

# LM-79

## Test Report

LM79-REVO-INGROUND-2700K-CRI80-DEG30

### General Discription

|                   |                    |
|-------------------|--------------------|
| Item number       | R-I-2-04-3         |
| Date and time     | 22-4-2016 15:54:06 |
| CCT (Kelvin)      | 2727 K             |
| Beam angle        | 29,2°              |
| Luminous flux     | 1309 lm            |
| Efficiency        | 68 lm/watt         |
| Weighted energy   | 19,2 kWh/1000h     |
| Power factor      | 0,94               |
| CRI (RA)          | 83,3               |
| Fidelity index Rf | Rf 84,7            |
| Gammut index Rg   | Rg 95,9            |



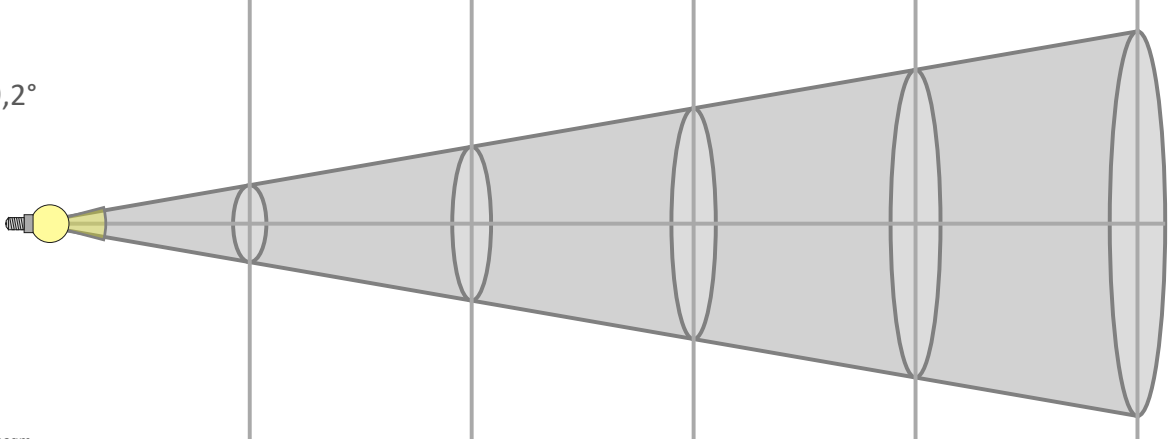
**CLS LED BV**  
info@cls-led.com  
www.cls-led.com

2017 CLS-LED BV. All rights reserved. Information subject to change without notice, CLS-LED BV and all affiliated companies disclaim liability for injury, damage direct or indirect loss, consequential or economic loss or any other loss occasioned by the use of, inability to use or reliance on the information contained in this document. No part of this document may be reproduced, in any form or by any means, without permission in writing from CLS-LED BV. Other legal information can be found in our General conditions, found on the back of your CLS-LED BV invoice, inside the CLS catalogue or on our website [www.cls-led.com/voorwaarden.pdf](http://www.cls-led.com/voorwaarden.pdf)

# LM-79

## Test Report

LM79-REVO-INGROUND-2700K-CRI80-DEG30

| Beam details                                                                                                  |         |         |         |                 | 1m        |        | 2m       |                   | 3m       |        | 4m       |                              | 5m       |        |        |                             |        |        |        |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------|---------|---------|---------|-----------------|-----------|--------|----------|-------------------|----------|--------|----------|------------------------------|----------|--------|--------|-----------------------------|--------|--------|--------|--|--|--|--|
| Lux*                                                                                                          |         |         |         |                 | 4278 lx   |        | 1069 lx  |                   | 475 lx   |        | 267 lx   |                              | 171 lx   |        |        |                             |        |        |        |  |  |  |  |
| <div><div>29,2°</div></div> |         |         |         |                 |           |        |          |                   |          |        |          |                              |          |        |        |                             |        |        |        |  |  |  |  |
| *measured at center of beam                                                                                   |         |         |         |                 |           |        |          |                   |          |        |          |                              |          |        |        |                             |        |        |        |  |  |  |  |
| Footcandles*                                                                                                  |         |         |         |                 | 397,4 fcd |        | 99,4 fcd |                   | 44,2 fcd |        | 24,8 fcd |                              | 15,9 fcd |        |        |                             |        |        |        |  |  |  |  |
| Beam width (meter)                                                                                            |         |         |         |                 | 0,5 m     |        | 1 m      |                   | 1,6 m    |        | 2,1 m    |                              | 2,6 m    |        |        |                             |        |        |        |  |  |  |  |
| Beam width (Feet)                                                                                             |         |         |         |                 | 1,7 ft    |        | 3,4 ft   |                   | 5,1 ft   |        | 6,8 ft   |                              | 8,6 ft   |        |        |                             |        |        |        |  |  |  |  |
| Beam intensities                                                                                              |         |         |         |                 |           |        |          |                   |          |        |          |                              |          |        |        |                             |        |        |        |  |  |  |  |
| 1m                                                                                                            | 2m      | 3m      | 4m      | 5m              | 6m        | 7m     | 8m       | 9m                | 10m      | 11m    | 12m      | 13m                          | 14m      | 15m    | 16m    | 17m                         | 18m    | 19m    | 20m    |  |  |  |  |
| 4278lx                                                                                                        | 1069lx  | 475lx   | 267lx   | 171lx           | 119lx     | 87lx   | 67lx     | 53lx              | 43lx     | 35lx   | 30lx     | 25lx                         | 22lx     | 19lx   | 17lx   | 15lx                        | 13lx   | 12lx   | 11lx   |  |  |  |  |
| 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 |  |  |  |  |
| 397,4fcd                                                                                                      | 99,4fcd | 44,2fcd | 24,8fcd | 15,9fcd         | 11fcd     | 8,1fcd | 6,2fcd   | 4,9fcd            | 4fcd     | 3,3fcd | 2,8fcd   | 2,4fcd                       | 2fcd     | 1,8fcd | 1,6fcd | 1,4fcd                      | 1,2fcd | 1,1fcd | 1fcd   |  |  |  |  |
| 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°    |  |  |  |  |
| 4278                                                                                                          | 4192    | 4058    | 3761    | 3431            | 3029      | 2625   | 2226     | 1837              | 1455     | 1133   | 831      | 620                          | 432      | 319    | 222    | 165                         | 119    | 90     | 68     |  |  |  |  |
| 100%                                                                                                          | 98%     | 95%     | 88%     | 80%             | 71%       | 61%    | 52%      | 43%               | 34%      | 26%    | 19%      | 14%                          | 10%      | 7%     | 5%     | 4%                          | 3%     | 2%     | 2%     |  |  |  |  |
| 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°    |  |  |  |  |
| 4278                                                                                                          | 4212    | 4057    | 3776    | 3439            | 3049      | 2662   | 2286     | 1923              | 1570     | 1244   | 943      | 701                          | 500      | 359    | 251    | 182                         | 130    | 96     | 72     |  |  |  |  |
| 100%                                                                                                          | 98%     | 95%     | 88%     | 80%             | 71%       | 62%    | 53%      | 45%               | 37%      | 29%    | 22%      | 16%                          | 12%      | 8%     | 6%     | 4%                          | 3%     | 2%     | 2%     |  |  |  |  |
| 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°    |  |  |  |  |
| 4278                                                                                                          | 4192    | 4058    | 3761    | 3431            | 3029      | 2625   | 2226     | 1837              | 1455     | 1133   | 831      | 620                          | 432      | 319    | 222    | 165                         | 119    | 90     | 68     |  |  |  |  |
| 100%                                                                                                          | 98%     | 95%     | 88%     | 80%             | 71%       | 61%    | 52%      | 43%               | 34%      | 26%    | 19%      | 14%                          | 10%      | 7%     | 5%     | 4%                          | 3%     | 2%     | 2%     |  |  |  |  |
| 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°    |  |  |  |  |
| 4278                                                                                                          | 4212    | 4057    | 3776    | 3439            | 3049      | 2662   | 2286     | 1923              | 1570     | 1244   | 943      | 701                          | 500      | 359    | 251    | 182                         | 130    | 96     | 72     |  |  |  |  |
| 100%                                                                                                          | 98%     | 95%     | 88%     | 80%             | 71%       | 62%    | 53%      | 45%               | 37%      | 29%    | 22%      | 16%                          | 12%      | 8%     | 6%     | 4%                          | 3%     | 2%     | 2%     |  |  |  |  |
| Beam angle 50%                                                                                                |         |         |         | Field angle 10% |           |        |          | Cutoff angle 2,5% |          |        |          | Intensity ratio in 120° cone |          |        |        | Intensity ratio in 90° cone |        |        |        |  |  |  |  |
| 29,2°                                                                                                         |         |         |         | 53°             |           |        |          | {C_ANG}°          |          |        |          | 98,4%                        |          |        |        | 96,5%                       |        |        |        |  |  |  |  |



**CLS LED BV**  
info@cls-led.com  
www.cls-led.com

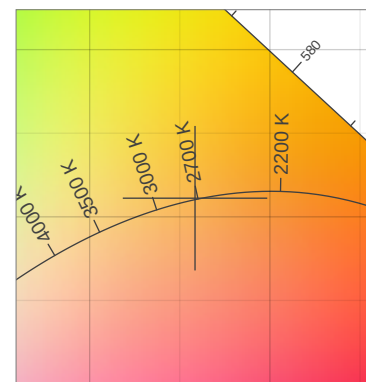
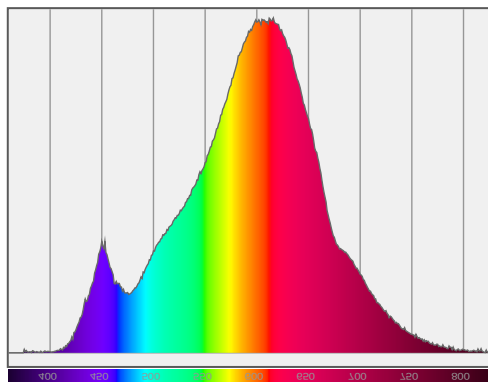
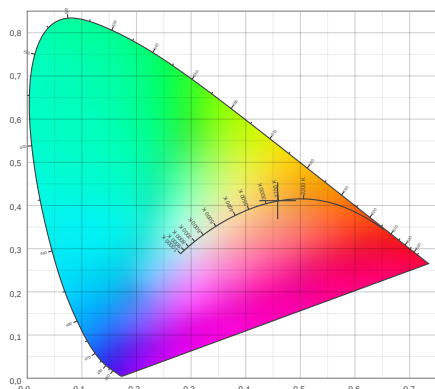
2017 CLS-LED BV. All rights reserved. Information subject to change without notice, CLS-LED BV and all affiliated companies disclaim liability for injury, damage direct or indirect loss, consequential or economic loss or any other loss occasioned by the use of, inability to use or reliance on the information contained in this document. No part of this document may be reproduced, in any form or by any means, without permission in writing from CLS-LED BV. Other legal information can be found in our General conditions, found on the back of your CLS-LED BV invoice, inside the CLS catalogue or on our website [www.cls-led.com/voorwaarden.pdf](http://www.cls-led.com/voorwaarden.pdf)

LM-79

Test Report

LM79-REVO-INGROUND-2700K-CRI80-DEG30

## Color details



CIE 1931

x: 0,458

2727 K

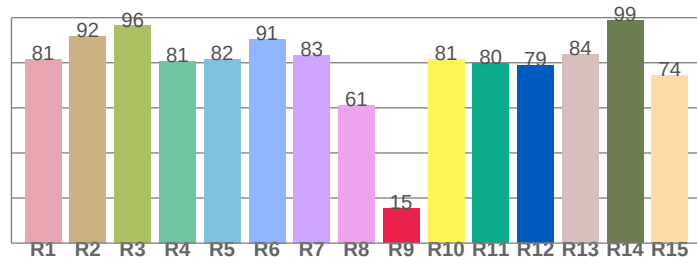
y: 0,411

Spectra

CIE 1931 ZOOM

 $\Delta uv$ : 0,0003

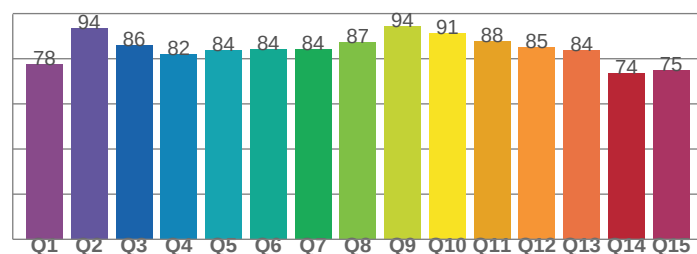
CRI: 83,3 (R1-R8)



CRI values, R1-R8 are used to calculate final CRI value

| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   |
|------|------|------|------|------|------|------|------|
| 81,4 | 91,6 | 96,4 | 80,8 | 81,6 | 90,5 | 83,3 | 61,0 |
| R9   | R10  | R11  | R12  | R13  | R14  | R15  |      |
| 15,3 | 81,4 | 79,7 | 78,7 | 83,6 | 98,6 | 74,2 |      |

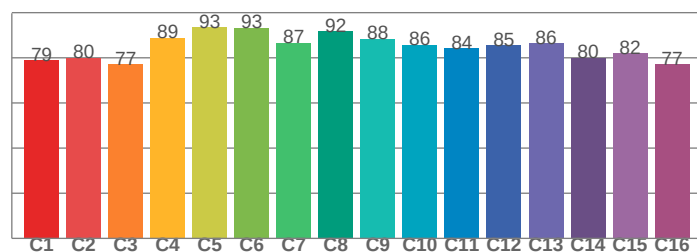
CQS: 83,3



CQS values

| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   |
|------|------|------|------|------|------|------|------|
| 77,6 | 93,7 | 85,8 | 81,8 | 83,7 | 84,2 | 84,0 | 87,4 |
| Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |      |
| 94,5 | 91,1 | 87,8 | 85,1 | 83,7 | 73,6 | 74,7 |      |

TM30: 84,7



TM30 values, 16 binned values out of total of 99 values

| C1   | C2   | C3   | C4   | C5   | C6   | C7   | C8   |
|------|------|------|------|------|------|------|------|
| 78,9 | 79,9 | 77,1 | 88,8 | 93,5 | 93,3 | 86,6 | 91,6 |
| C9   | C10  | C11  | C12  | C13  | C14  | C15  |      |
| 88,5 | 85,6 | 84,2 | 85,5 | 86,3 | 79,8 | 82,0 |      |

## Color parameters

| Color temperature | 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 |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT               | CRI                   | CRI R9        | TM30 Rf        | TM30 Rg     | CQS                 | x                         | y                         | u                | v                | $\Delta uv$                     |
| 2727 K            | 83,3                  | 15,3          | 84,7           | 95,9        | 83,3                | 0,458                     | 0,411                     | 0,261            | 0,352            | 0,0003                          |



CLS LED BV  
info@cls-led.com  
www.cls-led.com

2017 CLS-LED BV. All rights reserved. Information subject to change without notice, CLS-LED BV and all affiliated companies disclaim liability for injury, damage direct or indirect loss, consequential or economic loss or any other loss occasioned by the use of, inability to use or reliance on the information contained in this document. No part of this document may be reproduced, in any form or by any means, without permission in writing from CLS-LED BV. Other legal information can be found in our General conditions, found on the back of your CLS-LED BV invoice, inside the CLS catalogue or on our website [www.cls-led.com/voorwaarden.pdf](http://www.cls-led.com/voorwaarden.pdf)

# LM-79

## Test Report

LM79-REVO-INGROUND-2700K-CRI80-DEG30

### TM30 details

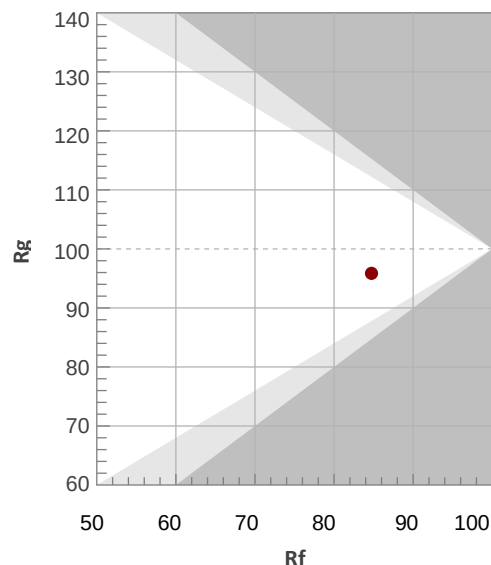
Rf 84,7

Fidelity index Rf

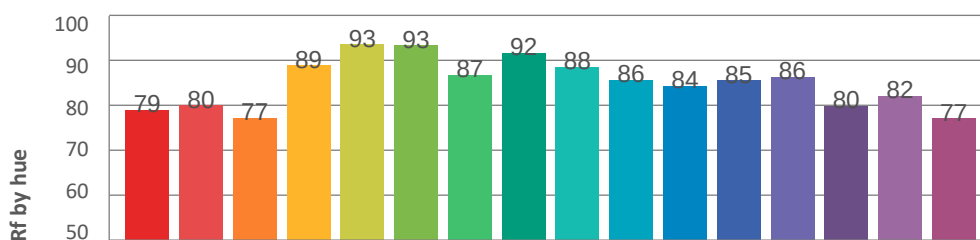
Rg 95,9

Gamut index Rg

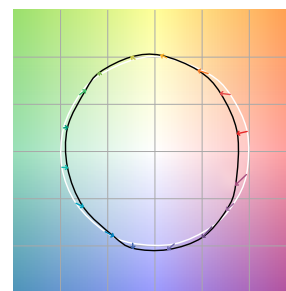
| Hue Bin | R <sub>f</sub> | Graphic shifts (%) |      |
|---------|----------------|--------------------|------|
|         |                | Chroma             | Hue  |
| 1       | 79             | -11%               | 0%   |
| 2       | 80             | -8%                | 7%   |
| 3       | 77             | -3%                | 10%  |
| 4       | 89             | 1%                 | 6%   |
| 5       | 93             | 3%                 | 4%   |
| 6       | 93             | 2%                 | -2%  |
| 7       | 87             | -3%                | -7%  |
| 8       | 92             | -4%                | -1%  |
| 9       | 88             | -6%                | 1%   |
| 10      | 86             | -4%                | 7%   |
| 11      | 84             | -1%                | 10%  |
| 12      | 85             | 5%                 | 1%   |
| 13      | 86             | 5%                 | -8%  |
| 14      | 80             | 4%                 | -14% |
| 15      | 82             | -3%                | -10% |
| 16      | 77             | -9%                | -13% |



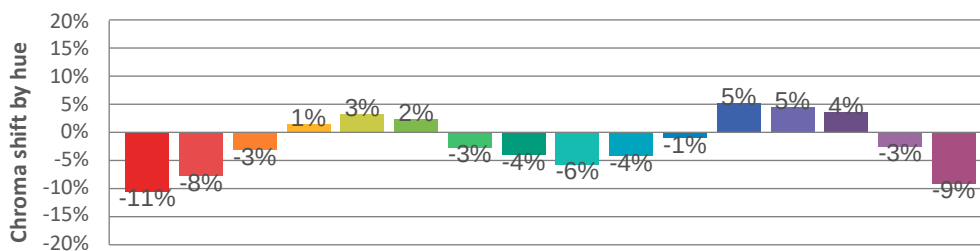
### Hue binH



### Color vector graphics



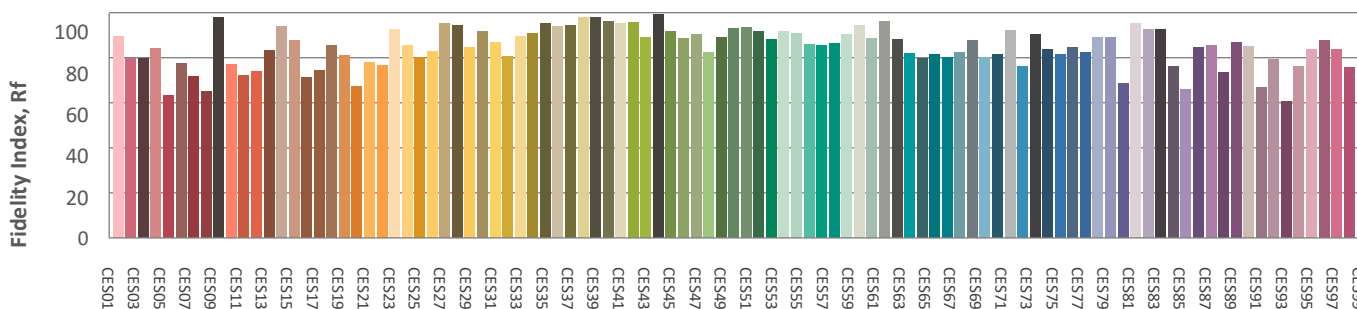
### Hue bin



### Color distortion graphics



### Color Evaluation Sample



CLS LED BV  
info@cls-led.com  
www.cls-led.com

2017 CLS-LED BV. All rights reserved. Information subject to change without notice, CLS-LED BV and all affiliated companies disclaim liability for injury, damage direct or indirect loss, consequential or economic loss or any other loss occasioned by the use of, inability to use or reliance on the information contained in this document. No part of this document may be reproduced, in any form or by any means, without permission in writing from CLS-LED BV. Other legal information can be found in our General conditions, found on the back of your CLS-LED BV invoice, inside the CLS catalogue or on our website [www.cls-led.com/voorwaarden.pdf](http://www.cls-led.com/voorwaarden.pdf)

## Glare Evaluation According to 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 lamp axis |      |      |      |      | Viewing direction parallel to lamp axis |      |      |      |      |
| 2H                                                              | 2H  | 11,2                                           | 11,9 | 11,5 | 12,1 | 12,3 | 11,4                                    | 12,0 | 11,6 | 12,2 | 12,5 |
|                                                                 | 3H  | 11,6                                           | 12,2 | 11,9 | 12,5 | 12,7 | 11,7                                    | 12,3 | 12,0 | 12,6 | 12,8 |
|                                                                 | 4H  | 11,7                                           | 12,3 | 12,0 | 12,5 | 12,8 | 11,8                                    | 12,4 | 12,1 | 12,6 | 12,9 |
|                                                                 | 6H  | 11,7                                           | 12,2 | 12,0 | 12,5 | 12,8 | 11,8                                    | 12,4 | 12,2 | 12,6 | 12,9 |
|                                                                 | 8H  | 11,7                                           | 12,2 | 12,0 | 12,5 | 12,8 | 11,8                                    | 12,3 | 12,2 | 12,6 | 12,9 |
|                                                                 | 12H | 11,7                                           | 12,2 | 12,0 | 12,5 | 12,8 | 11,8                                    | 12,3 | 12,2 | 12,6 | 13,0 |
| 4H                                                              | 2H  | 11,4                                           | 11,9 | 11,7 | 12,2 | 12,5 | 11,5                                    | 12,1 | 11,8 | 12,3 | 12,6 |
|                                                                 | 3H  | 11,8                                           | 12,3 | 12,2 | 12,6 | 13,0 | 11,9                                    | 12,4 | 12,3 | 12,7 | 13,1 |
|                                                                 | 4H  | 12,0                                           | 12,4 | 12,4 | 12,7 | 13,1 | 12,1                                    | 12,5 | 12,5 | 12,8 | 13,2 |
|                                                                 | 6H  | 12,0                                           | 12,4 | 12,5 | 12,8 | 13,2 | 12,2                                    | 12,5 | 12,6 | 12,9 | 13,3 |
|                                                                 | 8H  | 12,0                                           | 12,3 | 12,5 | 12,7 | 13,1 | 12,2                                    | 12,5 | 12,6 | 12,9 | 13,3 |
|                                                                 | 12H | 12,0                                           | 12,3 | 12,5 | 12,7 | 13,1 | 12,2                                    | 12,5 | 12,7 | 12,9 | 13,3 |
| 8H                                                              | 4H  | 12,0                                           | 12,3 | 12,4 | 12,7 | 13,1 | 12,1                                    | 12,4 | 12,5 | 12,8 | 13,2 |
|                                                                 | 6H  | 12,1                                           | 12,3 | 12,5 | 12,7 | 13,2 | 12,2                                    | 12,4 | 12,6 | 12,8 | 13,3 |
|                                                                 | 8H  | 12,1                                           | 12,3 | 12,6 | 12,7 | 13,2 | 12,2                                    | 12,4 | 12,7 | 12,9 | 13,4 |
|                                                                 | 12H | 12,1                                           | 12,2 | 12,6 | 12,7 | 13,2 | 12,3                                    | 12,5 | 12,8 | 12,9 | 13,4 |
| 12H                                                             | 4H  | 12,0                                           | 12,2 | 12,4 | 12,6 | 13,1 | 12,0                                    | 12,3 | 12,5 | 12,7 | 13,2 |
|                                                                 | 6H  | 12,1                                           | 12,2 | 12,5 | 12,7 | 13,2 | 12,2                                    | 12,4 | 12,6 | 12,8 | 13,3 |
|                                                                 | 8H  | 12,1                                           | 12,2 | 12,6 | 12,7 | 13,2 | 12,2                                    | 12,4 | 12,7 | 12,9 | 13,4 |
| Variation of the observer position for the luminaire distance S |     |                                                |      |      |      |      |                                         |      |      |      |      |
| S = 1,0H                                                        |     | +2,7 / -1,7                                    |      |      |      |      | +3,0 / -1,8                             |      |      |      |      |
| S = 1,5H                                                        |     | +4,9 / -2,1                                    |      |      |      |      | +5,2 / -2,4                             |      |      |      |      |
| S = 2,0H                                                        |     | +6,7 / -3,1                                    |      |      |      |      | +7,0 / -3,1                             |      |      |      |      |
| Standard table                                                  |     | BK02                                           |      |      |      |      | BK02                                    |      |      |      |      |
| Correction summand                                              |     | -5,8                                           |      |      |      |      | -5,6                                    |      |      |      |      |
| Corrected glare indices referring to 1309lm total luminous flux |     |                                                |      |      |      |      |                                         |      |      |      |      |

