

LED LINEAR™
lighting solutions

Member of the
Fagerhult Group



LINEAR LIGHTING SOLUTIONS
FROM Δ ALPHA TO Ω OMEGA

ABOUT US

LIGHT IS OUR PASSION

Founded in May 2006, our enterprise supplies high quality linear LED lighting solutions based on flexible printed circuit boards worldwide. Our offer is a cost effective, unique modular LED tool kit for interior or exterior linear lighting solutions - from mood to general lighting - with an ingress protection of up to IP67.

Our international awards and reference projects, including exquisite lighting solutions for decorative or architectural applications, stand as proof of our high quality manufacturing philosophy. Based on this philosophy and the depth of our LED knowledge we are constantly working on improving products for your lighting requirements. Throughout the following pages, we invite you to familiarize yourself with the LED Linear™ world of experience.



⊖ LINEAR

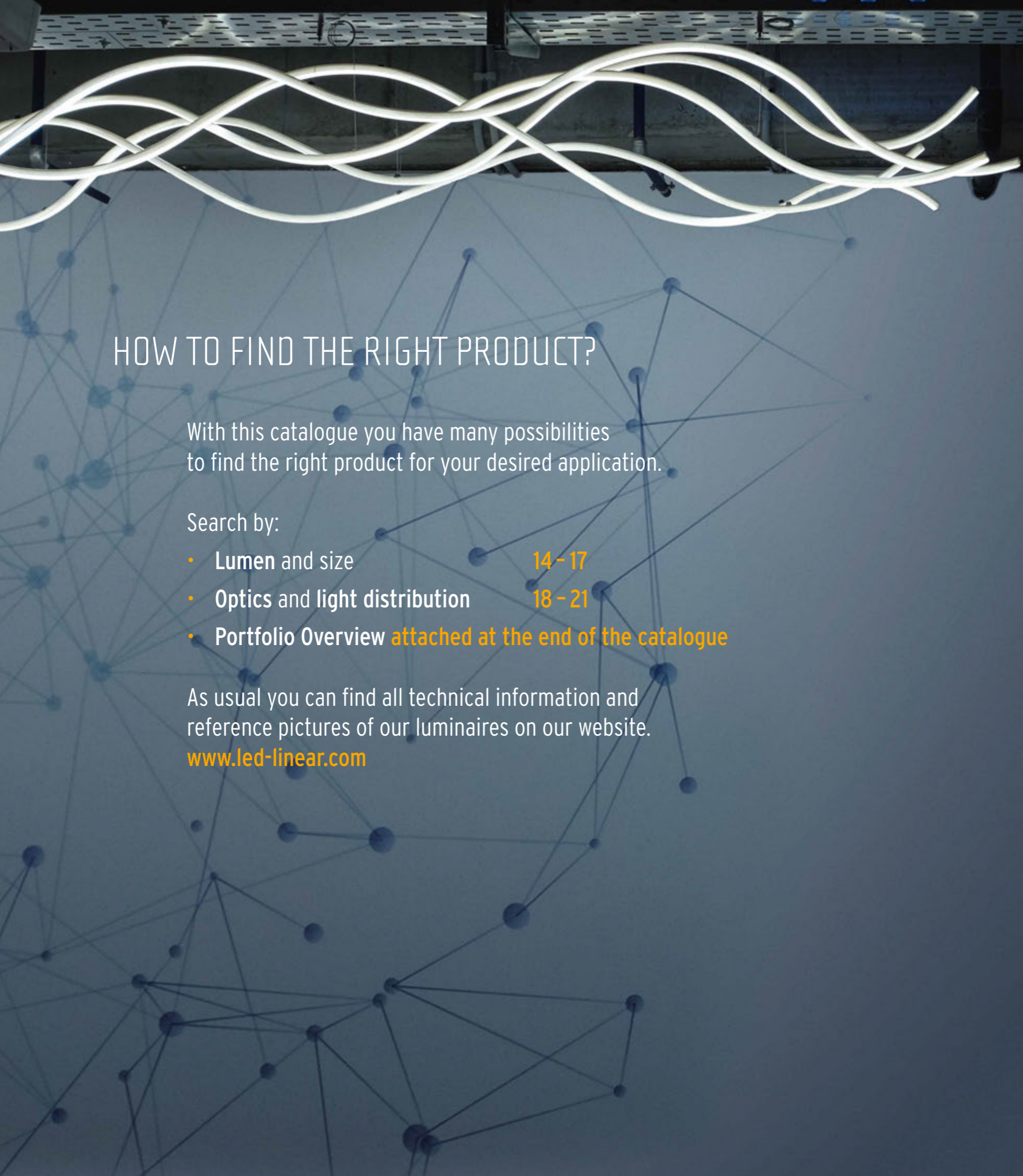
Continuous illumination without any breaks. Linear lighting can be smartly integrated into architectural details. Lighting then appears well thought of, seamless and unobtrusive. It increases the quality of life in cities, makes intelligent factories more efficient, it strengthens well-being and productivity in the office and in education, it increases guest comfort in the hospitality industry and creates new shopping experiences in shopping areas.

⊕ MODULAR

Modular stands for versatile combinations. Our product portfolio is based on a modular construction toolkit. Configure your individual lighting solution according to your wishes. You select: mounting type, protection grade, color rendition, color temperature, luminosity, wattage, optic and profile - we offer your desired product!

∞ INFINITE

You can look forward to more than 30 million standard variations, which will leave endless lighting solutions for your lighting task. Whether you would like to provide contour lighting for a 300 meter high facade, illuminate a waterscape, equip an office complex with efficient light, or create mood light in the private sector - and your imagination inspires us!



HOW TO FIND THE RIGHT PRODUCT?

With this catalogue you have many possibilities to find the right product for your desired application.

Search by:

- Lumen and size **14 - 17**
- Optics and light distribution **18 - 21**
- Portfolio Overview **attached at the end of the catalogue**

As usual you can find all technical information and reference pictures of our luminaires on our website.

www.led-linear.com

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OUTDOOR

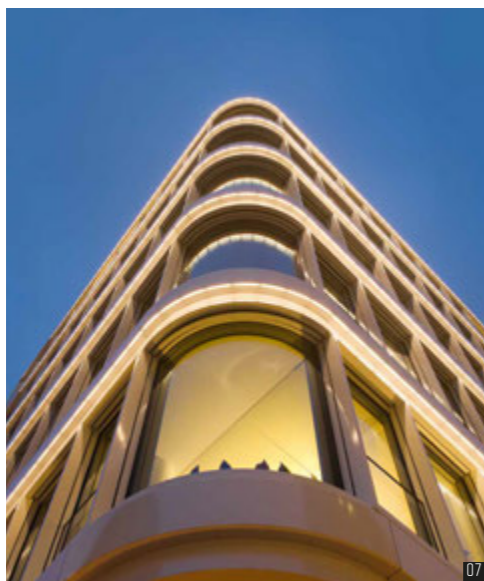
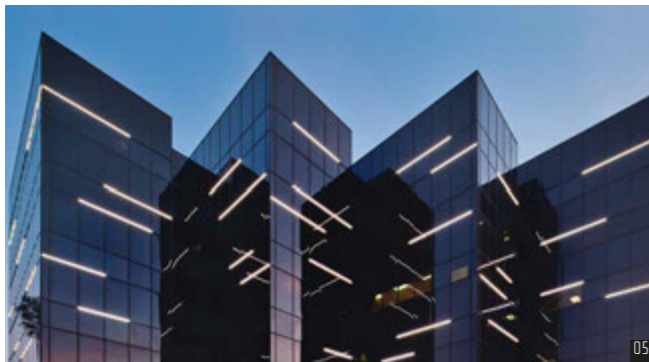
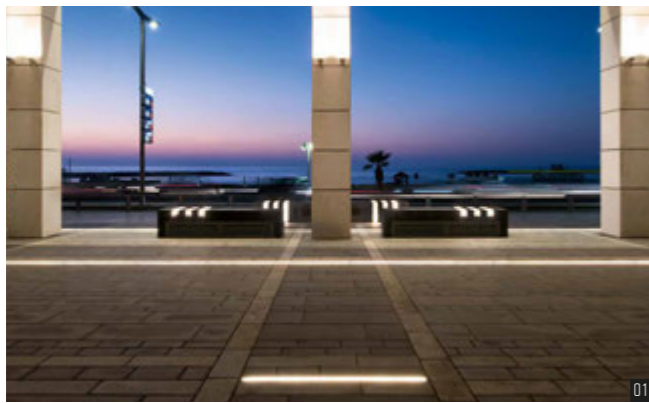


Photo 1: Omri Amsalem Photo 02: Ismail Gamal Abdulla, LED Linear™ Photo 05: Lane Barden Photo 06: Andrew Worssam Photo 07: Günther Fotodesign, LED Linear™ Photo 08: Photowalas

OUTDOOR

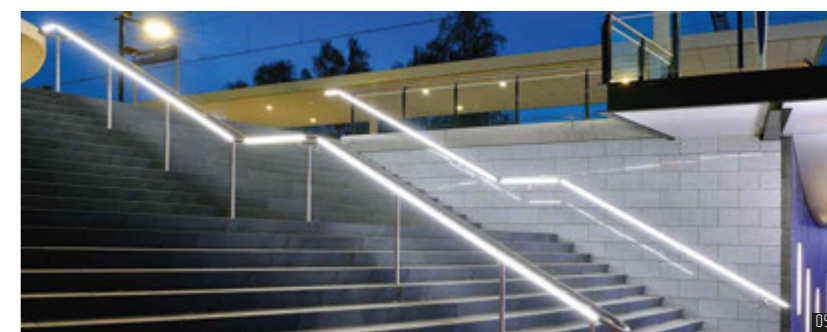
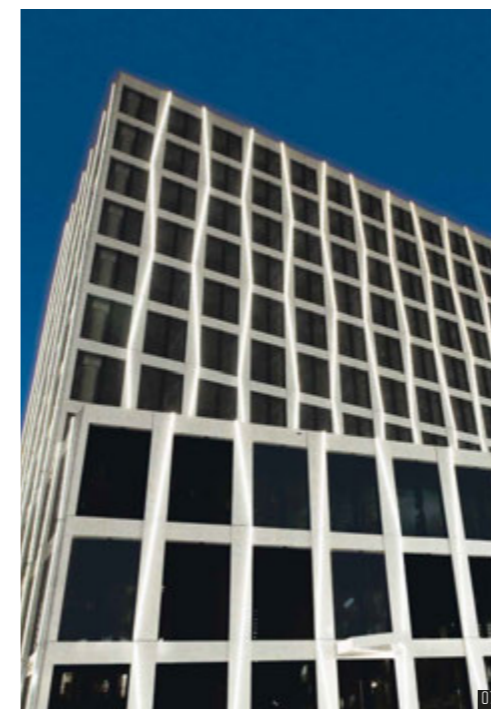


Photo 01: Luke Hayes Photo 02: Alex Haw Photo 04: Frédérique Félix-Faure, François Moura, Guillaume Ombreux Photo 05: Luke Hayes Photo 06: Amphitype Photo 08: Ludovic Loewert

INDOOR

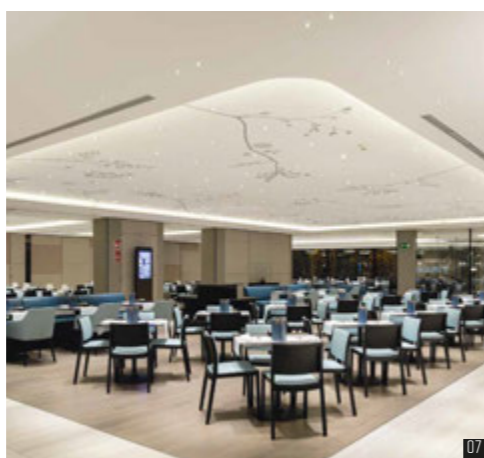


Photo 01: Shutterstock.com / Zhu Difeng Photo 02: Pirjo Lindfors Photo 03: Jonathan Taylor at Cloud 9 Photography Photo 04: Miguel Coll Photo 05: Daniel Kessler Photo 06: Fernando Alda Photo 07: Álvaro Valdecantos 08: Whitelight Studio Berlin, Jens Bösenberg

INDOOR

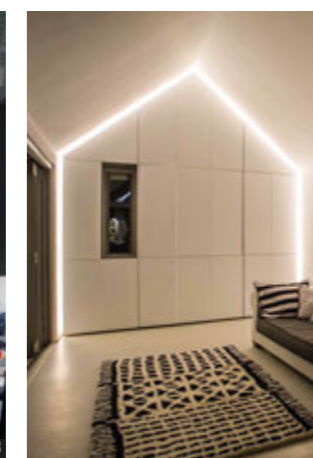
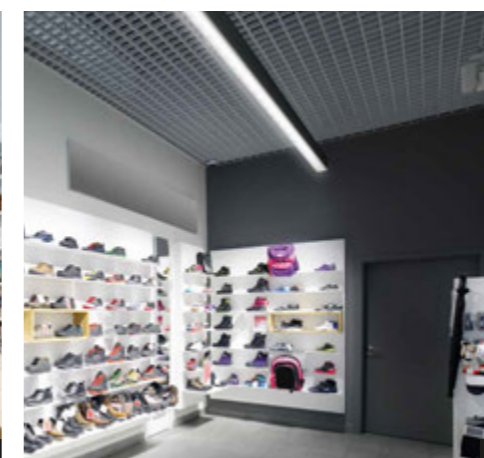
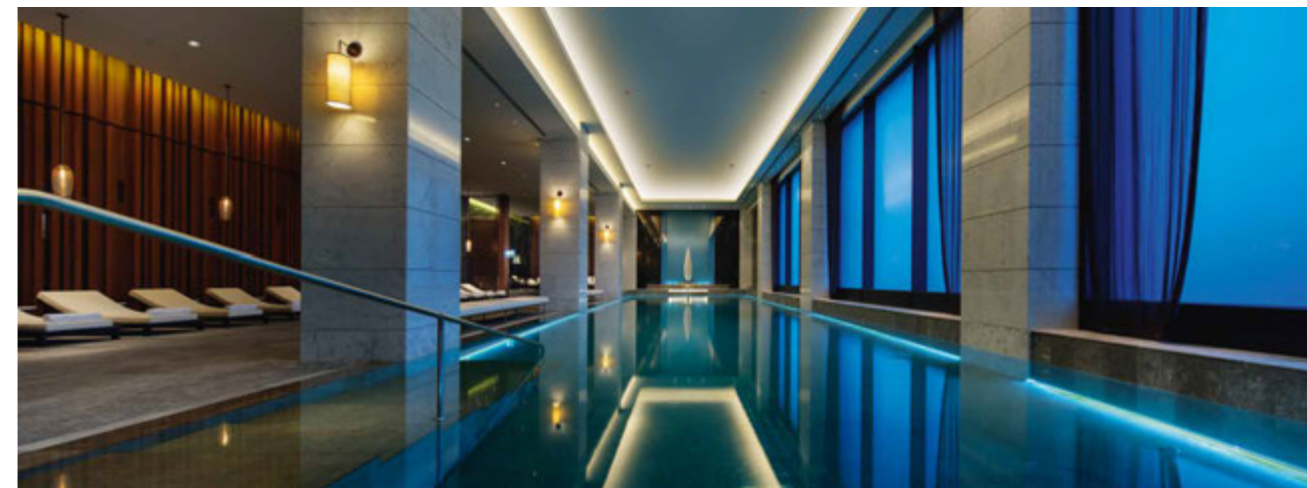
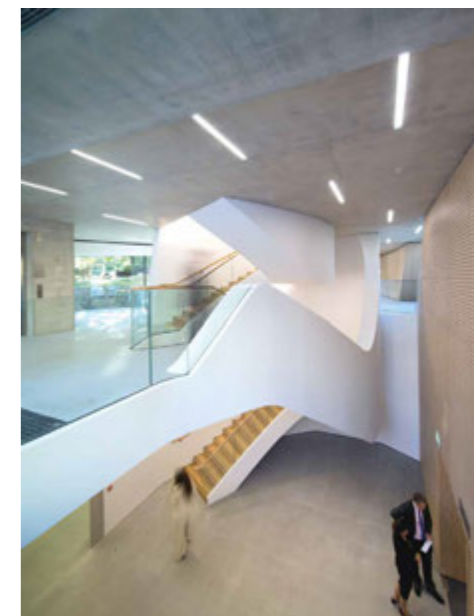
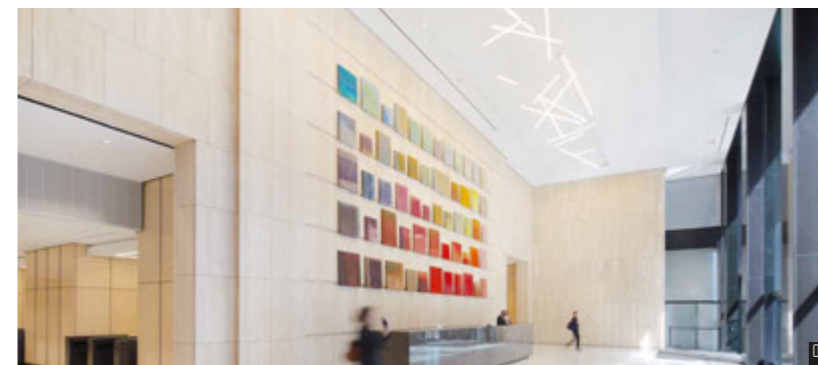
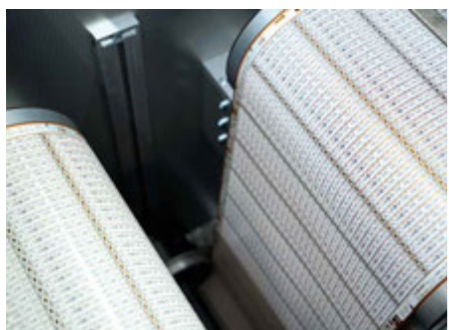


Photo 01: Akito Goto/ goto photo office Photo 02: KKS Strategy LLP / Timothy Soar Photo 03: Kevin Chu + Jessica Paul - Architectural photographers Photo 04: Contagious Agency Photo 05: Luke Hayes Photo 06: Hilton Hotels & Resorts Photo 07: Florian Monheim Photo 08: Shutterstock.com / Fipfoto Photo 09: Chris Orange

OUR CORE TECHNOLOGY



Premium LEDs and R2R production process



One of our Reel-to-Reel tape production line at our production site in Germany.

As trivial as it sounds, a great luminaire starts with a great light source. We, at LED Linear™, consider this aspect to be the key to a unique lighting experience. We carefully select the best LED packages available in terms of quality and reliability. Using our state-of-the-art Reel-to-Reel (R2R) process production lines, these LEDs are soldered automatically in a precise manner with numerous in-line inspections. This production process offers LED tapes without stairway-high loss-effect between cut lengths and improved mechanical stability due to homogeneous flexible material compared to sheet-to-sheet or rigid PCB light modules.



NanoRay technology

NanoRay is a new **technology** enabling the engineering and the production of nano structured optics. The size of the structures is comparable to 1/10 of a human hair which enables an absolute control of the lighting distribution, as well as the color over angle.

In order to get these new optics to work at their best, the smallest possible light source is needed. LED manufacturers offered the perfect solution: Chip Scale Package LEDs (CSP). This new generation of LEDs is only 1 x 1 mm and offers many advantages such as better thermal management. That means a better lifetime and an outstanding color rendition performances compared to previous technologies. With the newest generation of LED - CSP which have a better CRI and R9 value we could start to use these optics. Thanks to this combination LED Linear™ was able to shrink the footprint of their luminaires while improving its performances.



Luminaire encapsulation



Polyurethane potting stations allowing the production of IP67 light lines up to 10 m in length. PU shows superior test performance compared to silicone and is more water-proof as others. It also outperforms other encapsulation technologies in terms of chemical resistance.



TrueColor technology

Outdoor projects like facades or gardens with architectural highlights require luminaires with standing any weather conditions. Such luminaires often use a potting compound to fully encapsulate the LEDs and ensure an IP67 rating. Since the size of the fixtures varies and therefore the thickness of the encapsulation layer, the color shift of each fixture is not consistent.

With our **TrueColor technology** those issues are eliminated. LED Linear™ has a color consistency in all True Color luminaires, using the same tape. This is essential for projects with different luminaires which should deliver with the same CCT.

ICON OVERVIEW

OUTDOOR / INDOOR

You will find these icons on every product page referring to the different features of the product.

Feature	
	TrueColor technology
	NanoRay technology
	Low glare
	Field cuttable
	Tool free installation
	Continuous row
	Drive over
	Stainless steel housing

	Recessed
	Surface-mounted / Ceiling
	Pendant
	Two flames
	In-ground
	Wall-mounted

Technical Data / Performance

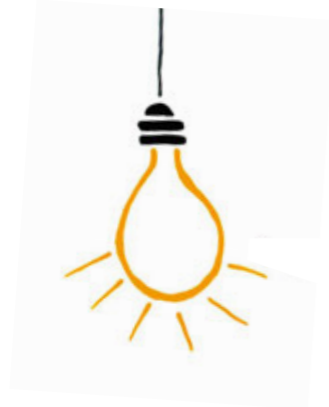
	White		IP00
	Tunable White		IP20
	Color		IP20/IP40
	RGB		IP40
	RGBW		IP65
	Reel-to-reel (R2R) production		IP67
	Electronic design		
	OneBinOnly		
	Thermal management		

	Lifetime White/ IQ White
	Lifetime White/ IQ White
	Lifetime Color/RGB
	Impact resistant
	Top view R _{min} = 15 cm
	Side view R _{min} = 15 cm

Technical Specifications	
Circle section	Ø max 47 mm
Length	30, 40, 50, 100, 150, 200, 300, 400, 500, 600, 700, 800, 900, 1000 mm
Power	6 W/m - 15 W/m
Luminous flux	270 lm/m - 1200 lm/m
Efficiency	up to 70 lm/W
Beam angle/optics	CSP
Color temperatures	2700 K, 3000 K, 3500 K, 4000 K and 5000 K
CS	up to 9%

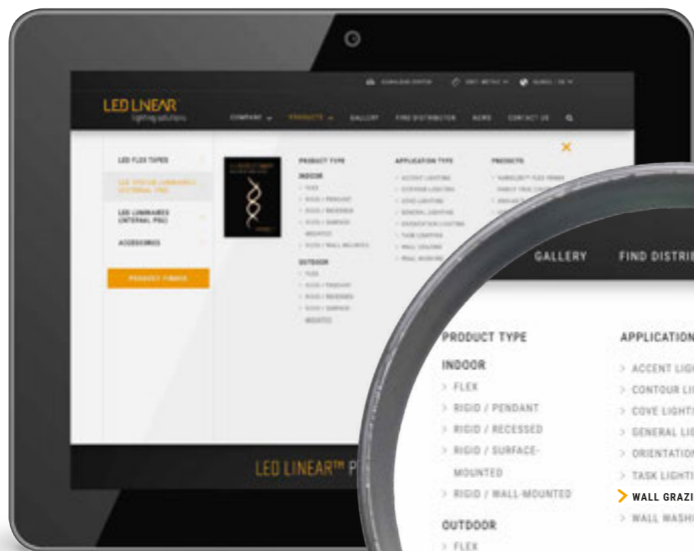
EASY TO SPECIFY

Customize your own luminaire with the LED Linear™ online configurator on our website www.led-linear.com



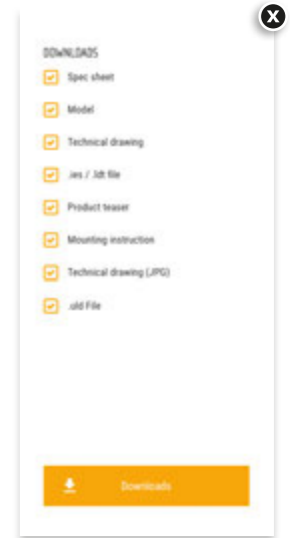
Choose your right product with 3 options.

- by product type
- by application type
- directly to the product section

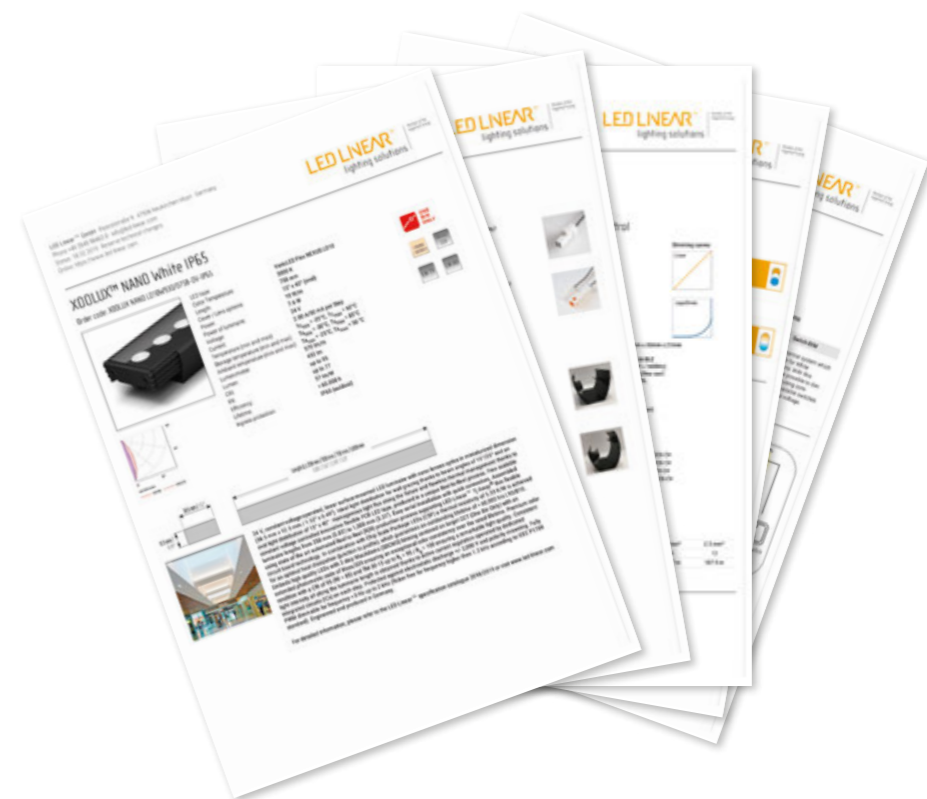


After selecting the right luminaire family you can customize the product to your individual needs in the final configuration.

All data information of the configured product is available for download e.g. data sheet, photometric files (ies/ldt), mounting instructions etc.

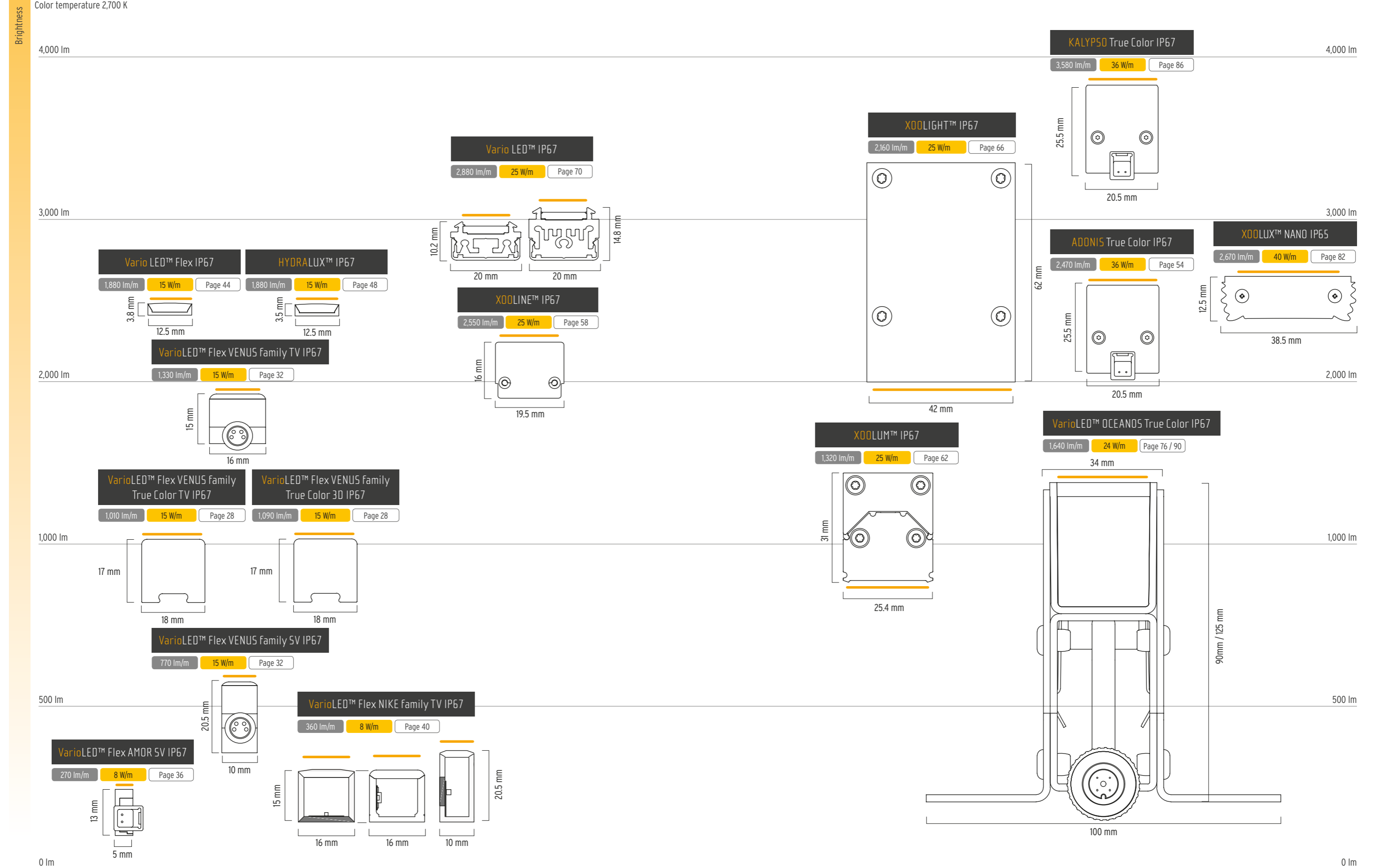


At the end of your configuration process you will get your custom made spec sheet with all relevant information related to your configured luminaire, accessories in appropriate quantities, PSU controls, wiring and maximal feed length.



OUTDOOR IP65 / IP67

All dimensions in the scale 1:1



INDOOR IP20 / IP40

All dimensions in the scale 1:1

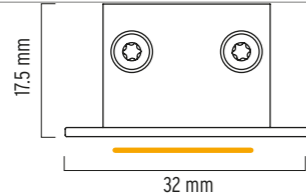
Brightness

Color temperature 2,700 K

5,000 lm

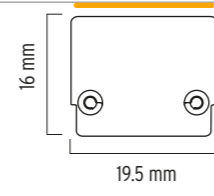
LUNA IP40

5,000 lm/m 36 W/m Page 110



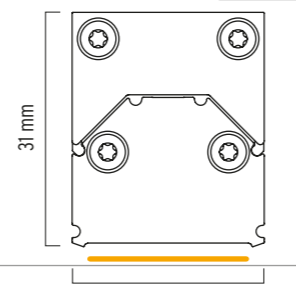
XOOLINE™ IP40

5,000 lm/m 36 W/m Page 98



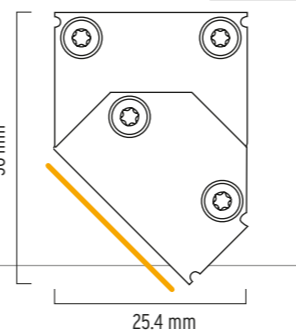
XOOLUM™ R IP20

4,130 lm/m 40 W/m Page 140



XOOLUM™ R Wall Wash IP20

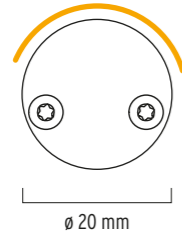
4,130 lm/m 40 W/m Page 160



4,000 lm

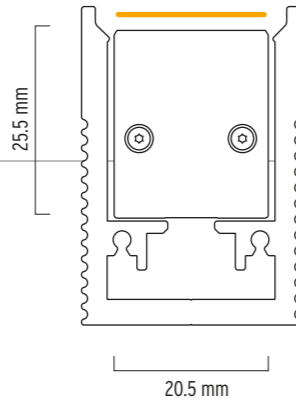
XOOCOVE IP40

3,600 lm/m 25 W/m Page 150



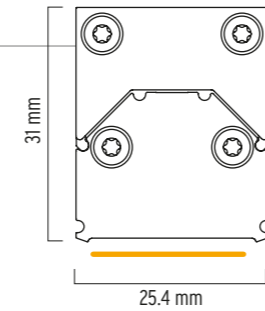
KALYPSO True Color

3,580 lm/m 36 W/m Page 170



XOOLUM™ IP40

3,350 lm/m 42 W/m Page 106



3,500 lm

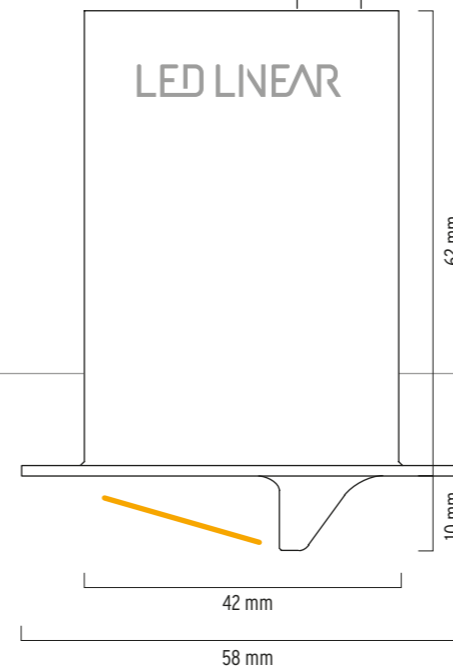
LYRA IP40

3,240 lm/m 25 W/m Page 102



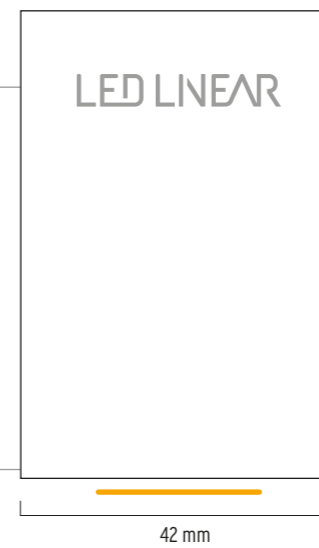
MARS Wall Wash IP20

4,170 lm/m 46 W/m Page 156



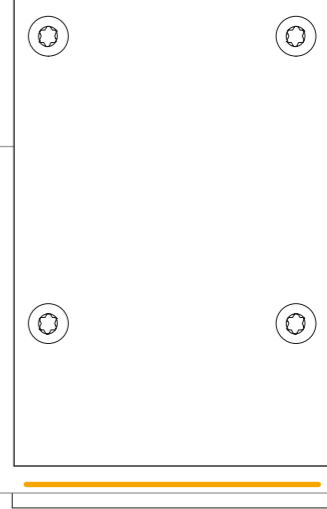
XOOMINAIRE™ Family IP20/IP40

5,100 lm/m 40 W/m Page 128



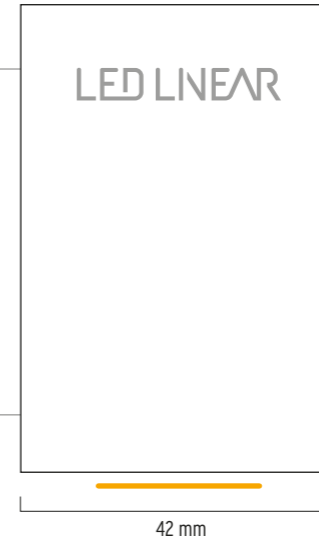
XOOLIGHT™ IP40

3,790 lm/m 42 W/m Page 124



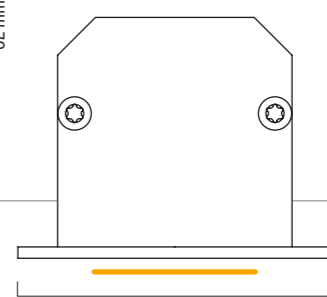
MARS NANO IP40 (Ceiling / Pendant)

3,270 lm/m 40 W/m Page 116



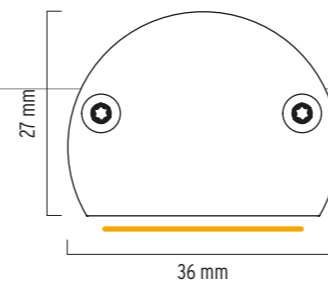
MARS NANO IP40 (Recessed)

3,270 lm/m 40 W/m Page 116



LYRA 36 NANO IP40

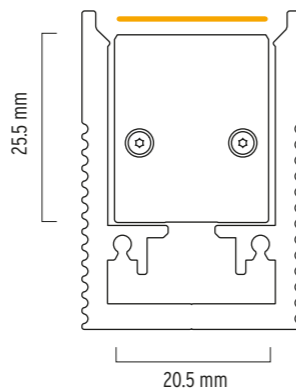
2,990 lm/m 40 W/m Page 120



3,000 lm

ADONIS True Color

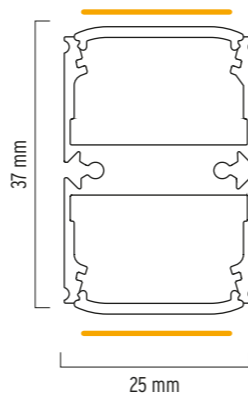
2,470 lm/m 36 W/m Page 166



XOOTOO IP20/IP40

2,448 lm/m* 50 W/m Page 144

*One flame only



2,000 lm

2,000 lm

Small size

Large size

LED Linear™ GmbH

LED Linear™ GmbH

INTRO

OUTDOOR

INDOOR

FLEXIBLE LIGHT ENGINE















MIX & MATCH

DESIGN LUMINAIRES

APPENDIX

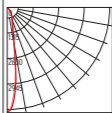
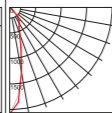
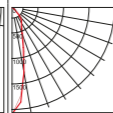
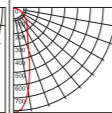
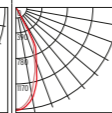
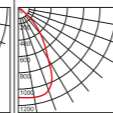
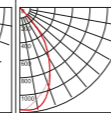
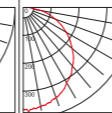
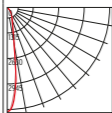
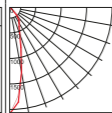
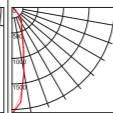
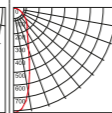
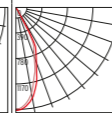
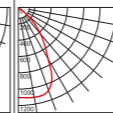
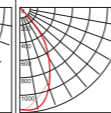
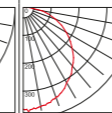
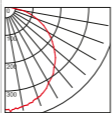
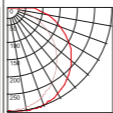
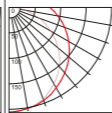
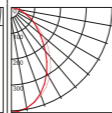
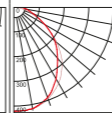
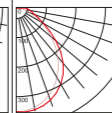
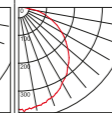
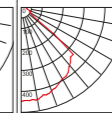
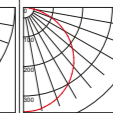
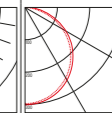















OUTDOOR IP65 / IP67

Optic combinations

	10°	15°	25°	30°	60°	65°		120°	15° x 40°	Opal Encapsulation	Clear Encapsulation	Opal Cover (L ²)	Diffuse Cover (L ²)	Clear Cover	Page
 VarioLED™ Flex VENUS family True Color IP67								✓		✓					28
 VarioLED™ Flex VENUS family IP67								✓		✓					32
 VarioLED™ Flex AMOR IP67										✓					36
 VarioLED™ Flex NIKE family IP67										✓					40
 VarioLED™ Flex IP67											✓				44
 HYDRALUX™ IP67											✓				48
 ADONIS True Color IP67										✓					54
 XOOLINE™ IP67								✓		✓		✓	✓	✓	58
 XOOLUM™ IP67										✓					62
 XOOLIGHT™ IP67										✓					66
 VarioLED™ IP67								✓			✓				70
 VarioLED™ OCEANOS True Color IP67	✓			✓						✓	✓				76 / 90
 XOOLUX™ NANO IP65		✓	✓						✓						82
 KALYPSO True Color IP67	✓			✓	✓										86

INDOOR IP20 / IP40

Optic combinations

		10°	15°	25°	30°	40°	60°	65°	WW	Opal Cover (120°)			Diffuse Cover (120°)			Clear Cover (120°)		Opal Encapsu- lation	Clear Encapsu- lation	Page
										L²	H²	R	L²	H²	R	L²	R			
																				
	XOOLINE™ IP40	✓			✓		✓				✓	✓	✓	✓	✓	✓				98
	LYRA IP40	✓			✓		✓													102
	XOOLUM™ IP40										✓			✓		✓				106
	LUNA IP40	✓			✓		✓				✓	✓	✓	✓	✓	✓	✓			110
	MARS NANO IP40		✓	✓		✓		✓												116
	LYRA 36 NANO IP40		✓	✓		✓		✓												120
	XOOLIGHT™ IP40										✓		✓			✓				124
	XOOMINAIRE™ family IP20/IP40			✓				✓			✓									128
	XOOLUM™ R IP20			✓				✓												140
	XOOTOO IP20/IP40			✓				✓			✓	✓		✓	✓					144
	XOOCOVE IP40						✓													150
	MARS Wall Wash IP20								✓											156
	XOOLUM™ R Wall Wash IP20								✓											160
	ADONIS True Color																✓			166
	KALYPSO True Color	✓			✓		✓													170

PAGE EXPLANATION

The catalogue is divided into two main chapters: OUTDOOR and INDOOR. For each main chapter there are sub chapters such as "Light lines". In every sub chapter suitable luminaires are initially presented as an overview. Then the lights are explained in more detail with technical information and mounting options. Small icons at the edge of the pages show features of the specific product. With it, different luminaires can be compared well and easily.

Main chapter → **OUTDOOR**

Introduction → Turn common landscapes, facades or outdoor areas to unique spaces.

Sub chapter title → **26 FLEXIBLE LIGHT LINES**

Chapter + explanation → Bendable light lines providing a set of contour or indirect lighting luminaires embracing into organic shapes.

26 FLEXIBLE LIGHT LINES
Bendable light lines providing a set of contour or indirect lighting luminaires embracing into organic shapes.

52 RIGID LIGHT LINES
Set of modular and robust light lines for non-curved application as a complement to the flexible assortment.

74 IN-GROUND
Rock holes in-ground luminaires suitable for pedestrian and drive-through areas.

80 GRAZER
Linear luminaires designed to highlight special architecture surfaces, textures, materials and structures (wall-grazing) directing high power in a tight beam.

Color icon(s) → **OUTDOOR**

Sub chapter → **FLEXIBLE LIGHT LINES**

Introduction → Flexible IP67 luminaires offering various illuminated surfaces and lighting directions. Each of them uses polymer optic encapsulation material offering a premium waterproof sealing, UV resistance, chemical stability against urban gases and protection against abrasion damages.

Product name + page number → **VarioLED™ Flex VENUS TO White/TrueColor Top View IP67 / Page 26**

Product name → **VarioLED™ Flex VENUS Family True Color IP67** / Page 26

Product photo / Detail → **Top View**

Page number → **26**

Technical data

Variant	Power (Watt)	Lumens Flux (lm)	CR	CCT (Kelvin)	Length (m)
VENUS 6	270-450	195-3200	90	2,200-5,000	304-3,000
PHOENIX 10	480-1,350	195-3,200	90	2,200-5,000	304-3,000
SKYLLA 16	720-1,980	195-3,200	90	2,200-5,000	304-3,000

Second generation of VENUS, available in 3 variants (top or side view) enables an optimum rendition of the LED spectrum (minimal color shift).

VarioLED™ Flex VENUS Family IP67 / Page 27

Variant	Power (Watt)	Lumens Flux (lm)	CR	CCT (Kelvin)	Length (m)
VENUS 6	270-450	195-3,200	90	2,200-5,000	304-3,000
PHOENIX 10	270-1,350	195-3,200	90	2,200-5,000	204-4,000
SKYLLA 16	270-1,350	195-3,200	90	2,200-5,000	204-4,000

Light lines bendable in one direction (top view or side view) with a perfectly homogeneous and dot-free light surface for outdoor architectural lighting.

VarioLED™ Flex AMOR IP67 / Page 26

Power (Watt)	Lumens Flux (lm)	CR	CCT (Kelvin)	Length (m)
6	240-270	90	2,500-3,000	304-3,000

Slim (5 mm x 15 mm) dot-free and homogeneous light line for delicate contour lighting.

VarioLED™ Flex NIKE family IP67 / Page 40

Variant	Power (Watt)	Lumens Flux (lm)	CR	CCT (Kelvin)	Length (m)
NIKE 6	320-360	195-2,400	90	2,400-5,000	248-3,000
PHOENIX 8	190-230	195-2,400	90	2,400-5,000	270-3,000
NIKE 8	190-230	195-2,400	90	2,400-5,000	270-3,000

Cost-efficient homogeneous dot-free light line (IP67) available in standard lengths delivered with 500 mm open cable on one end.

VarioLED™ Flex IP67 / Page 44

Power (Watt)	Lumens Flux (lm)	CR	CCT (Kelvin)	Length (m)
3-15	104-2,000	90	2,200-5,000	240-3,000

Fluorinated light line produced to the desired length with IP67 connectors on both ends for fast indirect facade lighting installations.

HYDRALUX™ IP67 / Page 40

Power (Watt)	Lumens Flux (lm)	CR	CCT (Kelvin)	Length (m)
3-15	230-1,000	90	2,200-5,000	104-1,500

Field cuttable light line with visible joints and high efficiency ideal for indirect lighting applications.

Product name → **XOOLLUX™ NANO IP65**

Introduction → A sleek and functional design enables mountings close to the illuminated surface while keeping the luminaires as discrete as possible in the architecture for optimal grazing effects and minimally invasive installation.

Application photo → [Image of a building facade illuminated with XOOLLUX NANO IP65]

Product photo / Detail → [Image of the XOOLLUX NANO IP65 luminaire strip]

Feature icons → [Icons for dimming, color temperature, and other features]

3 Product highlights

- The age of nano optics has begun
- Nano lens optics allow precise control of the light distribution while maximizing lumen output and minimizing color over angle for crisp and homogeneous grazing.
- Different light distributions makes XOOLLUX™ NANO the top product for grazing - as well as delicate flooding applications.
- Further improving flexibility is achieved through the use of mounting clips, enabling tilt angles every 2° increments from 0° to 40°.

QR-Code to → www.led-linear.com/...

Mounting options + dimensions

Product name → **XOOLLUX™ NANO IP65**

Product photo / Detail → [Image of the XOOLLUX NANO IP65 luminaire strip]

Technical icons → [Icons for dimming, color temperature, and other features]

Light distribution curves → [Graphs showing light distribution curves for different beam angles]

Technical data

Beam angle	Beam diameter	Beam diameter
Beam 0°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 2°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 4°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 6°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 8°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 10°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 12°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 14°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 16°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 18°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 20°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 22°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 24°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 26°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 28°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 30°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 32°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 34°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 36°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 38°	300 mm x 0.2 m	300 mm x 0.2 m
Beam 40°	300 mm x 0.2 m	300 mm x 0.2 m

Technical drawing with dimensions → [Technical drawing of the luminaire strip with dimensions]

Mounting accessories

- 1. Ceiling
- 2. Surface mounted

Example of applications → [Image showing application of the luminaire in a building facade]

OUTDOOR

Turn common landscapes, facades or outdoor areas to unique spaces.

26 | FLEXIBLE LIGHT LINES

Bendable light lines providing a set of contour or indirect lighting luminaires embracing into organic shapes.

52 | RIGID LIGHT LINES

Set of modular and robust light lines for non-curved application as a complement to the flexible assortment.

74 | IN-GROUND

Rock solid in-ground luminaire suitable for pedestrian and drive-through areas.

80 | GRAZER

Linear luminaires designed to highlight special architecture surfaces, textures, materials and structures (wall-grazing) delivering high power in a tight beam.

VarioLED™ OCEANOS True Color White/IQ White/RGB IP67 | Page 76 and 90

FLEXIBLE LIGHT LINES

Flexible IP67 luminaires offering various illuminated surfaces and bending directions. Each of them uses polyurethane encapsulation material offering a premium waterproof sealing, UV resistance chemical stability against urban gazes and protection against abrasion damages.



VarioLED™ Flex VENUS IQ White/RGB/Color Top View IP67 | Page 32

VarioLED™ Flex VENUS family True Color IP67 | Page 28

Variant	Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
VENUS	6	270 - 410	95	2,200 - 5,000	354 - 3,924
PHOBOS	10	480 - 730	95	2,200 - 5,000	354 - 3,924
SKYLLA	15	720 - 1,090	85	2,200 - 5,000	354 - 3,924

Second generation of VENUS available in 2 variants (top or 3D bendable) enables an optimum rendition of the LED spectrum (minimal color shift).



VarioLED™ Flex VENUS family IP67 | Page 32

Variant	Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
VENUS	6	290 - 1,330	95	2,200 - 7,200	214 - 5,000
PHOBOS	10	290 - 1,330	95	2,200 - 7,200	214 - 5,000
SKYLLA	15	290 - 1,330	85	2,200 - 7,200	214 - 4,000

Light lines bendable in one direction (top view or side view) with a perfectly homogeneous and dot-free light surface for outdoor architectural lighting.



VarioLED™ Flex AMOR IP67 | Page 36

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
8	240 - 270	85	2,500 - 7,000	391 - 5,016

Slim (5 mm x 13 mm) dot free and homogeneous light line for delicate contour lighting.



VarioLED™ Flex NIKE family IP67 | Page 40

Variant	Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
TV	8	320 - 360	85	2,400 - 5,800	268 - 5,018
TV/SB	8	190 - 210	85	2,400 - 5,400	275 - 5,025
SV	8	120 - 130	85	2,400 - 5,000	275 - 5,025

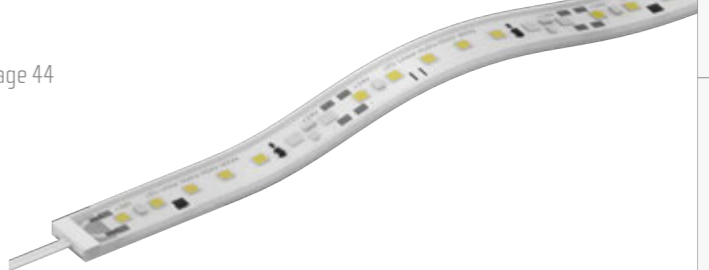
Cost efficient homogeneous dot free light line (TV/SV) available in standard lengths delivered with 500 mm open cable on one end.



VarioLED™ Flex IP67 | Page 44

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
3 - 15	230 - 1,880	uo to 95	2,200 - 9,600	82 - 10,019

Pixelized light line produced to the desired length with IP67 connectors on both ends for fast indirect facade lighting installations.



HYDRALUX™ IP67 | Page 48

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
3 - 15	230 - 1,880	uo to 95	2,500 - 9,600	4,000 - 10,000

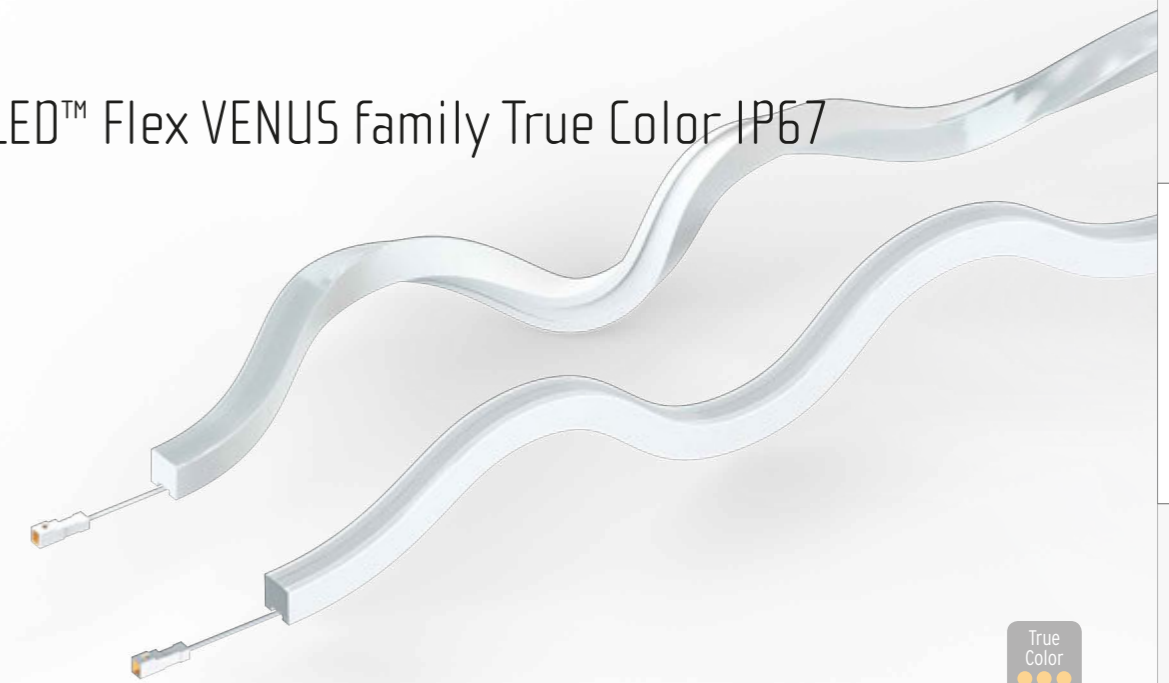
Field cuttable light line with visible pixels and high efficiency ideal for indirect lighting applications.



VARIOLED™ FLEX VENUS FAMILY TRUE COLOR IP67

After gathering inputs and ideas from our customers VENUS True Color now carries on all the features which made VENUS a worldwide success with new major benefits. The first variant Top-View takes over the applications covered by its predecessor for 2D bends perpendicular to the luminous surface. The second variant provides a light line which can be twisted or bent in 3 dimensions in order to follow any curves present in modern architectural concepts.

VarioLED™ Flex VENUS family True Color IP67



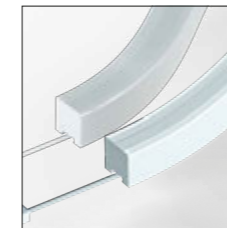
True Color



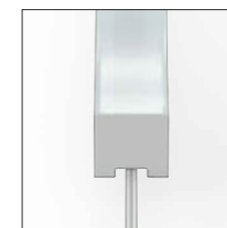
Dot free encapsulated 3D bendable LED design light line



Available in 2D (Top View) and 3D bending directions allowing to follow almost any shape and conceive creative designs.



VENUS True Color Top-View (TV) and 3D have the same cross section and comparable lumen output. It simplifies the specification process while enabling a consistent light line in intensity and size regardless of the geometry of the installation.



VENUS True Color features an improved fixture to fixture overlap without light gap. Thus, it is the ideal solution for endless homogeneous curved light lines.



www.led-linear.com/venustc

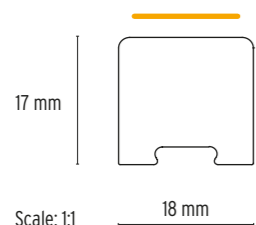
VarioLED™ Flex VENUS family True Color IP67

Technical Specifications

- White
- IP67
- L80/B10 > 60,000 h
- R_{max} = 15 cm
- R_{max} = 15 cm



Cross section	18 mm x 17 mm
Length	3D: 494 mm - 1,964 mm / TV: 354 mm - 3,924 mm
Power	6 W/m - 15 W/m
Luminous flux	270 lm/m - 1,090 lm/m
Efficacy	up to 73 lm/W
Beam angle/optics	120°
Color temperatures	2,200 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
CRI	up to 95



Mounting All dimensions in mm.

Mounting	Mounting accessories	Description	Example of applications
1. Surface-mounted, Clips and profile without mounting channel 	VTC Surface Mounting Clip Low Art.-#: 13000277 VTC Surface Mounting Channel Low Art.-#: 10000552 (2 m) 10000552-4m (4 m)	Robust aluminum extrusion painted in white available as profile or clips for surface mount.	
2. Surface-mounted, Clips and profile with mounting channel 	VTC Surface Mounting Clip high Art.-#: 13000278 VTC Surface Mounting Channel high Art.-#: 10000553 (2 m) 10000553-4m (4 m)	Robust aluminum extrusion painted in white available as profile or clips for surface mount.	
3. Surface-mounted, vertical / horizontal 	VTC Surface Holding Clamp Clear Art.-#: 13000279	Robust aluminum extrusion painted in white available as profile or clips for surface mount.	
4. Recessed 	VTC Recessed Profile (2 m Set) (With 3 x Mounting Spring & Flexible Snap on Cover Strips) Art.-#: 10000559 (2 m) 10000559-4m (4 m) VTC End Cap Recessed (Set of 2) Art.-#: 11000214 VTC Flexible Recessed Profile (2 m Set) (with 6 x mounting spring & flexible snap on cover strips) Art.-#: 10000560	Profile or clips with mounting springs can be installed directly into false ceiling.	
5. Pendant 	VTC Pendant Set for Flexible Pendant Profile (2 m Wire) Art.-#: 13000273 VTC Flexible Pendant Channel Art.-#: 10000554 VTC Pendant Set for Flexible Pendant Profile (5 m Wire) Art.-#: 13000274 Square Canopy Set (optional) Art.-#: 13000330	Pendant set with profil for installation directly on the ceiling. 2 m or 5 m suspension is cuttable on-site.	

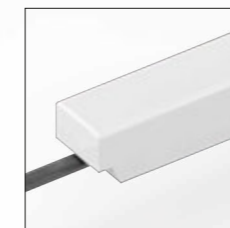
VARIOLED™ FLEX VENUS IP67 FAMILY

First linear flexible LED luminaire for outdoor architectural lighting with a perfectly homogeneous and dot-free light surface. The innovation brought by this 2 dimensions bendable light lines opened new doors in lighting design which were unreachable by any luminaires back then.

VarioLED™ Flex VENUS IP67 Family



Flexible, dot-free design light line for appealing lighting accents



VENUS is a polyurethane encapsulated luminaire resistance and chemical stability against urban gases.



With an efficiency up to 95 lm/W, VENUS stands out as one of the most efficient light line available to date.



The various lumen output and a large panel of available CCTs turns VENUS into a modular lighting design tool-kit.



www.led-linear.com/venus

LED Linear™ GmbH



Photo: Frédérique Félix-Faure, François Moura, Guillaume Ombreux

VarioLED™ Flex VENUS family IP67

Technical Specifications

- White
- IO White
- Color
- RGB
- IP67
- L80/B10 > 60,000 h



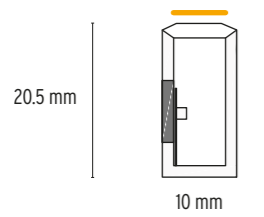
Side View (SV)

Top View (TV)

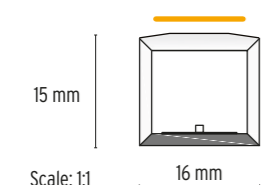


Polyurethane encapsulation

Side View (SV)



Top View (TV)

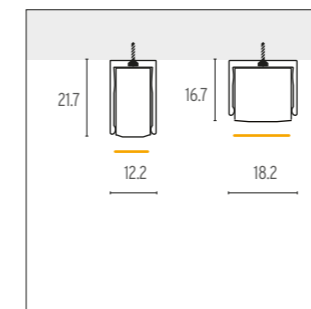


Scale: 1:1

Cross section	SV: 20.5 mm x 10.0 mm / TV: 15.0 mm x 16.0 mm
Length	SV: 228 mm - 5,040 mm / TV: 214 mm - 5,026 mm
Power	6 W/m - 15 W/m
Luminous flux	up to 1,330 lm/m
Efficacy	up to 89 lm/W
Beam angle/optics	120°
Color temperatures	2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Color	Tunable White (SV 2,500 K - 4,800 K / TV 2,600 K - 4,900 K), RGB, Color
CRI	85 - 95

Mounting All dimensions in mm.

1. Surface-mounted, Clips and profile without mounting channel



Mounting accessories

Side View
VarioContour SV
2,000 mm channel
(anodized aluminum)
Art.-#: 10000048-01

VarioClip SV 50 mm
(5 clips required/meter,
anodized aluminum)
Art.-#: 13000011-01

Top View
VarioContour TV
2,000 mm channel
(anodized aluminum)
Art.-#: 10000049-01

VarioClip TV 50 mm
(5 clips required/meter,
anodized aluminum)
Art.-#: 13000010-01

Description

Side View
Continuous anodized aluminum surface mounting profile designed to fit Venus SV product.

Aluminum surface mounting bracket. Recommended for overhead mounting 5 brackets per meter (3 brackets for other mountings).

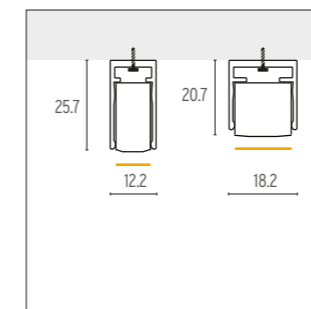
Top View
Continuous anodized aluminum surface mounting profile designed to fit Venus TV product.

Aluminum surface mounting bracket. Recommended for overhead mounting 5 brackets per meter (3 brackets for other mountings).

Example of applications



2. Surface-mounted, Clips and profile with mounting channel



Mounting accessories

Side View
VarioContour SV CC
2,000 mm (anodized aluminum) inclusive cable raceway
Art.-#: 10000520

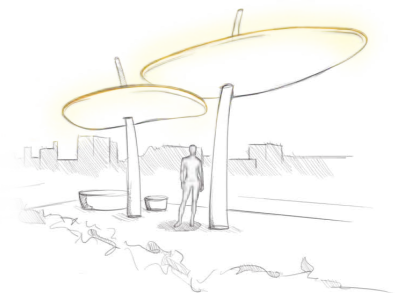
Top View
VarioContour TV CC
2,000 mm (anodized aluminum) inclusive cable raceway
Art.-#: 10000339

Description

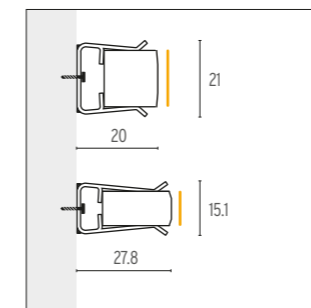
Side View
Continuous aluminum surface mounting profile. Cable Runway allows the cables to run underneath the fixture.

Top View
Continuous aluminum surface mounting profile. Cable Runway allows the cables to run underneath the fixture.

Example of applications



3. Surface-mounted, SST Clips



Mounting accessories

Side View
VarioClip SV 30 mm 301
(5 clips required/meter,
stainless steel - V4A)
water features
Art.-#: 13000051-01

Top View
VarioClip TV 30 mm 301
(5 clips required/meter,
stainless steel - V4A)
water features
Art.-#: 13000050-01

Description

Side View
Special grade stainless steel surface mounting clip for harsh environments. Recommended to use for overhead mounting 5 brackets per meter (3 brackets for other mountings).

Top View
Special grade stainless steel surface mounting clip for harsh environments. Recommended to use for overhead mounting 5 brackets per meter (3 brackets for other mountings).

VARIOLED™ FLEX AMOR IP67

AMOR is designed as a super slim luminaire to be used when space is limited but light is needed. It is the perfect product when creating eye-catching lines of light.

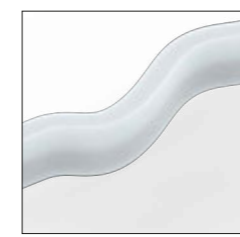
VarioLED™ Flex AMOR IP67



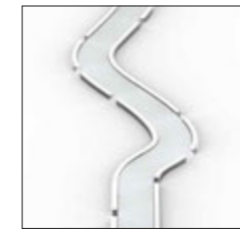
Narrowest, flexible LED light line sets new standards in decorative lighting



Cross section of 5 mm x 13 mm, making it the most minimalistic product, which enables slim lines of light.



Unmatched flexibility with a minimum bending radius of 3 cm.



Dot free homogeneous light emission despite small footprints when recessed.



www.led-linear.com/amor



LED Linear™ GmbH

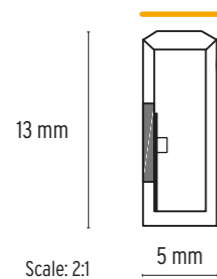
VarioLED™ Flex AMOR IP67

Technical Specifications

- White
- IP67
- L80/B10 > 60,000 h

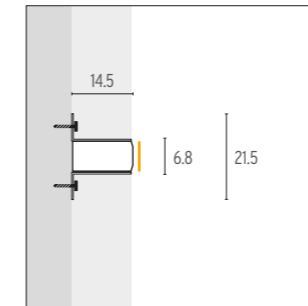


Cross section	5 mm x 13 mm
Length	391 mm - 5,016 mm
Power	8 W/m
Luminous flux	up to 270 lm/m
Efficacy	36 lm/W
Beam angle/optics	120°
Color temperatures	2,500 K, 3,000 K, 3,500 K, 4,000 K, 4,800 K and 7,000 K
CRI	85



Mounting All dimensions in mm.

1. Recessed, Mounting channel



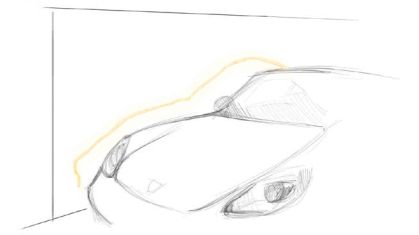
Mounting accessories

-  AMOR SV Flexible Mounting Profile, 980 mm
Art.-#: 10000527
-  Dummy AMOR SV for Plastering, 5 m
Art.-#: 10000528-SCH

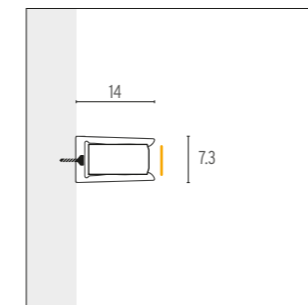
Description

Flexible mounting profile for plaster in mounting.

Example of applications



2. Surface-mounted, Clips



Mounting accessories

-  AMOR SV Aluminum Mounting Bracket
Art.-#: 13000234

Description

Anodized aluminum clips for surface mount application.

Example of applications



VARIOLED™ FLEX NIKE FAMILY IP67

Cost efficient IP67 flexible homogeneous and dot free linear light line with a 16 mm x 15 mm cross section and opal encapsulation for indoor and outdoor organic facade accent lighting requiring a high level of environmental resistance.



Photo: Jan van Lierde

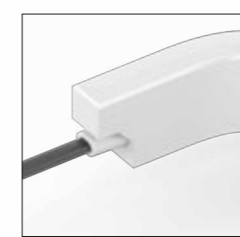
VarioLED™ Flex NIKE family IP67



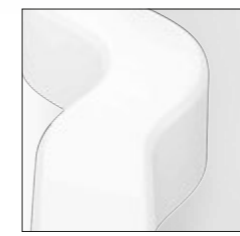
Cost effective flexible light line



Vertical bending with radius of 150 mm.



Delivered in standard lengths with 500 mm open-end cable on one-side.



Resistant to UV, urban gases and abrasion.



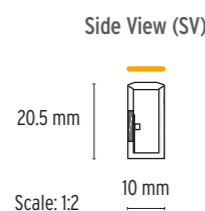
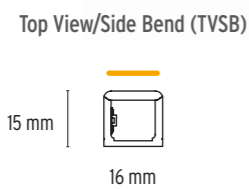
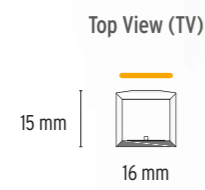
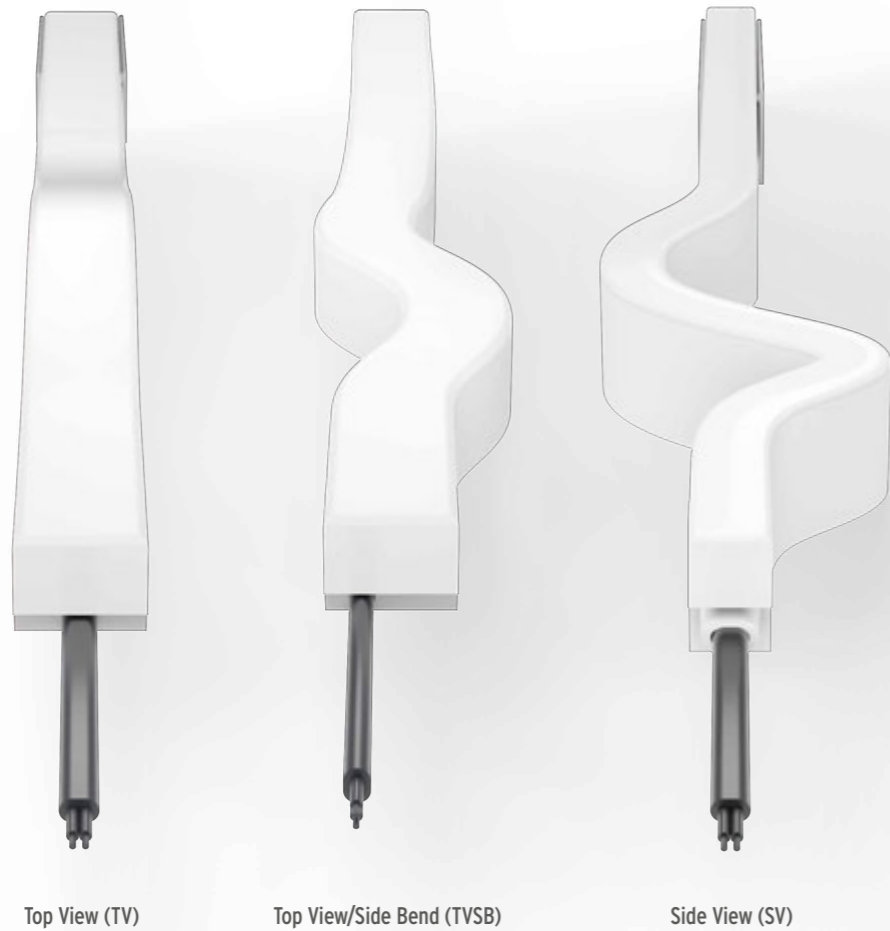
www.led-linear.com/nike

LED Linear™ GmbH

VarioLED™ Flex NIKE family IP67

Technical Specifications

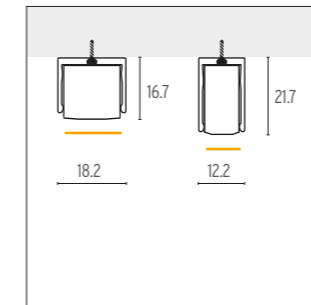
- White
- IP67
- L80/B10 > 60,000 h
-
-



Cross section	TV/TVSB: 15.0 mm x 16.0 mm / SV: 20.5 mm x 10.0 mm
Length	TV: 268 mm, 518 mm, 1,018 mm, 2,018 mm, 5,018 mm SV/TVSB: 275 mm, 525 mm, 1,025 mm, 2,025 mm, 5,025 mm
Power	8 W/m
Luminous flux	120 - 360
Efficacy	45 lm/W
Beam angle/optics	120°
Color temperatures	TV: 2,400 K, 3,000 K, 3,400 K, 3,800 K, 4,200 K and 5,800 K TVSB: 2,400 K, 2,900 K, 3,300 K, 3,700 K, 4,400 K and 5,400 K SV: 2,400 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
CRI	85

Mounting All dimensions in mm.

1. Surface-mounted, Clips and profile without mounting channel

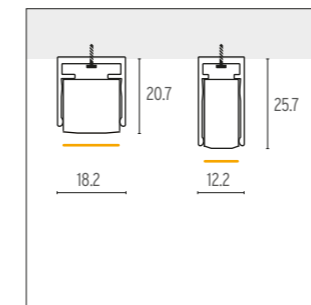


- Mounting accessories**
- Top View**
VarioContour TV 2,000 mm channel (anodized aluminum)
Art.-#: 10000049-01
 - VarioClip TV 50 mm (5 clips required/meter, anodized aluminum)
Art.-#: 13000010-01
 - Side View**
VarioContour SV 2,000 mm channel (anodized aluminum)
Art.-#: 10000048-01
 - VarioClip SV 50 mm (5 clips required/meter, anodized aluminum)
Art.-#: 13000011-01

- Description**
- Top View**
Continuous anodized aluminum surface mounting profile designed to fit Venus TV product.
 - Aluminum surface mounting bracket. Recommended for overhead mounting 5 brackets per meter (3 brackets for other mountings).
 - Side View**
Continuous anodized aluminum surface mounting profile designed to fit Venus SV product.
 - Aluminum surface mounting bracket. Recommended for overhead mounting 5 brackets per meter (3 brackets for other mountings).

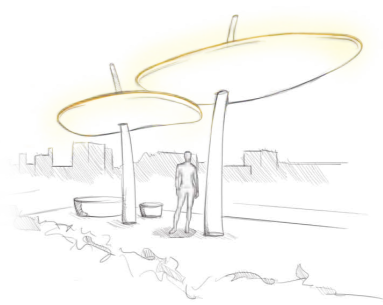


2. Surface-mounted, Clips and profile with mounting channel

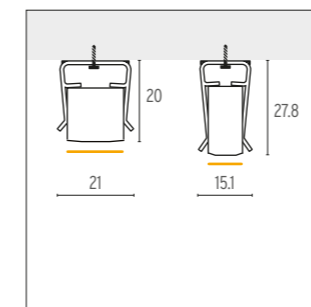


- Mounting accessories**
- Top View**
VarioContour TV CC 2,000 mm (anodized aluminum) inclusive cable raceway
Art.-#: 10000339
 - Side View**
VarioContour SV CC 2,000 mm (anodized aluminum) inclusive cable raceway
Art.-#: 10000520

- Description**
- Top View**
Continuous aluminum surface mounting profile. Cable Runway allows the cables to run underneath the fixture.
 - Continuous aluminum surface mounting profile. Cable Runway allows the cables to run underneath the fixture.



3. Surface-mounted, SST Clips



- Mounting accessories**
- Top View**
VarioClip TV 30 mm 301 (5 clips required/meter, stainless steel - V4A) water features
Art.-#: 13000050-01
 - Side View**
VarioClip SV 30 mm 301 (5 clips required/meter, stainless steel - V4A) water features
Art.-#: 13000051-01

- Description**
- Top View**
Special grade stainless steel surface mounting clip for harsh environments. Recommended to use for overhead mounting 5 brackets per meter (3 brackets for other mountings).
 - Special grade stainless steel surface mounting clip for harsh environments. Recommended to use for overhead mounting 5 brackets per meter (3 brackets for other mountings).

VARIOLED™ FLEX IP67

VarioLED™ Flex IP67 are flexible, linear LED light lines produced in customer specified individual lengths. Depending on the step measurement they are freely scalable and available in lengths of up to 10 m (with large pitch). For applications such as coves, contours, furniture, counters, stairways, etc.

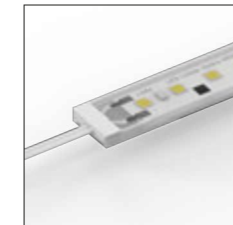
VarioLED™ Flex IP67



High protection and amazing flexibility



High efficiency with up to 76 Lumen/Watt.



IP67 protection against water, salt water and UV radiation through a clear polyurethane encapsulation.



The lamps are delivered ready to plug in with IP67 mini connectors at both ends and can be easily installed with adhesive tape or plastic clips.



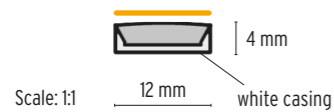
VarioLED™ Flex IP67

Technical Specifications

- White
- IO White
- Color
- RGB
- IP67
- L80/B10 > 60,000 h

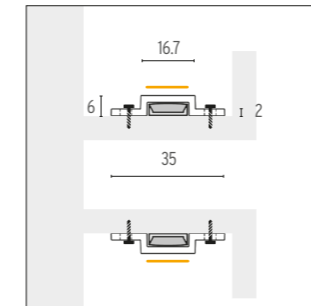


Cross section	12 mm x 4 mm
Length	82 mm - 10,019 mm
Power	3 W/m - 15 W/m
Luminous flux	230 lm/m - 1,880 lm/m
Efficacy	up to 125 lm/W
Beam angle/optics	60°, 160°
Color temperatures	2,500 K, 2,900 K, 3,300 K, 3,800 K, 4,300 K, 5,100 K, 6,100 K and 9,600 K
Colors	Tunable White, Color, RGB
CRI	85 - 95



Mounting All dimensions in mm.

1. Surface-mounted, Clips



Mounting accessories



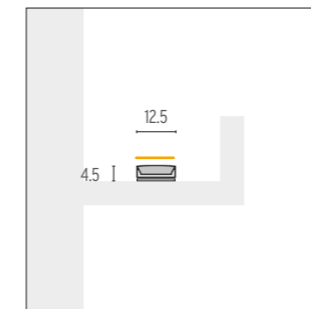
Description

Clear plastic mounting clips. Use to mount the product on hard surfaces. Sold as set of 50 pieces.

Example of applications



2. Surface-mounted, Tape



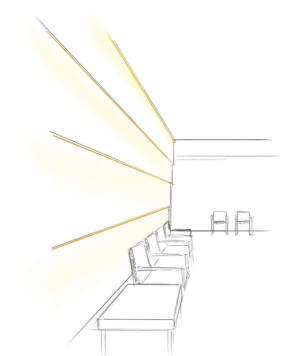
Mounting accessories



Description

Double sided 3M adhesive tape roll. Use to mount products on surfaces.

Example of applications



HYDRALUX™ IP67

IP67 protected field cuttable luminaire with simple assembly that can be easily and individually adapted to any application.

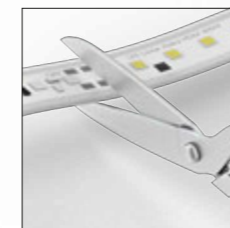


Photo: Photowalas

HYDRALUX™ IP67



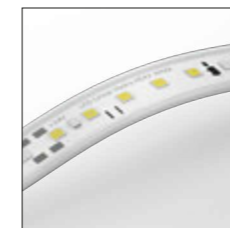
The new standard of light



Cut on site to the desired length.



Quick installation using IP67 connector assembly assembled by adhesive bonding or with clips against external influences (IP67 protection).

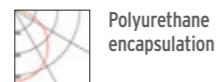


A white base profile with lateral fins and reflective surface ensures high lumen currents of up to 1,880 lm/m.



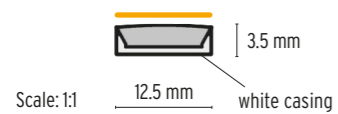
www.led-linear.com/hydralux

LED Linear™ GmbH



Polyurethane encapsulation

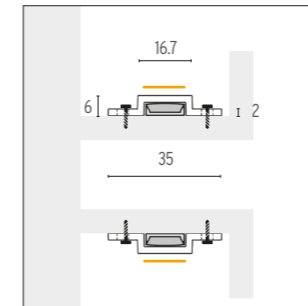
Cross section	12.5 mm x 3.5 mm
Length	4 m - 10 m
Power	3 W/m - 15 W/m
Luminous flux	up to 1,880 lm/m
Efficacy	up to 125 lm/W
Beam angle/optics	120°
Color temperatures	2,500 K, 2,900 K, 3,300 K, 3,800 K, 4,300 K, 5,100 K, 6,100 K and 9,600 K
Colors	RGB
CRI	85 - 95



Scale: 1:1

Mounting All dimensions in mm.

1. Surface-mounted, Clips



Mounting accessories



VarioClip Flex 12.7 mm
Clear (Set of 50)
Art.-#: 13000115

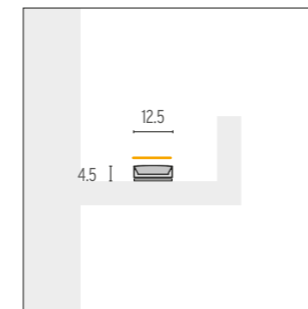
Description

Clear plastic mounting clips. Use to mount the product on hard surfaces. Sold as set of 50 pieces.

Example of applications



2. Surface-mounted, Tape



Mounting accessories



3M Adhesive tape
Art.-#: 182000035

Description

Double sided 3M adhesive tape roll. Use to mount products on surfaces.

Example of applications



RIGID LIGHT LINES

Assortment of rigid IP67 luminaires complementing the flexible line-up for straight lines application on facade, landscapes as well as ambient lighting. Each luminaire consists an extruded aluminum housing in combination with polyurethane encapsulation material offering an optimal waterproof sealing, UV resistance chemical stability against urban and protection against abrasion damages.

VarioLED™ Flex VENUS family White Top View IP67 | Page 32



ADONIS True Color IP67 | Page 54

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 36	220 - 2,470	85 - 96	2,000 - 5,000	639 - 1,827

Compact and robust dot free luminaire that is a rigid equivalent to VENUS with cable groove on its backside. It fascinates with a simple installation with internal mounting clips for recessed or surface-mount without visible light joints and connections.



XOOLINE™ IP67 | Page 58

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 25	290 - 2,550	85 - 95	2,500 - 9,600	380 - 2,005

Modular luminaire with 9 different optics available and side cabling and a large panel of mounting options.



XOOLUM™ IP67 | Page 62

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 25	180 - 1,320	85 - 95	2,400 - 7,200	198 - 4,010

Luminaire with 45° adjustable head with opal encapsulation or reflectors in clear encapsulation for wall-washing, general or accent lighting.



XOOLIGHT™ IP67 | Page 66

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 25	290 - 2,160	85 - 95	2,400 - 7,200	84 - 4,021

Sleek design luminaire for general lighting manufactured to length. Available as pendant, surface and recessed.



VarioLED™ IP67 | Page 70

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
2.9 - 25	320 - 2,880	85 - 95	2,500 - 9,600	82 - 4,019

Pixelized light line produced to the desired length with IP67 connectors on both ends for fast indirect facade lighting installations. Suitable with 10 different optics.

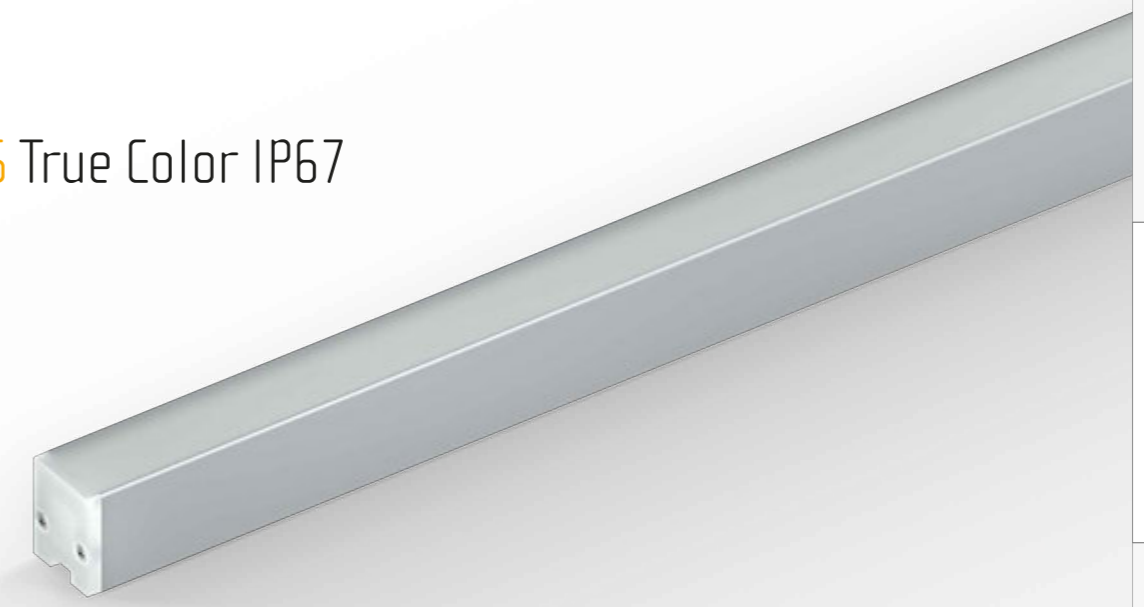


ADONIS TRUE COLOR IP67

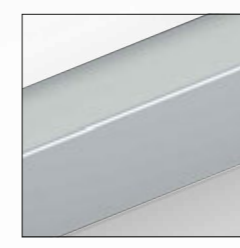
ADONIS True Color is a minimalistic linear luminaire suitable for facade or ceiling direct view applications. A possible output of 2,470 lm/m combined with CCTs ranging between 2,000 K to 5,000 K makes ADONIS True Color a multifunctional luminaire.



ADONIS True Color IP67



Convinces with light intensity and homogeneous light output



True color technology allows a minimal deviation of the color temperature.



Polyurethane is utilized in ADONIS TC to make it more resistant to impact from salt water UV-light and solvents.



The translucent end caps combined with smart cabling and mounting management operated on the back groove the profile enables infinite light lines without dark or hot spots.



www.led-linear.com/adonis

LED Linear™ GmbH

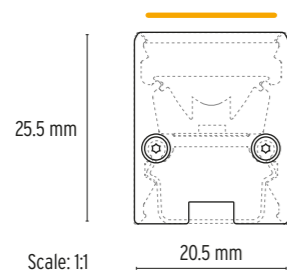
ADONIS True Color IP67

Technical Specifications

- White
- IO White
- RGB
- IP67
- L80/B10 > 60,000 h
- IK10

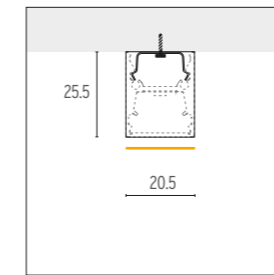


Cross section	20.5 mm x 25.5 mm
Length	639 mm, 952 mm, 1,264 mm, 1,514 mm, 1,827 mm
Power	6 W/m - 36 W/m
Luminous flux	up to 2,470 lm/m
Efficacy	up to 69 lm/W
Beam angle/optics	120°
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), RGB
CRI	up to 96



Mounting All dimensions in mm.

1. Surface Mounting fixed horizontal Mounting accessories

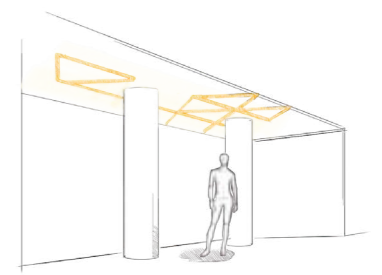


VarioClip 010 Set
Art.-#: 13000202

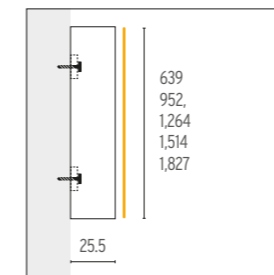
Description

Aluminum mounting clip with washer. Clips inside the fixture profile for invisible mounting. Recommended to use every 60 cm.

Example of applications



2. Surface Mounting fixed vertical Mounting accessories



Sliding block C010 Set,
incl. Screw
Art.-#: 13000287

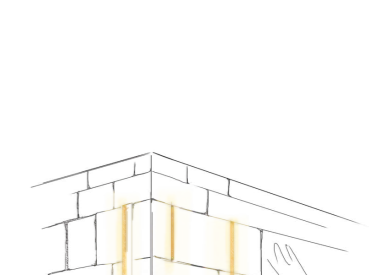


VarioClip 010 Set
Art.-#: 13000202

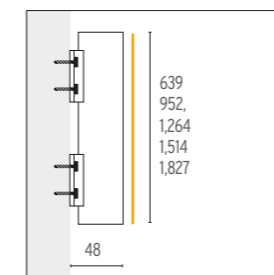
Description

Metal mounting block with set screw for vertical applications. Install inside the fixture profile to stop the fixture from sliding. Recommended to use one mounting lock per fixture and clips every 60 cm.

Example of applications



3. Surface Mounting adjustable Mounting accessories



Sliding block C010 Set,
incl. Screw
Art.-#: 13000287



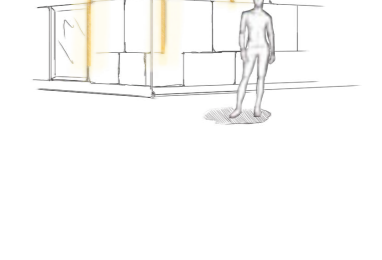
Adjustable Mounting Clip
C007/C010 L140
Art.-#: 13000265-SIL



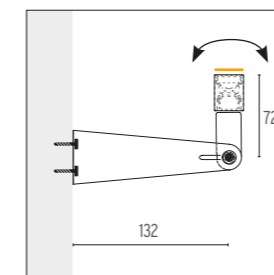
Adjustable Mounting Clip
C007/C010 L140
Art.-#: 13000265-SCH

Description

140 mm adjustable mounting clip with a tilt of 60° to each side. Recommended to use every 60 cm.



4. Wall Mounted adjustable Mounting accessories

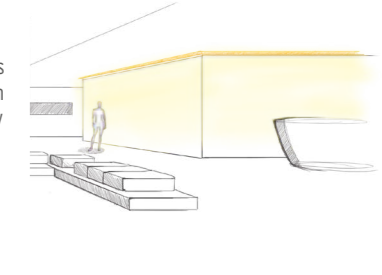


Contour 010 Adjustable
Wall Mount Set
Art.-#: 13000165

Description

Metal surface mounting adjustable wall arm. The set includes mounting block, mounting clip and adjusting screws. Tilts 140° in each direction and screw locks in position. Recommended to use for every 90 cm. Silver finish.

Example of applications



XOOLINE™ IP67

XOOLINE™ is a minimalistic modular luminaire with IP rating of IP67, enabling outdoor use. A possible output of 2,550 lm/m combined with a color temperature (CCT) ranging between 2,500 K to 9,600 K makes XOOLINE™ a multifunctional luminaire.

XOOLINE™ IP67



Setting accents with soft light or precise light direction



Its large range of cover and light sources makes XOOLINE™ a versatile lighting tool-box.



The lumen output up to 2,550 lm/m and max efficiency of 105 lm/W is high for such a minimal fixture. This makes it possible to meet the demands of most projects.



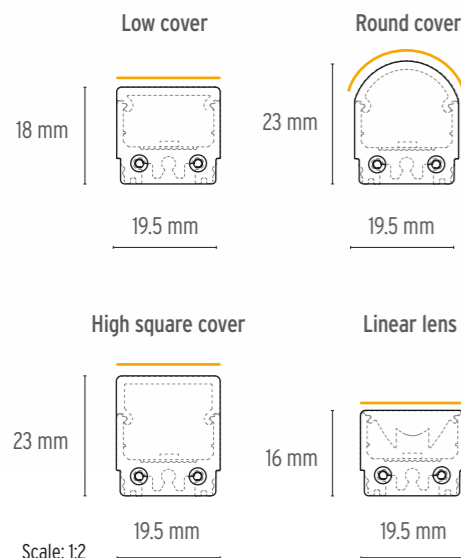
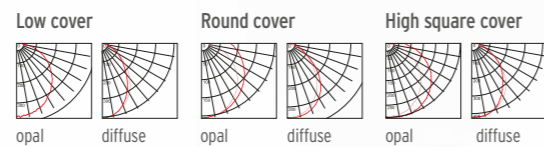
Translucent end caps, making it possible to create slim infinite lines of light with a minimalistic form factor.



XOOLINE™ IP67

Technical Specifications

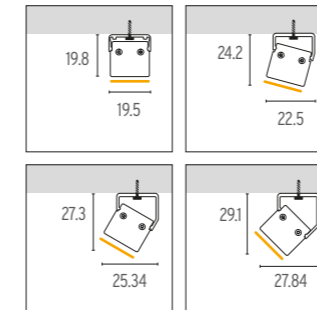
- White
- IO White
- RGB
- IP67
- L80/B10 > 60,000 h



Length	380 mm - 2,005 mm
Power	5 W/m - 25 W/m
Luminous flux	290 lm/m - 2,550 lm/m
Efficacy	98 lm/W - 105 lm/W
Beam angle/optics	Opal, Diffuse
Color temperatures	2,500 K, 2,900 K, 3,300 K, 3,800 K, 4,300 K, 5,100 K, 6,100 K and 9,600 K
Colors	Tunable White (2,700 K - 5,800 K), RGB
CRI	85 - 95

Mounting All dimensions in mm.

1. Surface-mounted*, horizontal



* Low cover

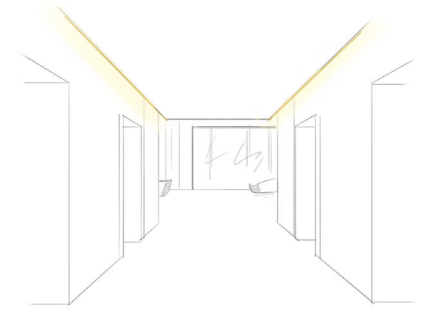
Mounting accessories

- Full length mounting channel
Digits in order code: MP
- 0° aluminum mounting clip in 90 mm length
Digits in order code: CL0
- 15° aluminum mounting clip in 90 mm length
Digits in order code: CL15
- 30° aluminum mounting clip in 90 mm length
Digits in order code: CL30
- 45° aluminum mounting clip in 90 mm length
Digits in order code: CL45

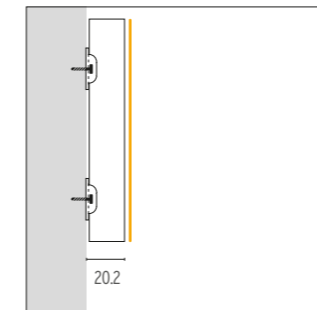
Description

Aluminum surface mounting bracket, recommended to use every 50 cm. Available in four different angles.

Example of applications



2. Surface-mounted, vertical



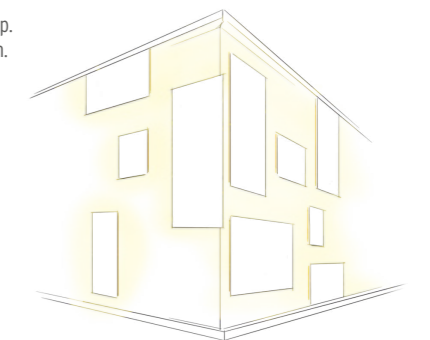
Mounting accessories

- Plastic Mounting Bracket
Digits in order code: PCL

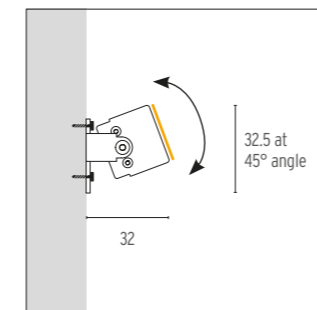
Description

White plastic surface mounting clip. Recommended to use every 50 cm. Cannot be used together with the aluminum mounting profile.

Example of applications



3. Adjustable, vertical



Mounting accessories

- Adjustable Bracket
Digits in order code: AMC

Description

Use to adjust and fix the angle of fixture. 180 degrees adjusting range. Delivered with axis screw.

Example of applications

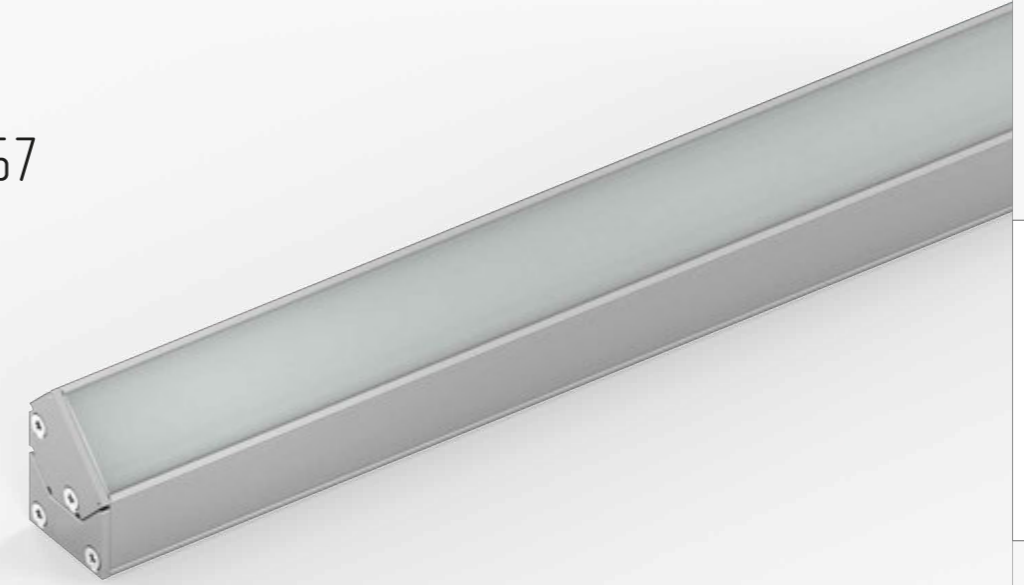


XOOLUM™ IP67

XOOLUM™ is an exceptionally efficient design lamp, which offers enormous modularity and user-friendliness. Through the external converter, the light line retains its sleek shape.

Photo: Stadtwerke Schwerin / Maxpress

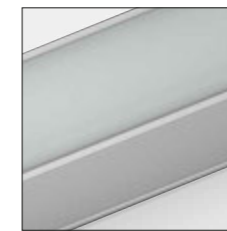
XOOLUM™ IP67



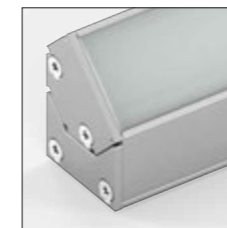
The smallest and brightest lighting solutions for general illumination



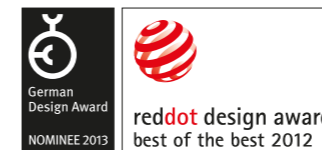
High lumen output up to 1,320 lm/m and efficiency of 102 lm/W in combination with minimalistic design (25.4 mm x 31 mm) makes XOOLUM™ an efficient product.



The range of covers and reflectors (opal, 25°, 65° and Wall Washer) increase the versatility of XOOLUM™.



XOOLUM™ is a two in one fixture thanks to the possibility to mount it with an 45° angle. It can be surface mounted or as pendant fixture.



www.led-linear.com/xoolum

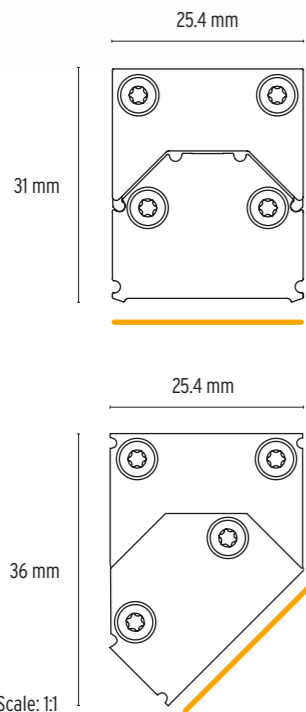


LED Linear™ GmbH

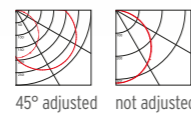
XOOLUM™ IP67

Technical Specifications

- White
- IO White
- Color
- RGB
- IP67
- L80/B10 > 60,000 h
- IK10



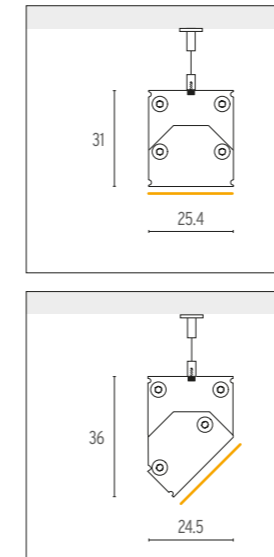
opal encapsulation



Cross section	25.4 mm x 31 mm / 25.4 mm x 36 mm
Length	198 mm - 4,010 mm
Power	6 W/m - 25 W/m
Luminous flux	180 lm/m - 1,320 lm/m
Efficacy	30 lm/W - 53 lm/W
Beam angle/optics	Reflectors: 25°, 65°, WW / Diffusers: Opal, Diffuse, Opal encapsulation
Color temperatures	2,400 K, 2700 K, 3,000 K, 3,500 K, 3,900 K, 4,600 K, 5,500 K and 7,200 K
Colors	Tunable White (2,600 K - 4,900 K), RGB, Color
CRI	85 - 95

Mounting All dimensions in mm.

1. Pendant



Mounting accessories

- VarioPendant 007 Slide Silver Art.-#: 13000157
- VarioPendant 007 Slide Black Art.-#: 13000158
- Square Canopy Set (optional) Art.-#: 13000330

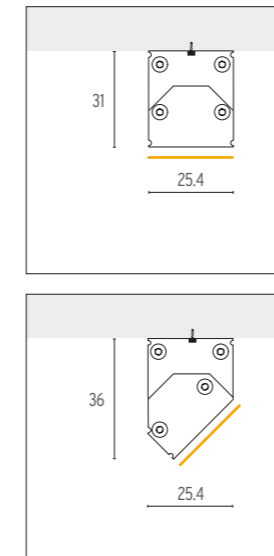
Description

Pendant set with screws for installations directly on the ceiling. 2 m Suspension is cuttable on site. Recommended to use every 1.5 m.

Example of applications



2. Surface-mounted, fixed



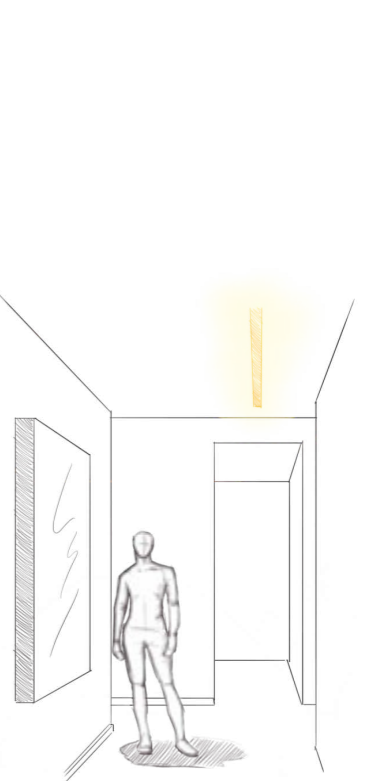
Mounting accessories

No additional accessories are required for this mounting option.

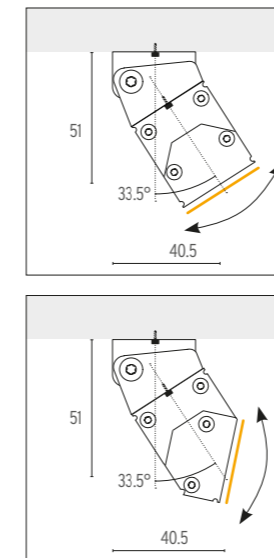
Description

Special designed mounting profile for surface-mounting options. Holes have to be drilled at site.

Example of applications



3. Surface-mounted, adjustable



Mounting accessories

- XOOLUM™ 007 Swivel-Angle Set +/- 45° Art.-#: 13000081

Description

Adjustable clip for extra 45° tilt.

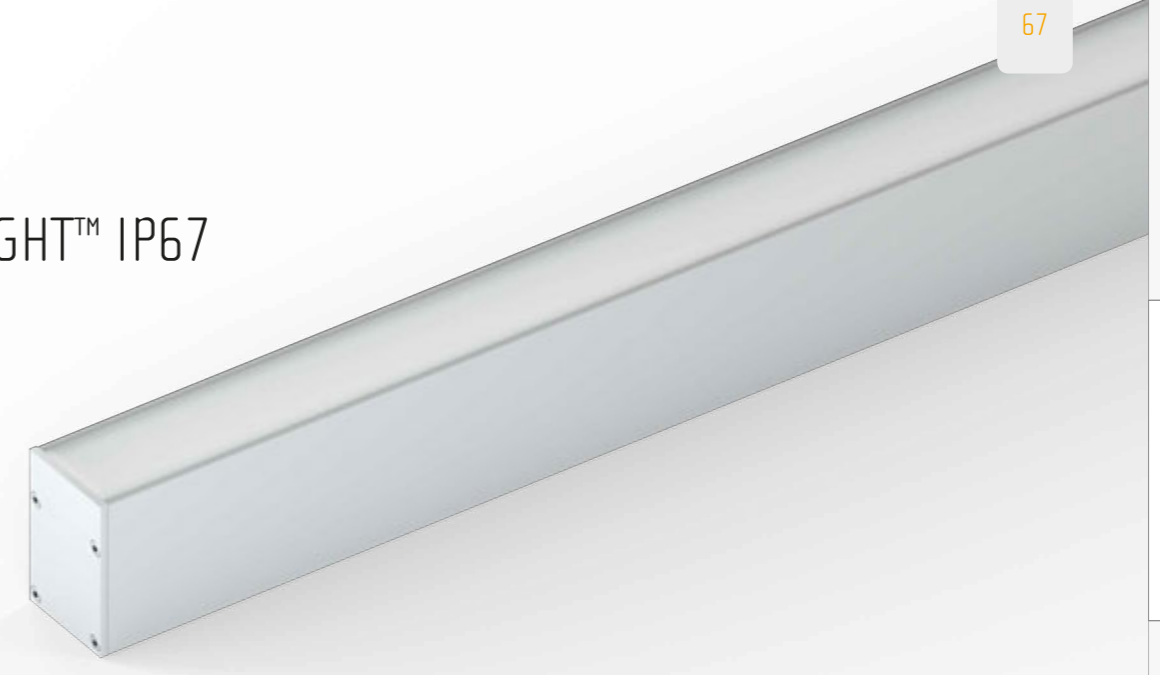
XOOLIGHT™ IP67

XOOLIGHT™ with its classic and elegant design form is a luminaire for general illumination. The wide range of light sources enable a variety of lumen output and make it possible to use the fixture in public areas for ambient lighting.



Photo: BMLD, Barcelona

XOOLIGHT™ IP67



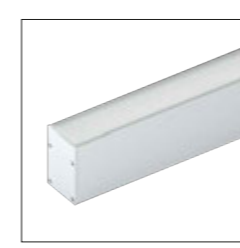
Excellent balance between design and functional lighting



Pleasing form factor of 42 mm x 62 mm.



3 Different mounting possibilities for homogeneity throughout a building. It is therefore possible to utilize the same product at different locations using different construction types.



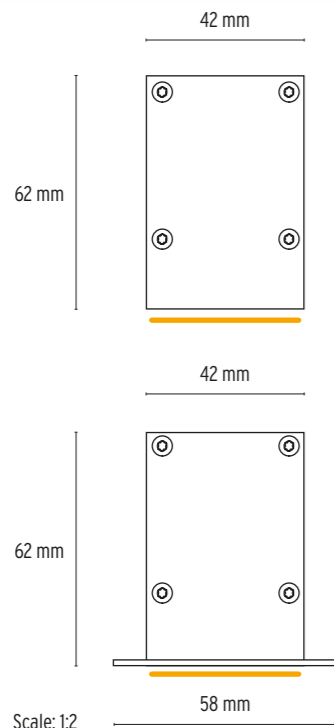
Freely scalable up to 4 m.



XOOLIGHT™ IP67

Technical Specifications

- White
- IO White
- RGB
- IP67
- L80/B10 > 60,000 h



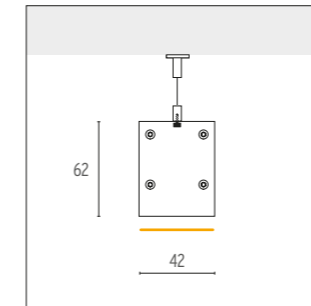
IP67 without lenses only and with opal encapsulation on top

Cross section	42 mm x 62 mm / 58 mm x 62 mm (recessed)
Length	84 mm - 4,021 mm
Power	6 W/m - 25 W/m
Luminous flux	290 lm/m - 2,160 lm/m
Efficacy	44 lm/W - 86 lm/W
Beam angle/optics	Opal
Color temperatures	2,400 K, 2700 K, 3,000 K, 3,500 K, 3,900 K, 4,600 K, 5,500 K and 7,200 K
Colors	Tunable White (2,600 K - 4,900 K), RGB
CRI	85 - 95

Scale: 1:2

Mounting All dimensions in mm.

1. Pendant



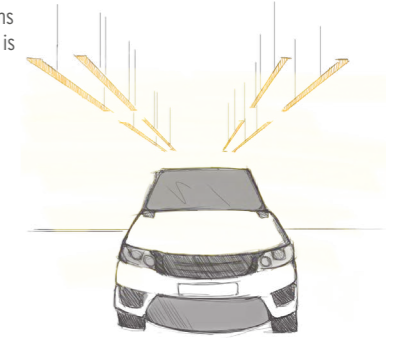
Mounting accessories

- VarioPendant 4262
Art.-#: 13000106
- Square Canopy Set (optional)
Art.-#: 13000330

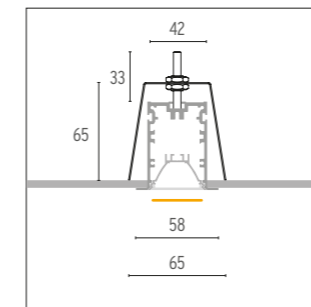
Description

Pendant set with screws for installations directly on the ceiling. 2 m Suspension is cuttable on site. Recommended to use every 1.5 m.

Example of applications



2. Recessed



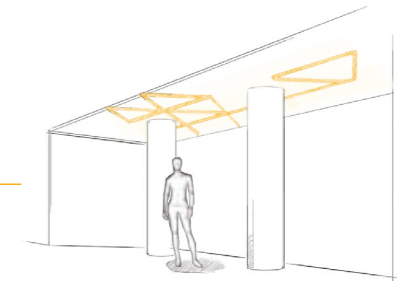
Mounting accessories

- VarioClamp Contour 4262R
Art.-#: 13000080

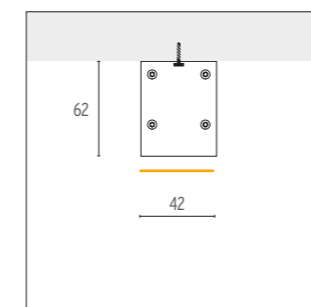
Description

The clamps can be adjusted in height to properly fit the thickness of the ceiling by tightening up the screw/bolt before clicking the light insert in.

Example of applications



3. Surface-mounted, horizontal



Mounting accessories

No additional accessories are required for this mounting option.

Description

Special designed mounting profile for surface-mounting options. Holes have to be drilled at site.

VARIOLED™ IP67

VarioLED™ IP67 fixtures are fully encapsulated linear LED light lines in aluminum profiles with excellent heat dissipation and very high lumen packages of up to 2,900 lm/m suitable for surface mounting and recessed installation and optimal for the indirect illumination of facades, baths and shower rooms, workshops, back lighting and other dusty or humid areas etc.



Photo: Jannes Linders

VarioLED™ IP67



High protection and optimum heat dissipation



Delivered ready to use with an IP67 connector on both ends and can be easily installed via clips or mounting profiles.



The aluminum profile is used for thermal management, so that even powerful LED strips with up to 25 W/m can be used.



The polyurethane encapsulation ensures an IP67 rating and high resistance against salt water and UV radiation by a clear polyurethane encapsulation.

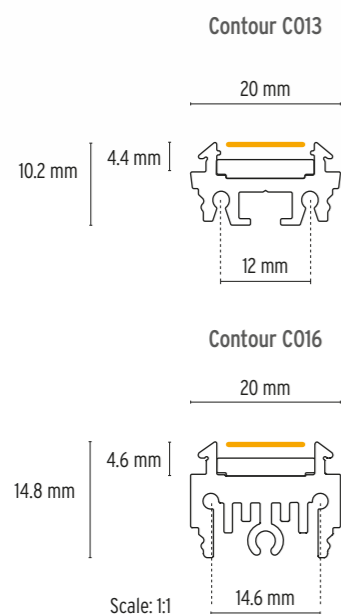


VarioLED™ IP67

Technical Specifications



Polyurethane encapsulation

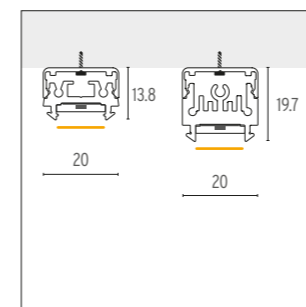


Cross section	20 mm x 10.2 mm / 20 mm x 14.8 mm
Length	up to 4 m
Power	2.9 W/m - 25 W/m
Luminous flux	2,880 lm/m
Efficacy	118 lm/W
Beam angle/optics	120°
Color temperatures	2,500 K, 2,900 K, 3,300 K, 3,600 K, 4,300 K, 4,900 K, 6,600 K and 9,600 K
Colors	Tunable White (2,900 K - 9,600 K), RGB
CRI	85 - 95

Mounting

All dimensions in mm.

1. Surface-mounted, Clips



Mounting accessories



0° aluminum mounting clip
in 90 mm length
Art.-#: 10000040-01

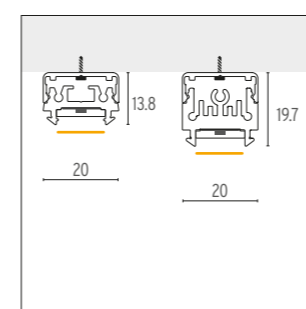
Description

Aluminum surface mounting bracket,
recommended to use every 50 cm.

Example of applications



2. Surface-mounted, Profile



Mounting accessories

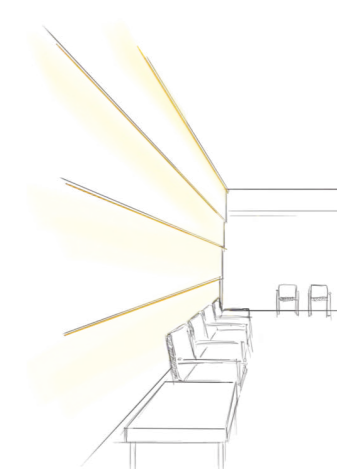


Full length mounting
channel
Art.-#: 10000039

Description

Aluminium surface mounting profile
in 2 m length

Example of applications



IN-GROUND

Robust IP67 walk-over and roll-over (air filled tires) luminaire for in-ground installation with drainage management ideal for parking lots, roads or pedestrian areas. Luminaire using hard polyurethane encapsulation offering an optimal waterproof sealing, UV resistance, chemical stability against urban pollution and protection against abrasion damages.

VarioLED™ Flex VENUS family White Top View IP67 | Page 32

Photo: Omri Amsalem



VarioLED™ OCEANOS True Color IP67 | Page 76

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 24	360 - 1,640	85 - 96	2,000 - 5,000	520 or 1,020

Robust, roll-over, dot free and homogeneous light line with 10° and 30° made of V4A stainless steel available in two standard lengths.



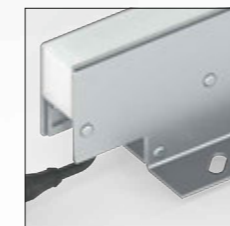
VARIOLED™ OCEANOS TRUE COLOR IP67

Precise engineered linear fixtures with IP67 and IK10 classifications suitable for challenging application environments. Installation system designed specifically for linear outdoor in-ground applications with continuous, homogeneous or directional lighting effects.

VarioLED™ OCEANOS True Color IP67



Soft and endless in-ground light lines to lead the way



The V4A stainless steel housing makes the fixture extremely resistant to impact and helps to increase the resistance against vehicles driving over it.



The many different optics enable adaptability to different projects. The 10° optic suit well for wall grazing, as the 30° and opal are suitable for accent lighting.



IK10 classification and suitable for walk and drive over according to DIN EN 60598-2-13.



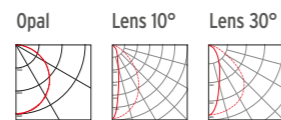
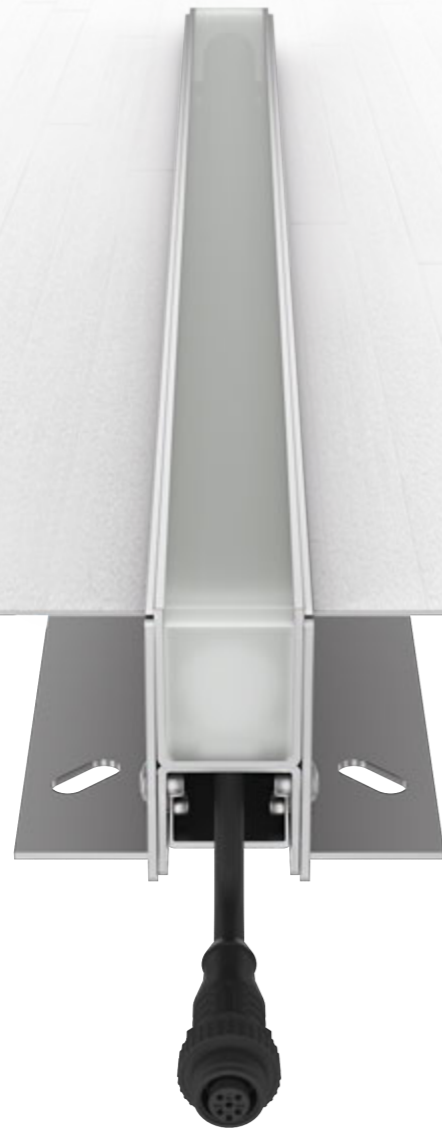
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LED Linear™ GmbH

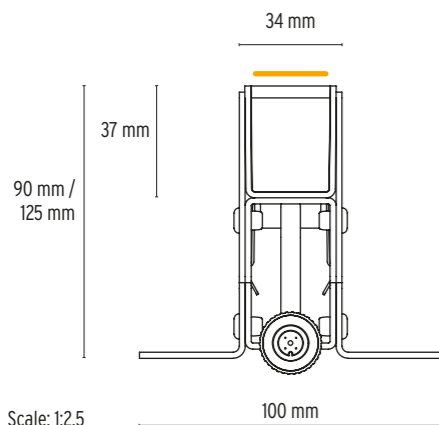
VarioLED™ OCEANOS True Color IP67

Technical Specifications

- White
- IO White
- RGB
- IP67
- L80/B10 > 60,000 h
- IK10

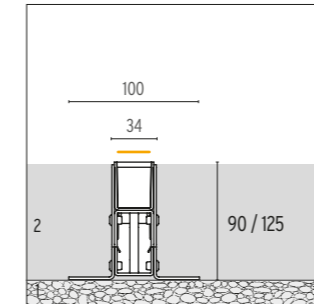


Cross section	37 mm x 30 mm (fixture only)
Length	520 mm or 1,020 mm
Power	6 W/m - 24 W/m
Luminous flux	up to 1,640 lm/m
Efficacy	up to 110 lm/W
Beam angle/optics	Opal, 10° or 30° (clear encapsulation)
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), RGB
CRI	85 - 96



Mounting All dimensions in mm.

1. In-ground



1. solid base with drainage possibility
2. materials like stone, concrete, cement, rock, paving

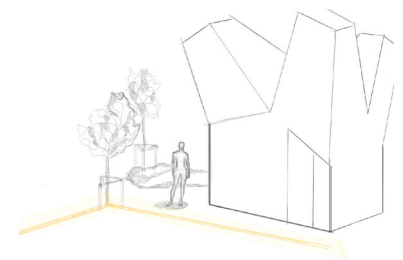
Mounting accessories

-  OCEANOS TC End Cap Mounting Kit
Art.-#: 11000226
-  OCEANOS TC Dismounting tool
Art.-#: 13100031
-  OCEANOS TC IP67 Cable Protection Cap
Art.-#: 15000133

Description

- Recommended at the end of each light lines to prevent vandalism.
- Use to take the fixture out of the inground mounting frame.
- Use to cap and seal the unused end of the cable before starting the inground installation. Required to maintain IP67 grade.

Example of applications



GRAZER

Collection of IP65/67 luminaires with high lumen outputs and tight angle optics for longitudinally homogeneous outstanding grazing effects.



KALYPSO True Color IQ White/RGB IP67 | Page 86



XOOLUX™ NANO IP65 | Page 82

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 40	320 - 2,670	95	2,200 - 5,000	258 - 1,008

XOOLUX™ NANO is a minimalistic and flat luminaire designed primarily for grazing applications. The updated IP classification now stretch to IP65, meaning water resistance and suitable for canopied outdoor use.



KALYPSO True Color IP67 | Page 86

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 36	330 - 3,580	85 - 95	2,000 - 5,000	639 - 1,827

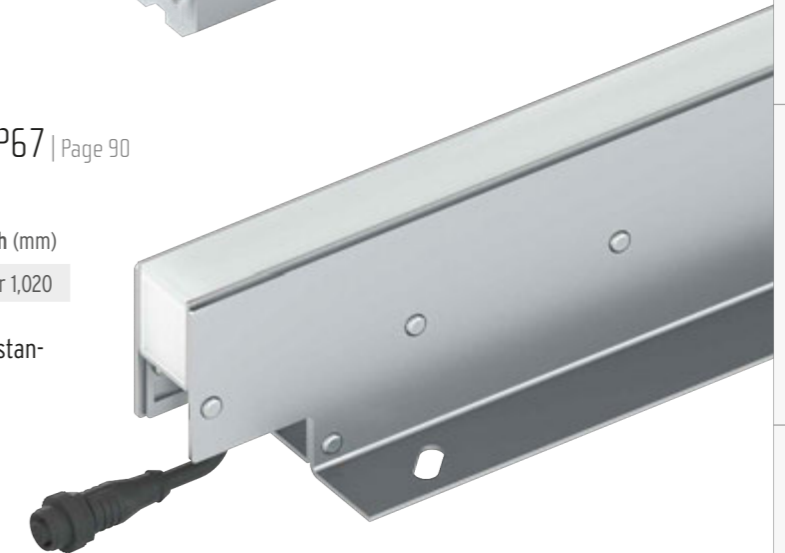
Compact and robust grazing luminaire in a small form factor. KALYPSO TC is designed with a cable groove that makes it possible to install the fixture without cables and clips disturbing the finish.



VarioLED™ OCEANOS True Color IP67 | Page 90

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 24	360 - 1,640	85 - 96	2,000 - 5,000	520 or 1,020

Robust in ground grazer made of V4A stainless steel available in standard lengths and 10° and 30° beam optic.



XOOLUX™ NANO IP65

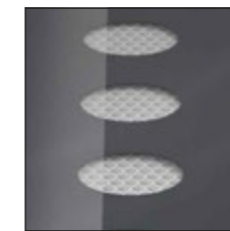
A sleek and functional design enables mountings close to the illuminated surface while keeping the luminaire as discrete as possible in the architecture for optimal grazing effects and minimally invasive installation.



XOOLUX™ NANO IP65



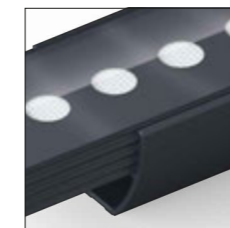
The age of nano optics has begun



Nano lens optics allow precise control of the light distribution while maximizing lumen output and minimizing color over angle for crisp and homogeneous grazing.



Different light distributions makes XOOLUX™ NANO the go-to product for grazing- as well as delicate flooding applications.



Further improving flexibility is achieved through the use of mounting clips, enabling tilt angles every 5° increments from 0° to 45°.

NANO
RAY



www.led-linear.com/xoolux

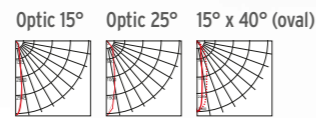


LED Linear™ GmbH

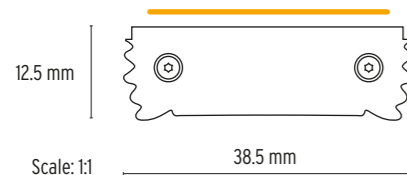
XOOLUX™ NANO IP65

Technical Specifications

- White
- IO White
- IP65
- L80/B10 > 60,000 h

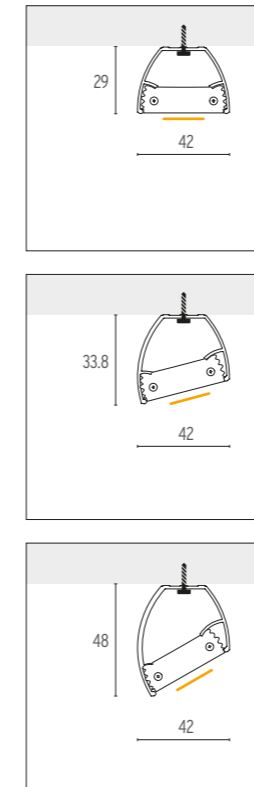


Cross section	38.5 mm x 12.5 mm
Length	up to 1 m
Power	5 W/m - 40 W/m
Luminous flux	up to 2,670 lm/m
Efficacy	up to 72 lm/W
Beam angle/optics	Oval (15° x 40°), 15° or 25°
Color temperatures	2,200 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 5,000 K)
CRI	85 - 95




Mounting All dimensions in mm.

1. Ceiling



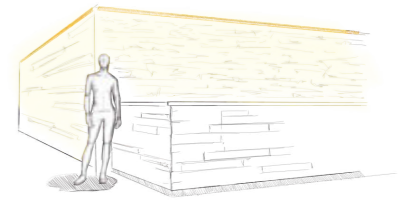
Mounting accessories

-  XOOLUX™ NANO Mounting Bracket, 0° Black Plastic Art. #: 13000291-SCH
-  XOOLUX™ NANO Mounting Bracket, 0° - 15° Black Aluminum Art. #: 13000292-SCH
-  XOOLUX™ NANO Mounting Bracket, 15° - 30° Black Aluminum Art. #: 13000293-SCH
-  XOOLUX™ NANO Mounting Bracket, 30° - 45° Black Aluminum Art. #: 13000294-SCH

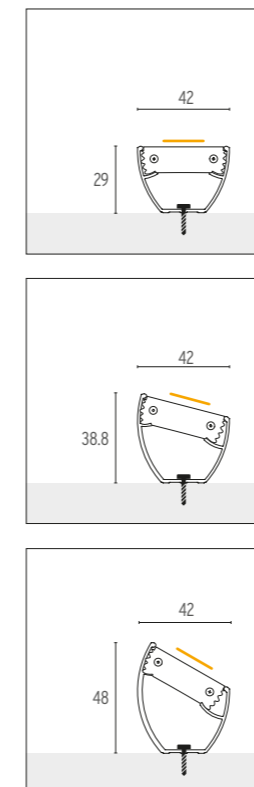
Description

5 cm long, surface mounting brackets. Installs with screws to surface. The product can be tilted every 5 degrees inside the bracket. Plastic lips for indoor use only. Recommended to use every 50 cm.




Example of applications



2. Surface-mounted



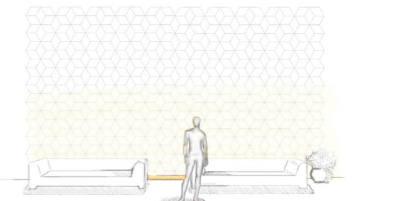
Mounting accessories

-  XOOLUX™ NANO Mounting Bracket, 0° Black Plastic Art. #: 13000291-SCH
-  XOOLUX™ NANO Mounting Bracket, 0° - 15° Black Aluminum Art. #: 13000292-SCH
-  XOOLUX™ NANO Mounting Bracket, 15° - 30° Black Aluminum Art. #: 13000293-SCH
-  XOOLUX™ NANO Mounting Bracket, 30° - 45° Black Aluminum Art. #: 13000294-SCH

Description

5 cm long, surface mounting brackets. Installs with screws to surface. The product can be tilted every 5 degrees inside the bracket. Plastic lips for indoor use only. Recommended to use every 50 cm.

Example of applications



KALYPSO TRUE COLOR IP67

KALYPSO True Color is a minimalistic luminaire suitable for wall grazing. Due to its three optics, IP67 and IK rating, a large range of applications is covered. A maximum output of 3,580 lm/m combined with a CCT ranging between 2,000 K to 5,000 K makes KALYPSO True Color a multifunctional luminaire.



Photo: studiocandela

KALYPSO True Color IP67



True
Color



Convinces with light intensity and precise light control



High lumen output in minimalistic design with a small cross section of (W x H) 20.5 mm x 25.5 mm.



Screwed translucent end caps for continuous rows and an optimal sealing at both ends of the luminaire.



Robust polyurethane encapsulated fixture with IP67 and IK10 classification.



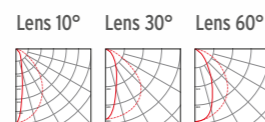
www.led-linear.com/kalypso

LED Linear™ GmbH

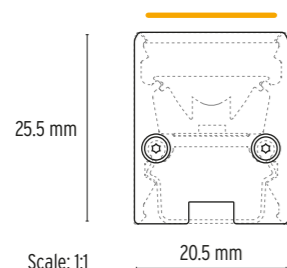
KALYPSO True Color IP67

Technical Specifications

- White
- IO White
- RGB
- IP67
- L80/B10 > 60,000 h
- IK10

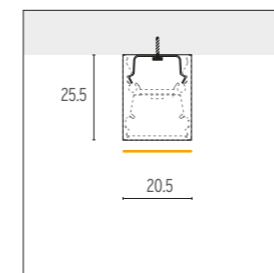


Cross section	20.5 mm x 25.5 mm
Length	639 mm, 952 mm, 1,264 mm, 1,514 mm, 1,827 mm
Power	6 W/m - 36 W/m
Luminous flux	up to 3,580 lm/m
Efficacy	101 lm/W
Beam angle/optics	10°, 30°, 60°
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), RGB
CRI	85 - 95



Mounting All dimensions in mm.

1. Surface Mounting fixed horizontal Mounting accessories



VarioClip 010 Set
Art.-#: 13000202

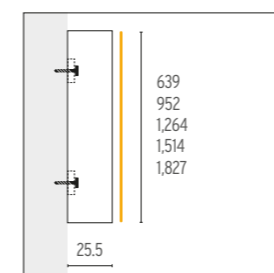
Description

Aluminum mounting clip with washer. Clips inside the fixture profile for an invisible mounting. Recommended to use every 60 cm.

Example of applications



2. Surface Mounting fixed vertical Mounting accessories



Sliding block C010 Set, incl. Screw
Art.-#: 13000287

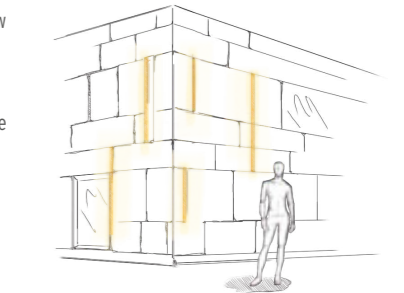


VarioClip 010 Set
Art.-#: 13000202

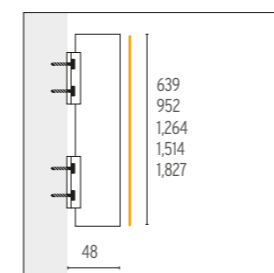
Description

Metal mounting block with set screw for vertical applications. Install inside the fixture profile to stop the fixture from sliding. Recommended to use one mounting lock per fixture and clips every 60 cm.

Example of applications



3. Surface Mounting adjustable Mounting accessories



Sliding block C010 Set, incl. Screw
Art.-#: 13000287



Adjustable Mounting Clip C007/C010 L140
Art.-#: 13000265-SIL

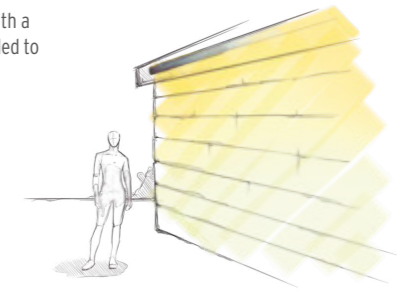


Adjustable Mounting Clip C007/C010 L140
Art.-#: 13000265-SCH

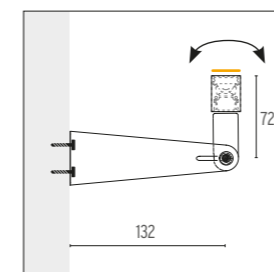
Description

140 mm adjustable mounting clip with a tilt of 60° to each side. Recommended to use every 60 cm.

Example of applications



4. Wall Mounted adjustable Mounting accessories

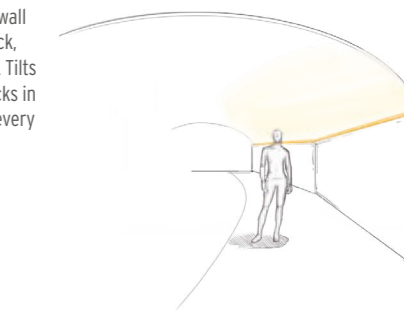


Contour 010 Adjustable Wall Mount Set
Art.-#: 13000165

Description

Metal surface mounting adjustable wall arm. The set includes mounting block, mounting clip and adjusting screws. Tilts 140° in each direction and screw locks in position. Recommended to use for every 90 cm. Silver finish.

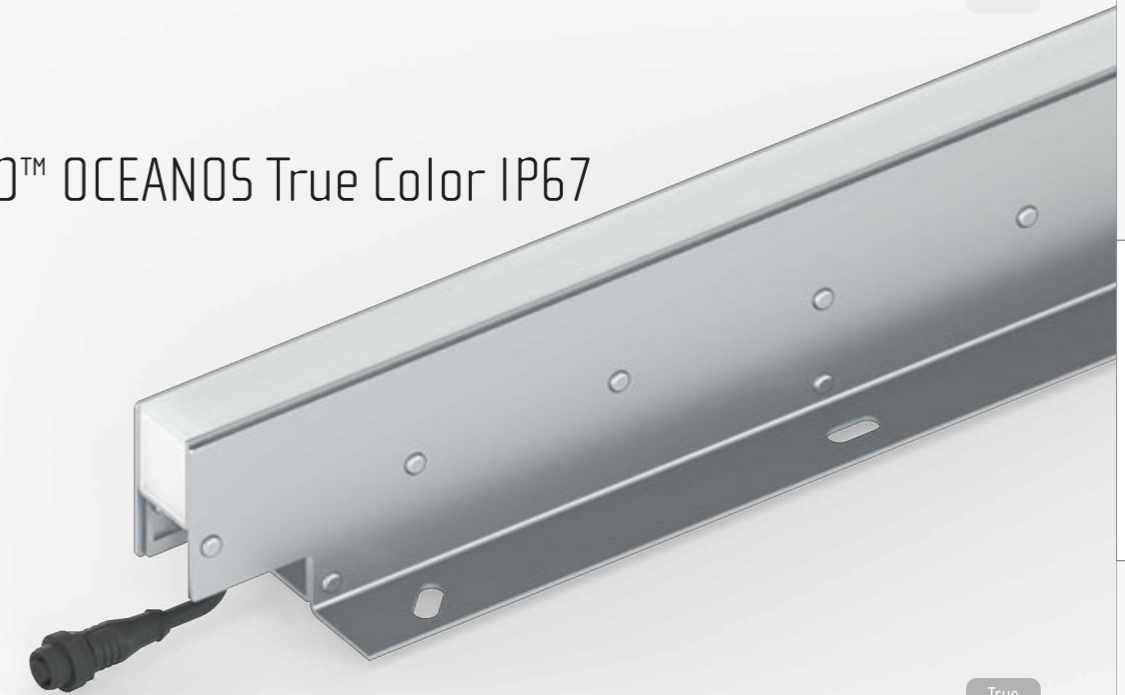
Example of applications



VARIOLED™ OCEANOS TRUE COLOR IP67

Complete system solution designed and engineered to offer a robust housing (IK10) with continuous, homogeneous and directional lighting effects with 10° optics for wall grazing and 30° optics for accent lighting.

VarioLED™ OCEANOS True Color IP67



In ground drive over linear LED luminaire



OCEANOS True Color has an environmental resistance of IP67. This is made possible thanks to the unique polyurethane encapsulation.



The many different optics enable adaptability to different projects. The 10° optic suit well for wall grazing, as the 30° and opal are suitable for accent lighting.



OCEANOS True Color has an IK10 classification hence is very robust. The ability to withstand a pressure of 30kN is equivalent to being traversed by a vehicle according to DIN-EN-60598-2-13.

True
Color



Stainless
steel
housing



INTRO

OUTDOOR

INDOOR

FLEXIBLE LIGHT ENGINE

MIX & MATCH

DESIGN LUMINAIRES

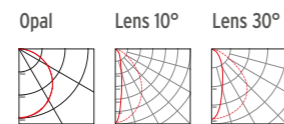
APPENDIX



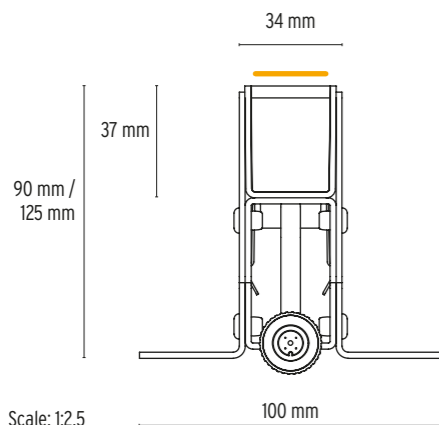
VarioLED™ OCEANOS True Color IP67

Technical Specifications

- White
- IO White
- RGB
- IP67
- L80/B10 > 60,000 h
- IK10

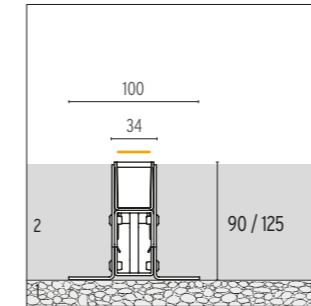


Cross section	37 mm x 30 mm
Length	520 mm or 1,020 mm
Power	6 W/m - 24 W/m
Luminous flux	up to 1,640 lm/m
Efficacy	up to 110 lm/W
Beam angle/optics	Opal, 10° or 30° (clear encapsulation)
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), RGB
CRI	85 - 96



Mounting All dimensions in mm.

1. In ground



1. solid base with drainage possibility
2. materials like stone, concrete, cement, rock, paving

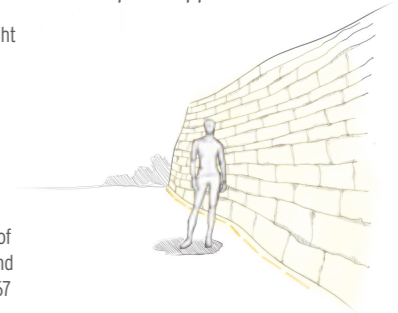
Mounting accessories

-  OCEANOS TC End Cap Mounting Kit
Art.-#: 11000226
-  OCEANOS TC Dismounting tool
Art.-#: 13100031
-  OCEANOS TC IP67 Cable Protection Cap
Art.-#: 15000133

Description

- Recommended at the end of each light lines to prevent vandalism.
- Use to take the fixture out of the inground mounting frame.
- Use to cap and seal the unused end of the cable before starting the inground installation. Required to maintain IP67 grade.

Example of applications



INDOOR

Modular set of decorative to functional lighting solutions for indoor applications.

96 | **ALLROUNDER**
Modular by definition.

114 | **GENERAL LIGHTING & TASK LIGHTING**
Family of luminaires providing uniform lighting ambiance with limited glare to create the substitute of natural lighting within an enclosed indoor space.

148 | **COVE**
Cove lighting system creating an ambient glow in the space purely with reflected lighting leading to a softer and soothing atmosphere.

154 | **WALL WASH**
Collection of luminaires with asymmetric lighting optimized for Wall-wash application offering uniform vertical illumination of surfaces.

165 | **IN-GROUND**
Assortment of in-ground light lines for guidance, decorative or grazing lighting applications.

VarioLED™ Flex VENUS family White Top View IP67 | Page 32
VarioLED™ Flex HYDRA LD White | Page 178

Photo: David Wakely Photography

ALLROUNDER

Family of highly modular luminaires with slim extruded aluminum housings which can implement various optics. These luminaires can be used for grazing, ambient, decorative or indirect lighting as well as in coves.

VarioLED™ Flex HYDRA HD White | Page 178

Lighting Design: Licht Kunst Licht
Photo: Sichau & Walter Architekten



XOOLINE™ IP40 | Page 98

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 42	380 - 5,000	85 - 95	2,000 - 5,000	380 - 2,005

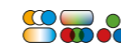
Minimalistic modular surface mount luminaire with 9 different optics available for any application, side cabling and a large panel of mounting accessories.



LYRA IP40 | Page 102

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 25	270 - 3,240	85 - 95	2,000 - 5,000	73 - 4,010

Elegant and chic round luminaire with the choice of LD and HD tapes further increasing the possibility of creating unique solutions.



XOOLUM™ IP40 | Page 106

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 42	120 - 3,350	85 - 95	2,000 - 5,000	135 - 4,010

Compact luminaire with adjustable luminaire head (45°) which offers enormous modularity lighting effect and mounting wise.



LUNA IP40 | Page 110

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 42	228 - 5,000	85 - 95	2,000 - 5,000	135 - 4,010

Sister of XOOLINE™ as a recessed version offering 3 more optics.



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XOOLINE™ IP40

XOOLINE™ is a minimalistic modular luminaire suitable for wall washing, wall grazing and general lighting. The IP rating ranges up to IP67, enabling outdoor use. A possible output of 5,000 lm/m combined with a color temperature (CCT) ranging between 2,000 K to 5,000 K makes XOOLINE™ a multifunctional luminaire.

XOOLINE™ IP40

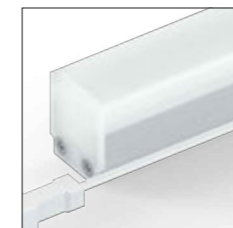
Modular linear LED luminaire with minimal foot-print



Translucent end caps and side cabling, making it possible to create infinite lines of light.



The lumen output up to 5,000 lm/m and max efficiency of 140 lm/W is high for such a minimal fixture. This makes it possible to meet the demands of most projects.



Minimalistic form factor enabling seamless integration.



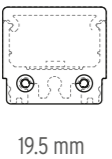
XOOLINE™ IP40

Technical Specifications

- White
- IO White
- RGB
- IP40



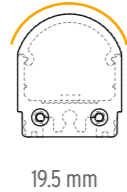
Low cover



16 mm

19.5 mm

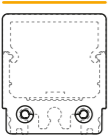
Round cover



23 mm

19.5 mm

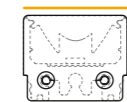
High square cover



23 mm

19.5 mm

Linear lens



16 mm

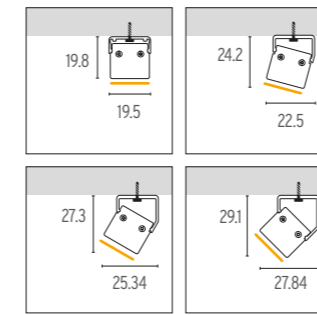
19.5 mm

Scale: 1:2

	Low cover	Round cover	High square cover	Linear lens
Length	up to 2,005 mm			
Power	5 W/m - 42 W/m			
Luminous flux	380 lm/m - 5,000 lm/m			
Efficacy	up to 140 lm/W			
Beam angle/optics	opal, diffuse	opal, diffuse	opal, diffuse	10°, 30°, 60°
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K			
Colors	Tunable White (2,200 K - 4,000 K), RGB			
CRI	85 - 95			






Mounting All dimensions in mm.

1. Surface-mounted*, horizontal



* Low cover

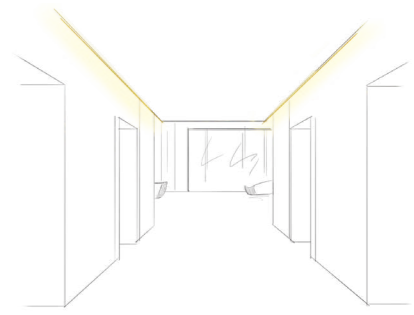
Mounting accessories

-  Full length mounting channel
Digits in order code: MP
-  0° aluminum mounting clip in 90 mm length
Digits in order code: CL0
-  15° aluminum mounting clip in 90 mm length
Digits in order code: CL15
-  30° aluminum mounting clip in 90 mm length
Digits in order code: CL30
-  45° aluminum mounting clip in 90 mm length
Digits in order code: CL45

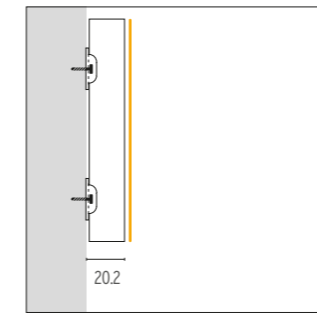
Description

Aluminum surface mounting bracket, recommended to use every 50 cm. Available in four different angles.

Example of applications



2. Surface-mounted, vertical



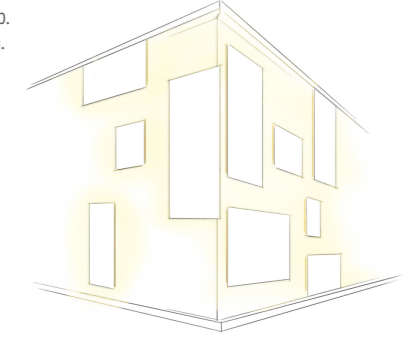
Mounting accessories

-  Plastic Mounting Bracket
Digits in order code: PCL

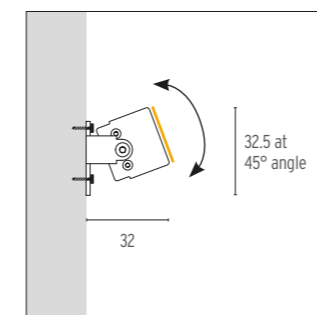
Description

White plastic surface mounting clip. Recommended to use every 50 cm. Cannot be used together with the aluminum mounting profile.


Example of applications



3. Adjustable, vertical



Mounting accessories

-  Adjustable Bracket
Digits in order code: AMC

Description

Use to adjust and fix the angle of fixture. 180 degrees adjusting range. Delivered with axis screw.

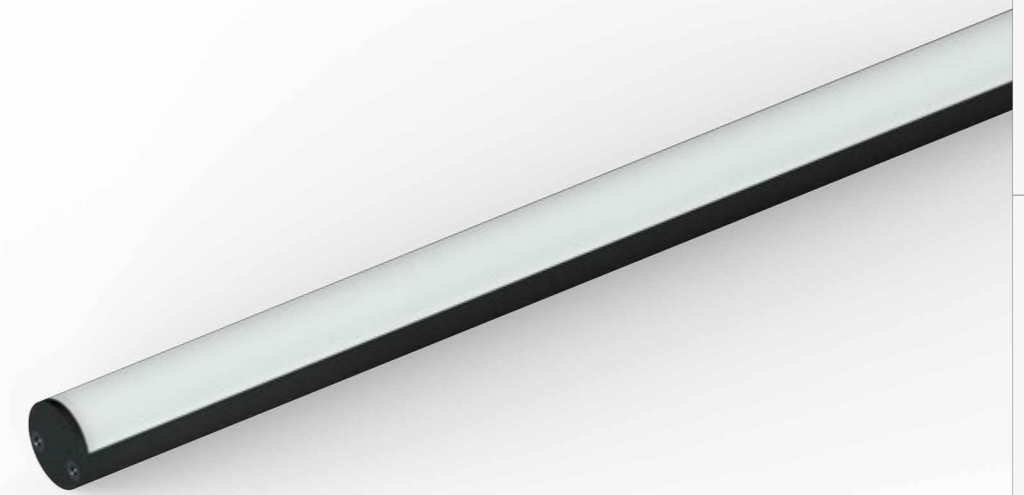
Example of applications



LYRA IP40

LYRA is a slim luminaire, applicable as pendant or surface mount. The possibility to rotate the fixture makes it possible to illuminate targets in any direction.

LYRA IP40



Perfectly shaped and stylish lighting solution



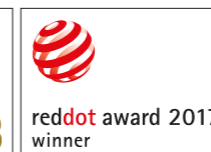
The lumen output up to 3,240 lm/m is high for such a minimalistic fixture.



The elegant spirit of LYRA is also shown in the mounting clips, which enable both pendant and surface mount.



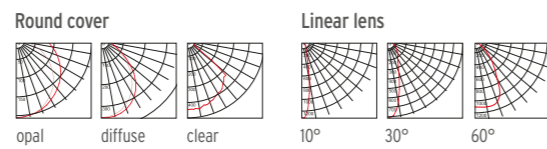
The possibility to choose between a linear lens or a clear cover provides flexibility and makes it possible to create multiple light distributions.



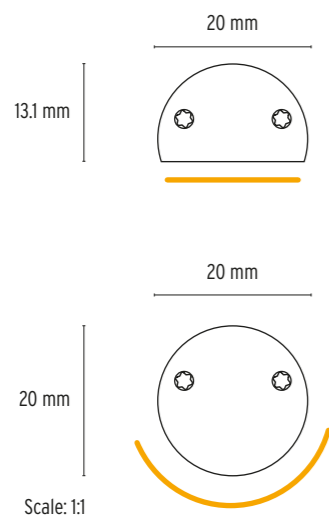
LYRA IP40

Technical Specifications

- White
- IO White
- RGB
- IP40

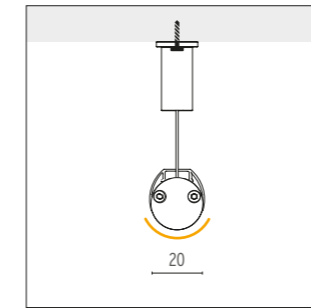


Cross section	∅ 20 mm
Length	up to 4,010 mm
Power	5 W/m - 25 W/m
Luminous flux	up to 3,240 lm/m
Efficacy	up to 130 lm/W
Beam angle/optics	10°, 30°, 60°, opal, diffuse, clear
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (HYDRA: 2,500 K - 4,000 K/ATON: 2,200 K - 4,000 K), RGB
CRI	85 - 95
Profile colors	Black, Silver






Mounting All dimensions in mm.

1. Pendant



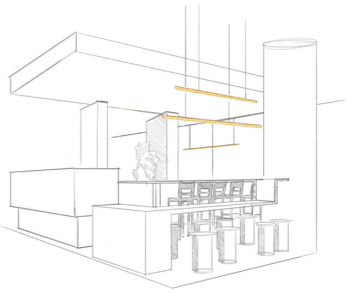
Mounting accessories

-  VarioPendant 024 Set Silver
Art.-#: 13000161
-  VarioPendant 024 Set Black
Art.-#: 13000161-SCH
-  Square Canopy Set (optional)
Art.-#: 13000330

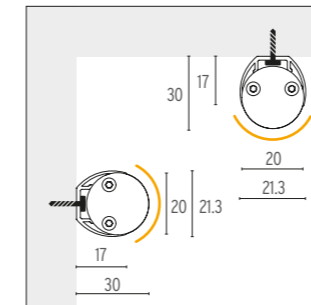
Description

Pendant set with screws for installations directly on the ceiling. 2 m Suspension is cuttable on site. Recommended to use every 1.5 m.

Example of applications



2. Surface mounted



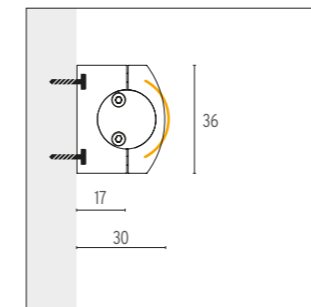
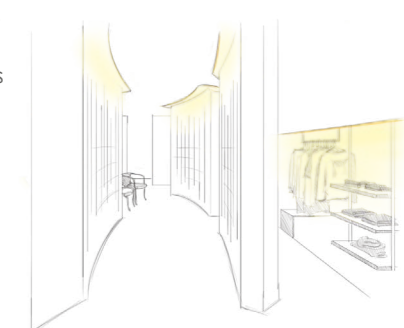
Mounting accessories


-  VarioClip 024 Silver
Art.-#: 13000160
-  VarioClip 024 Black
Art.-#: 13000160-SCH

Description

Surface mount clips with screws for installation directly on the wall or ceiling. Recommended to use 2 clips per meter.

Example of applications



-  VarioContour 024 Surface Mounting Set
Art.-#: 13000162

XOOLUM™ IP40

XOOLUM™ is applicable in almost any area and project thanks to the many covers and reflectors. The mounting possibilities are surface, pendant and cove and it is possible to tilt the fixture in an 45° angle.

XOOLUM™ is suitable as the general or functional light source in offices, production areas, schools and museums.

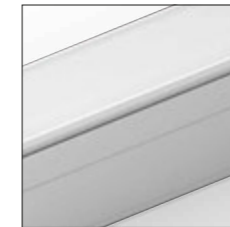
XOOLUM™ IP40



The smallest and brightest lighting solutions for general illumination



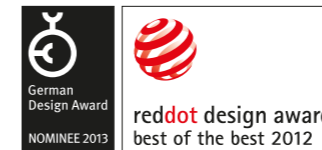
High lumen output up to 3,670 lm/m and efficiency of 100 lm/W in combination with a minimalist design makes XOOLUM™ an efficient product.



The range of covers and reflectors (25°, 65° and Wall Washer) increase the flexibility of XOOLUM™.



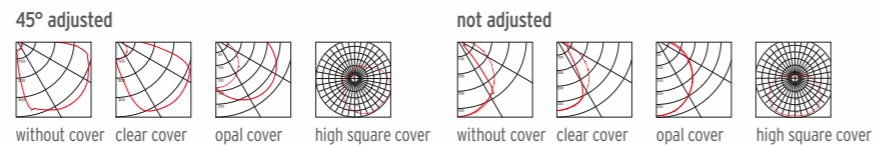
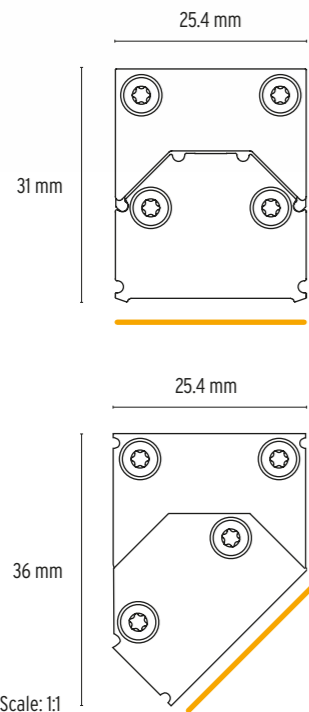
XOOLUM™ is a two in one fixture thanks to the possibility to mount it with an 45° angle. The mounting possibilities are surface, pendant and cove.



XOOLUM™ IP40

Technical Specifications

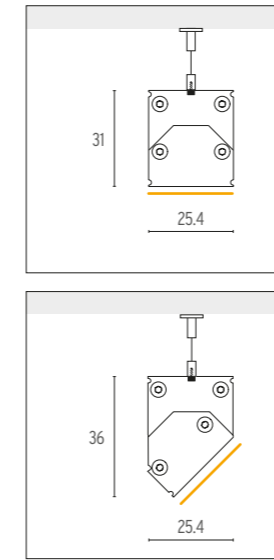
- White
- IQ White
- Color
- RGB
- RGBW
- IP40



Cross section	25.4 mm x 31 mm / 25.4 mm x 36 mm
Length	135 mm - 4,010 mm
Power	6 W/m - 42 W/m
Luminous flux	120 lm/m - 3,550 lm/m
Efficacy	15 lm/W - 97 lm/W
Beam angle/optics	Opal, Clear, without cover (Reflector optics please see page 140)
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), Color, RGBW, RGB
CRI	85 - 95

Mounting All dimensions in mm.

1. Pendant



Mounting accessories

- VarioPendant 007 Slide Silver
Art.-#: 13000157
- VarioPendant 007 Slide Black
Art.-#: 13000158
- Square Canopy Set (optional)
Art.-#: 13000330

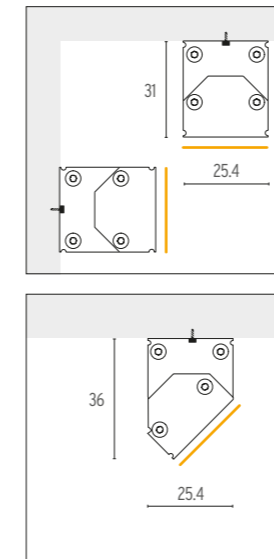
Description

Pendant set with screws for installations directly on the ceiling. 2 m Suspension is cuttable on site. Recommended to use every 1.5 m.

Example of applications



2. Surface-mounted, fixed



Mounting accessories

No additional accessories are required for this mounting option.

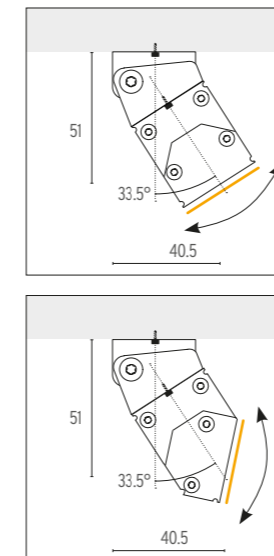
Description

Special designed mounting profile for surface-mounting options. Holes have to be drilled at site.

Example of applications



3. Surface-mounted, adjustable



Mounting accessories

- XOOLUM™ 007 Swivel-Angle Set +/- 45°
Art.-#: 13000081

Description

Adjustable clip for extra 45° tilt.

LUNA IP40

LUNA is a recessed luminaire with IP40 classification. It is possible to choose between 12 different optics. The smooth lines of LUNA with a flat cover is perfectly integrated into ceiling creating long light lines. This makes it possible to meet the demands of most projects.

LUNA IP40



Discreet and elegant - the lighting solution for recessed applications



9 different covers for flexibility in applications and 3 different lenses increases possible solutions.



High lumen output in minimalistic design up to 5,000 lm/m.



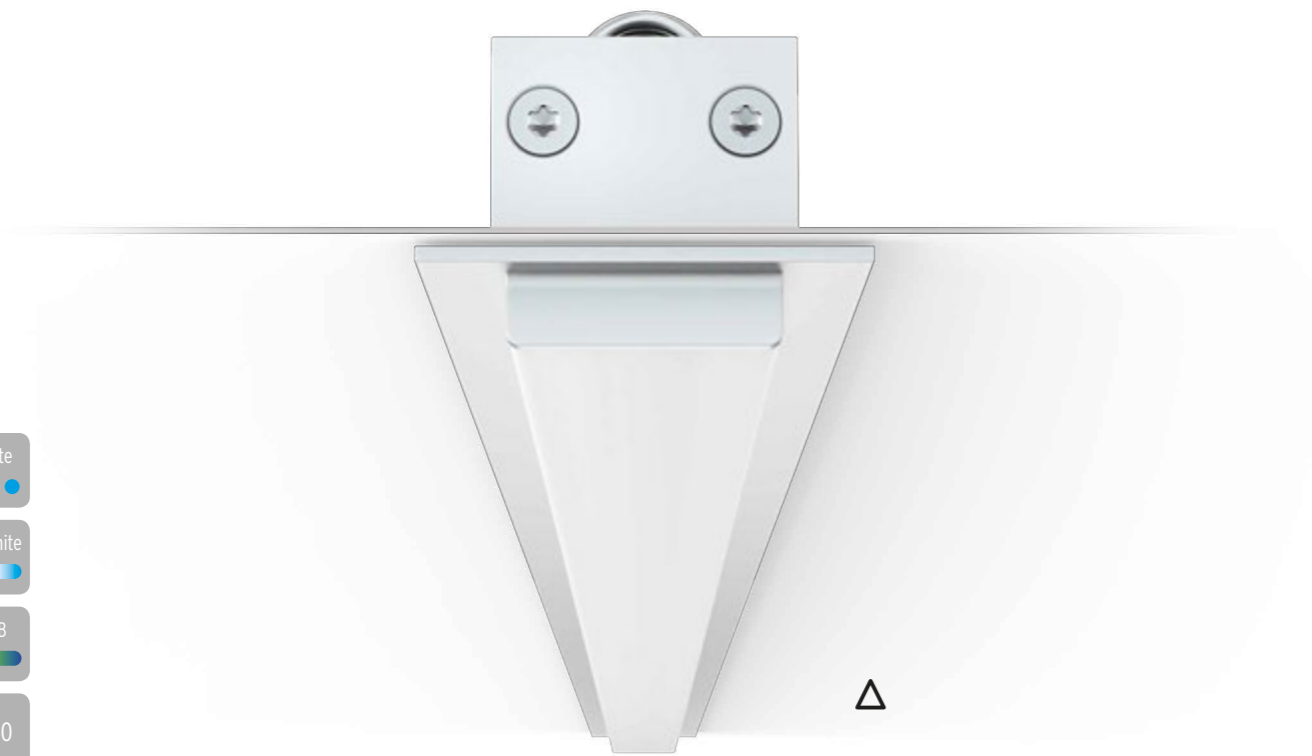
LUNA is minimally invasive and designed in a way that enables easy installation thanks to pre-mounted springs and low installation depth.



LUNA IP40

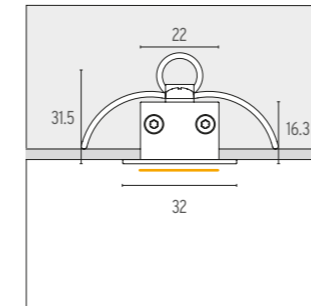
Technical Specifications

- White
- IO White
- RGB
- IP40



Mounting All dimensions in mm.

1. Recessed



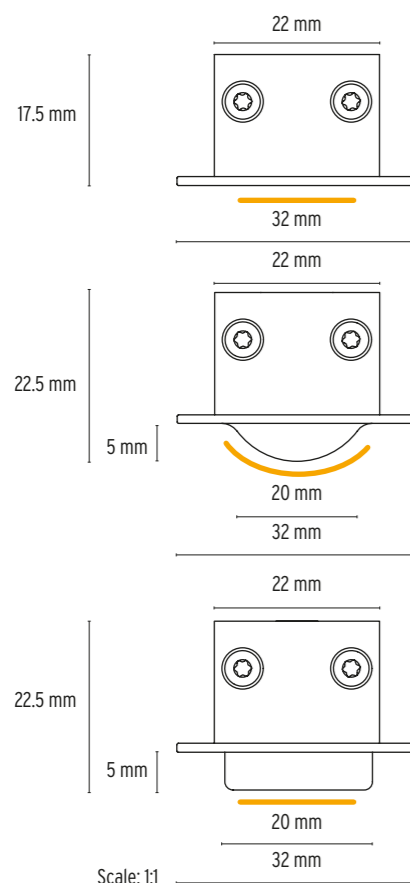
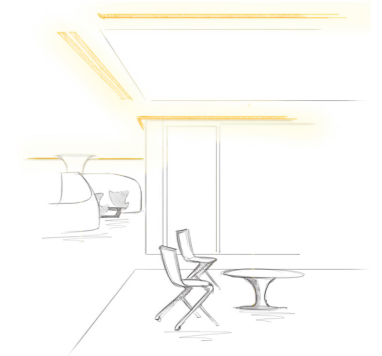
Mounting accessories

No additional accessories are required for this mounting option.

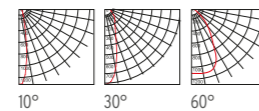
Description

Mounting springs are pre mounted. Luminaire can be installed directly into false ceiling.

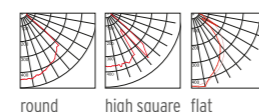
Example of applications



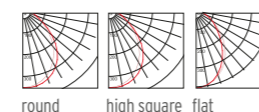
Linear lens



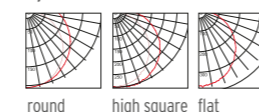
Clear cover



Diffuse cover



Opal cover



Cross section	32 mm x 17,5 mm / 32 mm x 22,5 mm
Length	up to 4,010 mm
Power	5 W/m - 42 W/m
Luminous flux	up to 5,000 lm/m
Efficacy	up to 150 lm/W
Beam angle/optics	10°, 30°, 60°, clear, diffuse, opal
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (HYDRA: 2,500 K - 4,000 K/ATON: 2,200 K - 4,000 K), RGB
CRI	85 - 95

Scale: 1:1

GENERAL LIGHTING & TASK LIGHTING

Assortment of functional luminaires offering homogeneous illumination with wide or narrow distributions for ambient lighting as well as excellent glare control for task lighting.

VarioLED™ Flex HYDRA LD/HD White | Page 178

Photo: KKS Strategy LLP/Timothy Soar

MARS NANO IP40 | Page 114

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 40	390 - 3,270	85 - 95	2,200 - 5,000	139 - 4,014

Compact invisible linear downlight based embedding nano optics with the possibility to apply as recessed, ceiling and pendant enabling a homogeneity of design.



LYRA 36 NANO IP40 | Page 118

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 40	360 - 2,990	85 - 95	2,200 - 5,000	139 - 4,014

The merger of MARS NANO and LYRA creates a product where beloved features such as anti glare louver, nano optics and the elegant round design blend into a beautiful functional luminaire.



XOOLIGHT™ IP40 | Page 122

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 42	350 - 3,790	85 - 95	2,000 - 5,000	84 - 4,021

Sleek design luminaire for general lighting manufactured to length. Available as pendant surface and recessed.



XOOMINAIRE™ Family IP40 | Page 126

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
15 - 40	1,720 - 5,100	85 - 95	2,700 - 4,000	700 - 1,900

Aesthetics and functionality merge into one luminaires family. With integrated power supply and control units, the XOOMINAIRE™ line-up offers easy continuous row installation with opal or reflector based low-glare optics.



XOOLUM™ R IP20 | Page 140

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 40	380 - 4,130	85 - 95	2,000 - 5,000	135 - 4,010

Small form factor and yet modular luminaire with 45° adjustable light head embedding specular reflectors with excellent glare control.



XOOTOO IP20 / IP40 | Page 144

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
10 - 50	direct: 234 - 1,755 indirect: 272 - 2,448	85 - 95	2,000 - 5,000	260 - 4,010

XOOTOO is the smallest direct and indirect luminaire in the portfolio with the same optics as XOOLUM™, but with indirect light. Direct and indirect light provides a comfortable atmosphere in the room.



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MARS NANO IP40

MARS NANO is a great solution for general light in public spaces such as offices, conference rooms and showrooms. The high light accuracy and flexibility with lumen packages ranging from 390 lm/m to 3,270 lm/m makes the luminaire also great for museums, galleries, hospitality, residential and civic buildings.

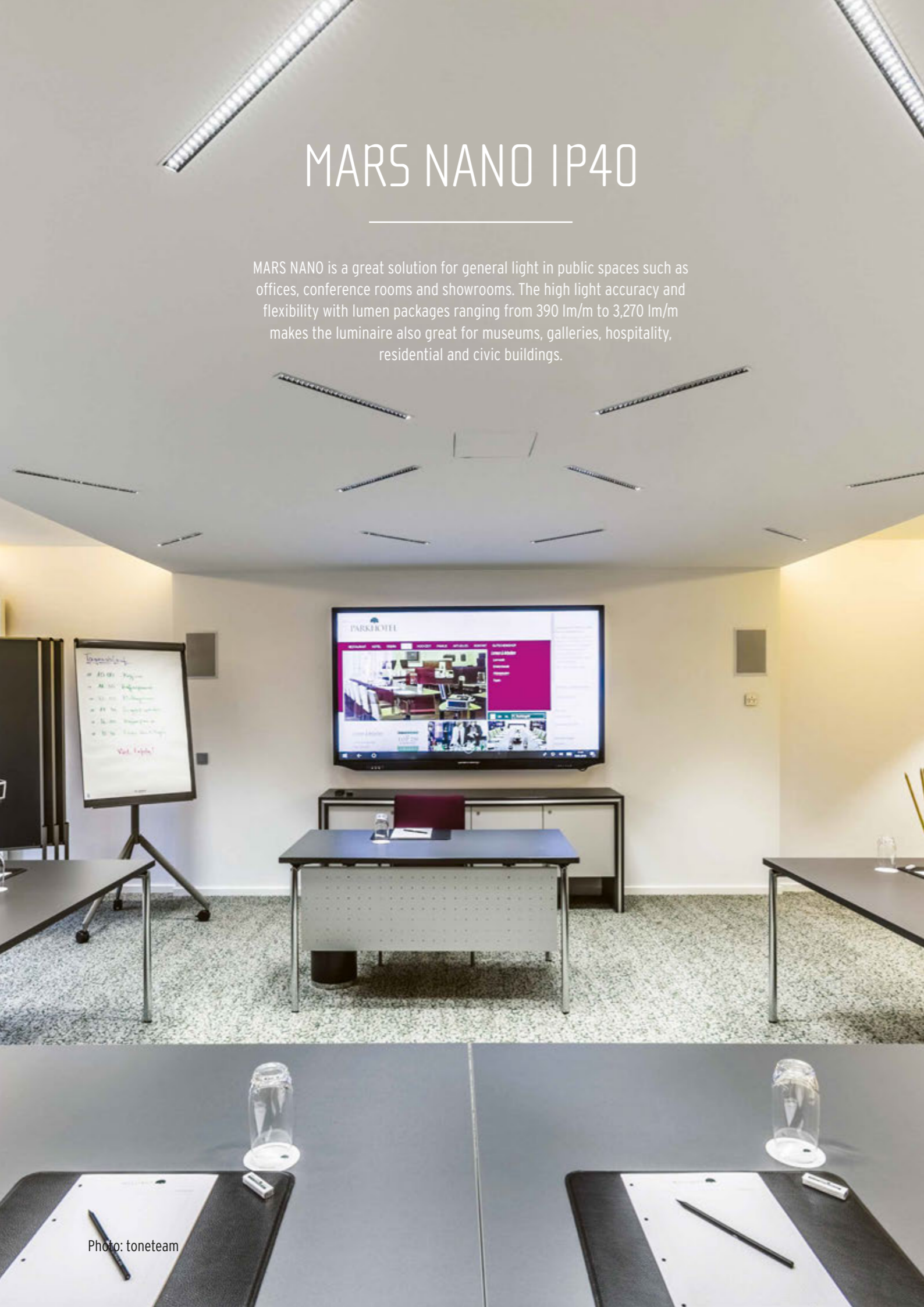


Photo: toneteam

MARS NANO IP40



The linear revolution of downlights



Invisible light and anti glare louver - UGR < 13 where the light source becomes invisible.



Nano lens optics for an accurate beam control and no direct view of LEDs.



The compact form factor of 33 mm makes the fixture minimally invasive in recessed applications.

NANO RAY

UGR < 13



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INDOOR

FLEXIBLE LIGHT ENGINE

MIX & MATCH

DESIGN LUMINAIRES

APPENDIX



www.led-linear.com/mars

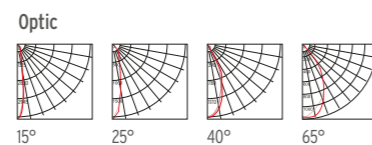
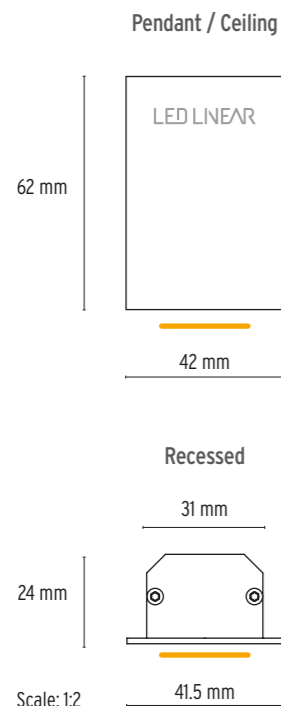
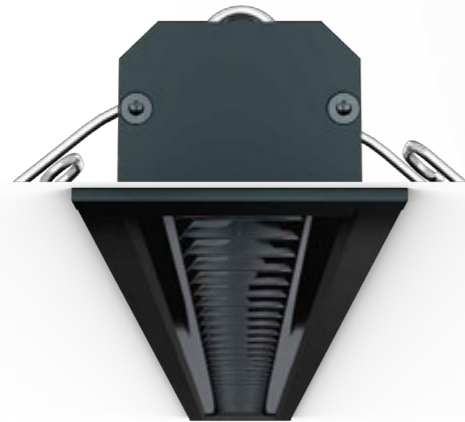


LED Linear™ GmbH

MARS NANO IP40

Technical Specifications

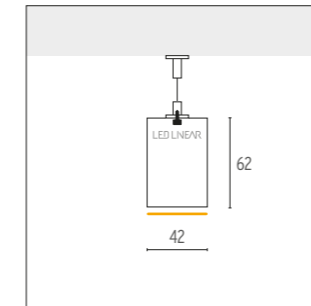
- White
- IO White
- IP40





Cross section	41.5 mm x 24 mm (Recessed) / 42 mm x 62 mm (Ceiling & Pendant)
Length	139 mm - 4,014 mm
Power	5 W/m - 40 W/m
Luminous flux	up to 3,270 lm/m
Efficacy	85 lm/W
Beam angle/optics	15°, 25°, 40° or 65°
Color temperatures	2,200 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,500 K - 4,000 K)
CRI	up to 95 (except at 2,200 K and 5,000 K)

Mounting All dimensions in mm.

1. Pendant



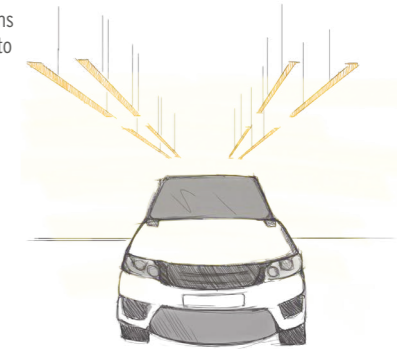
Mounting accessories

-  VarioPendant 4262
Art.-#: 13000106
-  Square Canopy Set (optional)
Art.-#: 13000330

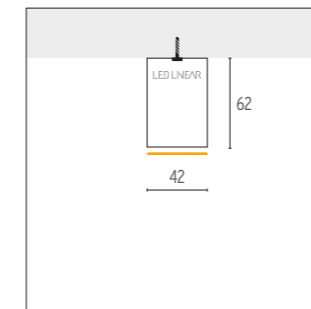
Description

Pendant set with screws for installations directly on the ceiling. Recommended to use every 1 m.

Example of applications



2. Surface-mounted, horizontal



Mounting accessories

No additional accessories are required for this mounting option.

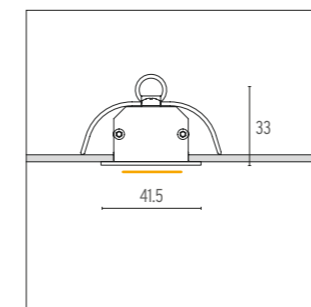
Description

Simple installation by just screw the profile onto the ceiling thanks to pre-drilled holes.

Example of applications



3. Recessed



Mounting accessories

No additional accessories are required for this mounting option.

Description

Pre-mounted springs on the backside for easy installation.

Example of applications



LYRA 36 NANO IP40

A stylish round luminaire with a diameter of 36 mm and multiple areas of use. It can be mounted as a pendant or surface solution. The mounting clips are executed in the same elegant style as the fixture itself.

LYRA 36 NANO IP40



Creates a beautiful lit effect with unmatched precise beam and glare control

NANO
RAY

UGR
<13



The lumen output up to 2,990 lm/m is high for such a minimalistic fixture.



Minimal color over angle with excellent glare reduction.



LYRA 36 comes in 15°, 25°, 40° or 65° beam angle, making it possible to utilize LYRA 36 NANO in multiple applications.



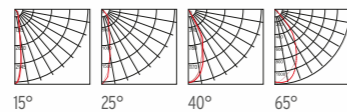
LYRA 36 NANO IP40

Technical Specifications

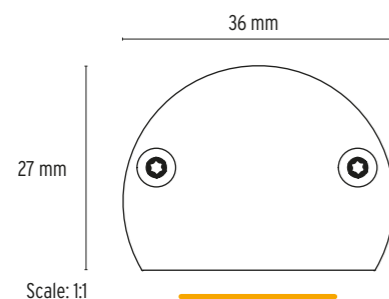
- White
- IO White
- IP40



Optic

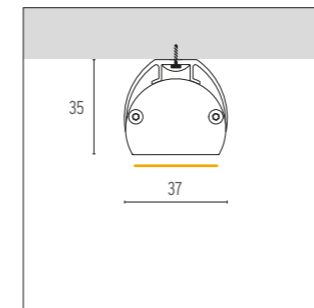


Cross section	36 mm diameter
Length	up to 4,014 mm
Power	5 W/m - 40 W/m
Luminous flux	up to 2,990 lm/m
Efficacy	up to 85 lm/W
Beam angle/optics	15°, 25°, 40° or 65°
Color temperatures	2,200 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
CRI	up to 95 (except at 2,200 K and 5,000 K)



Mounting All dimensions in mm.

1. Surface-mounted, horizontal



Mounting accessories

- VarioClip LYRA 36 NANO Black
Art.-#: 13000267-SCH
- VarioClip LYRA 36 NANO Silver
Art.-#: 13000267-SIL

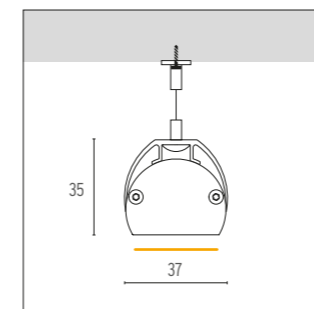
Description

Black or silver anodized clips with pre drilled holes for quick installation. Recommended to use every 1 m.

Example of applications



2. Pendant



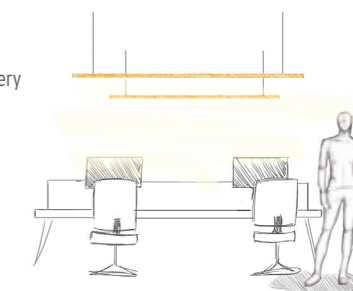
Mounting accessories

- VarioPendant LYRA 36 NANO Set Black
Art.-#: 13000300-SCH
- VarioPendant LYRA 36 NANO Set Silver
Art.-#: 13000300-SIL
- Square Canopy Set (optional)
Art.-#: 13000330

Description

Black or silver anodized clips with pre drilled holes and on site cuttable suspensions. Recommended to use every 1 m.

Example of applications



XOOLIGHT™ IP40

The design of XOOLIGHT™ blend in perfectly in offices but is also a nice solution for swimming halls, schools and warehouses. The wide range of tapes enables a variety of lumen output and efficiency. He luminaire is freely scalable up to 4 m.

XOOLIGHT™ IP40



Excellent balance between design and functional lighting



XOOLIGHT™ is configurable with 3 different optics. Thereby, XOOLIGHT™ has a variety in light distributions.



3 Different mounting possibilities (pendant, recessed and surface) for design consistency throughout a building



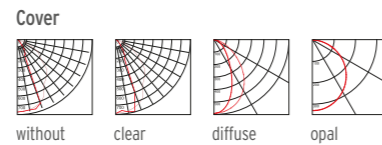
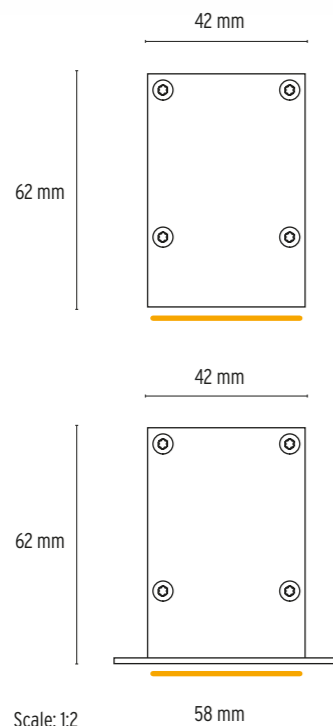
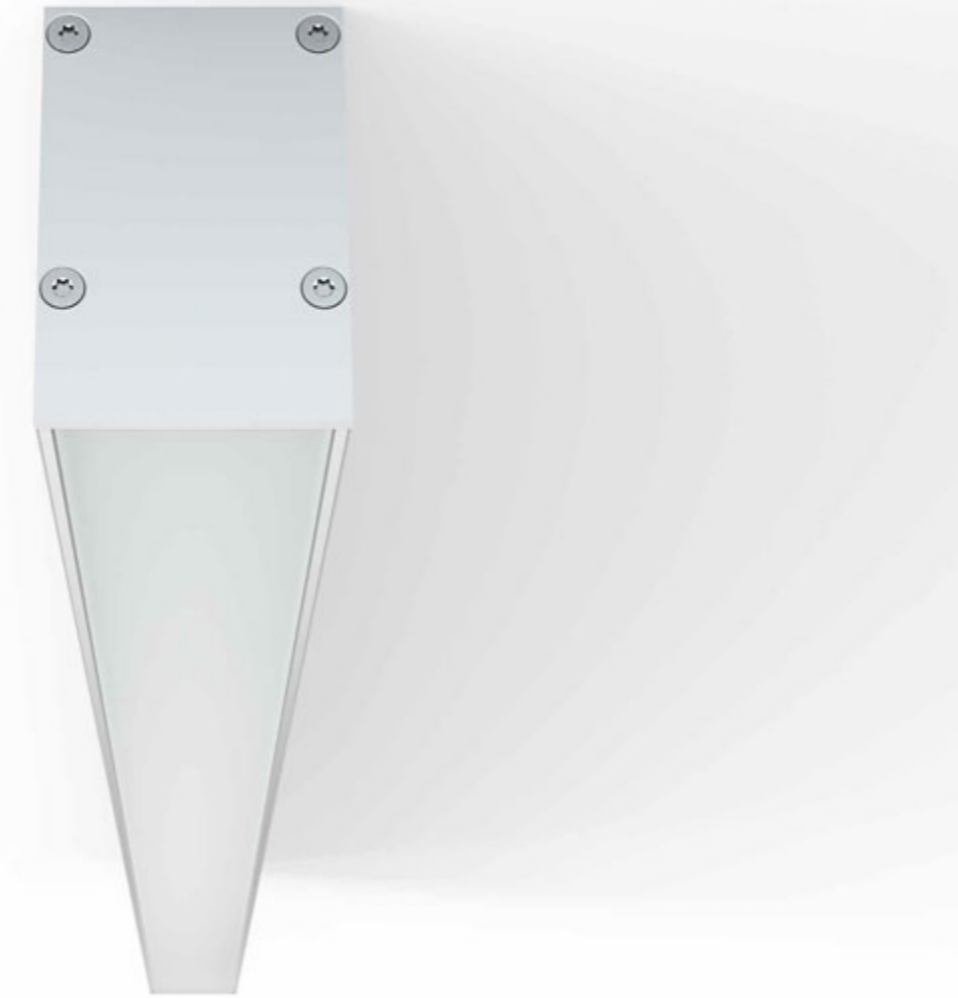
Designed for general illumination in any environment



XOOLIGHT™ IP40

Technical Specifications

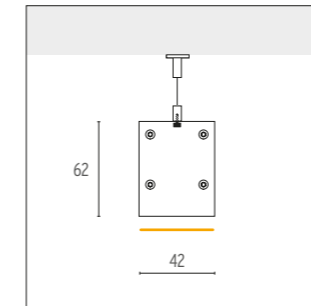
- White
- IO White
- RGB
- RGBW
- IP40





Cross section	42 mm x 62 mm / 58 mm x 62 mm (recessed)
Length	84 mm - 4,021 mm
Power	6 W/m - 42 W/m
Luminous flux	up to 3,790 lm/m
Efficacy	up to 104 lm/W
Beam angle/optics	Clear, Diffuse, Opal, without cover
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), RGBW, RGB
CRI	85 - 95

Mounting All dimensions in mm.

1. Pendant



Mounting accessories

-  VarioPendant 4262
Art.-#: 13000106
-  Square Canopy Set (optional)
Art.-#: 13000330

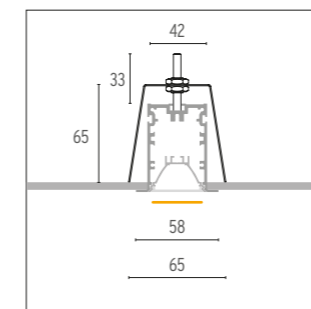
Description

Pendant set with screws for installations directly on the ceiling. 2 m suspension is cuttable on site. Recommended to use every 1 m.


Example of applications



2. Recessed



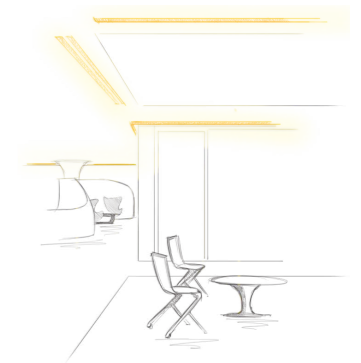
Mounting accessories

-  VarioClamp Contour 4262R
Art.-#: 13000080

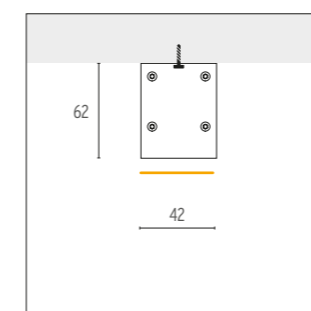
Description

Premounted on luminaire at delivery.

Example of applications



3. Surface-mounted, horizontal



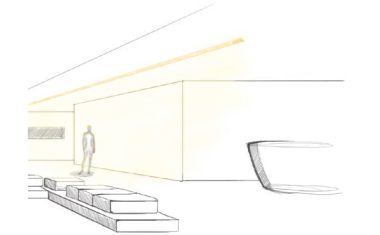
Mounting accessories

No additional accessories are required for this mounting option.

Description

Set with screws for installation directly on the ceiling. Recommended to use 2 screws per meter.

Example of applications



XOOMINAIRE™ FAMILY IP20 / IP40

Assortment of functional luminaires offering homogeneous illumination with wide or narrow distributions for ambient lighting as well as excellent glare control for task lighting.



XOOMINAIRE™ 4262 IP40 | Page 132

Photo: Jonathan Taylor



XOOMINAIRE™ 4262 IP20 / IP40 | Page 132

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
15 - 40	1,330 - 2,700	85	2,700 - 4,000	762 - 1,512

A discrete design luminaire which blends into any lighting concept thanks to its pleasing form factor available as recessed, surface-mounted or pendant luminaire. Ideal for corridors, offices and lavatories.



XOOMINAIRE™ 4292 IP20 / IP40 | Page 134

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
15 - 40	2,700 - 5,100	85	2,700 - 4,000	887 - 1,512

Direct and indirect luminaire available as pendant or wall-mounted with the same width and optics as 4262 which enables a consistent visual in large project implementing both luminaires. Ideal for open space offices or corridor wall-mounted lighting in hospitals for example.



XOOMINAIRE™ ONYX IP40 | Page 136

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
21	1,722	95	2,700 - 4,000	940 - 1,874

Elegant and modern design luminaire with an optimal glare control (UGR < 13) available as recessed, surface-mounted or pendant. A stylish luminaire for conference room, lobby or canteens.



XOOMINAIRE™ 9999 IP40 | Page 138

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
15 - 31	1,800 - 3,400	85	3,000 and 4,000	app. 1,400

Appealing large design luminaire as much as a lighting working horse for large halls, shops, production sites and many more general lighting applications thanks to various precise optical systems. Available as surface-mounted or pendant.



INTRO

OUTDOOR

INDOOR

FLEXIBLE LIGHT ENGINE

MIX & MATCH

DESIGN LUMINAIRES

APPENDIX

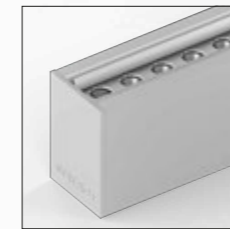
XOOMINAIRE™ FAMILY IP20 / IP40

The XOOMINAIRE family stands at crossroad of modularity and functionality embedded in aesthetic design. Each luminaire has its own driver on board (on/off or DALI) and can be easily mounted in continuous line as recessed, surface, pendant or wall luminaires.

XOOMINAIRE™ family IP20 / IP40



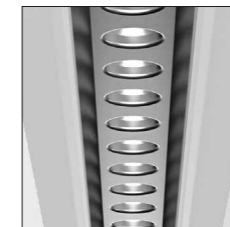
Continuous light line system



Easy fixture to fixture mounting thanks to robust mechanical connectors and through wiring system.



Magnetic end caps and tight mechanical tolerances offering a screw-free for a clean finish while avoiding any light leaks.



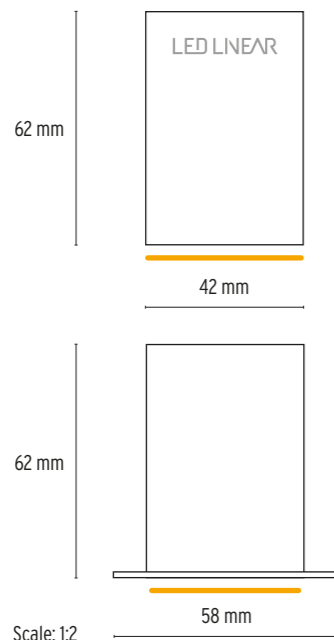
High efficiency reflectors with excellent glare control (UGR < 16) for task lighting and wide beam opal cover for ambient lighting applications.



XOOMINAIRE™ 4262 IP20 / IP40

Technical Specifications

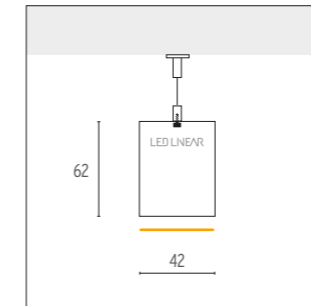
- White
- IO White on request
- IP20/ IP40





Cross section	42 mm x 62 mm / 58 mm x 62 mm (recessed)
Length	762 mm, 887 mm, 1,262 mm, 1,512 mm
Power	15 - 40 W/m
Luminous flux	HE 1,300 lm/m, HO 2,100 lm/m, SO 2,700 lm/m (opal over)
Efficacy	up to 120 lm/W @ 65° reflectors
Beam angle/optics	opal, 25°, 65°
Color temperatures	2,700 K, 3,000 K, 3,500 K and 4,000 K
CRI	> 85
Control	on/off, DALI

Mounting All dimensions in mm.

1. Pendant



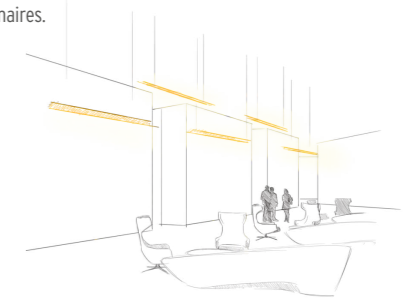
Mounting accessories

-  VarioPendant 4262/ONYX
Art.-#: 13000106
-  Square Canopy Set (optional)
Art.-#: 13000330

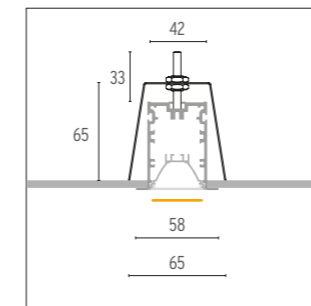
Description

Automatically delivered with luminaires.


Example of applications



2. Recessed



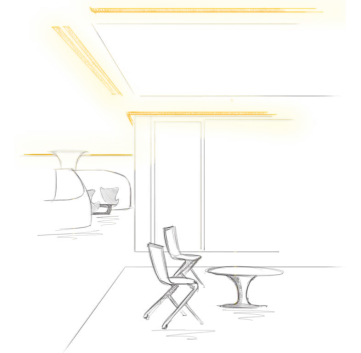
Mounting accessories

-  VarioClamp Contour 4262R
Art.-#: 13000080

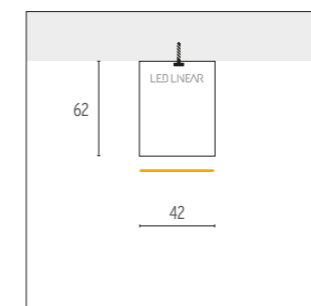
Description

Premounted on luminaire at delivery.

Example of applications



3. Surface-mounted, horizontal



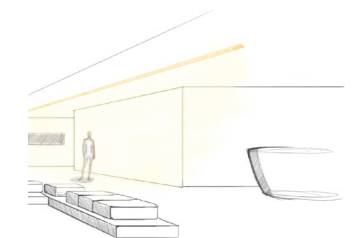
Mounting accessories

No additional accessories are required for this mounting option.

Description

Set with screws for installation directly on the ceiling. Recommended to use 2 screws per meter.

Example of applications

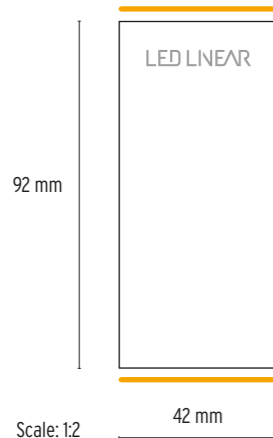


XOOMINAIRE™ 4292 IP20 / IP40

Technical Specifications



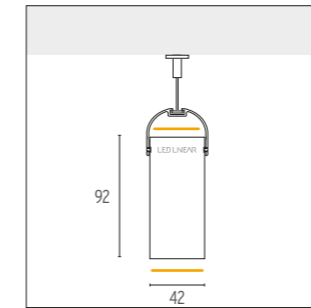
- White
- IO White on request
- IP20/ IP40





Cross section	42 mm x 92 mm
Length	887 mm, 1,262 mm, 1,512 mm
Power	15 - 40 W/m
Luminous flux	Direct: HE 1,300 lm/m, HO 2,100 lm/m, SO 2,700 lm/m (opal cover) Indirect: 1,400 lm/m, 2,400 lm/m (diffuse cover)
Efficacy	up to 120 lm/W @ 65° optics
Beam angle/optics	opal, 25°, 65°
Color temperatures	2,700 K, 3,000 K, 3,500 K and 4,000 K
CRI	> 85
Control	on/off, DALI

Mounting All dimensions in mm.

1. Pendant



Mounting accessories

-  VarioPendant 4292
Art.-#: 13000107
-  Square Canopy Set (optional)
Art.-#: 13000330

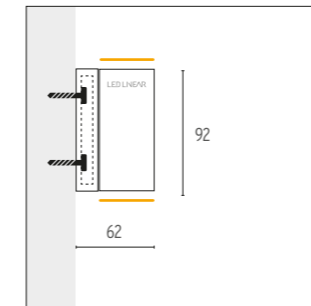
Description

Automatically delivered with luminaires.

Example of applications



2. Wall-mounted, horizontal



Mounting accessories

-  Wall-mounting Set 4292
Art.-#: 13000333

Description

Automatically delivered with luminaires.

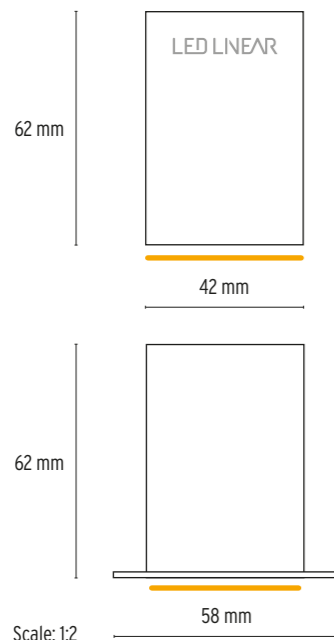
Example of applications



XOOMINAIRE™ ONYX IP40

Technical Specifications

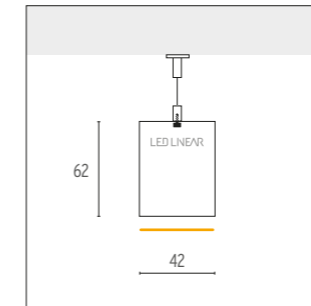
- White
- IO White
- IP40




Cross section	42 mm x 62 mm / 58 mm x 62 mm (recessed)
Length	940 mm, 1,407 mm, 1,874 mm
Power	21 W/m
Luminous flux	1,722 lm/m
Efficacy	up to 82 lm/W
Beam angle/optics	15°, 25°, 40°, 65°
Color temperatures	2,700 K, 3,000 K, 3,500 K and 4,000 K
CRI	95
Control	on/off, DALI

Mounting All dimensions in mm.

1. Pendant



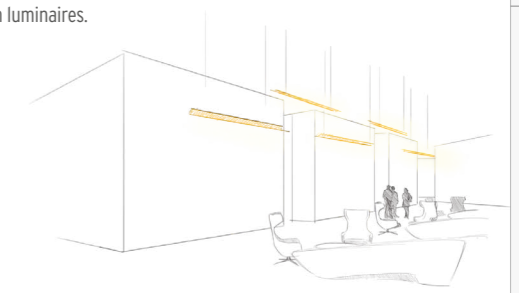
Mounting accessories

-  VarioPendant 4262/ONYX
Art.-#: 13000106
-  Square Canopy Set
(optional)
Art.-#: 13000330

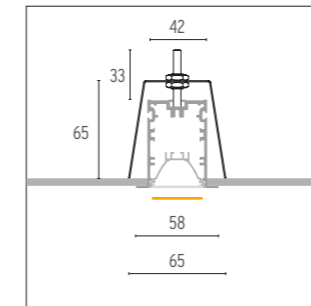
Description

Automatically delivered with luminaires.

Example of applications



2. Recessed



Mounting accessories

-  VarioClamp Contour
4262R
Art.-#: 13000080

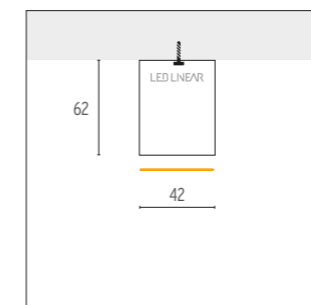
Description

Premounted on luminaire at delivery.

Example of applications



3. Surface-mounted, horizontal



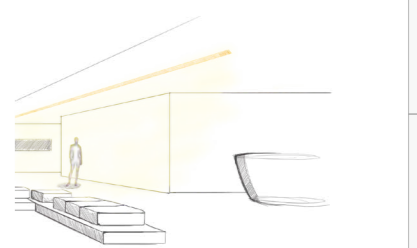
Mounting accessories

No additional accessories are required for this mounting option.

Description

Set with screws for installation directly on the ceiling. Recommended to use 2 screws per meter.

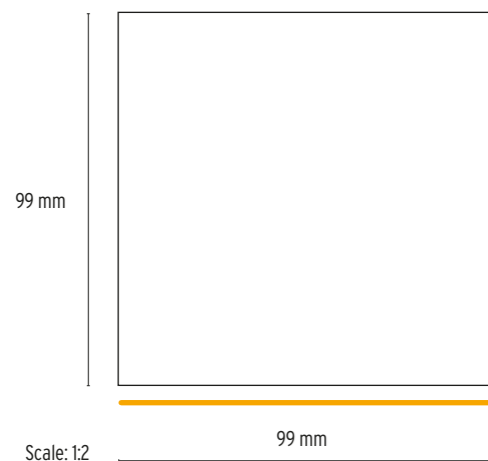
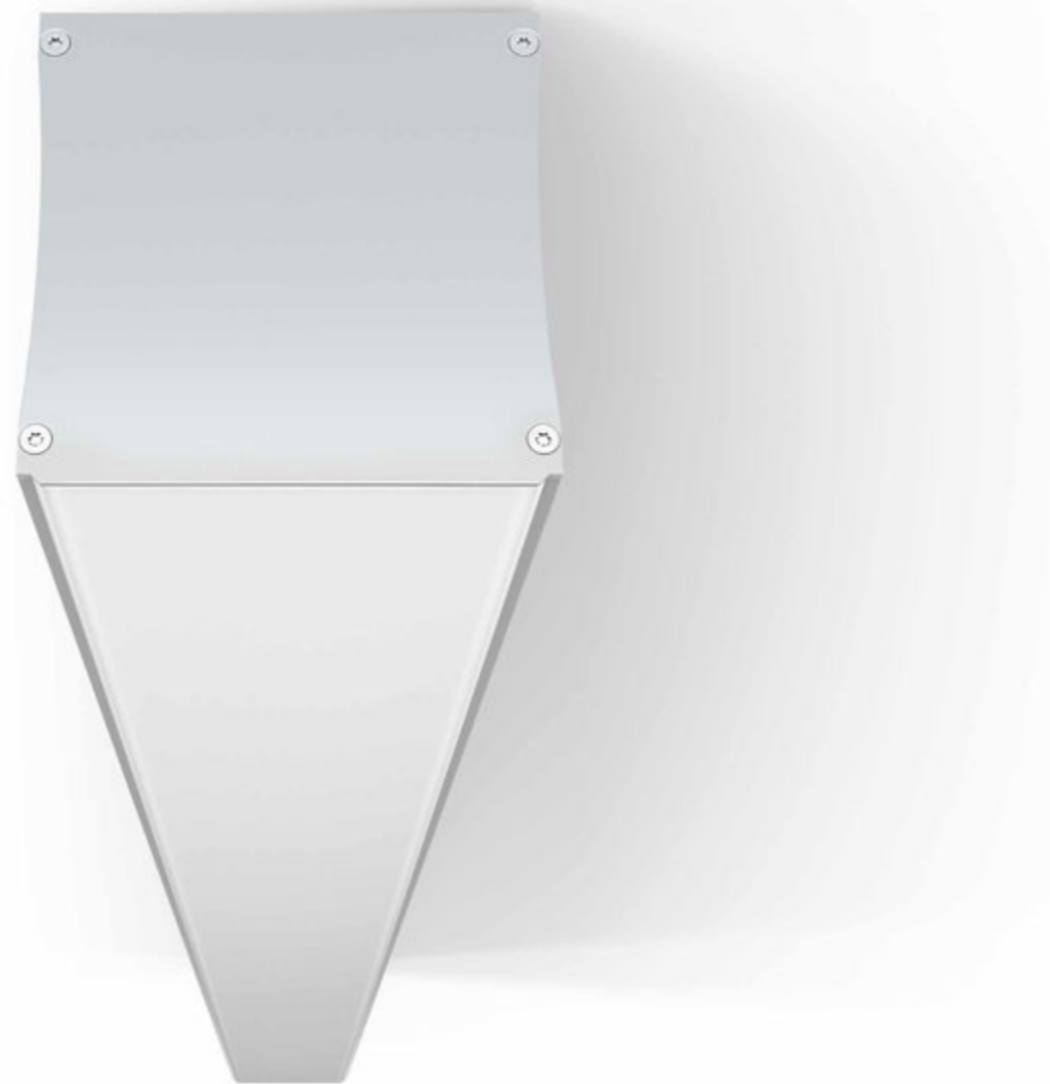
Example of applications



XOOMINAIRE™ 9999 IP40

Technical Specifications

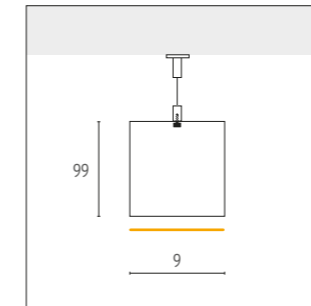
- White
- IO White
- IP40





Cross section	99 mm x 99 mm
Length	app. 1,400 mm
Power	15 - 31 W/m
Luminous flux	HE 1,800 lm/m, HO 3,400 lm/m
Efficacy	up to 120 lm/W
Beam angle/optics	PR, BW, 25°, 65°, SN, SW, AN, AW, OW, CO
Color temperatures	3,000 K and 4,000 K
CRI	85
Control	on/off, DALI

Mounting All dimensions in mm.

1. Pendant



Mounting accessories

-  VarioPendant 9999
Art.-#: 13000132
-  Square Canopy Set (optional)
Art.-#: 13000330

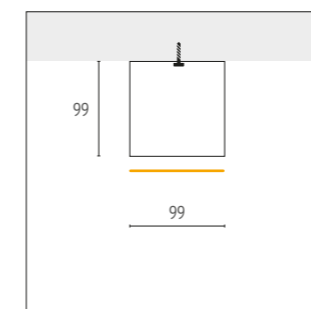
Description

Automatically delivered with luminaires.

Example of applications



2. Surface-mounted, horizontal



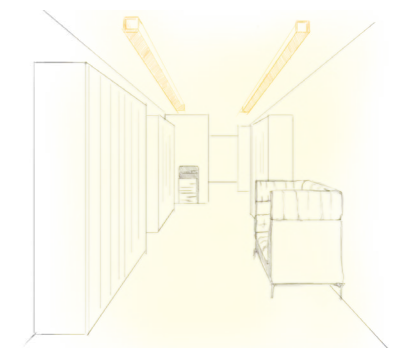
Mounting accessories

No additional accessories are required for this mounting option.

Description

Set with screws for installation directly on the ceiling. Recommended to use 2 screws per meter.

Example of applications



XOOLUM™ R IP20

XOOLUM™ R convinces by its high efficiency and low glare optics which keeping a compact design.

XOOLUM™ R IP20



Impresses with high versatility and aluminum reflectors



High optical efficiency with a UGR < 16.



Modular mounting and lighting scenery thanks to its LEDs-Click™ technology enabling a 45° tilt of the luminaire head.



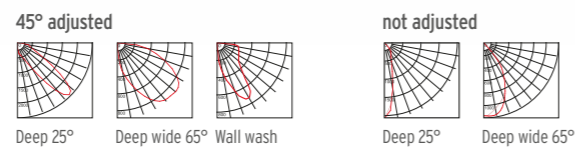
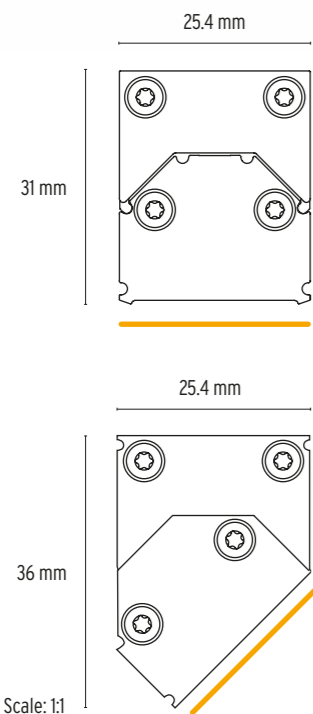
Appealing form factor of 25.4 mm by 31 mm which blends easily in any architectural concepts.



XOOLUM™ R IP20

Technical Specifications

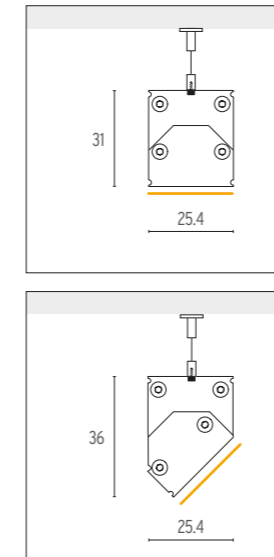
- White
- IO White
- Color
- RGB
- IP20



Cross section	25.4 mm x 31 mm / 25.4 mm x 36 mm
Length	135 mm - 4,010 mm
Power	5 W/m - 40 W/m
Luminous flux	380 lm/m - 4,130 lm/m
Efficacy	43 lm/W - 140 lm/W
Beam angle/optics	Reflectors: 25°, 65°, WW
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,500 K - 4,000 K), RGB
CRI	85 - 95

Mounting All dimensions in mm.

1. Pendant



Mounting accessories

-  VarioPendant 007 Slide Silver
Art.-#: 13000157
-  VarioPendant 007 Slide Black
Art.-#: 13000158
-  Square Canopy Set (optional)
Art.-#: 13000330

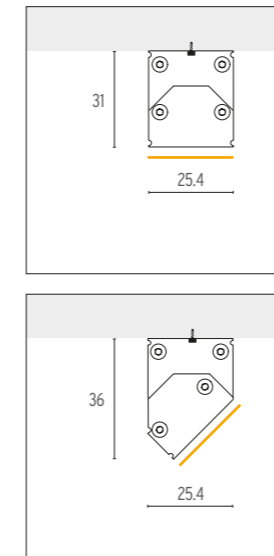
Description

Pendant set with screws for installations directly on the ceiling. 2 m Suspension is cuttable on site. Recommended to use every 1.5 m.

Example of applications



2. Surface-mounted, fixed



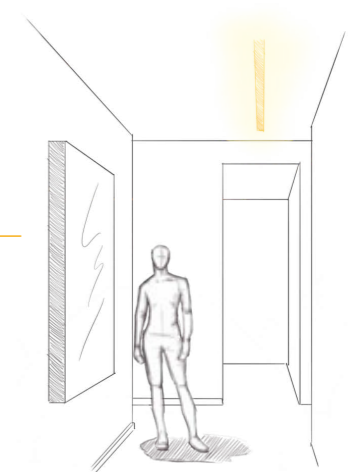
Mounting accessories

No additional accessories are required for this mounting option.

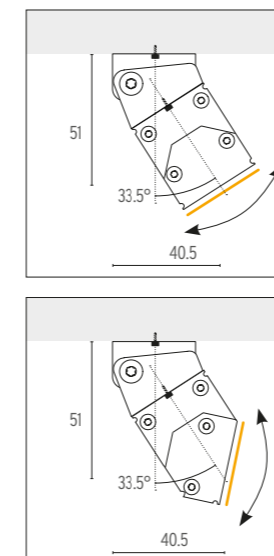
Description

Special designed mounting profile for surface-mounting options. Holes have to be drilled at site.

Example of applications



3. Surface-mounted, adjustable



Mounting accessories

-  XOOLUM™ 007 Swivel-Angle Set +/- 45°
Art.-#: 13000081

Description

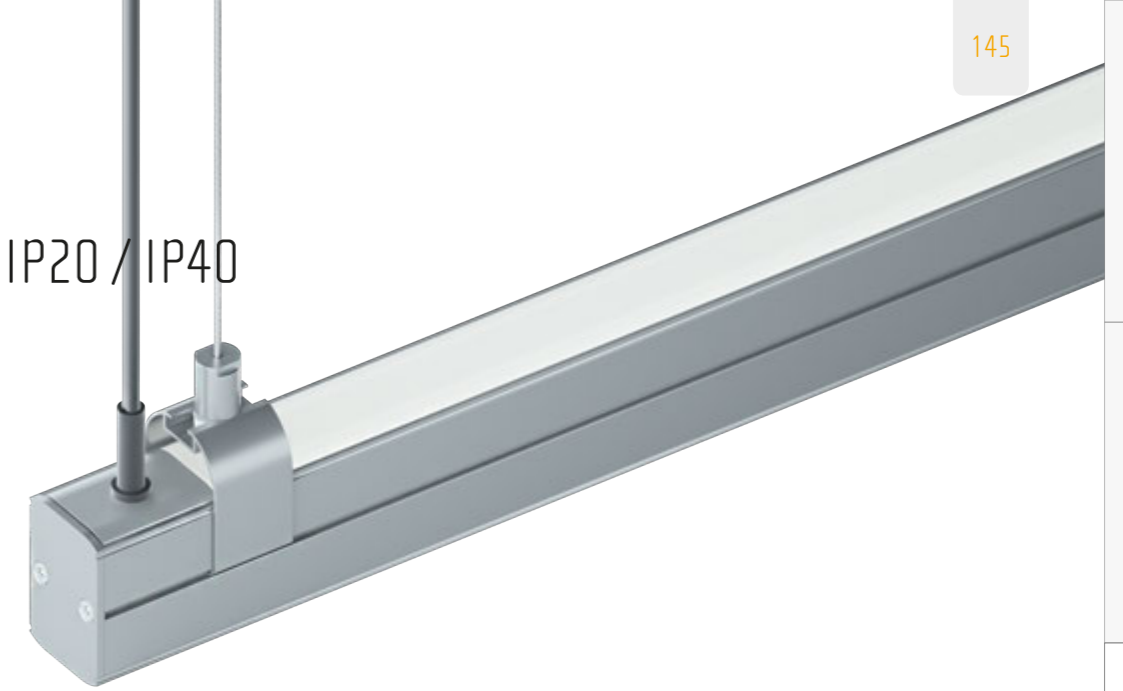
Adjustable clip for extra 45° tilt.

XOOTOO IP20 / IP40

XOOTOO is highly modular by using up to 13 different LED lamps with up to 5,700 lm/m (direct + indirect) and a wide range of decorative diffuser and functional reflector optics. XOOTOO is applicable in almost any area.



XOOTOO IP20 / IP40



The smallest two flame linear luminaire



High lumen output of 5,700 lm/m in regards to the minimal form factor.



The many optics enables a high flexibility to where XOOTOO can be used.

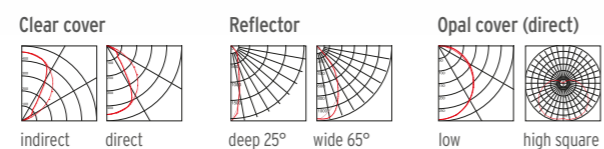
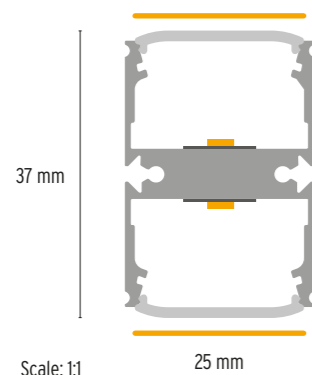


The efficiency of 131 lm/W is high, making the luminaire attractive in a perspective of energy consumed.



XOOTOO IP20 / IP40

Technical Specifications

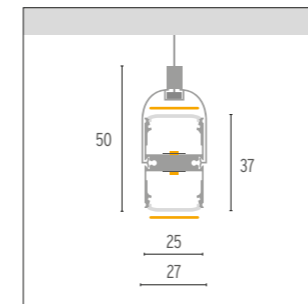


Cross section	25 mm x 37 mm
Length	260 mm - 4,010 mm
Power*	10 W/m - 50 W/m
Luminous flux*	direct: up to 1,755 lm/m indirect: up to 2,448 lm/m
Efficacy*	up to 131 lm/W
Beam angle/optics*	opal high, diffuse, 25°, 65°, opal
Color temperatures*	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors*	Tunable White (HYDRA 2,500 K - 4,000 K / ATON 2,200 K - 4,000 K), RGB
CRI*	85 - 95

* Direct and indirect parts of the luminaire are independently selectable

Mounting All dimensions in mm.

1. Pendant



Mounting accessories

No additional accessories are required for this mounting option.



Square Canopy Set
(optional)
Art.-#: 13000330

Description

Pendant set with screws for installations directly on the ceiling. 2 m suspension is cuttable on site. Recommended to use every 1 m.

Example of applications



COVE

Lighting system optimized for soft cove lighting effect and tool-free installation. Further lighting solutions for cove can be configured in the allrounder section or flexible light engine (Tape) and Profol and Cover System (Mix & Match).



XOOCOVE IP40 | Page 150

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 25	400 - 3,600	85 - 95	2,000 - 5,000	260 - 2,510

XOOCOVE is a quality solution for cove applications with minimal form factor with 360° adjustability. Thanks to the silicone pad, it is quick and easy to install.



INTRO

OUTDOOR

INDOOR

FLEXIBLE LIGHT ENGINE

MIX & MATCH

DESIGN LUMINAIRES

APPENDIX

XOOLINE HYDRA White IP40 | Page 98

XOOCOVE IP40

The luminaire is great to use for any cove solution and offers a homogeneous light distribution with an output up to 3,600 lm/m. It is possible to adjust the beam angle 360 degrees, increasing the flexibility of the fixture. XOOCOVE is designed with an LD tape to increase efficiency and due to the fact that cove solutions disable a direct view of the luminaire.

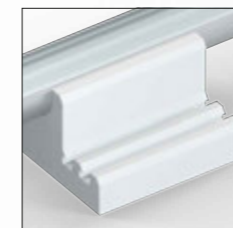


Photo: Andy Stagg

XOOCOVE IP40



The convenient system to master cove applications



The silicone pads are placed in the cove, followed by the fixture. This enables an installation where the luminaire can be rotated in 360° without the use of any tool.



A piercing connector enables installation where multiple luminaires are attached to one 24 V bus cable. The cables are then placed in the silicone pads groove for clean cable management.



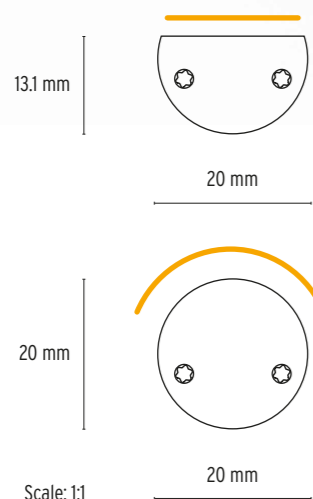
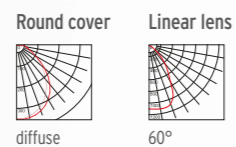
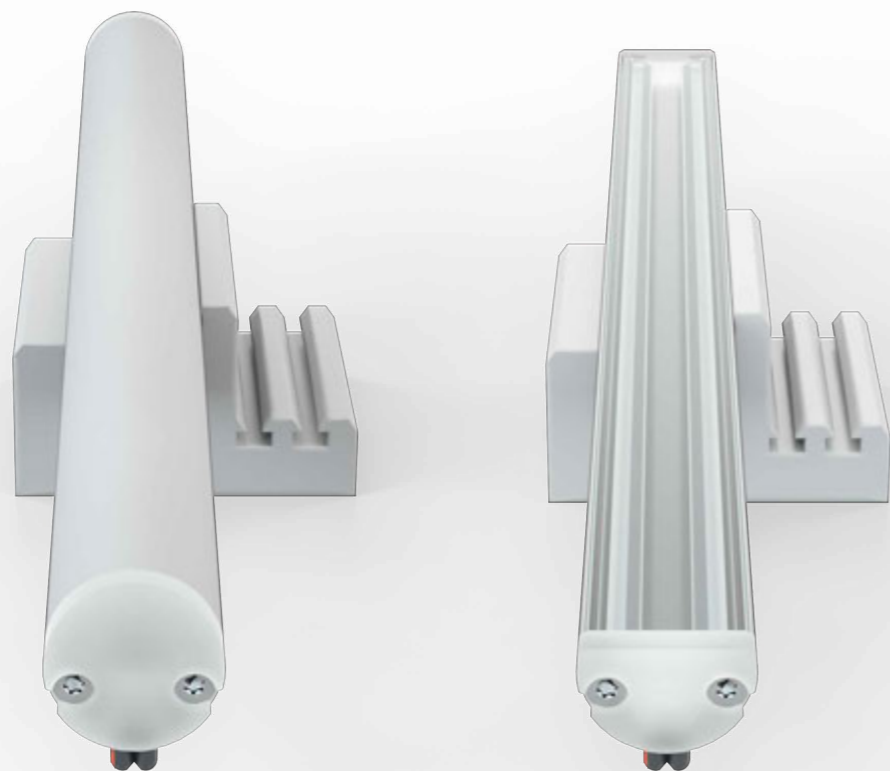
Available with diffuse cover or linear lens and translucent end caps increase cove homogeneity by prohibiting light gaps and dark spots.



XOOCOVE IP40

Technical Specifications

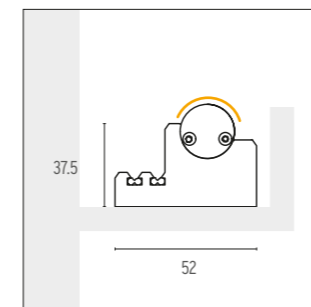
- White
- IO White
- IP40



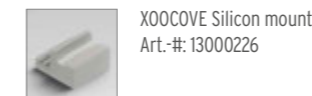
Cross section	20 mm diameter
Length	up to 2,510 mm
Power	5 W/m - 25 W/m
Luminous flux	up to 3,600 lm/m
Efficacy	up to 130 lm/W
Beam angle/optics	60° or 120° (diffuse)
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
CRI	85 - 95

Mounting All dimensions in mm.

1. Tool-free cove mounting



Mounting accessories



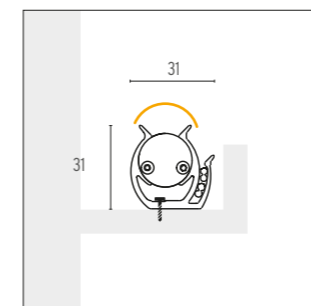
Description

Totally tool free installation of silicon mounting pad, 2 pads per meter are recommended

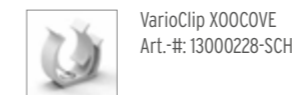
Example of applications



2. Fastened cove mounting

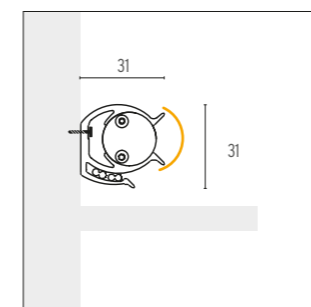


Mounting accessories



Description

Plastic mounting clips with special cable groove on the side to simplify the wiring. Recommended to use 2 per meter



WALL WASH

Slim and discrete surface mount wall-washer using a specular aluminum reflector tilted by 45° making the light source disappearing.



XOOLUM™ R WW IP20 | Page 160



MARS Wall Wash IP20 | Page 156

Power (W)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
8 - 46	2,200 - 4,170	85 - 98	2,200 - 5,000	180 - 980

MARS Wall Wash is a high end wall washer with Bartenbach reflectors and a possible output of 4,090 lm combined with a color temperature ranging between 2,200 K to 5,000 K.



XOOLUM™ R Wall Wash IP20 | Page 160

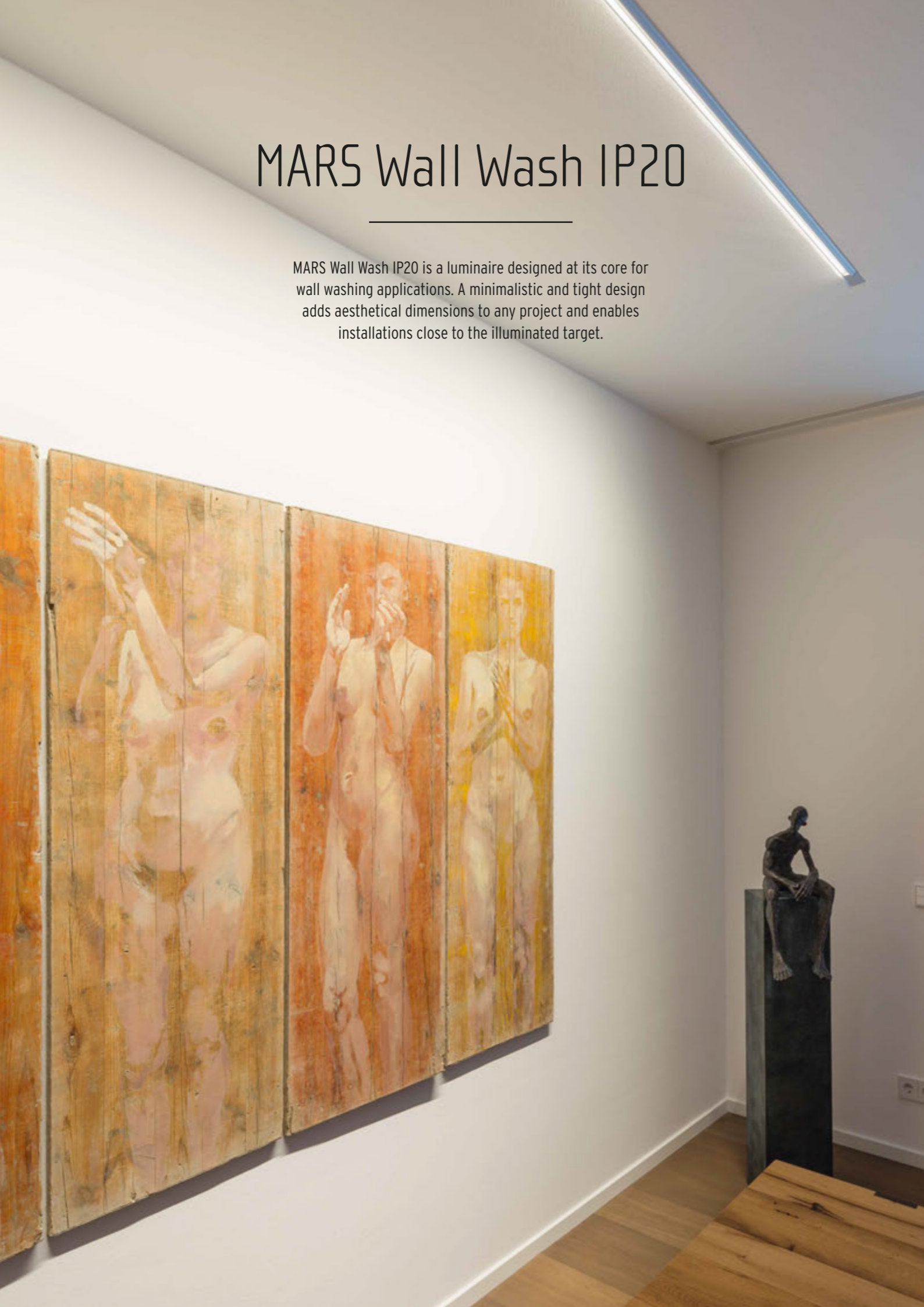
Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
5 - 40	380 - 4,130	85 - 95	2,000 - 5,000	135 - 4,010

Surface mount wall-washer with small form factor using specular reflector offering a variety of lumen outputs from 380 lm/m up to 4,130 lm/m and CCTs.



MARS Wall Wash IP20

MARS Wall Wash IP20 is a luminaire designed at its core for wall washing applications. A minimalistic and tight design adds aesthetical dimensions to any project and enables installations close to the illuminated target.



MARS Wall Wash IP20



Light where it is meant to be



MARS Wall Wash is equipped with Bartenbach reflectors which enable a precise cut off and perfect homogeneity .



Outstanding CRI up to 98 and low glare.



Minimally invasive (only 10 mm) and possibility to install close to the target.

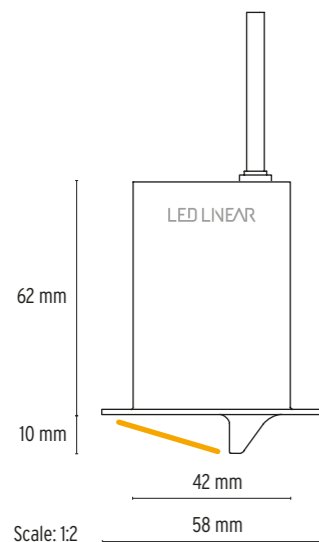


MARS Wall Wash IP20

Technical Specifications

White

IP20

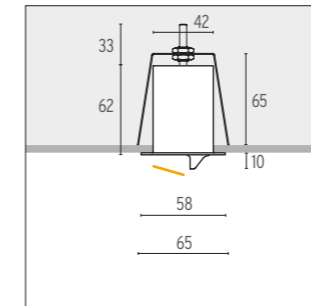


Wall wash reflector (Bartenbach®)

Cross section	42 mm x 72 mm
Length	180 mm - 980 mm
Power	8 W - 46 W
Luminous flux	up to 4,170 lm
Efficacy	90 lm/W
Beam angle/optics	Wall wash
Color temperatures	2,200 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
CRI	85 - 98

Mounting All dimensions in mm.

1. Recessed



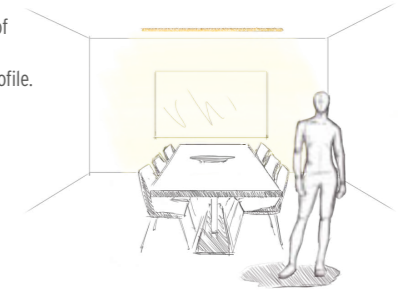
Mounting accessories



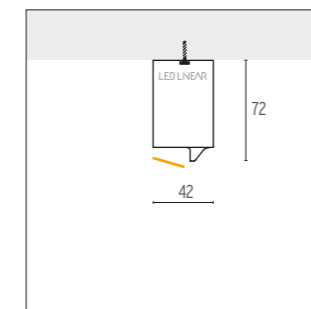
Description

Pre-drilled holes on the backside of the profile for a simple screw connection between clamp and profile.

Example of applications



2. Surface-mounted, horizontal



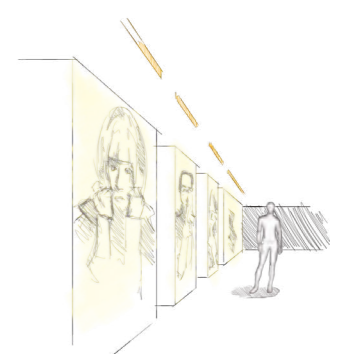
Mounting accessories

No additional accessories are required for this mounting option.

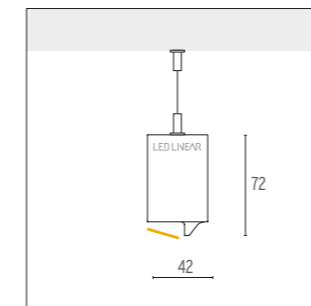
Description

Simple installation by just screw the profile onto the ceiling thanks to pre-drilled holes.

Example of applications



3. Pendant



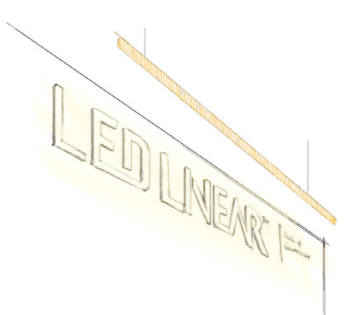
Mounting accessories



Description

Pendant set with 2m wire. Recommended to use two times a meter

Example of applications

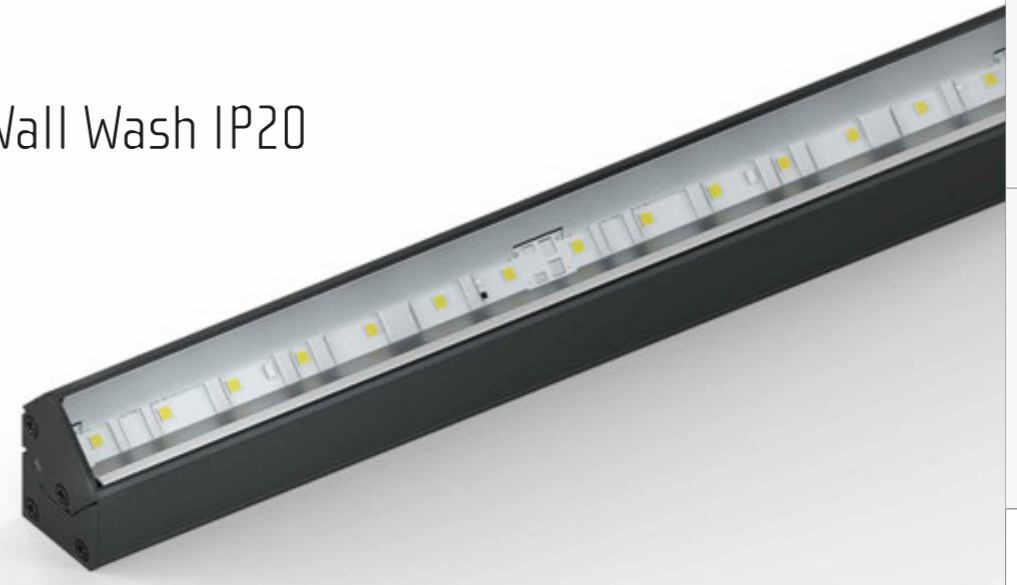


XOOLUM™ R Wall Wash IP20

Slim and discrete surface mount wall-washer using a specular aluminum reflector tilted by 45° making the light source disappearing.



XOOLUM™ R Wall Wash IP20



Smart solution for invisible wall washing



Alanod reflector technology for an excellent color mixing and homogeneous wall-wash effect.



Large offer of lumen outputs and CCTs with an outstanding efficiency of 94%.



Compact design and simple surface mounting enabling a discrete installation in the ceiling.



www.led-linear.com/xoolumr



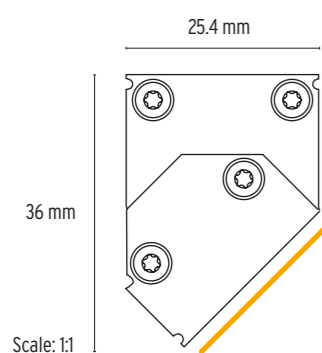
LED Linear™ GmbH

XOOLUM™ R Wall Wash IP20

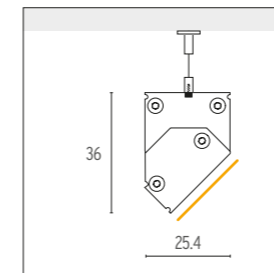
Technical Specifications



Cross section	25.4 mm x 36 mm
Length	135 mm - 4, 010 mm
Power	5 W/m - 40 W/m
Luminous flux	380 lm/m - 4,130 lm/m
Efficacy	97 lm/W
Beam angle/optics	WW
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,500 K - 4,000 K), RGB
CRI	85 - 95

Mounting All dimensions in mm.

1. Pendant



Mounting accessories



VarioPendant 007 Slide
Silver
Art.-#: 13000157



VarioPendant 007 Slide
Black
Art.-#: 13000158



Square Canopy Set
(optional)
Art.-#: 13000330

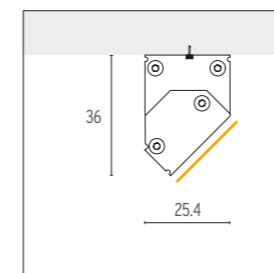
Description

Pendant set with screws for installations directly on the ceiling. 2 m Suspension is cuttable on site. Recommended to use every 1.5 m.

Example of applications



2. Surface-mounted, fixed



Mounting accessories

No additional accessories are required for this mounting option.

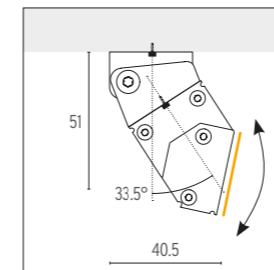
Description

Special designed mounting profile for surface-mounting options. Holes have to be drilled at site.

Example of applications



3. Surface-mounted, adjustable



Mounting accessories



XOOLUM™ 007
Swivel-Angle Set +/- 45°
Art.-#: 13000081

Description

Adjustable clip for extra 45° tilt.

IN-GROUND

Luminaires installed in robust in-ground channel for installation in concrete, wood, ceramic or carpet floors with drainage compartment and water outlet.

ADONIS True Color White | Page 166

Photo: Jin Hosoya



ADONIS True Color | Page 166

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 40	220 - 2,470	85 - 95	2,000 - 5,000	639 - 1,827

Opal encapsulated dot free, compact and robust that is a rigid equivalent to VENUS with cable groove on its backside. It fascinates with a simple installation with internal mounting clips for recessed or surface-mount without visible light joints and connections,



KALYPSO True Color | Page 170

Power (W/m)	Luminous flux (lm/m)	CRI	CCT (Kelvin)	Length (mm)
6 - 36	330 - 3,580	85 - 95	2,000 - 5,000	639 - 1,827

Clear encapsulation in combination with three optics options (10°, 30°, 60°) for grazing applications. KALYPSO TC is designed with a cable groove that makes it possible to install the fixture without cables and clips disturbing the finish.



ADONIS TRUE COLOR

ADONIS True Color is a minimalistic linear luminaire suitable for facade, ceiling direct view applications. A possible output of 2,470 lm/m combined with CCTs ranging between 2,000 K to 5,000 K makes ADONIS True Color a multifunctional luminaire.

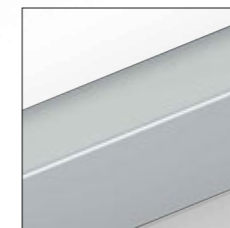
ADONIS True Color



Dot free rigid linear LED line



True color technology allows a minimal deviation of the color temperature.



Polyurethane is utilized in ADONIS TC to make it more resistant to impact from salt water UV-light and solvents.



A special chamber for the water management and drainage option for end caps.

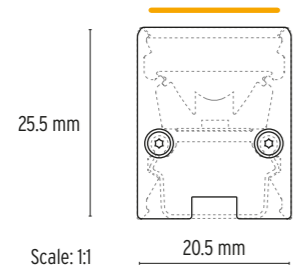


ADONIS True Color

Technical Specifications

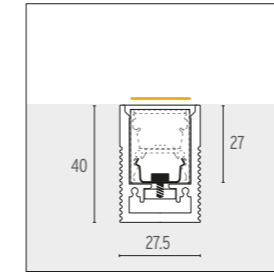


Cross section	20.5 mm x 25.5 mm
Length	639 mm, 952 mm, 1,264 mm, 1,514 mm, 1,827 mm
Power	6 W/m - 40 W/m
Luminous flux	up to 2,470 lm/m
Efficacy	up to 69 lm/W
Beam angle/optics	120°
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), RGB
CRI	up to 95







Mounting All dimensions in mm.

1. In-ground (only indoor)



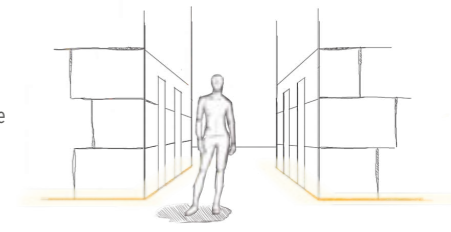
Mounting accessories

-  VarioContour 010 Inground Channel (for indoor installation only) Art.-#: 10000576-RAL9003-FS
-  Inground Channel End cap Set w Nozzle Art.-#: 11000231
-  VarioContour 010 Inground Chanel, Clip Set Art.-#: 13000288
-  Inground Channel End cap Set w Nozzle Art.-#: 11000232

Description

Powder-coated indoor in-ground channel. End caps required to cover the ends of the in-ground channel before installation. Available with or without drainage nozzle.

Example of application



KALYPSO TRUE COLOR

KALYPSO True Color is a minimalistic luminaire suitable for wall grazing. Due to its three optics and its IP67 rating, a high range of opportunities is covered. A maximum output of 3,580 lm/m combined with a CCT ranging between 2,000 K to 5,000 K makes KALYPSO True Color a multifunctional luminaire.

28
17

Photo: Andrew Worssam

KALYPSO True Color



Encapsulated linear LED luminaire with linear lenses



High lumen output in minimalistic design with a small cross section of (W x H) 20.5 mm x 25.5 mm



Screwed diffuse end caps for an optimal sealing at both ends of the luminaire.



A special chamber for the water management and drainage option for end caps.

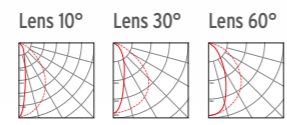
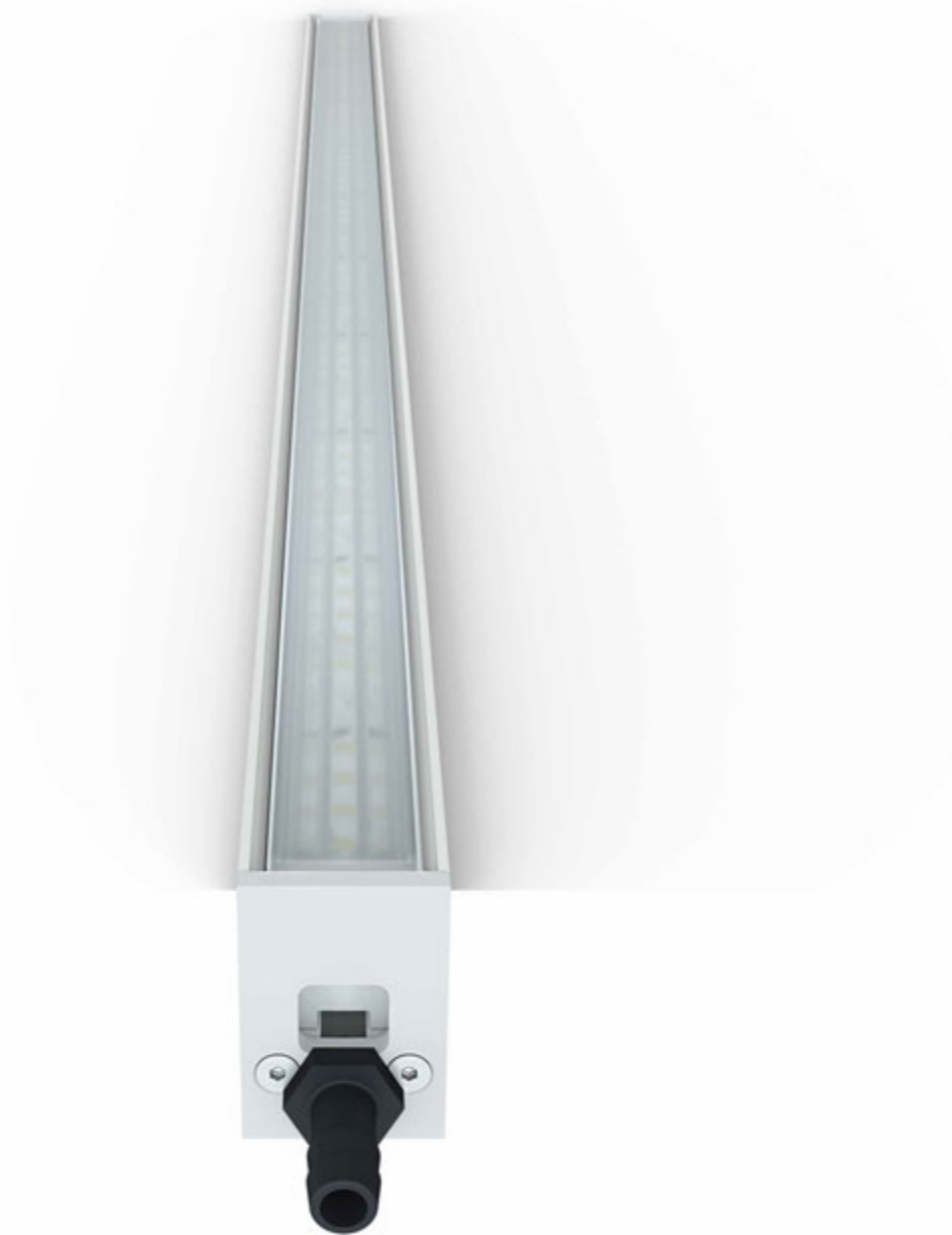


www.led-linear.com/kalypso

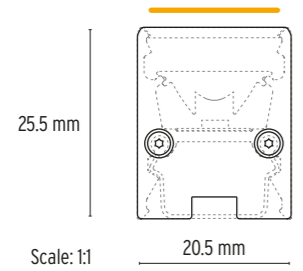
LED Linear™ GmbH

KALYPSO True Color

Technical Specifications

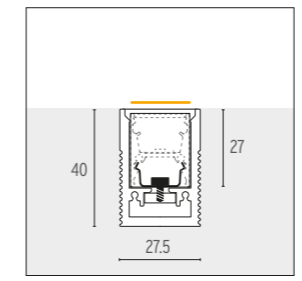


Cross section	20.5 mm x 25.5 mm
Length	639 mm, 952 mm, 1,264 mm, 1,514 mm, 1,827 mm
Power	6 W/m - 36 W/m
Luminous flux	up to 3,580 lm/m
Efficacy	101 lm/W
Beam angle/optics	10°, 30°, 60°
Color temperatures	2,000 K, 2,200 K, 2,500 K, 2,700 K, 3,000 K, 3,500 K, 4,000 K and 5,000 K
Colors	Tunable White (2,200 K - 4,000 K), RGB
CRI	85 - 95







Mounting All dimensions in mm.

1. In-ground (only indoor)



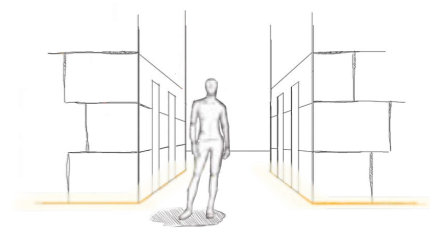
Mounting accessories

-  VarioContour 010 Inground Channel (for indoor installation only) Art.-#: 10000576-RAL9003-FS
-  Inground Channel End cap Set w Nozzle Art.-#: 11000231
-  VarioContour 010 Inground Channel, Clip Set Art.-#: 13000288
-  Inground Channel End cap Set w Nozzle Art.-#: 11000232

Description

Metal end caps with screws and rubber gasket. Required to cover the ends of the inground channel before installation. Available with or without drainage outlet.

Example of application



FLEXIBLE LIGHT ENGINE

The core of LED Linear™ technology.
A collection of static white, tunable white and color dynamic solutions produced in Germany with cutting edge components and production line technologies.
The line-up can be found in our luminaires or can be easily combined with LED Linear™ profil and cover system (Mix & Match) sortiment to address any linear lighting applications.

176 | LED LINEAR™ TECHNOLOGY
State-of-the-art from design to production

178 | FLEX LED TAPE STATIC WHITE
With numerous CCT, output levels and with various color rendition performances up to CRI 98
VarioLED™ Flex SOL, VarioLED™ Flex NEXUS, VarioLED™ Flex HYDRA, LUMINARIS ECO

180 | FLEX LED TAPE DYNAMIC WHITE
Available with several CCT spans and color rendition
VarioLED™ Flex IQ White SOL, VarioLED™ Flex IQ White NEXUS, VarioLED™ Flex IQ White HYDRA

180 | FLEX LED TAPE RGBW / RGB
For advanced color mixing and dynamic installations
VarioLED™ Flex RGBW, VarioLED™ Flex RGB

182 | APPLICATIONS – OVERVIEW
Examples of application types for every flexible light engine

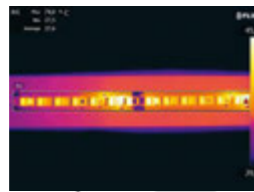
LED LINEAR™ TECHNOLOGY

High quality components & smart design

Automated production and quality control

LED
Each LED series implemented are carefully selected based on their performances, the tolerances of the 3 Step MacAdams binning as well as their lumen maintenance and color consistency stability.

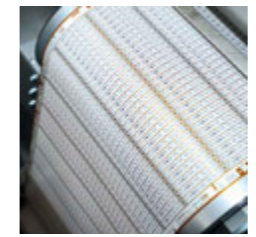
THERMAL MANAGEMENT
LED Linear™ Tj Away® thin flexible circuit board technology offers an optimal heat dissipation (junction to heat sink) which guarantees an optimal cooling of the LEDs which enables outstanding lifetime and color consistency ratings.



ELECTRONIC DESIGN
Each step embeds an active current regulation operated by a dedicated integrated circuits (ICs) which ensures homogeneous light intensity all along the tape length. The positioning of each component is optimized to have all LEDs at the same temperature levels. Finally, the components are specified to support PWM dimming at frequencies above the flicker threshold defined by IEEE P1789 standard.

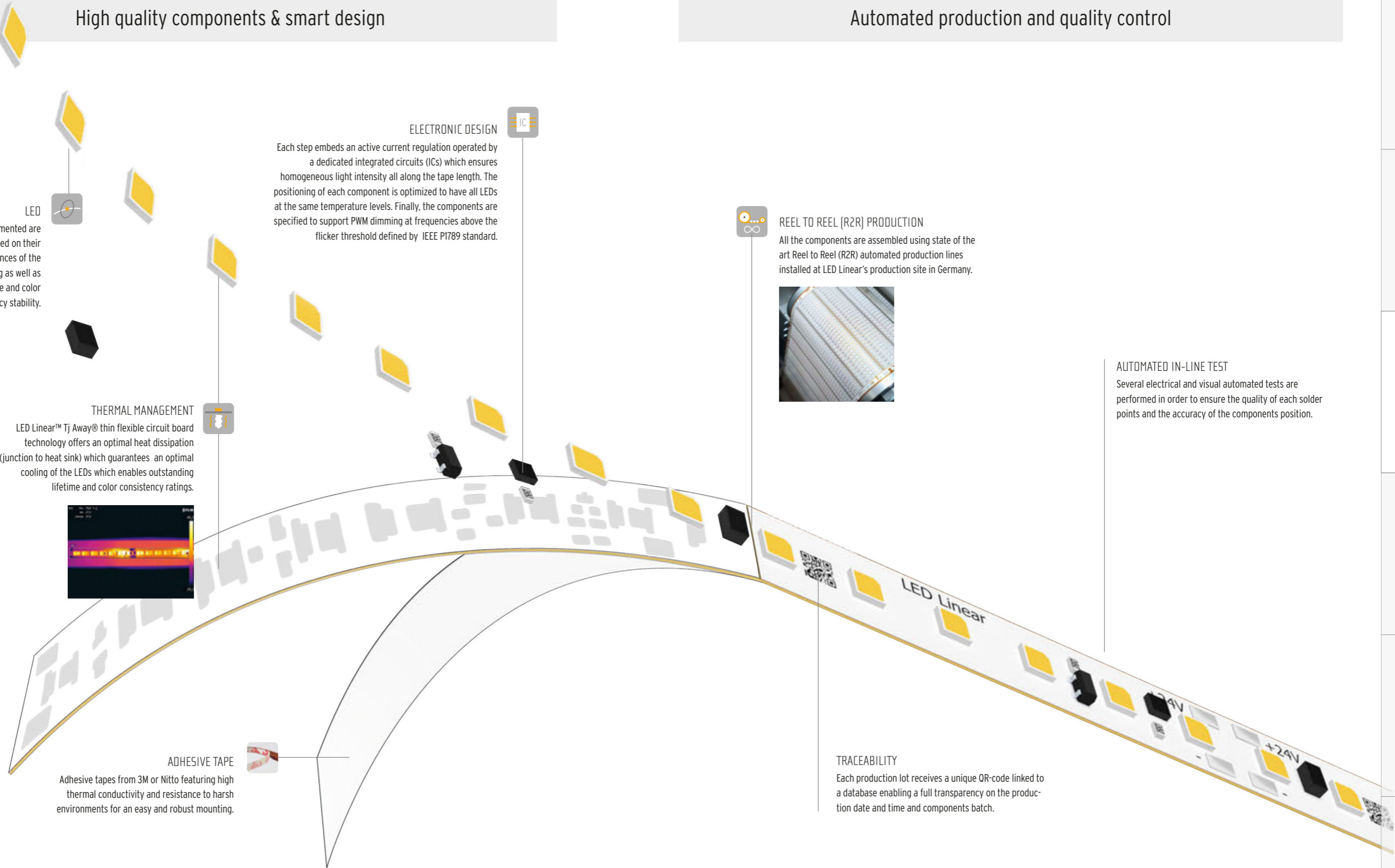
ADHESIVE TAPE
Adhesive tapes from 3M or Nitto featuring high thermal conductivity and resistance to harsh environments for an easy and robust mounting.

REEL TO REEL (R2R) PRODUCTION
All the components are assembled using state of the art Reel to Reel (R2R) automated production lines installed at LED Linear's production site in Germany.



AUTOMATED IN-LINE TEST
Several electrical and visual automated tests are performed in order to ensure the quality of each solder points and the accuracy of the components position.

TRACEABILITY
Each production lot receives a unique QR-code linked to a database enabling a full transparency on the production date and time and components batch.

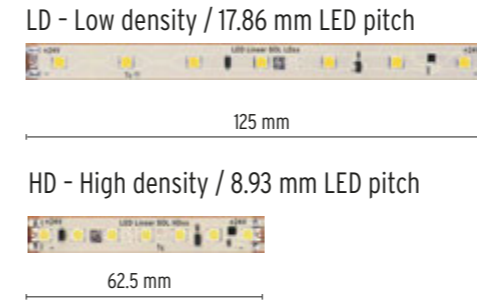
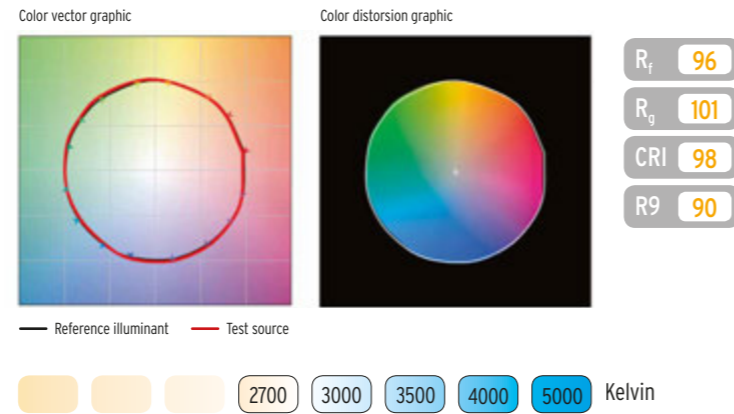


FLEX LED TAPE – STATIC WHITE

VarioLED™ Flex SOL

Award winning full spectrum LEDs providing the industry's closest match to both the sun and incandescent spectrums - Ideal for applications requiring outstanding color rendition or Human Centric Lighting (HCL).

L80/B10 > 60,000 h
Wxxx/339
White

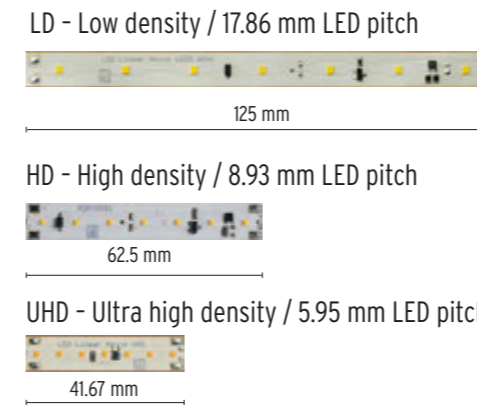
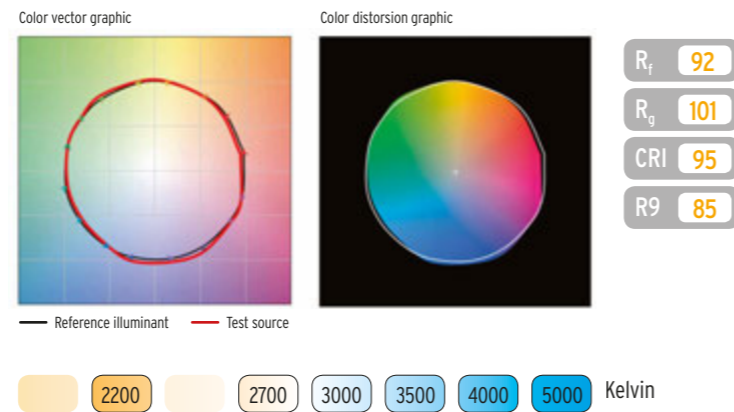


Watts per meter (W/m)		Lumens per meter (lm/m)	
5 W/m	60 W/m	530 lm/m	6,740 lm/m
15 W/m	25 W/m	1,640 lm/m	2,670 lm/m
15 W/m	36 W/m	1,640 lm/m	3,900 lm/m

VarioLED™ Flex NEXUS

Chip Scale Package (CSP) LEDs with outstanding thermal and color over angle performances - Ideal for applications requiring excellent color rendition.

L80/B10 > 60,000 h
Wxxx/339
White

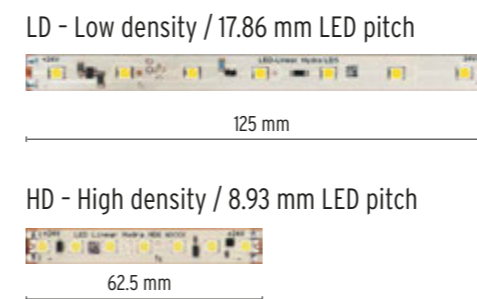
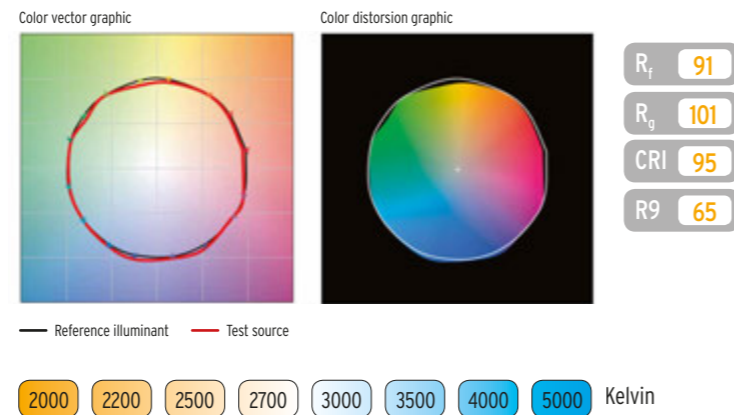


Watts per meter (W/m)		Lumens per meter (lm/m)	
5 W/m	60 W/m	530 lm/m	6,740 lm/m
5 W/m	40 W/m	660 lm/m	4,790 lm/m
6 W/m	60 W/m	630 lm/m	6,740 lm/m
15 W/m	25 W/m	1,690 lm/m	3,240 lm/m

VarioLED™ Flex HYDRA

High quality Japanese 3030 LEDs with ceramic package. Versatile light source offering high efficiency and reliability.

L80/B10 > 60,000 h
Wxxx/339
White

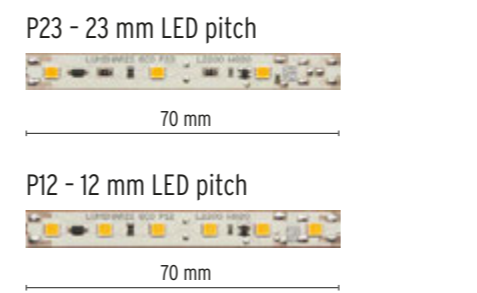
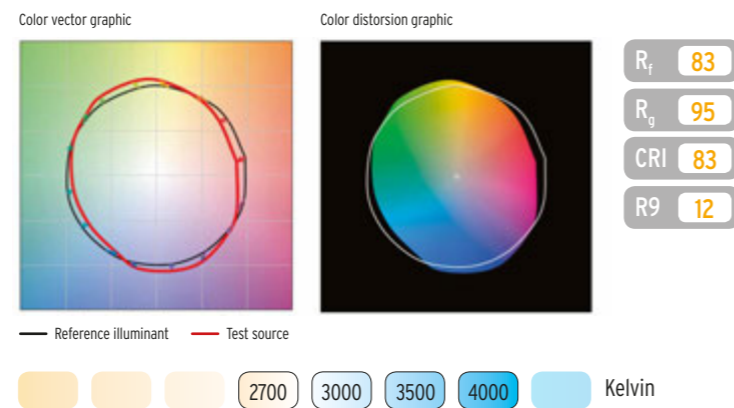


Watts per meter (W/m)		Lumens per meter (lm/m)	
5 W/m	60 W/m	530 lm/m	6,740 lm/m
5 W/m	40 W/m	690 lm/m	4,350 lm/m
6 W/m	36 W/m	830 lm/m	5,260 lm/m

LUMINARIS ECO

2835 LEDs - Cost efficient solution for cove.

L80/B10 > 60,000 h
White



Watts per meter (W/m)		Lumens per meter (lm/m)	
5 W/m	60 W/m	530 lm/m	6,740 lm/m
6 W/m	21 W/m	530 lm/m	2,250 lm/m
6 W/m	21 W/m	690 lm/m	2,470 lm/m

FLEX LED TAPE – DYNAMIC WHITE, RGBW & RGB

VarioLED™ Flex IQ White SOL

Award winning full spectrum LEDs providing the industry's closest match to both the sun and incandescent spectrums - Ideal for applications requiring outstanding color rendition and large CCT tuning range.

CRI **97**

R9 **90**



L80/B10 > 60,000 h Wxxx/339 IO White

VarioLED™ Flex IQ White NEXUS

Chip Scale Package (CSP) LEDs with outstanding thermal and color over angle performances - Ideal for applications requiring excellent color rendition and large tuning range.

CRI **85**

R9 **65**



L80/B10 > 60,000 h Wxxx/339 IO White

VarioLED™ Flex IQ White HYDRA

High quality Japanese 3030 LEDs with ceramic package. Versatile light source offering high efficiency and reliability. Ideal for applications requiring a tuning span close to Planckian locus.

CRI **85**

R9 **25**



L80/B10 > 60,000 h Wxxx/339 IO White

VarioLED™ Flex RGBW

High-end Japanese RGB LEDs combined with white CSP LEDs - Ideal for color dynamic application (Dim to Warm, pastel tones, etc.) with excellent color rendition and high power levels.

CRI **95**

R9 **85**



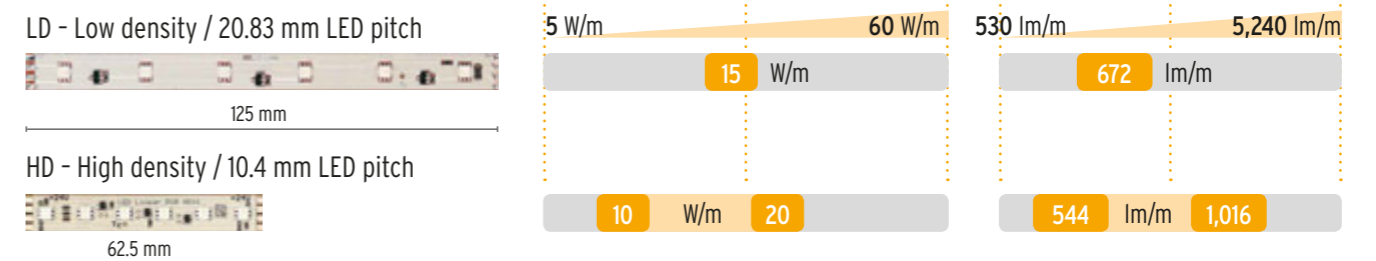
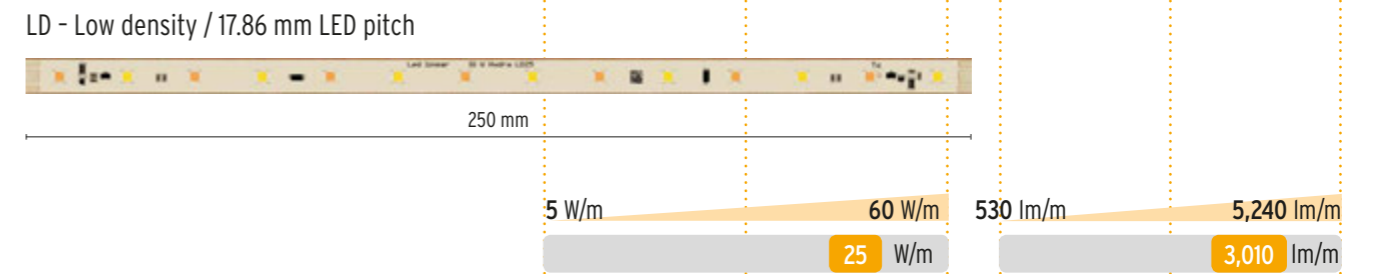
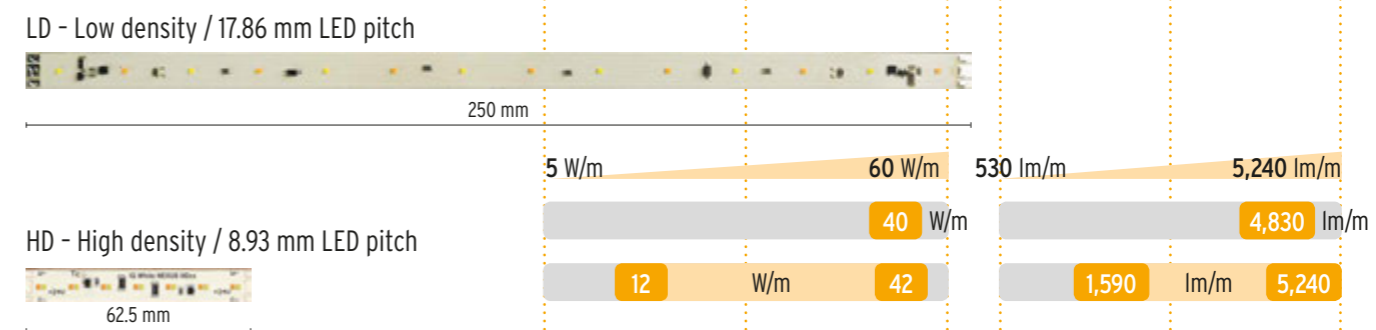
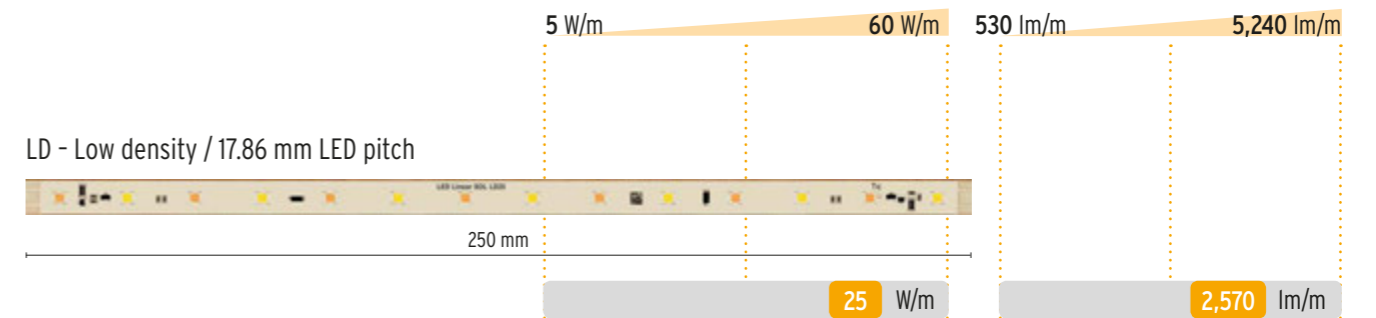
L90/B10 > 60,000 h L80 > 30,000 h RGBW

VarioLED™ Flex RGB








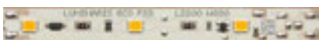








High-end Japanese RGB LEDs - Ideal for decorative color dynamic applications.

L80 > 30,000 h RGB

Watts per meter (W/m) Lumens per meter (lm/m)



APPLICATIONS – OVERVIEW

		General Lighting (direct)	Cove Lighting (indirect)	Decorative Lighting	Task Lighting	Retail	Furniture Lighting	Museum	Food	Outdoor (IP67)
		Functional and homogeneous lighting fixture	Low density pitch homogeneous light output	Option to adjust the color temperature to different scenarios	Higher color rendering and homogeneous light output	Good color rendering with option to adjust the color temperature to different scenarios	High color rendering and high density pitch to adjust the length to the furniture	Excellent color rendering for the artwork and option the create different moods	Great color rendering to stage the food	Option to have the tape encapsulated
STATIC WHITE	VarioLED™ Flex SOL LD 		✓					✓	✓	
	VarioLED™ Flex SOL HD 	✓			✓		✓	✓		
	VarioLED™ Flex NEXUS LD 		✓			✓		✓	✓	
	VarioLED™ Flex NEXUS HD 	✓			✓	✓	✓	✓		
	VarioLED™ Flex NEXUS UHD 	✓			✓	✓	✓			
	VarioLED™ Flex HYDRA LD 		✓							✓
	VarioLED™ Flex HYDRA HD 	✓			✓		✓			✓
	LUMINARIS ECO P23 			✓			✓			
LUMINARIS ECO P12 			✓		✓	✓				
DYNAMIC WHITE	VarioLED™ Flex IQ White SOL LD 		✓	✓				✓	✓	
	VarioLED™ Flex IQ White NEXUS LD 		✓	✓		✓		✓	✓	
	VarioLED™ Flex IQ White NEXUS HD 	✓		✓	✓	✓	✓	✓		
	VarioLED™ Flex IQ White HYDRA LD 		✓	✓						✓
RGBW	VarioLED™ Flex RGBW HD 	✓	✓	✓			✓			
RGB	VarioLED™ Flex RGB LD 		✓	✓						✓
	VarioLED™ Flex RGB HD 	✓		✓			✓			✓

MIX & MATCH

TAPE - PROFILE - COVER - MOUNTING - ACCESSORIES

Mix & Match complement LED Linears premium lighting solution by offering a DIY toll box which enables the integration of LED tapes in user defined luminaires. A large range of small and yet functional profile, covers and mounting options allows the configuration of individual luminaires to suit perfectly the desired application.



Photo: Steinitz Lirad

To specify out of the Mix & Match portfolio
please try out our online configurator
www.led-linear.com/mix&match/

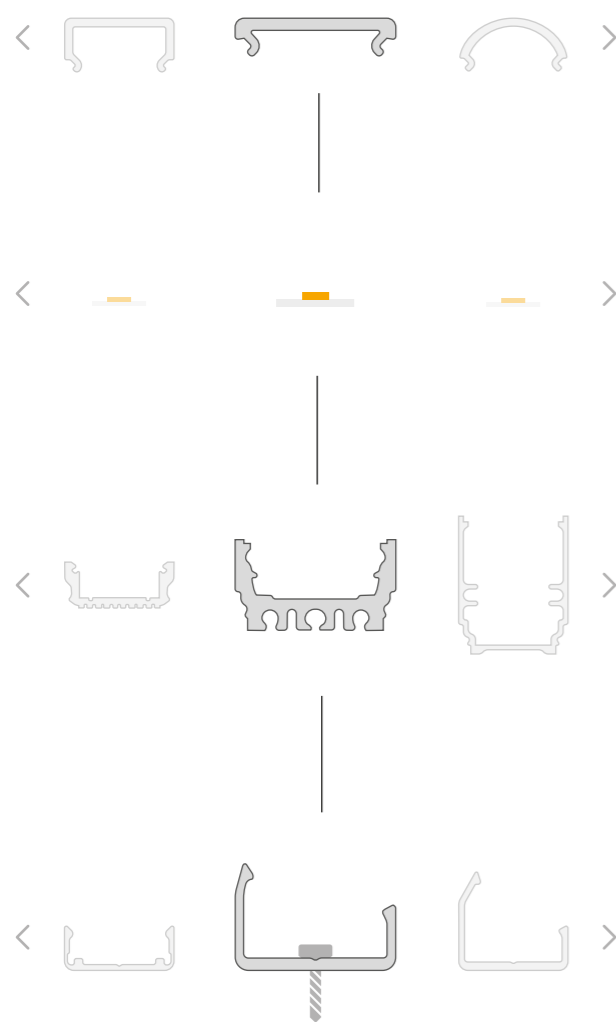


MIX & MATCH

Tape - Profile - Cover - Mounting - Accessories

This portfolio offers over 600,000 possible combinations. For example indirect and direct lighting, corner and shelf lighting, or recessed lighting. The delivery as Do It Yourself Kit in standard lengths to be cut on site makes this portfolio even more flexible and individual. With our new configurator you can start where you want to configure your own lighting fixture.

The light is with you!



COVER

You can choose between different cover forms - Round, High², Low² in opal for wide beam spread and homogenous light lines or diffuse for indirect lighting or higher efficiency.

LED TAPE

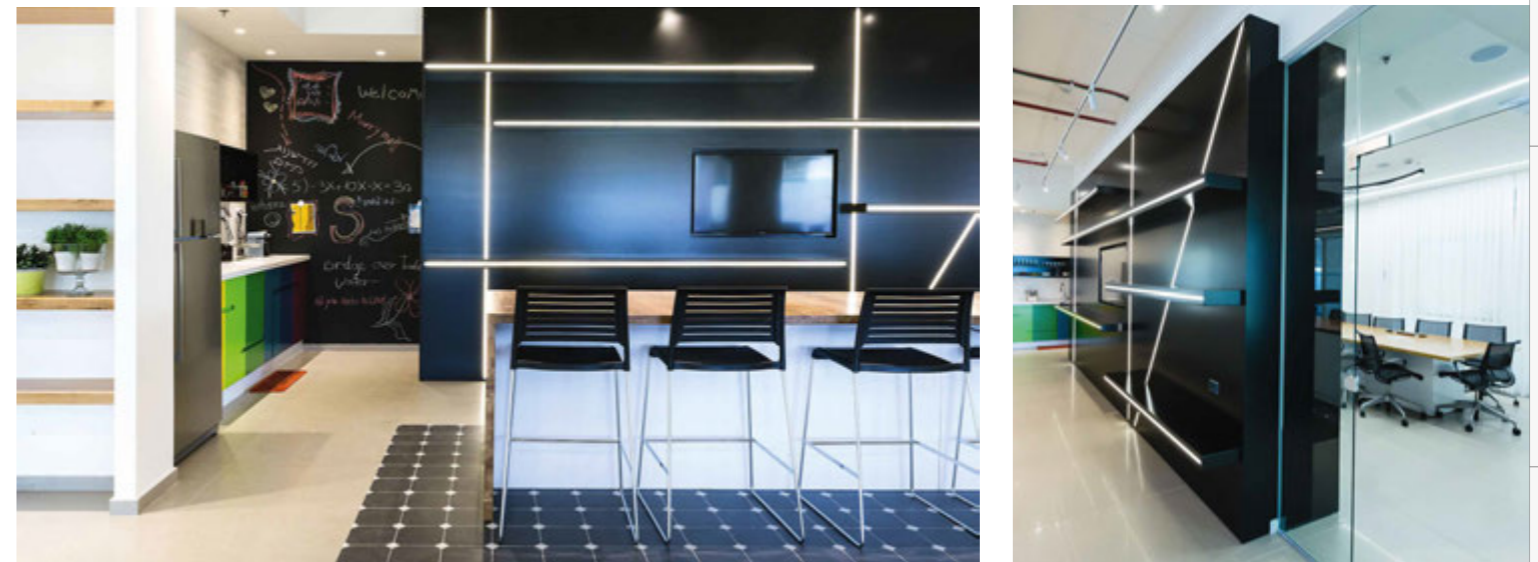
Choose among the large range of LED Linear's state of the art LED tape portfolio: VarioLED™ Flex or LUMINARIS ECO.

PROFILE

A new range of highly functional aluminum profiles with high tolerances for a clean design and a nice finish, in combination with LED Linear's Tj Away®, an optimal heat management to achieve durable luminaires.

MOUNTING

To enable flexibility and individuality in the combinations multiple mounting options are available for each profile to address multiple types of mounting and applications.



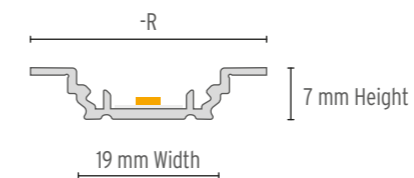
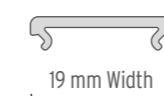
VarioContour
VarioCover
VarioClip

VarioContour 1907-R

19 mm Width

7 mm Height


Recessed Profil
or
Additional information
about Cover or Clips



To provide easy access and understanding of the possible combinations of different parts, the term contains a lot of information. The first numbers provide information about the width of the cover, the profile or mounting accessories and indicate whether the parts fit together.

This system gives us different product lines that can be freely combined with their covers and clips. An overview can be found on the following page.

PORTFOLIO OVERVIEW

COVER		PROFILE			MOUNTING																		
Opal	Diffuse	VarioContour	Article number	Max. Wattage W/m	10000039 (Profile)	10000040 (Clip)	10000040-15D	10000040-30D	10000040-45D	13000032	13000319	10000500	13000320	10000580-W	10000534	10000597-SCH	13000318	13000316	13000315	18200128			
					19 0°	19 15°	19 30°	19 45°	19 Plastic	19 Wall-Mount	19 60°	1907-R Corner	1508 Trimless DRY	1508 PVC	1512-R Mounting Spring	1508 0°	12 0°	12 0° Cone	Adhesive Tape				
					Recessed	Surface	Recessed	Recessed	Recessed	Surface	Surface	Surface	Recessed	Recessed	Recessed	Recessed	Recessed	Recessed	Recessed	Recessed			
					Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface		
 12000011 12000014		 1907-R	10000506 10000506-RAL9003 10000506-SCH	25	✓	✓	✓	✓	✓				✓								✓		
			10000038	25	✓	✓	✓	✓	✓													✓	
			10000300	30	✓	✓	✓	✓	✓			✓											✓
			10000533	25	✓	✓	✓	✓	✓			✓											✓
 12000055		 1508	10000537	20										✓	✓		✓				✓		
			10000535-RAL9003 10000535-SCH-FS	25													✓						✓
 12000057		 1207	10000583	20														✓	✓		✓		
			10000585	20															✓	✓		✓	
			10000587-W	20															✓	✓		✓	

DESIGN LUMINAIRES



Photo: Pirjo Lindfors



LYRA ECLIPSE

Poetic dance of light and darkness.
An elegant circular pendant luminaire with inner lighting.
An eye-catcher in every lounge, mall or lobby.



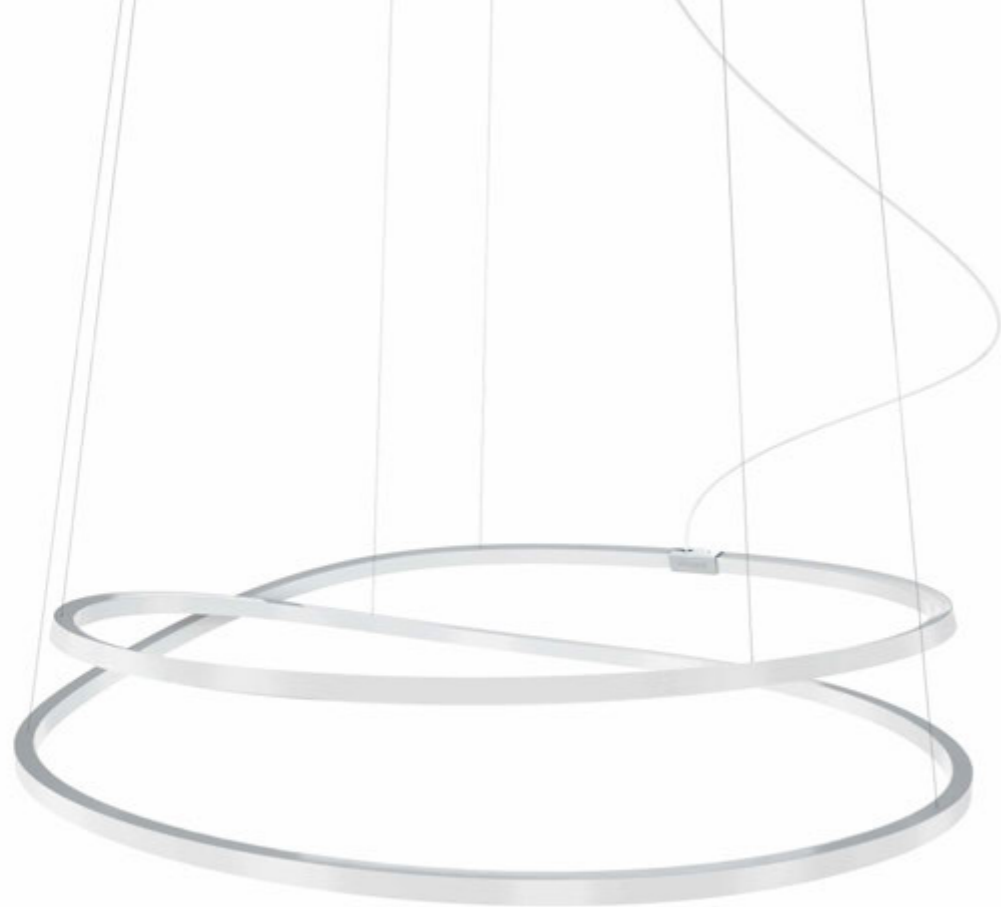
- Small cross section with minimal pendant and supply cable for a refined design with clean finish.
- Available in 806 mm or 1,164 mm diameter.
- Various lumen outputs up to 4,950 lm.



XOOTUBE™

XOOTUBE™ is a round linear luminaire which suits perfectly for different pendant solutions.
With lumen outputs reaching up to over 2,500 lm/m, the fixture can be used for multiple purposes.
XOOTUBE™ is possible to mount both horizontally and vertically as a perfect eye catcher.

- XOOTUBE™ is possible to adjust in any direction, making it flexible to use. So the 360° beam angle enables absolutely homogeneous light.
- The round design industrial design with a balance between robustness and elegance add an element of design to the room.
- The lumen output of 2,520 lm/m makes the luminaire functional.



FIRE DANCE

Graceful floating light

FIRE DANCE is a pendant luminaire with a round airborne design bringing elegance in every room – superb for eye-catching applications.

Awakens your creativity with the flexible design lighting.

- Minimalistic and floating design
- High quality and homogenous luminaire in 2,600 K and 3,100 K as a highlight in every room
- lumen output up to 1,580 lm



XOOM™ IN / XOOM™ OUT

XOOM-OUT is a circular luminaire with an aerial design floating in time and space. The light shines outward its ring shape and floods its surrounding with elegance.

XOOM-OUT complements any architectural concept with a graceful contrast of light and obscurity. Even though XOOM-OUT expels light out of its core, its innovative light distribution creates a singular lighting effect.

- Available in \varnothing 1,000 mm and \varnothing 1,400 mm
- High quality industrial design with almost invisible wires
- The lumen output up to 10,660 lm makes the luminaire perfect for large halls.

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GENERAL REFERENCES AND PRODUCT SPECIFIC INFORMATION

Trademarks and copyrights

LED Linear™ owns a broad portfolio of patents and trademarks for products manufactured by LED Linear™:

10 2008 016 697.9, PCT/EP 2009/002337, 10 709957.4-2307, PCT/EP 2010/000873, 10 709957.4, 10 2009 008 947.0, 10 2013 0052 30.0, 14001131.3, 50 2014 000 472.7, 2784373, 14/226877, 10 2012 013 332.4, 13 002 863.2, 13/932125, 10 201 301 7229.2, 102015001552.4, 20 2009 002 127.0, 20 2016 001 608.4, 20 2014 010 697.5, 2784373, 14/226877, 9,638,380, 13/307174, 20 2011 104 303, 20 2012 006 443.6, 202014002719.6, 002 069 351-01 bis -06, 402016000344.2, 29/469740, 402015000225.7-0001, 402015000225.7-0002, 402015000225.7-0003, 402015000225.7-0004, 402015000163-0001-0037, 402015000163-0002, 402015000163-0003, 402015000163-0004, 402015000163-0005, 402015000163-0006, 402015000163-0007, 402015000163-0008, 402015000163-0009, 402015000163-0010, 402015000163-0011, 402015000163-0012, 402015000163-0013, 402015000163-0014, 402015000163-0015, 402015000163-0016, 402015000163-0017, 402015000163-0018, 402015000163-0019, 402015000163-0020, 402015000163-0021, 402015000163-0022, 402015000163-0023, 402015000163-0024, 402015000163-0025, 402015000163-0026, 402015000163-0027, 402015000163-0028, 402015000163-0029, 402015000163-0030, 402015000163-0031, 402015000163-0032, 402015000163-0033, 402015000163-0034, 402015000163-0035, 402015000163-0036, 402015000163-0037, 402014000778.7, 29/325.374, 633,244, 000906235-0001, 000906235-0002, 000906235-0003, 000906235-0004, 000906235-0005, 29/469740, 001367676-0001, 001367676-0002, 001367676-0003, 001367676-0004, 001367676-0005, 001367676-0006, 001367676-0007, 001367676-0008, 001367676-0009, 001367676-0010, 001367676-0011, 001367676-0012, 001367676-0013, 003782267-0014, 004378610-0001, 004378610-0002, 004378610-0003, 004378610-0004, 004378610-0005, 004378610-0006, 004378610-0007, 004378610-0008, 004378610-0009, 004378610-0010, 004378610-0011, 30 2008 020 979, 007219959, 30 2012 000 809, 30 2012 000 809.7/09, 1132601, 4.374.183, T1215964J, 30 2012 000 808.9/09, 1132600, T1215963B, 4.374.182, 79/119246, 30703381.3/09, 010027605, 1102 872, 4,223,847, 79/107,641, T1200414J, 30 2011 028 727.9, T1112330H, 30 2010 057 680, 009903031, 4,156,313, 79/101,490, 1087873, 011065521, 011065513, 1512875, 1667663, 1691606, 1691609, 014961866, 1324479, 79198575, 1817269, 1821273, 011134996, 86/163695, 011415254, 4,986,108, 85/907705, 011415247, 5202489 85/953460, 011415239, 4458185, 85/907763, 011712429, 4998535, 85/883530, 86/036,654, 012152088, 86/129857, 012149621, 86/129781, 012318341, 86/136044, 012149613, 86/129704, 012318333, 4,746,032, 86/135731

General references

This catalogue supersedes all previous issues. We reserve the right to make technical and design changes to improve our products or to meet modified statutory requirements. Current data will be supplied on request. Our continually updated product documentation can be accessed at www.led-linear.com.

When assembling all applicable rules and regulations must be followed, i. e. the low Voltage Directive and the relevant norms and standards.

LED Linear™ luminaires are designed, manufactured and tested to the applicable standards and technical regulations of the VDE. The luminous flux values and other photometric data relate to an ambient temperature of 25°C. At other temperatures, deviations from the values stated in the catalogue are possible.

LED Linear™ reserves the right to discontinue any products from its collection at any time whatsoever and without prior notice, without prejudice to the essential characteristics of the models described; LED Linear™ also reserves the right to make technical and photometric modifications as well as to change any parts, details or finishes deemed suitable for improvement purposes or due to construction and commercial requirements.

Details regarding catalogue changes, min. and max. data sheet values and production tolerances

Changes

The values on this data sheet and catalogue can be changed because of technical development and innovation without a special notification.

Min. and max. ratings

Exceeding the minimum and maximum ratings as per data sheet will reduce lifetime or destroy the LED module. According to EN 60598-1, respectively UL 2108 and UL 8750 for North America the temperature of the LED module needs to be measured at the TC-point in a thermally constant status with a temperature sensor or temperature sensitive label (available at e. g. www.rs-components.com).

Production tolerances

Due to the specific conditions of the manufacturing process of LED the typical data of technical parameters in the respective data sheet only reflects statistical figures not necessarily correspond to the actual parameters of every single product which could defer from the technical data.

DIM-TO-WARM

"Dim-to-warm" describes the change in color temperature to the reddish area of the CIE (x, y) diagram of a luminaire during dimming. Well-known is this dimming behavior of thermal radiators such as incandescent or halogen lamps. As incandescent and halogen lamps are working with a glowing Wolfram wire. While dimming the wire glows less and less and is getting more reddish, as less current flows through it.

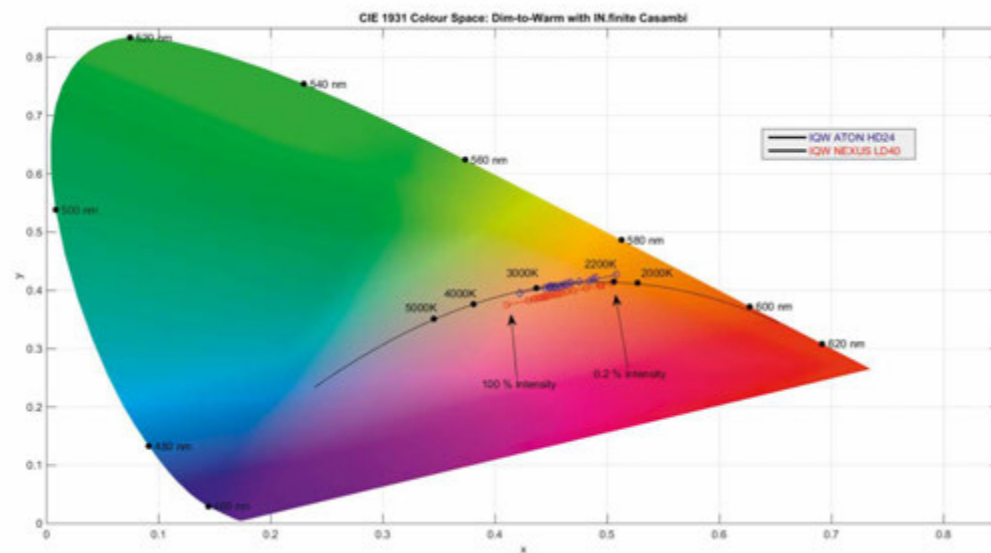
With the IN.finite CASAMBI control unit developed by LED Linear, it is possible to mimic this dimming behavior of thermal radiators. This dimming feature is perceived as pleasant from a historical perspective. IN.finite Casambi controls warm and cold white LED modules in intensity so that the color temperature during dimming resembles a black body. The special feature is the color temperature shift towards longer wavelengths (= red shift) when dimming. The black body curve represents the ideal color temperature profile for white light and serves as a guideline at the same time.

By mixing cold white and warm white LEDs, each with a color temperature of approx. 5,000 K or 2,000 K, the resulting correlated color temperature can be specifically influenced. The IN.finite Casambi by LED Linear™ actively controls the mixing ratio of the two LEDs and thus mimics a very accurate color gradient along the black body curve. While color is controlled linear, the intensity is controlled logarithmic at the same time. This intelligent mixing of the parameters results in a Dim to Warm range of approx. 3,500 K down to 2,100 K.

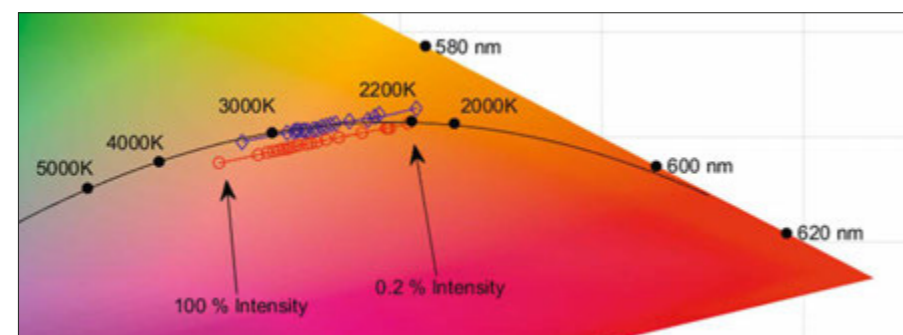
The graph below shows the black body curve within the CIE color chart (XYZ system). At lower color temperatures the proportion of red increases significantly. The measurement of a VarioLED™ Flex IQW ATON HD 24 (4000 K - 2000 K) and the VarioLED™ Flex IQW NEXUS LD40 (5,000 K - 2,200 K) controlled by IN.finite Casambi shows that the ideal curve is nearly complete reproduced.

Blue measurement point represents the VarioLED™ Flex IQW ATON HD24 (4,000 K - 2,000 K) Red measurement point represents the VarioLED™ Flex IQW NEXUS LD40 (5,000 K - 2,200 K)

For more information about IN.finite Casambi (Art. # 16000267-ID2473) please visit our website www.led-linear.com.



CIE-Diagram (XYZ-System) including the Black-Body-Curve



Measurement points along the Black-Body-Curve for VarioLED™ Flex IQW ATON HD24 (Blue) and VarioLED™ Flex IQW NEXUS LD40 (Red).

STANDARDS AND NORMS

STANDARDS AND NORMS SPECIFICALLY FOR LED'S

The importance of standards and norms specifically for LEDs and LED applications continues to grow steadily in the international market. Since the beginning of LED technology the standards and applications of the conventional lighting industry have been applied for many LED-based products. The safety aspects and the functional properties of LEDs are not entirely comparable with existing norms and standards for the conventional bulbs. The LEDs have to be treated as a separate application with separate standards.

To comply with the EU-Directive, according standards have to be applied. The current norms for LED lighting development include the norm for security of LED modules (DIN EN 62031) on the one hand and the photo biological security norm (DIN EN 62471) on the other hand. In addition to that further norms that will define the performance (DIN EN 62717) of LED and their applications for standard lighting applications are being prepared. These norms will include specific test methods and parameters for further LED developments in the future. Part of these norms will be standard test procedures to estimate the reliability and lifetime of LED modules and LED lamps.

For the certification of products with the CE mark, the products have to fulfill various requirements. For our LED Linear™ products especially the Low Voltage Directive 2014/35/EU and the EMC (Electro Magnetic Compatibility) Directive 2014/30/EU apply. In general the EMC Directive for LED modules can only be examined in a complete system connected to a converter and optionally to a control. In order to meet the Low Voltage Directive requirements, considering the security of LED modules, the norms are DIN EN 62031 and DIN EN 62471, which all LED Linear™ products adhere to.

Additionally, LED Linear™ meets the following european directives:

2009/125/EU (Ecodesign)

2011/65/EU (RoHS)

2012/19/EU (WEEE)

Some manufacturers of fixtures with LED modules deliver their products with an unstandardized technical documentation that is not restricted to any specific guideline. The manufacturer defines the parameters for the product and what will be provided with the customer. Besides the typical photometric and electrical data, these also include the reliability and lifetime of the product. Furthermore, it is yet to be determined how and under what circumstances these parameters are defined. This makes it difficult for the customers to compare products from different manufacturers with each other and to decide the most suitable product for their application.

For this reason another norm (DIN EN 62717) is in progress. This norm will specify the performance and the reliability of LED modules. It will apply for LED modules that emit white light with organic LEDs for general illumination. For LED lamps the norm DIN EN 62722 is being created. It will determine the specific requirements for LED lamps. The data supplied by LED Linear™ already covers most of the relevant characteristics of drafted norms.

LED Linear™ fulfills the following standards:

US-Market/UL Standard	Can-Market/CSA Standard
UL 8750	CSA C22.2#250
UL 2108	
Confirmation by certificates	
EU-Market	
LED modules	TM-30-15
	DIN EN 62031
	DIN EN 62471-1
LED luminaires	DIN EN 60598-1
	DIN EN 62722
	EN 55015
	EN 60100
	EN 61547
	EN 62493
	DIN EN 62717
Lifetime + Reliability + Measurement requirements	LM79
	LM80
	ANSI C78.377-2008
	TM-21-11
	IES LM-84
	IES LM-28

Cable length @ product length of 2 meter and allowing a voltage drop of 0.85 Volt

Product length Cable cross section AWG	2 meter						
	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex NEXUS LD5	14.28	19.42	28.56	42.84	57.12	85.68	142.80
VarioLED™ Flex NEXUS LD10	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex NEXUS LD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex NEXUS LD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex NEXUS LD40	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex NEXUS HD6	11.90	16.18	23.80	35.70	47.60	71.40	119.00
VarioLED™ Flex NEXUS HD10	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex NEXUS HD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex NEXUS HD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex NEXUS HD40	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex NEXUS UHD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex NEXUS UHD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex HYDRA SLD3	14.00	19.04	28.00	42.00	56.00	84.00	140.00
VarioLED™ Flex HYDRA LD5	14.28	19.42	28.56	42.84	57.12	85.68	142.80
VarioLED™ Flex HYDRA LD10	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex HYDRA LD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex HYDRA LD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex HYDRA LD40	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex HYDRA HD6	11.90	16.18	23.80	35.70	47.60	71.40	119.00
VarioLED™ Flex HYDRA HD10	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex HYDRA HD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex HYDRA HD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex HYDRA HD36	1.98	2.70	3.97	5.95	7.93	11.90	19.83
VarioLED™ Flex SOL LD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex SOL LD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex SOL HD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex SOL HD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex ATON 3	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex ATON AIR	5.10	6.94	10.20	15.30	20.40	30.60	51.00
VarioLED™ Flex ECO LD4	17.85	24.28	35.70	53.55	71.40	107.10	178.50
VarioLED™ Flex ECO LD12	5.95	8.09	11.90	17.85	23.80	35.70	59.50
VarioLED™ Flex ECO HD8	8.93	12.14	17.85	26.78	35.70	53.55	89.25
VarioLED™ Flex ECO HD24	2.98	4.05	5.95	8.93	11.90	17.85	29.75
VarioLED™ Flex SIDE VIEW LD10	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex SIDE VIEW HD20	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex IQ White NEXUS LD40	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex IQ White NEXUS HD12	5.95	8.09	11.90	17.85	23.80	35.70	59.50
VarioLED™ Flex IQ White NEXUS HD24	2.98	4.05	5.95	8.93	11.90	17.85	29.75
VarioLED™ Flex IQ White NEXUS HD42	1.70	2.31	3.40	5.10	6.80	10.20	17.00
VarioLED™ Flex IQ White HYDRA LD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex IQ White SOL LD25	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex IQ White ATON HD12	5.95	8.09	11.90	17.85	23.80	35.70	59.50
VarioLED™ Flex IQ White ATON HD24	2.98	4.05	5.95	8.93	11.90	17.85	29.75
VarioLED™ Flex IQ White ATON HD42	1.70	2.31	3.40	5.10	6.80	10.20	17.00
VarioLED™ Flex RGB LD15	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex RGB HD10	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex RGB HD20	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex RGBW HD20	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex RGBW HD40	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex ECO P12 R	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex ECO P12 G	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex ECO P12 B	7.14	9.71	14.28	21.42	28.56	42.84	71.40

Cable length @ product length of 3 meter and allowing a voltage drop of 0.85 Volt

Product length Cable cross section AWG	3 meter						
	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex NEXUS LD5	9.52	12.95	19.04	28.56	38.08	57.12	95.20
VarioLED™ Flex NEXUS LD10	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex NEXUS LD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex NEXUS LD25	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex NEXUS HD6	7.93	10.79	15.87	23.80	31.73	47.60	79.33
VarioLED™ Flex NEXUS HD10	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex NEXUS HD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex NEXUS HD25	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex NEXUS UHD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex NEXUS UHD25	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex HYDRA SLD3	9.33	12.69	18.67	28.00	37.33	56.00	93.33
VarioLED™ Flex HYDRA LD5	9.52	12.95	19.04	28.56	38.08	57.12	95.20
VarioLED™ Flex HYDRA LD10	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex HYDRA LD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex HYDRA LD25	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex HYDRA HD6	7.93	10.79	15.87	23.80	31.73	47.60	79.33
VarioLED™ Flex HYDRA HD10	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex HYDRA HD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex HYDRA HD25	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex SOL LD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex SOL HD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex ATON 3	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex ATON AIR	3.40	4.62	6.80	10.20	13.60	20.40	34.00
VarioLED™ Flex ECO LD4	11.90	16.18	23.80	35.70	47.60	71.40	119.00
VarioLED™ Flex ECO LD12	3.97	5.39	7.93	11.90	15.87	23.80	39.67
VarioLED™ Flex ECO HD8	5.95	8.09	11.90	17.85	23.80	35.70	59.50
VarioLED™ Flex ECO HD24	1.98	2.70	3.97	5.95	7.93	11.90	19.83
VarioLED™ Flex SIDE VIEW LD10	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex SIDE VIEW HD20	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex IQ White NEXUS HD12	3.97	5.39	7.93	11.90	15.87	23.80	39.67
VarioLED™ Flex IQ White NEXUS HD24	1.98	2.70	3.97	5.95	7.93	11.90	19.83
VarioLED™ Flex IQ White HYDRA LD25	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex IQ White ATON HD12	3.97	5.39	7.93	11.90	15.87	23.80	39.67
VarioLED™ Flex IQ White ATON HD24	1.98	2.70	3.97	5.95	7.93	11.90	19.83
VarioLED™ Flex RGB LD15	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex RGB HD10	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex RGB HD20	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex RGBW HD20	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex ECO P12 R	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex ECO P12 G	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex ECO P12 B	4.76	6.47	9.52	14.28	19.04	28.56	47.60

Cable length @ product length of 4 meter and allowing a voltage drop of 0.85 Volt

Product length	4 meter						
Cable cross section	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
AWG	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex NEXUS LD5	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex NEXUS LD10	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex NEXUS LD15	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex NEXUS HD6	5.95	8.09	11.90	17.85	23.80	35.70	59.50
VarioLED™ Flex NEXUS HD10	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex NEXUS HD15	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex NEXUS UHD15	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex HYDRA SLD3	7.00	9.52	14.00	21.00	28.00	42.00	70.00
VarioLED™ Flex HYDRA LD5	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex HYDRA LD10	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex HYDRA LD15	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex HYDRA HD6	5.95	8.09	11.90	17.85	23.80	35.70	59.50
VarioLED™ Flex HYDRA HD10	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex HYDRA HD15	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex ATON 3	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex ATON AIR	2.55	3.47	5.10	7.65	10.20	15.30	25.50
VarioLED™ Flex ECO LD4	8.93	12.14	17.85	26.78	35.70	53.55	89.25
VarioLED™ Flex ECO LD12	2.98	4.05	5.95	8.93	11.90	17.85	29.75
VarioLED™ Flex ECO HD8	4.46	6.07	8.93	13.39	17.85	26.78	44.63
VarioLED™ Flex SIDE VIEW LD10	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex SIDE VIEW HD20	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex IQ White NEXUS HD12	2.98	4.05	5.95	8.93	11.90	17.85	29.75
VarioLED™ Flex IQ White ATON HD12	2.98	4.05	5.95	8.93	11.90	17.85	29.75
VarioLED™ Flex IQ White ATON HD24	1.49	2.02	2.98	4.46	5.95	8.93	14.88
VarioLED™ Flex RGB LD15	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex RGB HD10	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex RGB HD20	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex RGB HD20	1.79	2.43	3.57	5.36	7.14	10.71	17.85
VarioLED™ Flex ECO P12 R	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex ECO P12 G	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex ECO P12 B	3.57	4.86	7.14	10.71	14.28	21.42	35.70

Cable length @ product length of 5 meter and allowing a voltage drop of 0.85 Volt

Product length	5 meter						
Cable cross section	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
AWG	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex NEXUS LD5	5.71	7.77	11.42	17.14	22.85	34.27	57.12
VarioLED™ Flex NEXUS LD10	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex NEXUS LD15	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex NEXUS HD6	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex NEXUS HD10	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex NEXUS HD15	1.90	2.59	3.81	5.71	7.62	11.42	19.04
VarioLED™ Flex HYDRA SLD3	5.60	7.62	11.20	16.80	22.40	33.60	56.00
VarioLED™ Flex HYDRA LD5	5.71	7.77	11.42	17.14	22.85	34.27	57.12
VarioLED™ Flex HYDRA LD10	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex HYDRA HD6	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex HYDRA HD10	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex ATON 3	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex ATON AIR	2.04	2.77	4.08	6.12	8.16	12.24	20.40
VarioLED™ Flex ECO LD4	7.14	9.71	14.28	21.42	28.56	42.84	71.40
VarioLED™ Flex ECO HD8	3.57	4.86	7.14	10.71	14.28	21.42	35.70
VarioLED™ Flex SIDE VIEW LD10	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex IQ White NEXUS HD12	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex IQ White ATON HD12	2.38	3.24	4.76	7.14	9.52	14.28	23.80
VarioLED™ Flex RGB HD10	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex RGB HD20	1.43	1.94	2.86	4.28	5.71	8.57	14.28
VarioLED™ Flex ECO P12 R	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex ECO P12 G	2.86	3.88	5.71	8.57	11.42	17.14	28.56
VarioLED™ Flex ECO P12 B	2.86	3.88	5.71	8.57	11.42	17.14	28.56

Cable length @ product length of 6 meter and allowing a voltage drop of 0.85 Volt

Product length	6 meter						
Cable cross section	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
AWG	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex NEXUS LD5	4.76	6.47	9.52	14.28	19.04	28.56	47.60
VarioLED™ Flex NEXUS HD6	3.97	5.39	7.93	11.90	15.87	23.80	39.67
VarioLED™ Flex HYDRA SLD3	4.67	6.35	9.33	14.00	18.67	28.00	46.67
VarioLED™ Flex HYDRA LD5	4.76	6.47	9.52	14.28	19.04	28.56	47.60

Cable length @ product length of 7 meter and allowing a voltage drop of 0.85 Volt

Product length	7 meter						
Cable cross section	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
AWG	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex NEXUS LD5	4.08	5.55	8.16	12.24	16.32	24.48	40.80
VarioLED™ Flex NEXUS HD6	3.40	4.62	6.80	10.20	13.60	20.40	34.00
VarioLED™ Flex HYDRA SLD3	4.00	5.44	8.00	12.00	16.00	24.00	40.00
VarioLED™ Flex HYDRA LD5	4.08	5.55	8.16	12.24	16.32	24.48	40.80

Cable length @ product length of 7.5 meter and allowing a voltage drop of 0.85 Volt

Product length	7.5 meter						
Cable cross section	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
AWG	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex NEXUS LD5	3.81	5.18	7.62	11.42	15.23	22.85	38.08
VarioLED™ Flex NEXUS HD6	3.17	4.32	6.35	9.52	12.69	19.04	31.73
VarioLED™ Flex HYDRA SLD3	3.73	5.08	7.47	11.20	14.93	22.40	37.33
VarioLED™ Flex HYDRA LD5	3.81	5.18	7.62	11.42	15.23	22.85	38.08

Cable length @ product length of 10 meter and allowing a voltage drop of 0.85 Volt

Product length	10 meter						
Cable cross section	0.25 mm ²	0.34 mm ²	0.50 mm ²	0.75 mm ²	1.00 mm ²	1.50 mm ²	2.50 mm ²
AWG	24	22	20	18	16	14	12
	m	m	m	m	m	m	m
VarioLED™ Flex HYDRA SLD3	2.80	3.81	5.60	8.40	11.20	16.80	28.00

LUMINAIRE CLASSIFICATION ACCORDING TO DIN 5040

LED Linear™ luminaires are classified according to DIN 5040 and thus represent a simple tool for the lighting design. The corresponding indication of the subdivision can be found in the relevant data sheet of the optic or of the luminaire. With the luminaire classification according to DIN 5040 lights are classified according to the distribution of the luminous flux in the upper and lower hemisphere of the luminaire. For this, a standard room S was defined which space is based on the room index $k = 1.25$ and a standard regular arrangement of luminaires, as seen in Figure 1. The definition of the room index k depending on the reflectance combinations for ceiling, walls and floor can be found in the publication LiTG 3.5.

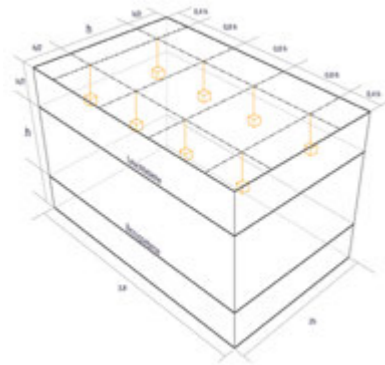


Figure 1 - Standard room S with luminaire standard arrangement in accordance with DIN 5040

The total luminous flux of the luminaire Φ_L is composed of the partial luminous fluxes in the upper hemisphere Φ_U and the lower hemisphere Φ_D . A part of the luminous flux in the lower hemisphere Φ_U falls directly on the used space of the standard room and forms the luminous flux Φ_{SU} which generates the direct illuminance E_{dir} there. This illuminance is considered usable illuminance in order to realize, for example, a task lighting (office work). Similarly, the ceiling luminous flux in the standard room is described with Φ_{SO} .

Based on the values defined above, the following parameters for the luminous flux distribution of a luminaire can be defined:

$\varphi_U = \Phi_U / \Phi_L$ Luminous flux in the lower hemisphere

$\varphi_D = \Phi_D / \Phi_L$ Luminous flux in the upper hemisphere

Further are defined:

$\varphi_{SU} = \Phi_{SU} / \Phi_U$ Usable luminous flux in the standard room S

$\varphi_{SO} = \Phi_{SO} / \Phi_D$ Luminous flux on the ceiling in the standard room S

By integrating the light intensity distribution, the relative partial luminous fluxes are determined and the luminaire can be categorized in a DIN 5040 table, as shown in Figure 2.

The code letter informs about the basic nature of the luminaires light distribution:

- A = direct illumination
- B = predominantly direct illumination
- C = direct-indirect illumination
- D = predominantly indirect illumination
- E = indirect illumination

The 1. code number arranges the luminaires according to the proportion of the direct luminous flux on the usable working plane in the standard room S φ_{SU} at the spatial luminous flux in the lower hemisphere φ_U (Direct illuminating component).

The 2. code number arranges the luminaires according to the proportion of the luminous flux on the ceiling of the standard room S φ_{SO} at the spatial luminous flux in the upper hemisphere φ_D (Indirect illuminating component).

If there is no luminous flux in the upper or lower hemisphere of the luminaire, the corresponding code is specified with 0.

Code letter	φ_U	φ_D	1. Code number	φ_{SU}	2. Code number	φ_{SO}
A	$0.9 \leq \varphi_U \leq 1.0$	$0 \leq \varphi_D \leq 0.1$	0	$\varphi_{SU} = 0$	0	$\varphi_{SO} = 0$
B	$0.6 \leq \varphi_U \leq 0.9$	$0.1 \leq \varphi_D \leq 0.4$	1	$0 \leq \varphi_{SU} \leq 0.3$	1	$0 \leq \varphi_{SO} \leq 0.3$
C	$0.4 \leq \varphi_U \leq 0.6$	$0.4 \leq \varphi_D \leq 0.6$	2	$0.3 \leq \varphi_{SU} \leq 0.4$	2	$0.5 \leq \varphi_{SO} \leq 0.7$
D	$0.1 \leq \varphi_U \leq 0.4$	$0.6 \leq \varphi_D \leq 0.9$	3	$0.4 \leq \varphi_{SU} \leq 0.5$	3	$0.7 \leq \varphi_{SO} \leq 0.9$
E	$0 \leq \varphi_U \leq 0.1$	$0.9 \leq \varphi_D \leq 1.0$	4	$0.5 \leq \varphi_{SU} \leq 0.6$	4	$0.9 \leq \varphi_{SO} \leq 1.0$
			5	$0.6 \leq \varphi_{SU} \leq 0.7$		
			6	$0.7 \leq \varphi_{SU} \leq 0.8$		
			7	$0.8 \leq \varphi_{SU} \leq 0.9$		
			8	$0.9 \leq \varphi_{SU} \leq 1.0$		
A			6			0

Figure 2 - Classification of luminous flux distribution of the luminaire in accordance with DIN 5040

An example, for a luminous flux distribution classified in accordance with DIN 5040 is shown in Figure 3.

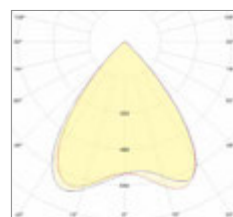


Figure 3 - Example for a luminous flux distribution A60 according DIN 5040

PHOTOMETRIC CODE ACCORDING TO DIN EN 62717

All LED lamps of LED Linear™ are marked with a photometric code on the data sheet. The photometric code provides information on photometric quantities of the used LED modules with white light emitting LEDs. The first 3 numbers indicate the general color

rendering (CRI index) and color temperature (CCT) of the modules. The subsequent 3 numbers handle the changes of color coordinates based on MacAdams ellipses and the lumen maintenance depending on the operating time.

Key for the photometric code:

Letter	1. Code number		2. + 3. Code number		4. Code number		5. Code number		6. Code number	
	Code	Initial CRI-Index	Code	Initial correlated color temperature in Kelvin	Code	Initial MacAdams ellipsis	Code	MacAdams after 25% of the operating time (max. 6,000 h)	Code	Remaining lumen output after 25% of the operating time (max. 6,000 h)
W	7	70 - 79	20	2,000 K	2	2 step MacAdams ellipse	2	2 step MacAdams ellipse	7	$\geq 70\%$
	8	80 - 89	22	2,200 K	3	3 step MacAdams ellipse	3	3 step MacAdams ellipse	8	$\geq 80\%$
	9	90 - 99	24	2,400 K	4	4 step MacAdams ellipse	4	4 step MacAdams ellipse	9	$\geq 90\%$
					5	5 step MacAdams ellipse	5	5 step MacAdams ellipse		
					27	2,700 K				
					30	3,000 K				
			35	3,500 K						
			40	4,000 K						
			50	5,000 K						
W	8		27		3		3		9	

Example of the photometric code based on the VarioLED™ Flex HYDRA HD15 with a correlated color temperature of 2,700 K and a color rendering index of CRI > 85. The photometric code always starts with "W" White.



Figure 4 - VarioLED™ Flex HYDRA HD15 W827

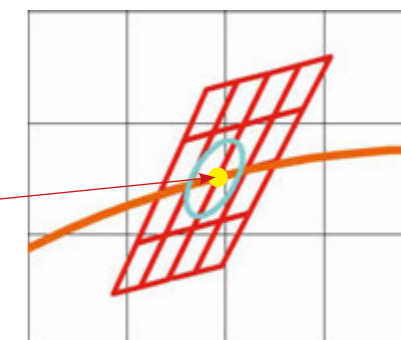


Figure 2 - 3 step MacAdams ellipse and 16 ANSI binnings for 2,700 K

LM 79 AND LM 80



LM 79 and LM 80

Light emitting diodes (LEDs) are a relatively new and unique source for outdoor lighting. They are more reliant upon effective thermal management than any previous source, more of a directional source, and have to be designed and tested as an entire lighting system.

Therefore, LEDs require new guidelines and practices for testing. There also needs to be a correlation between how LED manufacturers test their LEDs and how fixture manufacturers test their LED fixtures. In response, the Illuminating Engineering Society of North America or IESNA developed LM-79-08 and LM-80-08 for LED fixture and LED device testing.

As a high quality LED Linear™ lighting module and system supplier, LED Linear™ remains at the forefront of LED Linear™ lighting technology. LED Linear™ only uses high quality LED from Japanese manufacturers, who apply LM-80-08 to the LEDs delivered to LED Linear™.

LED Linear™ applies LM-79-08 to their LED lighting modules, systems and fixtures.

The IESNA

The IESNA is a 100+ year old lighting industry group with membership that includes manufacturers (both sources and fixtures), lighting in IESNA designers and architects, utilities, and others affiliated with lighting such as consultants, government, researchers and educators.

LM-80-08 for the LEDs themselves

LM-80-08 Approved Method: Measuring Lumen Maintenance of LED Light Sources was published by the IESNA Solid State Lighting (SSL) Subcommittee in the third quarter of 2008. Simply referred to as LM-80, this document covers lumen maintenance measurement for inorganic LED-based packages, arrays, and modules; it does not cover any other aspect of LED performance.

One of the key reasons for the development of LM-80 is due to differences in measuring LED performance criteria. LED manufacturers typically measure LEDs in pulse mode operation with no heat sink. The pulse is very short - typically 10 or 20 milliseconds (that is, thousands of a second) - which will not heat up the LED; therefore, no heat sink is required and Tj can be assumed to be equal to ambient temperature TA (typically held constant at 25°C). This is useful for doing high yield LED measurements quickly. This also explains why LED manufacturer data sheets typically show LED performance for Tj = 25°C.

In contrast, LED fixture manufacturers measure LED performance in situ, which means while it is in their fixture. Under these conditions, the LED is operated in constant DC mode and there are typically numerous LEDs configured together often in close proximity to one another, elevating Tj above 25°C. This elevated Tj affects the photometric and colorimetric performance of the LEDs. In order to compare “apples to apples”, a new testing criteria needed to be developed: LM-80-08.

LM-80-08 prescribes uniform test methods for LED manufacturers under controlled conditions for measuring LED lumen maintenance while controlling the LEDs TS or case temperature, the DC forward voltage and forward current to the LED. LM-80-08 requires 55°C, 85°C and one other TS chosen by the LED manufacturer. It also requires lumen maintenance data out to at least 6,000 hours of constant DC mode (not pulse mode) operation 4.

Many of LED Linear™ Japanese LED suppliers chose 120°C for the third TS for their LED and they have recorded data out to 10,000 hours which is the preferred duration in LM-80. Based upon LM-80-08 data, LED manufacturers then extrapolate lumen maintenance out to ten thousands of hours.

Our LED suppliers go out to 60,000 hours and beyond. While LM-80-08 does not specify the extrapolation method, many LED manufacturers use more conservative exponential extrapolation due to the exponential behavior of LEDs and most electronic components. The SSL Subcommittee is working on TM-21 which will standardize this extrapolation method.

The data resulting from LM-80-08 measurements are matrices of lumen maintenance values. LED fixture manufacturers use this data in combination with their UL in-situ thermal testing to predict the lumen maintenance of the LEDs when used in their fixtures and, subsequently, the lumen maintenance of the LED fixtures themselves. For example, if we measure 85°C TS at the hottest LED Linear™ LED in one of our fixtures, then we look up that particular data set from our Japanese suppliers to determine the LED fixture's lumen maintenance based upon and correlated with the LEDs lumen maintenance at that same TS. Fixture manufacturers also use the data to predict LED color stability over time at the various TS temperatures.

LM-79-08 for the LED fixture

CIE S 025 test method for LED lamps, LED luminaires and LED modules. LED lumen maintenance and color stability are only part of the puzzle. It is helpful to characterize the performance of LEDs in fixtures so that the entire system is considered. That's where LM-79-08 comes in. LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products was published by the IESNA Solid State Lighting (SSL) Subcommittee in the first quarter of 2008. LM-79-08 covers photometric and colorimetric performance as well as electrical power measurements for inorganic LED fixtures 5. LM-79-08 prescribes uniform test methods for LED fixture manufacturers under controlled conditions using LED fixtures as they would be manufactured for production.

Unlike traditional sources which are typically tested using relative photometry with test lamps and ballasts, LED fixtures are tested using absolute photometry with production LEDs and fixtures in the orientation in which it will be installed to ensure a more true test of LED performance when in situ. As previously discussed, LEDs operated in situ will perform differently due to the elevated Tj which will be further impacted by fixture orientation and thermal conditions; if the LED array or module were removed from the fixture, its performance would change. This is precisely why absolute photometry is a must for LED fixtures.

LM-79-08 testing is typically performed with either an integrating sphere for all photometric and colorimetric measurements or an integrating sphere in combination with a goniophotometer. The integrating sphere is recommended for colorimetric measurements; alternately, a goniospectroradiometer or gonio-colorimeter may be used. LED Linear™ has an integration sphere for all colorimetric, radiometric and photometric measurements for single LEDs and a custom designed goniophotometer lab and equipment where we test LED fixtures following LM-79-08 procedures. We also test key LED fixtures in independent DOE approved labs - look for the .ies photometric files on our web site that indicate LM-79-08.

In 2015 CIE S 025 was published that focuses on test methods for LED fixtures.

SECURITY AND ENVIRONMENTAL PROTECTION

Protection classes with regard to insulation

Protection class	Symbol	Meaning
I		Luminaires in which protection is based not solely on the basic insulation but also on a protective earth conductor that is connected to exposed conductive parts.
II		Luminaires in which protection is based not solely on the basic insulation but also on an additional or reinforced insulation or which there is no protective earth connection.
III		Luminaires in which protection is based not solely on safety extra low voltage (SELV/PELV). There must be no voltage higher than the safety extra-low voltage in the luminaire. 50 V AC, 120 V DC

The protection class of a luminaire for mains voltage indicates the way in which an electric shock to the user is prevented in the event of a fault. A luminaire in protection class II does not have a protective earth so it places great demands on the design because in this case double isolations have to be available on electrically conductive parts.

More protection classes

Symbol	Meaning
	Luminaires with this identifier are suitable according to DIN VDE 0710 Part 14 for installation in and on furniture, the material of which have normal or reduced flammability as per DIN 4102.
	Luminaires with this identifier are suitable according to DIN VDE 0710 Part 14 for installation in and on furniture with unknown flammability.

The glow wire test

Symbol	Meaning
960°C	For general-purpose luminaires installed in enclosed horizontal escape routes and stairwells.
850°C	For general-purpose luminaires installed in buildings open to the general public if the entire visible area of the ceiling covered by the luminaires is more than 25% of the building area.
750°C	For other general-purpose luminaires installed in buildings open to the general public

External parts of fixed or suspended luminaires must be subjected to a glow wire test at the temperatures indicated above, based on their location and purpose. The above values are binding for France, otherwise a temperature of 650°C is usual.

More information and specifications can be taken from the DIN EN 60598-1.



ETL-Label

Historically, structures and contents of the safety standards in the U.S. have developed different to the standards in the European market. The ETL label is a mark of quality that guarantees the proof of compliance with the relevant UL standards in the United States and the Canadian Standards in accordance with CSA standard. This label has a high acceptance in the U.S. and Canada. It is attributed to the Electrical testing laboratories, which are established by Thomas Alva Edison in 1896. The ETL Label is the second largest and fastest-growing certification label in the North American market.



CE label

The CE label confirms that the product complies with the relevant EU directives, such as the Low-Voltage Directive 2014/35/EU or the EMC directive 2014/30/EU. Of course, LED Linear™ luminaires meet the requirements of the relevant EC directives and therefore carry the CE label.



Compliance with safety regulations and other standards

Luminaires should not only look good and provide good light, they must also be protected against injury and fire. Safety is guaranteed by compliance with a variety of regulations and standards. Luminaires from LED Linear™ meet all relevant national and international regulations and this can be indicated by approval marks from independent test institutes such as the ones shown above. This is documented by additional approval marks, such as the VDE or ENEC certificate, if the customer wishes..



German “Elektrogesetz”

The icon with crossed-out wastebasket on a EEE states that the product should not be disposed of with household waste at its end of life. Instead, it can be returned free of charge at an appropriate collection point nearby. Please check the available collection points in your city or local government. If the old unit contains personal data, please act responsibly and delete before disposing of it.

The registration number of LED Linear: WEEE-Reg.-Nr. DE 12683737.

Safety of the human eye with LED products

In 2006 the International Electrotechnical Commission (IEC) has committed the IEC 62471:2006 to set up the photo biological safety with lamps and lamp systems. This standard can be applied to LEDs, too. In Germany and Europe the DIN EN 62471 must be applied to lamps and lamp systems. In this standard different risk groups are defined. The risk group classification includes the different spectral ranges and exposure time which takes effect to the human eye, especially for the blue and white light emitting LEDs. According to this definition most of our products are within the exempt group. In this case additional markings and protective actions are not necessary. Nevertheless, never look into the light source directly. Keep in mind that increasing the current or adding optical components can change the risk group and can damage the human eye.

EU-ENERGY LABEL

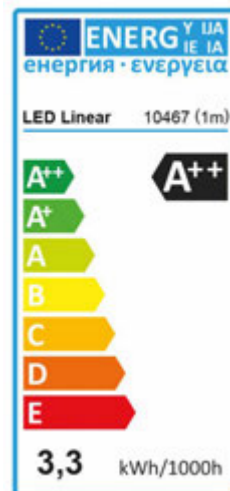
EU Regulation 874/2012 - energy labeling of electrical lamps and luminaires

The EU Regulation 874/2012 supplementing Directive 2010/30/ EU of the European Parliament deals with energy labeling of electrical lamps and luminaires. The stated aim of Regulation 874/2012 is to promote efficient products through clear information regarding their energy efficiency.

In the European Union energy-related products, such as lighting equipment, are marked with a label for electric power consumption - the EU Energy Label. The Energy Label for lamps provides information about the energy efficiency class, the respective lamp is assigned, and what demand for energy it has in 1,000 operating hours. This ensures an easy comparison of products in terms of energy consumption in the competition.

For us it is important to develop environmentally designed products, for thereby contributing to the sustainable conservation of resources. LED Linear™ develops and manufactures high quality products, which are characterized by high energy efficiency and a long lifetime. Starting with the product idea to the recycling of our products, we ensure that the environmental impact will be reduced continuously throughout the entire product life cycle.

- The EU Energy Labels are ready for download on the relevant product page at www.led-linear.com.
- EU Energy Label based on VarioLED™ Flex HYDRA SLD3 W850 with a product length of 1 m.



REACH AND ROHS COMPLIANCE

Since 1 June 2007 the regulation (EC) no. 1907/2006, the so-called REACH regulation (REACH-Registration, Evaluation, Authorisation and Restriction of Chemicals) has been in force.

To put it in plain words, the REACH regulation distinguishes between chemical products ("substances on their own and in preparations") and non-chemical products ("substances in articles").

LED Linear™ GmbH as a manufacturer of non-chemical products (linear lighting solutions with LED) is a "producer of articles" according to the REACH regulation. As such a producer LED Linear™ GmbH would be in principle obliged to (pre-)register if, when using our products, chemical substances were released under normal and reasonably foreseeable conditions. But as this is not the case, only the provisions concerning the "candidate list" (substances of very high concern) are important for us.

According to these provisions, producers and importers of articles containing a substance from the "candidate list" in a concentration above 0.1 % by mass per article must provide their professional recipients with sufficient information to allow safe use of the products including, as a minimum, the name of that substance. If the articles contain more than 1 t/a of the substance, the European Chemicals Agency (ECHA) must be informed.

The candidate list according to article 59 (1, 10) REACH (EC regulation no. 1907/2006) has been published in the meantime (see internet address of the European Chemicals Agency (ECHA) <http://echa.europa.eu/>). However, we do not have any information that substances from the candidate list are contained in a concentration above 0.1 % by mass per article in the products delivered to you.

We want to clarify that for the manufacture of our products chemicals are of course used. If they contain substances liable to registration, the duty to register, however, exclusively applies to our suppliers and not to us as a "downstream user". We have contacted the corresponding suppliers to ensure that we are supplied, if possible, with the required chemicals.

We know, of course, the requirements of the RoHS guideline directive concerning lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ethers (PBDE) and their implementation into national law. Our products are always conform to the current RoHS-policy.



HIGH COLOR RENDITION, HIGH R9

The color rendition is a quality characteristic of light. The most natural of all light sources, the sun, has a color rendering index of CRI = 100. This means that all known colors are 100 % reproduced by the spectral emission of the sunlight. We have set ourselves the aim to perceive this characteristic of the sun with our products. Many LED Linear™ products provide a color rendering index of up to 98 and feature a R9 value of up to 90. Red shades are very powerful colors. The accurate color renderings of these deep red shades are measured in the R9 color spectrum. Many LEDs have a high overall CRI value, the critical R9 performance may be missing. Therefore selected LED Linear™ products based on the VarioLED™ Flex HYDRA LD5, HD6 and HD10 use special, purpose-optimized LEDs to ensure a higher color rendering in critical R9 range and thus reproduce strong colors in all facets of life.

Use this page to test the color rendering of our LED light lines.



LED LINEAR LABORATORY: CLIMATE AND TEMPERATURE TEST CHAMBERS

To ensure and test our high level of product reliability and lifetime we have expanded our laboratory with modern climate and temperature shock test chambers. To have an impression of the performance of the chambers a few technical details are shown below.

Climatic Test Chamber 2 x VCL4010

Temperature mode

- Temperature range: -40°C - +180°C
- Temperature deviation: ±1°C
- Temperature homogeneity: ±2°C

Climate mode

- Temperature range: 10°C - 95°C
- Humidity range: 10% - 98%
- Humidity range: ±3%
- Temperature deviation: ±0.5°C
- Temperature homogeneity: ±1.5°C

General info

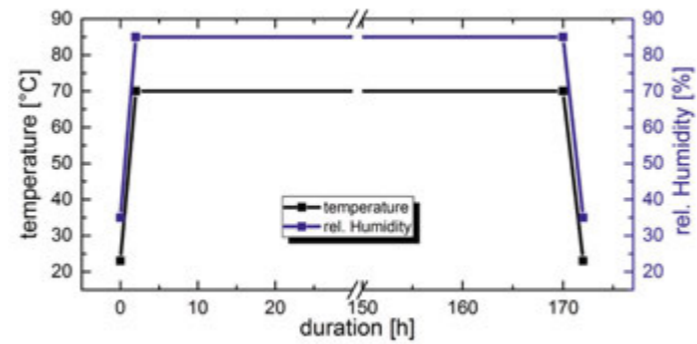
- Testing volume: 100 l
- Dimension of test chamber: 50 cm x 49 cm x 40 cm (H x W x L)
- 1 opening for electrical contacts
- Annual maintenance and calibration

Changing rate:

- Heating: 3.5°C/min
- Cooling: 5°C/min

Typical tests at LED Linear™

- Temperature Humidity Bias Test (THBT)
- 70°C & 85 % r. H.
- Severity level depends on duration
- I: 168 h
- II: 504 h
- III: 1000 h
- IV: 2000 h



Temperature Shock Chamber VT³701252

Hot chamber

- Temperature range: +50°C - +220°C
- Temperature deviation: ±1°C
- Temperature homogeneity: ±2°C

Cold chamber

- Temperature range: -80°C - +70°C
- Temperature deviation: ±1°C
- Temperature homogeneity: ±2°C



Schematic

Changing rate:

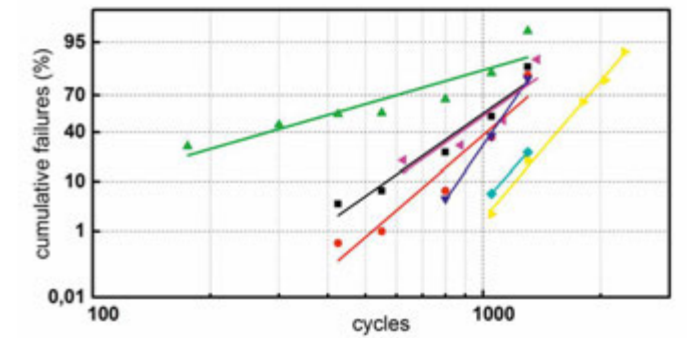
- Heating: 14 K/min

Changing rate:

- Heating: 2 K/min
- Cooling: 6.3 K/min

Typical tests at LED Linear™

- Testing of interconnections of components
- -25°C; 85°C ; 30 min; 24 cycles
- reliability of the solder joints
- -55°C; 125°C; 30 min; ≤ 3,000 cycles
- (weibull distribution)



Climatic Test Chamber 1 x VC³4100

Temperature mode

- Temperature range: -42°C - 180°C
- Temperature deviation: ±1°C
- Temperature homogeneity: ±2°C

Climate mode

- Temperature range: 10°C - 95°C
- Humidity range: 10% - 98%
- Humidity range: ±3%
- Temperature deviation: ±0.5°C
- Temperature homogeneity: ±1.5°C

General info

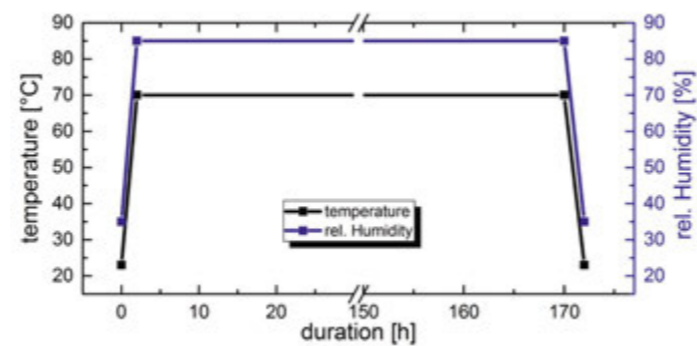
- Testing volume: 990 l
- Dimension of test chamber: 95 cm x 110 cm x 95 cm (H x W x L)
- 2 openings for electrical contacts
- Annual maintenance and calibration

Changing rate:

- Heating: 3.5°C/min
- Cooling: 5°C/min

Typical tests at LED Linear™

- Temperature Humidity Bias Test (THBT)
- 70°C & 85 % r. H.
- Severity level depends on duration
- I: 168 h
- II: 504 h
- III: 1000 h
- IV: 2000 h



NEW

PHOTOMETRIC MEASUREMENTS

LED LINEAR™ SERVICE OFFER: IN HOUSE LABORATORY PHOTOMETRIC MEASUREMENTS

Since 2018 we are able to offer you photometric measurements and several tests as a new service of our in house laboratory. The main measurement and test equipment is shown below.

For applying these or additional measurements and tests do not hesitate to ask your contact partner of LED Linear™.

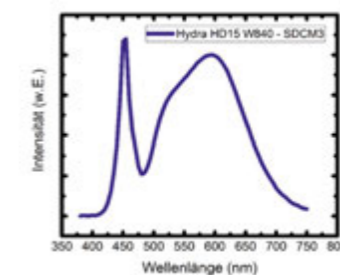
Lighting Measurements^A

Goniometer

- Measurement of the light distribution curve up to gamma = 120°^A
- Luminous flux
- Measurement of angle dependent colorimetric values
- Photometric results available as IES- or EULUMDAT Files

Integration sphere

- Luminous flux
- Measurement of colorimetric values like: CCT, CRI etc.
- Measurement of spectral radiant flux



Climatic Tests and Thermal Shock^B

Temperature mode



- Temperature range: -40°C - +180°C
- Temperature deviation: ±1°C
- Temperature homogeneity: ±2°C

Changing rate

- Heating: 3.5°C/min
- Cooling: 5°C/min

Climate mode



- Temperature range: 10°C - 95°C
- Humidity range: 10% - 98%
- Humidity range: ±3%
- Temperature deviation: ±0.5°C
- Temperature homogeneity: ±1.5°C

Thermal shock on demand

Thermography^C

- Thermographic measurement of devices and components



Template Test Report

^A) Measurements according to DIN EN 13032-4:2015-08, CIE S 025:2015; DIN EN ISO/IEC 17025 (works in progress)

^B) Diverse Standards possible, please ask

^C) With ITC level 2 certified personnel

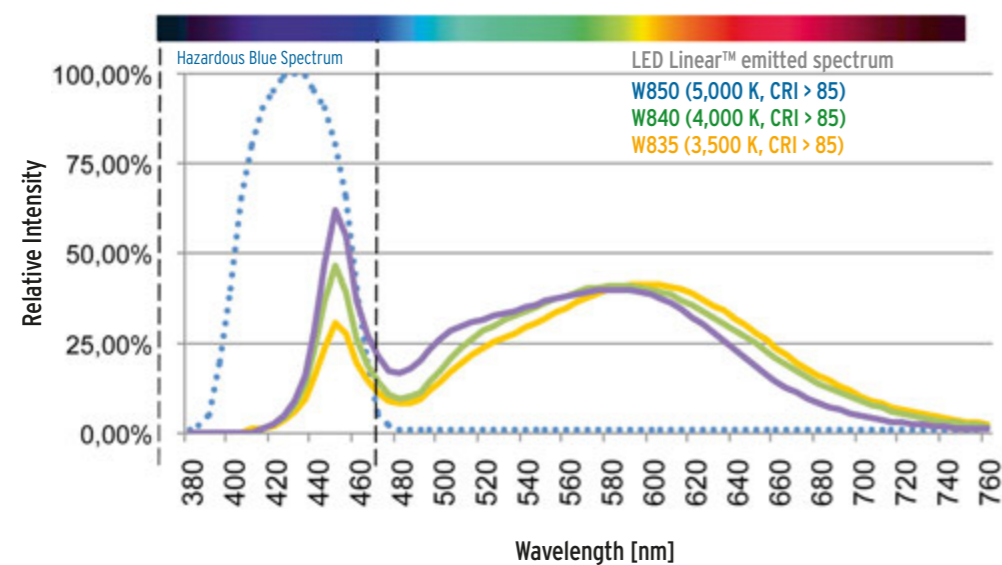
PHOTOBIOLOGICAL SAFETY OF LED LINEAR LIGHT SOURCES

(HAZARDOUS BLUE INDEX ACCORDING TO IEC 62471)

Photobiological safety is a constant and highly frequented topic in the lighting industry. Most discussions are about hazardous radiation in certain wavelength ranges, on radical radiation angles and high luminances.

Especially for the LED technology these topics are always on top due to the fact, that LEDs often have high luminous intensities on a small surface and a high blue component of the emitted light in the wavelength range of 380 nm - 480 nm which can harm

the eyes, especially the retina of humans. High luminances can be easily reduced by optical systems. It looks different with the high blue light part of the LED. Most LEDs for general lighting have a blue emitting chip-die on which a phosphor conversion layer enriched with color particles is applied. This combination creates white light through additive color mixing.



The IEC 62471 standard deals with the photobiological safety of light sources as well as the blue light hazard between 380 nm and 480 nm. To distinguish, four groups are defined in IEC 62471 to give the people an indication of the danger. LED Light engines

by LED Linear™ do not pose any harm to humans due to the low blue component of the emitted light within 380 nm - 480 nm. LED Linear™ light engines are principle for any type of lighting application.

LED Linear VarioLED™ Flex			
Exempt Group	Risk Group I*	Risk group II	Risk Group III
Lamp or luminaire does not constitute a danger in the sense of Photobiological safety. Labeling is not required.	Lamp or luminaire does not constitute a danger in the sense of Photobiological safety. Labeling is not required.	Lamp or luminaire does not constitute a danger in the sense of Photobiological safety. Labeling is not required.	Not permitted in general lighting

* LED Linear™ LED light engines with "risk group I" according to IEC 62471 are correspondingly labeled or marked.

PHOTOBIOLOGICAL SAFETY OF LED LINEAR LIGHT SOURCES

(VARIOLED FLEX HYDRA SERIES - HAZARDOUS BLUE INDEX ACCORDING TO IEC 62471)

This document certifies on behalf of LED Linear that, to the best of LED Linear's knowledge that the products based on VarioLED Flex™ HYDRA series was tested and evaluated by LED Linear™ in compliance with IEC 62471(2006) assigned to the risk group specified as follows:

Details of Evaluation:

Based on VarioLED Flex HYDRA Series up to $I_f = 65 \text{ mA}$

Hazard Name	Symbol	Measurement Value	Emission Limits			Units	Risk Group
			Exempt	Low-Risk	Mod-Risk		
Actinic UV	E_S	*2	10^{-3}	3×10^{-3}	3×10^{-2}	$\frac{W}{m^2}$	Exempt group *3
Near UV	E_{UVA}	*2	10	33	10^2	$\frac{W}{m^2}$	Exempt group *3
Retinal blue-light	L_B	N/A	10^2	10^4	4×10^6	$\frac{W}{m^2/sr}$	
Retinal blue-light, small source	E_B	2.50×10^{-1} *4 3.17×10^{-1} *5	1	1	4×10^2	$\frac{W}{m^2}$	Exempt group *4 Exempt group *5
Retinal thermal	L_R	3.80×10^4 *4 4.62×10^4 *5	8.2×10^6 *4 6.9×10^6 *5	8.2×10^6 *4 6.9×10^6 *5	2.1×10^7 *4 1.7×10^7 *5	$\frac{W}{m^2/sr}$	Exempt group *4 Exempt group *5
Retinal thermal, weak visual stimulus	L_{IR}	*2	5.5×10^5 *4 5.5×10^5 *5	5.5×10^5 *4 5.5×10^5 *5	5.5×10^5 *4 5.5×10^5 *5	$\frac{W}{m^2/sr}$	Exempt group *3
IR radiation, eye	E_{IR}	*2	10^2	5.7×10^2	3.2×10^3	$\frac{W}{m^2}$	Exempt group *3

- *1 Only if the hazard is considered when determining the Risk Group(s) assigned to the product, the measurement values for this hazard is provided.
- *2 This product has not been evaluated for the hazard due to no emission in the applicable wavelength range.
- *3 This product has been classified as Exempt Group due to no emission in the applicable wavelength range.
- *4 For general lighting service lamps Measurement distance: 240 mm, Aperture size: 7 mm, Angular subtense: 3.39 mrad, Ambient: 25°C/40%RH
- *5 For all other light sources Measurement distance: 200 mm, Aperture size: 7 mm, Angular subtense: 4.07 mrad, Ambient: 25°C/40%RH
- *6 This product is not applicable to this hazard.

Notes

In accordance with the classification for lamps intended for general lighting service (GLS), this product was classified as Exempt Group. The measurement value for each hazard was below the emission limit for Exempt Group.

In accordance with the classification for all other light sources, this product was classified as Exempt Group. The measurement value for each hazard was below the emission limit for Exempt Group.

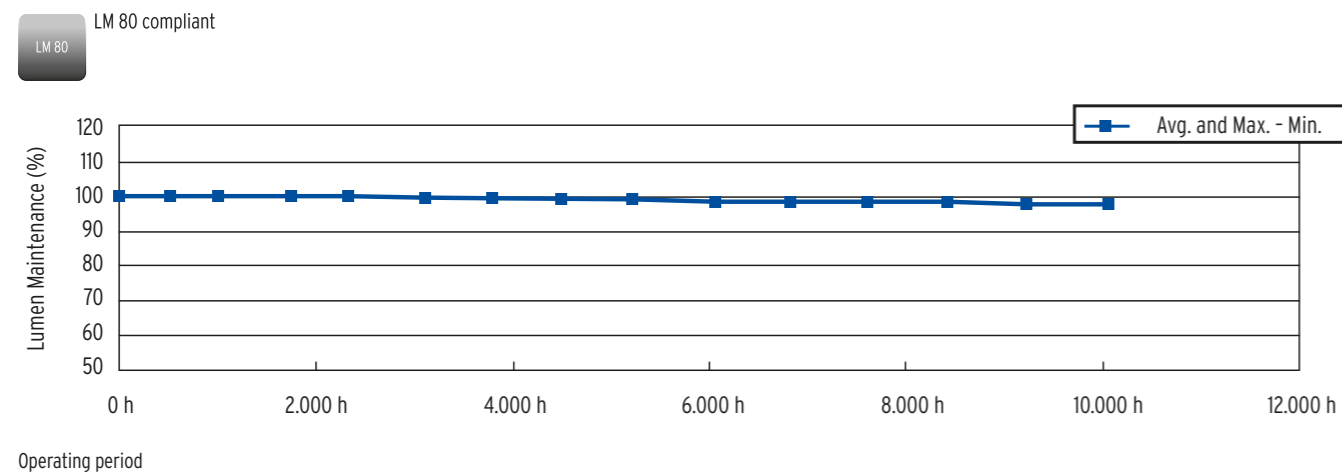
* LED Linear™ LED light engines with "risk group I" according to IEC 62471 are correspondingly labeled or marked.

LUMEN MAINTENANCE ACCORDING TO LM-80-08

The standard LM-80-08 "Measuring Lumen Maintenance of LED Light Sources" provides methods of the measurement of lumen maintenance of LED packages and LED modules.

The products shall be tested for at least 6,000 hours with data collection at a minimum of every 1,000 hours. Test must include three case temperatures, recommend-

ing nominal case temperatures: 55°C, 85°C and a third temperature which can be freely chosen by the manufacturer and is in our case mostly at 105°C. Depending on the application with corresponding current an additional case temperature is selected. Chromaticity or voltage shift is also reported over the measurement time.



Operating period

LIFETIME PREDICTION ACCORDING TO TM-21-11

The TM-21-11 standard „Projecting Long Term Lumen Maintenance of LED Light Sources“ provides a calculation tool to interpret the data collected from LM-80-08 testing. LED Linear™ provides users with lumen maintenance life projection or to predict estimated lumen output values at a given time duration by interpolating lumen maintenance behaviors for the in-situ temperature which are different from testing temperature.

For example the lumen maintenance life projection L80 in hours is estimated when 80% from primarily lumen output is given. Or the predicted lumen maintenance can be calculated within a given lifetime.

LED Linear™ calculates all lifetime data according to the standard TM-21-11 and are documented on all data sheets. Do not hesitate to ask for detailed test reports.

NEW STANDARDS

Lumen maintenance according to IES LM-84

This standard provides the method for reproducible measurements of lumen and color maintenance of LED lamps, light engines and LED luminaires. It does not provide performance requirements or predictive estimations or extrapolation for lumen maintenance beyond the limits of the lumen maintenance determined from actual measurements.

Lifetime prediction according to IES LM-28

The typical minimum test duration is 6,000 h. If at least 6,000 h of LM-84 data are available, a TM-21 like projection based on these data can be used. LM-84 data may be used in conjunction with LM-80 data for the same type of LEDs to reduce the test duration to 3,000 h. Some specification allows 3,000 hour test results to be used for prequalification.

VarioLED™ Flex VENUS White TV IP67

Private residence, Davos



Photo: Daniel Kessler, Zürich

IES TM-30-15 REPORT: VARIOLED™ FLEX WHITE

In May 2015 the Illuminating Engineering Society proposed a new calculation method for the color rendering of LEDs. This new method is described in detail in the technical memorandum IES TM-30-15. This novel method assesses the spectral power distribution (SPD) of white light sources near the Planck locus regarding the color fidelity, color discrimination and color preference. The TM-30-15 method utilizes 99 color evaluation samples (CES) - each represented by a spectral reflectance factor function - to quantify the difference in color rendition between the test source and reference source. This allows for a much more differentiated assessment of the color rendering of a light source compared to the CRI method utilizing only 8 reference colors. The introduced Fidelity Index R_f and the Gamut Index R_g characterizing the light source will help our customers to specify our luminaires more easily for certain applications or for projects with given design rules.

- ADONIS True Color IP67* / KALYPSO True Color IP67
- VarioLED™ OCEANOS True Color IP67
- XOOLINE™ IP40/IP67
- LYRA IP40
- LYRA 36 NANO IP40
- XOOLUX™ NANO IP65
- LUNA IP40
- XOOLUM™ IP40/IP67 / XOOLUM™ R IP20/IP67
- MARS CV / MARS CC IP40
- XOOTUBE™ 38 IP40
- XOOTOO IP40

This report details the findings of the tests conducted on the color rendering of the product families VarioLED™ Flex HYDRA, SOL, NEXUS and ATON as well as XOOMINESCENT™. The tests and calculation methods are fully compliant with the novel IES standard TM-30-15. The results can be transferred without restrictions of any kind to system luminaires, that are using the HYDRA White tapes as light engine, in particular:

- VarioLED™ Flex NEXUS / HYDRA / SOL / ATON / ECO
- XOOMINESCENT™ CC
- VarioLED™ Flex VENUS / PHOBOS / SKYLLA TV IP67*
- VarioLED™ Flex VENUS / PHOBOS / SKYLLA SV IP67*
- VarioLED™ Flex VENUS True Color TV/3D

The measurements of the spectral power distribution are conducted at 25°C ambient temperature in the photometric laboratory of LED Linear™ using an absolute calibrated spectrometer BTS256-LED in the integrating sphere ISD-100HF-V01 (both Gigahertz Optik, Germany). The tested CRI 95+ and CRI 85+ LED types are tested with the photometric codes W830, W930, W940. TM30 reports for the other CCTs are available on request.

This report is based on calculations processed with the IES TM-30-15 Advanced Calculation Tool (version 1.01 as of 2015-10-02), provided by the Illuminating Engineering Society (IES).

*) The LED tapes in IP67 products are encapsulated in Polyurethane (PU). This can cause a specific CCT shift of about 200 - 400 K into the cold white spectrum along the Planck locus. The PU encapsulation has no impact on the integral index R_f . However, the CCT shift may influence individual R_f of the 99 CES. We will provide CES diagrams of the IP67 products on request.

OUTDOOR LINEAR LIGHTING WITH HIGH INGRESS PROTECTION FOR ROUGH ENVIRONMENTS

The entire VarioLED™ Flex Tape Portfolio is as well designed for the application in rough environmental conditions. We offer up to IP68 protect LED Lighting products. Based on our patented process technology we seal our products in a continuous cover of highly resistant polyurethane.

With our design we protect the products against the immersion of water.

The used material itself is resistant against UV-A, UV-B, fuel, acid, solvents and salt water. Thermal shock, heat, high temperature, abrasion and flammability resistance guarantee a high product quality and durability, too.

TOLERANCE OF THE COLOR TEMPERATURE AT IP67/IP68 PRODUCTS

The values mentioned in the data sheets and in the photometric files represent statistical variables. The values do not necessarily represent the exact parameters of an individual product, so the actual color temperature can be different from averages indicated in the data sheets.

The tolerance of the color temperature of IP67 products are caused by

- the LED
- the production process
- the encapsulation material
- the measurement

The LED:

The LED are classified in binnings according to their color temperature, i. e. divided into different finely graduated classes. The human eye perceives color temperatures within one MacAdam binning as absolutely homogeneous. In case of cool white LEDs, the tolerance of the color temperature within one binning is larger than in case of warm white LEDs.

Encapsulation material:

Due to the encapsulation material polyurethane the respective spectral regions are affected differently. The optical path through the encapsulation material affects the color temperature on the basis of wavelength-dependent absorption. Here, the blue part of the spectrum passes out preferably from the encapsulation material. The light is therefore overall colder due to the shift to higher color temperatures. This effect is more pronounced in warm white LED strips.

Production process:

The production of our LED strips is based on several process steps that are all subject to a tolerance. Especially during the encapsulation tolerances affecting the color temperature can occur. For some products, multilayer systems from different encapsulation materials are generated leading to the increase in the CCT value. In the technical process, deviations of the layer compositions due to machine tolerances are unavoidable.

Measurement:

The color temperature is determined by measuring instruments in the lighting laboratory. As in any measurement, the absolute accuracy of laboratory measurements is limited due to statistics and the given measurement inaccuracy of instruments and devices.



POLYURETHANE ENCAPSULATION SYSTEM FOR LEDS

Outdoor Resistance

Tests	Ref. Method	Test Conditions	Results
Florida Test	SAE J 1976	Direct Inland, 45° South	Good (after 2 years)
Arizona Test	SAE J 1976	Direct Weathering, 45° South	Good (after 2 years)
Xenon WOM	SAE J1960-89 2000h	65 °C - cycle 102 min. UV + 18 min. UV/water spray	no color change, minimal gloss change
Weatherometer QUV-B	SAE J 2020	(8 h UV 60° - 4 h cond. 50 °C)	no color change, minimal gloss change
Weatherometer QUV-A	SAE J 2020	2,000 h (8 h UV 70° - 4 h cond. 50 °C)	no color change, minimal gloss change

Water and Chemical Resistance

Tests	Ref. Method	Test Conditions	Results
Fuel Resistance	G.M.6073	Immersion	No gloss change/No degradation
Acid Resistance	MS-CG12	Spot Test 0.5 - 10 % conc.	No gloss change/No degradation
Solvent Resistance	GM 6121 M	Various types of used chemicals	No gloss change/No degradation
Water Immersion	WSK-M3G178	240 h @ 45°C	No gloss change/No degradation
Salt Spray Resistance	ASTM B117-95	2,000 h @ 38 °C 5 % NaCl	No gloss change/No degradation
Humidity Resistance	MS-CG12	250 h @ 40 °C 100 % R. H.	No gloss change/No degradation
Environmental Cycle	G.M.6073	Three Cycles	No gloss change/No degradation

Heat Resistance

Tests	Ref. Method	Test Conditions	Results
Heat Resistance	MS-CG12	250 h @ 80 °C	No gloss change/No degradation
High Temperature Resistance	G.M.6073	60 min. @ 93 °C	No gloss change/No degradation
Thermal Shock	ESK-M99P16-A:3.5.5	16 h @ - 40 °C+ water @ 70 °C/10 cycles	No gloss change/No degradation

Abrasion Resistance

Tests	Ref. Method	Test Conditions	Results
Stone Chip Resistance	SAE J400:85	0.47 L of 250 - 300 graded gravel fired @ sample @ 480 KPa in 5 - 10 s	Chipping rating 10- No chipping to substrate

Flammability Resistance

Tests	Ref. Method	Test Conditions	Results
Flammability Resistance	FMVSS 302	ISO 3795	Flame self extinguishing

Electrical Properties

Tests	Ref. Method	Test Conditions	Results
Surface Resistivity	ASTM D257	500 V - spec. thickness 2 mm	2 x 10E15 Ohm
Volume Resistivity	ASTM D257	500 V - spec. thickness 2 mm	1 x 10E15 Ohm cm

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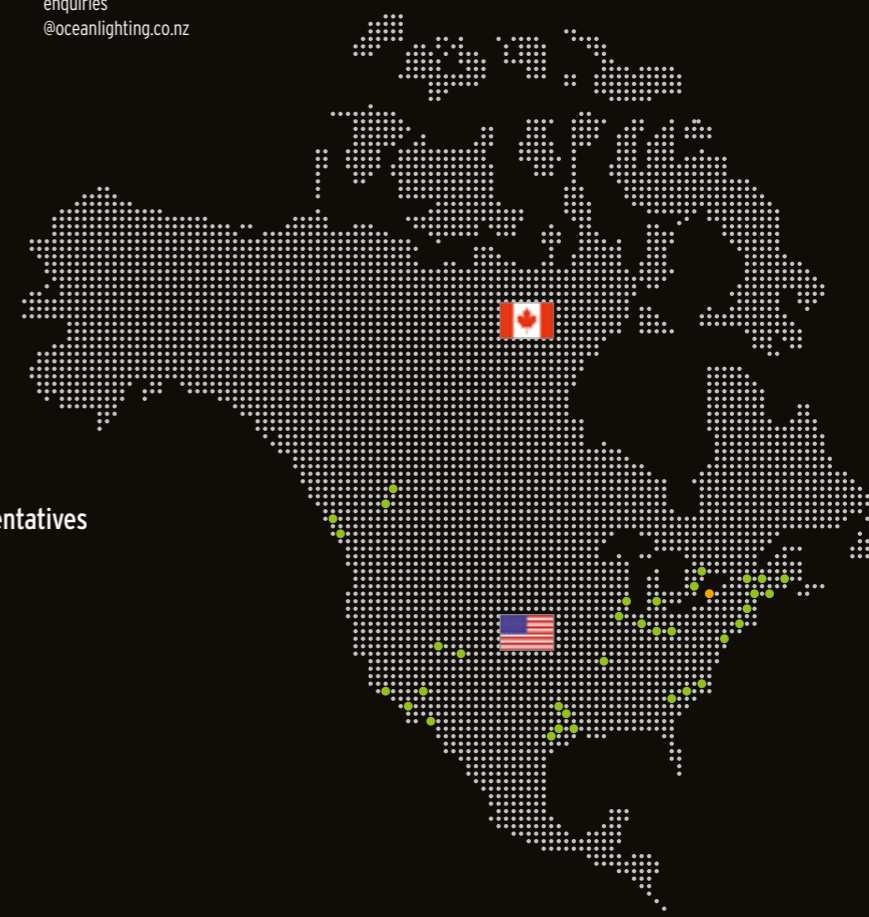
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