
LED LINEAR™
A Fagerhult Group Company
FUSION
Designed to be SMALL.
Engineered to PERFORM.

FUSION: New Standards for Performance in Outdoor Lighting

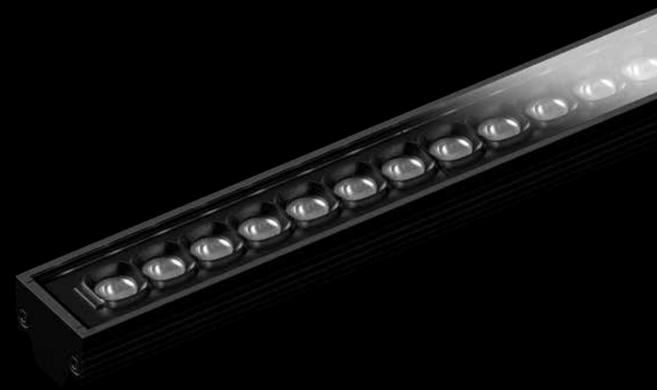
LED Linear is driven by a singular vision:

To create and supply innovative, high-performance linear LED lighting solutions that are as sustainable as they are inspiring. With a deep commitment to quality and craftsmanship, we design and manufacture LED lighting systems for a multitude of applications while setting the standard for excellence across the industry.

Rooted in the belief that lighting should enhance visibility while delivering maximum durability, we integrate advanced optical control and cutting-edge encapsulation technology to ensure superior performance in even the most challenging environments. Our mission is to push the limits of lighting technology – creating energy efficient, reliable, and resilient lighting solutions.

LED Linear. The Difference is the Details.

FUSION combines our three core technologies for the first time – uniting robustness, precision and unmatched efficiency in one system. With its ultra-slim design and precise light control, FUSION sets a benchmark for lasting performance and visual brilliance in outdoor lighting.



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Introducing FUSION

Key Features Overview

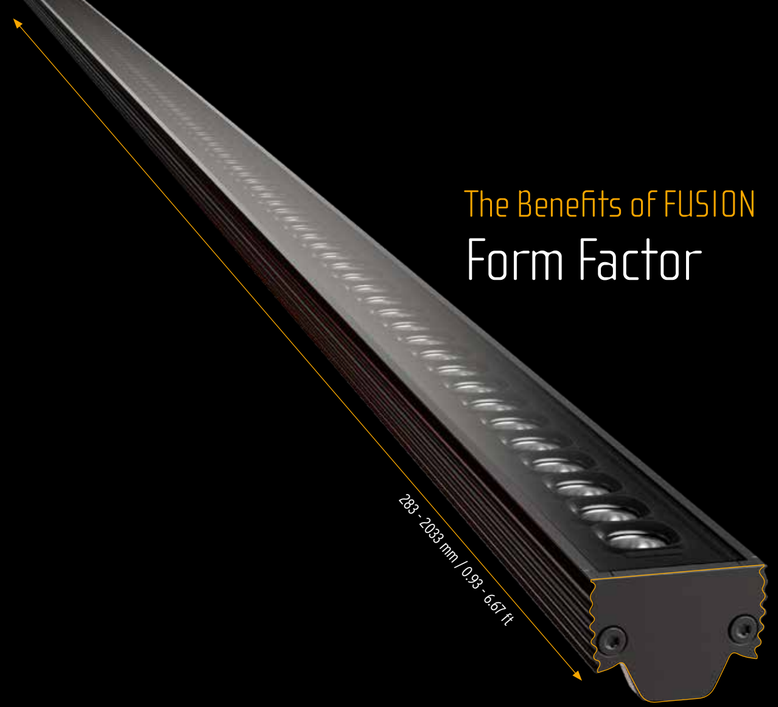
Form Factor
FUSION delivers top-tier performance in an ultra-slim design. With a total height of just 28 mm, it blends effortlessly into architectural lines – no compromise on efficiency or control.

Robustness
Built to endure impact and extreme outdoor conditions. Rated IK10 and IP67, FUSION resists mechanical stress, dust, and water – even in harsh environments.

Long-Lasting & Sustainable
Encapsulated in high-grade PU, FUSION is resistant against UV, salt, and chemicals. Designed for decades of use with minimal degradation – and reduced environmental impact.

Optical Precision
Seven high-performance nano-optics ensure pinpoint light distribution. Optimized for visual comfort, the anti-glare eliminates spill light and supports versatile applications.

Unmatched Application Efficiency
FUSION achieves industry-leading efficiency in its class – up to 60 % higher than comparable systems. Every lumen is directed with purpose, not wasted.



The Benefits of FUSION

Form Factor

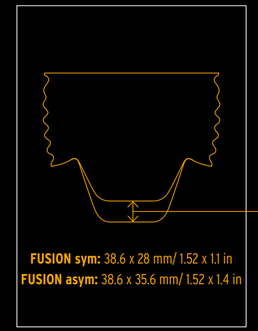
100%
ACTUAL SIZE

Ultra-slim – just 28 mm high incl. anti-glare

With a width of 38.5 mm and a total height of only 28 mm including anti-glare, FUSION integrates effortlessly into minimalistic designs and tight architectural spaces.

Fits where others can't

See the white shape?
This represents common industry dimensions – highlighting how FUSION sets a new standard in compact design.



FUSION sym: 38.6 x 28 mm/ 1.52 x 1.1 in
FUSION asym: 38.6 x 35.6 mm/ 1.52 x 1.4 in

The endcap of the asymmetrical Fusion is 5 mm deeper. This has no impact on installation height of the mounting options.

COMPETITORS: 50 x 70 mm / 2 x 2.75 in

The Benefits of FUSION

Long-Lasting & Robust

Engineered for maximum resilience – in every environment. Proven through extensive internal and external testing.

Certification:

On request: TM21, LM79, LM80 and TM82

IP67 Protection

IP67

Backed by over 20 years of polyurethane encapsulation expertise, FUSION ensures long-lasting IP67 protection – essential for installations exposed to heavy rain, high humidity and urban chemical exposure.

Additionally to the internal IP67 test in our climate chambers the ingress protection against water is externally tested as part of the CB-report.

CB-Report
Standard:
IEC 60598-2-1:2020;
IEC 60598-1:2020;
IEC 62031:2018

Another external saltwater test (EN IEC 60068-2-52:2018) underlines the durability for coastal regions.

Impact-Resistant IK 10

IK10

Its robust, powder-coated aluminum body combined with polyurethane achieves IK10 protection – tested to withstand a 5 kg object falling from a height of 40 cm (EN 62262:2002/A1:2021). A crucial feature for public area installations.

FUSION installed into the inground channel is approved for drive and walk-over situations and tested externally according to EN 60598-2-13: 2006 + A11: 2021.

UV & Heat Resistant

L80/B10 >60,000h

FUSION has outstanding UV resistance, tested according to DIN ISO 4892-2 with doses of UV-A and UV-B radiation equivalent to ten years of direct sunlight exposure.

FUSION does not show any discoloration or changes in material properties!

Minimal Use of Materials

For maximum sustainability. Through smart design and miniaturized optics, we use only as much material as truly needed – no more, no less. This reduces waste and makes our solution exceptionally eco-friendly.

99 % of all components of FUSION are sourced in Europe to make sure that the quality and the working conditions are controlled and to reduce the CO_2 emissions from transportation.

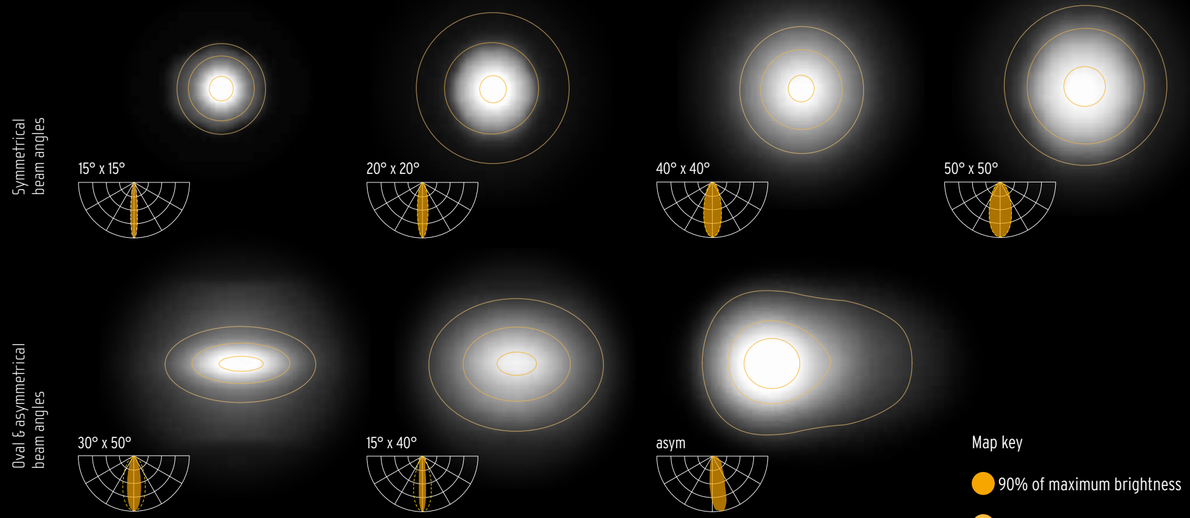
The Benefits of FUSION

Optical Precision

Beams shaped precisely by every ray.

Our optics deliver precise light distribution tailored for a wide range of applications.

The simulations illustrate various beam angles - from symmterical, elliptical to asymmetrical optics - showcasing the versatility of our lighting solutions. Using advanced simulations and high-precision lens manufacturing, we ensure uniformity, efficiency, and maximum control over the light pattern.



Color over angle measured at 4000 K within the respective light distribution at max. 100 K.

The Benefits of FUSION

Unmatched Application Efficiency

FUSION with integrated anti-glare technology takes performance to the next level.

Unlike conventional solutions, our anti-glare system maximizes visual comfort without compromising output. Conventional products typically sacrifice a significant amount of light when anti-glare is added - our engineering avoids this trade-off entirely.

60 % more efficiency*

120 lm/w

*compared to similar competitor products with additional anti-glare based on: 15W@4000K

Optic	UGR longitudinal	UGR lateral
15° x 15°	13	11
20° x 20°	16	15
40° x 40°	18	16
50° x 50°	20	19
15° x 40°	19	13
30° x 50°	21	14

Integrated anti-glare

This is not just glare control.
This is not just an anti-glare.

It's comfort without compromise.

Why is it relevant?

Unmatched Application Efficiency

The **Application efficiency** measures the amount of light that really serves the application and neglects undesirable spill light that causes light pollution, especially in outdoor application scenarios.

$$\text{Application Efficiency} = \frac{\text{usable light flux in target area}}{\text{total lumen flux}}$$

Luminaire Efficiency

The luminaire efficiency measures the ratio of total lumen flux and the electrical power consumption. For technical illumination scenarios the efficiency does not give any clue on the amount of light that really benefits the desired application.

Application Efficiency

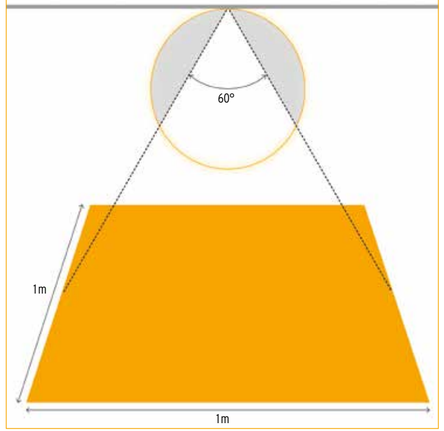
FUSION's application efficiency is unmatched, because the optical system combines a sophisticated glare control and ultra-precise nano-optics. The glare control eliminates straylight while the precision of the nano optics technology enables for excellent application match.

Difference between Luminaire Efficiency and Application Efficiency

See the difference

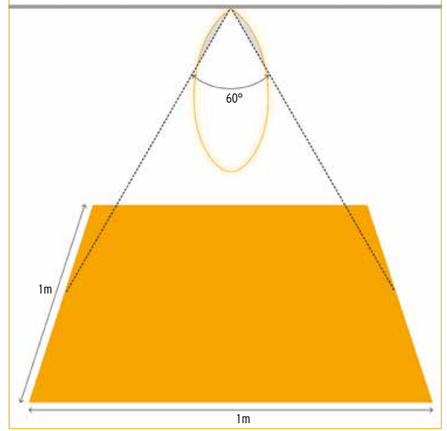
Opal light distribution

Luminaire efficiency	120 lm/W
Application efficiency	60% of lumen flux
Undirected spill light	**40% of lumen flux**



Targeted light distribution

Luminaire efficiency	120 lm/W
Application efficiency	90% of lumen flux
Undirected spill light	**10% of lumen flux**



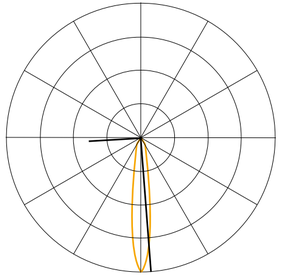
Visible Results

Application Efficiency in Action

Wall Grazing

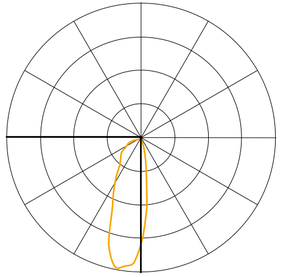
LDC 15° x 15°

Cut-off angle	**90°**
Total lumen flux	**100 %**
Spill light	**19.3 %**
Application efficiency	**80.7 %**



With a very precise beam angle of 15° x 15° and mounting angle of 5°, more than 80 % of the total lumen flux serves the application.

This helps to reduce the power level, because less lumens are wasted and contribute to light pollution. The light pollution is significantly reduced by choosing products with a high application efficiency combined with the right mounting accessory and, if needed, glare control tools.



Wall Washing

LDC asymmetric

Cut-off angle	**90°**
Total lumen flux	**100 %**
Spill light	**13.3 %**
Application efficiency	**86.7 %**

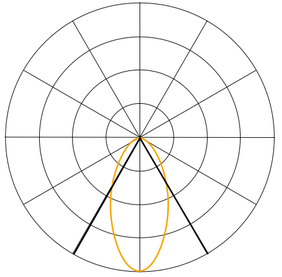
Optimized for wall or floor washing applications, the asymmetric light distribution with 0° tilt brings almost 90 % of the total lumen flux to the application surface.

An outstanding wall wash result is achieved with a 15° tilted angle and a distance of 1/3 of the wall height, using the C15 surface clip or the adjustable wall mount arm. The integrated glare control reduces spill light to a minimum. In combination with the precise optic the FUSION highlights architectural features by adding an outstanding contrast to the lighting scene utilizing more than 85% of the lumen flux.

General Lighting

LDC 50° x 50°

Cut-off angle	**60°**
Total lumen flux	**100 %**
Spill light	**8.2 %**
Application efficiency	**91.8 %**



For general lighting applications the wide 50° x 50° optics combined with an integrated glare control directs more than 90 % of the lumen output to the surfaces to be illuminated while offering an outstanding visual comfort with an UGR expected from office lighting standards.

Adapted to every Space

FUSION in Practice

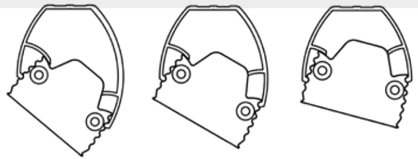
Designed to be small. Engineered to perform. FUSION adapts effortlessly to diverse architectural conditions with multiple mounting solutions. The tiltable surface clips allow precise alignment in 5° steps, with three selectable angle ranges. For wall installations, our wallmount arm is available in four different distances (40, 100, 200 or 300 mm) with 120° tilting to each side, to position the light exactly as required.

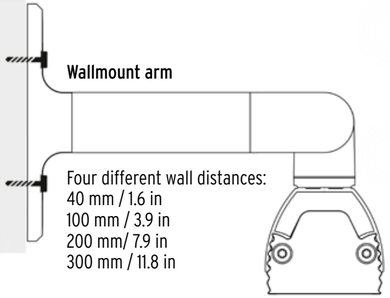
FUSION can also be seamlessly integrated into the architecture using an inground frame. For public areas the mounting lock secures for vandalism and heavy weather conditions.

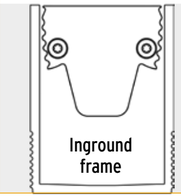
Mounting Options

Surface clips tiltable in 5° steps

C30: 30-45° C15: 15-30° C00: 0-15°

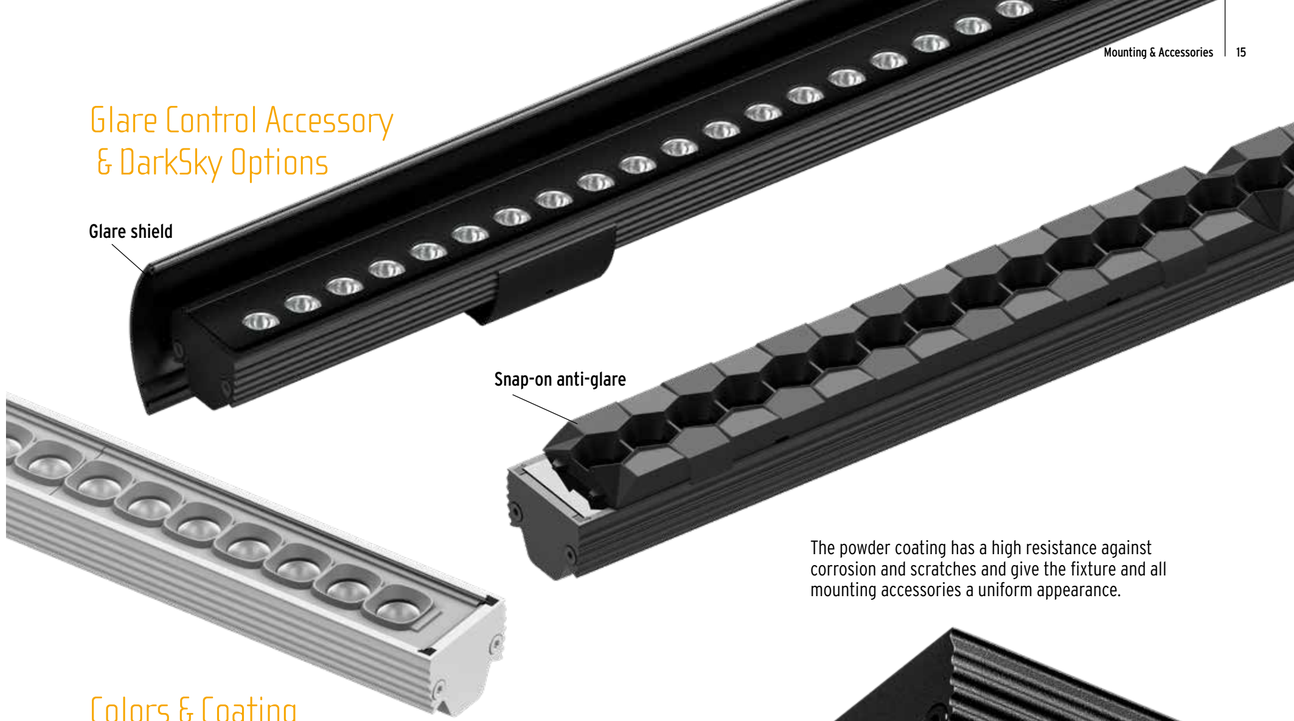






Mounting lock 0°

Glare Control Accessory & DarkSky Options



The powder coating has a high resistance against corrosion and scratches and give the fixture and all mounting accessories a uniform appearance.

Colors & Coating

FUSION offers three different standard colors black, grey and white. For special demands also custom colors are available on request, to match perfectly into the application.

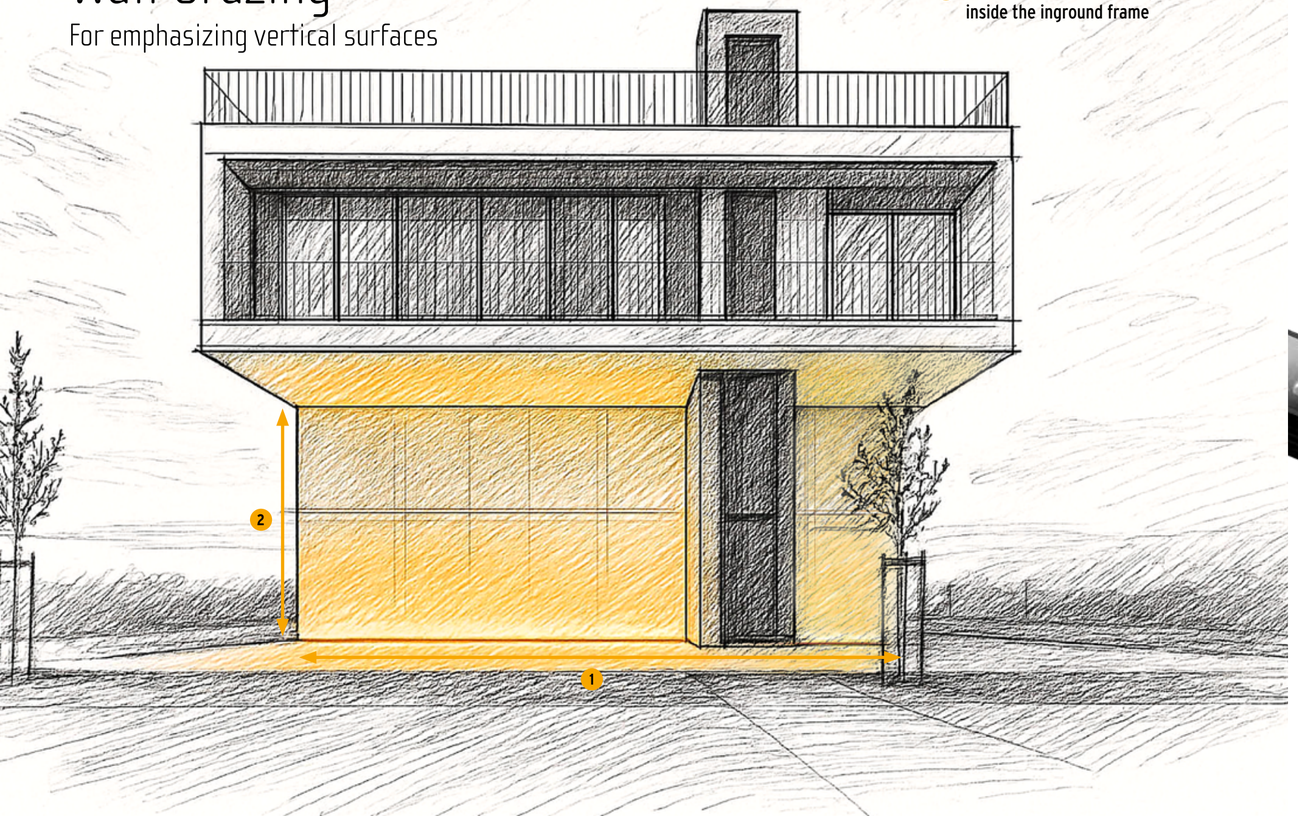
RAL 9004 - Black

RAL 9003 - White

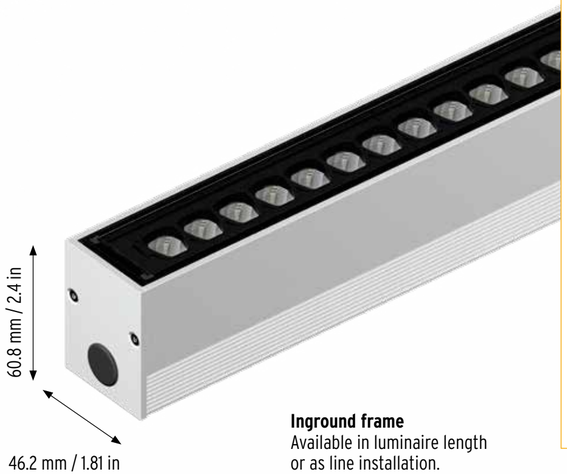
RAL 9022 - Grey

Wall Grazing

For emphasizing vertical surfaces



1. Width of the wall 10 m
2. Five fixtures each 2 m length inside the inground frame



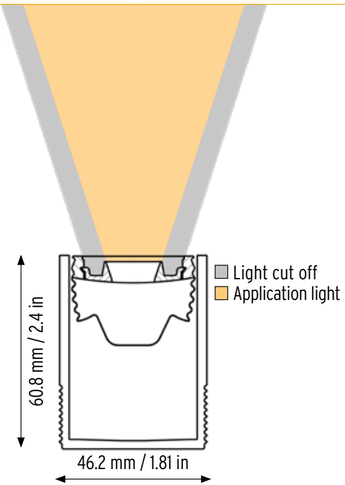
Inground frame
Available in luminaire length or as line installation. Mechanical connection possible. Cabling inside the frame. Drainage is needed.

Light distribution: 15°x40°
Power level: 25 W/m with 1662 lm/m
CCT: 2200 K
CRI: 86

Why FUSION for Wall Grazing:

FUSION is purpose-built for precise wall grazing. Its ultra-slim 38.6 mm profile and integrated glare control ensure discreet integration with clean vertical illumination. With the easy to install inground frame FUSION offers a solution if the facades are listed or if wall mounting is not possible. With a IK10 rating and a drive over release, FUSION as inground-version can be used as walk over fixture.

With high performance optics and up to 16 m reach at 3000 K, FUSION dramatically enhances textures, lines, and architectural elements. The 15° x 40° oval optic enables a narrow light distribution along the wall, maximizing illumination while minimizing the number of fixtures required - making it both cost-effective and sustainable.



NEW COLORS
- RAL 9003 - White
- RAL 9022 - Grey
- RAL 9004 - Black

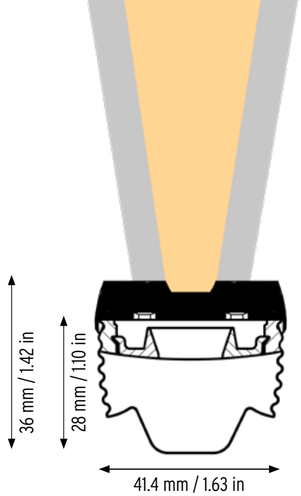
Accent Lighting

For dramatic façade effects

1 Façade height 6 m

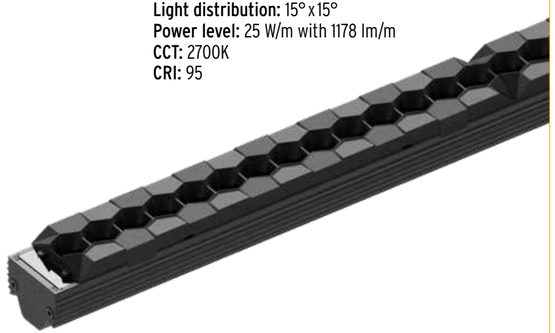
2 Column width 1 m
FUSION length 783 mm

Adjustable arm L100
Distance: 100 mm distance, tilted 10°
Four different distances from 40-300mm.
Allows tilting by 120° in any direction.



Snap-on anti-glare
Easy mounting by clicking on the luminaire.
Delivered in 250 mm pieces only in black.

Light distribution: 15° x 15°
Power level: 25 W/m with 1178 lm/m
CCT: 2700K
CRI: 95



Why FUSION for Accent Lighting:

FUSION brings depth and drama to façades by precisely highlighting architectural details. Its compact design (28 x 38.5 mm H x W) allows for subtle placement, while narrow beam optics create sharp contrasts that emphasize columns, arches, and edges. Ideal for adding structure and rhythm to vertical surfaces, FUSION transforms buildings into visual statements – even from a distance.

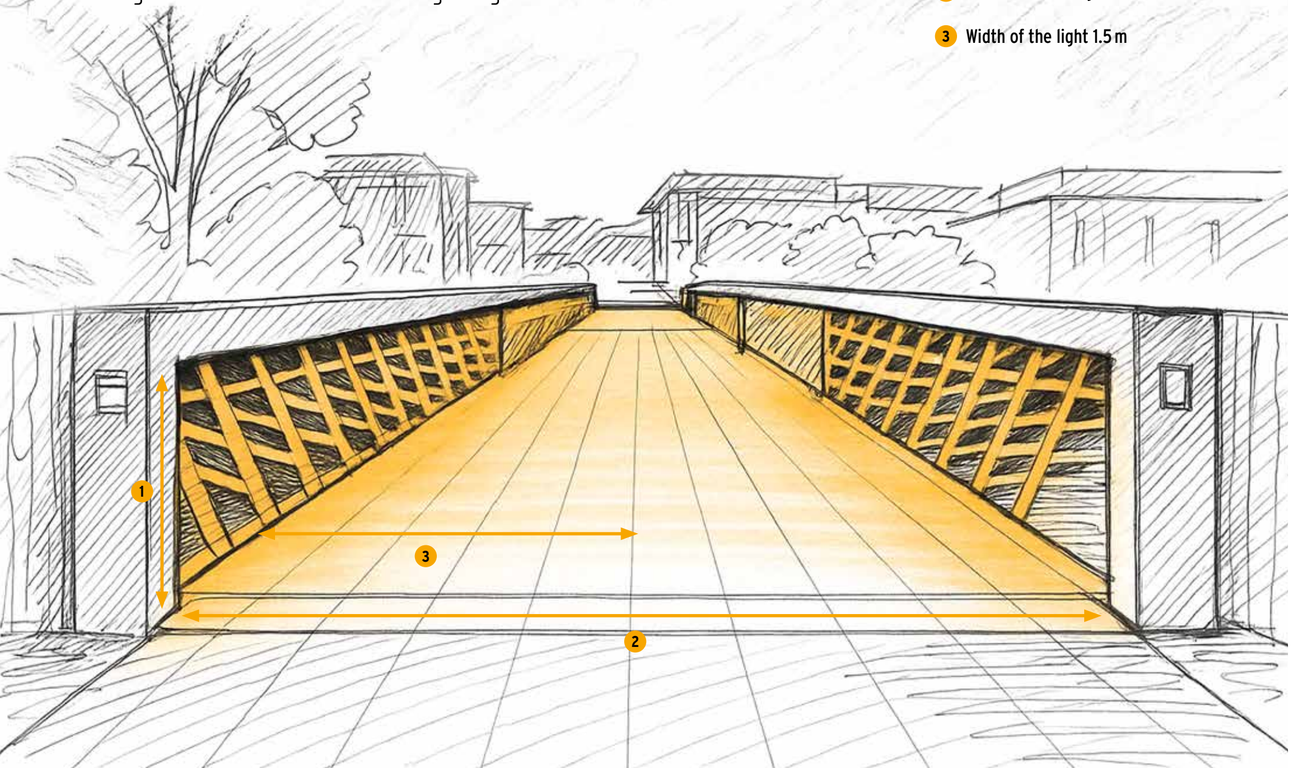
The 15° x 15° optic enables a sharp separation between illuminated and non-illuminated surfaces - ideal for precise accenting without spill light. Additionally, glare control accessories, such as snap-on anti-glare, eliminate unwanted spill light entirely to enhance dramatic contrast between light and shadow.

NEW COLORS
- RAL 9003 - White
- RAL 9022 - Grey
- RAL 9004 - Black

Floor Washing

For night-sensitive orientation lighting

1. Height of the balustrade 1.2 m
2. Width of the bridge 3 m
3. Width of the light 1.5 m



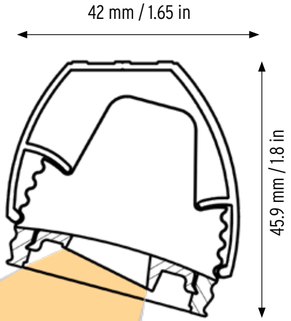
Why FUSION for Floor Washing:

FUSION asymmetric enables the perfect light distribution to illuminate even and homogeneous a floor or a wall. In combination with the 15° tilt with the C15 surface clip FUSION has a perfect wall wash light distribution to highlight floors and walls to create a quiet and safe environment.

With the asymmetric optic inside the small form factor of 33 x 38.5 mm, FUSION can be used for orientation lighting in public spaces. The integrated anti-glares reduces the spill light to the opposite direction to increase the application efficiency to a maximum.

Light distribution: asymmetric
Power level: 15W/m with 1070 lm/m
CCT: 2200K
CRI: 86

15° aluminium mounting clip
5cm long, surface mounting brackets
15° tilt for optimized floor wash effect
0° and 30° tilted clip also available

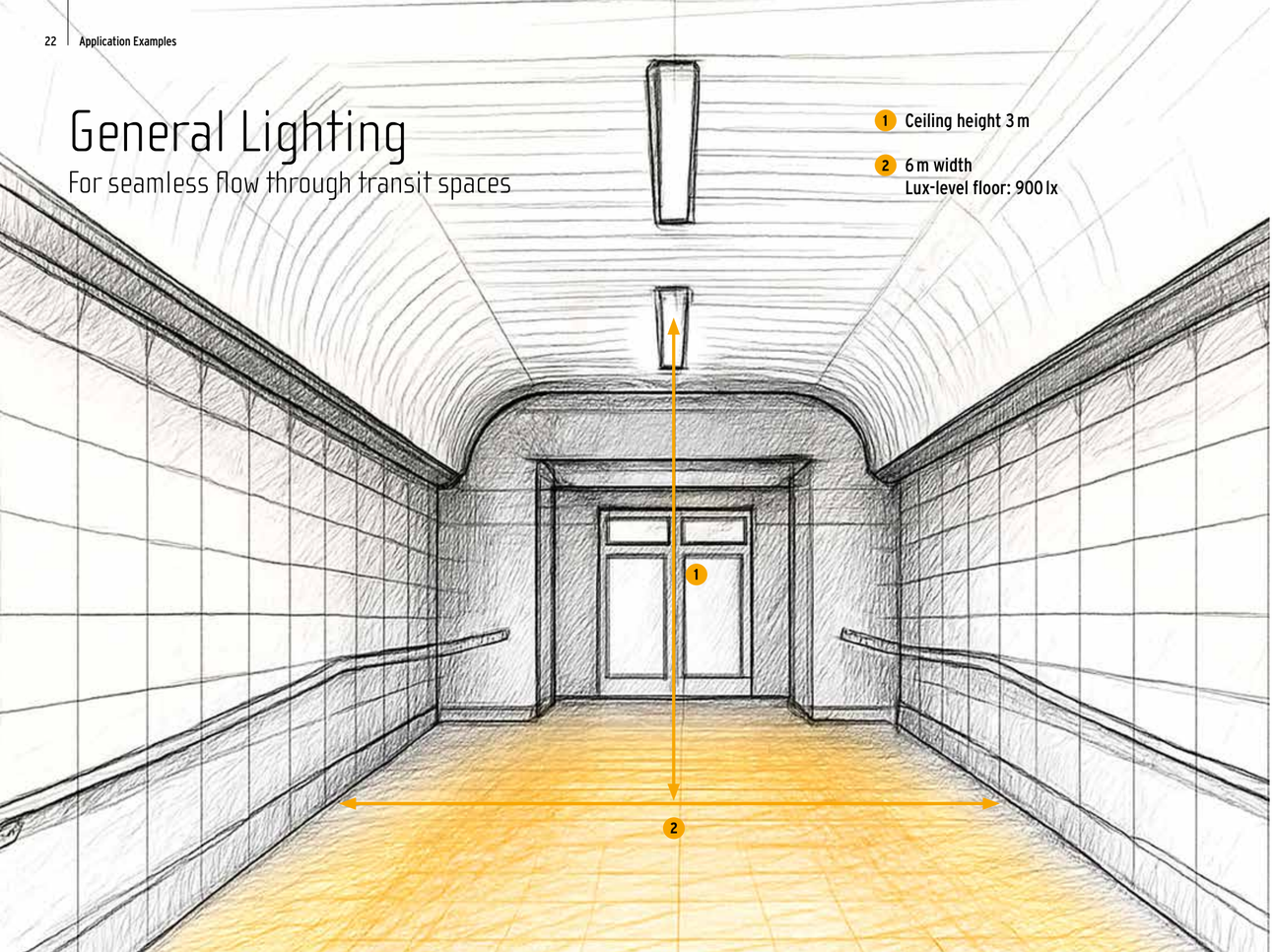


Light cut off
Application light

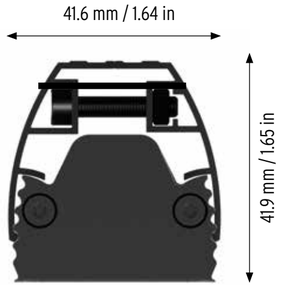
NEW COLORS
RAL 9003 - White
RAL 9022 - Grey
RAL 9004 - Black

General Lighting

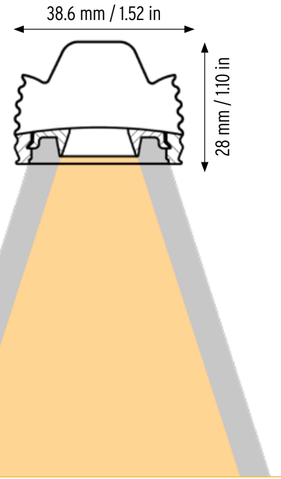
For seamless flow through transit spaces



1. Ceiling height 3 m
2. 6 m width
   Lux-level floor: 900 lx



Mounting lock 0°
5 cm long, surface mounting brackets.
Product is tiltable in 5° steps up to 15°.
15° and 30° tilted clips also available.



With 50 x 50 optics:
UGR longitudinal = 20
UGR lateral = 19

IK10 rated
IP67 safe
Vandal-proof

Light cut off
Application light

Light distribution: 50° x 50°
Power level: 40 W/m with 2784 lm/m
CCT: 4000 K
CRI: 95

Why FUSION for General Lighting:

In transit zones like hallways, train stations or others, FUSION ensures uniform brightness, safe orientation and glare-free visibility. The light source, electronics and optical system are 100 % separated from the environment through our full encapsulation which ensures that FUSION can be cleaned easily and will not be damaged or affected through dust, dirt or water (IP67, IK10).

With tailored optics, FUSION delivers seamless light distribution across wide surfaces – minimizing shadows and maximize guiding flow. With the integrated anti-glare FUSION offers 60 % more application efficiency which helps to reduce the energy consumption for application where light is used 24/7 in demanding public environments.

NEW COLORS
- RAL 9003 - White
- RAL 9022 - Grey
- RAL 9004 - Black

Fusion of our

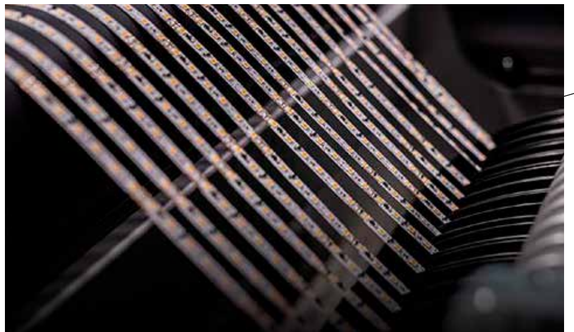
Core Technologies

Reel-2-Reel Production

Efficient thermal management enables a longer lifetime of the LEDs.
Our proprietary substrate draws heat directly away from the LED source into high-quality aluminum profiles. This prevents heat build-up inside the luminaire. The result: reduced aging, improved color and light stability and significantly extended lifetime.

R2R in detail

- Fully automated reel-to-reel production with in-line inspection.
- Light engine produced seamlessly “all of a piece” without any breaking points or inter-board connectors.
- Outstanding heat management due to minimal thermal resistance between heat source (LED) and heat sink (Alu profile).
- LED Tj < 80 °C. Temperature has the highest influence for aging of the chips. Our light engines never exceed 80°C.
- LED chips are carefully qualified and selected for excellent color consistency throughout lifetime within less than 3-Step Mc Adams.
- Integrated circuits for active current regulation (IC's) guarantee stable lumen maintenance within the maximum specified run length.

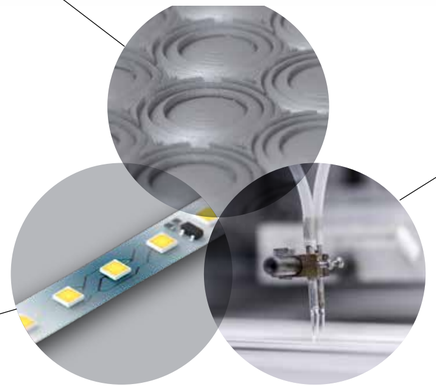


Nano Optics – NanoRay

Precision on a microscopic scale.
Our custom-developed nano optics enable exceptionally accurate light control - even in extremely compact formats. Designed specifically to meet the demands of architectural miniaturization, they ensure maximum efficiency and precision.

Nano Optic in detail

- NanoOptical System engineered and produced in Europe.
- Light engine = chip scale LED package with 1x1 mm².
- CSP Chip enables minimal distance between light source and optical structure.
- More than 1 Mio. Nano lenses per optical element.
- One meter of the nano optical system weights just 50 g equivalent to one single glass or silicon TIR-lens.
- As result: the light distributions represent perfect gaussian distributions with the desired full widths at half maximum.



PU Encapsulation

Engineered for lasting reliability.
Our specially formulated 2K polyurethane offers complete protection against UV exposure, urban atmosphere/gases, and extreme environmental conditions. The crystal-clear encapsulation maintains optical performance and ensures long-term durability - even in the harshest settings.

PU in detail

- Proprietary polyurethane formula made for LED technology developed together with our German partner.
- Compared to other sealing materials such as silicone or epoxy, PU has a significantly higher resistance to water.
- Superior test performance against environmental impact:
  UV resistance
  Corrosive gases like Sulfur, Chlorines or Salt mist
  Production & Material 100% in Europe
- Fully automated and reliable encapsulation process in house.
- 100% visual and functional inspection of every fixture - not only FUSION.

Light Pollution is a Growing Challenge

For millennia, the natural rhythm of day and night has shaped life on Earth. Darkness is more than just the absence of light - it is essential for ecosystems, human well-being, and climate impact. But with increasing urbanization and artificial lighting, the natural night is disappearing. As cities grow brighter, uncontrolled lighting spills into the sky, disrupts wildlife, and leads to excessive energy consumption. At the same time, well-designed lighting can enhance safety, create atmosphere, and improve quality of life - if used responsibly.

At LED Linear™, we actively combat light pollution by adhering to DarkSky International Standards, ensuring that our lighting solutions contribute to a more sustainable and well-balanced nighttime environment.

Certified by DarkSky.org

The 5 principles of DarkSky lighting

Useful

1

Use light only if it is needed

All light should have a clear purpose. Consider how the use of light will impact the area, including wildlife and their habitats.

Targeted

2

Direct light so it falls only where it is needed

Use shielding and careful aiming to target the direction of the light beam so that it points downwards and does not spill beyond where it is needed.

Low level

3

Light should be no brighter than necessary

Use the lowest light level required. Be mindful of surface conditions, as some surfaces reflect more light into the night sky than intended.

Controlled

4

Use light only when it is needed

Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.

Warm-colored

5

Use warmer color lights where possible

Limit the amount of shorter wavelength (blueish) light to the least amount needed.

Achieving this balance requires a new approach:

Application efficiency means delivering light only where it is needed. By reducing glare, spill light, and upward emissions, our solutions not only support Dark Sky principles but also ensure maximum usable light.

The examples shown here illustrate how precise optics and glare control achieve high efficiency in real-world applications - turning theory into measurable results.

Certified by DarkSky.org

Glare-shield
Completely cut-off to one side.

Snap-on anti-glare
Deeper light source to cut off spill light. For symmetrical distributions only.

Integrated glare control Highest application efficiency.

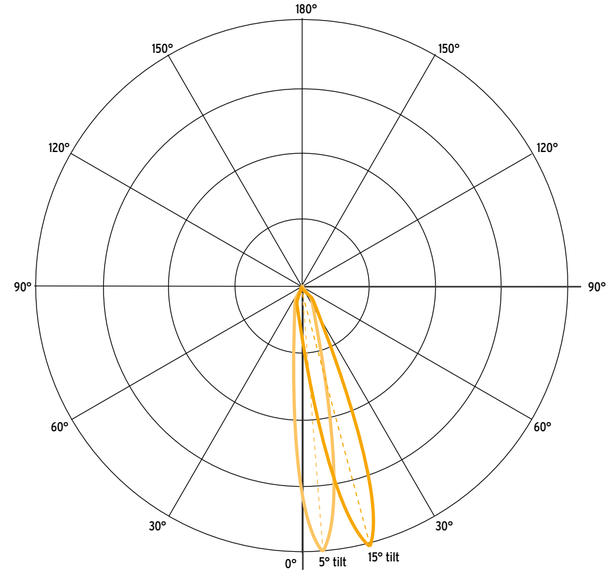
Example: FUSION with 15° x 15° for wall grazing

COO Surface clip **5° tilted**
Application efficiency **80.7% of lumen flux**
Undirected spill light 19,3% of lumen flux

COO Surface clip **15° tilted**
Application efficiency **98.7% of lumen flux**
Undirected spill light 1.3% of lumen flux

With a difference of 10° tilt the undirected spill light decreases down to less than 2% of the total lumen flux.

The way of installation makes the difference between less light pollution and no light pollution.



LED LINEAR™

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LED Linear in Virtual Reality

Check out our FUSION VR Experience

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