



## Lighting Calculation Favaretti Padel field with F150 Pro Tour LED Flood light

## Preliminary remarks

Notes on planning:

The energy consumption quantities do not take into account light scenes and their dimming levels.

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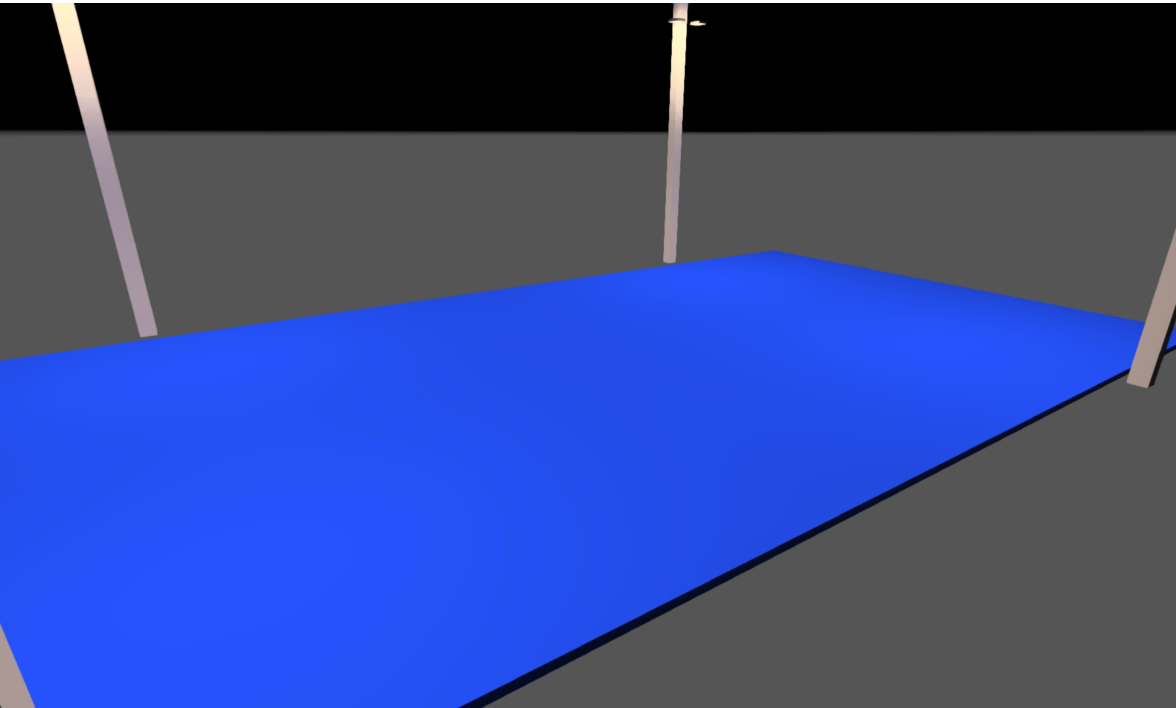
## Contacts



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## Description

- Lighting Simulation with 8pcs F150 Pro Tour 200W with special fresnel lens in PMMA for competition use. min. lux avg. 500Lx, indoor/outdoor competition.

- Simulazione con fari 150W F150 Pro Tour rispetto normativa EN12193 competizioni amatoriali, 500Lx medi, allenamento interno/esterno

CEO

Eng. Giuseppe Albanese

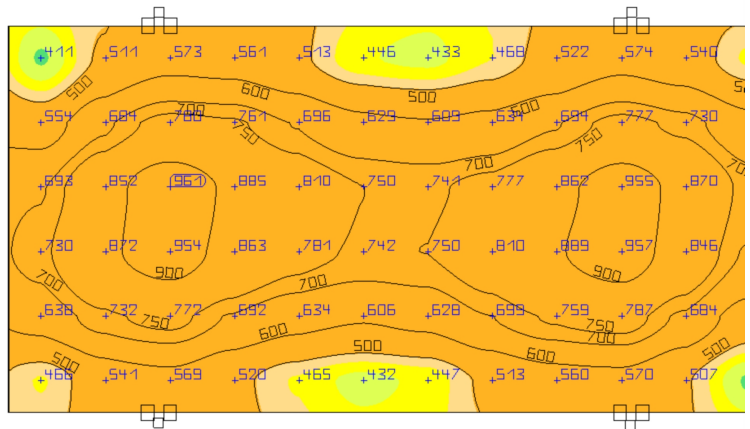
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T 0331-318355

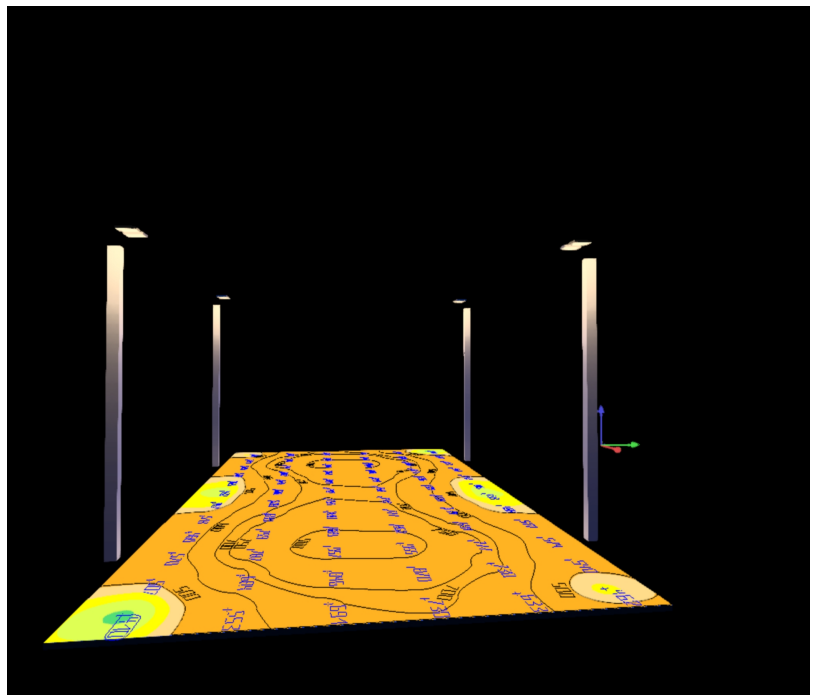
giuseppe.albanese@mgepower.com

## Images

Site 1 (5)

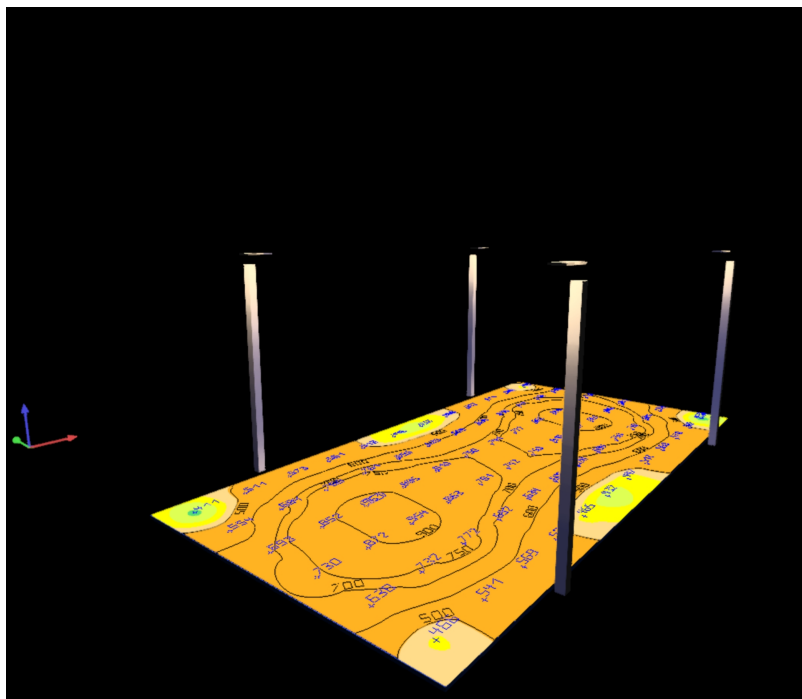


Site 1 (6)



## Images

Site 1 (7)



## Luminaire list

 $\Phi_{\text{total}}$ 

196016 lm

 $P_{\text{total}}$ 

1192.8 W

Luminous efficacy

164.3 lm/W

| pcs. | Manufacturer     | Article No.        | Article name       | P       | $\Phi$   | Luminous efficacy |
|------|------------------|--------------------|--------------------|---------|----------|-------------------|
| 8    | MGE Lighting Srl | F150P-150W-840-TP3 | F150P-150W-840-TP3 | 149.1 W | 24502 lm | 164.3 lm/W        |

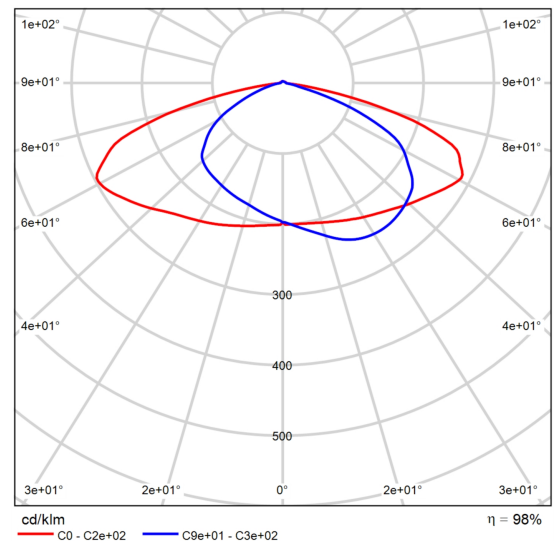
## Product data sheet

MGE Lighting Srl F150P-150W-840-TP3

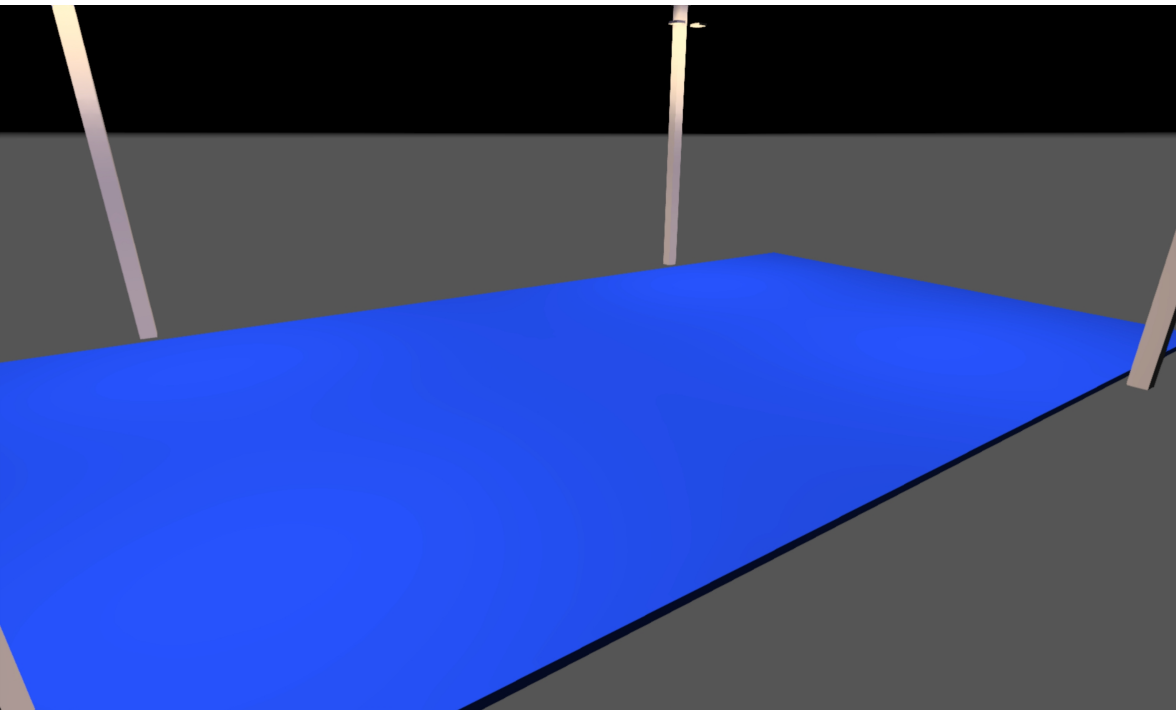


Article No. F150P-150W-840-TP3

|                           |            |
|---------------------------|------------|
| P                         | 149.1 W    |
| $\Phi_{\text{Lamp}}$      | 25001 lm   |
| $\Phi_{\text{Luminaire}}$ | 24502 lm   |
| $\eta$                    | 98.00 %    |
| Luminous efficacy         | 164.3 lm/W |
| CCT                       | 4000 K     |
| CRI                       | 80         |



Polar LDC

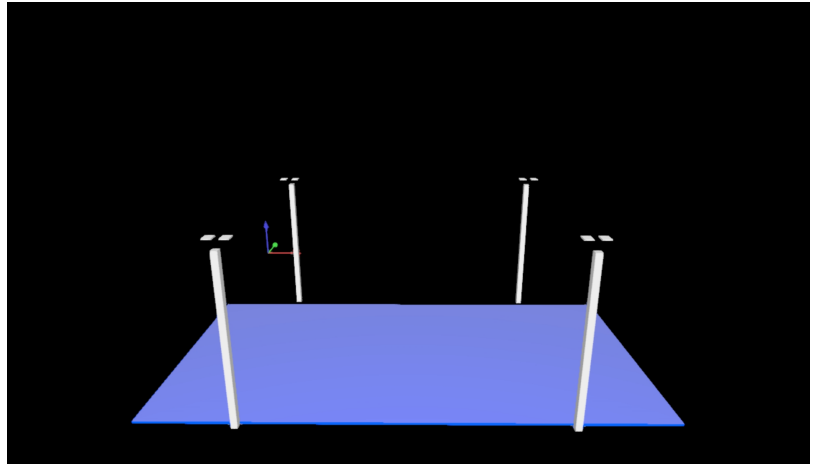


Padel Field

## Description

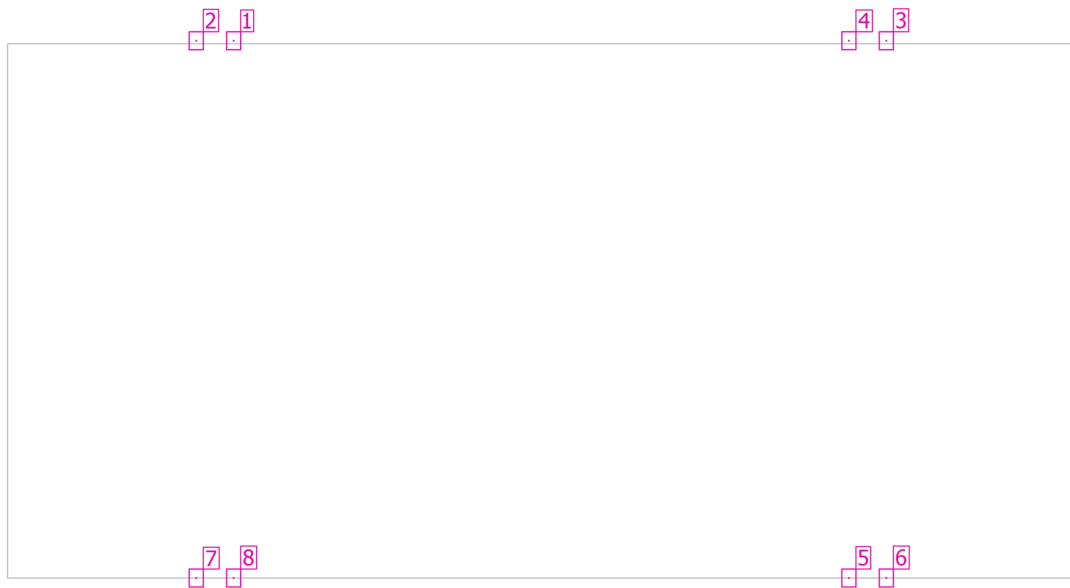
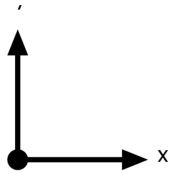
## Images

Area 1 (17)

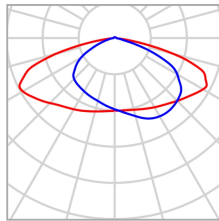


Padel Field

## Luminaire layout plan



Padel Field

**Luminaire layout plan**

|              |                    |                           |          |
|--------------|--------------------|---------------------------|----------|
| Manufacturer | MGE Lighting Srl   | P                         | 149.1 W  |
| Article No.  | F150P-150W-840-TP3 | $\Phi_{\text{Luminaire}}$ | 24502 lm |
| Article name | F150P-150W-840-TP3 |                           |          |
| Fitting      | 1x 2835 Philips HE |                           |          |

## Individual luminaires

| X        | Y         | Mounting height | Luminaire |
|----------|-----------|-----------------|-----------|
| 4.342 m  | -8.443 m  | 6.027 m         | 1         |
| 3.641 m  | -8.443 m  | 6.027 m         | 2         |
| 16.560 m | -8.443 m  | 6.027 m         | 3         |
| 15.860 m | -8.443 m  | 6.027 m         | 4         |
| 15.860 m | -18.500 m | 6.027 m         | 5         |
| 16.560 m | -18.500 m | 6.027 m         | 6         |
| 3.641 m  | -18.500 m | 6.027 m         | 7         |
| 4.342 m  | -18.500 m | 6.027 m         | 8         |

Padel Field

**Luminaire list** $\Phi_{\text{total}}$ 

196016 lm

 $P_{\text{total}}$ 

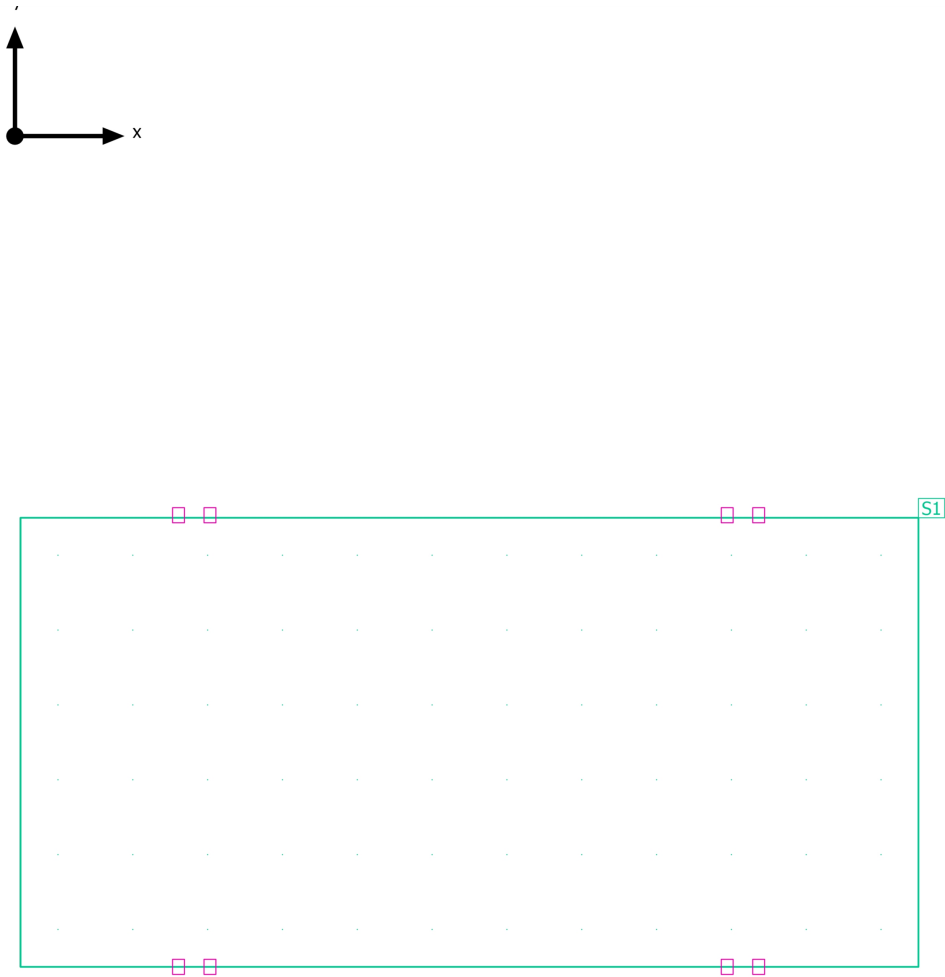
1192.8 W

Luminous efficacy

164.3 lm/W

| pcs. | Manufacturer     | Article No.        | Article name       | P       | $\Phi$   | Luminous efficacy |
|------|------------------|--------------------|--------------------|---------|----------|-------------------|
| 8    | MGE Lighting Srl | F150P-150W-840-TP3 | F150P-150W-840-TP3 | 149.1 W | 24502 lm | 164.3 lm/W        |

Calculation objects



Padel Field

**Calculation objects**

Calculation surfaces

| Properties                                                          | $\bar{E}$ | $E_{min}$ | $E_{max}$ | $g_1$ | $g_2$ | Index |
|---------------------------------------------------------------------|-----------|-----------|-----------|-------|-------|-------|
| Calculation surface<br>Perpendicular illuminance<br>Height: 0.000 m | 319 lx    | 266 lx    | 361 lx    | 0.83  | 0.74  | S1    |

Padel Field

## Calculation objects

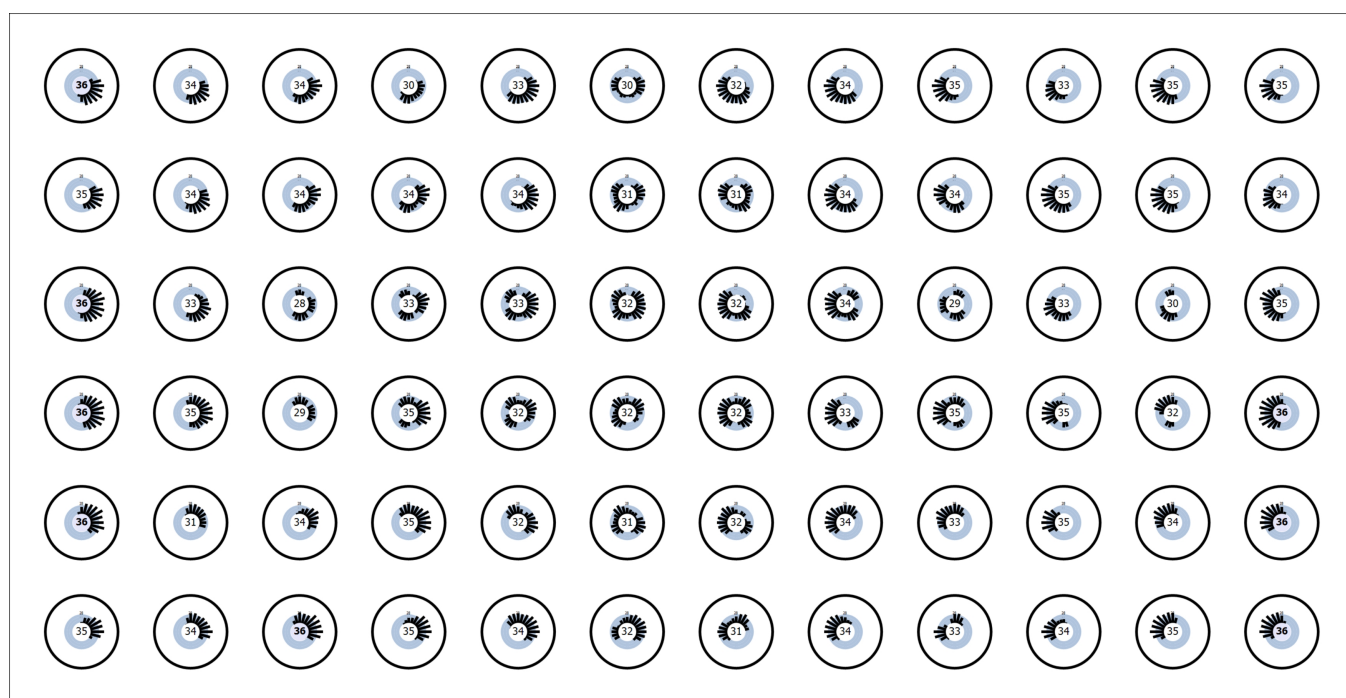
Calculation surface (GR)

|                      |                                          |
|----------------------|------------------------------------------|
| Strongest glare at   | 30°                                      |
| max                  | 36                                       |
| Target               | ≤50                                      |
| Viewing sector       | 0° - 360°                                |
| Step width           | 15°                                      |
| Angle of inclination | -2°                                      |
| Height               | 0.000 m                                  |
| Index                | S1                                       |
| Method               | Simplified calculation<br>as per EN12464 |

Padel Field

## Calculation objects

Calculation surface (GR)



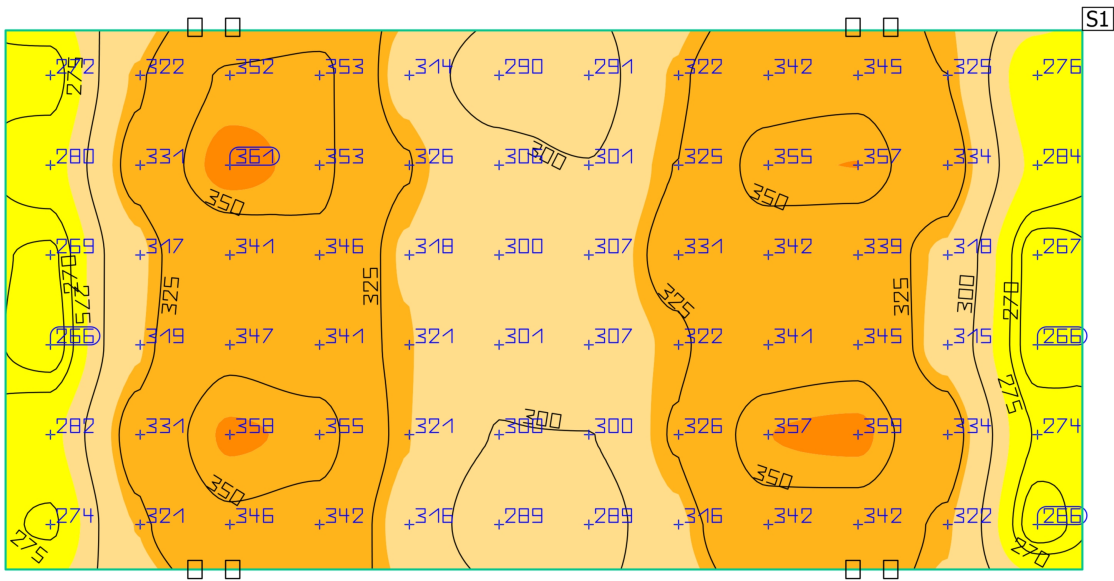
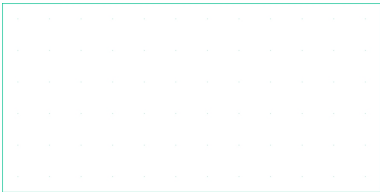
Padel Field

## Calculation objects

Utilisation profile: Preimpostazione DIALux, Standard (area di transito all'aperto)

Padel Field

Calculation surface



| Properties                | $\bar{E}$ | $E_{min}$ | $E_{max}$ | $g_1$ | $g_2$ | Index |
|---------------------------|-----------|-----------|-----------|-------|-------|-------|
| Calculation surface       | 319 lx    | 266 lx    | 361 lx    | 0.83  | 0.74  | S1    |
| Perpendicular illuminance |           |           |           |       |       |       |
| Height: 0.000 m           |           |           |           |       |       |       |

Utilisation profile: Preimpostazione DIALux, Standard (area di transito all'aperto)

## Glossary

### A

|   |                                              |
|---|----------------------------------------------|
| A | Formula symbol for a surface in the geometry |
|---|----------------------------------------------|

### B

|                 |                                                                                                                                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Background area | The background area borders the direct ambient area according to DIN EN 12464-1 and reaches up to the borders of the room. In larger rooms, the background area is at least 3 m wide. It is located horizontally at floor level. |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### C

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCT | <p>(Engl. correlated color temperature)</p> <p>Body temperature of a thermal radiator that serves to describe its light color. Unit: Kelvin [K]. The lesser the numerical value the redder; the greater the numerical value the bluer the light color. The color temperature of gas-discharge lamps and semi-conductors are termed "correlated color temperature" in contrast to the color temperature of thermal radiators.</p> <p>Allocation of the light colors to the color temperature ranges acc. to EN 12464-1:</p> <p>Light color - color temperature [K]<br/> warm white (ww) &lt; 3,300 K<br/> neutral white (nw) <math>\geq 3,300 - 5,300</math> K<br/> daylight white (dw) &gt; 5.300 K</p> |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                  |                                                                                                                                               |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Clearance height | The designation for the distance between upper edge of the floor and bottom edge of the ceiling (in the completely furnished status of room). |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CRI | <p>(Engl. color rendering index)</p> <p>Designation for the color rendering index of a luminaire or a lamp acc. to DIN 6169: 1976 or CIE 13.3: 1995.</p> <p>The general color rendering index Ra (or CRI) is a dimensionless figure that describes the quality of a white light source in regards to its similarity with the remission spectra of defined 8 test colors (see DIN 6169 or CIE 1974) to a reference light source.</p> |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### D

|                 |                                                                                                                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Daylight factor | <p>Ratio of the illuminance achieved solely by daylight incidence at a point in the inside to the horizontal illuminance in the outer area under an unobstructed sky.</p> <p>Formula symbol: D (Engl. daylight factor)<br/> Unit: %</p> |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Glossary

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Daylight quotient effective area | A calculation surface within which the daylight quotient is calculated.                                                                                                                                                                                                                                                                                                                                                                            |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| E                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Eta ( $\eta$ )                   | <p>(light output ratio)</p> <p>The light output ratio describes what percentage of the luminous flux of a free radiating lamp (or LED module) is emitted by the luminaire when installed.</p> <p>Unit: %</p>                                                                                                                                                                                                                                       |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| G                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| g1                               | <p>Often also Uo (Engl. overall uniformity)</p> <p>Designates the overall uniformity of the illuminance on a surface. It is the quotient from Emin to <math>\bar{E}</math> and is required, for instance, in standards for illumination of workstations.</p>                                                                                                                                                                                       |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| g2                               | <p>Actually it designates the "non-uniformity" of the illuminance on a surface. It is the quotient of Emin to Emax and is generally only relevant for certifying the emergency lighting acc. to EN 1838.</p>                                                                                                                                                                                                                                       |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| I                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Illuminance                      | <p>Describes the ratio of the luminous flux that strikes a certain surface to the size of this surface (<math>\text{lm}/\text{m}^2 = \text{lx}</math>). The illuminance is not tied to an object surface. It can be determined anywhere in space (inside or outside). The illuminance is not a product feature because it is a recipient value. Luxometers are used for measuring.</p> <p>Unit: Lux<br/>Abbreviation: lx<br/>Formula symbol: E</p> |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Illuminance, adaptive            | <p>For the determining of the middle adaptive illuminance on a surface, this is rastered "adaptively". In the area of large illuminance differences within the surface, the raster is subdivided finer; within lesser differences, a rougher classification is made.</p>                                                                                                                                                                           |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Illuminance, horizontal          | <p>Illuminance that is calculated or measured on a horizontal (level) surface (this can be for example a table top or the floor). The horizontal illuminance is usually identified by the formula letter Eh.</p>                                                                                                                                                                                                                                   |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Illuminance, perpendicular       | <p>Illuminance that is calculated or measured plumb-vertical to a surface. This needs to be taken into account for tilted surfaces. If the surface is horizontal or vertical, then there is no difference between the perpendicular and the horizontal or vertical illuminance.</p>                                                                                                                                                                |
| <hr/>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Glossary

|                       |                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Illuminance, vertical | <p>Illuminance that is calculated or measured on a vertical surface (this can be for example the front of some shelves). The vertical illuminance is usually identified by the formula letter Ev.</p>                                                                                                                                                                 |
| L                     |                                                                                                                                                                                                                                                                                                                                                                       |
| LENI                  | <p>(Engl. lighting energy numeric indicator)<br/>Lighting energy numeric indicator acc. to EN 15193</p> <p>Unit: kWh/m<sup>2</sup> year</p>                                                                                                                                                                                                                           |
| Light loss factor     | See MF                                                                                                                                                                                                                                                                                                                                                                |
| LLMF                  | <p>(Engl. lamp lumen maintenance factor)/acc. to CIE 97: 2005<br/>Lamp flux maintenance factor that takes the luminous flux reduction into account of a luminaire or an LED module in the course of the operating time. The lamp flux maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no luminous flux reduction existing).</p> |
| LMF                   | <p>(Engl. luminaire maintenance factor)/acc. to CIE 97: 2005<br/>Luminaire maintenance factor that takes the soiling into account of the luminaire in the course of the operating time. The luminaire maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).</p>                                                 |
| LSF                   | <p>(Engl. lamp survival factor)/acc. to CIE 97: 2005<br/>Lamp survival factor that takes the total failure into account of a luminaire in the course of the operating time. The lamp survival factor is specified as a decimal digit and can have a maximum value of 1 (no failures existing within the time concerned or prompt replacement after the failure).</p>  |
| Luminance             | <p>Dimension for the "brightness impression" that the human eye has of a surface. The surface itself can emit light thereby or light striking it can be reflected (emitter value). It is the only photometric value that the human eye can perceive.</p> <p>Unit: Candela per square meter<br/>Abbreviation: cd/m<sup>2</sup><br/>Formula symbol: L</p>               |
| Luminous efficacy     | <p>Ratio of the emitted luminous flux <math>\Phi</math> [lm] to the absorbed electrical power P [W] Unit: lm/W.</p> <p>This ratio can be formed for the lamp or LED module (lamp or module light output), the lamp or module with control gear (system light output) and the complete luminaire (luminaire light output).</p>                                         |

## Glossary

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Luminous flux      | <p>Dimension for the total light output that is emitted from one light source in all directions. It is thus an "emitter value" that specifies the entire emitting output. The luminous flux of a light source can only be determined in a laboratory. A difference is made between the lamp or LED module luminous flux and the luminaire luminous flux.</p> <p>Unit: Lumen<br/>Abbreviation: lm<br/>Formula symbol: <math>\Phi</math></p>                                                                                                                                                                  |
| Luminous intensity | <p>Describes the intensity of the light in a certain direction (emitter value). The luminous intensity is a matter of the luminous flux <math>\Phi</math> that is emitted in a certain spherical angle <math>\Omega</math>. The radiation characteristics of a light source are presented graphically in a light distribution curve (LDC). The luminous intensity is an SI base unit.</p> <p>Unit: Candela<br/>Abbreviation: cd<br/>Formula symbol: I</p>                                                                                                                                                   |
| M                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| MF                 | <p>(Engl. maintenance factor)/acc. to CIE 97: 2005<br/>Maintenance factor as decimal number between 0 and 1 that describes the ratio of the new value of a photometric planning parameter (e.g. of the illuminance) to a maintenance value after a certain time. The maintenance factor takes into account the soiling of luminaires and rooms as well as the luminous flux reduction and the failure of light sources.<br/>The maintenance factor is taken into account either overall or determined in detail acc. to CIE 97: 2005 by the formula <math>RMF \times LMF \times LLMF \times LSF</math>.</p> |
| P                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| P                  | <p>(Engl. power)<br/>Electric power consumption</p> <p>Unit: watt<br/>Abbreviation: W</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| R                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Reflection factor  | <p>The reflection factor of a surface describes how much of the striking light is reflected back. The reflection factor is defined by the color of the surface.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Glossary

|                  |                                                                                                                                                                                                                                                                                                                                               |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RMF              | (Engl. room maintenance factor)/acc. to CIE 97: 2005<br>Room maintenance factor that takes the soiling into account of the space encompassing surfaces in the course of the operating time. The room maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).                              |
| <hr/>            |                                                                                                                                                                                                                                                                                                                                               |
| S                |                                                                                                                                                                                                                                                                                                                                               |
| Surrounding area | The ambient area directly borders the area of the visual task and should be planned with a width of at least 0.5 m according to DIN EN 12464-1. It is at the same height as the area of the visual task.                                                                                                                                      |
| <hr/>            |                                                                                                                                                                                                                                                                                                                                               |
| U                |                                                                                                                                                                                                                                                                                                                                               |
| UGR (max)        | (unified glare rating)<br>Measure for the psychological glare effect in interiors.<br>In addition to luminaire luminance, the UGR value also depends on the position of the observer, the viewing direction and the ambient luminance. Among other things, EN 12464-1 specifies maximum permissible UGR values for various indoor workplaces. |
| <hr/>            |                                                                                                                                                                                                                                                                                                                                               |
| UGR observer     | Calculation point in the room, for the DIALux the UGR value is determined. The location and height of the calculation point should correspond to the typical observer position (position and eye level of the user).                                                                                                                          |
| <hr/>            |                                                                                                                                                                                                                                                                                                                                               |
| V                |                                                                                                                                                                                                                                                                                                                                               |
| Visual task area | The area that is needed for carrying out the visual task in accordance with DIN EN 12464-1. The height corresponds with the height at which the visual task is executed.                                                                                                                                                                      |
| <hr/>            |                                                                                                                                                                                                                                                                                                                                               |
| W                |                                                                                                                                                                                                                                                                                                                                               |
| Wall zone        | Circumferential area between working plane and walls that is not taken into account for the calculation.                                                                                                                                                                                                                                      |
| <hr/>            |                                                                                                                                                                                                                                                                                                                                               |
| Workplane        | Virtual measuring or calculation surface at the height of the visual task that generally follows the room geometry. The working plane may also feature a wall zone.                                                                                                                                                                           |
| <hr/>            |                                                                                                                                                                                                                                                                                                                                               |