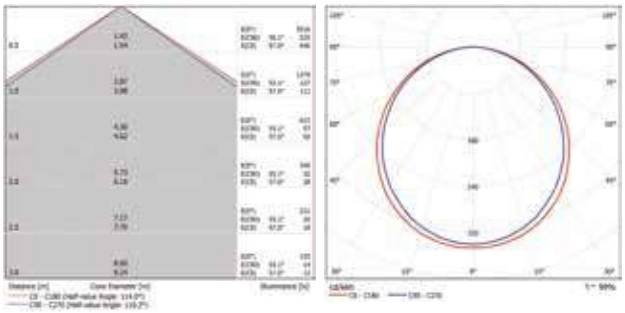

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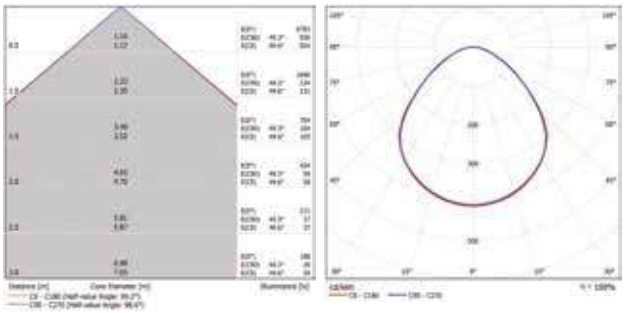

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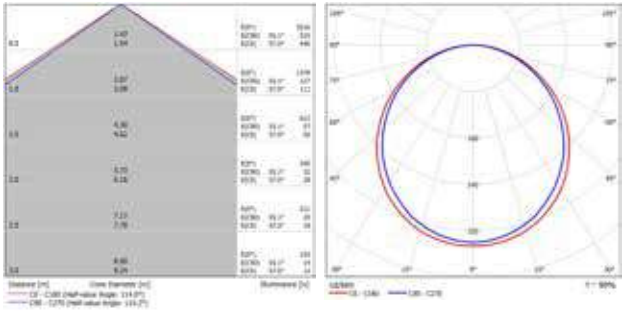

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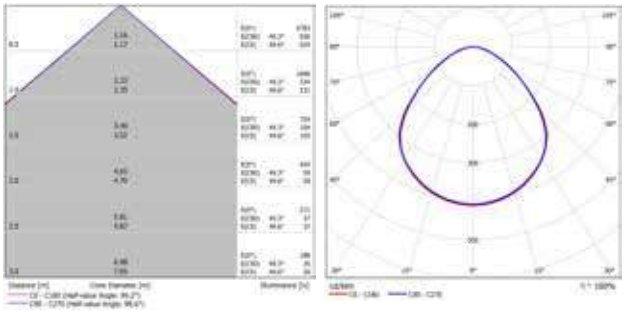


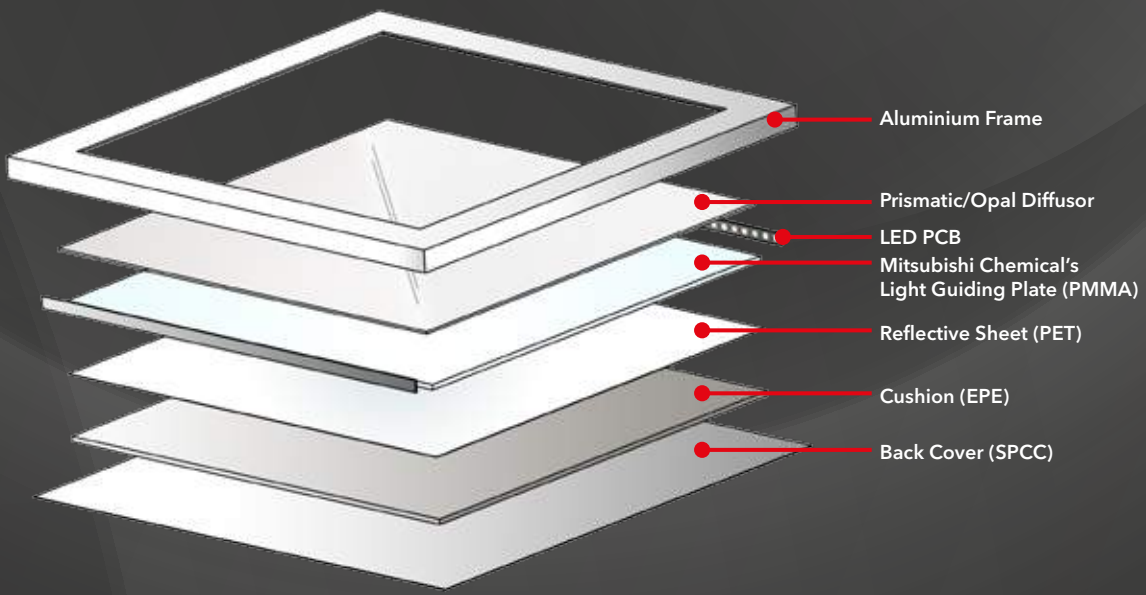
360 Pretoria Ave, South Africa

# ADVANCED PRODUCT DESIGN

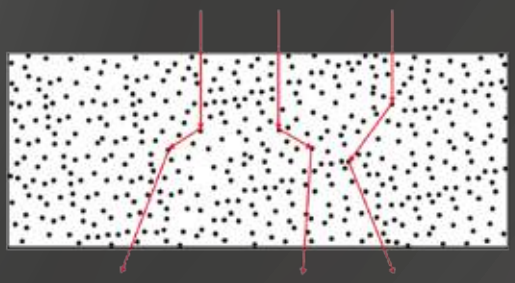
## Mitsubishi Chemical's light guiding plate for LED panels

Verbatim LED panels consist of a multi-layered set-up in which the aluminium frame and back place provide structural support and heatsink functionality. The optical system features edge-lit technology with high quality LEDs and a premium light guiding plate. A choice of two different diffuser finishes round off the elegant, minimalistic appearance of the luminaire.

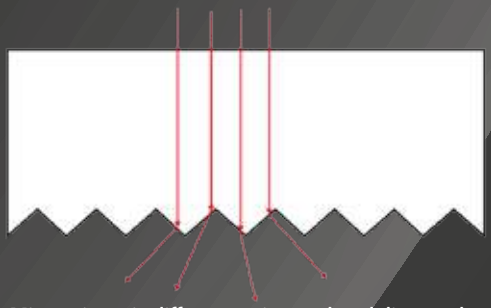
With an optical system being the determining factor of the luminaire, they benefit from Mitsubishi's technical know-how in plastic materials. The LED panels feature Mitsubishi Chemical's light guiding plate; a light-guiding acrylic sheet produced from a special, high quality continuous cast sheet formula, developed specifically for edge-lit illumination, giving excellent evenness of illumination. Bright, thin and energy efficient - requiring less energy to illuminate large areas.



Excellent homogeneity of Mitsubishi Chemical's light guiding plate results in evenness of illumination. Light is inserted in the edge of the light guiding plate and propagated via total internal reflection. Two different types of diffuser scatter light appropriate to the need of application.



**Opal diffuser, fire-resistant polycarbonate diffuser, formulated with evenly dispersed diffusion particles resulting in uniform homogeneity. Excellent resistance to ignition and reduced fire risk due to self extinguishing properties. Glow wire test according to IEC 60695-2-11: 850°C.**



**Microprismatic diffuser engineered to deliver a photometric output that complies with the 65° cutoff requirement. In accordance with EN12464, reducing glare to a comfortable working environment (UGR<19) especially suitable for office applications. Controlled luminance and perfect visual comfort for avoiding decreased effectiveness and visual fatigue.**

# LED Linear

Linear LED lighting system for general architectural lighting.

Homogeneous light emission thanks to the opal polycarbonate diffuser which passes the glow wire test at 850°C. White coloured luminaire housing made of extruded aluminium profile.

Modular lighting system for direct mounting on ceilings and walls, available in three lengths and two colour temperatures. Installation as seamless line is possible. Accessory kits for recessed-mounting and suspension allows various configurations in installation.

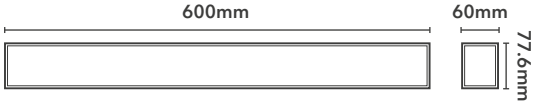
Supplied by default with a flicker-free, non-dimmable driver.

Excellent energy efficiency, a long lifetime of 50.000 hours and a narrow binning of SDCM ≤3 make it a perfect replacement for linear lighting systems with conventional fluorescent tubes.

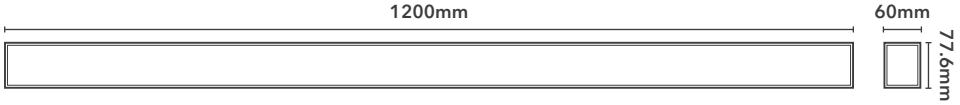
## Application

Suitable for general lighting in public and commercial buildings, retail and hospitality.

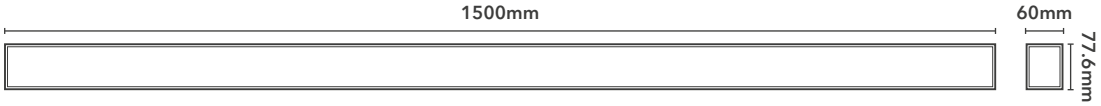
52278 / 52281




52279 / 52282




52280 / 52283



220-240V | 50 000 Hours | 3000K | 4000K | CRI ≥80 | 850 °C

| Product Number | Wattage (W) | Luminous Flux (lm) | CCT (K) | Product Weight (g) |
|---|---|---|---|---|
| 52278 | 12 | 1150 | 3000 | 1300 |
| 52281 | | 1200 | 4000 | |
| 52279 | 24 | 2400 | 3000 | 2200 |
| 52282 | | 2500 | 4000 | |
| 52280 | 30 | 3000 | 3000 | 2680 |
| 52283 | | 3100 | 4000 | |

## Accessories

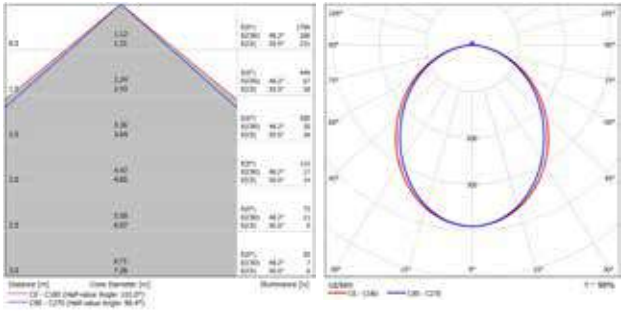
52932 - Verbatim Suspension Kit for LED Linear

52933 - Verbatim Recessed-mounting Kit for LED Linear

52929 Tridonic LED DALI Driver for 600mm LED Linear
52930 Tridonic LED DALI Driver for 1200mm LED Linear
52931 Tridonic LED DALI Driver for 1500mm LED Linear

## LED Linear Photometric Data

52278



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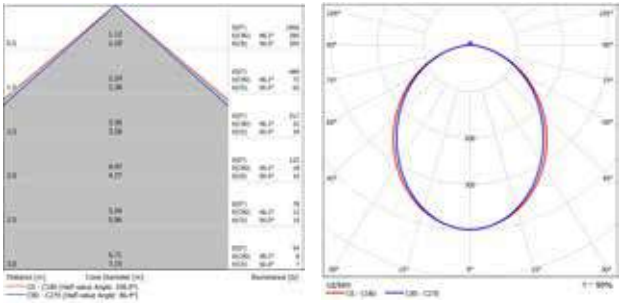

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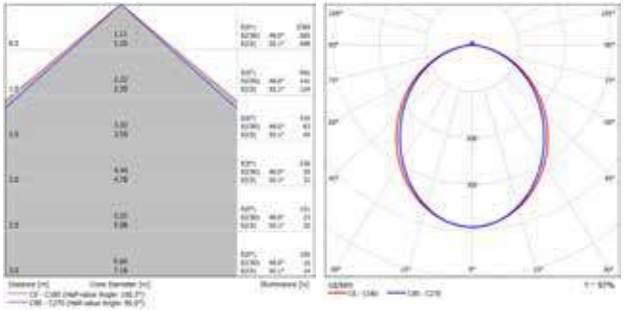

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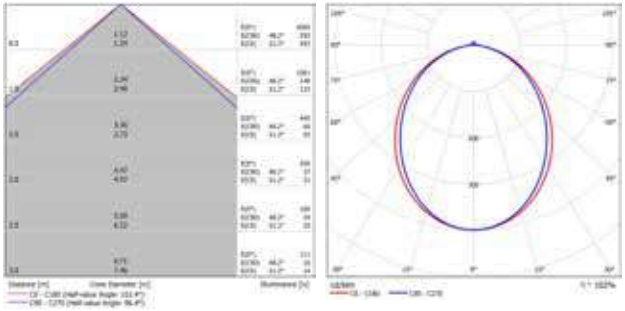

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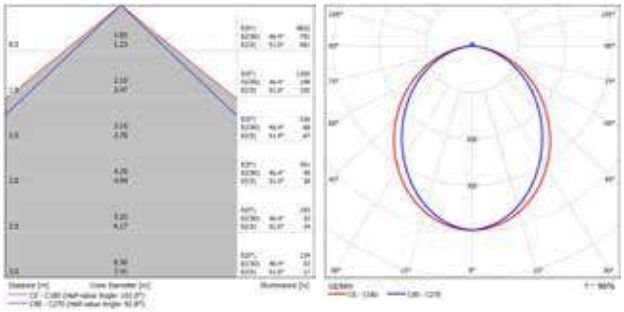

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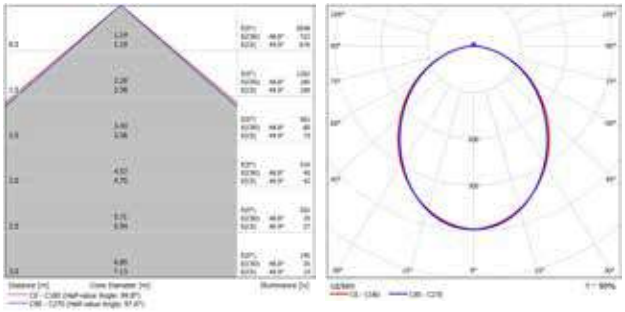


# LED Batten Luminaires

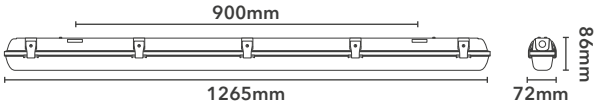
Energy efficient alternative for batten luminaires containing fluorescent tubes. Durable, maintenance-free and reliable. Verbatim LED batten luminaires offer a high-quality solution for general lighting in technical environments.

These IP65 batten luminaires provide not only protection against moisture and dust but also impress with an aesthetic design and excellent functionality. Mounted either directly on the ceiling or suspended with the corresponding chain suspension, these luminaires fit in various applications. Only recommended for use with Verbatim LED T8 Tubes.

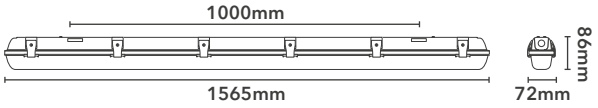
## Application

A direct replacement for batten luminaires containing fluorescent tubes. For general lighting in car parks, garages, sports areas, workshops and warehouses.

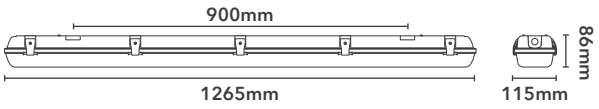
52430




52434




52431

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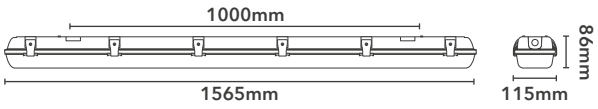


G13 | 220-240V | IP65 | 850 °C

| Product Number | Fitting | Dimensions (mm) | Product Weight (g) |
|---|---|---|---|
| 52430 | Single | 86x72x1265 | 1100 |
| 52431 | Twin | 86x115x1265 | 1650 |
| 52434 | Single | 86x72x1565 | 1650 |
| 52435 | Twin | 86x115x1565 | 2150 |

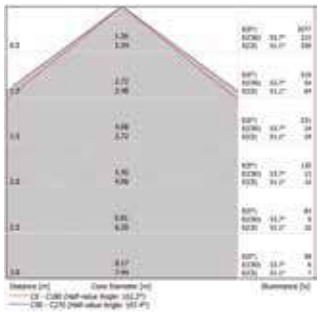
Recommended for use with Verbatim LED T8 Tubes - please refer to page 96

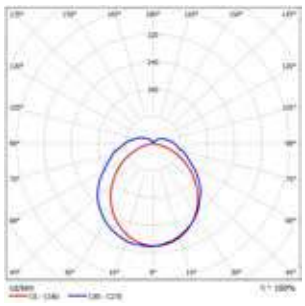
## Accessories

52905 - Chain suspension for Batten Luminaire IP65

## LED Batten Luminaires Photometric Data

52430





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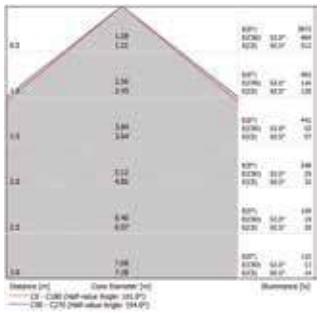

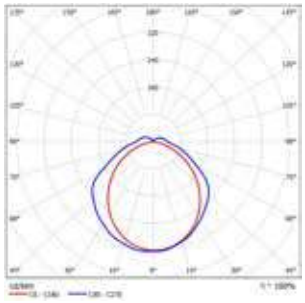

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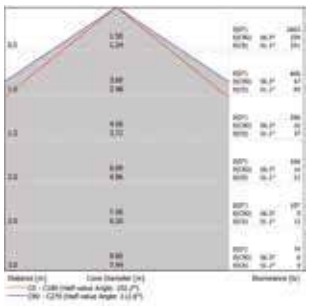

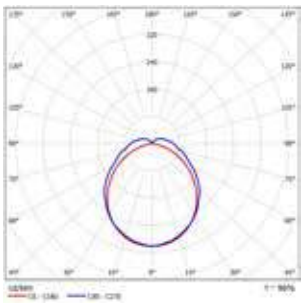

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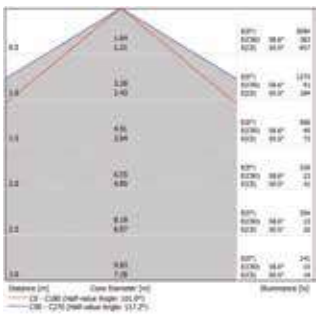
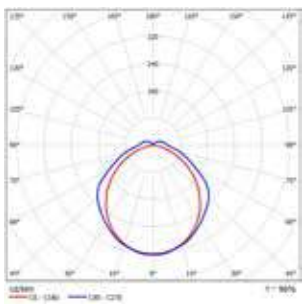




5区
5区

Verbatim

Verbatim

Verbatim
Designed for Apple
Made in China

# Performance Lamps

Verbatim's LED performance lamps provide a direct replacement for current incandescent and halogen lamps. They offer outstanding light performance for a wide range of applications, significantly reducing energy and maintenance costs.

LED lamps for the professional installer with a wide range of beam angles, long lifetime and colour temperatures to suit all applications.

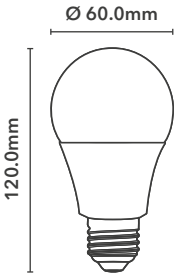
# Classic A

The Verbatim dimmable Classic A offers light with great light distribution and a good dimming capability. Its broadly distributed light makes your space bright and cosy in an efficient way. This is the perfect product to replace the popular 60W, 75W and 100W incandescent lamps.

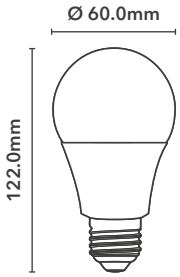
## Application

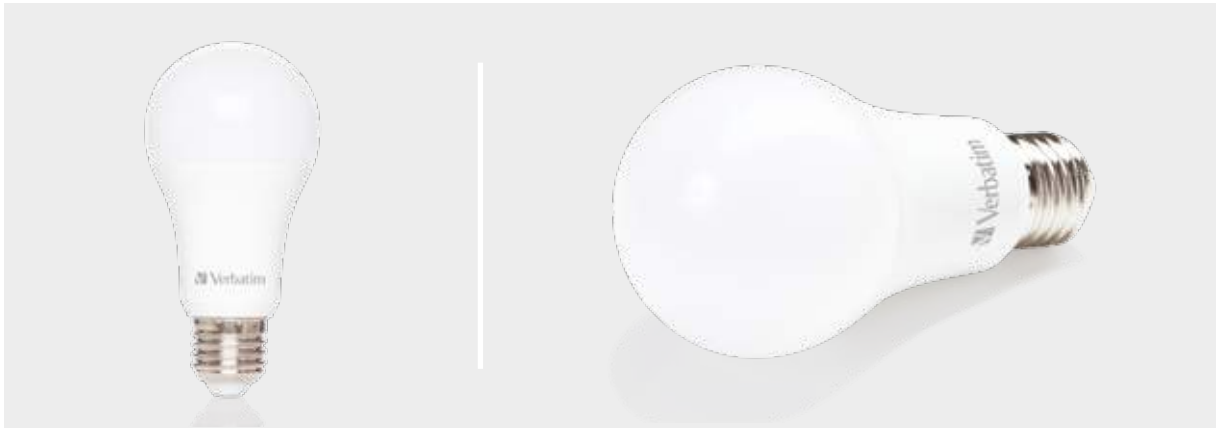
Suitable for a wide range of applications in the home, hotels or other public spaces.

52336




52337 / 52338 / 52339

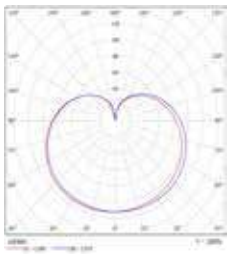


| Product Number | Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Luminous Intensity (cd) | CCT (K) | Beam Angle (°) | Product Weight (g) | Power Factor |
|---|---|---|---|---|---|---|---|---|
| 52336 | 9.5 | 60 | 810 | 85 | 2700 | 240 | 76 | ≥0.90 |
| 52337 | 12 | 75 | 1060 | 120 | | | | |
| 52338 | 13.5 | 100 | 1520 | 205 | 3000 | 200 | 126 | |
| 52339 | | 100 | | | 4000 | | | |

## Classic A Photometric Data

52336



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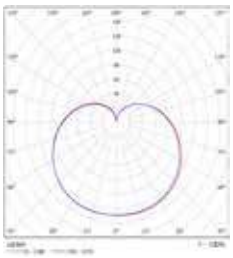

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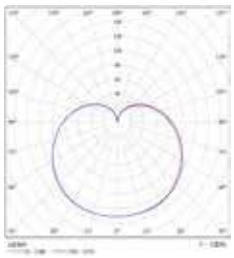
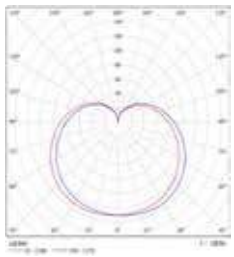


52339



**Go to www.verbatimlighting.com for dimmer compatibility information**

# Mirageball Classic A

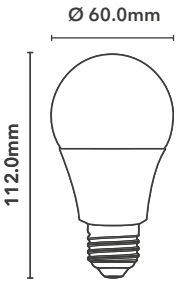
Verbatim LED Classic A E27 Mirageball is a design oriented Classic A lamp with a special focus on aesthetics. Mirageball provides an elegant and attractive lighting effect, transforming rooms into warm and comforting spaces thanks to its uniform omnidirectional shadow-free light distribution.

Dimmable Mirageball lamps offer a soft, warm ambience and harmonious light to create an intimate space.

To ensure the lighting presents extra warmth and ambience, the Mirageball LED lamps feature a colour temperature of 2500K rather than the typical 2700K or 3000K of Classic A lamps.

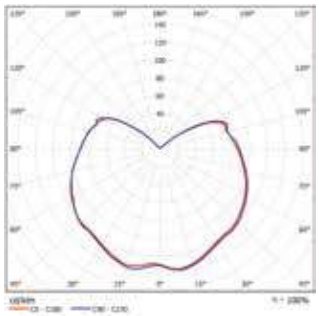
## Application

Ideal for decorative fixtures where a very even and wide angled light distribution is necessary. The clear and beautiful warm white light creates a pleasing illumination and ambiance.



| Product Number | Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Luminous Intensity (cd) | CCT (K) | Beam Angle (°) | Product Weight (g) | Power Factor |
|---|---|---|---|---|---|---|---|---|
| 52322 | 8.8 | 41 | 490 | 130 | 2500 | 230 | 124 | ≥0.90 |

## Mirageball Classic A Photometric Data



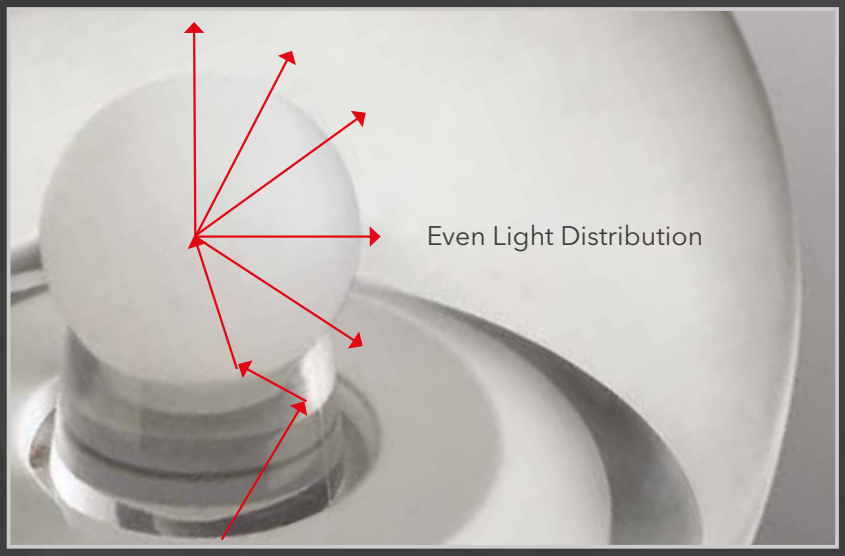
Go to www.verbatimlighting.com for dimmer compatibility information

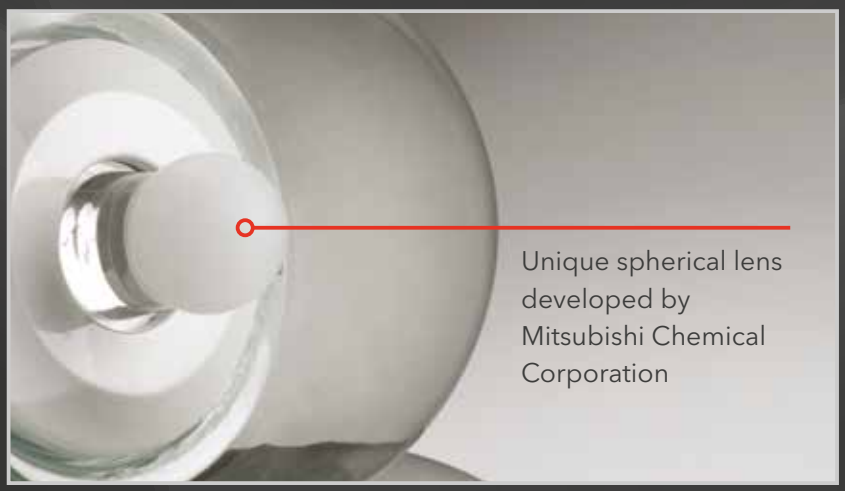
# ADVANCED PRODUCT DESIGN

## Mirageball Optics

A problem with many LED non-directional wide beam lamps is that the light output is not uniform which results in shadows or rings. Mitsubishi has created the Mirageball optic lens, using a two-colour moulding process, that delivers a very even and wide angled light that is perfect for decorative fixtures where uniformity is particularly important.

Two-colour moulding, also known as two-material moulding, refers to a process that uses two different types of material for creating one object. For Verbatim's Mirageball lamps, the top frosted part of the lens is made of polycarbonate and diffusing material while the clear/ transparent lower part of the lens is made solely of polycarbonate.



Showroom LUXimprove BV, Netherlands

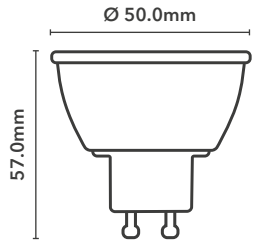
# Dichroic LED

Verbatim LED PAR16 and MR16 LED lamps are great replacements for dichroic halogen lamps. Conventional dichroic halogen (reflector lamps) produce a glitter surrounding lighting effect thanks to its dichroic reflector that lets IR-Radiation pass to the back. Verbatim's dichroic MR16 and PAR16 match the glitter and the lighting effect of real halogen.

## Application

Dichroic lamps are very popular for applications such as track lighting, pendant fixtures and retail display lighting. They produce a unique lighting effect especially suitable for decorative applications.
Ideal for spotlighting and general lighting in public and shopping areas such as reception, bar counter, lounge, display window, corridors, lobbies and conference rooms where the light is used for long periods of time.

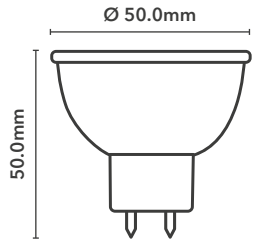
## PAR16



GU10 | 220-240V | 25 000 Hours | 35° | 3000K | Energy Class A+ | CRI ≥80 | 48g

| Product Number | Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Useful Lumen 90° Cone (lm) | Luminous Intensity (cd) | Power Factor |
|---|---|---|---|---|---|---|
| 52504 | 4.0 | 38 | 300 | 250 | 480 | ≥0.47 |

## MR16

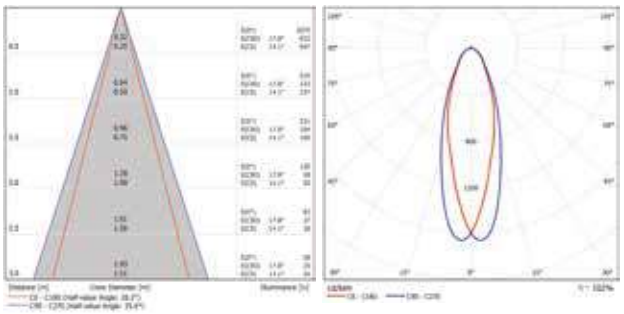


GU5.3 | 12V AC/DC | 25 000 Hours | 35° | 3000K | Energy Class A+ | CRI ≥80 | 39g

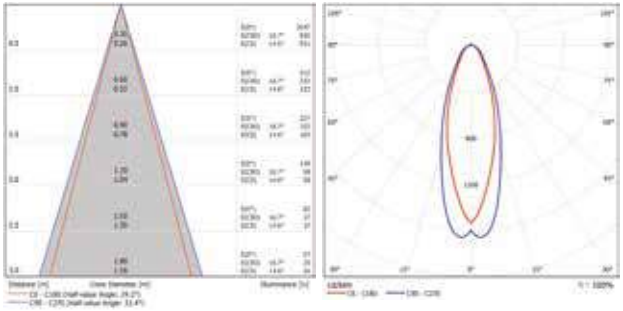
| Product Number | Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Useful Lumen 90° Cone (lm) | Luminous Intensity (cd) | Power Factor |
|---|---|---|---|---|---|---|
| 52503 | 3.7 | 25 | 300 | 250 | 480 | ≥0.70 |

## Dichroic LED Photometric Data

52503



52504



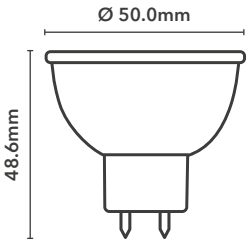
# MR16 GU5.3

12 volt driven MR16 LED lamps with bi-pin push-fit GU5.3 base directly replace standard MR16 halogen lamps. Delivering a warm, halogen-like accent beam and offering a very long lifetime, Verbatim has extended its range of retrofit LED lamps for spotlight applications with a line of LED MR16 with the highest luminous efficacy on the market.

The LED MR16 GU5.3 features a unique heatsink designed by parent company Mitsubishi Chemical  Corporation and the combination of COB (Chip On Board) LED technology with diamond cut optics.

## Application

MR16 GU5.3 LEDs are favoured for directional lighting as well as for mood lighting. They offer flexibility of mounting arrangements where the space is limited.
Ideal for spotlighting and general lighting in public areas such as restaurants, reception, corridors, lobbies and conference rooms and other areas where the light is used for long periods of time.



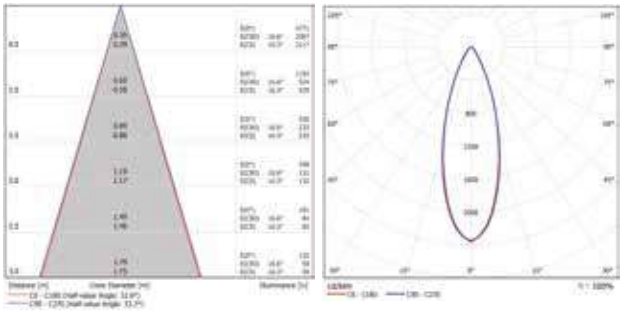
GU5.3 | 12 V AC/DC | Dimmable | 35° | 2700K | 3000K | 4000K | Energy Class A+ | CRI ≥80 | 55g

| Product Number | Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Useful Lumen 90° Cone (lm) | Luminous Intensity (cd) | CCT (K) | Lifetime (h) | Power Factor |
|---|---|---|---|---|---|---|---|---|
| 52316 | 5.5 | 38 | 420 | 400 | 1000 | 2700 | 40,000 | ≥0.90 |
| 52317 | | 40 | 450 | 430 | 1100 | 3000 | | |
| 52318 | | 41 | 470 | 450 | 1170 | 4000 | | |

Go to www.verbatimlighting.com for dimmer compatibility information

## LED MR16 GU5.3 Photometric Data

52316



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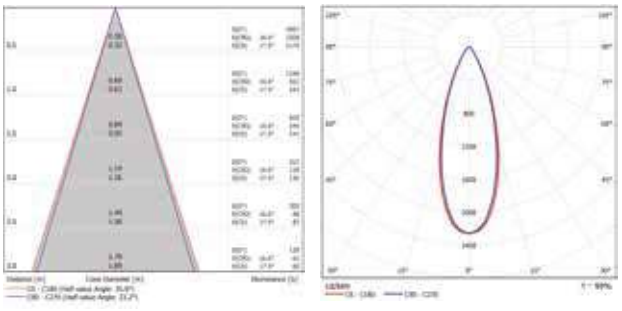

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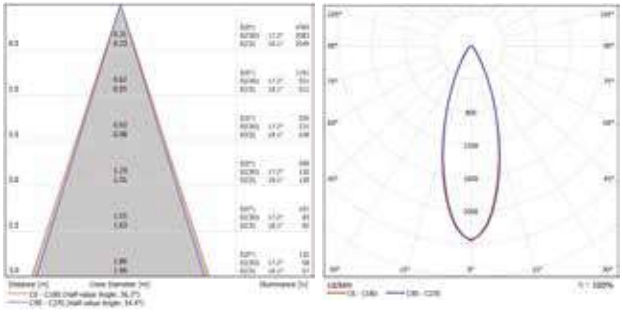


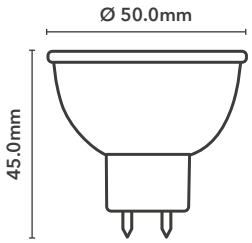
# MR16 GU5.3 WITH HIGH CRI

12V driven, dimmable LED MR16 lamps with bi-pin push-fit GU5.3 base directly replace standard MR16 halogen lamps. The LED MR16 GU5.3 features a combination of COB (Chip On Board) LED technology with diamond cut optics and a unique heatsink designed by parent company Mitsubishi Chemical  Corporation offering a very long lifetime of 40.000 hours.

Verbatim has extended its range of retrofit LED lamps with a line of LED MR16 with a high colour rendering index of ≥90 for optimum light quality and natural colour rendering.

## Application

Ideal for spotlighting and general lighting in public areas such as restaurants, reception, corridors, lobbies and conference rooms and other areas where the light is used for long periods of time.



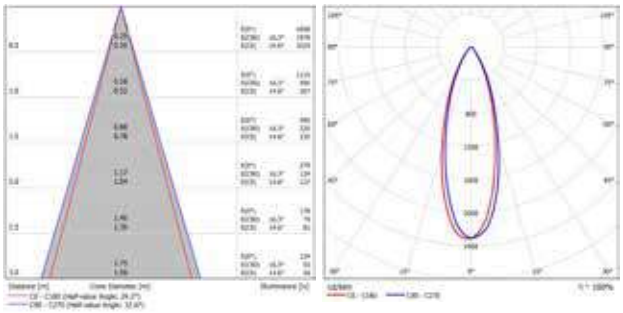
GU5.3 | Dimmable | 12V AC/DC | 35° | 2700K | 3000K | 4000K | Energy Class A+ | HIGH CRI ≥90 | 45g

| Product Number | Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Useful Lumen 90° Cone (lm) | Luminous Intensity (cd) | CCT (K) | Lifetime (h) | Power Factor |
|---|---|---|---|---|---|---|---|---|
| 52353 | 6.0 | 39 | 430 | 410 | 1010 | 2700 | 40,000 | ≥0.90 |
| 52354 | | 40 | 460 | 440 | 1100 | 3000 | | |
| 52355 | | 41 | 480 | 460 | 1170 | 4000 | | |
| 52356 | 8.0 | 45 | 570 | 530 | 1100 | 2700 | | |
| 52357 | | 47 | 620 | 570 | 1170 | 3000 | | |
| 52358 | | 49 | 650 | 610 | 1240 | 4000 | | |

Go to www.verbatimlighting.com for dimmer compatibility information

## LED MR16 GU5.3 with high CRI Photometric Data

52353



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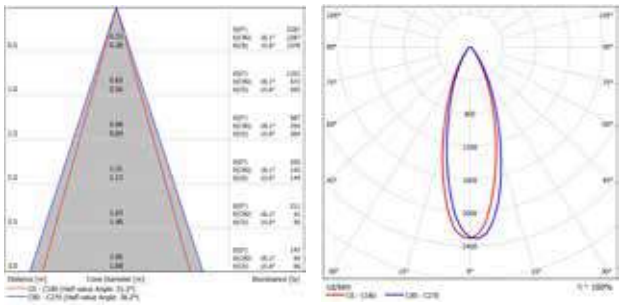

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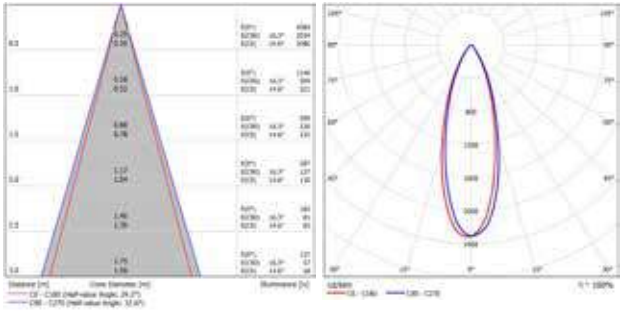

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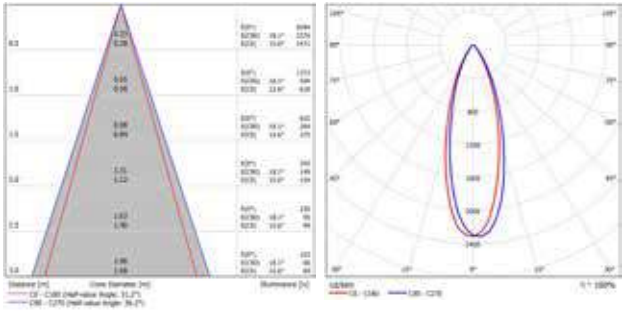

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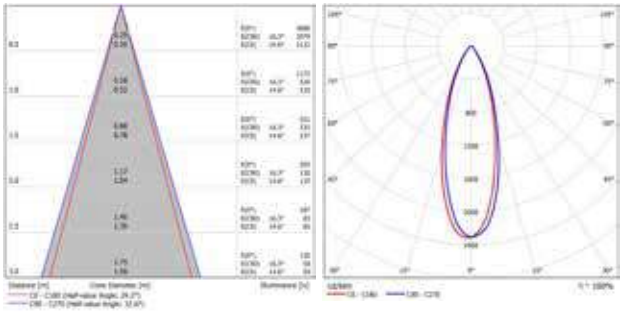

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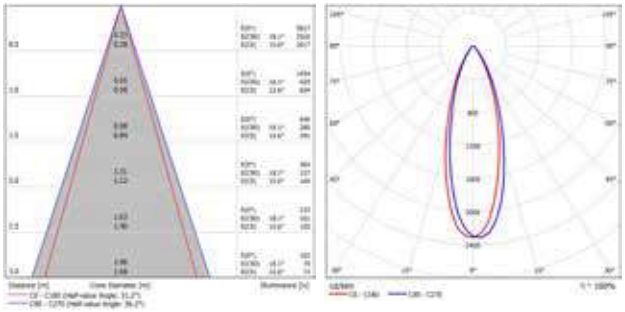


Strak in Pakken Alkmaar , Netherlands

# PAR16 GU10

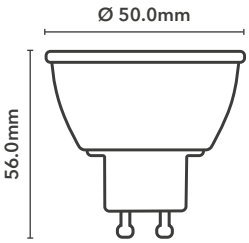
The spot PAR16 GU10 is a great replacement for standard mains voltage halogen lamps. It is energy efficient and has a built-in temperature management control system that guarantees long lifetime. Verbatim LED spot PAR16 GU10 saves up to 91% energy compared to conventional lighting.

The unique heat sink designed by parent company Mitsubishi Chemical Corporation maximizes heat dissipation.

The LED PAR16 GU10 uses a combination of COB (Chip On Board) LED technology and diamond cut optics that create a superb light within a defined beam without multiple shadows and unpleasant glare.

## Application

PAR16 GU10 LEDs are favoured for directional lighting and are particularly suitable for working areas as well as for mood lighting. They offer flexibility of mounting arrangements where the space is limited.
Ideal for spotlighting and general lighting in public areas such as restaurants, reception, corridors, lobbies, conference rooms and other areas where the light is used for long periods of time.



GU10 | 220-240V | 35° | 2700K | 3000K | 4000K | CRI ≥80 | 55g

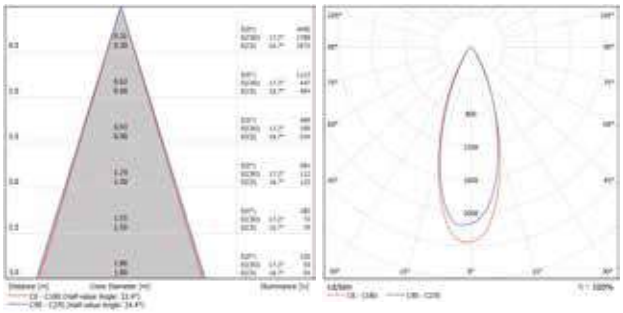
| Product Number | Actual Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Useful Lumen 90° Cone (lm) | Luminous Efficacy (lm/W) | Luminous Intensity (cd) | CCT (K) | Power Factor | Lifetime (hours) | Dimmable | Energy Efficiency Class |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 52323 | 4.0 | 44 | 320 | 300 | 80 | 740 | 2700 | ≥0.65 | 50,000 | Yes | A++ |
| 52324 | | 47 | 340 | 320 | 85 | 770 | 3000 | | | | |
| 52312 | 6.0 | 57 | 420 | 400 | 70 | 1000 | 2700 | ≥0.70 | 40,000 | | A+ |
| 52307 | | 61 | 450 | 430 | 75 | 1100 | 3000 | | | | |
| 52308 | | 64 | 470 | 450 | 78 | 1170 | 4000 | | | | |
| 52306 | | 61 | 450 | 430 | 75 | 1100 | 3000 | ≥0.80 | | No | |
| 52314 | | 64 | 470 | 450 | 78 | 1170 | 4000 | | | | |
| 52313 | 8.5 | 82 | 620 | 590 | 73 | 1180 | 2700 | ≥0.70 | 30,000 | Yes | |
| 52310 | | 86 | 650 | 620 | 76 | 1250 | 3000 | | | | |
| 52311 | | 91 | 690 | 660 | 81 | 1340 | 4000 | | | | |
| 52309 | | 86 | 650 | 620 | 76 | 1250 | 3000 | ≥0.80 | | No | |
| 52315 | | 91 | 690 | 660 | 81 | 1340 | 4000 | | | | |

Downlight fittings are also available - please refer to page 88.

Go to www.verbatimlighting.com for dimmer compatibility information

## LED PAR16 GU10 Photometric Data

52306



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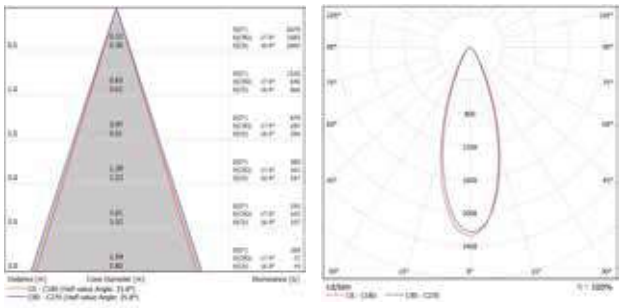

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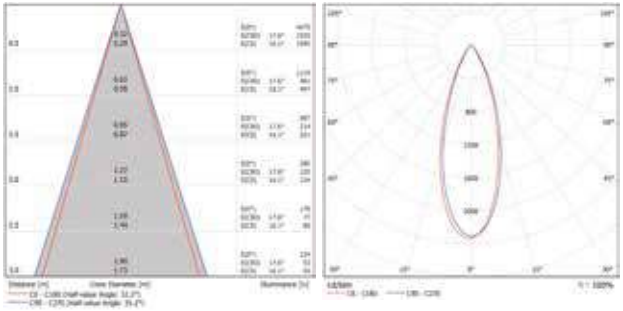

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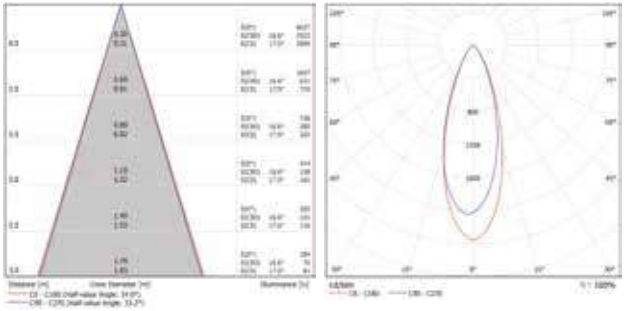

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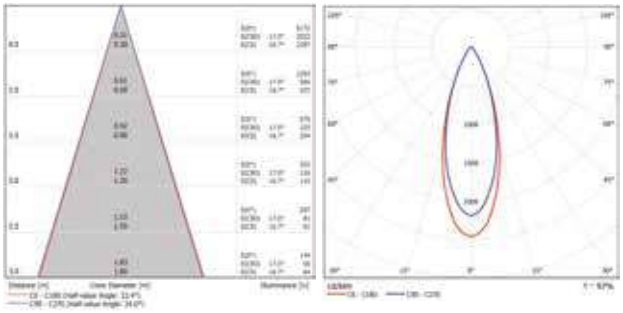

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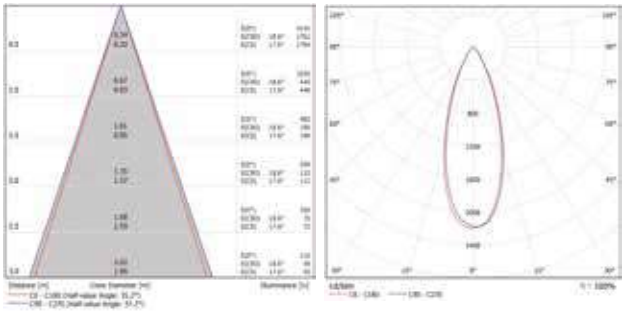

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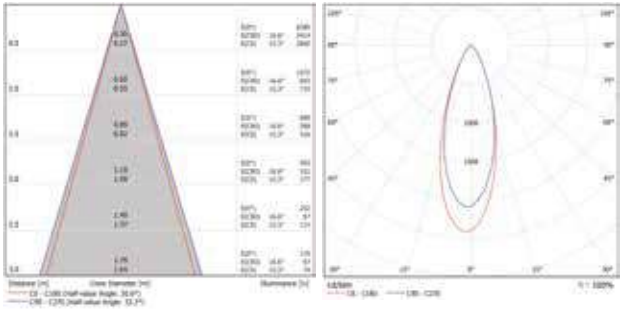

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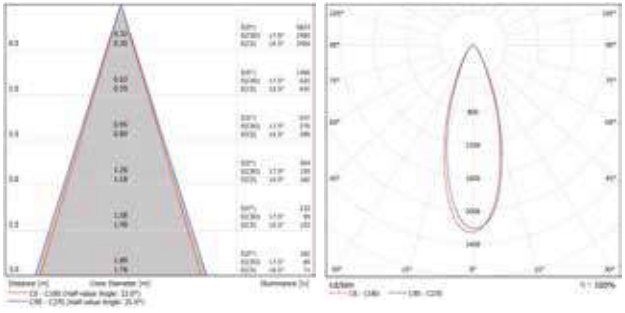

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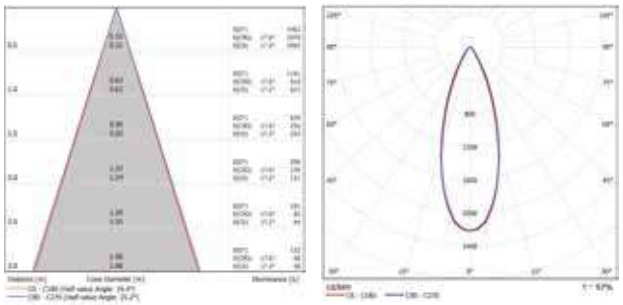

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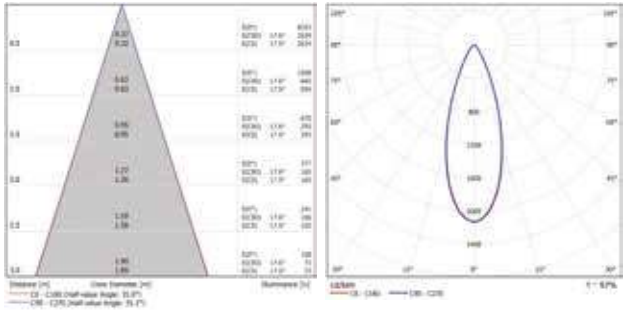
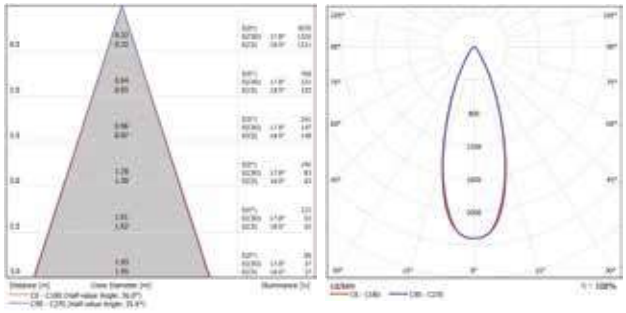


52323



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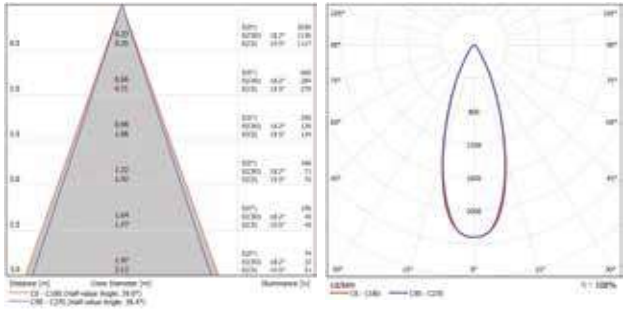


# PAR16 GU10 WITH HIGH CRI

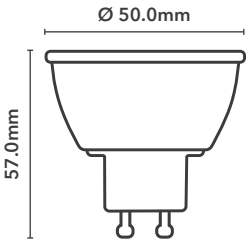
The LED PAR16 GU10 range is a great replacement for standard mains voltage halogen lamps. It uses a combination of COB (Chip On Board) LED technology and diamond cut optics that create a superb light within a defined beam without multiple shadows and unpleasant glare.

The unique heat sink designed by parent company Mitsubishi Chemical Corporation maximizes heat dissipation. It is energy efficient and has a built-in temperature management control system that guarantees long lifetime of 40.000 hours.

Verbatim has extended its range of retrofit LED lamps with a line of LED PAR16 GU10 with a high colour rendering index of ≥90 for optimum light quality and natural colour rendering.

## Application

PAR16 GU10 LEDs are favoured for directional lighting and are particularly suitable for working areas as well as for mood lighting. They offer flexibility of mounting arrangements where the space is limited. Ideal for spotlighting and general lighting in public areas such as restaurants, reception, corridors, lobbies, conference rooms and other areas where the light is used for long periods of time.



GU10 | Dimmable | 220-240V | 35° | 2700K | 3000K | 4000K | Energy Class A+ | HIGH CRI ≥90 | 56g

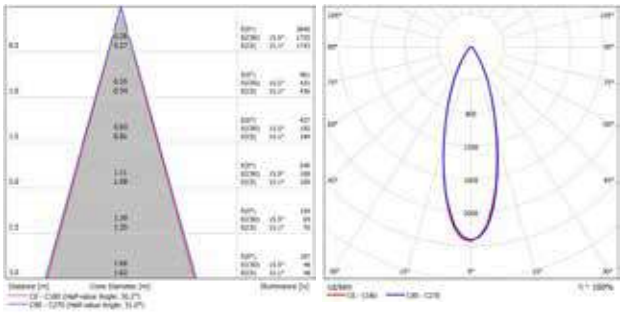
| Product Number | Actual Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Useful Lumen 90° Cone (lm) | Luminous Intensity (cd) | CCT (K) | Lifetime (h) | Power Factor |
|---|---|---|---|---|---|---|---|---|
| 52347 | 6.0 | 58 | 430 | 410 | 1010 | 2700 | 40,000 | ≥0.9 |
| 52348 | | 62 | 460 | 440 | 1100 | 3000 | | |
| 52349 | | 65 | 480 | 460 | 1170 | 4000 | | |
| 52350 | 8.0 | 74 | 570 | 530 | 1100 | 2700 | | |
| 52351 | | 79 | 620 | 570 | 1170 | 3000 | | |
| 52352 | | 85 | 650 | 610 | 1240 | 4000 | | |

Downlight fittings are also available - please refer to page 88.

Go to www.verbatimlighting.com for dimmer compatibility information

## LED PAR16 GU10 with high CRI Photometric Data

52347



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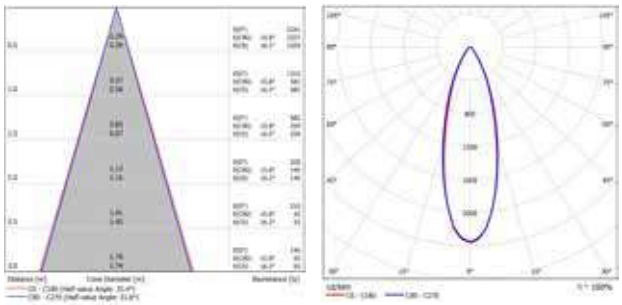

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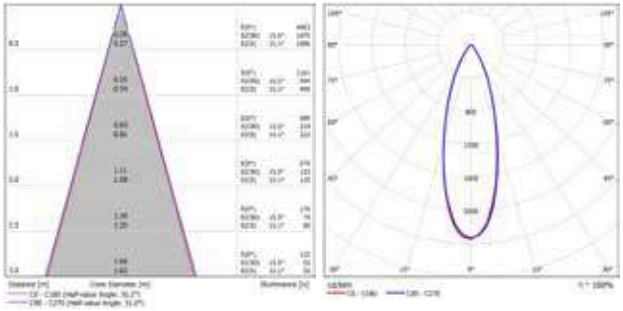

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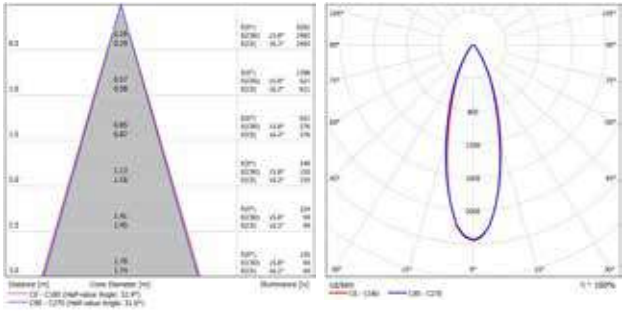

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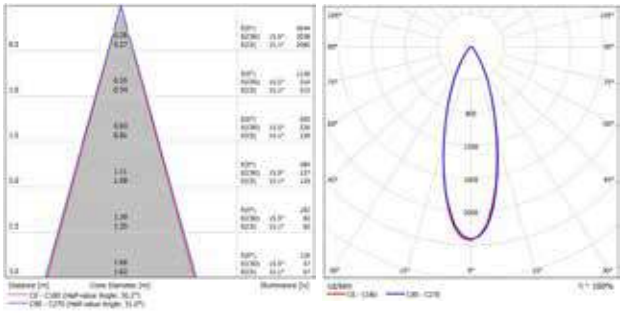

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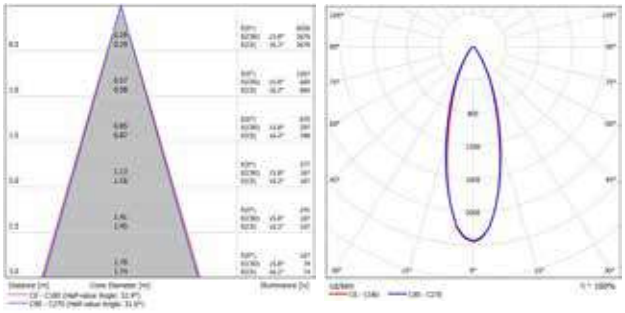


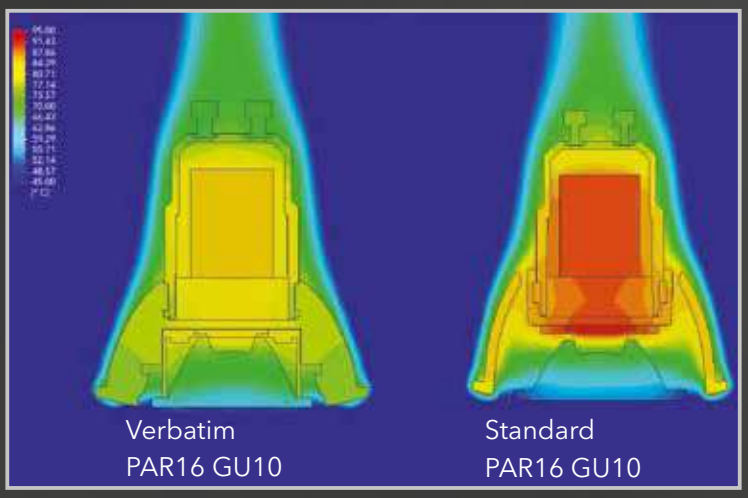
Regus Schiphol The Base, Netherlands

# ADVANCED PRODUCT DESIGN

## GU10/MR16 Thermal Management

**Mitsubishi heatsink technology for optimal thermal management.**

Efficient thermal management is related to product reliability and lifetime. Lumen output reduces with rising operating temperature, so thermal management is vital to the performance of LEDs.




Mitsubishi's uniquely designed heat sink air flow cooling system delivers very effective thermal management, reducing the temperature by 20% compared to standard heat sinks which in turn makes it extremely reliable

The LED GU10/MR16 use a combination of COB (Chip On Board) LED technology and diamond cut optics that gives these lamps a highly desired halogen effect with perfect beam control. This helps to minimize spill light and avoid multiple shadows and unpleasant glare that is sometimes a factor in spotlights.

The sophisticated matt grey finished heatsink looks good and is compatible with standard fixtures. However, its key attribute is that it maximizes the heat transfer and dissipation performance by optimizing its shape and fin arrangement for self cooling by convection of the surrounding air, conduction through the air, and radiation.

The single light source with the diamond-cut reflector and fly-eye optics provides well controlled beam and minimized glare.

Boconcept, Germanys

# Downlight Fittings for LED PAR16 GU10

Verbatim downlight fittings are perfect for all Verbatim LED PAR16 GU10 lamps.

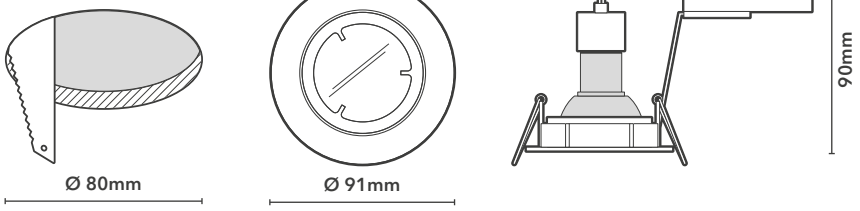
They are available in packs which consist of a white or aluminium fixed ring plus a holding pin, a GU10 socket and an electrical connection box.

Available in two different IP protection ratings, the IP23 rated version is suitable for general-purpose lighting while the IP44 version offers better water resistance making it ideal for lighting in bathrooms and other damp rooms.

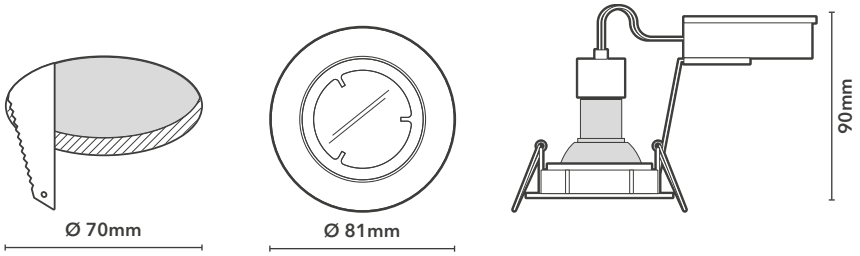
## Application

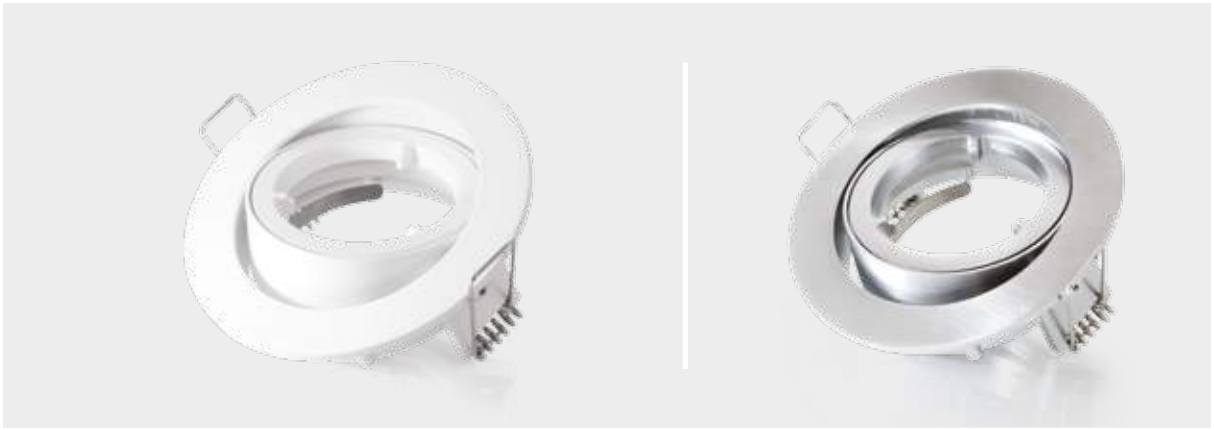
Economic solution for general lighting in corridors, offices, shops or in domestic households, in living rooms, kitchens, bedrooms or bathrooms.

52400 / 52401




52402 / 52403



GU10 | 220-240V

| Product Number | Tilting Angle (°) | Housing Colour | Product Weight (g) | Protection Class |
|---|---|---|---|---|
| 52400 | 40 | White | 140 | IP23 |
| 52401 | 40 | Brushed Aluminium | | |
| 52402 | - | White | | IP44 |
| 52403 | - | Brushed Aluminium | | |

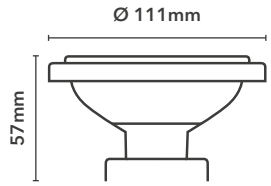
Recommended for use with Verbatim LED PAR16 GU10 lamps - see page 78.

# LED AR111

Verbatim's anti-glare AR111 LED lamp serves as a true performance plug-in halogen lamp replacement. To avoid the uncomfortable glare from the central beam that often characterizes rival LED products, Verbatim's retrofit 10.0W AR111s feature a unique design that emits light indirectly using the reflector. The AR111 LED lamp is dimmable and available in different beam angles and colour temperatures. With a high CRI of ≥90 for optimum light quality and natural colour rendering, the lamp also feature an optimized thermal control design developed by Mitsubishi Chemical which guarantees long lifetime of 50.000 hours.

## Application

Ideal for general lighting and spotlighting in public areas such as lobbies, corridors, stairwells and shops where the light is used for long periods of time.



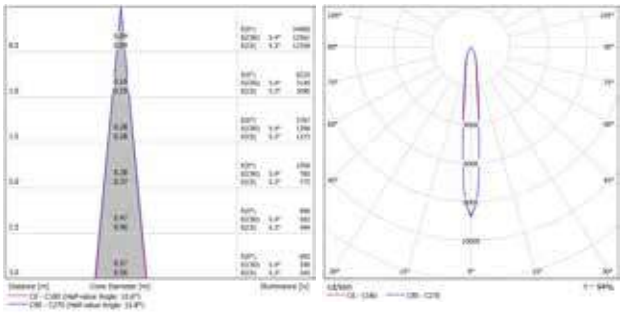
G53 | 12V AC/DC | Dimmable | 50 000 Hours | 2700K | 3000K | 4000K | Energy Class A | HIGH CRI ≥90 | 90g

| Product Number | Actual Wattage (W) | Equivalent Wattage (W) | Luminous Flux (lm) | Useful Lumen 90° Cone (lm) | Luminous Intensity (cd) | Beam Angle (°) | CCT (K) | Power Factor |
|---|---|---|---|---|---|---|---|---|
| 52340 | 10.0 | 84 | 690 | 675 | 5500 | 12 | 2700 | ≥0.90 |
| 52341 | | 88 | 720 | 700 | 5700 | | 3000 | |
| 52342 | | 70 | 690 | 675 | 2300 | 25 | 2700 | |
| 52343 | | 72 | 720 | 700 | 2400 | | 3000 | |
| 52344 | | 75 | 750 | 735 | 2500 | | 4000 | |
| 52345 | | 70 | 690 | 675 | 1500 | 40 | 2700 | |
| 52346 | | 72 | 720 | 700 | 1600 | | 3000 | |

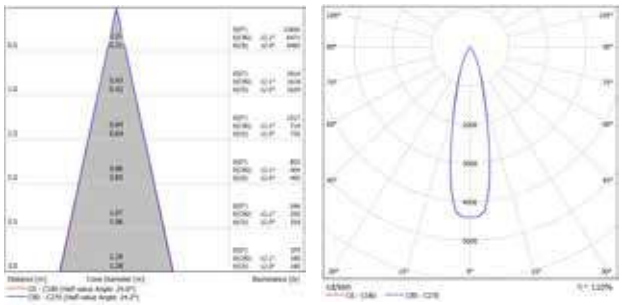
Go to www.verbatimlighting.com for dimmer compatibility information

## LED AR111 Photometric Data

52340



52344



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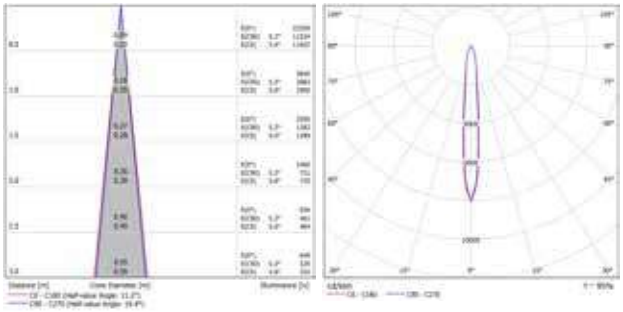

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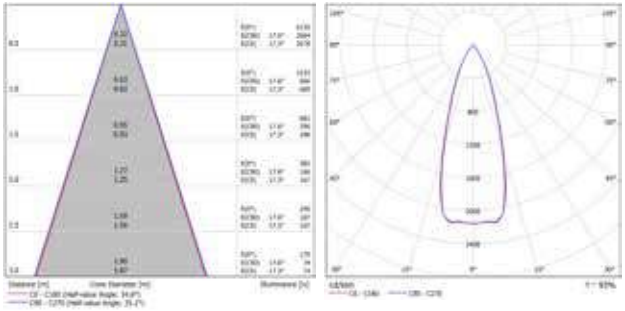

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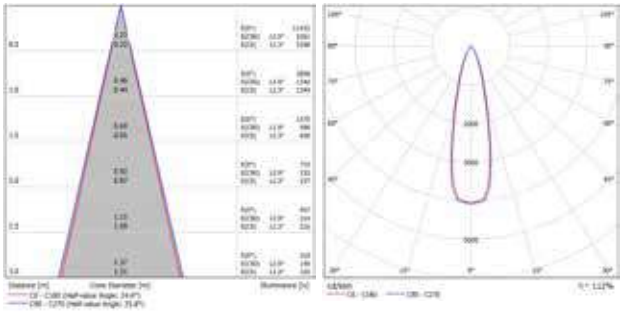

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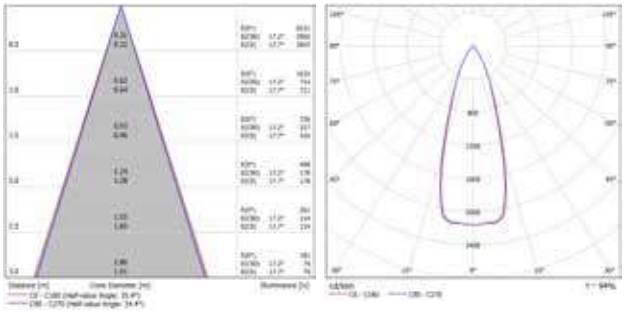

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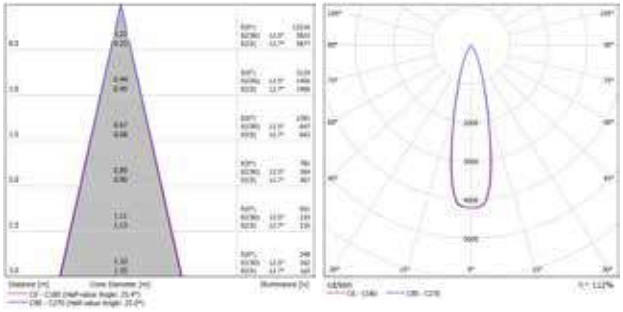


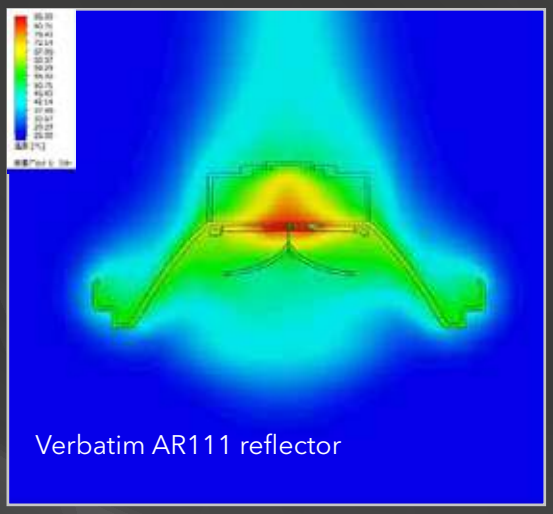
Boconcept, Germany

# ADVANCED PRODUCT DESIGN

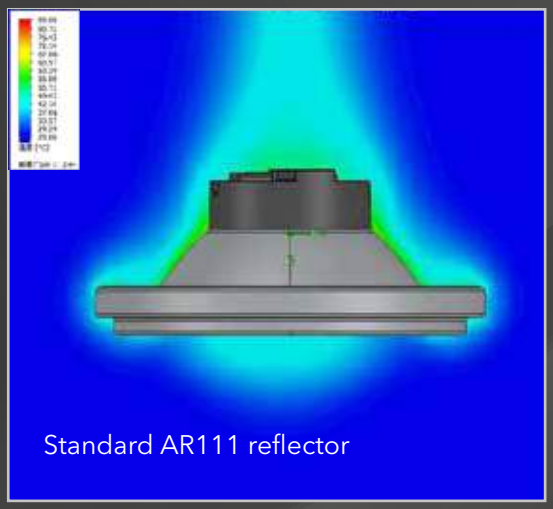
## AR111 Optimized thermal control design

Developed by Mitsubishi Chemical, the AR111 weighs just 90g and its shape and dimensions enable the lamp to be physically compatible with all different types of AR111 fixtures, something rival products do not achieve without sacrificing reliability and energy efficiency. A special thermal control system enables a compact size which is a major advantage given traditional LED AR111s usually feature a heatsink design that is too bulky for seamless substitution with halogen lamps.

The entire body of the lamp is designed to be most functional. The reflector of the lamp not only controls the light but to also dissipates the heat across its entire surface.  This helps to achieve a very long life span for the lamp without the requirement of an additional heatsink.



Verbatim AR111 reflector



Standard AR111 reflector

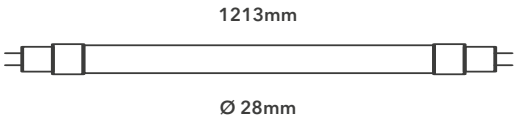
# LED T8 Tubes

Verbatim LED T8 tubes are a mercury-free, flicker-free and instant-on alternative for fluorescent tubes in T8 fixtures with conventional control gear. Available in three different colour temperatures, they provide high energy savings with a long lifetime of 50.000 hours. A replacement starter is provided with every tube.

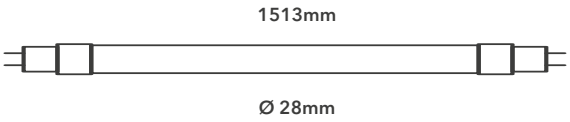
## Application

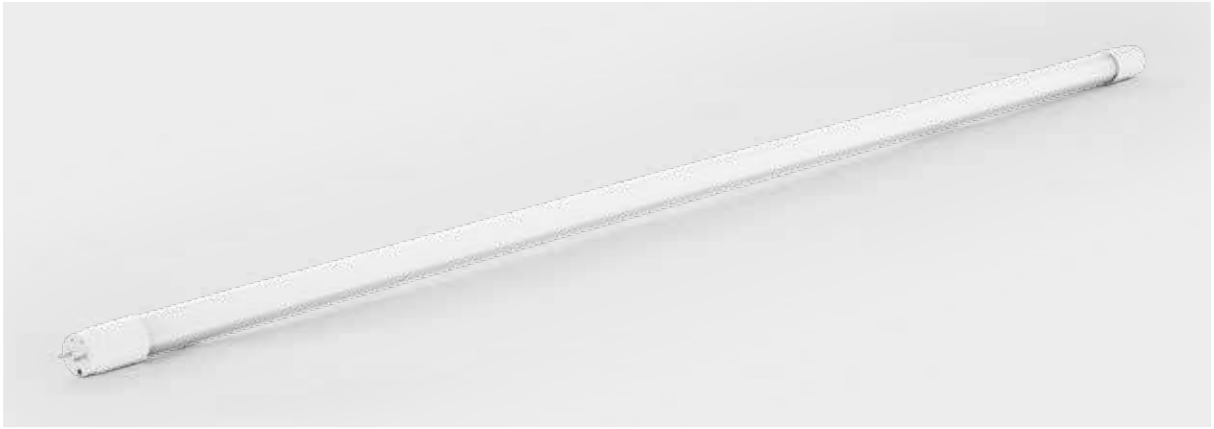
Ideal for general lighting in car parks, garages, offices, workshops and warehouses.

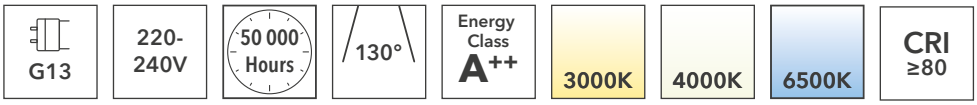
52706 / 52707 / 52708




52709 / 52710 / 52711



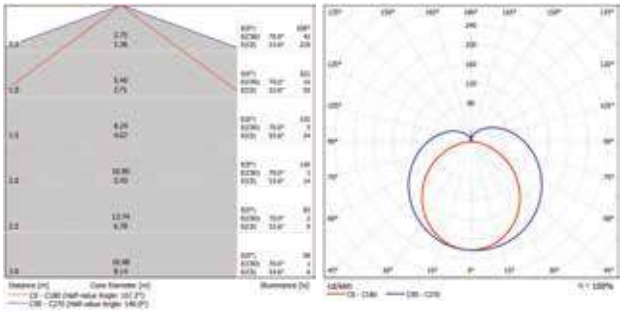






| Product Number | Wattage (W) | Luminous Flux (lm) | CCT (K) | Product Weight (g) |
|---|---|---|---|---|
| 52706 | 18 | 2200 | 3000 | 250 |
| 52707 | | 2300 | 4000 | |
| 52708 | | | 6500 | |
| 52709 | 23 | 2800 | 3000 | 300 |
| 52710 | | 2950 | 4000 | |
| 52711 | | | 6500 | |

## LED T8 Tubes Photometric Data

52706



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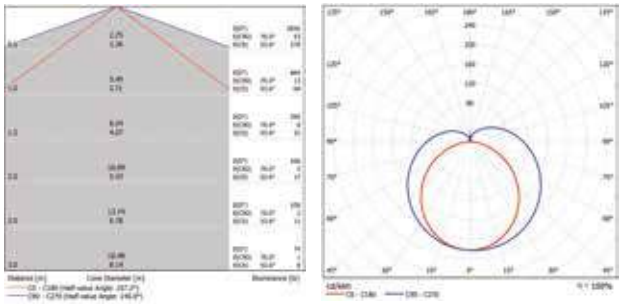

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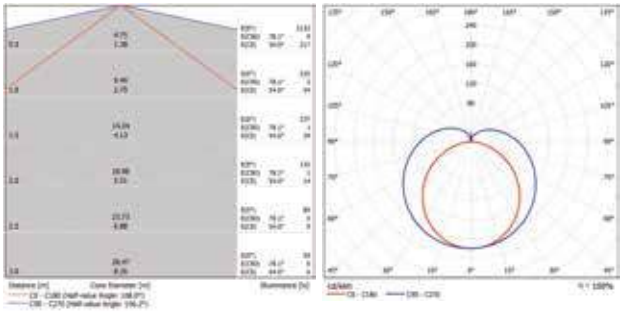

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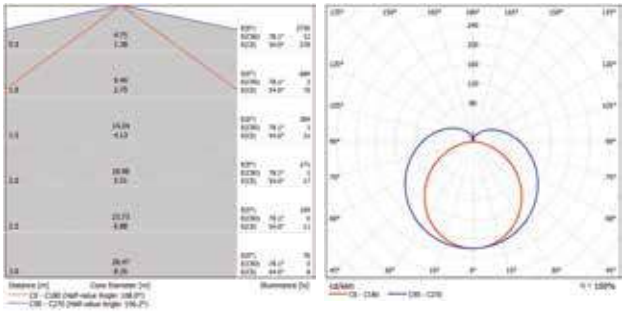

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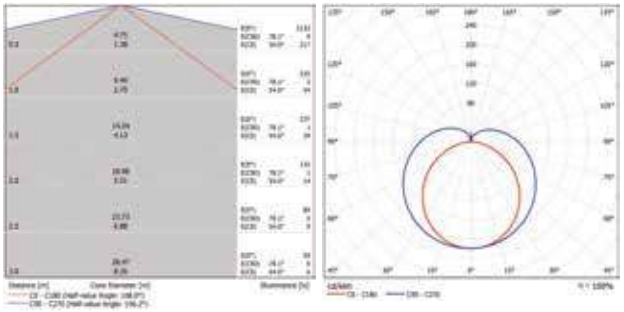

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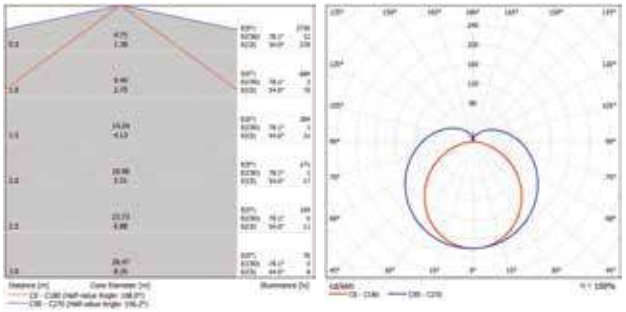


5区

# Electronic Transformer for 12V LED lamps

A 12V LED-compatible electronic transformer offering high efficiency, greater than 95%. The transformer is dimmable with leading and trailing edge dimmers and a constant voltage. It has a long lifetime of over 50,000 hours.

## Application

Suitable for all Verbatim LED MR16 and AR111.

| | |
|---|---|
| Type | Electronic Transformer |
| Product number | 52900 |
| Primary voltage range | 220-240V |
| Frequency | 50/60Hz |
| Input current | 0.29A |
| Secondary voltage | 11.5VAC |
| Lamp wattage | Halogen: 0-70W<br>LED lamp: 0-45W recommended |
| Efficiency | >95% |
| Power factor | >0.99 |
| Input capacitance | 100 nF |
| Dimming | Leading and trailing edge dimmers |
| Dimensions<br>L x W x H | 113 x 44 x 28mm |
| Weight | 80g |
| Safety class | II |

# TOOLS

## Dimmer compatibility tool

Verbatim recognizes the market's increasing need for dimmable products and provide a number of compatible combinations of major brand dimmers and Verbatim dimmable LED lamps and luminaires based on our internal testing conducted in a laboratory environment.

Verbatim's LED retrofit lamps work with a wide range of common leading and trailing edge dimmers on the market. Because there is no general compatibility between all dimmers available on the market, Verbatim has provided for each product a compatibility list with recommended dimmers and also drivers in the case of 12V lamps, on its website **http://www.verbatimlighting.com/dimmer**

The information can be searched by a dimmer finder. Just type in the product code of the selected product, press enter, and you will find a list of compatible dimmers and drivers that work smoothly with Verbatim's products.

## Dialux PlugIn

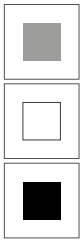
DIALux DIAL has developed and continues to develop a planning tool for indoor and outdoor lighting design. DIALux not only makes professional lighting design simpler and accessible for everyone, but as a platform and tool, it is a network for designers and manufacturers all over the world.

You can now download the DIALux plug-in for simple, effective and professional lighting design with Verbatim's LED product range. Verbatim Plug-in is available for download on Verbatim website **http://www.verbatimlighting.com/dialux**. You can take full advantage of this advanced software to create your own lighting scenes enabled by Verbatim lighting products.

# Pictograms

**Base:** the base of a lamp is the part that provides electrical and mechanical connection to the light fixture. A standardized system of lamp bases guarantees interoperability and easy replacement. Verbatim offers LED lamps with the most commonly used lamp bases.

**Beam angle:** defined as the angle at which the luminous intensity of a directional light source is 50% of the maximum light intensity of emitted light. It is the angle between peak intensity and 50% of peak intensity at full width – referring to both sides of the beam axis.



**Colour:** indicates the housing colour (black, white, silver) of the product.

**Colour rendering index (CRI):** describes the colour rendering properties, the visual appearance of objects lit by a light source, compared to a reference source of the same colour temperature. On a scale from 0 to 100, it indicates the ability to faithfully reveal colours and depends on the spectrum of the light source.

**Colour temperature in Kelvin (K):** is the colour appearance of light in comparison to an ideal black body radiator. According to EN12464, colour temperatures are classified in 3 groups: Warm white (<3300K), neutral or intermediate white (3300K-5300K) and cold white (>5300K).

**DALI:** Digital Addressable Lighting Interface - DALI is a global standard and open protocol for communications and control of lighting equipment including control gears and control devices. It guarantees interoperability with DALI system components and intelligent control of lighting.

**Dimmable** via leading and trailing edge.

**Energy class:** the energy classes according to EU Directive 1194/2012 categorize energy efficiency and eco-design requirements for directional and non-directional LED lamps. Verbatim's LED lamp feature energy classes from A to A++.

**Ingress protection:** the IP (ingress protection) rating indicates the level of protection against intrusion and water. The first digit refers to the protection from solid objects whereas the second digit indicates protection from liquids. Generally, the higher the value, the more protected a LED device is against either intrusion or water – starting with "0" for no protection at all.

**Installation:** to be installed in an open fixture

**Lifetime (L70) in hours:** defined as the time until the light output of a LED device has decreased to 70% of the initial output. It also refers to lumen depreciation which is the decrease in lumen output that occurs as a LED device is operated.

**Safety class:** the safety classes define the protection and insulation requirements against electric shock. Whereas protection in Class III for low voltage lighting relies only on supply at SELV, Class I requires means of earthing and Class III double-insulated safety precautions.

**Class I**
Luminaires in this class are electrically insulated and provided with a connection to earth. Earthing protects exposed metal parts that could become live in the event of basic insulation failure.

**Class II**
Luminaires in this class are designed and constructed so that protection against electric shock does not rely on basic insulation only. This can be achieved by means of reinforced or double insulation. No provision for earthing is required.

**Class III**
Here protection against electric shock relies on supply at Safety Extra - Low Voltage (SELV) and in which voltages higher than those of SELV are not generated (max. 50V ac rms).

**Voltage:** indicates the voltage that is required to operate the LED device. For operating 12V LED lamps, an additional electric transformer is required (see page 88).

**Weight:** indicates the weight of the product measured in grams (g).

**1-10V** analog dimmable lighting system via a two-wire, low-voltage control line connecting control gear and controllers. Light levels are scaled so that at 10V, the controlled light is at 100% of its potential output whereas 1V signifies 10% of the potential light output

**850°C glow wire test:** the glow wire test according to EN 60695-2 is used to test flammability and fire resistance of a product. All Verbatim's LED devices pass the glow wire test at 650°C. If stated differently, the test has been conducted at 850°C.

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| 52454 | 40 |
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| 52457 | 40 |
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| 52473 | 36 |
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| 52497 | 20 |
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| 52900 | 100 |
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