# DUO² - the evolution of performance

## Introducing duo²

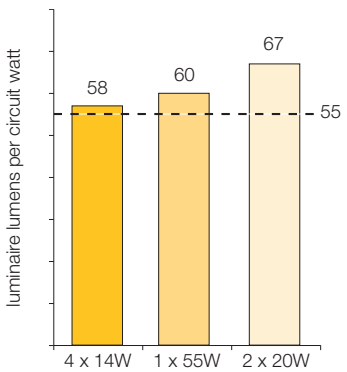
### The most advanced recessed luminaire available today

At its launch in 2009, DUO set the standard for high quality recessed fluorescent luminaires. Since then, it has had many imitators. To keep ahead of this trend, Whitecroft have now developed DUO² which sets new standards in both visual comfort and lighting performance.

DUO² boasts all of the features that made its predecessor so successful, whilst the range has been broadened with the addition of a new fixed micro prism optic. This optic uses the same conical refraction technology as the flagship dual position micro prism variant but with a recessed central optic arrangement similar to the louvred variants in the DUO² range.

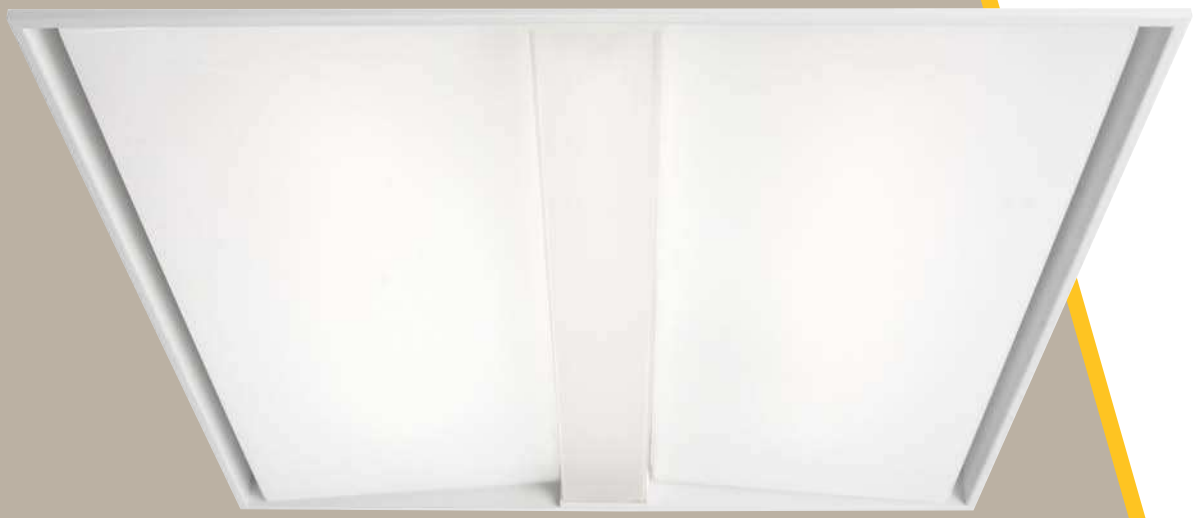
## Compliance Guaranteed

An uplift in performance across the range has been achieved with the development of new high output reflector technology, resulting in a 10% increase in light output. This means that the entire DUO² range achieves efficacy in excess of 55 luminaire lumens per circuit watt, resulting in guaranteed compliance with Part L of UK Building Regulations. This energy efficiency makes DUO² the ideal lighting solution for low carbon lighting schemes. Indeed its high performance means that DUO² has Light Output Ratios of up to 84%, whilst its unique Intermediate Brightness Zones allow this performance without the high degrees of glare normally associated with high LOR luminaires.




# duo² the range

## Centre Optic



## Dual Optic Technology

The DUO² luminaire range has two distinct optical elements which are common throughout the range.

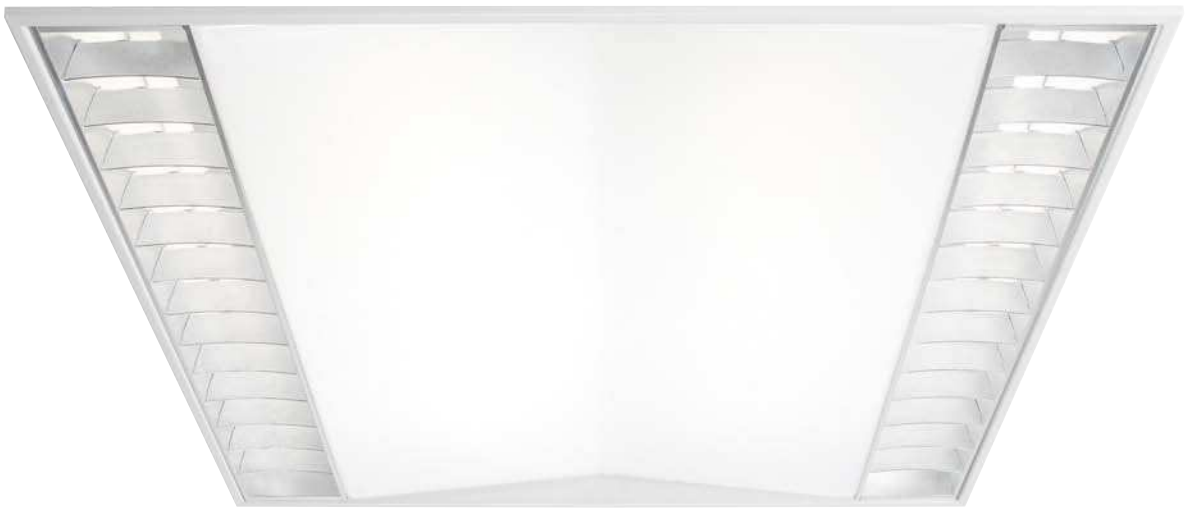
DUO² employs Intermediate Brightness Zones (IBZ), which deliver diffuse light and inject brightness directly into the ceiling plane. These work in conjunction with optical cells which deliver controlled light, maximising efficiency and reducing glare.

These optical cells are available with a choice of four controllers. The Micro Prism optic delivers exceptional controlled contrast with higher luminance and is available in either fixed or moveable versions. The latter has the unique ability to be used in either its recessed position for maximum ceiling integration or dropped to allow its linear refractor optics to further enhance the lighting of the ceiling plane.

If lower luminance levels are required a choice of two louvres are available: a 'living' louvre which builds on our unique Vivant louvre technology to create visual interest and a conventional semi-specular louvre. Both offer excellent glare control.

DUO²'s Micro Prism optic can be dropped from its recessed position to enhance the lighting of the ceiling plane

## Side Optic



## Luminaire Aesthetics

As well as offering a choice of optical arrangements, DUO$^2$ allows for two distinct aesthetic options. The DUO$^2$ centre optic range combines a familiar design style with high performance, whilst the DUO$^2$ side optic range maximises performance and has been designed to offer the ultimate aesthetic integration.

Two sizes of luminaire are available to integrate into both 600mm$^2$ and 1200mm x 300mm suspended ceiling systems.

All DUO$^2$ luminaires have air handling capability as standard - a carefully considered design feature which eliminates the need for unsightly extraction vents in the ceiling plane. DUO$^2$ has an air handling capacity of between 20 and 40 litres per second depending on its optical configuration.

Moveable Micro Prism

Fixed Micro Prism

Living Louvre

Semi-Specular Louvre

Duo$^2$ 600mm$^2$ centre optic

Duo$^2$ 600mm$^2$ side optic

Duo$^2$ 1200mm x 300mm

# duo²

## dual optic recessed luminaire

### Optics

- 3 optical options:
  - Micro Prism – combines micro optical cones in a fixed recessed format or alternatively a flexible pod which can be fully recessed or lowered to deliver further enhanced room surface ratios
  - Living Louvre – vacuum metalised injection moulded and textured louvre
  - Semi-Specular Louvre – high quality zero iridescence aluminium louvre
- 600 x 600mm lamp options:
  - 3 x 14W T5
  - 4 x 14W T5
  - 3 x 20W T5
  - 1 x 55W TC-L (Amalgam)
- 1200 x 300mm lamp options:
  - 1 or 2 x 28/54W T5
  - 1 or 2 x 25/50W T5
- Side or centre optic positions
- Intermediate Brightness Zone technology using TP(a) rated polycarbonate material (fixed centre pod micro prism product TP(b) rated PMMA)

### Body

- Steel body finished white
- For 600 x 600mm or 1200 x 300mm grid ceilings
- Compatible with the following ceiling types:
  - Exposed T 15mm and 25mm flat
  - Exposed T 15mm tegular
  - Spring T
  - Plasterboard prepared aperture
- Air handling as standard 20 to 40 litres per second depending on the luminaire type (refer to Whitecroft Technical Desk)

# duo² centre optic

## Order Codes

| Duo Micro Prism Optic | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 3 x 14W | D2CH314PXT | D2CH314PXTEM |
| T5 3 x 20W ECO | D2CH320PXT | D2CH320PXTEM |

| Duo Living Louvre | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 3 x 14W | D2CH314VXT | D2CH314VXTEM |
| T5 3 x 20W ECO | D2CH320VXT | D2CH320VXTEM |
| T5 4 x 14W | D2CH414VXT | D2CH414VXTEM |

| Duo Semi-Specular Louvre | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 3 x 14W | D2CH314WXT | D2CH314WXTEM |
| T5 3 x 20W ECO | D2CH320WXT | D2CH320WXTEM |
| T5 4 x 14W | D2CH414WXT | D2CH414WXTEM |

| Duo Micro Prism Optic (Fixed) | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 3 x 14W | D2FH314PXT | D2FH314PXTEM |
| T5 3 x 20W ECO | D2FH320PXT | D2FH320PXTEM |
| T5 2 x 20W ECO | D2FH220PXT | D2FH220PXTEM |
| TC-L 1 x 55W (Amalgam) | D2FH155PXT | D2FH155PXTEM |

### Options

| | | |
|---|---|---|
| DALI/SWITCH DIMMING | Replace H with **C** | i.e. D2C**C**414PXT |
| EASYTEST | Add suffix **/ET** | i.e. D2CH414PXT**/ET** |
| COMEPS | Add suffix **/EP** | i.e. D2CH414PXT**/EP** |
| COMMAND 4* | Replace H with **Q4Y** | i.e. D2F**Q4Y**314PXT |
| COMET | Add suffix **/CT** | i.e. D2CH414PXT/**CT** |
| PREPARED APERTURE/ SPRING T INTEGRATION | Replace XT with **ST** | i.e. D2CH414P**ST** |
| PREPARED APERTURE | DUO2 Fixed Micro Prism only | **D2FPA** |
| TEGULAR T15 CEILING INTEGRATION** | Bracket kit for pull up | **DUO600BKTKIT** |

* Only available with DUO2 Micro Prism Optic (Fixed)

** Not required with DUO2 Micro Prism Optic (Fixed)

Micro Prism Optic (Lowered)

Living Louvre

Semi-Specular Louvre

Micro Prism Optic (Fixed)

## Ceiling Integration

Refer to common ceiling compatibility matrix – See page 404

### Exposed T Grids

T25 Lay in
T15 Lay in
T15 Tegular (Bracket kit required)

### Alugrids (Fixed Micro Prism Only)

SAS AL 15/16
SAS AL 15/08

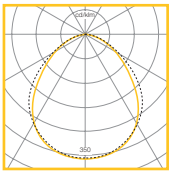
### Spring T Grids (Add ST)

SAS – 150
Armstrong – Orcal 1800/3000
Burgess – Clip in/A bar

### Plasterboard (Add ST)

Prepared aperture

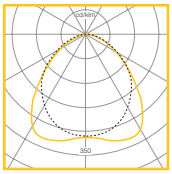
## Photometric Performance



2 x 20W ECO T5
Micro Prism (Fixed)
• LOR = 84.0%
• SHR MAX = 1.55

**Utilisation Factors UF(F)**

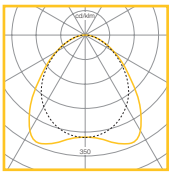
| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.63 | 0.83 | 0.89 |



3 x 20W ECO T5
Living Louvre
• LOR = 79.2%
• SHR MAX = 1.71

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.59 | 0.79 | 0.84 |



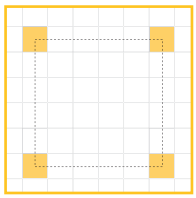
3 x 20W ECO T5
Semi-Specular
• LOR = 78.9%
• SHR MAX = 1.72

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.54 | 0.77 | 0.82 |

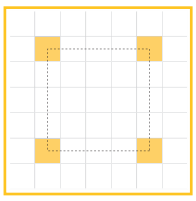
## Performance Guide

| Lamps | Illuminance | Spacing |
|---|---|---|
| 1 x 55W T5 Micro Prism | 340 lux | 3.0m x 3.0m |



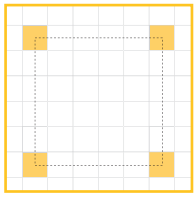
Maintenance: 0.8
Reflectance: 70/50/20
Ceiling Height: 2.7m
Working Plane: 0.8m

| Lamps | Illuminance | Spacing |
|---|---|---|
| 1 x 55W T5 Micro Prism | 520 lux | 2.4m x 2.4m |



Maintenance: 0.8
Reflectance: 70/50/20
Ceiling Height: 2.7m
Working Plane: 0.8m

| Lamps | Illuminance | Spacing |
|---|---|---|
| 3 x 20W T5 Micro Prism | 400 lux | 3.0m x 3.0m |

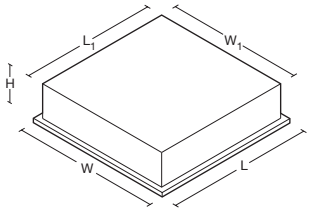


Maintenance: 0.8
Reflectance: 70/50/20
Ceiling Height: 2.7m
Working Plane: 0.8m

## Lamp Performance

| Wattage | IL@25°C | Lamp Life |
|---|---|---|
| 1 x 14W T5 | 1250 | 24,000hrs |
| 1 x 20W T5 ECO | 1650 | 21,000hrs |
| 1 x 55W TC-L | 4800 | 20,000hrs |

## Dimensions




| MP/LL/SSL* | L | W | H | $L_1$ | $W_1$ | Prepared Aperture | KG | KG |
|---|---|---|---|---|---|---|---|---|
| Exposed T | 593 | 593 | 103 | 575 | 575 | – | 4.9 | 5.9 |
| Plasterboard/Spring T | 599 | 599 | 103 | 575 | 575 | 587 x 587 $^{0}_{+5}$ | 4.9 | 5.9 |

| Micro Prism Fixed | L | W | H | $L_1$ | $W_1$ | Prepared Aperture | KG | KG |
|---|---|---|---|---|---|---|---|---|
| Exposed T | 584 | 584 | 103 | 570 | 570 | – | 6.4 | 7.4 |
| Plasterboard/Spring T | 599 | 599 | 103 | 570 | 570 | 587 x 587 $^{0}_{+5}$ | 6.4 | 7.4 |

* Micro Prism Optic (MP), LIving Louvre (LL), Semi-Specular Louvre (SSL)

## To Specify

Recessed T5 600 x 600mm luminaire with dual optic configuration and air return facility. Incorporating Intermediate Brightness Zone element to diffuse light and graduate brightness across the ceiling, manufactured in a TP(a) rated polycarbonate (TP(b) rated PMMA for fixed Micro Prism), and 1 optical cell with Micro Prisms / Living Louvre / Semi Spec Louvre to control light and reduce glare – as Whitecroft Lighting DUO$^2$

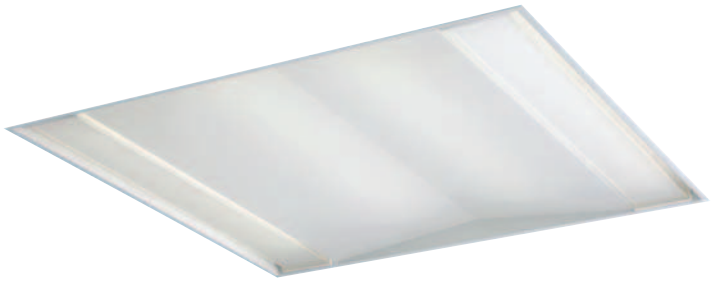
# duo² side optic

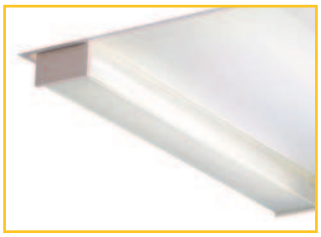
## Order Codes

| | HF Gear | 3 hr Emergency |
|---|---|---|
| **Duo Micro Prism Optic**<br>T5 4 x 14W | **D2SH414PXT** | **D2SH414PXTEM** |
| **Duo Living Louvre**<br>T5 4 x 14W | **D2SH414VXT** | **D2SH414VXTEM** |
| **Duo Semi-Specular Louvre**<br>T5 4 x 14W | **D2SH414WXT** | **D2SH414WXTEM** |

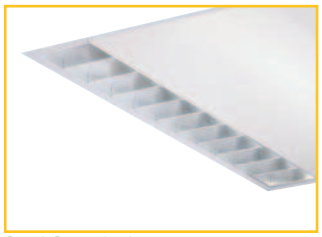
### Options

| | | |
|---|---|---|
| DALI/SWITCH DIMMING | Replace H with **C** | i.e. D2S**C**414PXT |
| EASYTEST | Add suffix **/ET** | i.e. D2SH414PXT**/ET** |
| COMEPS | Add suffix **/EP** | i.e. D2SH414PXT**/EP** |
| COMET | Add suffix **/CT** | i.e. D2SH414PXT**/CT** |
| PREPARED APERTURE/ SPRING T INTEGRATION | Replace XT with **ST** | i.e. D2SH414P**ST** |
| TEGULAR T15 CEILING INTEGRATION | Bracket kit for pull up | **DUO600BKTKIT** |

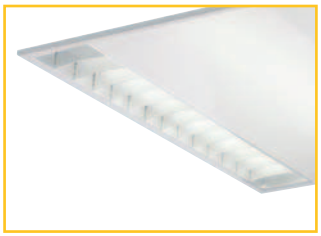




Micro Prism Optic (Lowered)



Semi-Specular Louvre



Living Louvre

## Ceiling Integration

Refer to common ceiling compatibility matrix – See page 404

### Exposed T Grids

T25 Lay in
T15 Lay in
T15 Tegular (Bracket kit required)

### Spring T Grids (Add ST)

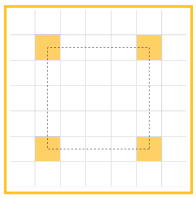
SAS – 150
Armstrong – Orcal 1800/3000
Burgess – Clip in/A bar

### Plasterboard (Add ST)

Prepared aperture

## Performance Guide

| Lamps | Illuminance | Spacing |
|---|---|---|
| 4 x 14W T5 | 550 lux | 2.4m x 2.4m |

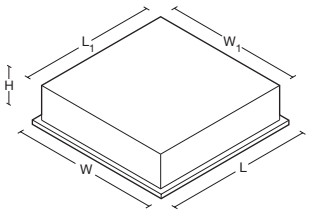


Maintenance: 0.8
Reflectance: 70/50/20
Ceiling Height: 2.7m
Working Plane: 0.8m

## Lamp Performance

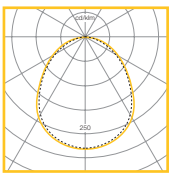
| Wattage | IL@25°C | Lamp Life |
|---|---|---|
| 1 x 14W T5 | 1250 | 24,000hrs |

## Dimensions




| Version | L | W | H | $L_1$ | $W_1$ | Prepared Aperture | KG | KG PW |
|---|---|---|---|---|---|---|---|---|
| Exposed T | 593 | 593 | 103 | 575 | 575 | – | 4.9 | 5.9 |
| Plasterboard/Spring T | 599 | 599 | 103 | 575 | 575 | 587 x 587 $^{-0}_{+5}$ | 4.9 | 5.9 |

## Photometric Performance

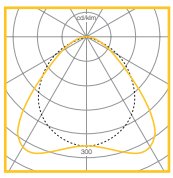


4 x 14W T5
Micro Prism
• LOR* = 70.1 (71.5)%
• SHR MAX = 1.56

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.51 | 0.69 | 0.74 |

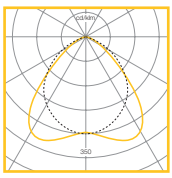
*Cell in recessed position – Figures in brackets cell in lowered position



4 x 14W T5
Living Louvre
• LOR = 72.8%
• SHR MAX = 1.77

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.50 | 0.71 | 0.76 |



4 x 14W T5
Semi-Specular
• LOR = 72.2%
• SHR MAX = 1.74

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.51 | 0.71 | 0.76 |

## To Specify

Recessed T5 600 x 600mm luminaire with dual optic configuration and air return facility. Incorporating Intermediate Brightness Zone element to diffuse light and graduate brightness across the ceiling, manufactured in a Tp(a) rated polycarbonate, and 2 optical cells with (Micro Prisms / Living Louvre / Semi Spec Louvre) to control light and reduce glare – as Whitecroft Lighting DUO²

# duo² 1200 x 300 linear

## Order Codes

| Duo Micro Prism Optic | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 1 x 28W | D2CH128PST | D2CH128PSTEM |
| T5 1 x 54W | D2CH154PST | D2CH154PSTEM |

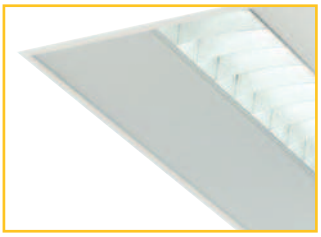
| Duo Living Louvre | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 1 x 28W | D2CH128VST | D2CH128VSTEM |
| T5 2 x 28W | D2CH228VST | D2CH228VSTEM |
| T5 1 x 54W | D2CH154VST | D2CH154VSTEM |
| T5 2 x 54W | D2CH254VST | D2CH254VSTEM |

| Duo Semi-Specular Louvre | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 1 x 28W | D2CH128WST | D2CH128WSTEM |
| T5 2 x 28W | D2CH228WST | D2CH228WSTEM |
| T5 1 x 54W | D2CH154WST | D2CH154WSTEM |
| T5 2 x 54W | D2CH254WST | D2CH254WSTEM |

| Duo Micro Prism Optic (Fixed) | HF Gear | 3 hr Emergency |
|---|---|---|
| T5 1 x 25/28W | D2FH128PST | D2FH128PSTEM |
| T5 ECO 1 x 50W | D2FH154PST | D2FH154PSTEM |
| T5 2 x 25/28W | D2FH228PST | D2FH228PSTEM |
| T5 ECO 2 x 50W | D2FH254PST | D2FH254PSTEM |

### Options

| | | |
|---|---|---|
| DALI / SWITCH DIMMING | Replace H with **C** | i.e. D2C**C**128PST |
| EASYTEST | Add suffix **/ET** | i.e. D2CH128PST**/ET** |
| COMEPS | Add suffix **/EP** | i.e. D2CH128PST**/EP** |
| COMET | Add suffix **/CT** | i.e. D2CH128PST**/CT** |



Living Louvre

Micro Prism Optic (Fixed)

## Lamp Performance

| Wattage | IL@25°C | Lamp Life | Wattage | IL@25°C | Lamp Life |
|---|---|---|---|---|---|
| 1 x 28W T5 | 2625 | 24,000hrs | 1 x 25W T5 | 1650 | 21,000hrs |
| 1 x 54W T5 | 4450 | 24,000hrs | 1 x 50W T5 | 4400 | 24,000hrs |

## Ceiling Integration

Refer to common ceiling compatibility matrix –
See page 404

### Spring T Grids

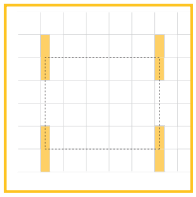
SAS – 150
Armstrong – Orcal 1800/3000
Burgess – Clip in/A bar

### Plasterboard

Prepared aperture

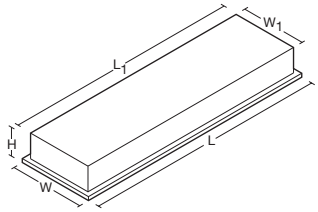
## Performance Guide

| Lamps | Illuminance | Spacing |
|---|---|---|
| 2 x 28W T5 | 520 lux | 2.4m x 3.0m |



Maintenance: 0.8
Reflectance: 70/50/20
Ceiling Height: 2.7m
Working Plane: 0.8m

## Dimensions

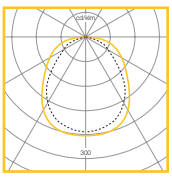



| MP/LL/SSL* | L | W | H | $L_1$ | $W_1$ | Prepared Aperture | KG | KG |
|---|---|---|---|---|---|---|---|---|
| Plasterboard/Spring T | 1199 | 299 | 123 | 1175 | 275 | 285 x 1187 $^{0}_{+5}$ | 8.1 | 9.1 |

| Micro Prism Fixed | L | W | H | $L_1$ | $W_1$ | Prepared Aperture | KG | KG |
|---|---|---|---|---|---|---|---|---|
| Plasterboard/Spring T | 1199 | 299 | 103 | 1175 | 281 | 285 x 1187 $^{0}_{+5}$ | 8.6 | 9.5 |

* Micro Prism Optic (MP), LIving Louvre (LL), Semi-Specular Louvre (SSL)

## Photometric Performance

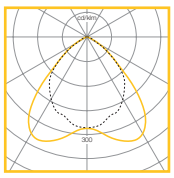


1 x 28W T5
Micro Prism
• LOR* = 67.1 (75.0)%
• SHR MAX = 1.53

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.47 | 0.65 | 0.70 |

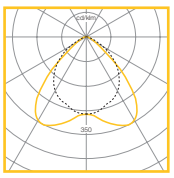
*Cell in recessed position – Figures in brackets cell in lowered position



1 x 28W T5
Living Louvre
• LOR = 72.4%
• SHR MAX = 1.81

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.51 | 0.70 | 0.74 |



1 x 28W T5
Semi-Specular
• LOR = 69.6%
• SHR MAX = 1.81

**Utilisation Factors UF(F)**

| Room Reflectance | | | Room Index | | |
|---|---|---|---|---|---|
| C | W | F | 1.00 | 3.00 | 5.00 |
| 0.70 | 0.50 | 0.20 | 0.51 | 0.70 | 0.74 |

## To Specify

Recessed T5 1200 x 300mm luminaire with dual optic configuration and air return facility. Incorporating Intermediate Brightness Zone element to diffuse light and graduate brightness across the ceiling and 1 optical cell with (Micro Prisms / Living Louvre / Semi Spec Louvre) to control light and reduce glare – as Whitecroft Lighting DUO²