

# LM-79

## Test Report

### LM79-RUBY-BRACKET-6-2700K-CRI80-SPOT

#### General Discription

|                   |                     |                                                                                    |
|-------------------|---------------------|------------------------------------------------------------------------------------|
| Item number       | RU-36-X-X-01-1-X    |  |
| Date and time     | 18-11-2016 14:06:04 |                                                                                    |
| CCT (Kelvin)      | 2675 K              |                                                                                    |
| Beam angle        | 14,3°               |                                                                                    |
| Luminous flux     | 2666 lm             |                                                                                    |
| Efficiency        | 92 lm/watt          |                                                                                    |
| Weighted energy   | 28,9 kWh/1000h      |                                                                                    |
| Power factor      | 0,99                |                                                                                    |
| CRI (RA)          | 81,9                |                                                                                    |
| Fidelity index Rf | Rf 82,1             |                                                                                    |
| Gammut index Rg   | Rg 97,0             |                                                                                    |
| Peak              | 14391 cd            |                                                                                    |



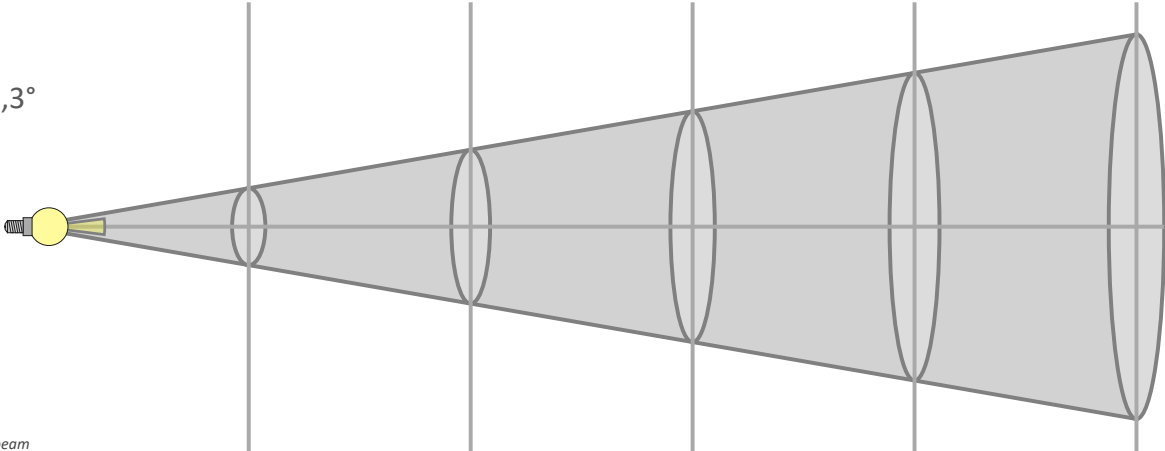
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| Beam details                                                                                                  |        |          |         | 1m              |         | 2m        |         | 3m                |         | 4m       |        | 5m                           |        |        |        |                             |        |        |        |
|---------------------------------------------------------------------------------------------------------------|--------|----------|---------|-----------------|---------|-----------|---------|-------------------|---------|----------|--------|------------------------------|--------|--------|--------|-----------------------------|--------|--------|--------|
| Lux*                                                                                                          |        |          |         | 14382 lx        |         | 3595 lx   |         | 1598 lx           |         | 899 lx   |        | 575 lx                       |        |        |        |                             |        |        |        |
| <div><div>14,3°</div></div> |        |          |         |                 |         |           |         |                   |         |          |        |                              |        |        |        |                             |        |        |        |
| *measured at center of beam                                                                                   |        |          |         |                 |         |           |         |                   |         |          |        |                              |        |        |        |                             |        |        |        |
| Footcandles*                                                                                                  |        |          |         | 1336,1 fcd      |         | 334,0 fcd |         | 148,5 fcd         |         | 83,5 fcd |        | 53,4 fcd                     |        |        |        |                             |        |        |        |
| Beam width (meter)                                                                                            |        |          |         | 0,3 m           |         | 0,5 m     |         | 0,8 m             |         | 1 m      |        | 1,3 m                        |        |        |        |                             |        |        |        |
| Beam width (Feet)                                                                                             |        |          |         | 0,8 ft          |         | 1,6 ft    |         | 2,5 ft            |         | 3,3 ft   |        | 4,1 ft                       |        |        |        |                             |        |        |        |
| Beam intensities                                                                                              |        |          |         |                 |         |           |         |                   |         |          |        |                              |        |        |        |                             |        |        |        |
| 1m                                                                                                            | 2m     | 3m       | 4m      | 5m              | 6m      | 7m        | 8m      | 9m                | 10m     | 11m      | 12m    | 13m                          | 14m    | 15m    | 16m    | 17m                         | 18m    | 19m    | 20m    |
| 14382lx                                                                                                       | 3595lx | 1598lx   | 899lx   | 575lx           | 399lx   | 294lx     | 225lx   | 178lx             | 144lx   | 119lx    | 100lx  | 85lx                         | 73lx   | 64lx   | 56lx   | 50lx                        | 44lx   | 40lx   | 36lx   |
| 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 |
| 1336,1fcd                                                                                                     | 334fcd | 148,5fcd | 83,5fcd | 53,4fcd         | 37,1fcd | 27,3fcd   | 20,9fcd | 16,5fcd           | 13,4fcd | 11fcd    | 9,3fcd | 7,9fcd                       | 6,8fcd | 5,9fcd | 5,2fcd | 4,6fcd                      | 4,1fcd | 3,7fcd | 3,3fcd |
| Intensities in 0° c-plane                                                                                     |        |          |         |                 |         |           |         |                   |         |          |        |                              |        |        |        |                             |        |        |        |
| 0°                                                                                                            | 1°     | 2°       | 3°      | 4°              | 5°      | 6°        | 7°      | 8°                | 9°      | 10°      | 11°    | 12°                          | 13°    | 14°    | 15°    | 16°                         | 17°    | 18°    | 19°    |
| 14,4K                                                                                                         | 14,2K  | 13,6K    | 12,6K   | 11,4K           | 10,1K   | 8,7K      | 7,3K    | 6,1K              | 5,1K    | 4,3K     | 3,6K   | 3,1K                         | 2,7K   | 2,4K   | 2,1K   | 1,9K                        | 1,8K   | 1,6K   | 1,5K   |
| 100%                                                                                                          | 99%    | 94%      | 88%     | 80%             | 70%     | 60%       | 51%     | 43%               | 36%     | 30%      | 25%    | 22%                          | 19%    | 17%    | 15%    | 13%                         | 12%    | 11%    | 11%    |
| Intensities in 90° c-plane                                                                                    |        |          |         |                 |         |           |         |                   |         |          |        |                              |        |        |        |                             |        |        |        |
| 0°                                                                                                            | 1°     | 2°       | 3°      | 4°              | 5°      | 6°        | 7°      | 8°                | 9°      | 10°      | 11°    | 12°                          | 13°    | 14°    | 15°    | 16°                         | 17°    | 18°    | 19°    |
| 14,4K                                                                                                         | 14,2K  | 13,6K    | 12,7K   | 11,5K           | 10,2K   | 8,8K      | 7,4K    | 6,2K              | 5,2K    | 4,3K     | 3,7K   | 3,1K                         | 2,7K   | 2,4K   | 2,2K   | 1,9K                        | 1,8K   | 1,6K   | 1,5K   |
| 100%                                                                                                          | 99%    | 95%      | 88%     | 80%             | 71%     | 61%       | 51%     | 43%               | 36%     | 30%      | 25%    | 22%                          | 19%    | 17%    | 15%    | 14%                         | 12%    | 11%    | 11%    |
| Intensities in 180° c-plane                                                                                   |        |          |         |                 |         |           |         |                   |         |          |        |                              |        |        |        |                             |        |        |        |
| 0°                                                                                                            | 1°     | 2°       | 3°      | 4°              | 5°      | 6°        | 7°      | 8°                | 9°      | 10°      | 11°    | 12°                          | 13°    | 14°    | 15°    | 16°                         | 17°    | 18°    | 19°    |
| 14,4K                                                                                                         | 14,2K  | 13,6K    | 12,6K   | 11,4K           | 10,1K   | 8,7K      | 7,3K    | 6,1K              | 5,1K    | 4,3K     | 3,6K   | 3,1K                         | 2,7K   | 2,4K   | 2,1K   | 1,9K                        | 1,8K   | 1,6K   | 1,5K   |
| 100%                                                                                                          | 99%    | 94%      | 88%     | 80%             | 70%     | 60%       | 51%     | 43%               | 36%     | 30%      | 25%    | 22%                          | 19%    | 17%    | 15%    | 13%                         | 12%    | 11%    | 11%    |
| Intensities in 270° c-plane                                                                                   |        |          |         |                 |         |           |         |                   |         |          |        |                              |        |        |        |                             |        |        |        |
| 0°                                                                                                            | 1°     | 2°       | 3°      | 4°              | 5°      | 6°        | 7°      | 8°                | 9°      | 10°      | 11°    | 12°                          | 13°    | 14°    | 15°    | 16°                         | 17°    | 18°    | 19°    |
| 14,4K                                                                                                         | 14,2K  | 13,6K    | 12,7K   | 11,5K           | 10,2K   | 8,8K      | 7,4K    | 6,2K              | 5,2K    | 4,3K     | 3,7K   | 3,1K                         | 2,7K   | 2,4K   | 2,2K   | 1,9K                        | 1,8K   | 1,6K   | 1,5K   |
| 100%                                                                                                          | 99%    | 95%      | 88%     | 80%             | 71%     | 61%       | 51%     | 43%               | 36%     | 30%      | 25%    | 22%                          | 19%    | 17%    | 15%    | 14%                         | 12%    | 11%    | 11%    |
| Beam angle 50%                                                                                                |        |          |         | Field angle 10% |         |           |         | Cutoff angle 2,5% |         |          |        | Intensity ratio in 120° cone |        |        |        | Intensity ratio in 90° cone |        |        |        |
| 14,3°                                                                                                         |        |          |         | 39,9°           |         |           |         | 84,1°             |         |          |        | 99,4%                        |        |        |        | 98,0%                       |        |        |        |



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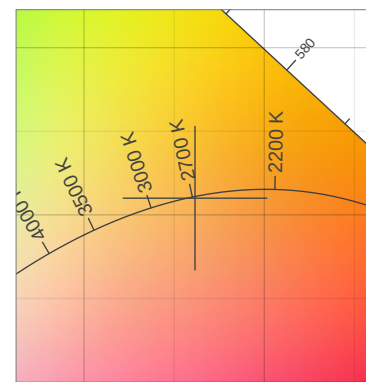
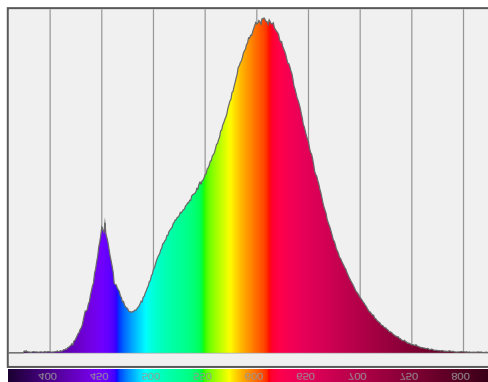
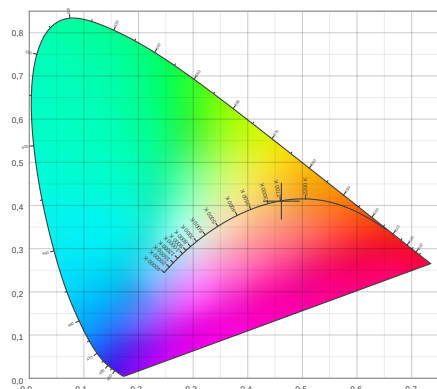
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#### Color details



CIE 1931

x: 0,462



Spectra

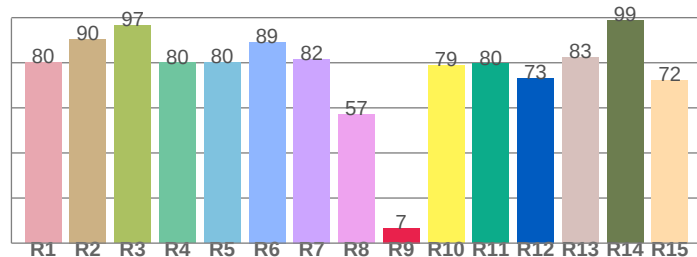
CIE 1931 ZOOM

2675 K

y: 0,410

$\Delta uv$ : 0,0004

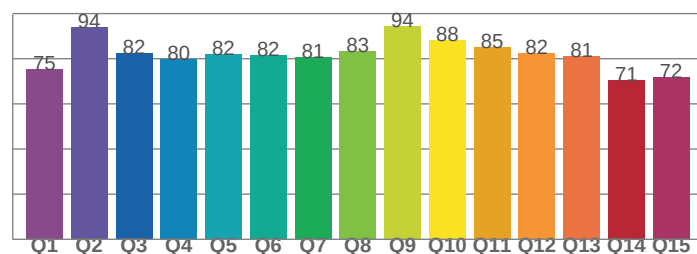
CRI: 81,9 (R1-R8)



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

| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   |
|------|------|------|------|------|------|------|------|
| 80,2 | 90,5 | 96,6 | 80,0 | 80,1 | 89,1 | 81,7 | 57,2 |
| R9   | R10  | R11  | R12  | R13  | R14  | R15  |      |
| 6,7  | 78,7 | 79,5 | 73,2 | 82,5 | 98,9 | 72,0 |      |

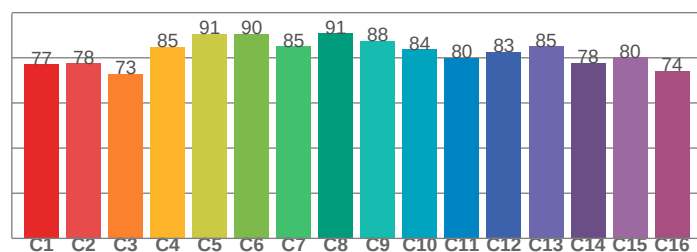
CQS: 80,9



CQS values

| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   |
|------|------|------|------|------|------|------|------|
| 75,3 | 93,9 | 82,4 | 79,9 | 82,1 | 81,5 | 80,7 | 83,4 |
| Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |      |
| 94,2 | 88,3 | 85,1 | 82,3 | 81,2 | 70,6 | 71,9 |      |

TM30: 82,1



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

| C1   | C2   | C3   | C4   | C5   | C6   | C7   | C8   |
|------|------|------|------|------|------|------|------|
| 77,0 | 77,5 | 72,8 | 84,7 | 90,7 | 90,4 | 85,0 | 90,8 |
| C9   | C10  | C11  | C12  | C13  | C14  | C15  |      |
| 87,5 | 83,6 | 80,0 | 82,6 | 85,0 | 77,6 | 80,1 |      |

#### 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                | $\Delta uv$                     |
| 2675 K            | 81,9                  | 6,7           | 82,1           | 97,0        | 80,9                | 0,462                     | 0,410                     | 0,264            | 0,352            | 0,0004                          |



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### LM79-RUBY-BRACKET-6-2700K-CRI80-SPOT

#### TM30 details

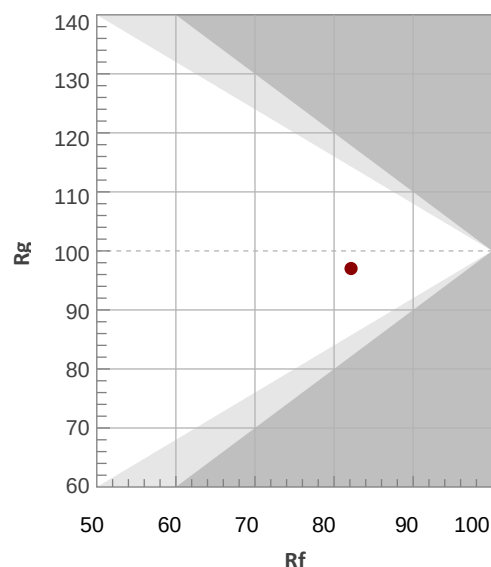
Rf 82,1

Fidelity index Rf

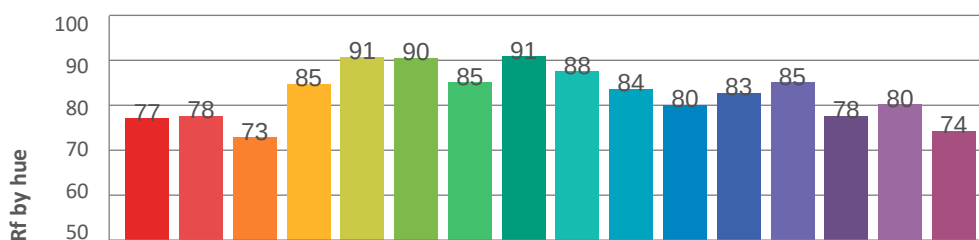
Rg 97,0

Gamut index Rg

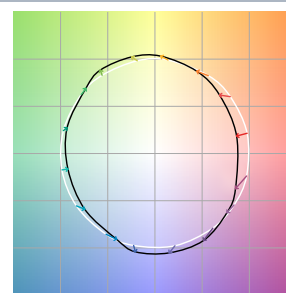
| Hue Bin | R <sub>f</sub> | Graphic shifts (%) |      |
|---------|----------------|--------------------|------|
|         |                | Chroma             | Hue  |
| 1       | 77             | -12%               | -1%  |
| 2       | 78             | -9%                | 8%   |
| 3       | 73             | -3%                | 13%  |
| 4       | 85             | 3%                 | 8%   |
| 5       | 91             | 5%                 | 5%   |
| 6       | 90             | 6%                 | -1%  |
| 7       | 85             | 0%                 | -8%  |
| 8       | 91             | -3%                | -4%  |
| 9       | 88             | -6%                | 0%   |
| 10      | 84             | -5%                | 8%   |
| 11      | 80             | -2%                | 12%  |
| 12      | 83             | 6%                 | 3%   |
| 13      | 85             | 6%                 | -7%  |
| 14      | 78             | 5%                 | -15% |
| 15      | 80             | -2%                | -11% |
| 16      | 74             | -9%                | -15% |



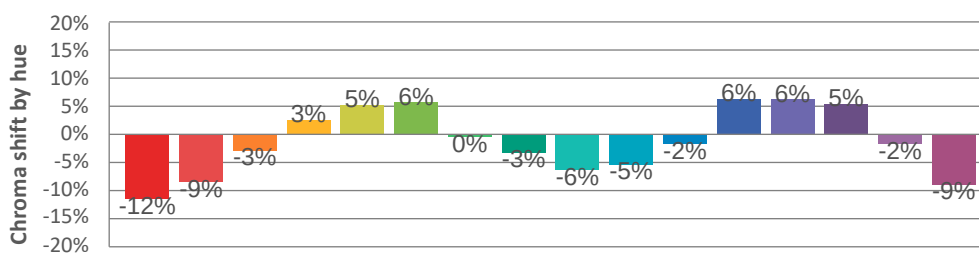
#### Hue binH



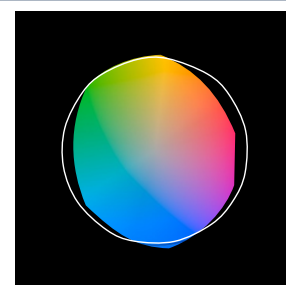
#### Color vector graphics



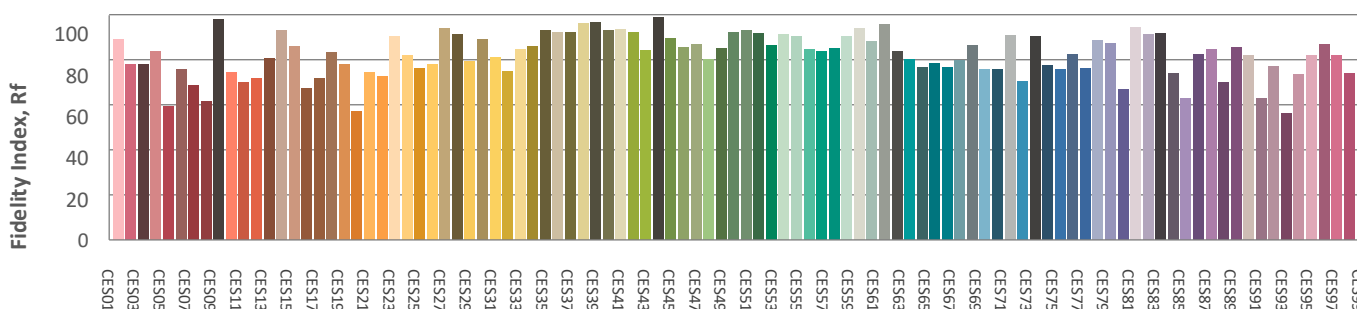
#### Hue bin



#### Color distortion graphics



#### Color Evaluation Sample



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# LM-79

## Test Report

### LM79-RUBY-BRACKET-6-2700K-CRI80-SPOT

#### 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  | 19,9                                           | 20,6 | 20,2 | 20,8 | 21,0 | 19,9                                    | 20,6 | 20,2 | 20,8 | 21,0 |
|                  | 3H  | 19,8                                           | 20,4 | 20,1 | 20,6 | 20,9 | 19,8                                    | 20,4 | 20,1 | 20,6 | 20,9 |
|                  | 4H  | 19,7                                           | 20,3 | 20,0 | 20,5 | 20,8 | 19,7                                    | 20,3 | 20,0 | 20,5 | 20,8 |
|                  | 6H  | 19,6                                           | 20,2 | 20,0 | 20,5 | 20,7 | 19,6                                    | 20,2 | 20,0 | 20,5 | 20,7 |
|                  | 8H  | 19,6                                           | 20,1 | 19,9 | 20,4 | 20,7 | 19,6                                    | 20,1 | 19,9 | 20,4 | 20,7 |
|                  | 12H | 19,6                                           | 20,0 | 19,9 | 20,4 | 20,7 | 19,6                                    | 20,0 | 19,9 | 20,4 | 20,7 |
| 4H               | 2H  | 19,7                                           | 20,3 | 20,0 | 20,5 | 20,8 | 19,7                                    | 20,3 | 20,0 | 20,5 | 20,8 |
|                  | 3H  | 19,6                                           | 20,0 | 19,9 | 20,4 | 20,7 | 19,6                                    | 20,0 | 19,9 | 20,4 | 20,7 |
|                  | 4H  | 19,5                                           | 19,9 | 19,9 | 20,2 | 20,6 | 19,5                                    | 19,9 | 19,9 | 20,2 | 20,6 |
|                  | 6H  | 19,4                                           | 19,8 | 19,8 | 20,1 | 20,5 | 19,4                                    | 19,8 | 19,8 | 20,1 | 20,5 |
|                  | 8H  | 19,4                                           | 19,7 | 19,8 | 20,1 | 20,5 | 19,4                                    | 19,7 | 19,8 | 20,1 | 20,5 |
|                  | 12H | 19,3                                           | 19,6 | 19,8 | 20,0 | 20,4 | 19,3                                    | 19,6 | 19,8 | 20,0 | 20,4 |
| 8H               | 4H  | 19,4                                           | 19,7 | 19,8 | 20,1 | 20,5 | 19,4                                    | 19,7 | 19,8 | 20,1 | 20,5 |
|                  | 6H  | 19,3                                           | 19,5 | 19,7 | 19,9 | 20,4 | 19,3                                    | 19,5 | 19,7 | 19,9 | 20,4 |
|                  | 8H  | 19,2                                           | 19,4 | 19,7 | 19,9 | 20,4 | 19,2                                    | 19,4 | 19,7 | 19,9 | 20,4 |
|                  | 12H | 19,2                                           | 19,3 | 19,7 | 19,8 | 20,3 | 19,2                                    | 19,3 | 19,7 | 19,8 | 20,3 |
| 12H              | 4H  | 19,3                                           | 19,6 | 19,8 | 20,0 | 20,4 | 19,3                                    | 19,6 | 19,8 | 20,0 | 20,4 |
|                  | 6H  | 19,2                                           | 19,4 | 19,7 | 19,9 | 20,4 | 19,2                                    | 19,4 | 19,7 | 19,9 | 20,4 |
|                  | 8H  | 19,2                                           | 19,3 | 19,7 | 19,8 | 20,3 | 19,2                                    | 19,3 | 19,7 | 19,8 | 20,3 |

#### Variation of the observer position for the luminaire distance S

|                    |              |              |
|--------------------|--------------|--------------|
| S = 1,0H           | +4,1 / -16,9 | +4,1 / -16,9 |
| S = 1,5H           | +6,4 / -19,5 | +6,4 / -19,5 |
| S = 2,0H           | +8,4 / -20,3 | +8,4 / -20,3 |
| Standard table     | BK00         | BK00         |
| Correction summand | 1,2          | 1,2          |

Corrected glare indices referring to 2666lm total luminous flux



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