TRILUX
SIMPLIFY YOUR LIGHT.

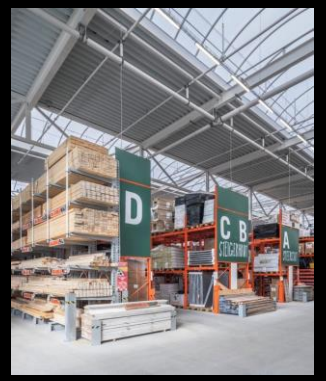
# TUGRA
# CONNECTING SPACES

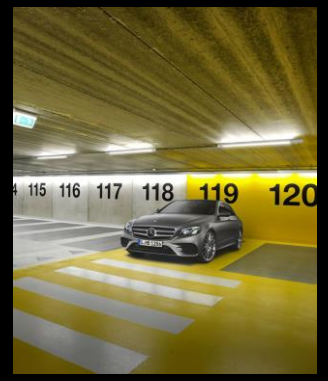
Launching EN

08-2022 Patrick Rüschenbaum

# TUGRA

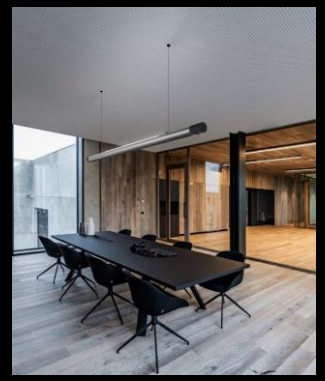
CONNECTING SPACES

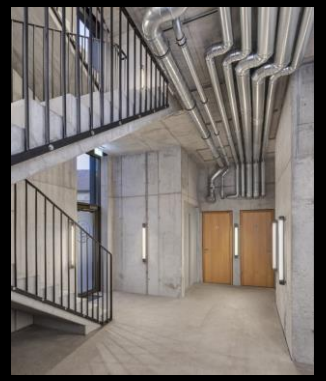




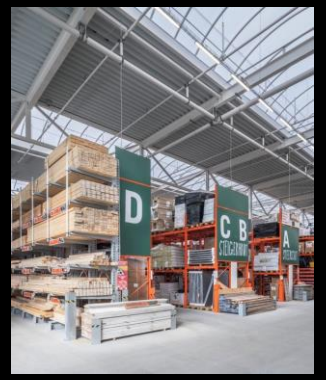


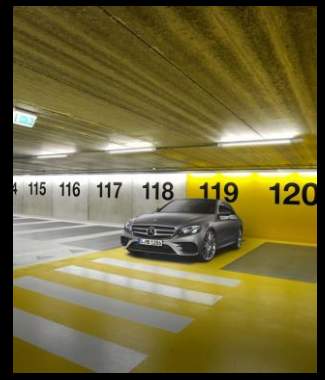





# TUGRA -
# CONNECTING SPACES

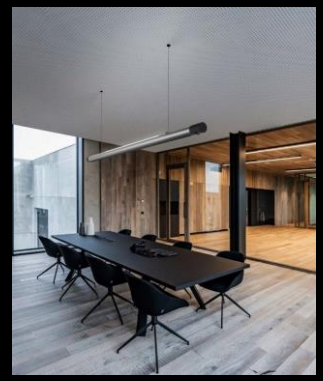
- The luminaire that connects rooms
- The red (light) thread in architecture
- Applicable across applications
- Timeless design language - round, linear
- Scalable according to individual requirements
- Freedom for creativity
- Simplified lighting design
- "Simplify your light" comes to life

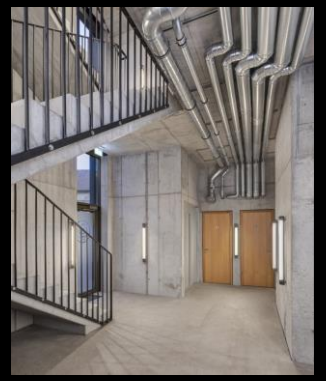








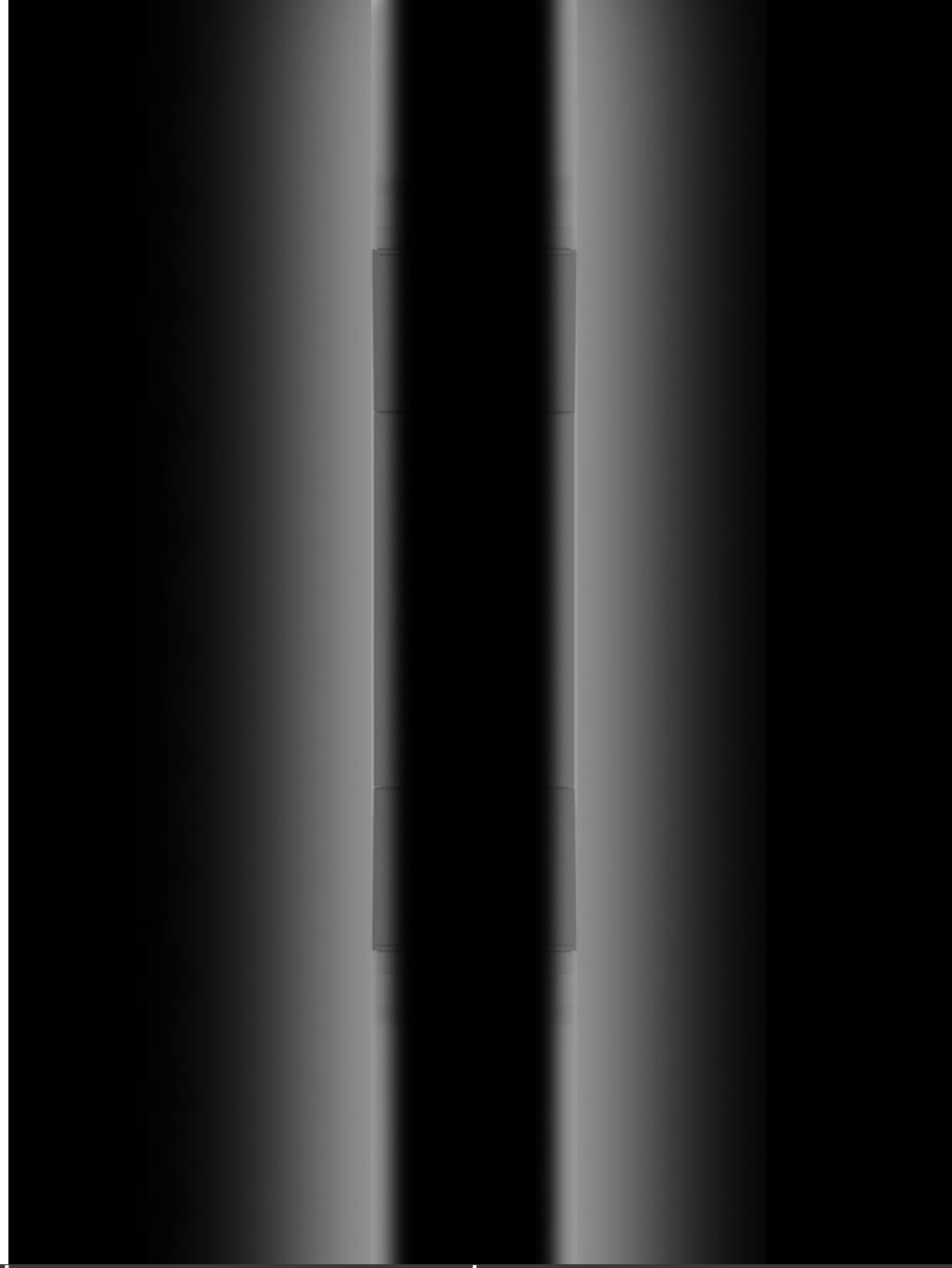





# TUGRA
## CONNECTING SPACES

Next level in:

- DESIGN
- LIGHT QUALITY
- SMART & MODULAR
- DIFFERENTIATION & VARIETY
- SUSTAINABILITY



TRILUX
SIMPLIFY YOUR LIGHT.

**SMART & FUTURE-PROOF**
IOT Ready: Smart modules (sensors, wifi repeater, beacon, etc.)

**ROUND**
75 mm Ø, outstanding design for staging all areas in and around buildings.
Functional round design for optimised cleaning.

**SCALABLE**
Variable lengths between 300mm - 2100mm, as a single luminaire or through-wired as a continuous line

**FLEXIBLE**
Optics kit, IP66, IK10, IOT Ready, during operation Up-Grade-Able, Various mounting options (ceiling & wall mounting)

# Tugra

The Tugra convinces with excellent, customised light and a uniquely timeless design. At the same time, the modular concept with IoT components offers the highest degree of future-proofing.

# FUNCTIONALITY MEETS DESIGN

**Timeless & minimalist**

Round design with a diameter of only 75 mm for easy cleaning & reduced dust build-up without compromising on light quality.

**IP66 - aligned**

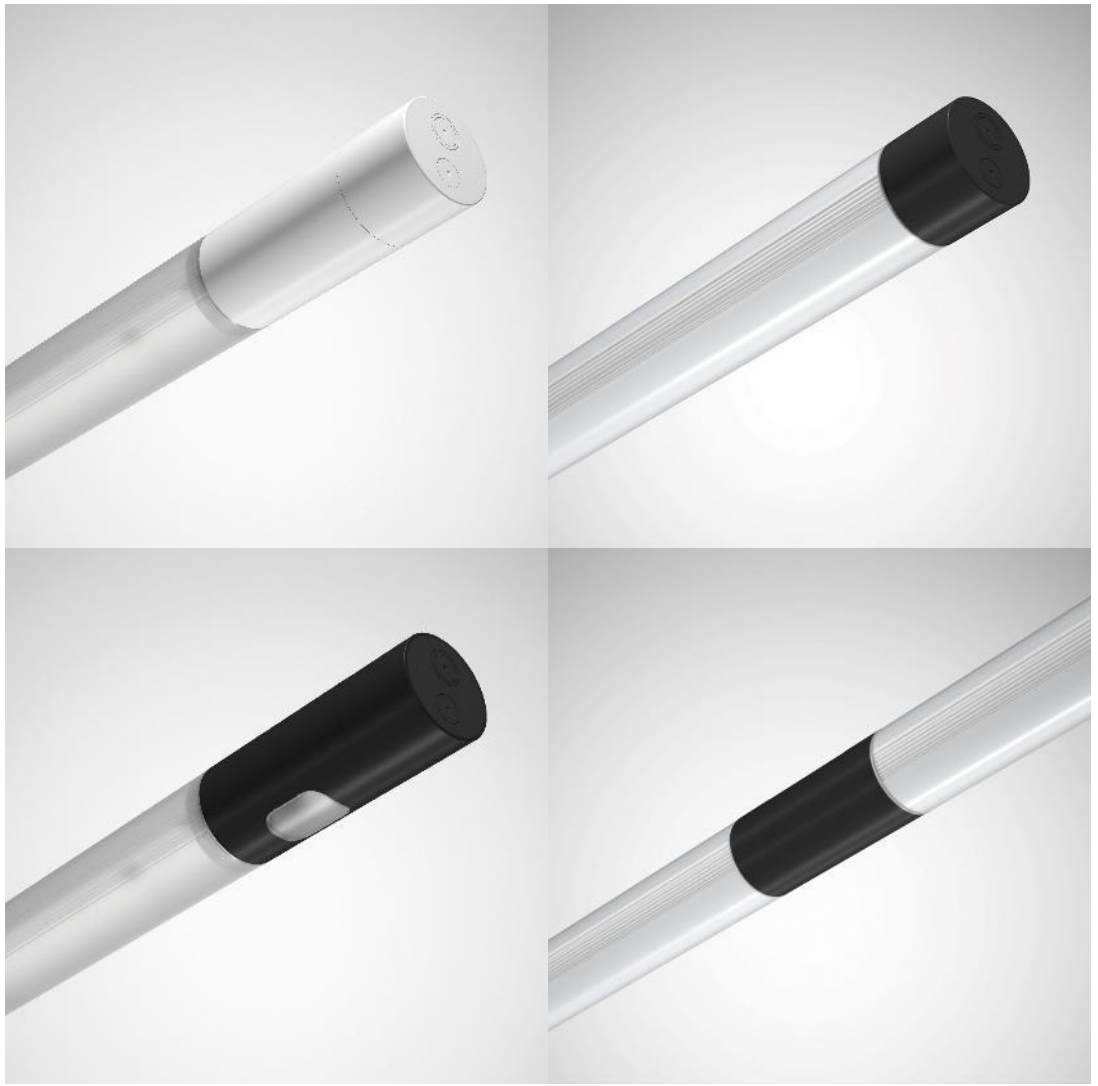
Flush luminaire concept without overlapping end caps or seals thanks to optimised application of ultrasonic technology

**Technical innovations & nice-looking**

Flexible connection options thanks to innovative multiple injection tooling (combination of hard and soft plastic)

# ARCHITECT

- Architecture and light as a unit
- timeless design language
- No limits in use/application
- Integration of smart modules
- Single luminaire to continuous line
- Made in Europe
- sustainable luminaire variant, component replacement
- IP66 - formally attractive



# PLANER


- Planning of extensive projects with just one system - efficient and precisely fitting
- Flexible configuration options: Lengths, luminous flux and beam characteristics, mounting types, smart modules
- Continuous mounting channel for maximum flexibility in combining the different luminaire lengths (300mm-2100mm)

# END CUSTOMER

- Uniform formal language & differentiation
- Efficiency of up to 189 lm/W in operation → Funding is possible
- Driver & LED module replaceable
- Integration of additional functions & trades
- Made in Europe

The Tugra can be customised. Even to the colours of the corporate design.

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**Cross-Application**

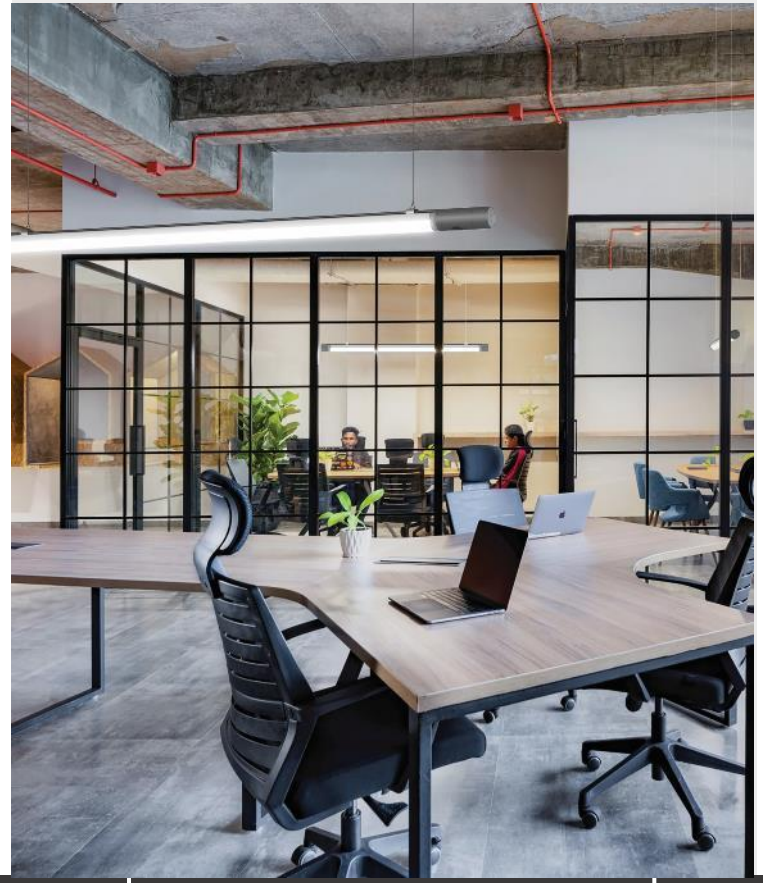
## Industry

CarPark, Logistics, (Food-) Production, Ancillary Areas, Laboratories

## Office / Education

Office, Entrance Area, Meeting Room, Ancillary Areas

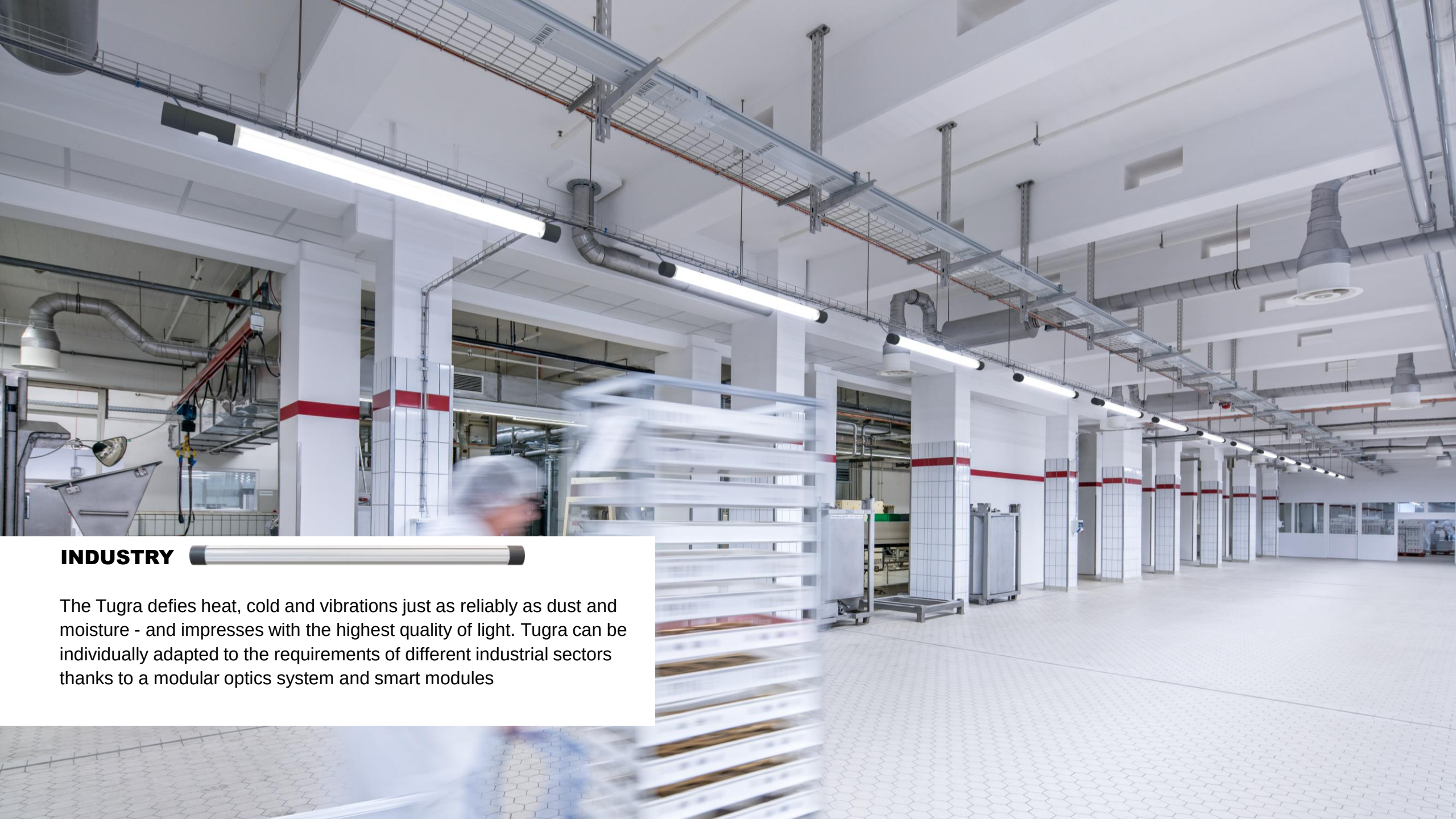
Professional Claas,  Lecture Hall, Workshop, Laboratories



## Retail / Fashion

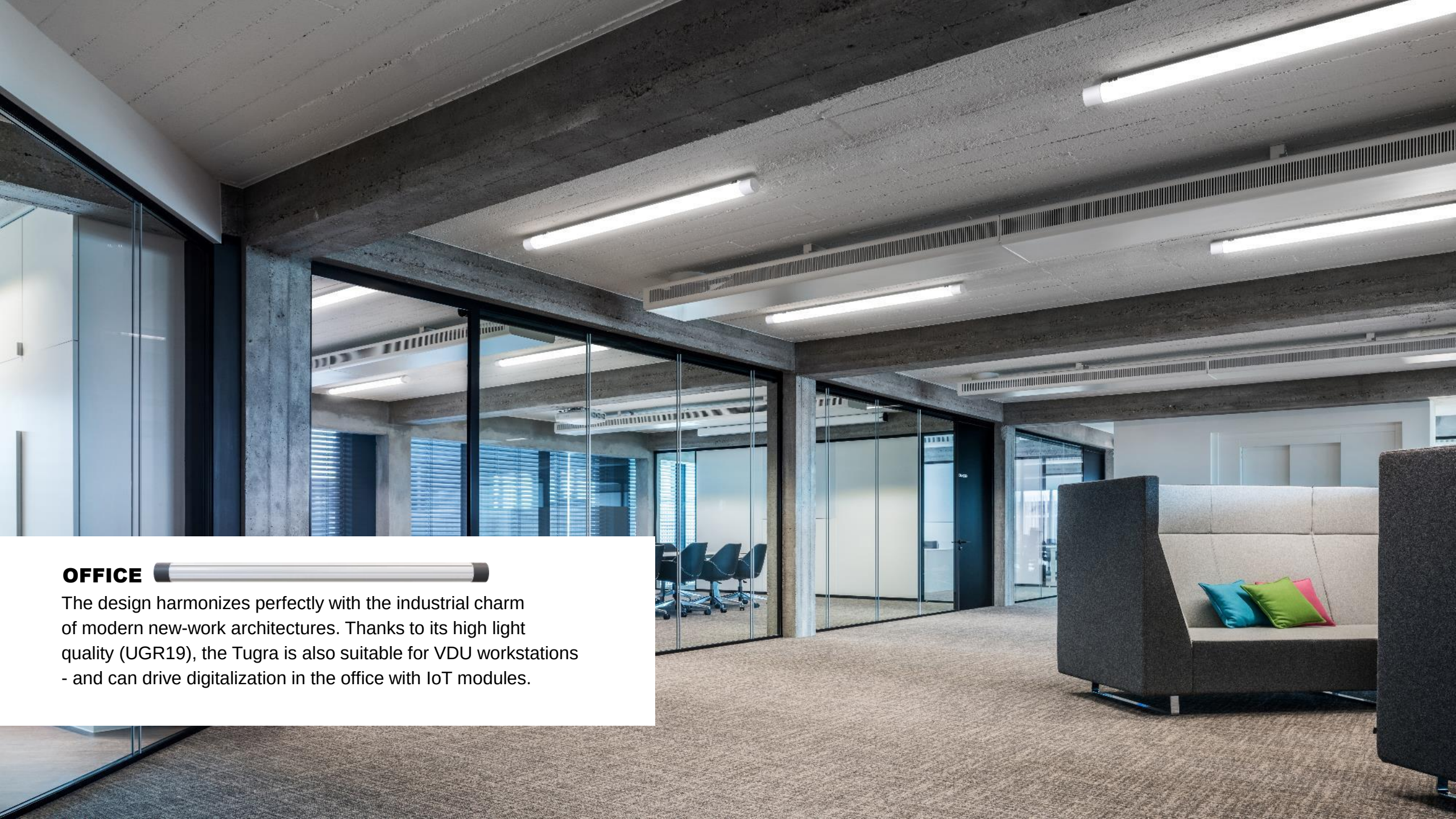
Sales Area, Exhibition Area, Cash Desk, Warehouse, CarPark

**DESIGN** | LIGHT QUALITY | SMART & MODULAR | DIFFERENTIATION & VARIETY | SUSTAINABILITY



## INDUSTRY

The Tugra defies heat, cold and vibrations just as reliably as dust and moisture - and impresses with the highest quality of light. Tugra can be individually adapted to the requirements of different industrial sectors thanks to a modular optics system and smart modules

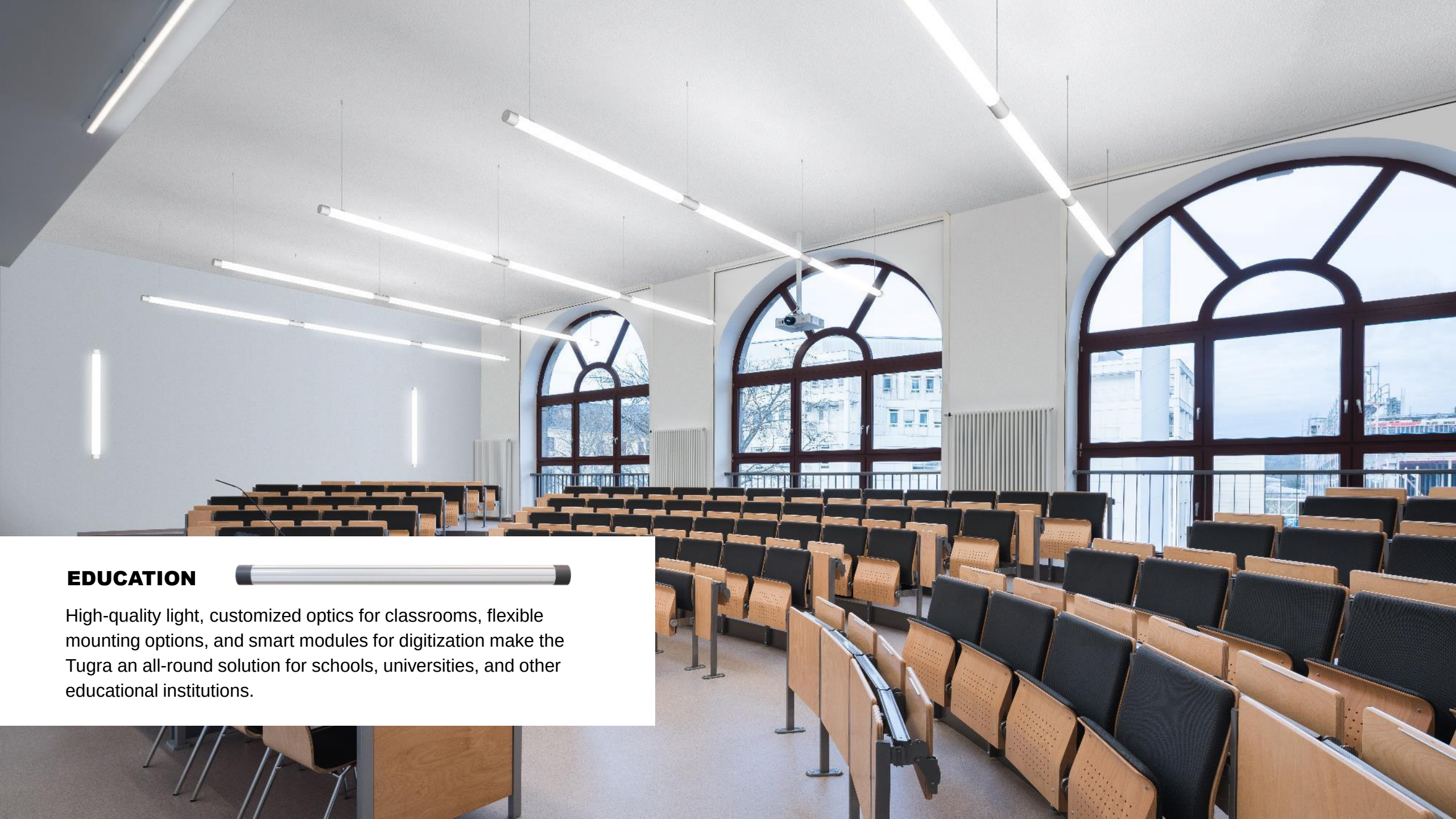


## OFFICE

The design harmonizes perfectly with the industrial charm of modern new-work architectures. Thanks to its high light quality (UGR19), the Tugra is also suitable for VDU workstations - and can drive digitalization in the office with IoT modules.


## RETAIL

The Tugra convinces with tailor-made light for retail - for example with specific light temperatures for best product presentation in fashion stores or UGR19 for the checkout area in the food retail and DIY-Stores. Added to this is an attractive, un-mistakable design. Optional IoT modules herald the future of retail.



## EDUCATION

High-quality light, customized optics for classrooms, flexible mounting options, and smart modules for digitization make the Tugra an all-round solution for schools, universities, and other educational institutions.

# LIGHT QUALITY

**MAXIMUM OPTIONS**

CRI:

- CRI>80
- CRI>90

Colours:

3000 K, 4000 K, 5000 K (on request),

6500 K,  HCL, RGBW

Lumen packages:

1.200 lm bis 17.000 lm

**MAX EFFICANCY & LIFETIME**

50,000 h up to 100,000 h service life (L80)
from up to 160 lm/W up to 189 lm/W (HE+)

**APPLICATION-SPECIFIC LIGHT DISTRIBUTION CURVES**

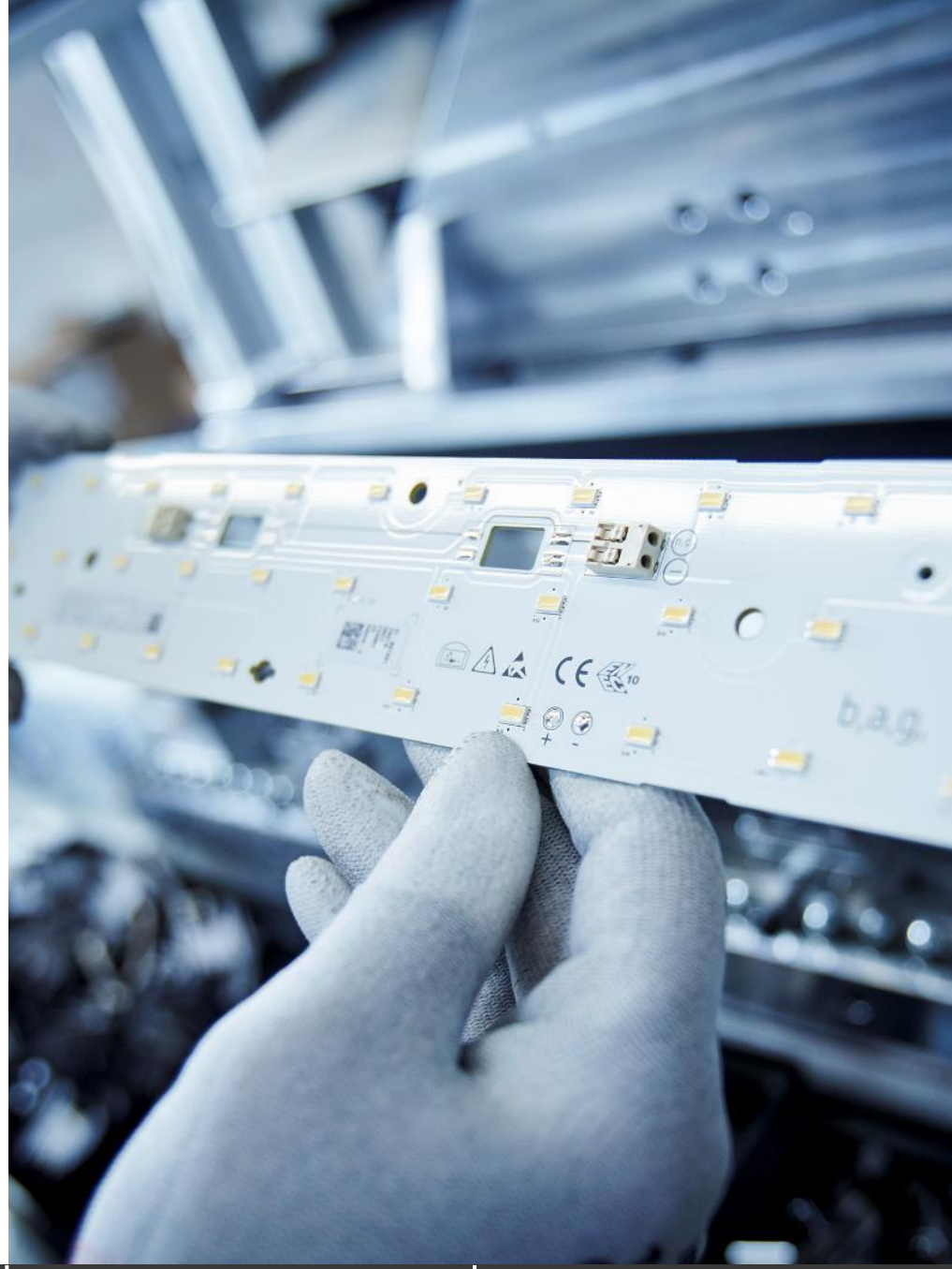
Prismatics in extrusion

Optics kit (5 primary optics → 8 LVKs))

Prismatic foil for glare reduction (UGR<19)

**SCALABLE LIGHTING TECHNOLOGY**

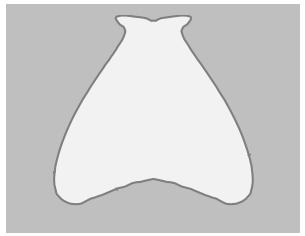
| | | | |
|---|---|---|---|
| TugraHE+ | L80 100.000h | 189 lm/W | -40° - +45° |
| TugraHE | L80  70.000h | 177 lm/W | -30° - +35° |
| Tugra | L80  50.000h | 160 lm/W | -25° - +30° |



# OPTICAL SYSTEM

### Wide

P-W



- Production
- Storage rooms
- Laboratories

### Wide UGR19

P-W19

- Office
- Retail
- Laboratories
- Data Center

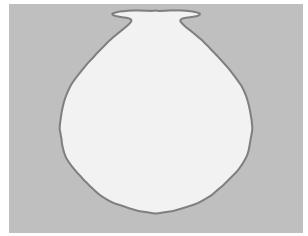
### Wide UGR19 w/ indirect light

P-W19-IL

- Office
- Education
- Data Center

### Lambertian

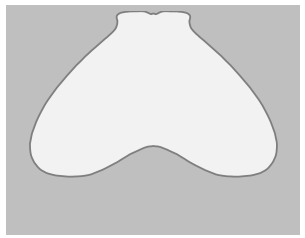
P-L



- Production
- Storage rooms
- Corridors
- Laboratories

### Very Wide

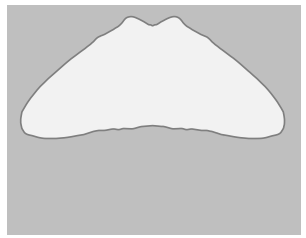
P-VW



- Fashion/Retail
- Production
- Medium mounting height

### Extra Wide

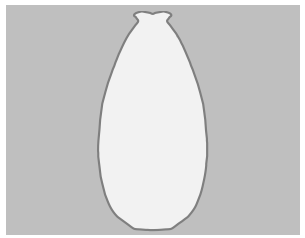
P-XW



- Car parks
- Low ceiling

### Narrow

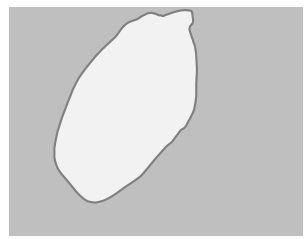
P-N



- High assembly height
- Logistics halls
- Warehouses

### Asymmetric

P-AW



- Retail
- Advertisements
- Blackboard lighting

# TUGRA OPTICS KIT

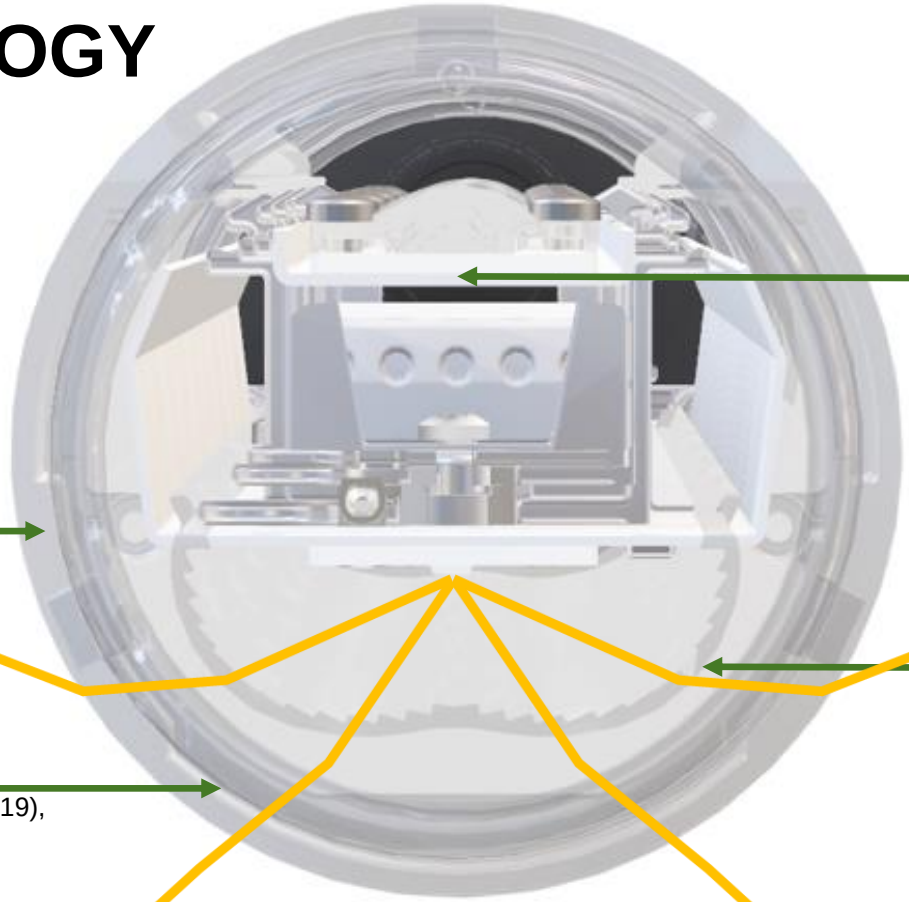
- 5 different primary optics
- Indirect modules
- Application-specific
- Variable

- Maximum lighting quality

- Modular
- Individual

| TUGRA LED | P = prismatic luminaire profile | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Lambertian | Wide | Very Wide | Extreme Wide | Narrow | Asymmetrical | Wide UGR19 | Wide UGR19 |
| | P-L | P-W | P-VW | P-XW | P-N | P-AW | P-W19 | P-W19-IL |
| PRIMARY OPTICS KIT |  |  |  |  |  |  |  |  |
| Beam angle (full) | 100° | 93° | 110° | 147° | 52° | 52° / 28° | 90° | 90° |
| Light spot height | 2,2m - 4m | 3m - 6m | 2,5m - 5m | > 2,2m | 3,5m - 8m | 2,2m - 4m | 2,5m - 4m | 2,5m - 4m |
| Applications | | | | | | | | |
| **Industry** | | | | | | | | |
| Carpark | | | | | | | | |
| Parking bays | | | | X | | X | | |
| Staircase | X | | | | | X | | |
| Entrance & Exit | X | | X | | | X | | |
| Checkout & Advertising | | X | | | | X | X | |
| Production (especially food) | X | X | X | | X | | | |
| Logistics (especially food) | | X | | | X | | | |
| Canopied outdoor areas | X | | | | | X | | |
| Laboratories | X | | X | | | | X | X |
| **Office** | | | | | | | | |
| Office spaces | | | | | | | X | X |
| Entrance & Reception | X | X | | | X | X | X | X |
| Meeting room | | | | | | X | X | X |
| Staircase | X | | | | | X | | |
| Hallways & Corridors | X | X | X | | | X | | |
| **Education** | | | | | | | | |
| Classroom | | | | | | X | X | X |
| Specialist class | | | | | | X | X | X |
| Workshop | X | X | | | | X | X | X |
| Laboratories | X | X | | | | | X | X |
| Lecture halls | | | | | X | X | X | |
| Hallways & Corridors | X | X | X | | | X | | |
| Canopied outdoor areas | X | | | | | X | | |
| **Retail** | | | | | | | | |
| Sale & Exhibition | | | X | | | X | | |
| Checkout | | | X | | | X | X | |
| Camp | X | X | X | | X | | | |
| Parking space/Carpark | X | | | X | | X | | |

# LIGHTING TECHNOLOGY



**MODULES**
incl. lens optics for indirect lighting
to brighten up the ceiling

**PRISMS FOR LIGHT CONTROL**
Increased indirect component or for compensation if indirect component is not obstructed due to ceiling construction

**PRIMARY OPTICS KIT**
5 different primary optics
optimum application-specific light distributions

**ADDITIVE PRISMATIC FILM**
optional, UGR glare control in longitudinal direction (UGR <19),
Display workstation suitability (BAP)

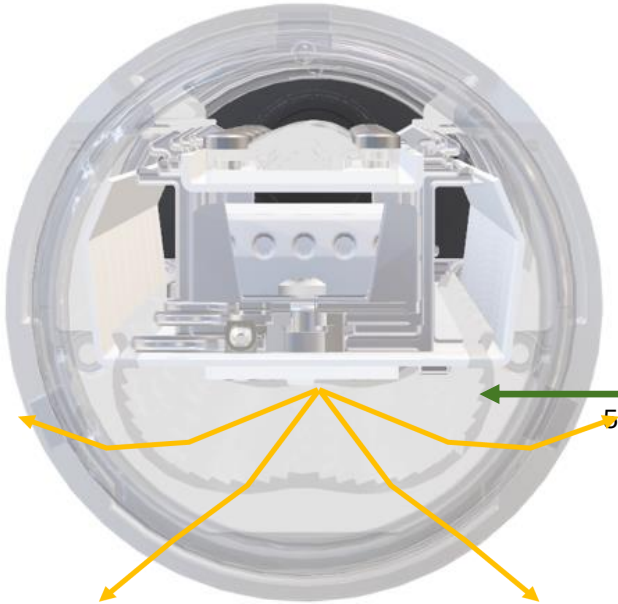
Light distribution
incl. beam pattern into the indirect ceiling area

# FREEDOM OF PLANNING

With Optics kit, the lighting designer can select the specific optimal primary optic, guaranteeing the maximum quality of light for every application and challenge.

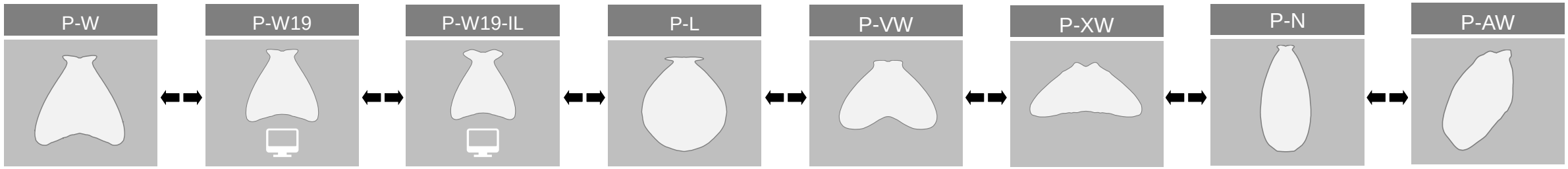
The planning possibilities range from industry to the classroom.

The Tugra makes planning easy.



**PRIMARY OPTICS CONSTRUCTION KIT**

5 different primary optics ideal application-specific light distributions

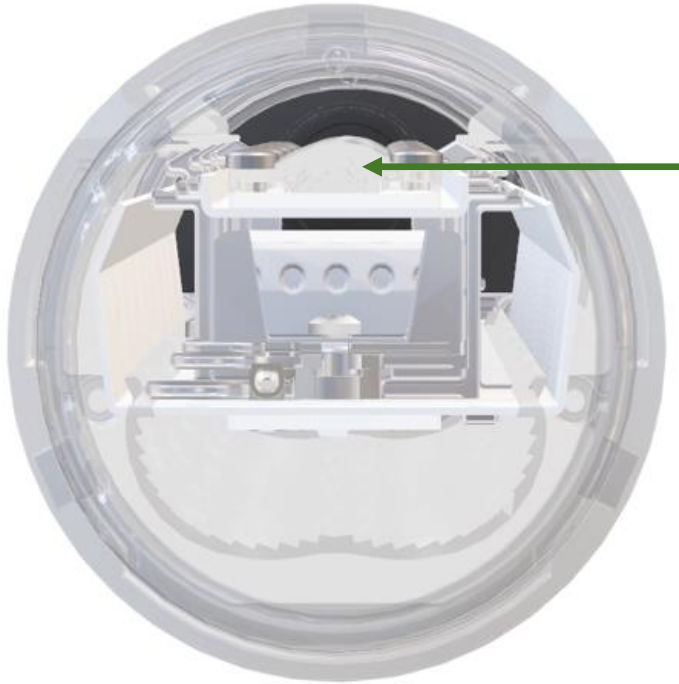


# INDIRECT LIGHT OUTPUT

**FLEXIBILITY**
The indirect LED board can also be retrofitted into an existing installation

**QUICK INSTALLATION**
Thanks to the clipable mounting rail and the bayonet fixing of the end caps

**INDIVIDUAL CONTROL**
Thanks to the use of two separately controllable drivers, the indirect and direct components of the luminaire can be individually controlled and adjusted.(factory-set luminous flux: 30% indirect/ 70% direct)



**MODULES**
incl. lens optics for indirect illumination
for ceiling brightening

# INDIRECT + DIRECT LIGHT P(W)…-IL

The standard luminaire has a light component of 70% direct and 30% indirect.

Since 15% of the direct component is ALWAYS emitted indirectly (with PW optics), the power supply of the indirect module is set so that an additional 15% is added to the indirect area of the light distribution. In total, this results in a luminous flux of 30% in the indirect area.

So if 70% direct 30% indirect is desired, of the 30%, 15% is supplied from the direct portion and another 15% is added by the indirect modules.

→with ETTD, the desired proportion can be adjusted on site, as the -IL luminaires are equipped with two drivers.

*Example of this on the next slide:*

# EXAMPLE

- → PW luminaires without indirect module always have the 15% indirect share from the direct module
- → For luminaires with direct and indirect modules, the light output can be adjusted by 2 LEDC drivers (Dali)
  - → Standard are always 70% direct and 30% indirect

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **Ziel:** | **85%** | **15%** | 15% | 15% |
| | | Lichtstrom TOTAL | Direkt | Indirekt | Indirekt (von Direkt) | Indirekt (über IL) |
| without indirect module | 10267754 | TugraHE 12 PW19 38-840 ET 01 | 3800 | 3230 | 570 | 570 | - |
| | 10267755 | TugraHE 12 PW19 38-840 ETDD 01 | 3800 | 3230 | 570 | 570 | - |
| | | | | **70%** | **30%** | | |
| with indirect module | 10267794 | TugraHE 12 PW19-IL 45-840 ET 01 | 4500 | 3150 | 1350 | 675 | 675 |
| | 10267795 | TugraHE 12 PW19-IL 45-840 ETDD 01 | 4500 | 3150 | 1350 | 675 | 675 |

1. we have a luminaire with 4500lm → of which 70% should radiate directly and 30% indirectly

2. now take 15% of the total lumens
→ 4500*0,15
This is now the portion that flows from the **direct light**, into the indirect one

3. 15% must now be added to arrive at the value that comes directly from the indirect light (30% in total).

4. finally, the **two indirect** values are summed and subtracted from the 4500lm→ the result is then the portion that exits the **direct module**

# RGBW

To be able to use the luminaire with RGBW (colored light) there are **two possibilities**:

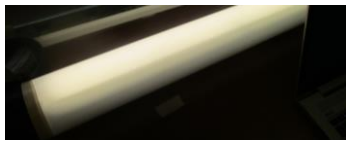
1. **Control via DALI (...8-RGBW ETDD...)**
   - 4-channel driver built into the luminaire (RGBW)
   - Circuit type ETDD
   - Programming the RGBW settings via DALI
   - **types in the Tugra portfolio set up as standard:**
     e.g. TugraHE 3 PL 12-8-RGBW ETDD PC 23 (10268148)

2. **Control via CASAMBI**
   - 4-channel driver built into the luminaire (RGBW) + CASAMBI control unit
   - Circuit type ETDD
   - Programming the RGBW settings via CASAMBI app
   - **Types available as SOF**

max. lumen output:
3% (R)

max. lumen output:
16% (G)

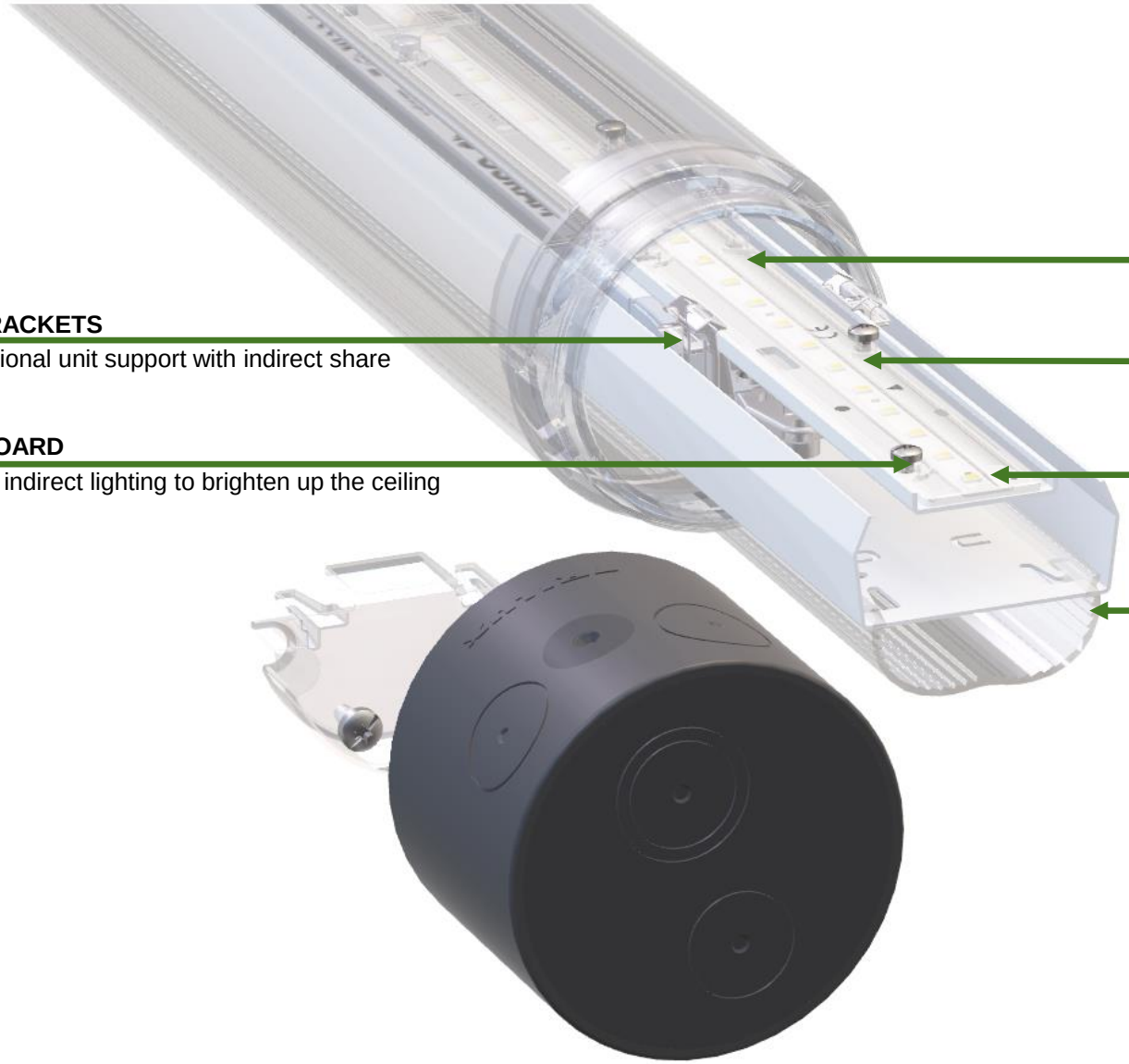
max. lumen output:
5% (B)



max. lumen output:
76% (W)

max. lumen output:
76% (W) + 3% (R)

# FUNCTION



**SLOT & HOLD BRACKETS**
Fixation of an additional unit support with indirect share modules

**INDIRECT LED BOARD**
incl. lens optics for indirect lighting to brighten up the ceiling

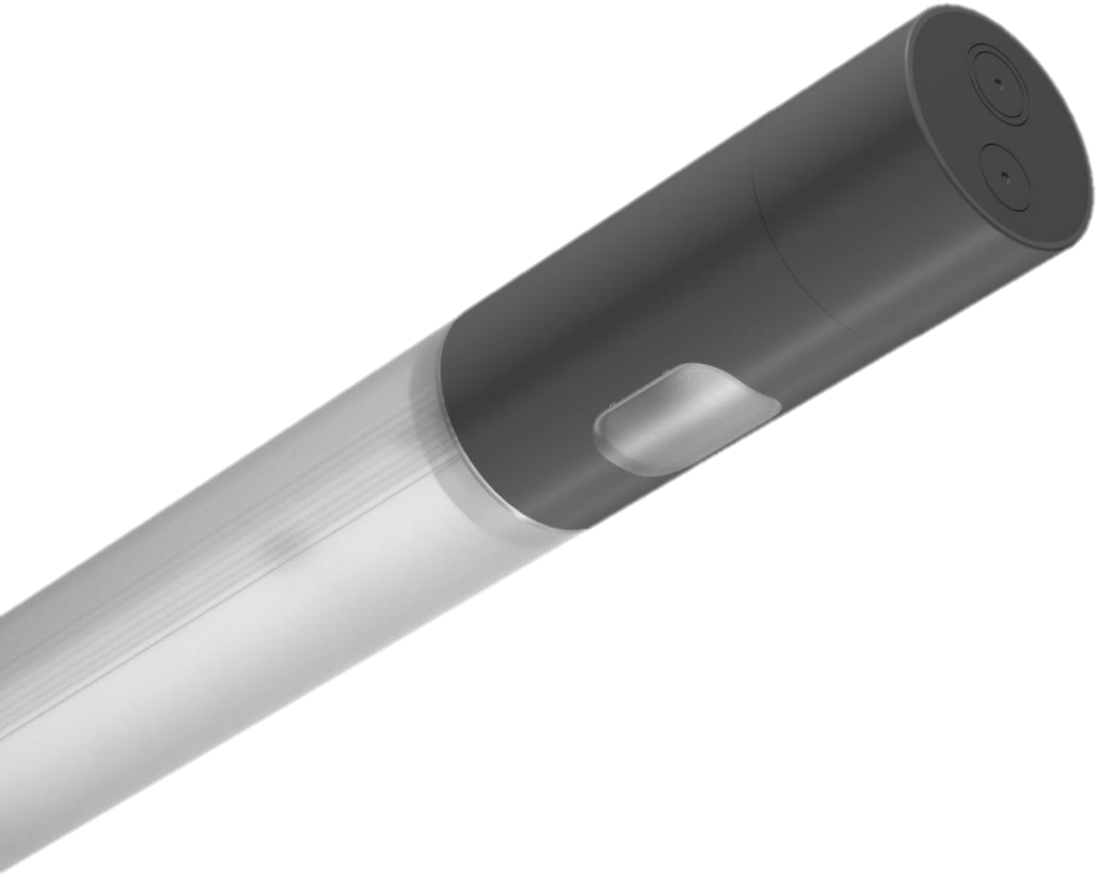
**RAILING SYSTEM**
For easy installation and removal

**SECURELY FIXED**
The optics are screwed onto the LED board

**PROFILE**
Pull-out for component exchange (Modules (Direct & Indirect), Driver)

**OBSTRUCTION FREE CABLE DUCT**
Flexibility for additional wiring, through-wiring

# SMART & MODULAR



**INTERCHANGEABILITY & RETROFITTING**

Additional functions can be added later
Modules can be swapped at any time

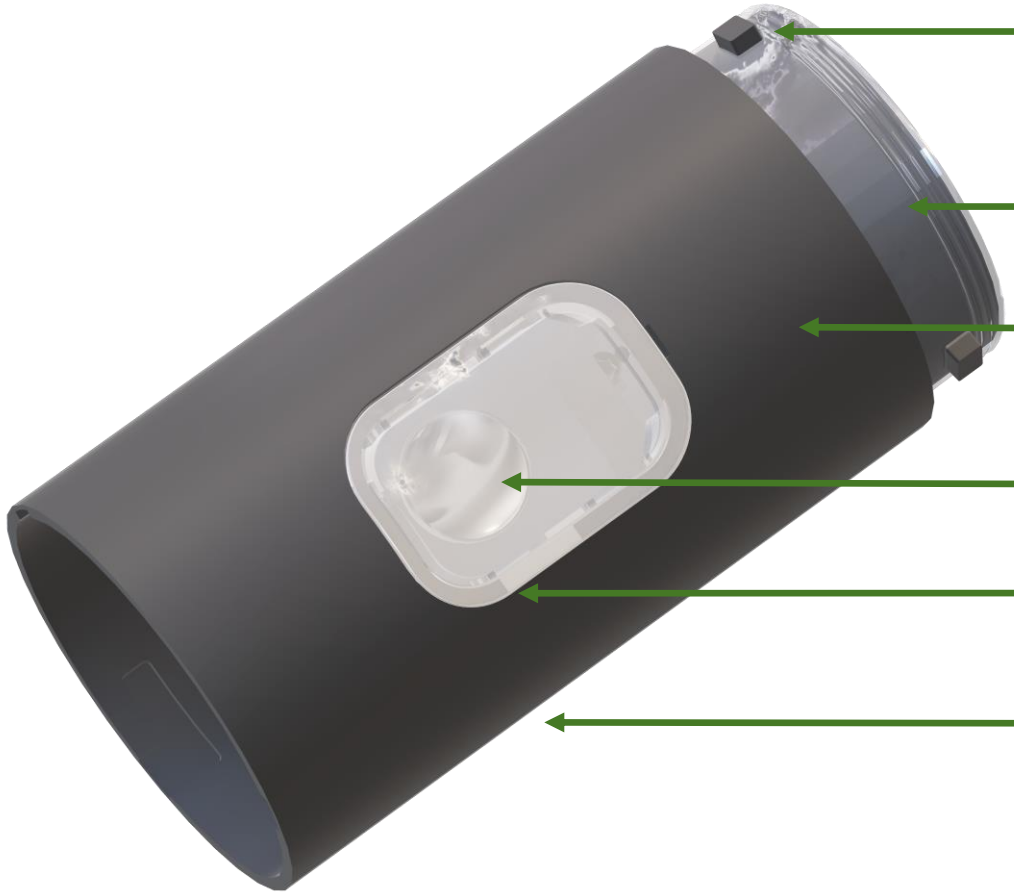
**FLEXIBILITY**

Modules can be placed at any connection point

**INTEGRATION OF 3RD PARTY DEVICES**

Customer and project-specific devices can be integrated into the smart modules to reduce complexity in service provider management. "More trades/functions from a single source".

# SMART & MODULAR



**SIMPLE BAYONET LOCKING**
Lock & connect with minimal rotational movement

**IP66 PROTECTION**
Custom-fit silicone-free sealing

**VDI 24 FINISH**
High quality injection moulding

**OPTICAL WINDOW**
For lenses/optics of e.g. sensors

**IP66 PROTECTION**
Precisely fitting silicone-free IP66 seal

**IOT MODULE**
Sensors, Livelink, Beacon, CEAG, Inotec, 230V, Data, WiFi Repeater

# SMART & MODULAR

### MAXIMUM EFFICIENCY IN OPERATION

Modules for sensor technology, lighting management & Livelink

### FROM SINGLE LUMINAIRE TO CONTINUOUS ROW

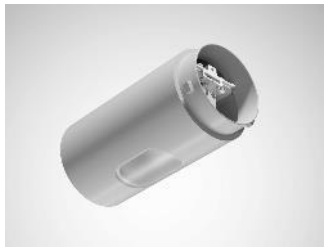
Various connection modules and couplers

### PRACTICAL ADDITIONAL FUNCTIONS

230V connection, data connection, universal mounting plate

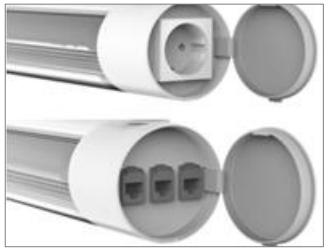
### INTEGRATION OF THIRD PARTY DEVICES

Wifi repeater, camera or loudspeaker integrated into modules to reduce the complexity of service providers at the end customer.



**SMART LUMINAIRE MODULES**

**SMART CONTINOUS LINE MODULES**



**INNOVATIVE FUNCTIONS**

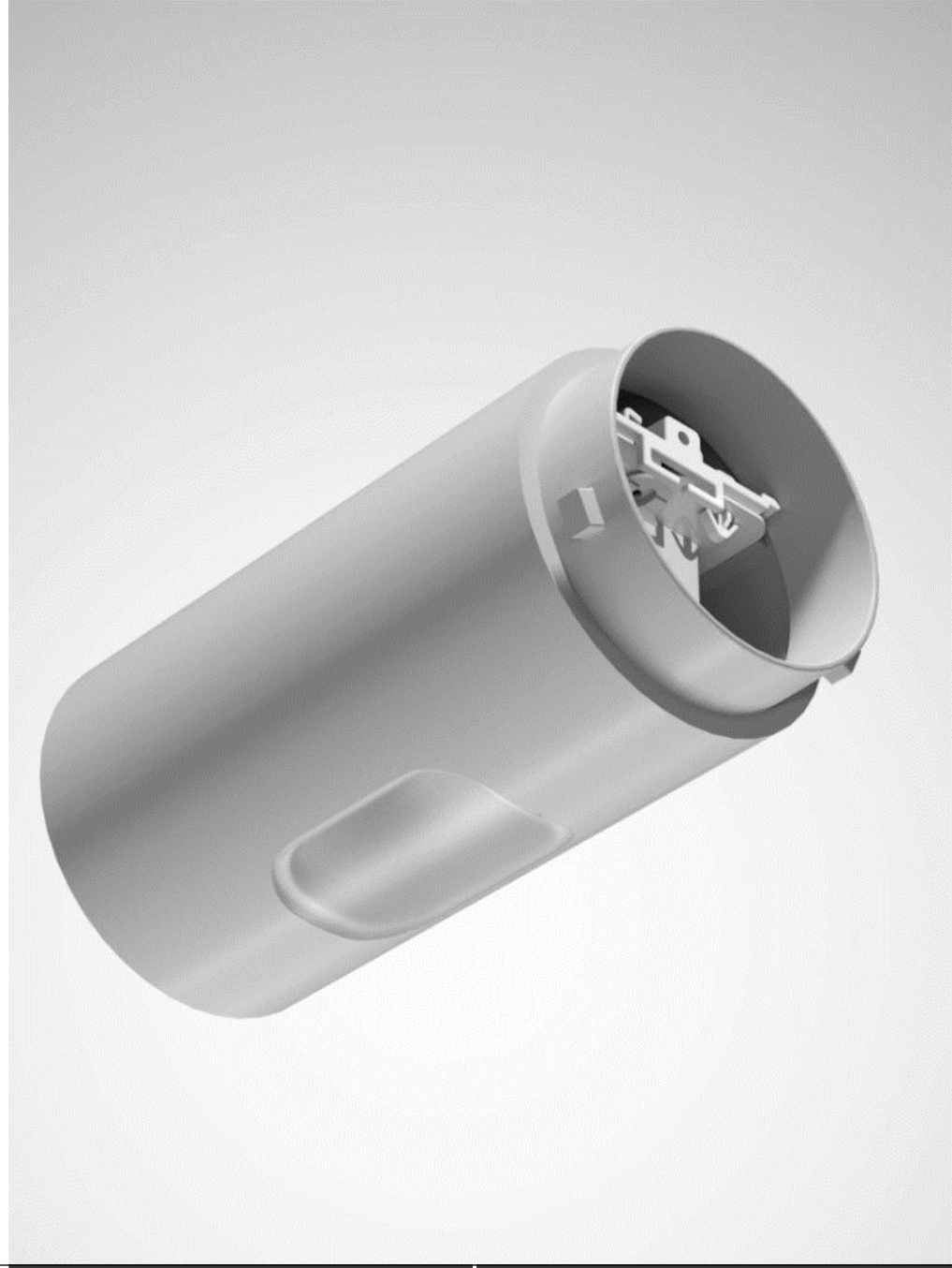
**CUSTOMISED SOLUTIONS**

# **MODULE LUMINAIRE**(LME)

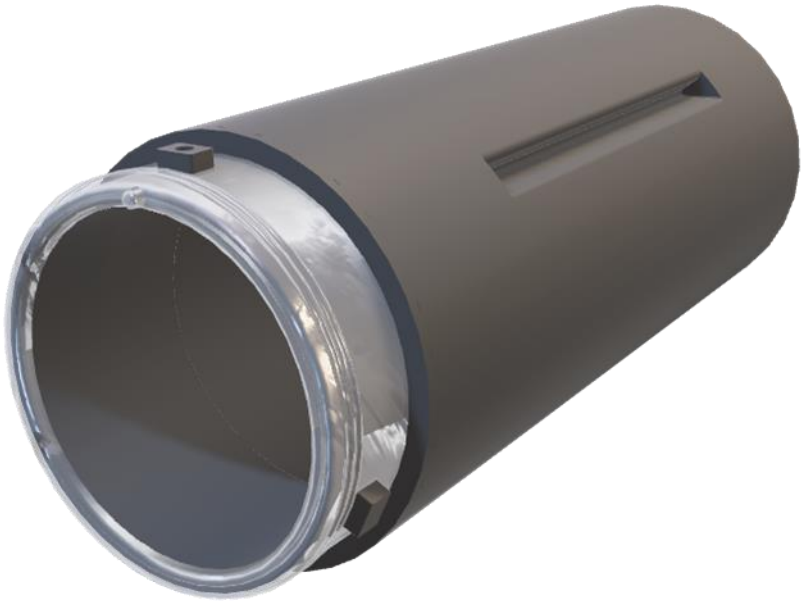
- Sensors (ET) AVAILABLE (SERIES)
- Sensors (ETDD) AVAILABLE (SERIES)
- LL SwarmSens AVAILABLE (SERIES)
- Services (Beacon) AVAILABLE (SERIES)

- Universal Mounting Plate AVAILABLE (SERIES)

- Emergency Lighting (CEAG / Inotec) AVAILABLE (SOF)
- $CO_2$-Sensor AVAILABLE (SOF)
- Wifi-Repeater AVAILABLE (SOF)
- Camera AVAILABLE (SOF)



# **MODULE CONTINOUS LINE** (LMB)



- Sensors (ET) AVAILABLE (SERIES)
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- LL SwarmSens AVAILABLE (SERIES)
- Services (Beacon) AVAILABLE (SERIES)

- Universal Mounting Plate AVAILABLE (SERIES)

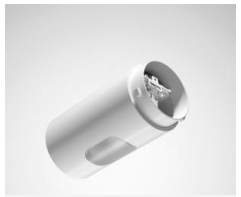
- Emergency Lighting (CEAG / Inotec) AVAILABLE (SOF)
- $CO_2$-Sensor AVAILABLE (SOF)
- Wifi-Repeater AVAILABLE (SOF)
- Camera AVAILABLE (SOF)

# AVAILABLE SYSTEMS & SENSORS

*All sensors are

- available in the colours 01 (white), 23 (light grey), C2 (dark grey) and 05 (black),
- in PC and PMMA material versions
- in LME (single luminaire) and LMB (continuous row)

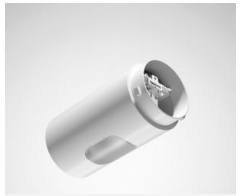
available for all types!



**LLWS**

10307234 Sensor Steinel Sensotec HF2 IPD type9025

TUGRA LME LLWS 130 01
– Example 8091200



**BEACON**

10233638 Beacon - Tracker 01 + 10233751 SLM-P-PS/12V-003-A

TUGRA LMB Beacon 165 01
– Example 8098600

**DMR**

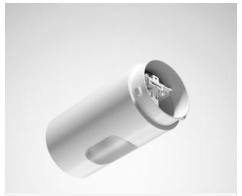
Dip Mesh Slave → 10236190 Sensor SEITEC SLM-C-PS-DALI-BT-009-A

TUGRA LMB DMR 165 01
– Example 8097000

**DMM**

Dip Mesh Master → 10236189 Sensor SEITEC SLM-C-PS-DALI-BT-HF-LI-008

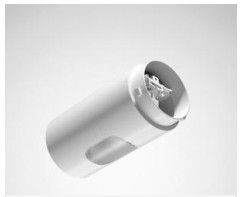
TUGRA LMB DMM 165 01
- Example 8097800



**HFS ET**

10145561 LMS HF-Sensotec Mini Steinel

TUGRA LME HFS ET 130 01
– Example 8090000



**HFS ETDD**

10212862 Sensor Steinel Sensotec MB HF1 DALI-2

TUGRA LME HFS ETDD 130 01
– Bsp. 8090800

# ACCESSORIES LUMINAIRE CONTINUOUS LINE COUPLING (ZLK)

Coupling accessory (length: 44mm) for connecting two luminaires with a simple bayonet lock.

**Continuous optics of the continuous line**

**Reduced dark spots between luminaires**

**Optimal utilisation of the full length for positioning luminaire units**

# **BLIND PROFILE** (BPL)

**Continuous optic of the continuous line**

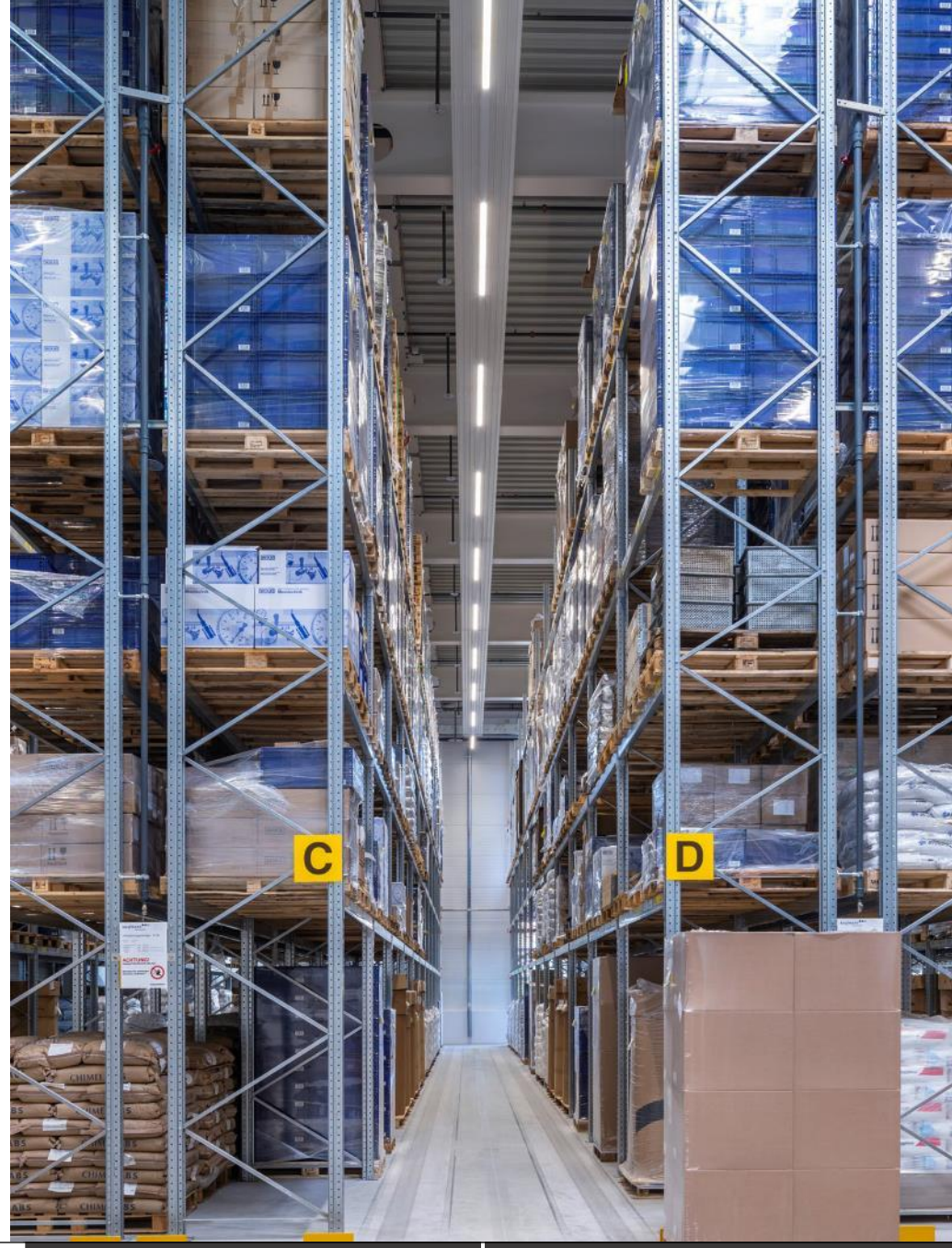
Blind profile incl. gear tray for cable feed-through & avoidance of shadows in the blind profile. Available in various lengths and materials to match the selected luminaire profile.

**Simple cable feed-through**

Barrier-free cable duct in luminaire & sufficient free space in blind profile for laying through-wiring or additional cables (network, data, ...)

**Maximum efficiency & flexibility**

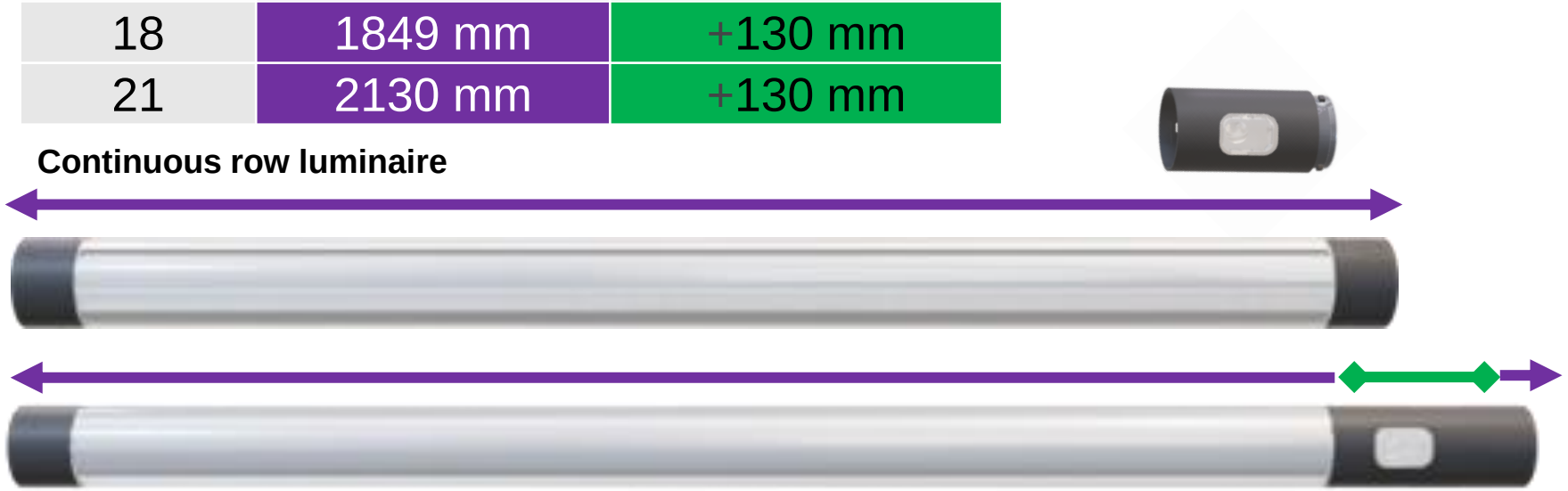
Combination of luminaire lengths, blind modules & connecting elements for efficient continuous line combination



# LENGTHS SINGLE LUMINAIRES

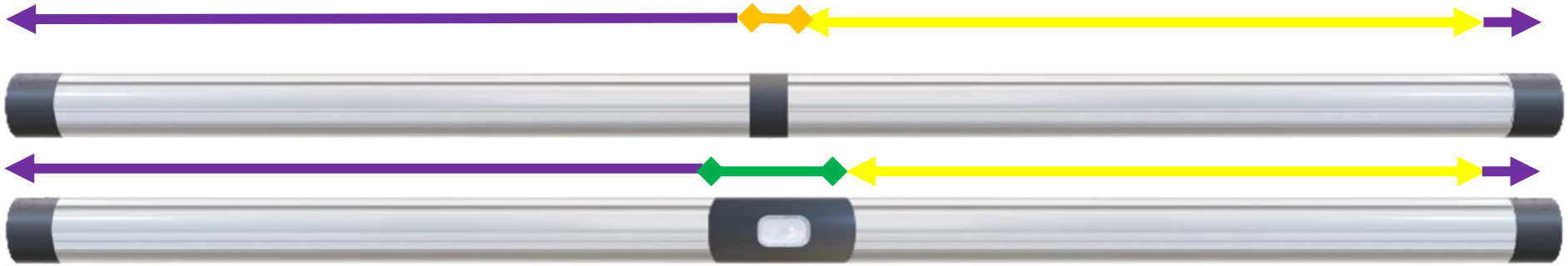
| Luminaire | Single length | LME…130 |
|---|---|---|
| 3 | 444 mm | +130 mm |
| 6 | 725 mm | +130 mm |
| 9 | 1006 mm | +130 mm |
| 12 | 1287 mm | +130 mm |
| 15 | 1568 mm | +130 mm |
| 18 | 1849 mm | +130 mm |
| 21 | 2130 mm | +130 mm |

**Continuous row luminaire**



# LENGTHS CONTINUOUS LINE

| Luminaire | Start lenght | ZLK | LMB...165 | Blind piece |
|---|---|---|---|---|
| 3 | 444 mm | +44 mm | +165 mm | +322 mm |
| 6 | 725 mm | +44 mm | +165 mm | +603 mm |
| 9 | 1006 mm | +44 mm | +165 mm | +884 mm |
| 12 | 1287 mm | +44 mm | +165 mm | +1165 mm |
| 15 | 1568 mm | +44 mm | +165 mm | +1446 mm |
| 18 | 1849 mm | +44 mm | +165 mm | +1727 mm |
| 21 | 2130 mm | +44 mm | +165 mm | +2008 mm |



# SMART & MODULAR

1.5 mm² diameter for long lines and low-voltage fluctuations (connection of up to 60 luminaires in the continuous row possible)

Core 1 – Earth

Core 2 – Neutral

Core 3 – Live

Core 4 – DALI +

Core 5 – DALI –

Core 6 – (emergency)

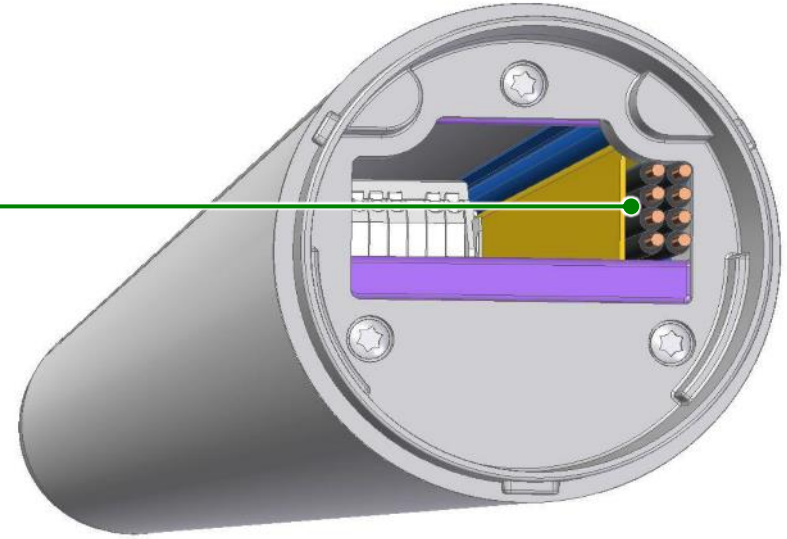
Core 7 – ?

Core 8 – ?

**BARRIER-FREE CABLE CHANNEL**

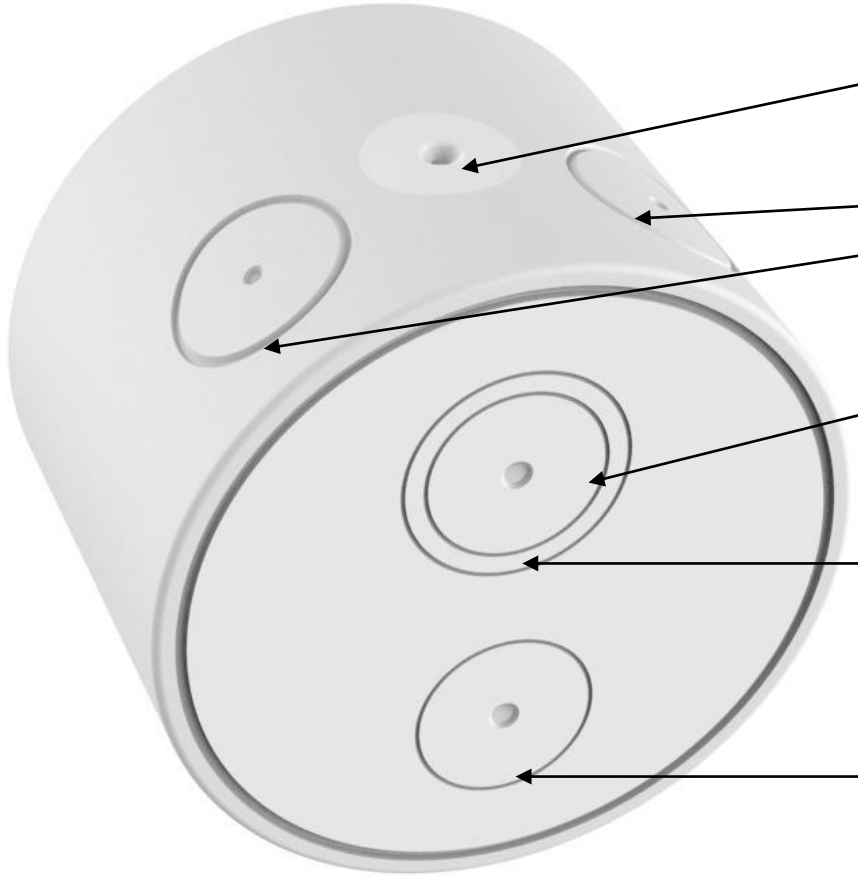
**Option 1:**
Use for ZLV (accessory through-wiring)

**Option 2:**
Order LV version & use cable channel for additional lines (network, data, ...)



# IP66 End cap – Rethought

## INSTALLER



**M16 membrane**
IP20 - Connection cable

**M20 feed (pre-stamped)**
IP66 - connection cable incl. sealing nipple/plug

**M25 feed (pre-stamped) (cross-section: 7-17 mm)**
IP66 - connection cable (no nipple/plug necessary), quick connector, PG screw connection

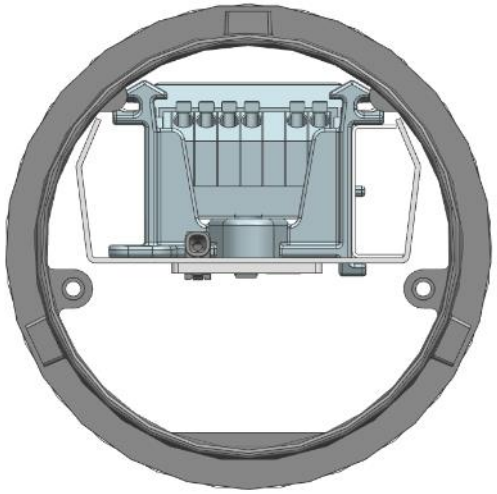
**M20 membrane ( diameter: 7-13 mm)**
IP66 - connection cable (no nipple/plug necessary), quick connector, PG screw connection

**M20 membrane ( diameter: 7-13 mm)**
IP66 - connection cable (no nipple/plug necessary), quick connector, PG screw connection

# Through-wiring

## INSTALLER

- 5 connection options for maximum flexibility & versatile mounting options
- 20% assembly time saving
- Less packaging waste on site
- Aesthetic design to suit all applications and mounting types



# BE DIFFERENT

- IP66 – also as Continous Line
- IK10
- Round-/Tube Luminaire
- Optics Kit
- 300 mm – 2.100 mm
- 150 lm/W – 189 lm/w
- Smart Modules
- 100% recycable Packaging
- Sustainable material Variants
- Innovative Connection Options

# DIFFERENTIATION IN THE PORTFOLIO

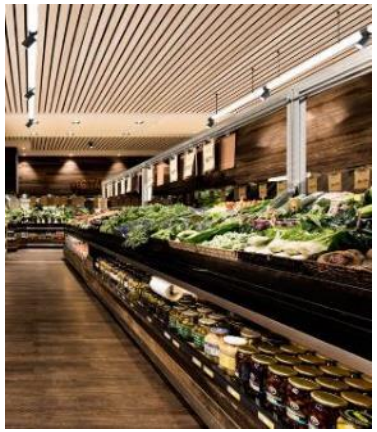
## INDUSTRY

- Round design - easy cleaning, less dust & dirt
- IP 66 - robust & resistant (can also be used as a continuous line)
- Flexibility in planning - different lengths/application areas
- Future-proof and integration options (subsequent upgrades possible) - IP protection
- Particularly suitable for car parks (new project), food production, laboratories
- Up to 20% faster installation due to innovative connection system in the end cap
- Up to 25% indirect component for ceiling illumination (safety & comfort)
- optional glare control options (UGR value reduction)

## OFFICE

- Differentiation through innovative design language
- Integration of additional trades - less disruptive design factor
- modular system - single luminaire and continuous row capability
- future-proofing and integration options (subsequent upgrades possible)
- Wall and ceiling mounting (horizontal and vertical mounting possible)
- Use of the cable duct for additional cables such as data cables

# DIFFERENTIATION IN THE PORTFOLIO



## EDUCATION

- Differentiation through innovative design language
- One luminaire for different rooms - particularly suitable for classrooms, specialist rooms such as chemistry, workshops, corridors, covered outdoor areas, lecture halls
- Flexibility in planning
- Future-proof and integration options (subsequent upgrades possible)
- IP66 & IK10 - "features-for-free" - impact resistance
- Enclosed circular luminaire (cleaning/vandalism)

## RETAIL

- Differentiation through innovative design language (also in covered outdoor areas/ from entrance to product staging).
- Future-proof and integration options (subsequent upgrades possible)
- Use as single luminaire or linear continuous line
- horizontal and vertical mounting possible
- direct integration of spots/spotlights into the lighting concept

# SCALABLE TO INDIVIDUAL CUSTOMER AND PROJECT REQUIREMENTS

**Upper Price**
(Performance-Segment)

**Scalable Product System**

**Starting Price**
(Core-segment)

# SUSTAINABILITY

**MADE IN EUROPE**

Components produced in Spain, Luminaire mounted in Spain at Zalux.

**INTERCHANGEABILITY OF COMPONENTS**

openable luminaires & modules

Exchange of LED modules

Exchange of LED drivers

**100% RECYCLABLE PACKAGING**

recyclable cardboard packaging

no plastic

no stereopor

**PROJECT PACKAGING**

Multiple packaging (28 luminaires per carton)

Project packaging (108 luminaires per pallet)

**SUSTAINABLE LIGHTS**

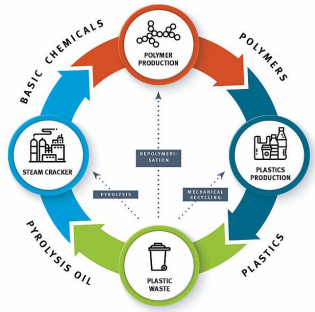
Luminaire variants consisting of sustainable material (IK10, like PC)

100% recyclable

Optimised $CO^2$ foodprint of luminaire production

Standard disposal (like conventional PC)

→ Example: Tugra 15 PL 64-840 ETDD PC + Sensor




# OVERVIEW - RECYCLING MATERIAL FOR LUMINAIRES

## COVESTRO

| | RE-PC (Covestro) |
|---|---|
| Material origin | Mix vegetal, Fossil based… Chemical Recycling |
| Additional costs | ~ 3€ |
| Material | Identical to PC |
| $CO_2$ Footprint | 0 to – **7,8** kg |
| % CO2 saving | <1% |
| Availability | On request |

**Depolymerization:** A single polymer waste such as polyurethanes or polyamides is required (e.g., carpet fibers or mattresses). The polymers are broken down into their monomers, from which the polymer can be rebuilt. The end products can be compared with new materials.

**Best scenario:** reduction of **7.8** kg CO2 by using recycled materials per luminaire!

**This is equivalent to:**

- Switching off a luminaire for 337 hours / 14 days / 0.67% of its service life
- Dimming the luminaire with daylight for 2 months *
- Change of presence detection from 5 minutes to 1 minute in 3 years **.
- Avoid driving 63 km in Europe
- Recycling 369 Tetrapack
- Plants of 0.05 trees ***

(*) average european sun
(**) 5x switches / day
(***) (encina / holm oak castaño / chestnut tree)

Alternative raw materials to reduce fossil dependency

Significant reduction in carbon footprint – up to climate-neutral

Solutions with the same properties as virgin grades

# RECYCLING PROCESS

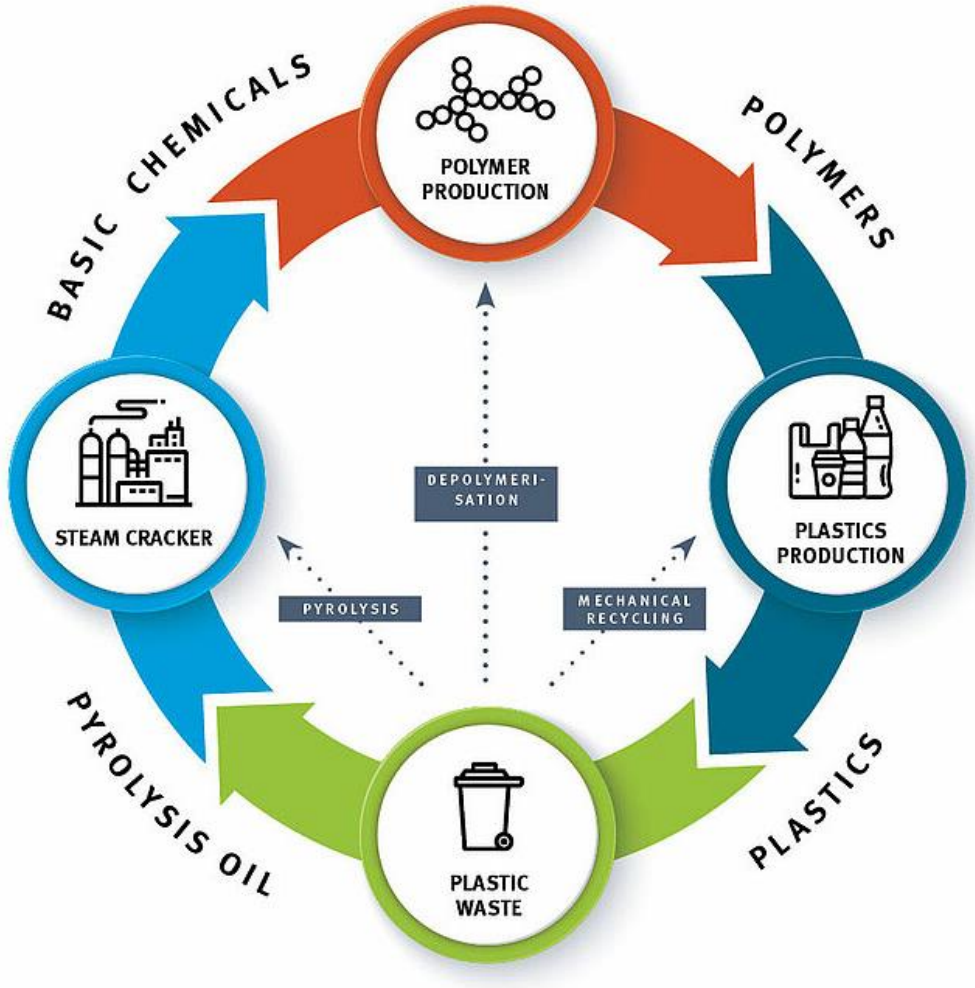
### Chemical Recycling

**Pyrolysis:** Mixed plastic waste is heated to 450-650 °C in the absence of oxygen to produce an oil that can be used as a feedstock in chemical plants such as steam crackers. The resulting products are virgin and suitable for use in food packaging, automotive parts or medical applications.

**Depolymerization:** A single polymer waste such as polyurethanes or polyamides is required (e.g. carpet fibers or mattresses). The polymers are broken down into their monomers, from which the polymer can be rebuilt. The end products are often new materials.

### Mechanical recycling

Polymer waste is recycled into the same polymer, e.g. PET bottles into PET bottles. The waste stream must be clean and made from a single polymer. However, in some cases, the resulting products are of lower quality and are therefore used for fencing, flowerpots, benches and the like.



# DETAILS
# PRODUCT AND ACCESSORIES

# ASSEMBLY

**BATTERY**

Emergency light function in case of power failure. Up to 3 hours of operation possible. Connection to central battery possible.

**HOLDER FOR EQUIPMENT RACK**

Fixing of gear tray to profile geometry

Transparent to avoid shadows

**DRIVER**

ET (switchable), ETDD (dali-dimmable), ET+ML (multilumen), Livelink, +ACT (HCL), SMC (Lightgrid)

**MOUNTING CLIPS**

Continuous mounting channel for maximum flexibility

**M16 ENTRANCE**

Soft plastic (TP) insulation/cover IP66

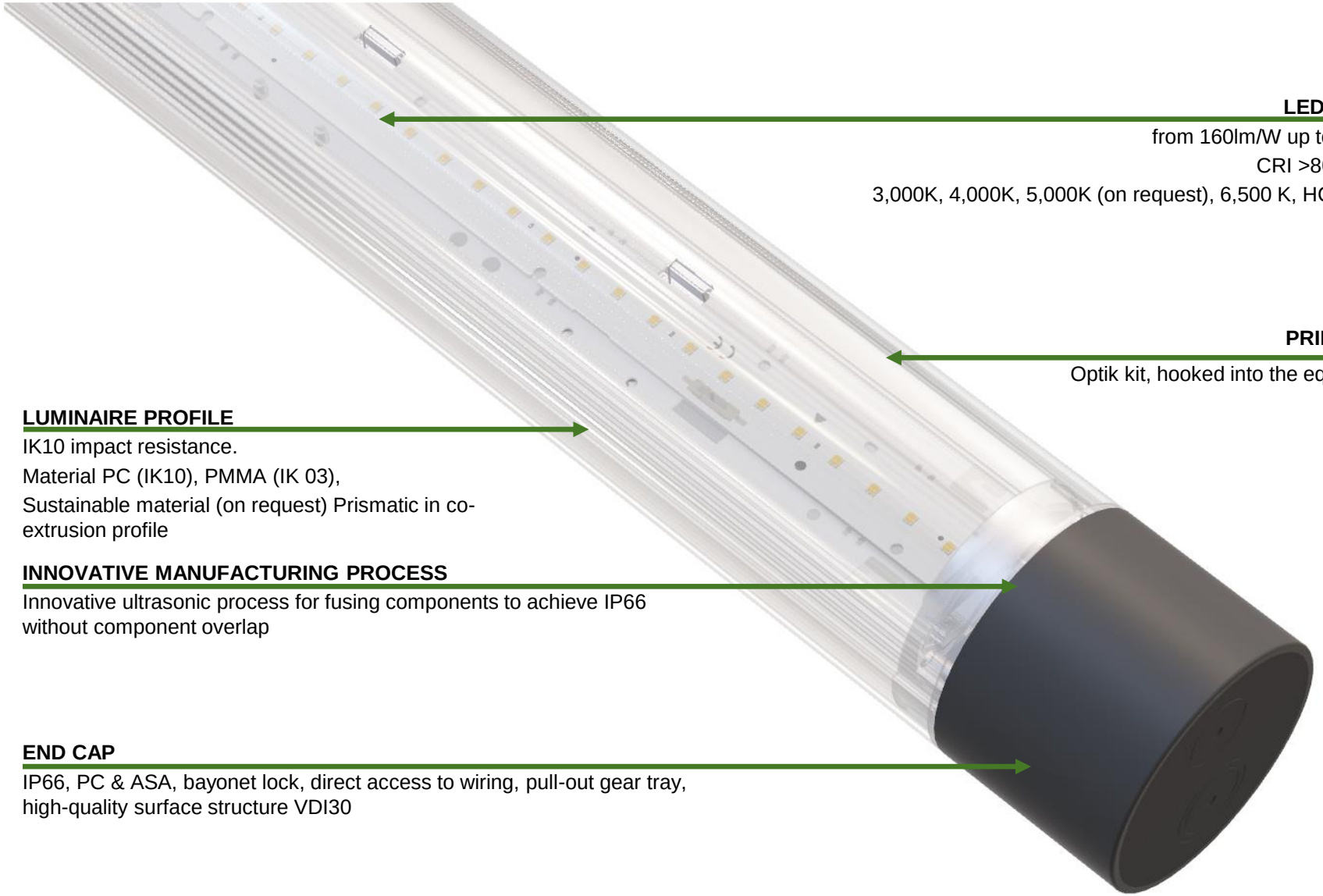
Primarily for Office/Education

**M20/M25 ENTRANCE**

Soft plastic (TP) insulation/cover IP66

Primarily for Industry

# ASSEMBLY



**LED MODULE**

from 160lm/W up to 189lm/W

CRI >80, CRI >90

3,000K, 4,000K, 5,000K (on request), 6,500 K, HCL, RGBW

**PRIMARY OPTICS**

Optik kit, hooked into the equipment carrier

**LUMINAIRE PROFILE**

IK10 impact resistance.

Material PC (IK10), PMMA (IK 03),

Sustainable material (on request) Prismatic in co-extrusion profile

**INNOVATIVE MANUFACTURING PROCESS**

Innovative ultrasonic process for fusing components to achieve IP66 without component overlap

**END CAP**

IP66, PC & ASA, bayonet lock, direct access to wiring, pull-out gear tray, high-quality surface structure VDI30

# NOMENCLATURE

**Example**

| HE+ | 15 | PW 19-IL | 80 | 940 | ETDD | LLWC | PC | 23 |
|---|---|---|---|---|---|---|---|---|
| Performance | Länge / Size (75mm ø) | Optiken / Optics | Lichtstrom / Luminous flux | Farbtemperatur / Colour Temperature | Schaltungsart / Switching Type | Lichtmanagement / Controls | Material | Farbe / Colour |
| [empty] L80 = 50.000 h -25°C/+35°C | 3 444 mm | PL Lambertisch Lambertian | 12 1.200 lm | 830 CRI > 80 \| 3000 K | ET Schaltbar Switchable | LLWC Mit integriertem LiveLink Controller With integrated LiveLink controller | PC IK10 | 01 Weiß White |
| HE L80 = 70.000 h -30°C/+35°C | 6 725 mm | PN Tiefstrahlend Narrow Beam | bis/up to | 840 CRI > 80 \| 4000 K | ETDD DALI | *weitere Funktionen in Form von Zusatzmodulen | PMMA IK03 | 05 Schwarz Black |
| HE+ L80 = 100.000 h -40°C/+45°C | 9 1.006 mm | PW Breitstrahlend Wide Beam | 170 17.000 lm | 850 CRI > 80 \| 5000 K | EB3 Notlichtbatterie Emergency Kit | *more Functions by additional Modules | PMMA IP69K IK03 (Gas-Tight) | 23 Hellgrau Light grey |
| | 12 1.287 mm | PVW Sehr breit Very Wide Beam | **UGR19** | 865 CRI > 80 \| 3000 K | ETDD8 (Act) DALI DT8 HCL 2700K-6500K | | auf Anfrage / on request biobasierter Kunststoff Bio-based plastic | C2 Dunkelgrau Dark grey |
| | 15 1.568 mm | PXW Extrem breit Extreme Wide | 38 3.400 lm | 930 CRI > 90 \| 3000 K | SMC Smart Connect (Lightgrid) | | | |
| | 18 1.849 mm | PAW Asymmetrisch Asymmetric | bis/up to | 940 CRI > 90 \| 4000 K | LV „Durchgangs-verdrahtung Through-wiring" | | | |
| | 21 2.130 mm | PW19 Breitstrahlend UGR19 Wide Beam UGR19 | 64 6.400 lm | 950 CRI > 90 \| 5000 K | | | | |
| | | PW19-IL UGR19 mit Indirektlicht UGR19 with Indirect Light | **UGR19 & BAP** | 965 CRI > 90 \| 6500 K | | | | |
| | | | 34 3.400 lm | 8-RGBW CRI > 80 RGBW | | | | |
| | | | bis/up to | | | | | |
| | | | 58 5.800 lm | | | | | |
| | | | **UGR19 & BAP (-IL)** | | | | | |
| | | | 45 4.500 lm | | | | | |
| | | | bis/up to | | | | | |
| | | | 80 8.000 lm | | | | | |
| | | | ML Multilumen | | | | | |

TRILUX
SIMPLIFY YOUR LIGHT.

# TOTAL PORTFOLIO

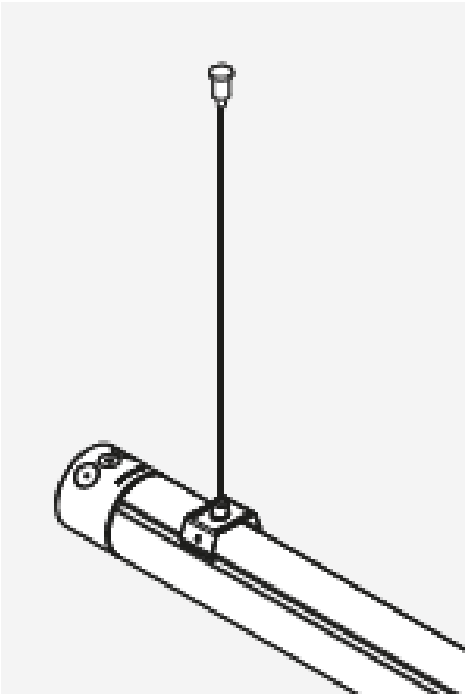
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Application / Protection** | IP66 | IP69K | incl. V2A (mounting brackets) | | | | | | |
| **Performance** | Standard | HE | HE+ | | | | | | |
| **Length single luminaire** | 300mm | 600mm | 900mm | 1200mm | 1500mm | 1800mm | 2100mm | 3000mm | |
| **Optics** | PL | PN | PW | PVW | PXW | PAW | PW19 | PW19-IL | |
| **Colors** | 01 | 23 | C2 | 05 | OPAL | Customised in any RAL Colour | | | |
| **Circuit type** | ET | ETDD | ETDD8 | ETDD EB3 | ETDD LLWC | ET EB3 | | | |
| **Material / Protection class** | PMMA IK03 | PC IK10 | PMMA IP69K | | | | | | |
| **Light color** | 830 CRI>80 \| 3000 K | 840 CRI>80 \| 4000 K | 865 CRI>80 \| 3000 K | 930 CRI>90 \| 3000 K | 965 CRI>90 \| 6500 K | RGBW CRI >80 | Act | Possible as SOF: 850 CRI>80 \| 5000 K | 940 CRI>90 \| 5000 K | 950 CRI>90 \| 5000 K |
| **Luminous fluxes** | 1.200 - 17.000 lm | UGR19 3.400 - 6.400 lm | UGR19 + BAP 3.400 - 5.800 lm | UGR19 + BAP (-IL) 4.500 - 8.000 lm | Multilumen | | | | |
| **Mounting** |  | | | | | | | | |
| **Smart modules (LMB / LME)** | LLWC | LLWS | BEACON | DMR | DMM | HFS ET | HFS ETDD | Possible as SOF: CEAG | INOTEC | Camera | Wifi Repeater |
| **Accessories** | Rope suspension | Blind piece | ZLK (short connection module) | LMB (long connection module) | ZLV (through wiring) | ZBATL (theft protection) | Ceiling junction boxes | Mounting plates | | | |
| **Mounting accessories** | ZBWM (Pivotable mounting bracket) | ZBRS (tube clamp) | V4A (mounting clips) | V2A (IP66, IP69K and BLP included in delivery) | | | | | | | |

# ACCESSORIES

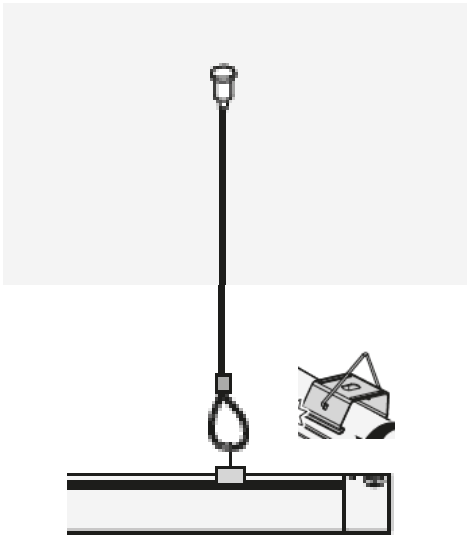
| Beschreibung/Description | OLD | TK | Erläuterung/Comments |
|---|---|---|---|
| Tugra KS 58 PC 23 Set | Tugra KS 58 PC 23 Set | 10271860 | KS= Kopfstück / Endcap; Set= 2x; 58= Length |
| Tugra KS 58 23 Set | Tugra KS 58 23 Set | 10271864 | PMMA |
| Tugra LME HFS ET 130 PC 23 | *Tugra ML HFS ET 105 PC 23* | 10271868 | LME= LeuchtenModulEnde / Luminaire Module End |
| Tugra LME HFS ETDD LLWS 130 23 | *Tugra ML HFS ETDD LLWS 105 23* | 10271884 | HFS….LLWS: Livelink-Wifi Sensor |
| Tugra LME DMR 130 PC 23 | *Tugra ML DMR 105 PC 23* | 10271888 | LL SwarmSens (DipMeshReceiver) |
| Tugra LME DMM 130 PC 23 | *Tugra ML DMM 105 PC 23* | 10271896 | LL SwarmSens (DipMeshMaster) |
| Tugra LME MP 130 01 | *Tugra ML MP 105 01* | 10271912 | MP= Montageplatte / Mounting Plate |
| Tugra LME MP 130 | *Tugra ML MP 105* | 10271913 | Unlackiert/Unpainted |
| Tugra LMB 165 PC 23 | *Tugra MLB 165 PC 23* | 10271914 | LMB= LeuchtenModulBand / Luminaire Module Continous Line |
| Tugra BLP 322 PL PC | *Tugra BP 322 PL PC* | 10271962 | BP= Blindprofil / Blind Profile; PL: wie PL / like PL |
| Tugra BLP 322 PXX PC | *Tugra BP 322 PXX PC* | 10271963 | BP= Blindprofil / Blind Profile; PXX: wie alle anderen / like all others |
| Tugra ZLK PC 23 | *Tugra ZLLK PC 23* | 10271990 | ZLK: Zubehör Lichtleiste Kopplung / Accessory Continous Line Connection |
| Tugra ZLV/315/3 | Tugra ZLV/315/3 | 10270662 | ZLV: Zubehör Leitungsverdrahtung / Accessory Through-Wiring; 315: 3x1.5mm; 3= Länge/Length |
| Tugra ZBRS | TUGRA ZBRS | 10274518 | ZBRS: Zubehör Rohrschellen / LMBessory Pipe-Clamps |
| Tugra ZBWM | TUGRA ZBWM | 10274519 | ZBWM: Zubehör Wandmontage / LMBessory Wall-mounting |
| Tugra ZLV/315/LMB | *Tugra ZLV/315/LMB* | 10274634 | LMB: Leitungsverdrahtung LMB / Through-Wiring LMB |
| Tugra ZB V2A | Tugra ZB V2A | 10274521 | ZB: Montageclip (Standard) (immer inkludiert) / Mounting Clip Standard (always included) |
| Tugra ZB V4A | Tugra ZB V4A | 10274522 | ZB V4A: Montageclip Material V4A / Mounting Clip V4A |
| Tugra ZBATL | *Tugra ZBAD* | 10274523 | ZBATL: Zubehör Anti-Diebstahl / Accessory Anti-theft |
| Tugra ZSDD/2000 | *TUGRA ZBSB/2000* | 10274516 | (Standard Office/Education) ZSDD= Zubehör Seil Deko Deko / Accessory Rope Deco Deco |
| Tugra ZSDT/2000 | *TUGRA ZBSBXP/2000* | 10274515 | ZSDT= Zubehör Seil Deko Triangel / Accessory Rope Deco Triangle |
| Tugra ZSST/2000 | *TUGRA ZSXP/2000* | 10274637 | (Standard Industry) ZSST= Zubehör Seil Schlaufe Triangel / Accessory Rope Loop Triangle |
| Tugra ZSSD/2000 | *TUGRA ZS/2000* | 10274517 | ZSSD= Zubehör Seil Schlaufe Deko / Accessory Rope Loop Deco |

# ACCESSORIES - SUSPENSIONS

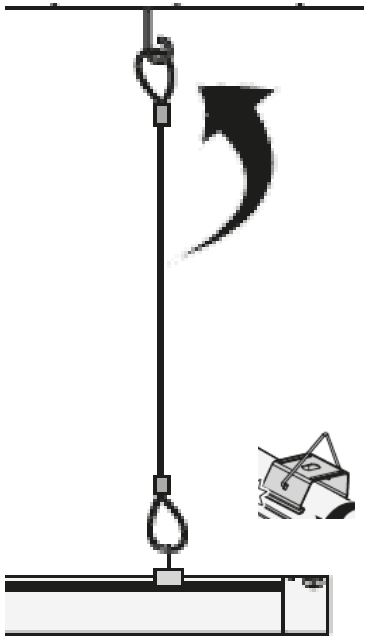
Tugra ZSDD/2000
10274516
Standard Office/Education



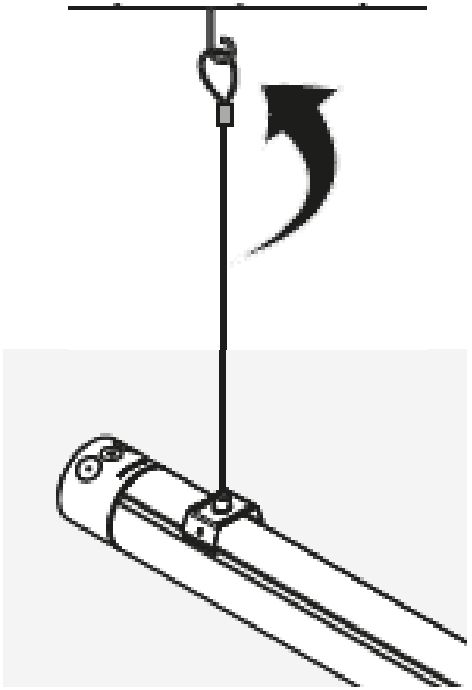
Tugra ZSDT/2000
10274515
Alternative



Tugra ZSST/2000
10274637
Standard Industry



Tugra ZSSD/2000
10274517
Alternative

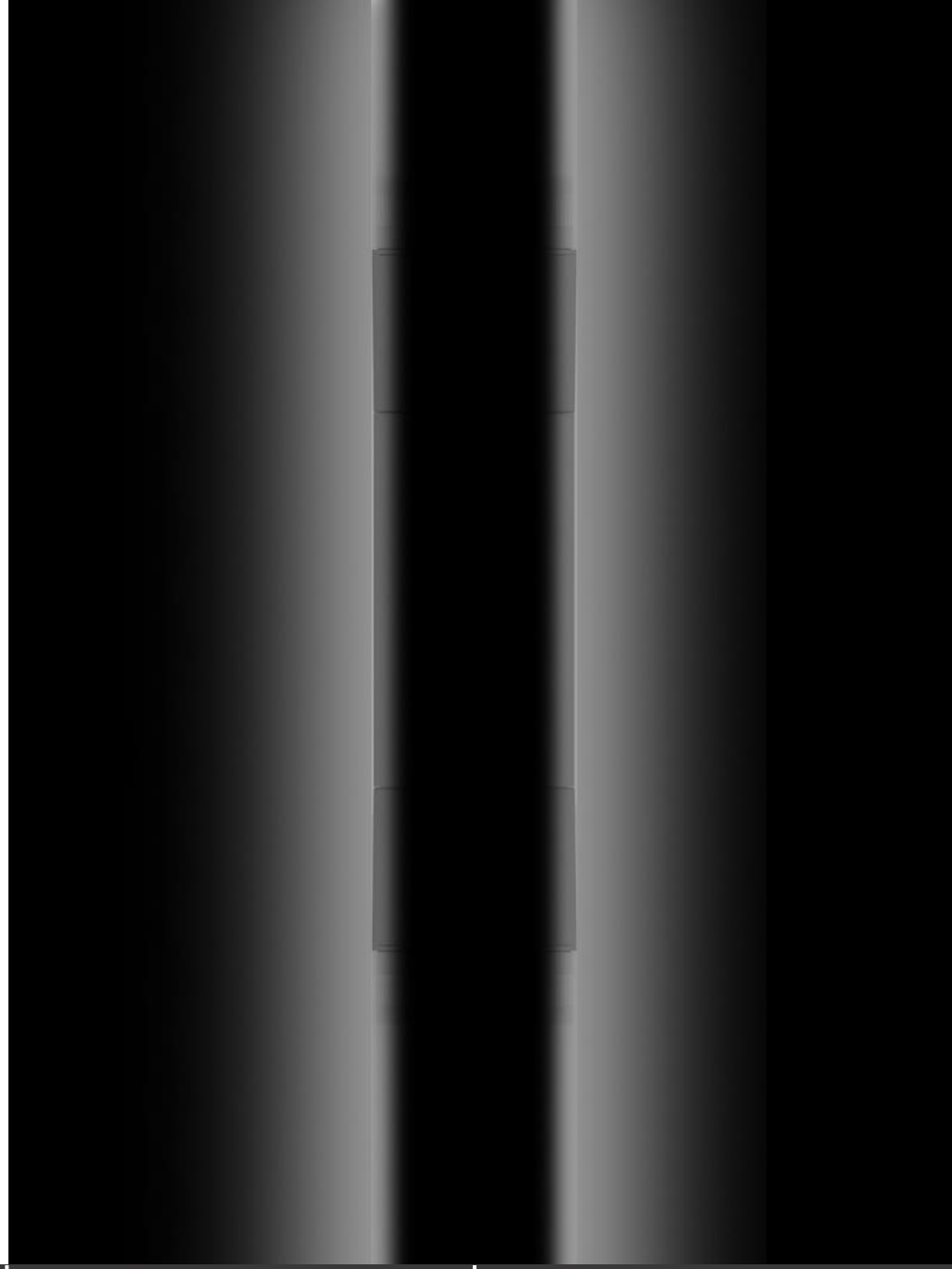


# DIGITAL SAMPLE CASE

# TUGRA
## CONNECTING SPACES

Next level in:

- DESIGN
- LIGHT QUALITY
- SMART & MODULAR
- DIFFERENTIATION & VARIETY
- SUSTAINABILITY



# CUSTOMER NEEDS

## END CUSTOMER

- Efficient & easy to maintain lighting system
- Low complexity
- Standard-compliant lighting quality
- Quality & sustainability

## E-PLANER

- Planning freedom & modularity
- Maximum lighting quality
- Simple & fast planning
- Sustainable lighting concept

## ARCHITECT

- Flexibility & freedom in design
- Reduced room design
- Standard-compliant lighting quality
- Sustainable lighting concept

## INSTALLER

- Simple and quick installation
- Flexible installation options
- Simple renovation solutions
- All around carefree package

# WE CONVINCE THROUGH BENEFITS

## END CUSTOMER

- Efficiency of up to 189 lm/W in operation Eligibility
- Driver & LED module replaceable
- Integration of additional functions & trades
- Uniform design language & differentiation
- Made in Europe

## ARCHITECT

- No limits in use/application (without interfering factors in the design)
- Made in Europe
- sustainable luminaire, component replacement
- IP66 & still attractive

## E-PLANNER

- Efficiency & optics kit
- Emergency lighting modules (battery, CE AG/Inotec)
- Modularity (luminaire, modules, continuo us row)
- Maximum lighting quality (indirect light, i ndirect modules, UGR prismatic foil)
- Cross-application & versatile
- Component exchange

## INSTALLER

- 20% assembly time saving
- Less packaging waste on site
- 5 connection options for maximum flexibility & versatile installation options
- Continuous mounting channel for flexibility in refurbishment

# END CUSTOMER

## Needs

- Efficient & easy to maintain lighting system
- Low complexity
- Standard-compliant lighting quality
- Quality & sustainability

## Benefits Tugra

- Efficiency of up to 189 lm/W in operation Eligibility
- Driver & LED module replaceable
- Integration of additional functions & trades
- Uniform design language & differentiation
- Made in Europe
- sustainable luminaire variants

# E-PLANER

## Needs

- Planning freedom & modularity
- Maximum lighting quality
- Simple & fast planning
- Sustainable lighting concept

## Benefits Tugra

- Efficiency & optics kit
- Emergency lighting modules (battery, CE AG/Inotec)
- Modularity (luminaire, modules, continuo us row)
- Maximum lighting quality (indirect light, i ndirect modules, UGR prismatic foil)
- Cross-application & versatile
- Component exchange

# ARCHITECT

## Needs

- Flexibility & freedom in design
- Reduced room design
- Standard-compliant lighting quality
- Sustainable lighting concept

## Benefits Tugra

- No limits in use/application (without interfering factors in the design)
- Made in Europe
- sustainable luminaire material, component replacement
- IP66 & still attractive

# INSTALLER

## Needs

- Simple and quick installation
- Flexible installation options
- Simple renovation solutions
- All around carefree package

## Benefits Tugra

- 20% assembly time saving
- Less packaging waste on site
- 5 connection options for maximum flexibility & versatile installation options
- Continuous mounting channel for flexibility in refurbishment

TRILUX
SIMPLIFY YOUR LIGHT.

# TUGRA
CONNECTING SPACES