

Light efficiency:

41 Lumen/Watt

Output: 1216 lm

Light quality:

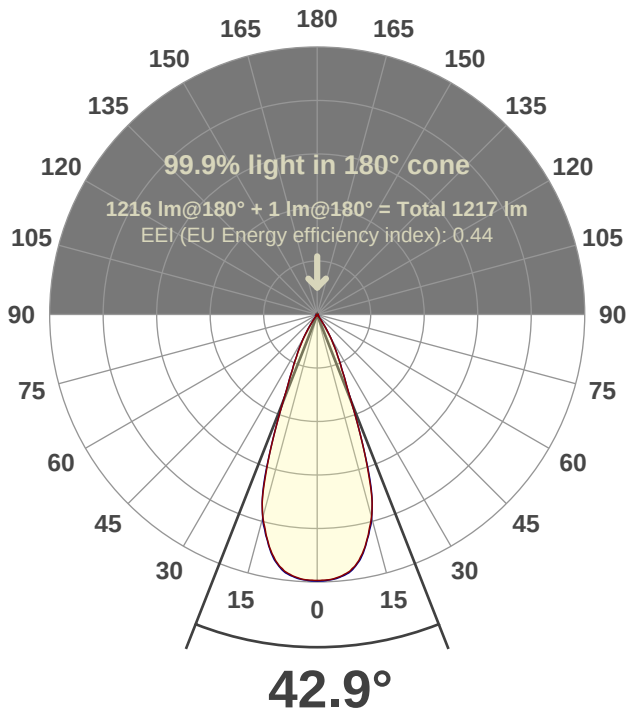
CRI: 92.4

Peak: 2496 cd

Power: 30.0 W



Beam angle



Test number:

CR4D-S-FL-C28-30k-55 (GRF-CZ20-WF-SQ)

Luminaire Model:

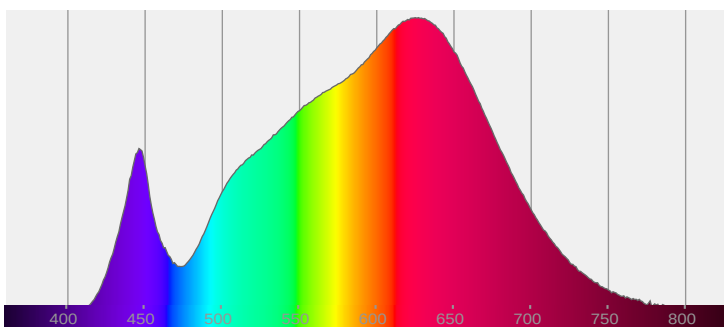
Core 4" Square Flat C28 30K 55°

Date and time:

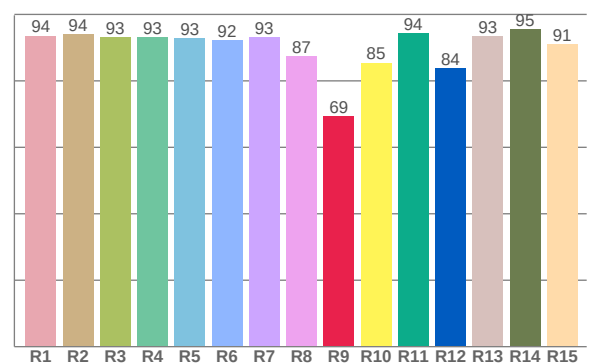
3/31/2017 2:29:38 PM

LUM: 1216

Spectra



CRI: 92.4 (R1-R8)



Color parameters

|  | Color rendering index | Red component | Color fidelity      | Color gamut         | Color quality scale | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate | Color deviation from black body |
|--|-----------------------|---------------|---------------------|---------------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
|  | CRI                   | CRI R9        | TM30 R <sub>f</sub> | TM30 R <sub>g</sub> | CQS                 | x                         | y                         | u                | v                | Δuv                             |
|  | 92.4                  | 69.2          | 90.3                | 103.1               | 90.2                | 0.428                     | 0.399                     | 0.247            | 0.345            | -0.0007                         |

**$R_f$  90.3**

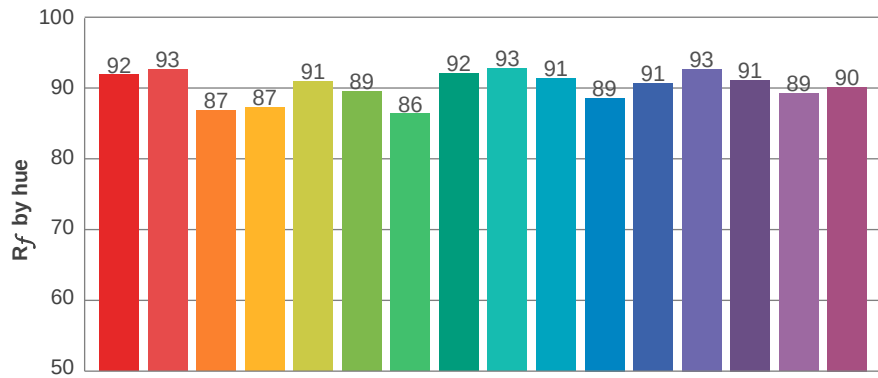
Fidelity index  $R_f$

**$R_g$  103.1**

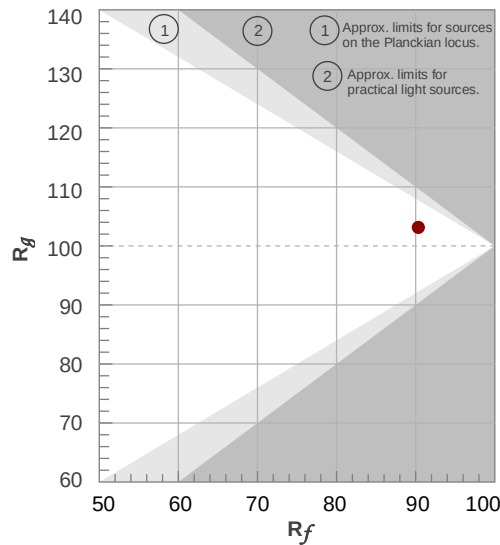
Gammut index  $R_g$

TM30: 90.3

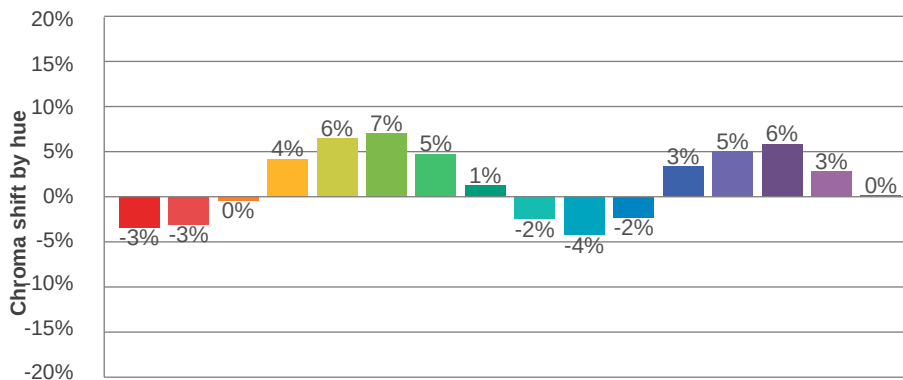
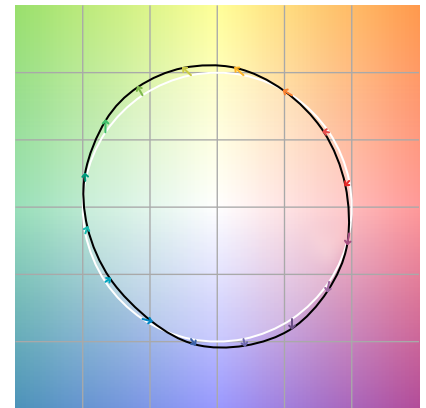
TM-30Color



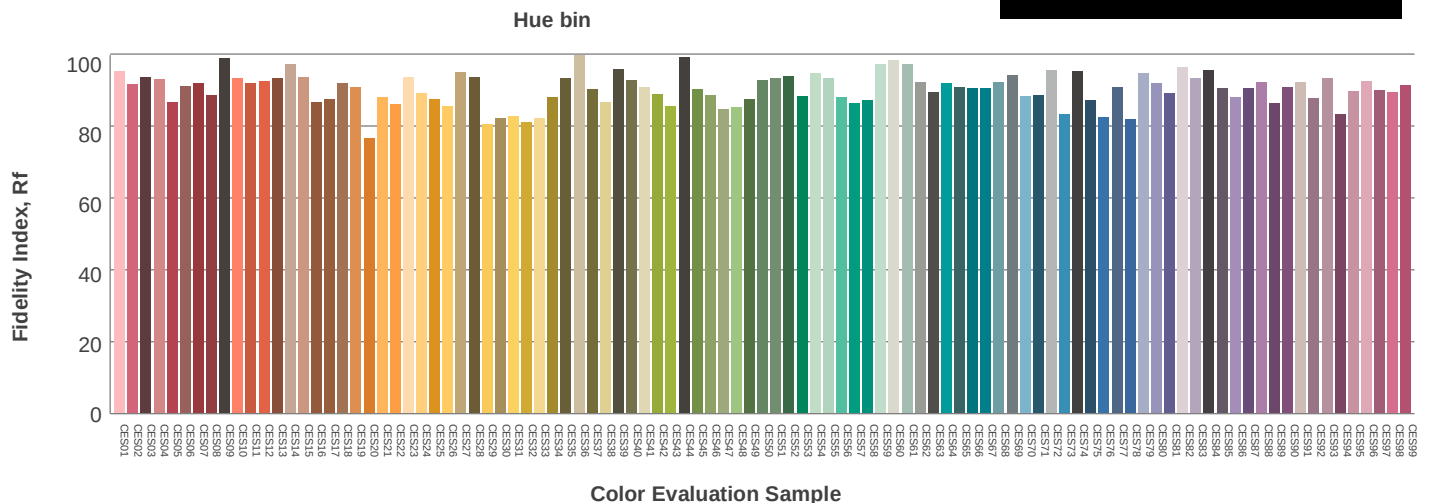
| Hue Bin | $R_f$ | Graphic shifts (%) |     |
|---------|-------|--------------------|-----|
|         |       | Chroma             | Hue |
| 1       | 92    | -3%                | -3% |
| 2       | 93    | -3%                | 3%  |
| 3       | 87    | 0%                 | 7%  |
| 4       | 87    | 4%                 | 7%  |
| 5       | 91    | 6%                 | 5%  |
| 6       | 89    | 7%                 | -1% |
| 7       | 86    | 5%                 | -7% |
| 8       | 92    | 1%                 | -5% |
| 9       | 93    | -2%                | -4% |
| 10      | 91    | -4%                | 0%  |
| 11      | 89    | -2%                | 7%  |
| 12      | 91    | 3%                 | 4%  |
| 13      | 93    | 5%                 | 0%  |
| 14      | 91    | 6%                 | -4% |
| 15      | 89    | 3%                 | -6% |
| 16      | 90    | 0%                 | -8% |



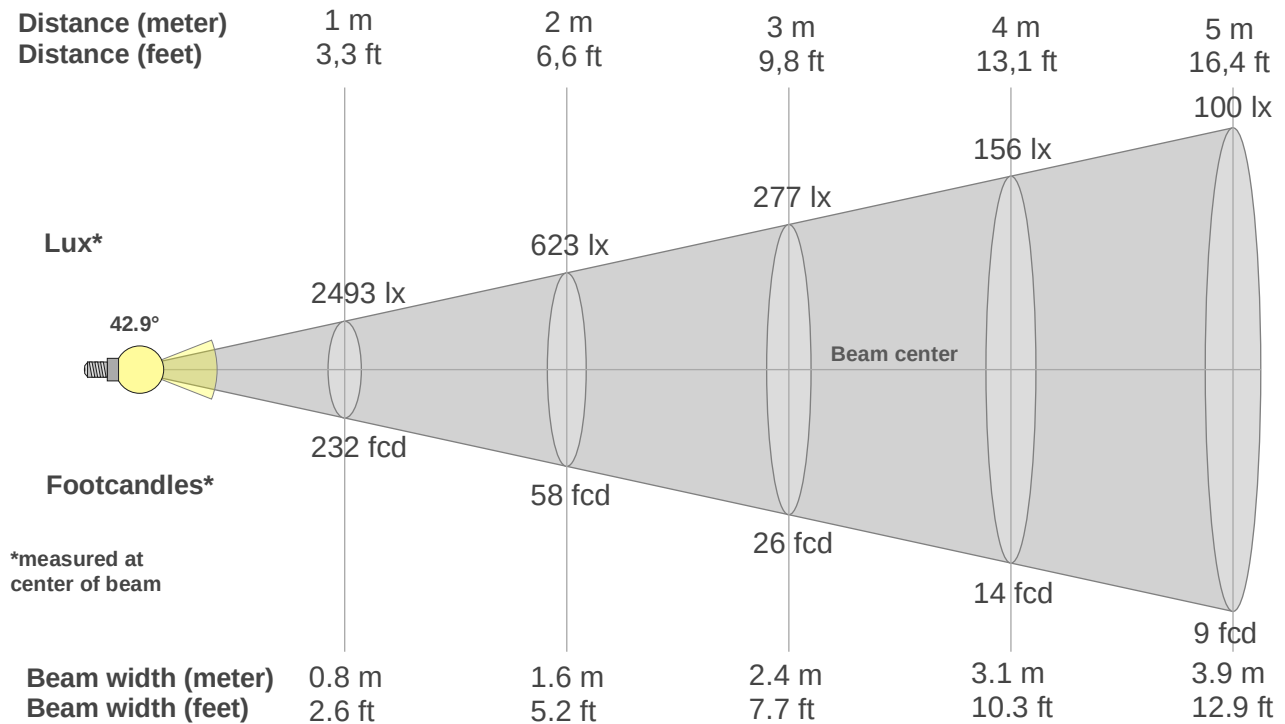
Color vector graphics



Color distortion



## Beam details



### Beam intensities from 1-20m

| 1m      | 2m      | 3m      | 4m      | 5m     | 6m     | 7m     | 8m     | 9m     | 10m    | 11m    | 12m    | 13m    | 14m    | 15m    | 16m    | 17m    | 18m    | 19m    | 20m    |
|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 3.3ft   | 6.6ft   | 9.8ft   | 13.1ft  | 16.4ft | 19.7ft | 23ft   | 26.2ft | 29.5ft | 32.8ft | 36.1ft | 39.4ft | 42.7ft | 45.9ft | 49.2ft | 52.5ft | 55.8ft | 59.1ft | 62.3ft | 65.6ft |
| 2493lx  | 623lx   | 277lx   | 156lx   | 100lx  | 69lx   | 51lx   | 39lx   | 31lx   | 25lx   | 21lx   | 17lx   | 15lx   | 13lx   | 11lx   | 10lx   | 9lx    | 8lx    | 7lx    | 6lx    |
| 231.6fc | 57.9fcd | 25.7fcd | 14.5fcd | 9.3fcd | 6.4fcd | 4.7fcd | 3.6fcd | 2.9fcd | 2.3fcd | 1.9fcd | 1.6fcd | 1.4fcd | 1.2fcd | 1fcd   | 0.9fcd | 0.8fcd | 0.7fcd | 0.6fcd | 0.6fcd |

### Intensities in 0° c-plane

| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14°  | 16°  | 18°  | 20°  | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2493 | 2484 | 2471 | 2443 | 2395 | 2313 | 2192 | 2041 | 1868 | 1551 | 1155 | 795 | 593 | 461 | 363 | 271 | 187 | 123 | 70  | 37  |
| 100% | 100% | 99%  | 98%  | 96%  | 93%  | 88%  | 82%  | 75%  | 62%  | 46%  | 32% | 24% | 19% | 15% | 11% | 7%  | 5%  | 3%  | 1%  |

### Intensities in 90° c-plane

| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14°  | 16°  | 18°  | 20°  | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2493 | 2490 | 2478 | 2452 | 2406 | 2326 | 2201 | 2054 | 1867 | 1577 | 1155 | 790 | 596 | 463 | 363 | 273 | 190 | 121 | 70  | 36  |
| 100% | 100% | 99%  | 98%  | 97%  | 93%  | 88%  | 82%  | 75%  | 63%  | 46%  | 32% | 24% | 19% | 15% | 11% | 8%  | 5%  | 3%  | 1%  |

### Intensities in 180° c-plane

| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14°  | 16°  | 18°  | 20°  | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2493 | 2484 | 2471 | 2443 | 2395 | 2313 | 2192 | 2041 | 1868 | 1551 | 1155 | 795 | 593 | 461 | 363 | 271 | 187 | 123 | 70  | 37  |
| 100% | 100% | 99%  | 98%  | 96%  | 93%  | 88%  | 82%  | 75%  | 62%  | 46%  | 32% | 24% | 19% | 15% | 11% | 7%  | 5%  | 3%  | 1%  |

### Intensities in 270° c-plane

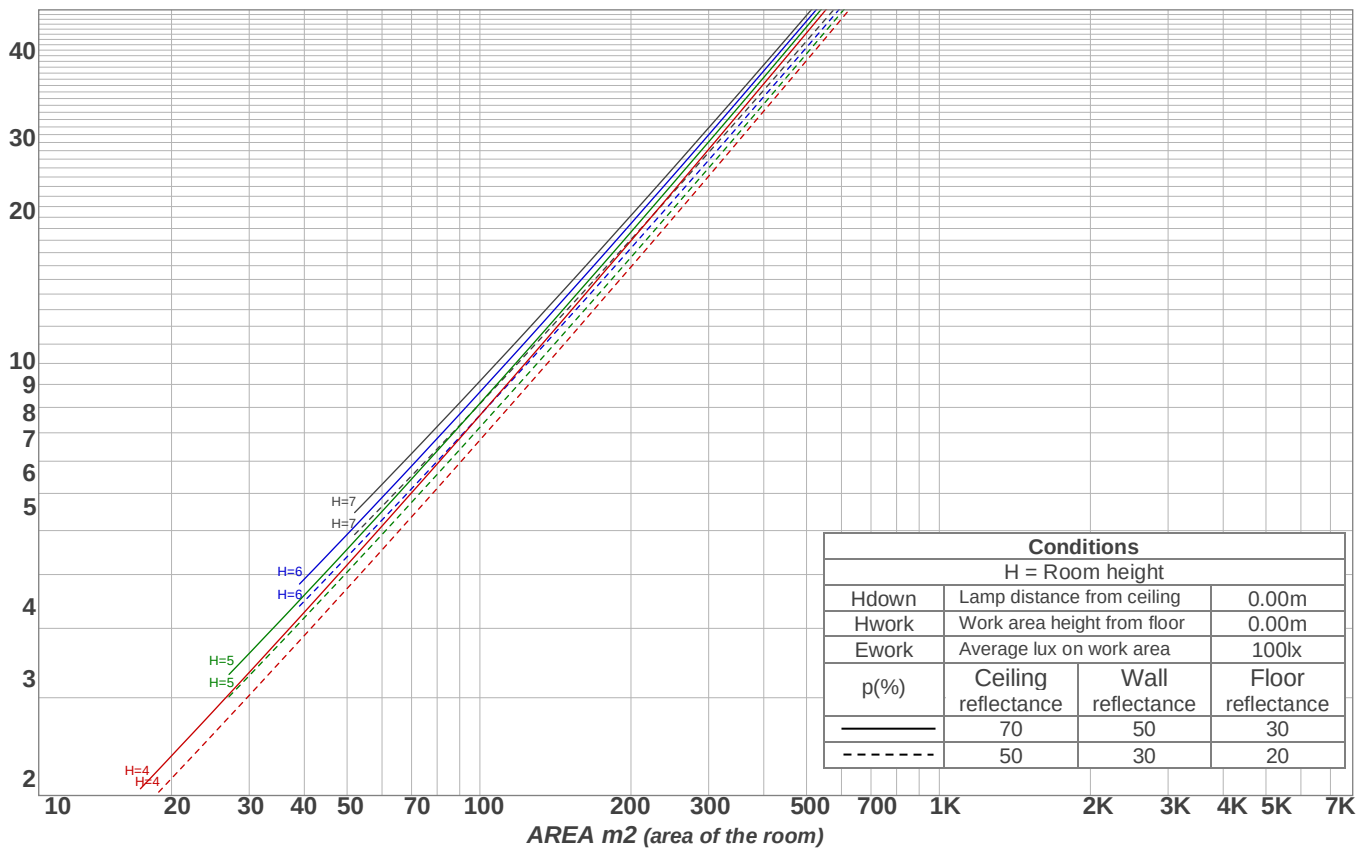
| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14°  | 16°  | 18°  | 20°  | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2493 | 2490 | 2478 | 2452 | 2406 | 2326 | 2201 | 2054 | 1867 | 1577 | 1155 | 790 | 596 | 463 | 363 | 273 | 190 | 121 | 70  | 36  |
| 100% | 100% | 99%  | 98%  | 97%  | 93%  | 88%  | 82%  | 75%  | 63%  | 46%  | 32% | 24% | 19% | 15% | 11% | 8%  | 5%  | 3%  | 1%  |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 42.9°          | 61.5°           | 74°               | 98.6%                        | 98.0%                       |

## Light planning

### Luminaire budgetary diagram

LAMPS (number of lamps)  
50



### Luminaire budgetary diagram

AREA m² (area of the room)

### 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 Lumens 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                   | 114                                                                                                      | 112 | 110 | 108 | 112 | 110 | 108 | 106 | 106 | 104 | 103 | 102 | 101 | 100 | 99  | 98  | 97  | 95  |
| 2                   | 110                                                                                                      | 105 | 102 | 99  | 108 | 104 | 101 | 98  | 101 | 98  | 96  | 98  | 96  | 94  | 95  | 93  | 92  | 90  |
| 3                   | 105                                                                                                      | 100 | 96  | 92  | 103 | 99  | 95  | 92  | 96  | 93  | 90  | 94  | 91  | 89  | 92  | 89  | 87  | 86  |
| 4                   | 101                                                                                                      | 95  | 90  | 87  | 100 | 94  | 90  | 86  | 92  | 88  | 85  | 90  | 87  | 84  | 88  | 86  | 83  | 82  |
| 5                   | 97                                                                                                       | 91  | 86  | 82  | 96  | 90  | 85  | 82  | 88  | 84  | 81  | 86  | 83  | 80  | 85  | 82  | 80  | 78  |
| 6                   | 94                                                                                                       | 87  | 82  | 78  | 93  | 86  | 81  | 78  | 84  | 80  | 77  | 83  | 80  | 77  | 82  | 79  | 76  | 75  |
| 7                   | 90                                                                                                       | 83  | 78  | 74  | 89  | 82  | 78  | 74  | 81  | 77  | 74  | 80  | 76  | 73  | 79  | 76  | 73  | 72  |
| 8                   | 87                                                                                                       | 79  | 74  | 71  | 86  | 79  | 74  | 71  | 78  | 74  | 71  | 77  | 73  | 70  | 76  | 73  | 70  | 69  |
| 9                   | 84                                                                                                       | 76  | 71  | 68  | 83  | 76  | 71  | 68  | 75  | 71  | 68  | 74  | 70  | 68  | 73  | 70  | 67  | 66  |
| 10                  | 81                                                                                                       | 73  | 69  | 65  | 80  | 73  | 68  | 65  | 72  | 68  | 65  | 71  | 68  | 65  | 71  | 67  | 65  | 64  |

### Zonal Lumen Summary

| 0°-10°   | 10°-20°   | 20°-30°   | 30°-40°   | 40°-50°   | 50°-60°   | 60°-70°   | 70°-80°   | 80°-90°   |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 232 lm   | 545 lm    | 337 lm    | 72.4 lm   | 8.33 lm   | 5.24 lm   | 6.94 lm   | 5.24 lm   | 3.81 lm   |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 0.000 lm | 0.000 lm  | 0.000 lm  | 0.000 lm  | 0.000 lm  | 0.000 lm  | 0.000 lm  | 0.000 lm  | 0.000 lm  |

## UGR

|                                                                  |     |                                                   |      |      |      |      |                                         |      |      |      |      |
|------------------------------------------------------------------|-----|---------------------------------------------------|------|------|------|------|-----------------------------------------|------|------|------|------|
| p Ceiling                                                        |     | 70                                                | 70   | 50   | 50   | 30   | 70                                      | 70   | 50   | 50   | 30   |
| p Walls                                                          |     | 50                                                | 30   | 50   | 30   | 30   | 50                                      | 30   | 50   | 30   | 30   |
| p Floor                                                          |     | 20                                                | 20   | 20   | 20   | 20   | 20                                      | 20   | 20   | 20   | 20   |
| Room size<br>X      Y                                            |     | Viewing direction at right angles to<br>lamp axis |      |      |      |      | Viewing direction parallel to lamp axis |      |      |      |      |
| 2H                                                               | 2H  | 23.9                                              | 24.4 | 24.0 | 24.6 | 24.8 | 24.1                                    | 24.6 | 24.2 | 24.8 | 25.0 |
|                                                                  | 3H  | 24.2                                              | 24.8 | 24.5 | 25.0 | 25.2 | 24.6                                    | 25.3 | 25.0 | 25.5 | 25.6 |
|                                                                  | 4H  | 24.4                                              | 25.1 | 24.8 | 25.3 | 25.5 | 25.0                                    | 25.7 | 25.4 | 25.9 | 26.1 |
|                                                                  | 6H  | 25.0                                              | 25.5 | 25.3 | 25.8 | 26.2 | 25.7                                    | 26.2 | 26.0 | 26.5 | 26.9 |
|                                                                  | 8H  | 25.3                                              | 25.8 | 25.7 | 26.2 | 26.5 | 26.0                                    | 26.5 | 26.4 | 26.9 | 27.3 |
|                                                                  | 12H | 25.9                                              | 26.3 | 26.2 | 26.7 | 27.1 | 26.6                                    | 27.1 | 26.9 | 27.4 | 27.8 |
| 4H                                                               | 2H  | 23.8                                              | 24.4 | 24.2 | 24.7 | 24.9 | 24.0                                    | 24.6 | 24.4 | 24.8 | 25.1 |
|                                                                  | 3H  | 24.5                                              | 25.0 | 24.8 | 25.3 | 25.8 | 25.0                                    | 25.4 | 25.3 | 25.8 | 26.2 |
|                                                                  | 4H  | 24.9                                              | 25.4 | 25.3 | 25.8 | 26.3 | 25.5                                    | 26.0 | 25.9 | 26.4 | 26.9 |
|                                                                  | 6H  | 25.6                                              | 26.1 | 26.1 | 26.5 | 26.8 | 26.3                                    | 26.9 | 26.8 | 27.2 | 27.5 |
|                                                                  | 8H  | 26.2                                              | 26.6 | 26.7 | 27.0 | 27.3 | 26.9                                    | 27.3 | 27.4 | 27.7 | 28.0 |
|                                                                  | 12H | 26.9                                              | 27.2 | 27.4 | 27.6 | 28.1 | 27.6                                    | 27.9 | 28.1 | 28.3 | 28.8 |
| 8H                                                               | 4H  | 25.2                                              | 25.7 | 25.7 | 26.0 | 26.4 | 25.7                                    | 26.2 | 26.3 | 26.5 | 26.9 |
|                                                                  | 6H  | 26.3                                              | 26.6 | 26.8 | 27.0 | 27.5 | 26.9                                    | 27.2 | 27.4 | 27.6 | 28.2 |
|                                                                  | 8H  | 27.0                                              | 27.3 | 27.5 | 27.8 | 28.4 | 27.6                                    | 27.9 | 28.1 | 28.4 | 29.0 |
|                                                                  | 12H | 28.0                                              | 28.2 | 28.6 | 28.7 | 29.3 | 28.6                                    | 28.8 | 29.2 | 29.3 | 29.9 |
| 12H                                                              | 4H  | 25.3                                              | 25.6 | 25.8 | 26.0 | 26.5 | 25.8                                    | 26.1 | 26.3 | 26.5 | 27.0 |
|                                                                  | 6H  | 26.5                                              | 26.7 | 27.0 | 27.2 | 27.9 | 27.1                                    | 27.3 | 27.6 | 27.8 | 28.4 |
|                                                                  | 8H  | 27.3                                              | 27.5 | 27.9 | 28.0 | 28.6 | 27.9                                    | 28.1 | 28.5 | 28.6 | 29.2 |
| Corrected glare indices referring to 1216 lm total luminous flux |     |                                                   |      |      |      |      |                                         |      |      |      |      |