



# TECHLUME

A U S T R A L I A

## LM-79 Test Report

|                       |   |
|-----------------------|---|
| Testing Method:       | IES Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products |
| Relevant Standards:   | IES LM-79-08  |
| Test Date and Time:   | 11/07/2023 7:43:22 PM   |
| Test Location:        | Techlume Australia - East Goderich Street<br>Deloraine, TAS 7304                              |
| Operator:             | Johnny Elmer  |
| Measurement Number:   | VFR-230711-0116-MS  |
| Measurement Method:   | Far Field, Type C Horizontal  |
| Measurement Distance: | 453.1 cm  |

### Equipment Used

|                      |   |
|----------------------|---|
| System Name:         | LabSpion Goniometer                               |
| Sensor Name / Model: | Viso LabSensor Model2 / Freedom VIS (Custom Viso) |
| Spectrometer Range:  | 360 nm – 830 nm                                   |
| Calibration Date:    | 7/12/2022   |
| Flicker Meter Type:  | Viso Systems LabFlicker                           |
| Manufacturer:        | Viso Systems, Denmark                             |

### Test Conditions

|                      |              |
|----------------------|--------------|
| Ambient Temperature: | 25 °C ± 1 °C |
|----------------------|--------------|

### Remarks

The results stated in this report represent the tested sample only. All photometric and colourimetric data has been measured in compliance with IES LM-79-08 standards.

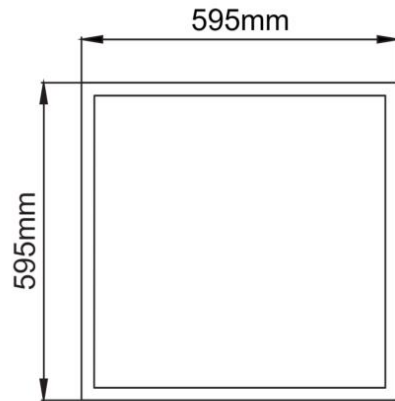


**Product Overview**

Product Description: CREST 24W Low Glare Panel Light, 600x600mm, 4000K, Non-Dim

Item Number: LC7215

Manufacturer: Decrolux Lighting Pty Ltd



**Photometric Measurements**

| Total Luminous Flux | Luminous Efficacy | Luminous Intensity |
|---------------------|-------------------|--------------------|
| 3094 lm             | 127 Lumen/watt    | 1590 cd            |

| Correlated Colour Temperature, Target | Correlated Colour Temperature, Measured | Colour Rendering Index (CRI) |
|---------------------------------------|---|------------------------------|
| 4000 K                                | 4024 K                                  | Ra 82.1                      |

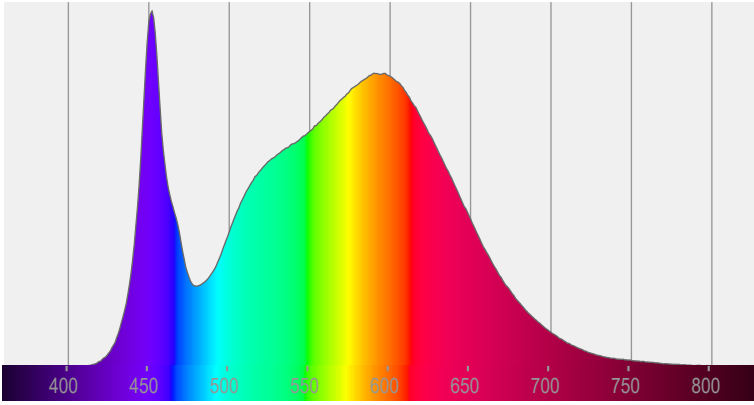
**Electrical Measurements**

| Input Voltage | Input Current | Input Power | Input Voltage Frequency |
|---------------|---------------|-------------|-------------------------|
| 240 VAC       | 0.111 A       | 24.4 W      | 60 Hz                   |

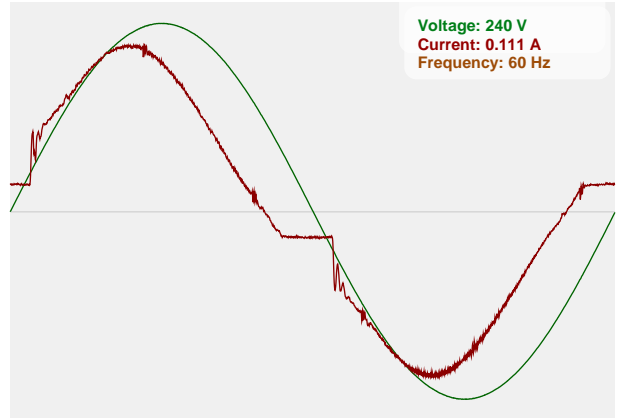
| Power Factor | Stabilisation Time              | Stabilisation Variation | Hours Operated Prior to Test |
|--------------|---------------------------------|-------------------------|------------------------------|
| 0.92         | Lamp stabilized in 30 min 1 sec | -0.2%                   | 0 hours                      |



### Spectral Power Distribution (SPD)



### Input Power Curve

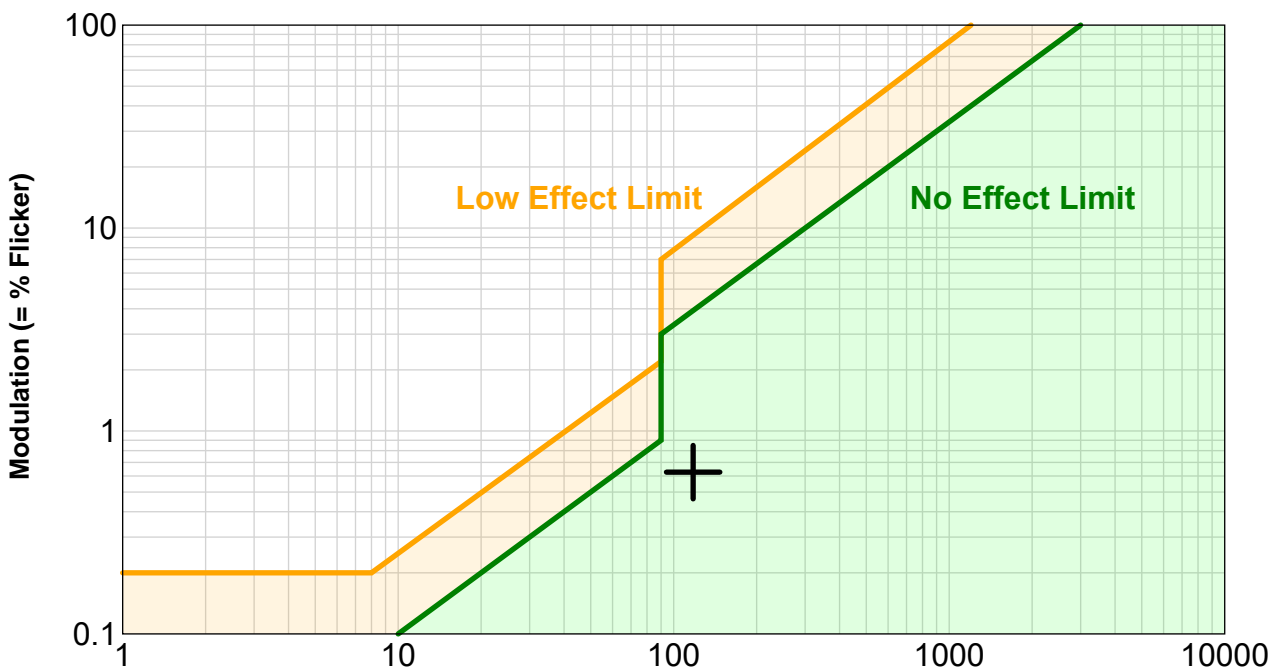


### Flicker Details

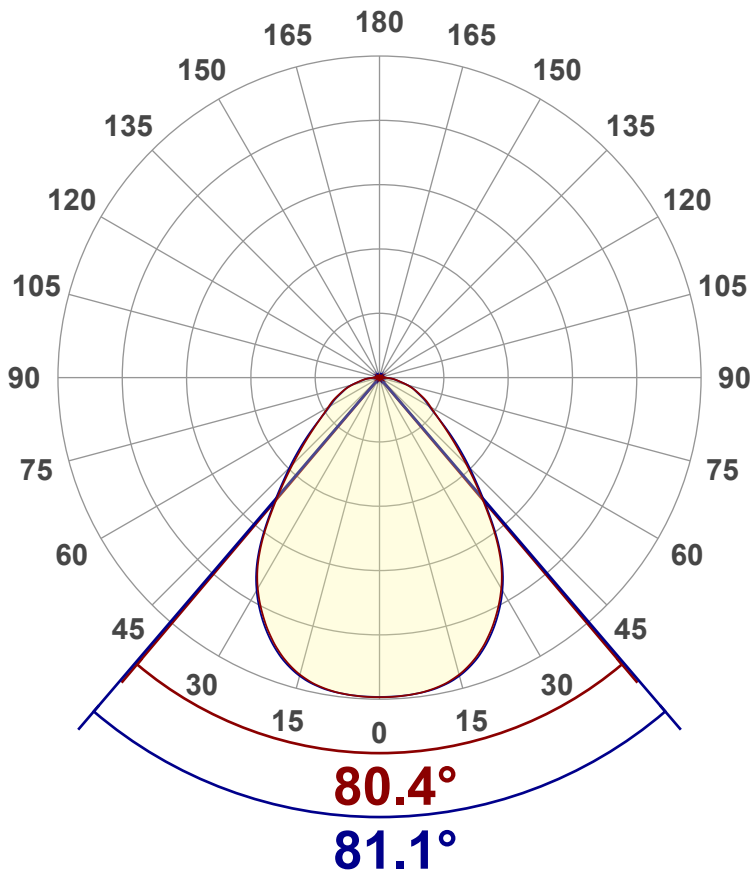
| Flicker Sample Rate | Flicker Percentage | Flicker Frequency | Flicker Index |
|---------------------|--------------------|-------------------|---------------|
| 20000 sample/s      | 0.63%              | 117.65 Hz         | 0             |

| Flicker SVM Value | Flicker PstLM Value | Measurement Time (PstLM) | Measurement Time (all other indices) |
|-------------------|---------------------|--------------------------|--------------------------------------|
| 0.01              | 0.06                | 180 s                    | 1.2 s                                |

### IEEE 1789 Frequency/Modulation Plot



### Angular Distribution – 0° / 90° Plane



#### Main Values

|                    |         |
|--------------------|---------|
| Total Lumen Output | 3094 lm |
| Lumen Up%          | 0.12%   |
| Lumen Down%        | 99.88%  |
| Peak Intensity     | 1590 cd |
| Beam Angle (90%)   | 81.1°   |

#### Cut-off Angle

|              |        |
|--------------|--------|
| Average 2.5% | 173.9° |
|--------------|--------|

#### Field Angle

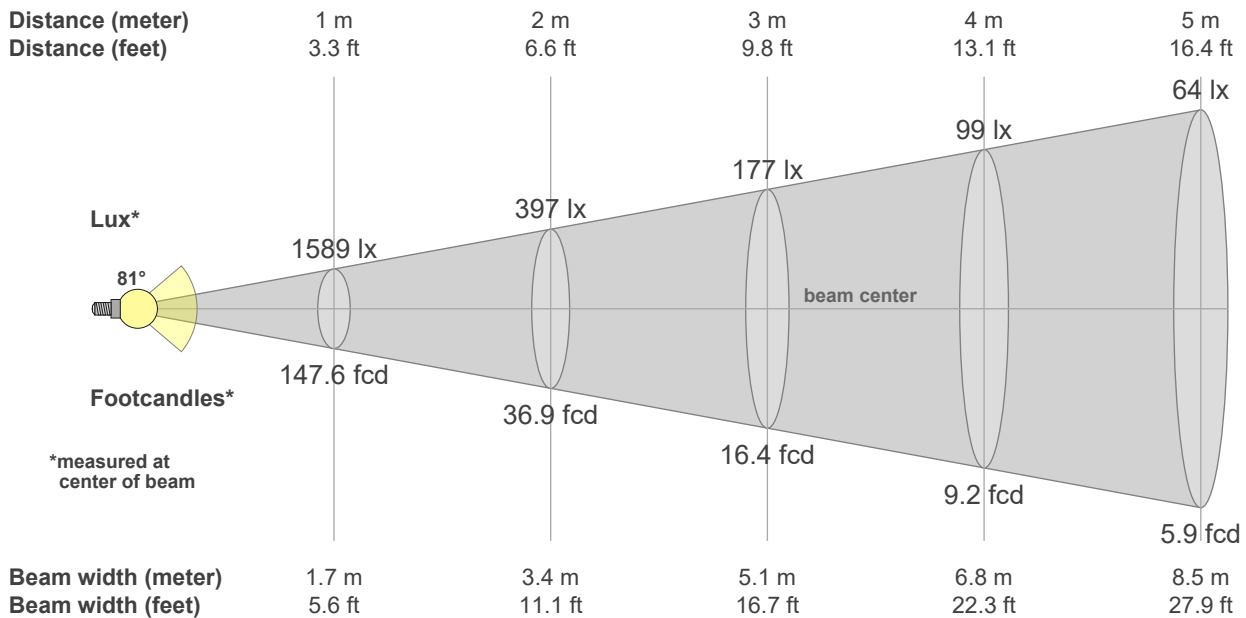
|             |        |
|-------------|--------|
| Average 10% | 144.4° |
|-------------|--------|

#### Intensity Ratio

|              |       |
|--------------|-------|
| In 120° Cone | 85.9% |
| In 90° Cone  | 67.8% |

**C000-C180**

**C090-C270**



#### Beam intensities from 1 – 20m

| 1     | 2    | 3    | 4    | 5    | 6    | 7  | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | m   |
|-------|------|------|------|------|------|----|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| 3.3   | 6.6  | 9.8  | 13.1 | 16.4 | 19.7 | 23 | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 | ft  |
| 1589  | 397  | 177  | 99   | 64   | 44   | 32 | 25   | 20   | 16   | 13   | 11   | 9    | 8    | 7    | 6    | 5    | 5    | 4    | 4    | lux |
| 147.6 | 36.9 | 16.4 | 9.2  | 5.9  | 4.1  | 3  | 2.3  | 1.8  | 1.5  | 1.2  | 1    | 0.9  | 0.8  | 0.7  | 0.6  | 0.5  | 0.5  | 0.4  | 0.4  | fc  |



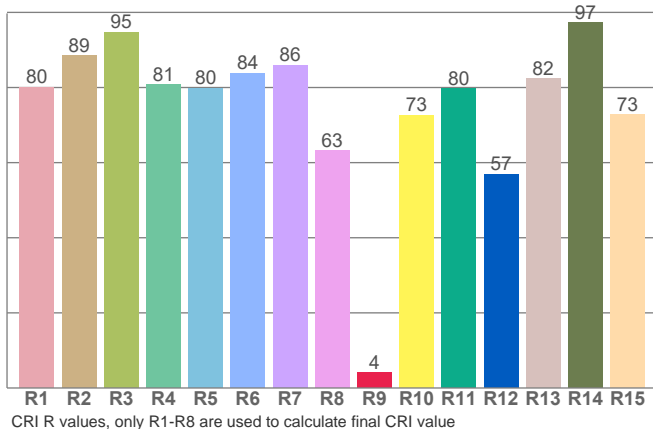
**Colour Details**

| Colour Rendering Index (CRI) | Colour Rendering Index R9 Value | Colour Rendering TM30-18                 |
|------------------------------|---------------------------------|--|
| Ra 82.1                      | R9 = 4.2                        | R <sub>f</sub> 83.2, R <sub>g</sub> 94.4 |

| Colour Quality Scale | Correlated Colour Temperature, Target | Correlated Colour Temperature, Measured |
|----------------------|---------------------------------------|---|
| CQS = 81.6           | CCT = 4000 K                          | CCT = 4024 K                            |

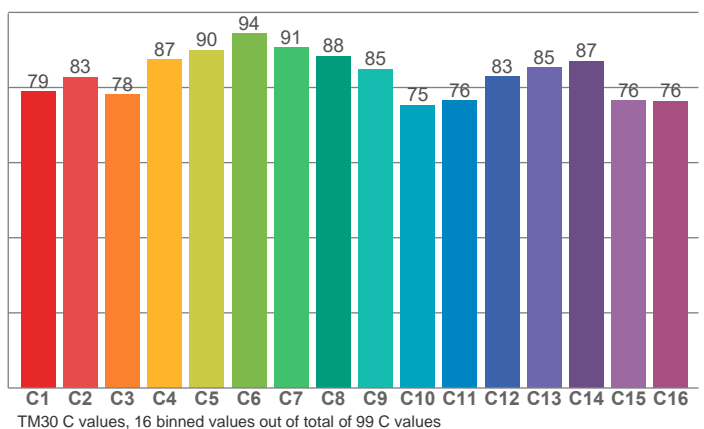
| MacAdam Steps | Colour Coordinates CIE 1931 | Colour Deviation from BBL |
|---------------|-----------------------------|---------------------------|
| SDCM = 1.7    | (x;y) = (0.381;0.377)       | Duv = 0.0021              |

**Colour Rendering Index per reference colour (CIE 1995)**



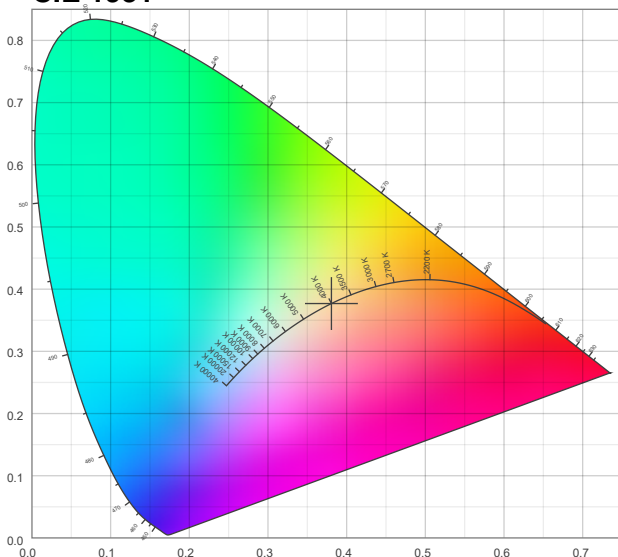
| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   | R9  | R10  | R11  | R12  | R13  | R14  | R15  |
|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|
| 80.1 | 88.5 | 94.8 | 80.8 | 79.8 | 83.8 | 86.0 | 63.2 | 4.2 | 72.6 | 79.6 | 56.9 | 82.3 | 97.3 | 72.8 |

**TM30-18 R<sub>f</sub>-values per hue bin**

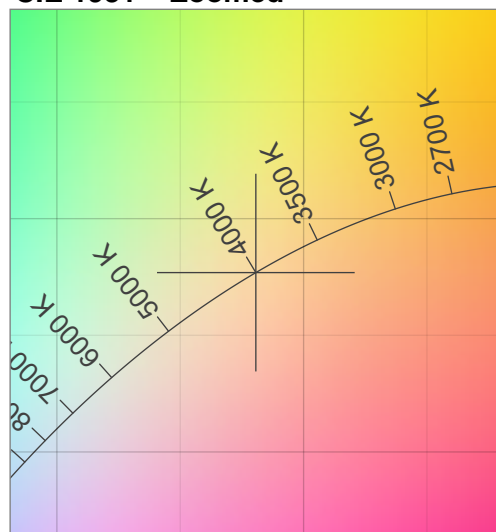


| C1   | C2   | C3   | C4   | C5   | C6   | C7   | C8   | C9   | C10  | C11  | C12  | C13  | C14  | C15  | C16  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 78.9 | 82.8 | 78.2 | 87.5 | 89.9 | 94.3 | 90.6 | 88.3 | 84.9 | 75.3 | 76.4 | 82.8 | 85.3 | 87.0 | 76.5 | 76.3 |

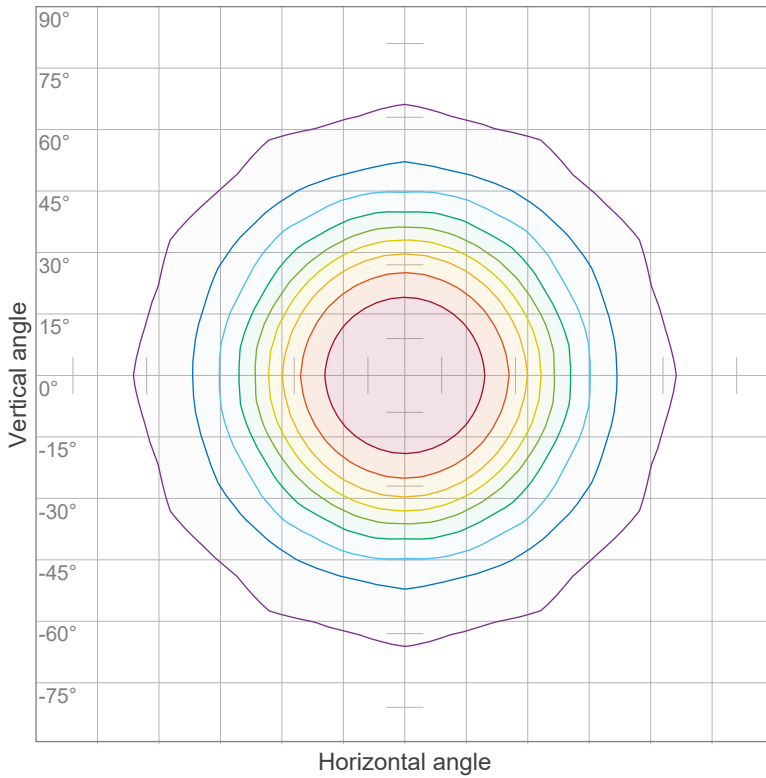
**CIE 1931**



**CIE 1931 – Zoomed**



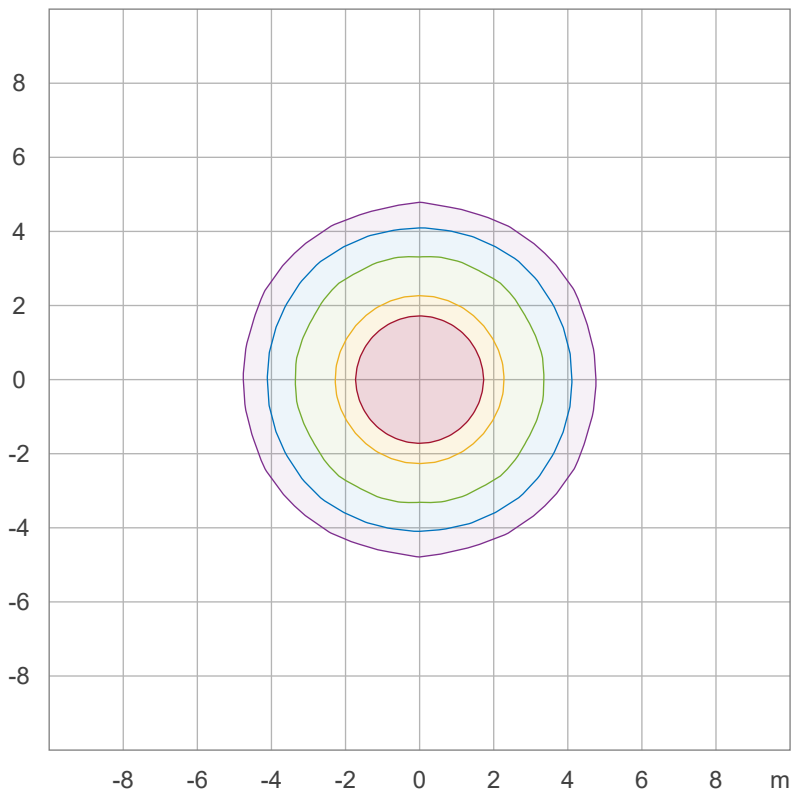
### Iso-intensity Diagram (Iso-Candela)



|      |           |
|------|-----------|
| 90 % | 1430.8 cd |
| 80 % | 1271.8 cd |
| 70 % | 1112.8 cd |
| 60 % | 953.9 cd  |
| 50 % | 794.9 cd  |
| 40 % | 635.9 cd  |
| 30 % | 476.9 cd  |
| 20 % | 318.0 cd  |
| 10 % | 159.0 cd  |

Peak intensity: 1589.8 cd  
Number of c-planes: 36

### Iso-illuminance Diagram (Iso-lux)



|        |         |
|--------|---------|
| 50.0 % | 88.3 lx |
| 30.0 % | 53.0 lx |
| 10.0 % | 17.7 lx |
| 5.0 %  | 8.8 lx  |
| 3.0 %  | 5.3 lx  |

Peak illuminance: 176.6 lx  
Mounting height: 3.0 m  
Number of c-planes: 36



**Light Planning – UGR table**

*Uncorrected, comprehensive UGR table according to 117-1995*

| Reflectances  |     | 70   | 70   | 50   | 50   | 30   | 70   | 70   | 50   | 50   | 30   |
|---|-----|--|------|------|------|------|--|------|------|------|------|
| ρ Ceiling   |     | 70   | 70   | 50   | 50   | 30   | 70   | 70   | 50   | 50   | 30   |
| ρ Walls   |     | 50   | 30   | 50   | 30   | 30   | 50   | 30   | 50   | 30   | 30   |
| ρ Floor   |     | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   |
| Room size   |     | Viewed Crosswise                                   |      |      |      |      | Viewed Endwise                                   |      |      |      |      |
| H = mounting height above eye level   |     | (Viewing direction orthogonal to lamp length axis) |      |      |      |      | (Viewing direction parallel to lamp length axis) |      |      |      |      |
| X   | Y   |  |      |      |      |      |  |      |      |      |      |
| 2H  | 2H  | 14.1   | 15.2 | 14.3 | 15.4 | 15.7 | 14.2   | 15.2 | 14.4 | 15.5 | 15.7 |
|   | 3H  | 15.1   | 16.2 | 15.5 | 16.5 | 16.7 | 15.2   | 16.3 | 15.6 | 16.5 | 16.7 |
|   | 4H  | 15.7   | 16.7 | 16.1 | 17.0 | 17.3 | 15.7   | 16.8 | 16.1 | 17.1 | 17.3 |
|   | 6H  | 16.3   | 17.2 | 16.6 | 17.5 | 17.8 | 16.3   | 17.2 | 16.6 | 17.5 | 17.9 |
|   | 8H  | 16.5   | 17.4 | 16.8 | 17.7 | 18.1 | 16.5   | 17.4 | 16.8 | 17.7 | 18.1 |
|   | 12H | 16.7   | 17.6 | 17.1 | 17.9 | 18.4 | 16.7   | 17.6 | 17.1 | 17.9 | 18.3 |
| 4H  | 2H  | 14.5   | 15.5 | 14.9 | 15.8 | 16.1 | 14.5   | 15.6 | 14.9 | 15.9 | 16.1 |
|   | 3H  | 15.9   | 16.8 | 16.3 | 17.1 | 17.6 | 15.9   | 16.8 | 16.3 | 17.1 | 17.6 |
|   | 4H  | 16.5   | 17.3 | 17.0 | 17.7 | 18.3 | 16.5   | 17.3 | 17.0 | 17.8 | 18.3 |
|   | 6H  | 17.2   | 18.0 | 17.7 | 18.3 | 18.7 | 17.2   | 18.0 | 17.7 | 18.3 | 18.7 |
|   | 8H  | 17.5   | 18.2 | 18.0 | 18.6 | 19.0 | 17.5   | 18.2 | 18.0 | 18.5 | 18.9 |
|   | 12H | 17.8   | 18.4 | 18.3 | 18.8 | 19.3 | 17.7   | 18.3 | 18.2 | 18.8 | 19.2 |
| 8H  | 4H  | 16.8   | 17.5 | 17.3 | 17.9 | 18.3 | 16.8   | 17.6 | 17.3 | 17.9 | 18.3 |
|   | 6H  | 17.7   | 18.2 | 18.2 | 18.7 | 19.2 | 17.7   | 18.2 | 18.2 | 18.7 | 19.2 |
|   | 8H  | 18.2   | 18.6 | 18.7 | 19.1 | 19.8 | 18.1   | 18.6 | 18.6 | 19.1 | 19.7 |
|   | 12H | 18.6   | 19.0 | 19.2 | 19.5 | 20.1 | 18.5   | 18.9 | 19.1 | 19.4 | 20.0 |
| 12H   | 4H  | 16.8   | 17.4 | 17.3 | 17.8 | 18.3 | 16.9   | 17.5 | 17.4 | 17.9 | 18.4 |
|   | 6H  | 17.8   | 18.3 | 18.3 | 18.8 | 19.4 | 17.8   | 18.3 | 18.3 | 18.8 | 19.4 |
|   | 8H  | 18.3   | 18.7 | 18.9 | 19.2 | 19.8 | 18.3   | 18.7 | 18.9 | 19.2 | 19.8 |
| <b>Variations with the observer position for the luminaire spacings, S:</b> |     |  |      |      |      |      |  |      |      |      |      |
| S = 1.0H  |     | 0.1 / -0.2   |      |      |      |      | 0.1 / -0.2                                       |      |      |      |      |
| S = 1.5H  |     | 0.4 / -0.4   |      |      |      |      | 0.4 / -0.4                                       |      |      |      |      |
| S = 2.0H  |     | 0.8 / -0.6   |      |      |      |      | 0.8 / -0.6                                       |      |      |      |      |

**Coefficients of Utilization**

| Ceiling reflectance  | 80  |     |     | 70  |     |     | 50  |     |     | 30  |     |     | 10  |     |     | 0   |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Wall reflectance   | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 0   |
| Floor reflectance  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 0   |
| RCR (RCR: Room Cavity Ratio)   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Room Values are expressed as percentage of Lumen delivered to the task surface |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 0  | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1  | 110 | 106 | 102 | 98  | 107 | 103 | 100 | 97  | 99  | 96  | 94  | 95  | 93  | 91  | 92  | 90  | 88  | 86  |
| 2  | 101 | 94  | 88  | 83  | 99  | 92  | 87  | 82  | 89  | 84  | 80  | 86  | 82  | 78  | 83  | 79  | 77  | 75  |
| 3  | 94  | 84  | 77  | 71  | 91  | 83  | 76  | 71  | 80  | 74  | 69  | 77  | 72  | 68  | 75  | 71  | 67  | 65  |
| 4  | 87  | 76  | 68  | 62  | 85  | 75  | 67  | 62  | 72  | 66  | 61  | 70  | 65  | 60  | 68  | 63  | 59  | 57  |
| 5  | 81  | 69  | 61  | 55  | 79  | 68  | 60  | 55  | 66  | 59  | 54  | 64  | 58  | 54  | 62  | 57  | 53  | 51  |
| 6  | 75  | 63  | 55  | 49  | 73  | 62  | 54  | 49  | 60  | 54  | 48  | 59  | 53  | 48  | 57  | 52  | 48  | 46  |
| 7  | 70  | 58  | 50  | 44  | 69  | 57  | 49  | 44  | 56  | 49  | 44  | 54  | 48  | 43  | 53  | 47  | 43  | 41  |
| 8  | 66  | 53  | 45  | 40  | 64  | 53  | 45  | 40  | 51  | 45  | 40  | 50  | 44  | 40  | 49  | 43  | 39  | 38  |
| 9  | 62  | 49  | 42  | 37  | 60  | 49  | 41  | 36  | 48  | 41  | 36  | 47  | 41  | 36  | 46  | 40  | 36  | 34  |
| 10   | 58  | 46  | 38  | 34  | 57  | 45  | 38  | 34  | 44  | 38  | 33  | 43  | 37  | 33  | 43  | 37  | 33  | 31  |

**NOTE:** An asymmetry correction has been applied to the beam distribution of this measurement in order to accurately calculate UGR.

