

# LM-79

## Test Report

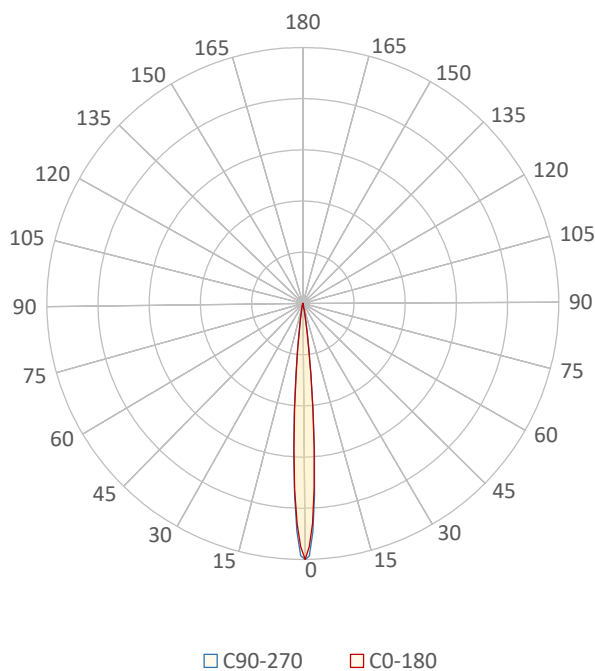
### LM79-JADE-ZOOM-2700K-CRI90-SPOT

#### General Discription

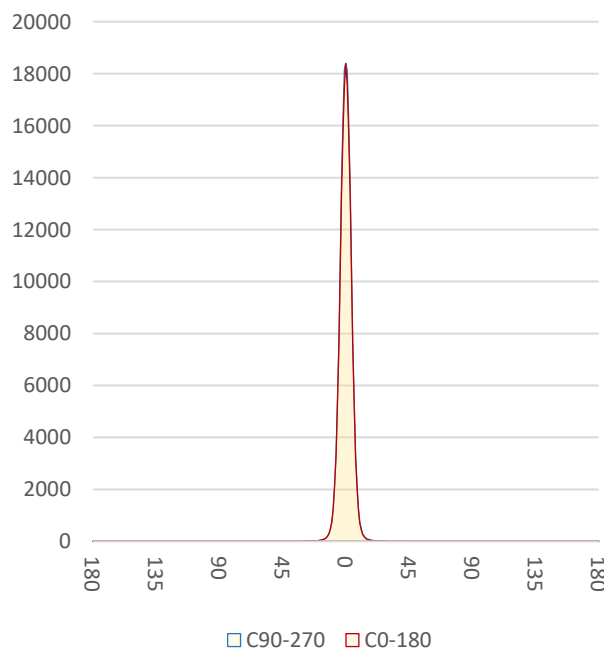
|                   |                    |
|-------------------|--------------------|
| Item number       |                    |
| Date and time     | 29-5-2019 12:14:10 |
| CCT (Kelvin)      | 2713 K             |
| Beam angle        | 8,9°               |
| Luminous flux     | 548 lm             |
| Efficiency        | 23 lm/watt         |
| Weighted energy   | 24,2 kWh/1000h     |
| Power factor      | 0,97               |
| CRI (RA)          | 91,8               |
| Fidelity index Rf | Rf 89,8            |
| Gammut index Rg   | Rg 101,2           |
| Peak              | 18755 cd           |



*Polar diagram*



*Cartesian diagram*



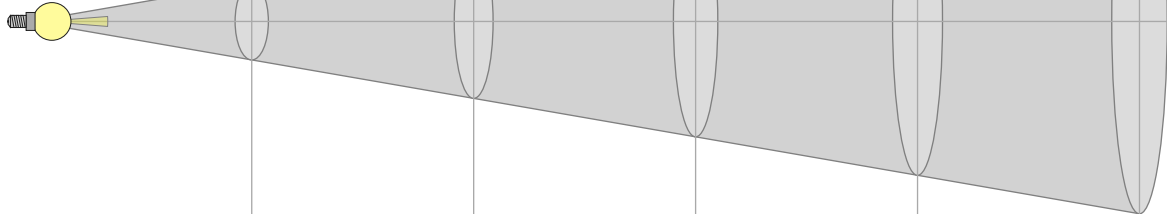
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| Beam details                                                                                                 |          |          |          |                 | 1m         |         | 2m        |                   | 3m        |         | 4m        |                              | 5m       |        |        |                             |        |        |        |
|--------------------------------------------------------------------------------------------------------------|----------|----------|----------|-----------------|------------|---------|-----------|-------------------|-----------|---------|-----------|------------------------------|----------|--------|--------|-----------------------------|--------|--------|--------|
| Lux*                                                                                                         |          |          |          |                 | 18393 lx   |         | 4598 lx   |                   | 2044 lx   |         | 1150 lx   |                              | 736 lx   |        |        |                             |        |        |        |
| <div><div>8,9°</div></div> |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| *measured at center of beam                                                                                  |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| Footcandles*                                                                                                 |          |          |          |                 | 1708,8 fcd |         | 427,2 fcd |                   | 189,9 fcd |         | 106,8 fcd |                              | 68,4 fcd |        |        |                             |        |        |        |
| Beam width (meter)                                                                                           |          |          |          |                 | 0,2 m      |         | 0,3 m     |                   | 0,5 m     |         | 0,6 m     |                              | 0,8 m    |        |        |                             |        |        |        |
| Beam width (Feet)                                                                                            |          |          |          |                 | 0,5 ft     |         | 1 ft      |                   | 1,5 ft    |         | 2 ft      |                              | 2,6 ft   |        |        |                             |        |        |        |
| Beam intensities                                                                                             |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| 1m                                                                                                           | 2m       | 3m       | 4m       | 5m              | 6m         | 7m      | 8m        | 9m                | 10m       | 11m     | 12m       | 13m                          | 14m      | 15m    | 16m    | 17m                         | 18m    | 19m    | 20m    |
| 18393lx                                                                                                      | 4598lx   | 2044lx   | 1150lx   | 736lx           | 511lx      | 375lx   | 287lx     | 227lx             | 184lx     | 152lx   | 128lx     | 109lx                        | 94lx     | 82lx   | 72lx   | 64lx                        | 57lx   | 51lx   | 46lx   |
| 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 |
| 1708,8fcd                                                                                                    | 427,2fcd | 189,9fcd | 106,8fcd | 68,4fcd         | 47,5fcd    | 34,9fcd | 26,7fcd   | 21,1fcd           | 17,1fcd   | 14,1fcd | 11,9fcd   | 10,1fcd                      | 8,7fcd   | 7,6fcd | 6,7fcd | 5,9fcd                      | 5,3fcd | 4,7fcd | 4,3fcd |
|                                                                                                              |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| 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°    |
| 18,4K                                                                                                        | 17,5K    | 15,8K    | 13,3K    | 10,4K           | 7,6K       | 5,1K    | 3,3K      | 2,1K              | 1,3K      | 0,8K    | 0,5K      | 0,3K                         | 0,2K     | 0,1K   | 0,1K   | 0,1K                        | 0,1K   | 0,0K   | 0,0K   |
| 100%                                                                                                         | 95%      | 86%      | 72%      | 57%             | 41%        | 28%     | 18%       | 11%               | 7%        | 4%      | 3%        | 2%                           | 1%       | 1%     | 1%     | 0%                          | 0%     | 0%     | 0%     |
|                                                                                                              |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| 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°    |
| 18,4K                                                                                                        | 18,2K    | 16,4K    | 13,8K    | 10,7K           | 7,8K       | 5,2K    | 3,3K      | 2,0K              | 1,2K      | 0,7K    | 0,5K      | 0,3K                         | 0,2K     | 0,1K   | 0,1K   | 0,1K                        | 0,1K   | 0,0K   | 0,0K   |
| 100%                                                                                                         | 99%      | 89%      | 75%      | 58%             | 42%        | 28%     | 18%       | 11%               | 7%        | 4%      | 2%        | 2%                           | 1%       | 1%     | 0%     | 0%                          | 0%     | 0%     | 0%     |
|                                                                                                              |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| 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°    |
| 18,4K                                                                                                        | 17,5K    | 15,9K    | 13,4K    | 10,4K           | 7,5K       | 5,0K    | 3,2K      | 2,0K              | 1,2K      | 0,7K    | 0,4K      | 0,3K                         | 0,2K     | 0,1K   | 0,1K   | 0,1K                        | 0,0K   | 0,0K   | 0,0K   |
| 100%                                                                                                         | 95%      | 86%      | 73%      | 57%             | 41%        | 27%     | 17%       | 11%               | 6%        | 4%      | 2%        | 1%                           | 1%       | 1%     | 0%     | 0%                          | 0%     | 0%     | 0%     |
|                                                                                                              |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| 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°    |
| 18,4K                                                                                                        | 18,1K    | 16,4K    | 13,8K    | 10,7K           | 7,8K       | 5,2K    | 3,3K      | 2,1K              | 1,2K      | 0,8K    | 0,5K      | 0,3K                         | 0,2K     | 0,1K   | 0,1K   | 0,1K                        | 0,1K   | 0,0K   | 0,0K   |
| 100%                                                                                                         | 99%      | 89%      | 75%      | 58%             | 42%        | 28%     | 18%       | 11%               | 7%        | 4%      | 3%        | 2%                           | 1%       | 1%     | 1%     | 0%                          | 0%     | 0%     | 0%     |
|                                                                                                              |          |          |          |                 |            |         |           |                   |           |         |           |                              |          |        |        |                             |        |        |        |
| Beam angle 50%                                                                                               |          |          |          | Field angle 10% |            |         |           | Cutoff angle 2,5% |           |         |           | Intensity ratio in 120° cone |          |        |        | Intensity ratio in 90° cone |        |        |        |
| 8,9°                                                                                                         |          |          |          | 16,4°           |            |         |           | 22°               |           |         |           | 99,1%                        |          |        |        | 98,8%                       |        |        |        |



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info@cls-led.com  
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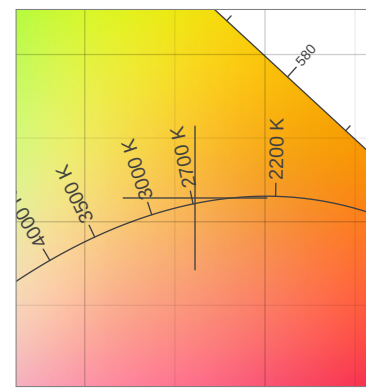
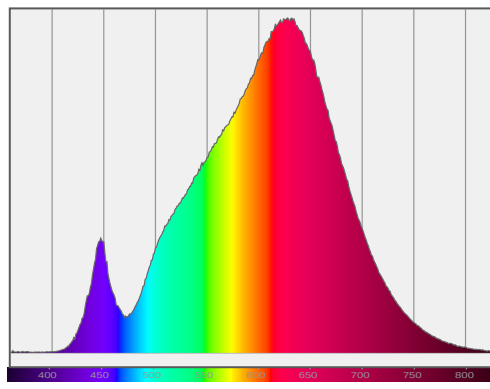
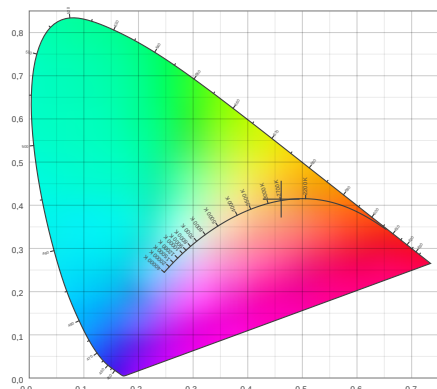
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### LM79-JADE-ZOOM-2700K-CRI90-SPOT

#### Color details



CIE 1931

x: 0,461



Spectra

CIE 1931 ZOOM

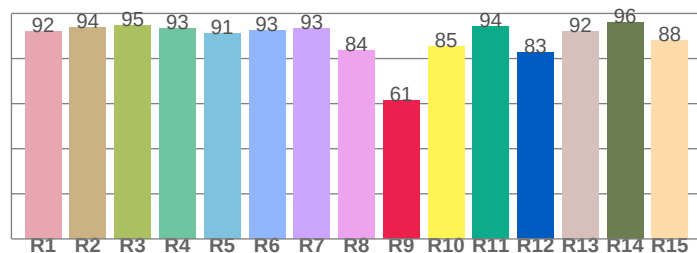
2713 K

y: 0,414

$\Delta uv$ : 0,0012

CRI: 91,8 (R1-R8)

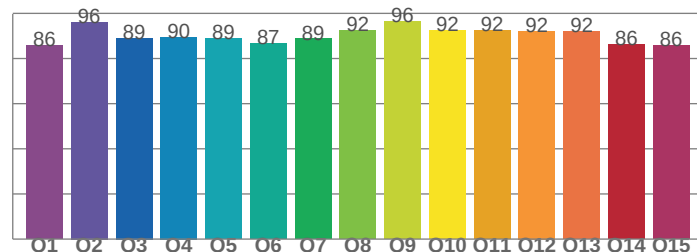
CRI values, R1-R8 are used to calculate final CRI value



| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   |
|------|------|------|------|------|------|------|------|
| 92,0 | 93,9 | 94,6 | 93,2 | 91,3 | 92,6 | 93,3 | 83,5 |
| R9   | R10  | R11  | R12  | R13  | R14  | R15  |      |
| 61,4 | 85,3 | 94,2 | 82,8 | 92,1 | 96,2 | 88,2 |      |

CQS: 89,5

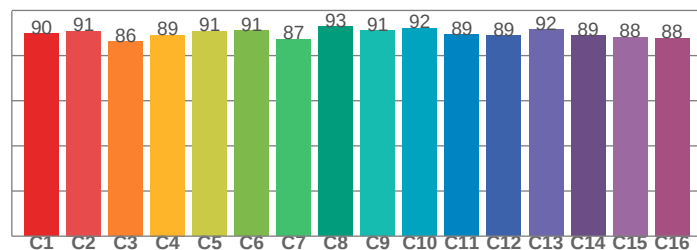
CQS values



| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   |
|------|------|------|------|------|------|------|------|
| 85,7 | 96,2 | 89,1 | 89,5 | 88,7 | 86,6 | 88,7 | 92,3 |
| Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |      |
| 96,5 | 92,3 | 92,3 | 92,2 | 92,2 | 86,1 | 85,9 |      |

TM30: 89,8

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



| C1   | C2   | C3   | C4   | C5   | C6   | C7   | C8   |
|------|------|------|------|------|------|------|------|
| 89,7 | 90,9 | 86,3 | 89,1 | 90,8 | 91,0 | 87,3 | 93,0 |
| C9   | C10  | C11  | C12  | C13  | C14  | C15  |      |
| 91,1 | 92,1 | 89,2 | 88,9 | 91,7 | 89,0 | 88,3 |      |

#### 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                | $\Delta uv$                     |
| 2713 K            | 91,8                  | 61,4          | 89,8           | 101,2       | 89,5                | 0,461                     | 0,414                     | 0,262            | 0,353            | 0,0012                          |



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info@cls-led.com  
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#### TM30 details

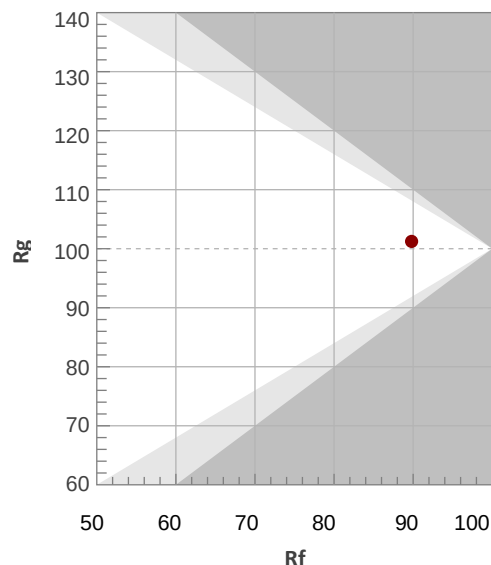
Rf 89,8

Fidelity index Rf

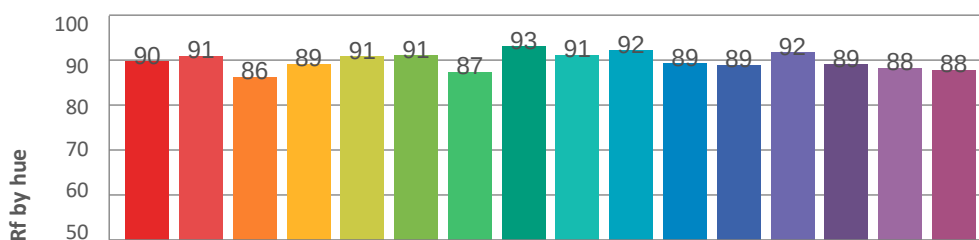
Rg 101,2

Gamut index Rg

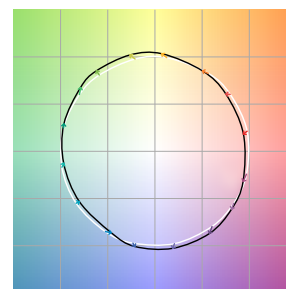
| Hue Bin | R <sub>f</sub> | Graphic shifts (%) |     |
|---------|----------------|--------------------|-----|
|         |                | Chroma             | Hue |
| 1       | 90             | -4%                | -2% |
| 2       | 91             | -4%                | 3%  |
| 3       | 86             | -1%                | 6%  |
| 4       | 89             | 3%                 | 6%  |
| 5       | 91             | 5%                 | 4%  |
| 6       | 91             | 5%                 | 0%  |
| 7       | 87             | 3%                 | -7% |
| 8       | 93             | 0%                 | -4% |
| 9       | 91             | -3%                | -4% |
| 10      | 92             | -4%                | 1%  |
| 11      | 89             | -3%                | 6%  |
| 12      | 89             | 3%                 | 3%  |
| 13      | 92             | 4%                 | -3% |
| 14      | 89             | 5%                 | -6% |
| 15      | 88             | 2%                 | -6% |
| 16      | 88             | -2%                | -8% |



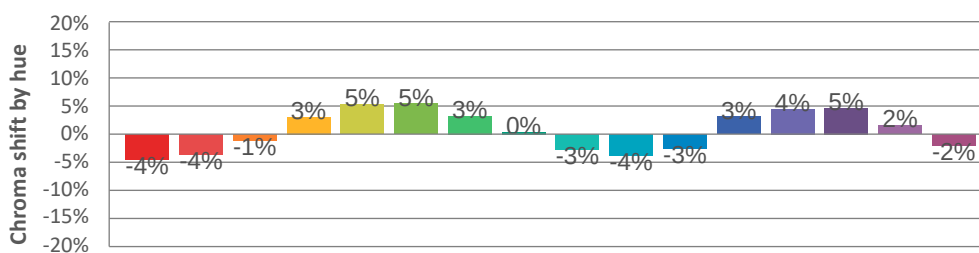
#### Hue binH



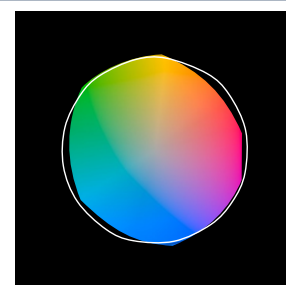
#### Color vector graphics



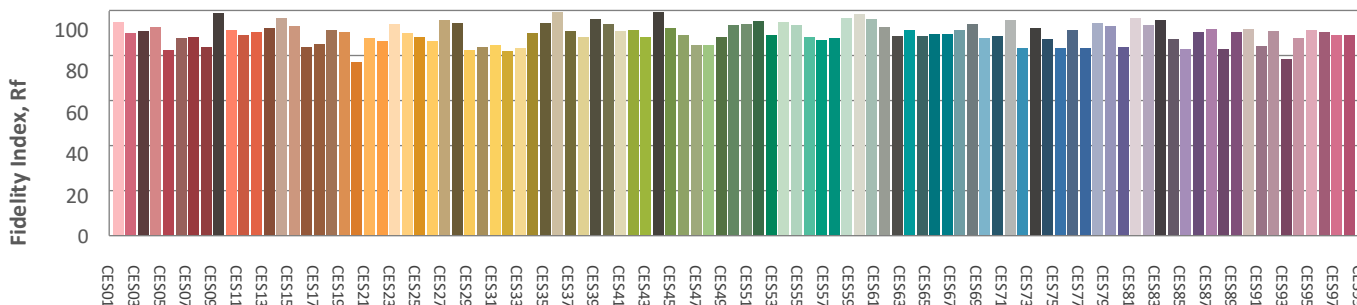
#### Hue bin



#### 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  | -5,5                                           | -4,9 | -5,3 | -4,7 | -4,5 | -2,7                                    | -2,1 | -2,5 | -1,9 | -1,7 |
|                  | 3H  | -5,0                                           | -4,4 | -4,7 | -4,2 | -4,0 | -2,4                                    | -1,8 | -2,1 | -1,6 | -1,3 |
|                  | 4H  | -4,4                                           | -3,8 | -4,1 | -3,6 | -3,3 | -2,0                                    | -1,5 | -1,7 | -1,2 | -0,9 |
|                  | 6H  | -2,8                                           | -2,3 | -2,4 | -2,0 | -1,7 | -1,0                                    | -0,5 | -0,7 | -0,2 | 0,1  |
|                  | 8H  | -1,2                                           | -0,7 | -0,8 | -0,4 | -0,1 | -0,4                                    | 0,1  | -0,0 | 0,4  | 0,7  |
|                  | 12H | 0,8                                            | 1,2  | 1,1  | 1,6  | 1,9  | -0,1                                    | 0,4  | 0,3  | 0,7  | 1,0  |
| 4H               | 2H  | -5,2                                           | -4,6 | -4,9 | -4,4 | -4,1 | -2,7                                    | -2,1 | -2,3 | -1,8 | -1,6 |
|                  | 3H  | -4,5                                           | -4,0 | -4,1 | -3,7 | -3,4 | -2,1                                    | -1,7 | -1,8 | -1,3 | -1,0 |
|                  | 4H  | -3,6                                           | -3,2 | -3,2 | -2,8 | -2,5 | -1,4                                    | -1,1 | -1,1 | -0,7 | -0,4 |
|                  | 6H  | -1,4                                           | -1,1 | -1,0 | -0,7 | -0,3 | 0,1                                     | 0,4  | 0,5  | 0,8  | 1,2  |
|                  | 8H  | 0,4                                            | 0,7  | 0,8  | 1,1  | 1,5  | 0,9                                     | 1,2  | 1,4  | 1,6  | 2,0  |
|                  | 12H | 2,5                                            | 2,8  | 3,0  | 3,2  | 3,6  | 1,3                                     | 1,6  | 1,8  | 2,0  | 2,4  |
| 8H               | 4H  | -2,9                                           | -2,6 | -2,5 | -2,3 | -1,8 | -0,8                                    | -0,5 | -0,4 | -0,1 | 0,3  |
|                  | 6H  | -0,3                                           | -0,1 | 0,1  | 0,3  | 0,8  | 1,2                                     | 1,4  | 1,7  | 1,9  | 2,3  |
|                  | 8H  | 1,7                                            | 1,9  | 2,2  | 2,3  | 2,8  | 2,2                                     | 2,3  | 2,6  | 2,8  | 3,3  |
|                  | 12H | 4,0                                            | 4,1  | 4,5  | 4,6  | 5,1  | 2,6                                     | 2,8  | 3,1  | 3,3  | 3,8  |
| 12H              | 4H  | -2,7                                           | -2,4 | -2,2 | -2,0 | -1,6 | -0,5                                    | -0,2 | -0,0 | 0,2  | 0,6  |
|                  | 6H  | 0,1                                            | 0,3  | 0,6  | 0,7  | 1,2  | 1,6                                     | 1,8  | 2,1  | 2,2  | 2,7  |
|                  | 8H  | 2,2                                            | 2,3  | 2,7  | 2,8  | 3,3  | 2,6                                     | 2,7  | 3,1  | 3,2  | 3,7  |

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

|                    |             |             |
|--------------------|-------------|-------------|
| S = 1,0H           | +0,3 / -0,2 | +0,1 / -0,2 |
| S = 1,5H           | +0,3 / -0,5 | +0,5 / -0,7 |
| S = 2,0H           | +0,5 / -0,8 | +1,2 / -0,9 |
| Standard table     | ---         | ---         |
| Correction summand | ---         | ---         |

Corrected glare indices referring to 548lm total luminous flux



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