

# LM-79

## Test Report

LM79-RUBY-BRACKET-8-2700K-CRI80-FLOOD-1210

### General Discription

|                   |                     |                                                                                    |
|-------------------|---------------------|------------------------------------------------------------------------------------|
| Item number       | RU-38-X-X-01-3-X    |  |
| Date and time     | 21-11-2016 10:43:08 |                                                                                    |
| CCT (Kelvin)      | 2711 K              |                                                                                    |
| Beam angle        | 63,3°               |                                                                                    |
| Luminous flux     | 5123 lm             |                                                                                    |
| Efficiency        | 90 lm/watt          |                                                                                    |
| Weighted energy   | 56,9 kWh/1000h      |                                                                                    |
| Power factor      | 0,98                |                                                                                    |
| CRI (RA)          | 80,9                |                                                                                    |
| Fidelity index Rf | Rf 81,9             |                                                                                    |
| Gammut index Rg   | Rg 96,1             |                                                                                    |
| Peak              | 5232 cd             |                                                                                    |



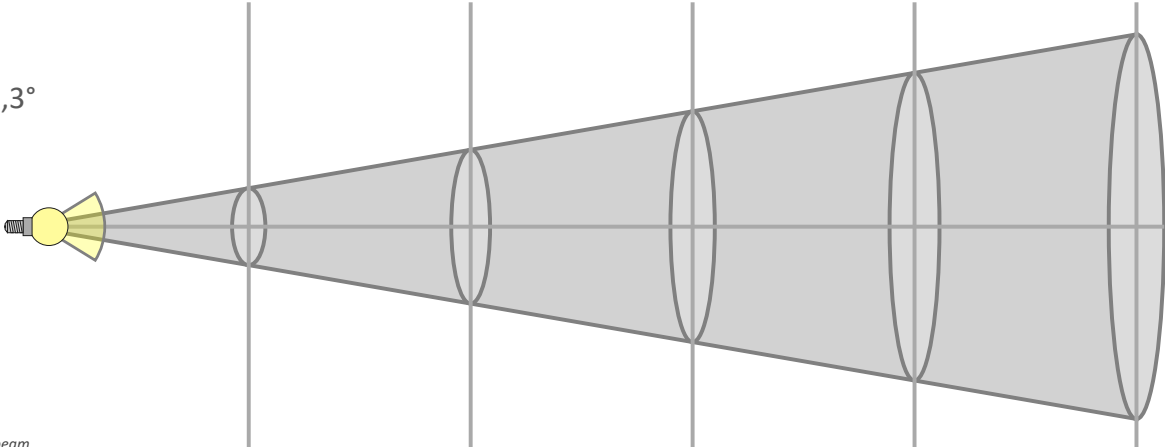
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| Beam details                                                                                                  |          |         |         |         | 1m              |        | 2m        |        | 3m       |                   | 4m       |        | 5m       |        |                              |        |        |        |        |                             |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------|----------|---------|---------|---------|-----------------|--------|-----------|--------|----------|-------------------|----------|--------|----------|--------|------------------------------|--------|--------|--------|--------|-----------------------------|--|--|--|--|
| Lux*                                                                                                          |          |         |         |         | 5207 lx         |        | 1302 lx   |        | 579 lx   |                   | 325 lx   |        | 208 lx   |        |                              |        |        |        |        |                             |  |  |  |  |
| <div><div>63,3°</div></div> |          |         |         |         |                 |        |           |        |          |                   |          |        |          |        |                              |        |        |        |        |                             |  |  |  |  |
|                                                                                                               |          |         |         |         |                 |        |           |        |          |                   |          |        |          |        |                              |        |        |        |        |                             |  |  |  |  |
|                                                                                                               |          |         |         |         |                 |        |           |        |          |                   |          |        |          |        |                              |        |        |        |        |                             |  |  |  |  |
|                                                                                                               |          |         |         |         |                 |        |           |        |          |                   |          |        |          |        |                              |        |        |        |        |                             |  |  |  |  |
| Footcandles*                                                                                                  |          |         |         |         | 483,7 fcd       |        | 120,9 fcd |        | 53,7 fcd |                   | 30,2 fcd |        | 19,3 fcd |        |                              |        |        |        |        |                             |  |  |  |  |
| Beam width (meter)                                                                                            |          |         |         |         | 1,2 m           |        | 2,5 m     |        | 3,7 m    |                   | 4,9 m    |        | 6,2 m    |        |                              |        |        |        |        |                             |  |  |  |  |
| Beam width (Feet)                                                                                             |          |         |         |         | 4 ft            |        | 8,1 ft    |        | 12,1 ft  |                   | 16,2 ft  |        | 20,2 ft  |        |                              |        |        |        |        |                             |  |  |  |  |
| Beam intensities                                                                                              |          |         |         |         |                 |        |           |        |          |                   |          |        |          |        |                              |        |        |        |        |                             |  |  |  |  |
| 1m                                                                                                            | 2m       | 3m      | 4m      | 5m      | 6m              | 7m     | 8m        | 9m     | 10m      | 11m               | 12m      | 13m    | 14m      | 15m    | 16m                          | 17m    | 18m    | 19m    | 20m    |                             |  |  |  |  |
| 5207lx                                                                                                        | 1302lx   | 579lx   | 325lx   | 208lx   | 145lx           | 106lx  | 81lx      | 64lx   | 52lx     | 43lx              | 36lx     | 31lx   | 27lx     | 23lx   | 20lx                         | 18lx   | 16lx   | 14lx   | 13lx   |                             |  |  |  |  |
| 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 |                             |  |  |  |  |
| 483,7fcd                                                                                                      | 120,9fcd | 53,7fcd | 30,2fcd | 19,3fcd | 13,4fcd         | 9,9fcd | 7,6fcd    | 6fcd   | 4,8fcd   | 4fcd              | 3,4fcd   | 2,9fcd | 2,5fcd   | 2,1fcd | 1,9fcd                       | 1,7fcd | 1,5fcd | 1,3fcd | 1,2fcd |                             |  |  |  |  |
| 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°    |                             |  |  |  |  |
| 5207                                                                                                          | 5232     | 5205    | 5133    | 5029    | 4920            | 4716   | 4511      | 4294   | 4068     | 3847              | 3665     | 3484   | 3293     | 3095   | 2874                         | 2530   | 2185   | 1785   | 1359   |                             |  |  |  |  |
| 100%                                                                                                          | 100%     | 100%    | 99%     | 97%     | 94%             | 91%    | 87%       | 82%    | 78%      | 74%               | 70%      | 67%    | 63%      | 59%    | 55%                          | 49%    | 42%    | 34%    | 26%    |                             |  |  |  |  |
| 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°    |                             |  |  |  |  |
| 5207                                                                                                          | 5182     | 5182    | 5129    | 5028    | 4923            | 4727   | 4531      | 4322   | 4103     | 3887              | 3704     | 3521   | 3327     | 3126   | 2901                         | 2551   | 2200   | 1798   | 1370   |                             |  |  |  |  |
| 100%                                                                                                          | 100%     | 100%    | 99%     | 97%     | 95%             | 91%    | 87%       | 83%    | 79%      | 75%               | 71%      | 68%    | 64%      | 60%    | 56%                          | 49%    | 42%    | 35%    | 26%    |                             |  |  |  |  |
| 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°    |                             |  |  |  |  |
| 5207                                                                                                          | 5232     | 5205    | 5133    | 5029    | 4920            | 4716   | 4511      | 4294   | 4068     | 3847              | 3665     | 3484   | 3293     | 3095   | 2874                         | 2530   | 2185   | 1785   | 1359   |                             |  |  |  |  |
| 100%                                                                                                          | 100%     | 100%    | 99%     | 97%     | 94%             | 91%    | 87%       | 82%    | 78%      | 74%               | 70%      | 67%    | 63%      | 59%    | 55%                          | 49%    | 42%    | 34%    | 26%    |                             |  |  |  |  |
| 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°    |                             |  |  |  |  |
| 5207                                                                                                          | 5182     | 5182    | 5129    | 5028    | 4923            | 4727   | 4531      | 4322   | 4103     | 3887              | 3704     | 3521   | 3327     | 3126   | 2901                         | 2551   | 2200   | 1798   | 1370   |                             |  |  |  |  |
| 100%                                                                                                          | 100%     | 100%    | 99%     | 97%     | 95%             | 91%    | 87%       | 83%    | 79%      | 75%               | 71%      | 68%    | 64%      | 60%    | 56%                          | 49%    | 42%    | 35%    | 26%    |                             |  |  |  |  |
| Beam angle 50%                                                                                                |          |         |         |         | Field angle 10% |        |           |        |          | Cutoff angle 2,5% |          |        |          |        | Intensity ratio in 120° cone |        |        |        |        | Intensity ratio in 90° cone |  |  |  |  |
| 63,3°                                                                                                         |          |         |         |         | 88,4°           |        |           |        |          | 113,5°            |          |        |          |        | 98,1%                        |        |        |        |        | 92,5%                       |  |  |  |  |



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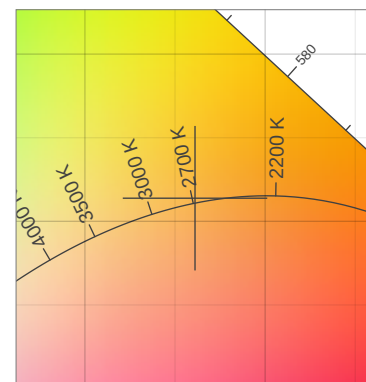
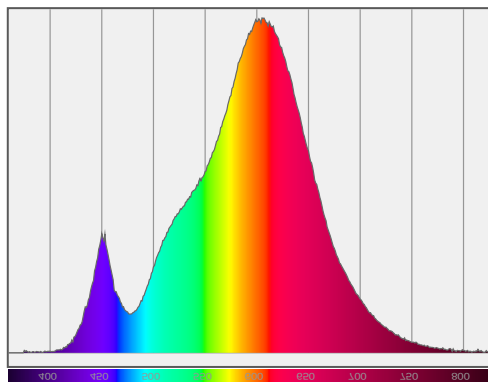
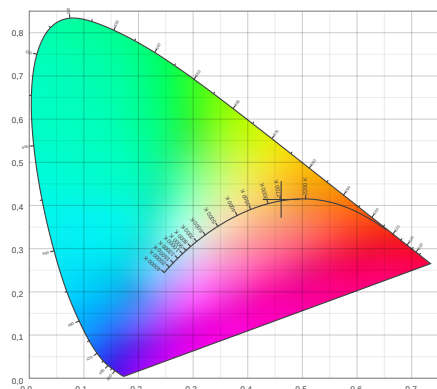
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### Color details



CIE 1931

x: 0,461

2711 K

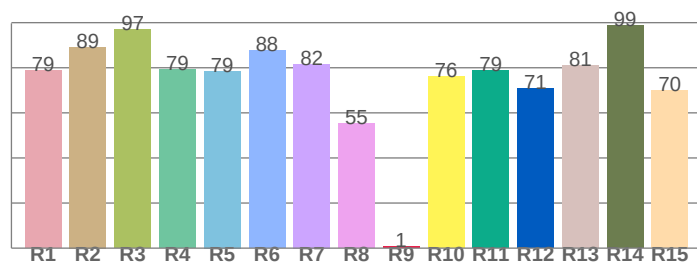
y: 0,414

Spectra

CIE 1931 ZOOM

$\Delta uv$ : 0,0011

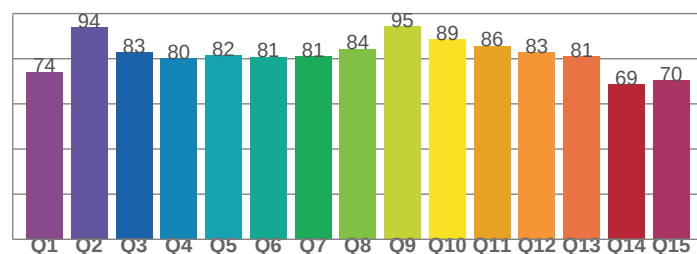
CRI: 80,9 (R1-R8)



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

| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   |
|------|------|------|------|------|------|------|------|
| 78,7 | 89,3 | 97,0 | 79,2 | 78,6 | 87,6 | 81,6 | 55,3 |
| R9   | R10  | R11  | R12  | R13  | R14  | R15  |      |
| 0,9  | 76,2 | 78,7 | 70,9 | 81,0 | 98,9 | 69,8 |      |

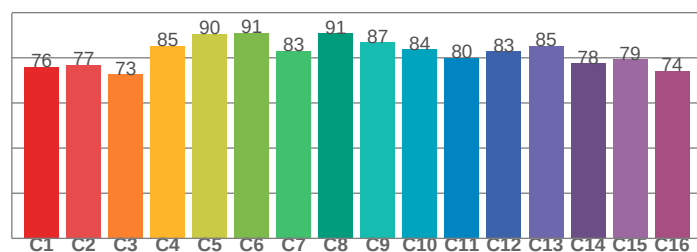
CQS: 80,6



CQS values

| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   |
|------|------|------|------|------|------|------|------|
| 74,2 | 94,0 | 82,9 | 80,2 | 81,7 | 80,9 | 80,9 | 84,4 |
| Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |      |
| 94,5 | 88,5 | 85,7 | 82,8 | 81,2 | 68,6 | 70,4 |      |

TM30: 81,9



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

| C1   | C2   | C3   | C4   | C5   | C6   | C7   | C8   |
|------|------|------|------|------|------|------|------|
| 75,9 | 76,8 | 72,6 | 85,2 | 90,5 | 90,9 | 83,1 | 90,8 |
| C9   | C10  | C11  | C12  | C13  | C14  | C15  |      |
| 86,8 | 83,7 | 80,0 | 82,9 | 85,3 | 77,6 | 79,3 |      |

### 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                | $\Delta uv$                     |
| 2711 K            | 80,9                  | 0,9           | 81,9           | 96,1        | 80,6                | 0,461                     | 0,414                     | 0,262            | 0,353            | 0,0011                          |



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### TM30 details

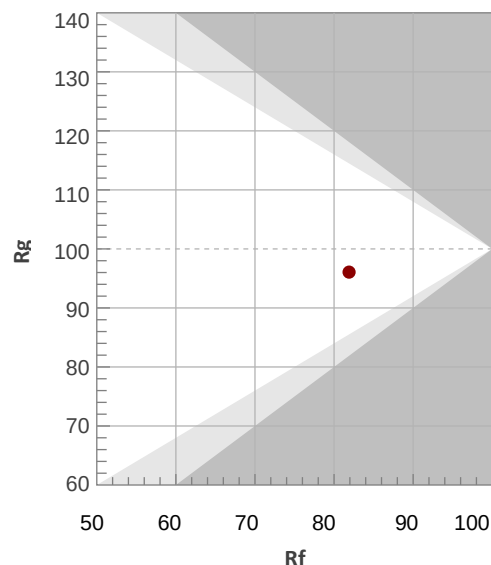
Rf 81,9

Fidelity index Rf

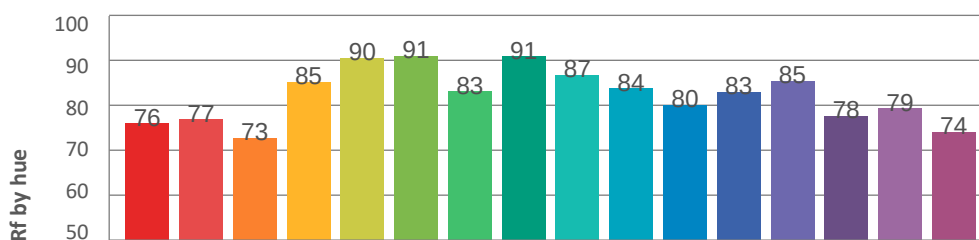
Rg 96,1

Gamut index Rg

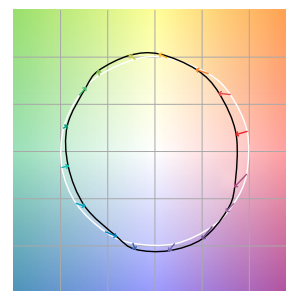
| Hue Bin | R <sub>f</sub> | Graphic shifts (%) |      |
|---------|----------------|--------------------|------|
|         |                | Chroma             | Hue  |
| 1       | 76             | -12%               | -1%  |
| 2       | 77             | -9%                | 8%   |
| 3       | 73             | -3%                | 13%  |
| 4       | 85             | 2%                 | 9%   |
| 5       | 90             | 5%                 | 5%   |
| 6       | 91             | 5%                 | -2%  |
| 7       | 83             | -1%                | -10% |
| 8       | 91             | -3%                | -3%  |
| 9       | 87             | -7%                | 0%   |
| 10      | 84             | -6%                | 7%   |
| 11      | 80             | -3%                | 12%  |
| 12      | 83             | 6%                 | 3%   |
| 13      | 85             | 6%                 | -7%  |
| 14      | 78             | 5%                 | -16% |
| 15      | 79             | -2%                | -11% |
| 16      | 74             | -10%               | -15% |



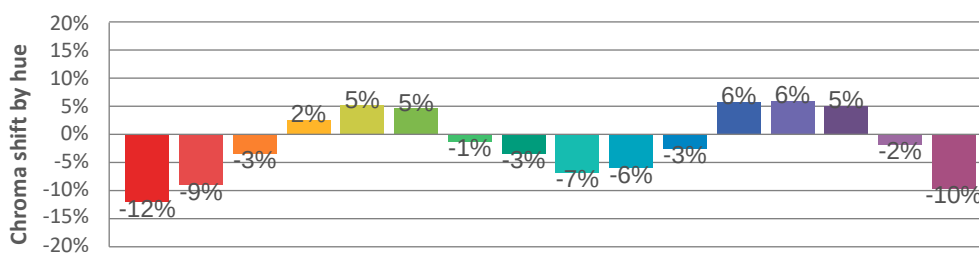
### Hue binH



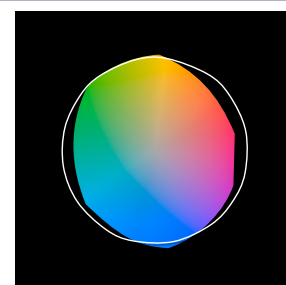
### Color vector graphics



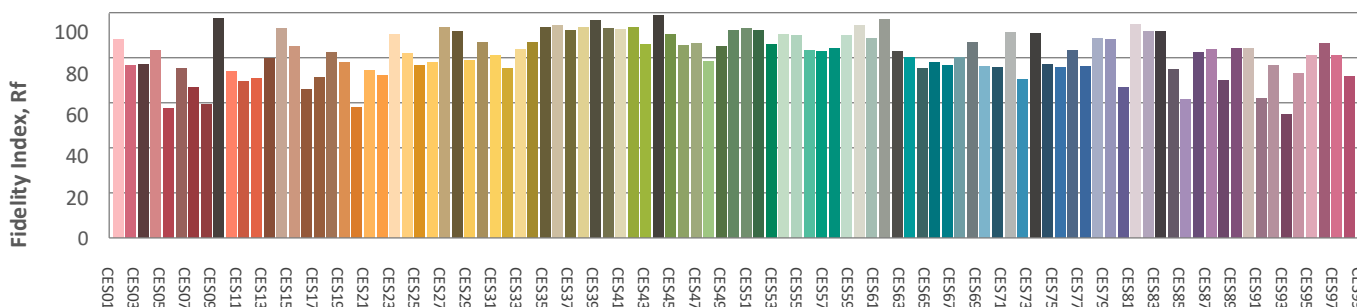
### Hue bin



### Color distortion graphics



### Color Evaluation Sample



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## 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  | 23,7                                           | 24,5 | 24,0 | 24,7 | 24,9 | 23,7                                    | 24,5 | 24,0 | 24,7 | 24,9 |
|                                                                 | 3H  | 23,7                                           | 24,3 | 24,0 | 24,6 | 24,8 | 23,7                                    | 24,3 | 24,0 | 24,6 | 24,8 |
|                                                                 | 4H  | 23,6                                           | 24,2 | 23,9 | 24,5 | 24,8 | 23,6                                    | 24,2 | 23,9 | 24,5 | 24,8 |
|                                                                 | 6H  | 23,5                                           | 24,1 | 23,9 | 24,4 | 24,7 | 23,5                                    | 24,1 | 23,9 | 24,4 | 24,7 |
|                                                                 | 8H  | 23,5                                           | 24,1 | 23,8 | 24,4 | 24,7 | 23,5                                    | 24,1 | 23,8 | 24,4 | 24,7 |
|                                                                 | 12H | 23,5                                           | 24,0 | 23,8 | 24,3 | 24,6 | 23,5                                    | 24,0 | 23,8 | 24,3 | 24,6 |
| 4H                                                              | 2H  | 23,6                                           | 24,2 | 23,9 | 24,5 | 24,8 | 23,6                                    | 24,2 | 23,9 | 24,5 | 24,8 |
|                                                                 | 3H  | 23,5                                           | 24,1 | 23,9 | 24,4 | 24,7 | 23,5                                    | 24,1 | 23,9 | 24,4 | 24,7 |
|                                                                 | 4H  | 23,5                                           | 23,9 | 23,9 | 24,3 | 24,6 | 23,5                                    | 23,9 | 23,9 | 24,3 | 24,6 |
|                                                                 | 6H  | 23,4                                           | 23,8 | 23,8 | 24,2 | 24,6 | 23,4                                    | 23,8 | 23,8 | 24,2 | 24,6 |
|                                                                 | 8H  | 23,4                                           | 23,7 | 23,8 | 24,1 | 24,5 | 23,4                                    | 23,7 | 23,8 | 24,1 | 24,5 |
|                                                                 | 12H | 23,3                                           | 23,6 | 23,8 | 24,0 | 24,5 | 23,3                                    | 23,6 | 23,8 | 24,0 | 24,5 |
| 8H                                                              | 4H  | 23,4                                           | 23,7 | 23,8 | 24,1 | 24,5 | 23,4                                    | 23,7 | 23,8 | 24,1 | 24,5 |
|                                                                 | 6H  | 23,3                                           | 23,6 | 23,8 | 24,0 | 24,4 | 23,3                                    | 23,6 | 23,8 | 24,0 | 24,4 |
|                                                                 | 8H  | 23,3                                           | 23,5 | 23,7 | 23,9 | 24,4 | 23,3                                    | 23,5 | 23,7 | 23,9 | 24,4 |
|                                                                 | 12H | 23,2                                           | 23,4 | 23,7 | 23,9 | 24,4 | 23,2                                    | 23,4 | 23,7 | 23,9 | 24,4 |
| 12H                                                             | 4H  | 23,3                                           | 23,6 | 23,8 | 24,0 | 24,5 | 23,3                                    | 23,6 | 23,8 | 24,0 | 24,5 |
|                                                                 | 6H  | 23,2                                           | 23,5 | 23,7 | 23,9 | 24,4 | 23,2                                    | 23,5 | 23,7 | 23,9 | 24,4 |
|                                                                 | 8H  | 23,2                                           | 23,4 | 23,7 | 23,9 | 24,4 | 23,2                                    | 23,4 | 23,7 | 23,9 | 24,4 |
| Variation of the observer position for the luminaire distance S |     |                                                |      |      |      |      |                                         |      |      |      |      |
| S = 1,0H                                                        |     | +3,9 / -5,7                                    |      |      |      |      | +3,9 / -5,7                             |      |      |      |      |
| S = 1,5H                                                        |     | +6,5 / -7,9                                    |      |      |      |      | +6,5 / -7,9                             |      |      |      |      |
| S = 2,0H                                                        |     | +8,5 / -10,1                                   |      |      |      |      | +8,5 / -10,1                            |      |      |      |      |
| Standard table                                                  |     | BK00                                           |      |      |      |      | BK00                                    |      |      |      |      |
| Correction summand                                              |     | 5,2                                            |      |      |      |      | 5,2                                     |      |      |      |      |
| Corrected glare indices referring to 5123lm total luminous flux |     |                                                |      |      |      |      |                                         |      |      |      |      |

