

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

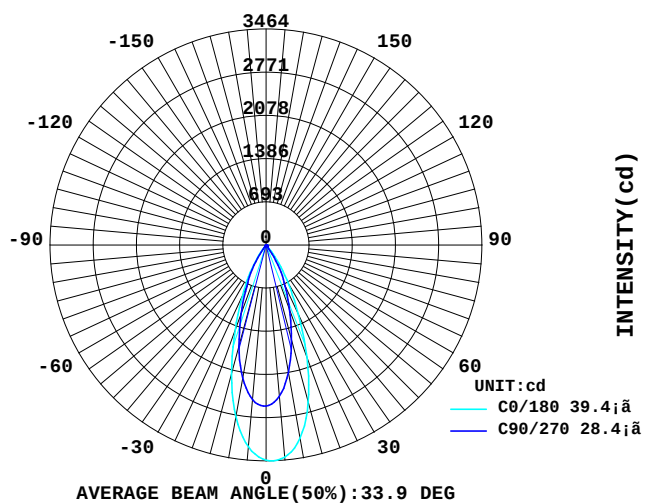
## LUMINAIRE PHOTOMETRIC TEST REPORT

Report number:

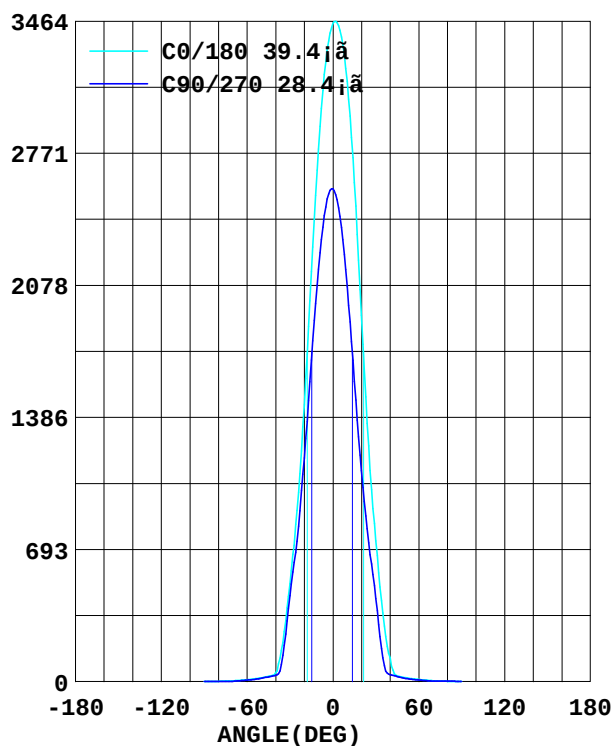
|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

|                  |        |                    |        |                  |       |
|------------------|--------|--------------------|--------|------------------|-------|
| DATA OF LAMP     |        | Imax(cd)           | 3464   | S/MH(C0/180)     | 0.59  |
| MODEL            | SMD    | EFFICIENCY(%)      | 100.0  | S/MH(C90/270)    | 0.61  |
| NOMINAL POWER(W) | 22     | TOTAL FLUX(lm)     | 1420.8 | Voltage(V)       | 231.3 |
| RATED VOLTAGE(V) | 232    | EFFICIENCY(lm/W)   | 65.2   | Current(A)       | 0.185 |
| NOMINAL FLUX(lm) | 1420.8 | $\eta$ up(%)       | 0.0    | Power(W)         | 21.78 |
| LAMPS QUANTITY   | 1      | $\eta$ down(%)     | 100.0  | Power Factor(PF) | 0.508 |
| TEST VOLTAGE(V)  | 231.4  | Effective Flux(lm) | 1420.8 | EEI              | 0.209 |

LUMINOUS INTENSITY DISTRIBUTION



LUMINOUS INTENSITY DISTRIBUTION



Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

## HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

---

### Color Temperature Data List

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

---

Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

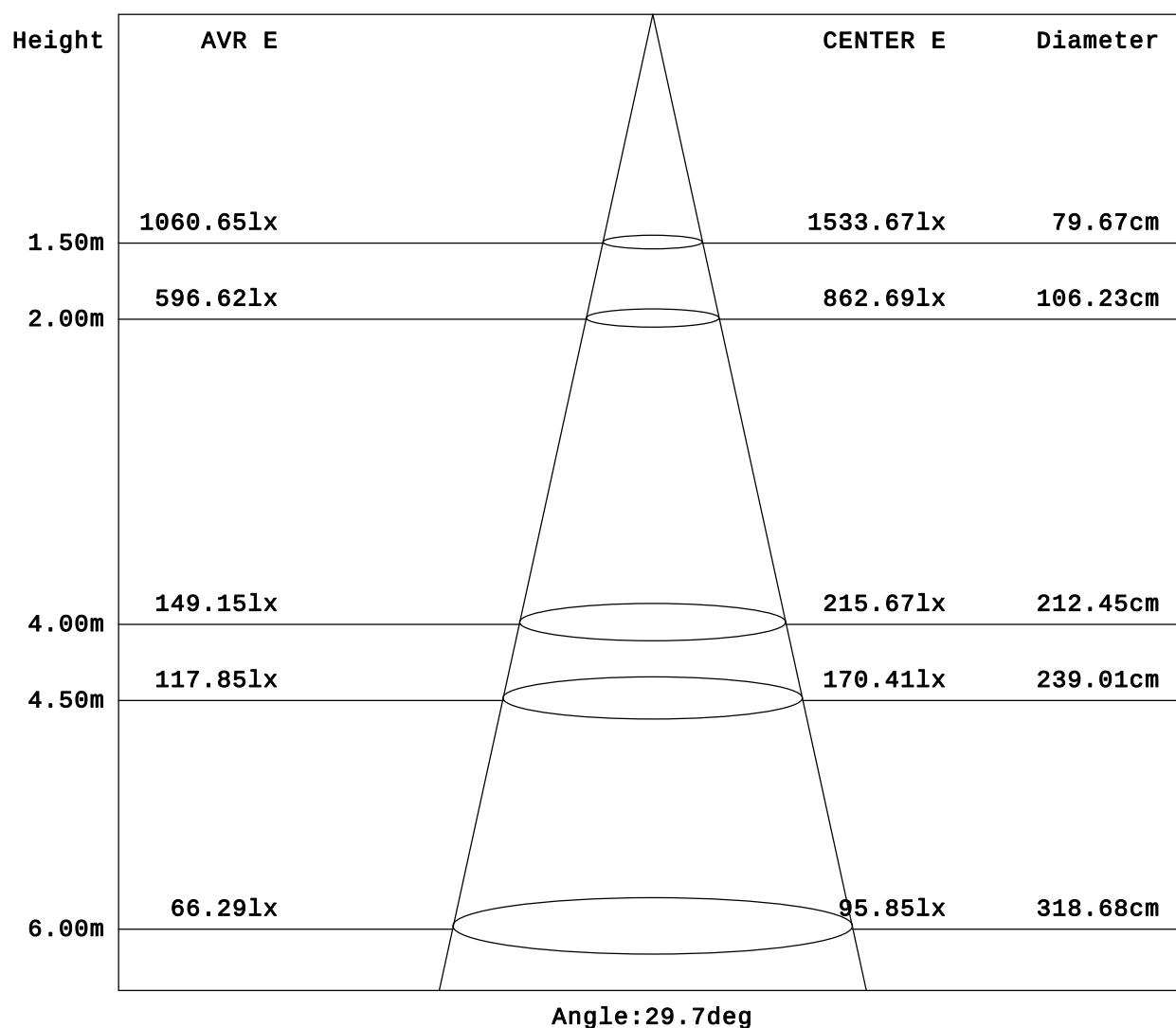
Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

## AVERAGE AND CENTER E Figure

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |



Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

## ZONAL FLUX DIAGRAM

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

| $\gamma$ | C0                    | C90   | C180  | C270  |  |  |  |  | $\gamma$ | zone    | total |
|----------|-----------------------|-------|-------|-------|--|--|--|--|----------|---------|-------|
| 5.0      | 3250                  | 2490  | 3417  | 2440  |  |  |  |  | 0- 5     | 70.74   | 70.74 |
| 10.0     | 2793                  | 2163  | 3147  | 2072  |  |  |  |  | 5- 10    | 194.7   | 265.4 |
| 15.0     | 2149                  | 1687  | 2616  | 1574  |  |  |  |  | 10- 15   | 269.3   | 534.7 |
| 20.0     | 1451                  | 1173  | 1921  | 1105  |  |  |  |  | 15- 20   | 278.9   | 813.7 |
| 25.0     | 897.4                 | 736.4 | 1236  | 727.3 |  |  |  |  | 20- 25   | 238.7   | 1053  |
| 30.0     | 513.2                 | 451.4 | 738.7 | 436.2 |  |  |  |  | 25- 30   | 179.0   | 1232  |
| 35.0     | 205.8                 | 138.8 | 360.7 | 124.6 |  |  |  |  | 30- 35   | 105.9   | 1338  |
| 40.0     | 45.51                 | 32.94 | 124.5 | 36.68 |  |  |  |  | 35- 40   | 37.55   | 1375  |
| 45.0     | 27.34                 | 25.06 | 30.68 | 26.46 |  |  |  |  | 40- 45   | 13.99   | 1389  |
| 50.0     | 19.81                 | 17.37 | 21.82 | 18.08 |  |  |  |  | 45- 50   | 9.323   | 1398  |
| 55.0     | 14.00                 | 11.69 | 15.51 | 12.30 |  |  |  |  | 50- 55   | 7.023   | 1405  |
| 60.0     | 9.892                 | 7.930 | 11.03 | 8.434 |  |  |  |  | 55- 60   | 5.194   | 1411  |
| 65.0     | 6.630                 | 4.721 | 7.665 | 5.092 |  |  |  |  | 60- 65   | 3.717   | 1414  |
| 70.0     | 4.561                 | 1.670 | 4.482 | 2.731 |  |  |  |  | 65- 70   | 2.337   | 1417  |
| 75.0     | 3.580                 | 1.405 | 3.076 | 2.387 |  |  |  |  | 70- 75   | 1.542   | 1418  |
| 80.0     | 1.670                 | 1.246 | 1.326 | 2.148 |  |  |  |  | 75- 80   | 1.162   | 1419  |
| 85.0     | 1.432                 | 0.875 | 1.113 | 1.697 |  |  |  |  | 80- 85   | 0.782   | 1420  |
| 90.0     | 1.193                 | 0.504 | 1.273 | 1.379 |  |  |  |  | 85- 90   | 0.631   | 1421  |
| 95.0     |                       |       |       |       |  |  |  |  | 90- 95   |         |       |
| 100.0    |                       |       |       |       |  |  |  |  | 95-100   |         |       |
| 105.0    |                       |       |       |       |  |  |  |  | 100-105  |         |       |
| 110.0    |                       |       |       |       |  |  |  |  | 105-110  |         |       |
| 115.0    |                       |       |       |       |  |  |  |  | 110-115  |         |       |
| 120.0    |                       |       |       |       |  |  |  |  | 115-120  |         |       |
| 125.0    |                       |       |       |       |  |  |  |  | 120-125  |         |       |
| 130.0    |                       |       |       |       |  |  |  |  | 125-130  |         |       |
| 135.0    |                       |       |       |       |  |  |  |  | 130-135  |         |       |
| 140.0    |                       |       |       |       |  |  |  |  | 135-140  |         |       |
| 145.0    |                       |       |       |       |  |  |  |  | 140-145  |         |       |
| 150.0    |                       |       |       |       |  |  |  |  | 145-150  |         |       |
| 155.0    |                       |       |       |       |  |  |  |  | 150-155  |         |       |
| 160.0    |                       |       |       |       |  |  |  |  | 155-160  |         |       |
| 165.0    |                       |       |       |       |  |  |  |  | 160-165  |         |       |
| 170.0    |                       |       |       |       |  |  |  |  | 165-170  |         |       |
| 175.0    |                       |       |       |       |  |  |  |  | 170-175  |         |       |
| 180.0    |                       |       |       |       |  |  |  |  | 175-180  |         |       |
| DEG      | LUMINOUS INTENSITY:cd |       |       |       |  |  |  |  |          | UNIT:lm |       |

Test System:HOP00 HPG1600  
 Temperature:25.3DEG  
 Operators:  
 Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:5.150 m  
 Remarks:

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

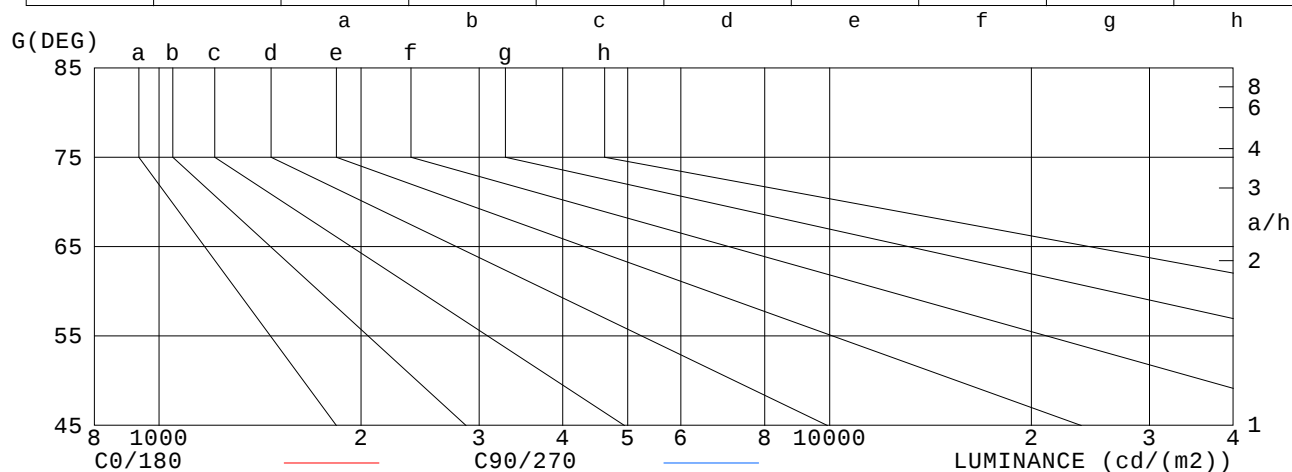
## LUMINANCE LIMITATION CURVES

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

### LUMINANCE LIMITATION CURVES

| GLARE | CLASS | ILLUMINANCE (lx) |      |      |       |       |       |       |       |
|-------|-------|------------------|------|------|-------|-------|-------|-------|-------|
| 1.15  | A     | 2000             | 1000 | 500  | <=300 |       |       |       |       |
| 1.50  | B     |                  | 2000 | 1000 | 500   | <=300 |       |       |       |
| 1.85  | C     |                  |      | 2000 | 1000  | 500   | <=300 |       |       |
| 2.20  | D     |                  |      |      | 2000  | 1000  | 500   | <=300 |       |
| 2.55  | E     |                  |      |      |       | 2000  | 1000  | 500   | <=300 |



| LUMINANCE cd/(m2) |        |         |
|-------------------|--------|---------|
| G( DEG )          | C0/180 | C90/270 |
| 85                | 164    | 100     |
| 80                | 96     | 72      |
| 75                | 138    | 54      |
| 70                | 133    | 49      |
| 65                | 157    | 112     |
| 60                | 198    | 159     |
| 55                | 244    | 204     |
| 50                | 308    | 270     |
| 45                | 387    | 354     |

Test System:HOP00 HPG1600  
 Temperature:25.3DEG  
 Operators:  
 Test Date:10-18-2020

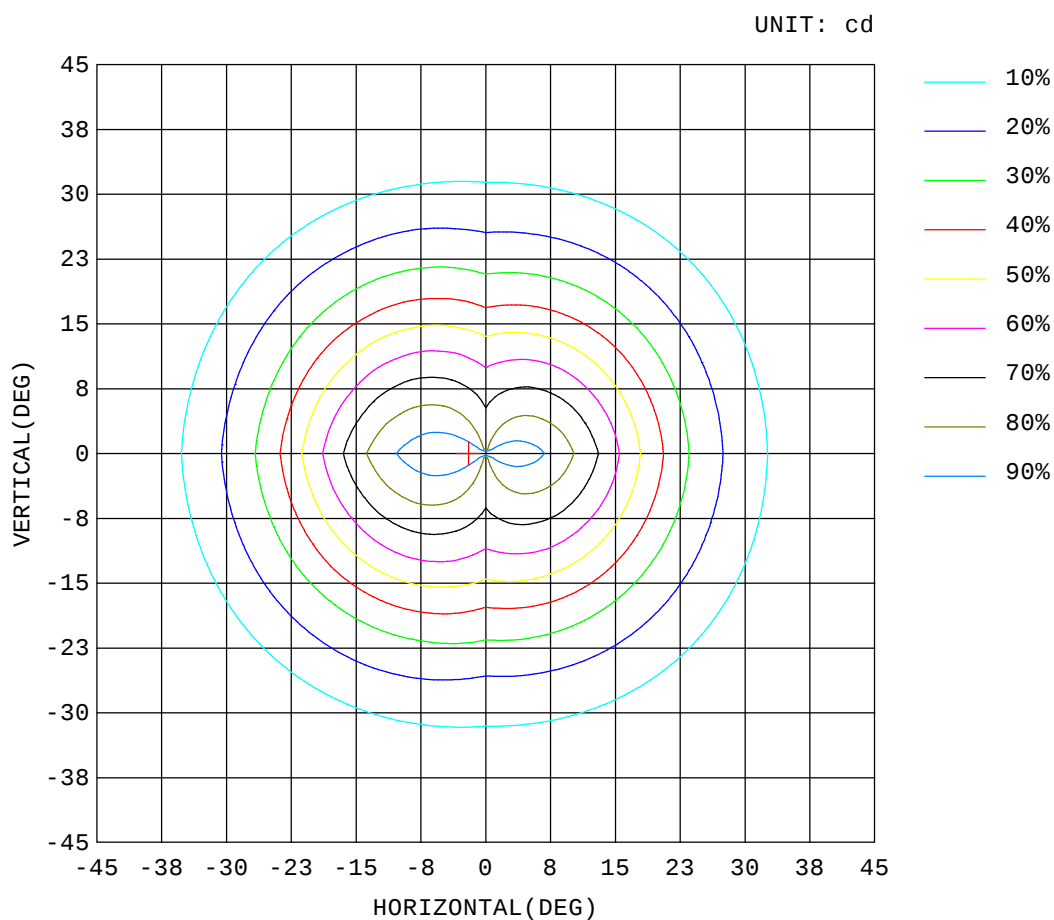
Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:5.150 m  
 Remarks:

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

## ISOCANDELA DIAGRAM

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |



Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

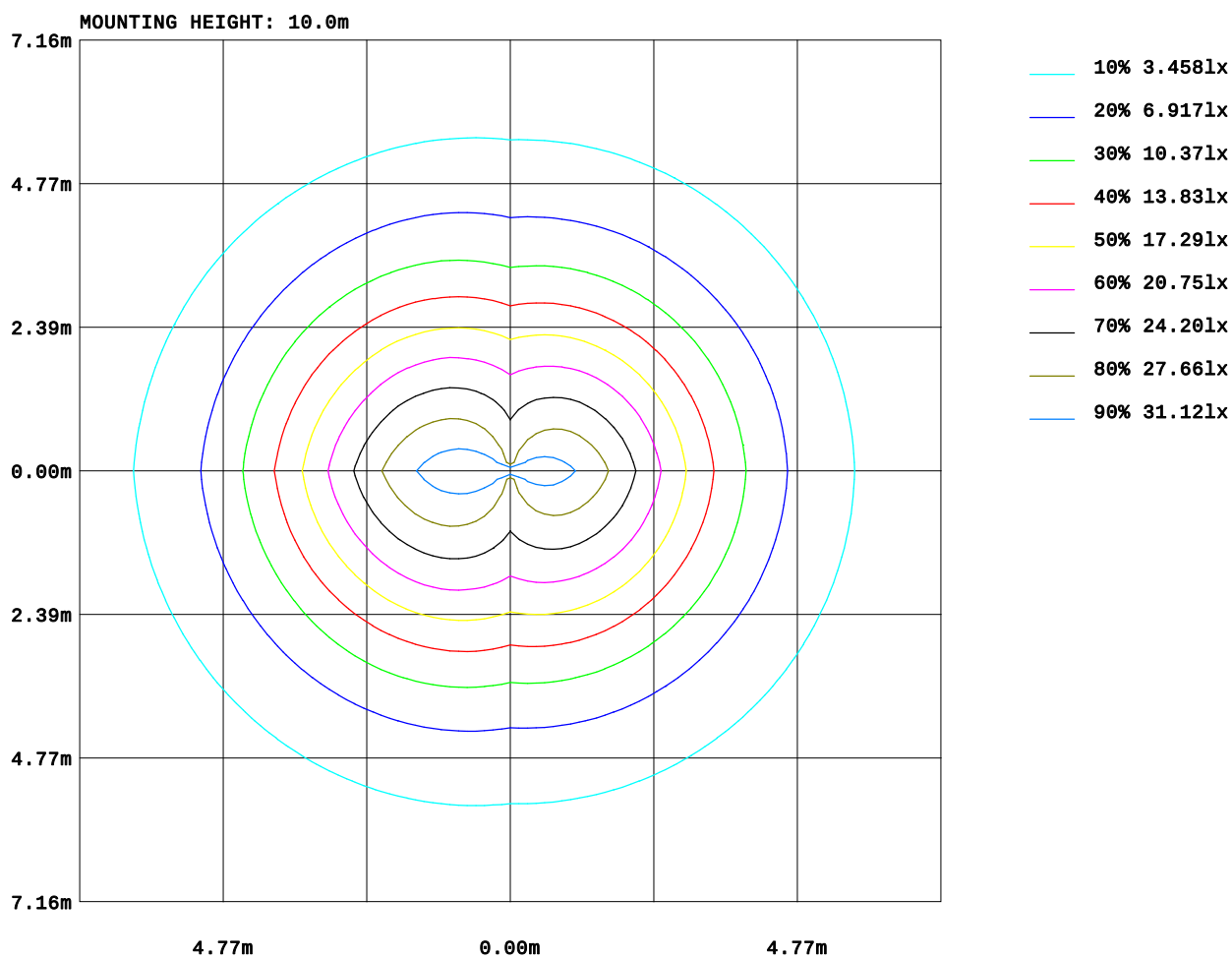
Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

# HOPOO GONIOPHOTOMETERS SYSTEM TEST REPORT

## ISOLUX DIAGRAM

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |



Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

# HOPOO GONIOPHOTOMETERS SYSTEM TEST REPORT

## AREA LUMINOUS FLUX

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

| VERTICAL (DEG) | AREA FLUX DIAGRAM |      |      |      |      |      |      |      |                  |      |      |      |      |      |      |      |      | UNIT:lm | Φ t  | Φ a  |
|----------------|-------------------|------|------|------|------|------|------|------|------------------|------|------|------|------|------|------|------|------|---------|------|------|
|                | 0.07              | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 | 0.25 | 0.25             | 0.24 | 0.23 | 0.21 | 0.19 | 0.16 | 0.14 | 0.11 | 0.09 | 0.06    | 2.93 | 2.93 |
| 45             | 0.09              | 0.11 | 0.15 | 0.19 | 0.27 | 0.39 | 0.48 | 0.52 | 0.50             | 0.46 | 0.42 | 0.34 | 0.27 | 0.22 | 0.18 | 0.14 | 0.11 | 0.08    | 4.91 | 4.91 |
| 40             | 0.10              | 0.14 | 0.20 | 0.37 | 0.65 | 1.06 | 1.57 | 1.98 | 2.12             | 2.04 | 1.78 | 1.29 | 0.76 | 0.39 | 0.24 | 0.18 | 0.13 | 0.10    | 15.1 | 15.1 |
| 35             | 0.12              | 0.18 | 0.38 | 0.85 | 1.69 | 2.83 | 3.86 | 4.46 | 4.56             | 4.44 | 4.12 | 3.38 | 2.31 | 1.21 | 0.49 | 0.23 | 0.16 | 0.12    | 35.4 | 35.4 |
| 30             | 0.14              | 0.27 | 0.78 | 1.83 | 3.44 | 5.06 | 6.34 | 7.13 | 7.17             | 6.95 | 6.54 | 5.56 | 4.25 | 2.70 | 1.23 | 0.41 | 0.19 | 0.13    | 60.1 | 60.1 |
| 25             | 0.17              | 0.49 | 1.41 | 3.16 | 5.30 | 7.51 | 9.53 | 10.6 | 10.6             | 10.2 | 9.76 | 8.24 | 6.21 | 4.23 | 2.31 | 0.84 | 0.24 | 0.15    | 91.2 | 91.2 |
| 20             | 0.21              | 0.77 | 2.18 | 4.47 | 7.19 | 10.4 | 13.3 | 14.9 | 14.7             | 14.2 | 13.7 | 11.5 | 8.50 | 5.66 | 3.34 | 1.40 | 0.37 | 0.16    | 127  | 127  |
| 15             | 0.27              | 1.06 | 2.88 | 5.55 | 9.10 | 13.3 | 17.1 | 19.1 | 18.5             | 18.1 | 17.8 | 14.8 | 10.7 | 6.98 | 4.13 | 1.91 | 0.53 | 0.17    | 163  | 163  |
| 10             | 0.32              | 1.28 | 3.34 | 6.31 | 10.5 | 15.7 | 20.3 | 23.0 | 22.5             | 22.0 | 21.4 | 17.5 | 12.5 | 7.92 | 4.61 | 2.22 | 0.65 | 0.18    | 193  | 193  |
| 5              | 0.32              | 1.28 | 3.35 | 6.31 | 10.5 | 15.7 | 20.4 | 23.2 | 22.6             | 22.1 | 21.5 | 17.6 | 12.5 | 7.94 | 4.62 | 2.22 | 0.65 | 0.18    | 194  | 194  |
| 0              | 0.27              | 1.06 | 2.89 | 5.57 | 9.13 | 13.5 | 17.4 | 19.5 | 19.0             | 18.6 | 18.1 | 15.1 | 10.9 | 7.02 | 4.14 | 1.92 | 0.53 | 0.17    | 165  | 165  |
| -5             | 0.21              | 0.77 | 2.20 | 4.49 | 7.22 | 10.5 | 13.6 | 15.4 | 15.4             | 14.9 | 14.2 | 11.8 | 8.66 | 5.68 | 3.36 | 1.42 | 0.37 | 0.16    | 131  | 131  |
| -10            | 0.17              | 0.49 | 1.42 | 3.19 | 5.33 | 7.57 | 9.78 | 11.1 | 11.2             | 10.8 | 10.2 | 8.49 | 6.28 | 4.26 | 2.35 | 0.85 | 0.24 | 0.15    | 94.0 | 94.0 |
| -15            | 0.14              | 0.27 | 0.77 | 1.86 | 3.49 | 5.10 | 6.41 | 7.30 | 7.45             | 7.23 | 6.70 | 5.62 | 4.30 | 2.75 | 1.26 | 0.40 | 0.19 | 0.13    | 61.4 | 61.4 |
| -20            | 0.12              | 0.17 | 0.37 | 0.84 | 1.73 | 2.90 | 3.93 | 4.53 | 4.64             | 4.52 | 4.19 | 3.45 | 2.38 | 1.25 | 0.49 | 0.22 | 0.16 | 0.11    | 36.0 | 36.0 |
| -25            | 0.10              | 0.14 | 0.19 | 0.35 | 0.64 | 1.08 | 1.64 | 2.07 | 2.22             | 2.15 | 1.88 | 1.35 | 0.78 | 0.39 | 0.23 | 0.17 | 0.13 | 0.10    | 15.6 | 15.6 |
| -30            | 0.08              | 0.11 | 0.15 | 0.19 | 0.26 | 0.37 | 0.46 | 0.52 | 0.51             | 0.47 | 0.42 | 0.33 | 0.25 | 0.21 | 0.17 | 0.14 | 0.11 | 0.08    | 4.81 | 4.81 |
| -35            | 0.07              | 0.09 | 0.11 | 0.14 | 0.16 | 0.19 | 0.22 | 0.23 | 0.23             | 0.22 | 0.21 | 0.20 | 0.18 | 0.16 | 0.13 | 0.11 | 0.08 | 0.06    | 2.79 | 2.79 |
| -40            | 0.07              | 0.09 | 0.11 | 0.14 | 0.16 | 0.19 | 0.22 | 0.23 | 0.23             | 0.22 | 0.21 | 0.20 | 0.18 | 0.16 | 0.13 | 0.11 | 0.08 | 0.06    | 2.79 | 2.79 |
| -45            | 0.07              | 0.09 | 0.11 | 0.14 | 0.16 | 0.19 | 0.22 | 0.23 | 0.23             | 0.22 | 0.21 | 0.20 | 0.18 | 0.16 | 0.13 | 0.11 | 0.08 | 0.06    | 2.79 | 2.79 |
|                | -45               | -40  | -35  | -30  | -25  | -20  | -15  | -10  | HORIZONTAL (DEG) |      |      |      | 10   | 15   | 20   | 25   | 30   | 35      | 40   | 45   |
| Φ t            | 2.97              | 8.79 | 22.9 | 45.8 | 76.9 | 114  | 147  | 166  | 164              | 160  | 153  | 127  | 92.2 | 59.1 | 33.4 | 14.9 | 4.94 | 2.31    | 1421 |      |
| Φ a            | 2.97              | 8.79 | 22.9 | 45.8 | 76.9 | 114  | 147  | 166  | 164              | 160  | 153  | 127  | 92.2 | 59.1 | 33.4 | 14.9 | 4.94 | 2.31    |      | 1421 |

Test System:HOP00 HPG1600  
 Temperature:25.3DEG  
 Operators:  
 Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:5.150 m  
 Remarks:

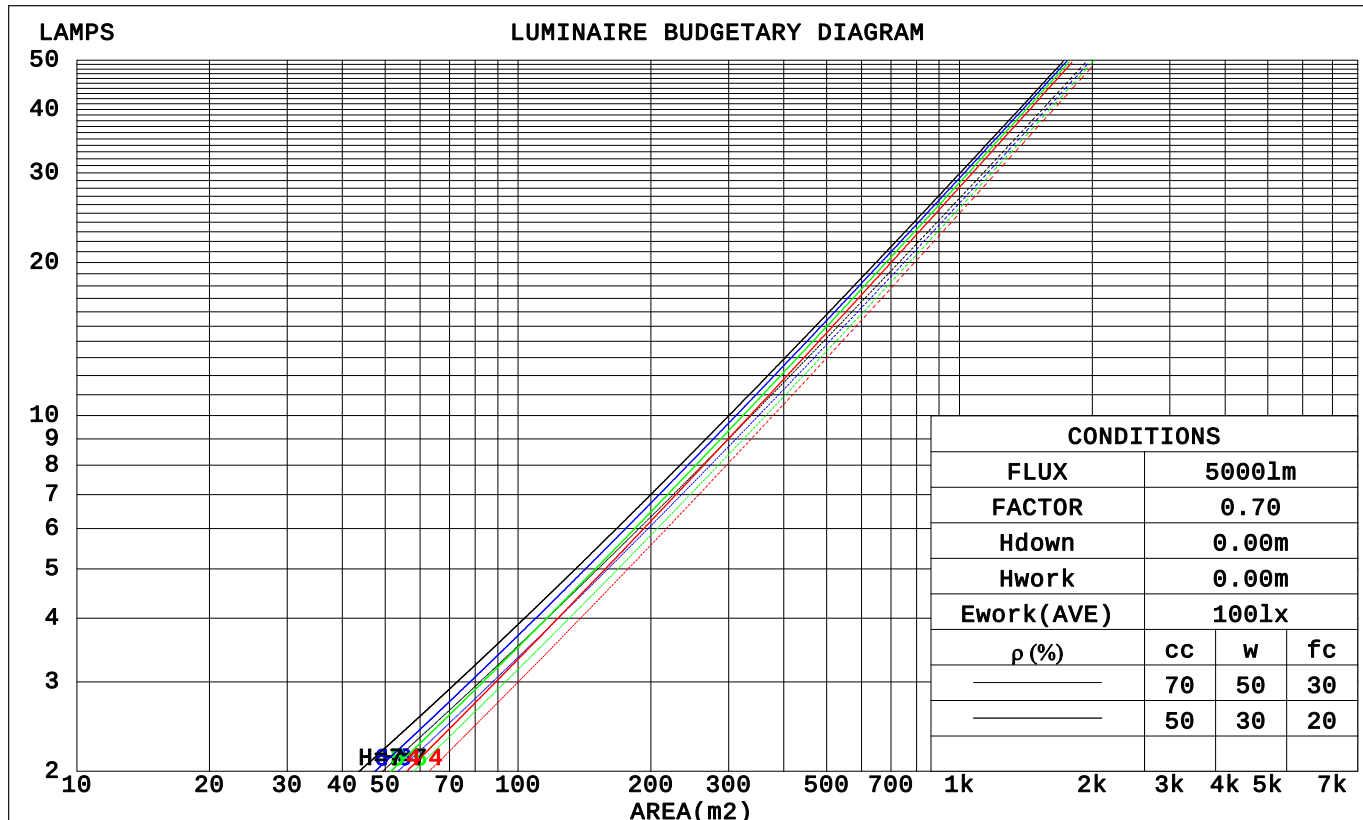
# HOPOO GONIOPHOTOMETERS SYSTEM TEST REPORT

## CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Report number:

|                |  |  |  |  |  |  |  |            |  |  |  |                            |  |  |  |
|----------------|--|--|--|--|--|--|--|------------|--|--|--|----------------------------|--|--|--|
| MANUFACTURER:  |  |  |  |  |  |  |  |            |  |  |  |                            |  |  |  |
| Address:       |  |  |  |  |  |  |  |            |  |  |  |                            |  |  |  |
| NAME: LOGAN20W |  |  |  |  |  |  |  | TYPE: 20W  |  |  |  | WEIGHT:                    |  |  |  |
| SPECIFICATION: |  |  |  |  |  |  |  | DIMENSION: |  |  |  | SERIAL No.: LA/YE6L-990706 |  |  |  |

| $\rho_{CC}$ | 80%                   |     |     | 70% |     |     | 50% |     |     | 30% |     |     | 10% |     |     | 0 |
|-------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| $\rho_W$    | 50%                   | 30% | 10% | 50% | 30% | 10% | 50% | 30% | 10% | 50% | 30% | 10% | 50% | 30% | 10% | 0 |
| $\rho_{fC}$ | 20%                   |     |     | 20% |     |     | 20% |     |     | 20% |     |     | 20% |     |     | 0 |
| RCR         | RCR:Room Cavity Ratio |     |     |     |     |     |     |     |     |     |     |     |     |     |     |   |



Test System:HOP00 HPG1600  
 Temperature:25.3DEG  
 Operators:  
 Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:5.150 m  
 Remarks:

# HOPOO GONIOPHOTOMETERS SYSTEM TEST REPORT

## WEC AND CCEC

Report number:

|                |  |  |  |  |  |  |  |            |  |  |                            |  |  |  |
|----------------|--|--|--|--|--|--|--|------------|--|--|----------------------------|--|--|--|
| MANUFACTURER:  |  |  |  |  |  |  |  |            |  |  |                            |  |  |  |
| Address:       |  |  |  |  |  |  |  |            |  |  |                            |  |  |  |
| NAME: LOGAN20W |  |  |  |  |  |  |  | TYPE: 20W  |  |  | WEIGHT:                    |  |  |  |
| SPECIFICATION: |  |  |  |  |  |  |  | DIMENSION: |  |  | SERIAL No.: LA/YE6L-990706 |  |  |  |

| $\rho_{CC}$ | 80%                   |      |      | 70%  |      |      | 50%                             |      |      | 30%  |      |      | 10%  |      |      | 0 |
|-------------|-----------------------|------|------|------|------|------|---------------------------------|------|------|------|------|------|------|------|------|---|
| $\rho_W$    | 50%                   | 30%  | 10%  | 50%  | 30%  | 10%  | 50%                             | 30%  | 10%  | 50%  | 30%  | 10%  | 50%  | 30%  | 10%  | 0 |
| $\rho_{fc}$ | 20%                   |      |      | 20%  |      |      | 20%                             |      |      | 20%  |      |      | 20%  |      |      | 0 |
| RCR         | RCR:Room Cavity Ratio |      |      |      |      |      | Wall Exitance Coefficients(WEC) |      |      |      |      |      |      |      |      |   |
| 0.0         |                       |      |      |      |      |      |                                 |      |      |      |      |      |      |      |      |   |
| 1.0         | .160                  | .091 | .029 | .154 | .088 | .028 | .141                            | .081 | .026 | .130 | .075 | .024 | .119 | .069 | .022 |   |
| 2.0         | .151                  | .083 | .025 | .145 | .080 | .025 | .135                            | .075 | .023 | .125 | .070 | .022 | .116 | .066 | .021 |   |
| 3.0         | .142                  | .076 | .023 | .138 | .074 | .022 | .129                            | .070 | .021 | .121 | .066 | .020 | .113 | .063 | .019 |   |
| 4.0         | .135                  | .070 | .021 | .131 | .068 | .020 | .123                            | .065 | .020 | .116 | .062 | .019 | .110 | .060 | .018 |   |
| 5.0         | .128                  | .065 | .019 | .124 | .064 | .019 | .118                            | .061 | .018 | .112 | .059 | .018 | .106 | .057 | .017 |   |
| 6.0         | .122                  | .061 | .017 | .119 | .060 | .017 | .113                            | .058 | .017 | .108 | .056 | .016 | .103 | .054 | .016 |   |
| 7.0         | .116                  | .057 | .016 | .114 | .057 | .016 | .109                            | .055 | .016 | .104 | .053 | .015 | .100 | .052 | .015 |   |
| 8.0         | .111                  | .054 | .015 | .109 | .054 | .015 | .104                            | .052 | .015 | .100 | .051 | .015 | .096 | .049 | .014 |   |
| 9.0         | .107                  | .052 | .014 | .104 | .051 | .014 | .101                            | .050 | .014 | .097 | .049 | .014 | .093 | .047 | .014 |   |
| 10.0        | .102                  | .049 | .014 | .100 | .049 | .014 | .097                            | .047 | .013 | .094 | .046 | .013 | .090 | .045 | .013 |   |

| $\rho_{cc}$ | 80%                   |      |      | 70%  |      |      | 50%                                        |      |      | 30%  |      |      | 10%  |      |      | 0 |
|-------------|-----------------------|------|------|------|------|------|--------------------------------------------|------|------|------|------|------|------|------|------|---|
| $\rho_w$    | 50%                   | 30%  | 10%  | 50%  | 30%  | 10%  | 50%                                        | 30%  | 10%  | 50%  | 30%  | 10%  | 50%  | 30%  | 10%  | 0 |
| $\rho_{fc}$ | 20%                   |      |      | 20%  |      |      | 20%                                        |      |      | 20%  |      |      | 20%  |      |      | 0 |
| RCR         | RCR:Room Cavity Ratio |      |      |      |      |      | Ceiling Cavity Exitance Coefficients(CCEC) |      |      |      |      |      |      |      |      |   |
| 0.0         | .190                  | .190 | .190 | .163 | .163 | .163 | .111                                       | .111 | .111 | .064 | .064 | .064 | .020 | .020 | .020 |   |
| 1.0         | .170                  | .157 | .146 | .145 | .135 | .126 | .099                                       | .093 | .087 | .057 | .054 | .051 | .018 | .017 | .016 |   |
| 2.0         | .153                  | .133 | .115 | .131 | .114 | .099 | .090                                       | .079 | .069 | .052 | .046 | .041 | .017 | .015 | .013 |   |
| 3.0         | .140                  | .113 | .092 | .120 | .098 | .080 | .082                                       | .068 | .056 | .048 | .040 | .033 | .015 | .013 | .011 |   |
| 4.0         | .129                  | .098 | .075 | .110 | .085 | .065 | .076                                       | .059 | .046 | .044 | .035 | .027 | .014 | .011 | .009 |   |
| 5.0         | .119                  | .087 | .062 | .102 | .075 | .054 | .070                                       | .052 | .038 | .041 | .031 | .023 | .013 | .010 | .007 |   |
| 6.0         | .111                  | .077 | .052 | .096 | .067 | .046 | .066                                       | .047 | .032 | .038 | .027 | .019 | .012 | .009 | .006 |   |
| 7.0         | .104                  | .069 | .044 | .090 | .060 | .039 | .062                                       | .042 | .027 | .036 | .025 | .016 | .012 | .008 | .005 |   |
| 8.0         | .098                  | .063 | .038 | .085 | .054 | .033 | .058                                       | .038 | .024 | .034 | .023 | .014 | .011 | .007 | .005 |   |
| 9.0         | .093                  | .057 | .033 | .080 | .050 | .029 | .055                                       | .035 | .021 | .032 | .021 | .012 | .010 | .007 | .004 |   |
| 10.0        | .088                  | .053 | .029 | .076 | .046 | .025 | .053                                       | .032 | .018 | .031 | .019 | .011 | .010 | .006 | .004 |   |

Test System:HOP00 HPG1600  
 Temperature:25.3DEG  
 Operators:  
 Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:5.150 m  
 Remarks:

# HOPOO GONIOPHOTOMETERS SYSTEM TEST REPORT

## Uncorrected UGR Table

Report number:

|                                                    |                  |     |     |     |            |                |     |                            |     |     |
|----------------------------------------------------|------------------|-----|-----|-----|------------|----------------|-----|----------------------------|-----|-----|
| MANUFACTURER:                                      |                  |     |     |     |            |                |     |                            |     |     |
| Address:                                           |                  |     |     |     |            |                |     |                            |     |     |
| NAME: LOGAN20W                                     |                  |     |     |     | TYPE: 20W  |                |     | WEIGHT:                    |     |     |
| SPECIFICATION:                                     |                  |     |     |     | DIMENSION: |                |     | SERIAL No.: LA/YE6L-990706 |     |     |
| ceiling/cavity                                     | 0.7              | 0.7 | 0.5 | 0.5 | 0.3        | 0.7            | 0.7 | 0.5                        | 0.5 | 0.3 |
| walls                                              | 0.5              | 0.3 | 0.5 | 0.3 | 0.3        | 0.5            | 0.3 | 0.5                        | 0.3 | 0.3 |
| working plane                                      | 0.2              | 0.2 | 0.2 | 0.2 | 0.2        | 0.2            | 0.2 | 0.2                        | 0.2 | 0.2 |
| Room dimensions                                    | Viewed crosswise |     |     |     |            | Viewed endwise |     |                            |     |     |
| x = 2H y = 2H                                      | 4.3              | 5.1 | 4.5 | 5.2 | 5.4        | 3.1            | 3.9 | 3.3                        | 4.1 | 4.3 |
| 3H                                                 | 4.2              | 5.0 | 4.5 | 5.2 | 5.4        | 3.0            | 3.8 | 3.3                        | 4.0 | 4.2 |
| 4H                                                 | 4.2              | 4.9 | 4.5 | 5.1 | 5.4        | 3.0            | 3.7 | 3.3                        | 3.9 | 4.1 |
| 6H                                                 | 4.2              | 4.9 | 4.5 | 5.1 | 5.3        | 2.9            | 3.6 | 3.2                        | 3.8 | 4.1 |
| 8H                                                 | 4.2              | 4.8 | 4.5 | 5.1 | 5.3        | 2.9            | 3.6 | 3.2                        | 3.8 | 4.1 |
| 12H                                                | 4.2              | 4.8 | 4.5 | 5.1 | 5.3        | 2.9            | 3.5 | 3.2                        | 3.8 | 4.0 |
| 4H 2H                                              | 4.1              | 4.8 | 4.4 | 5.0 | 5.2        | 3.0            | 3.7 | 3.3                        | 3.9 | 4.1 |
| 3H                                                 | 4.1              | 4.7 | 4.4 | 5.0 | 5.2        | 2.9            | 3.5 | 3.2                        | 3.8 | 4.1 |
| 4H                                                 | 4.1              | 4.7 | 4.4 | 5.0 | 5.3        | 2.9            | 3.4 | 3.2                        | 3.7 | 4.0 |
| 6H                                                 | 4.1              | 4.6 | 4.5 | 4.9 | 5.3        | 2.8            | 3.3 | 3.2                        | 3.7 | 4.0 |
| 8H                                                 | 4.1              | 4.6 | 4.5 | 4.9 | 5.3        | 2.8            | 3.3 | 3.2                        | 3.6 | 4.0 |
| 12H                                                | 4.1              | 4.5 | 4.5 | 4.9 | 5.3        | 2.8            | 3.2 | 3.2                        | 3.6 | 4.0 |
| 8H 4H                                              | 4.0              | 4.5 | 4.4 | 4.8 | 5.2        | 2.8            | 3.2 | 3.2                        | 3.6 | 4.0 |
| 6H                                                 | 4.0              | 4.4 | 4.4 | 4.8 | 5.2        | 2.8            | 3.2 | 3.2                        | 3.5 | 4.0 |
| 8H                                                 | 4.0              | 4.4 | 4.5 | 4.8 | 5.2        | 2.8            | 3.1 | 3.2                        | 3.5 | 4.0 |
| 12H                                                | 4.1              | 4.4 | 4.6 | 4.8 | 5.3        | 2.8            | 3.1 | 3.3                        | 3.5 | 4.0 |
| 12H 4H                                             | 3.9              | 4.4 | 4.4 | 4.7 | 5.1        | 2.7            | 3.2 | 3.1                        | 3.5 | 3.9 |
| 6H                                                 | 4.0              | 4.3 | 4.4 | 4.7 | 5.2        | 2.7            | 3.1 | 3.2                        | 3.5 | 3.9 |
| 8H                                                 | 4.0              | 4.3 | 4.5 | 4.7 | 5.2        | 2.8            | 3.1 | 3.2                        | 3.5 | 4.0 |
| Variations with the observer position at spacings: |                  |     |     |     |            |                |     |                            |     |     |
| S = 1.0H                                           | + 3.6 / - 2.3    |     |     |     |            | + 1.6 / - 1.6  |     |                            |     |     |
| 1.5H                                               | + 5.5 / - 1.7    |     |     |     |            | + 2.4 / - 1.0  |     |                            |     |     |
| 2.0H                                               | + 1.5 / - 1.1    |     |     |     |            | + 1.8 / - 1.4  |     |                            |     |     |

CIE Pub.117 Corrected 1421 lm Total Lamp Luminous Flux.(8log(F/F0) = 1.2)

Test System:HOP00 HPG1600  
 Temperature:25.3DEG  
 Operators:  
 Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:5.150 m  
 Remarks:

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

## UTILIZATION FACTORS TABLE

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

| REFLECTANCE                      |                                                     |     |           |     |     |     |     |               |     |        |
|----------------------------------|-----------------------------------------------------|-----|-----------|-----|-----|-----|-----|---------------|-----|--------|
| Ceiling                          | 0.8                                                 | 0.8 | 0.8       | 0.7 | 0.7 | 0.7 | 0.5 | 0.5           | 0.5 | 0      |
| Walls                            | 0.7                                                 | 0.5 | 0.3       | 0.7 | 0.5 | 0.3 | 0.7 | 0.5           | 0.3 | 0      |
| Working plane                    | 0.2                                                 | 0.2 | 0.2       | 0.2 | 0.2 | 0.2 | 0.2 | 0.2           | 0.2 | 0      |
| ROOM INDEX                       | UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$ |     |           |     |     |     |     |               |     |        |
| $k = 0.60$                       | 90                                                  | 84  | 80        | 89  | 83  | 80  | 88  | 83            | 80  | 76     |
| 0.80                             | 97                                                  | 91  | 88        | 96  | 91  | 88  | 95  | 90            | 87  | 84     |
| 1.00                             | 101                                                 | 95  | 92        | 100 | 95  | 92  | 98  | 95            | 91  | 88     |
| 1.25                             | 104                                                 | 99  | 96        | 103 | 99  | 96  | 101 | 98            | 95  | 91     |
| 1.50                             | 107                                                 | 102 | 99        | 106 | 102 | 99  | 104 | 100           | 98  | 93     |
| 2.00                             | 109                                                 | 105 | 102       | 108 | 104 | 102 | 105 | 102           | 100 | 95     |
| 2.50                             | 111                                                 | 107 | 104       | 109 | 106 | 104 | 106 | 104           | 102 | 96     |
| 3.00                             | 112                                                 | 109 | 106       | 110 | 108 | 105 | 107 | 105           | 103 | 97     |
| 4.00                             | 114                                                 | 112 | 110       | 112 | 110 | 108 | 109 | 107           | 105 | 98     |
| 5.00                             | 115                                                 | 113 | 112       | 113 | 111 | 110 | 109 | 108           | 107 | 99     |
| ROOM INDEX                       | UF(total)                                           |     |           |     |     |     |     |               |     | Direct |
| According to DIN EN 13032-2 2004 |                                                     |     | Suspended |     |     |     |     | SHRNOM = 1.25 |     |        |

Test System:HOP00 HPG1600  
 Temperature:25.3DEG  
 Operators:  
 Test Date:10-18-2020

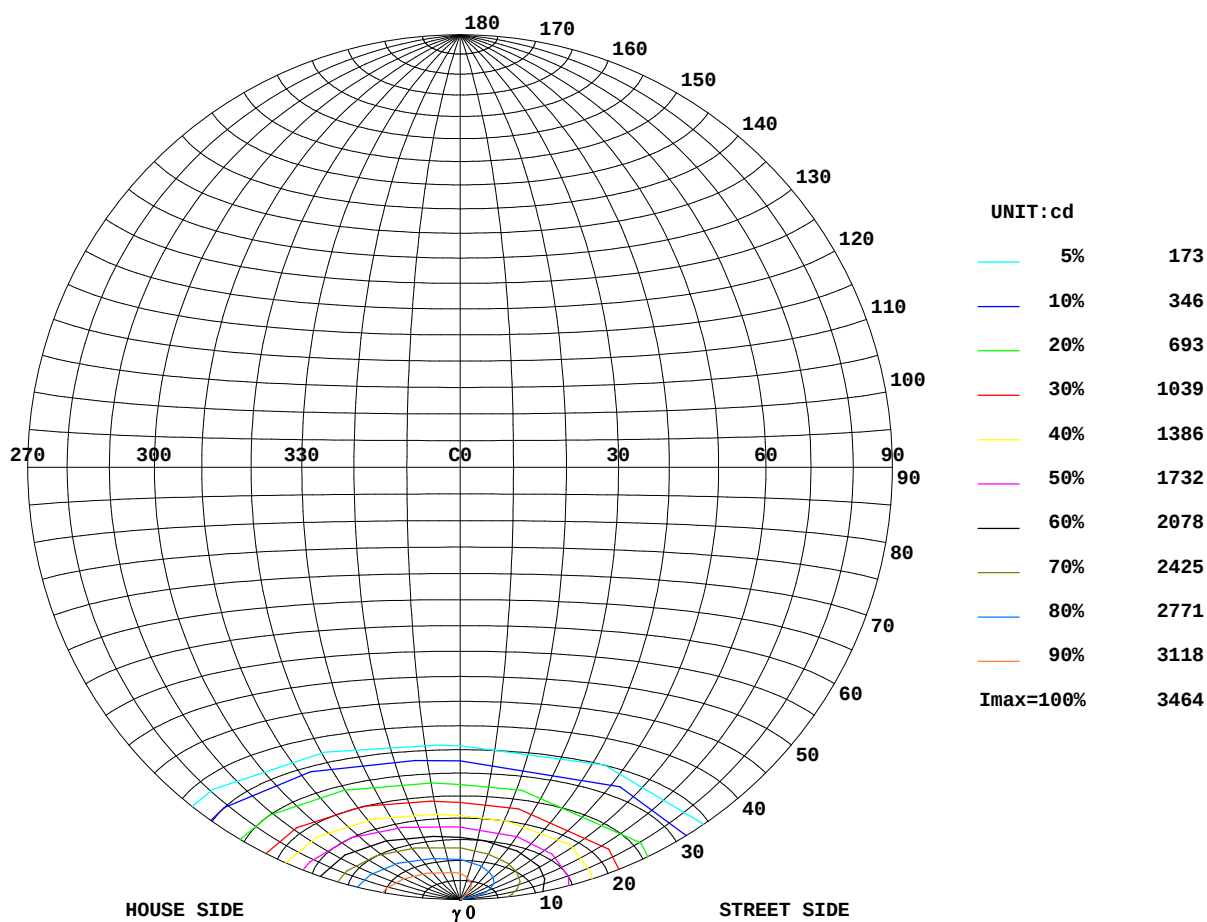
Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:5.150 m  
 Remarks:

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

## ISOCANDELA DIAGRAM

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |



Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

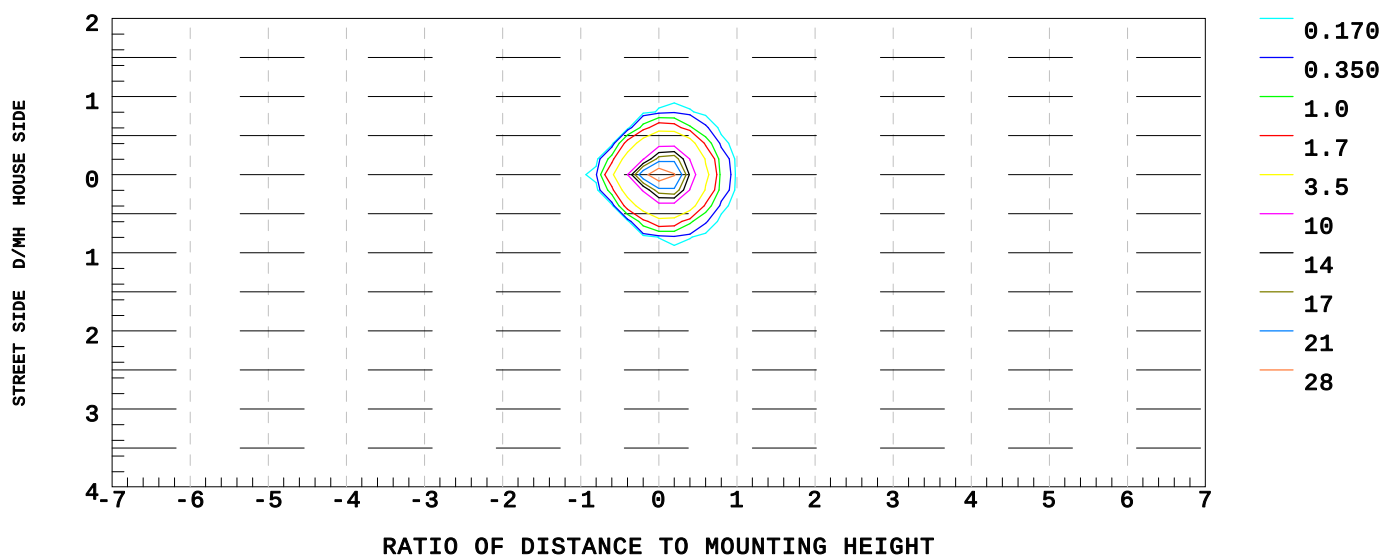
# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

## ISOLUX DIAGRAM

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

ILLUMINANCE AT MH=10 m, Enadir = 34.51 lx



Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

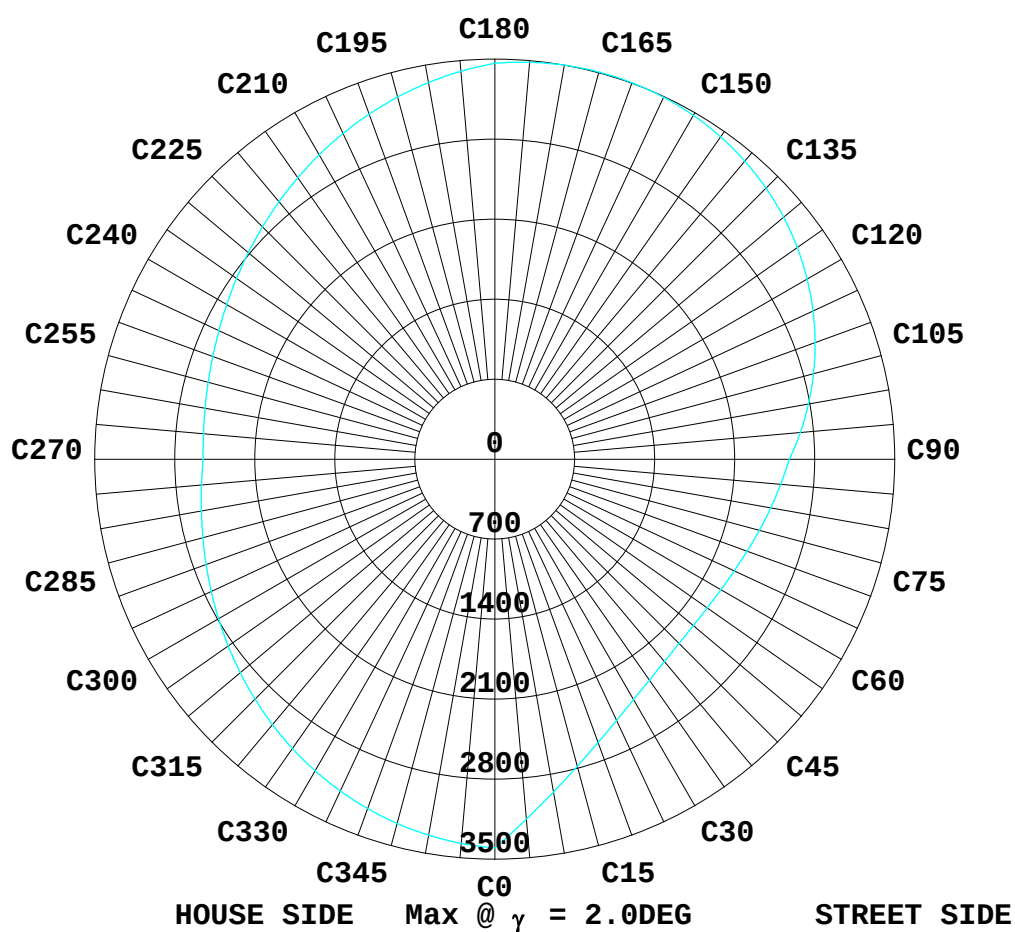
Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

# HOP00 GONIOPHOTOMETERS SYSTEM TEST REPORT

## ISOCANDELA DIAGRAM

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |



Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks:

# HOPOO GONIOPHOTOMETERS SYSTEM TEST REPORT

## LUMINOUS DISTRIBUTION INTENSITY DATA

Report number:

|                |            |                            |
|----------------|------------|----------------------------|
| MANUFACTURER:  |            |                            |
| Address:       |            |                            |
| NAME: LOGAN20W | TYPE: 20W  | WEIGHT:                    |
| SPECIFICATION: | DIMENSION: | SERIAL No.: LA/YE6L-990706 |

UNIT: cd

| C(DEG)<br>γ (DEG) | 0    | 90   | 180  | 270  |
|-------------------|------|------|------|------|
| 0.0               | 3451 | 2585 | 3451 | 2585 |
| 5.0               | 3250 | 2490 | 3417 | 2440 |
| 10.0              | 2793 | 2163 | 3147 | 2072 |
| 15.0              | 2149 | 1687 | 2616 | 1574 |
| 20.0              | 1451 | 1173 | 1921 | 1105 |
| 25.0              | 897  | 736  | 1236 | 727  |
| 30.0              | 513  | 451  | 739  | 436  |
| 35.0              | 206  | 139  | 361  | 125  |
| 40.0              | 45.5 | 32.9 | 125  | 36.6 |
| 45.0              | 27.3 | 25.0 | 30.6 | 26.4 |
| 50.0              | 19.8 | 17.3 | 21.8 | 18.0 |
| 55.0              | 14.0 | 11.6 | 15.5 | 12.3 |
| 60.0              | 9.89 | 7.93 | 11.0 | 8.43 |
| 65.0              | 6.63 | 4.72 | 7.66 | 5.09 |
| 70.0              | 4.56 | 1.67 | 4.48 | 2.73 |
| 75.0              | 3.58 | 1.40 | 3.07 | 2.38 |
| 80.0              | 1.67 | 1.24 | 1.32 | 2.14 |
| 85.0              | 1.43 | 0.88 | 1.11 | 1.69 |
| 90.0              | 1.19 | 0.50 | 1.27 | 1.37 |

Test System:HOP00 HPG1600  
Temperature:25.3DEG  
Operators:  
Test Date:10-18-2020

Test Set: 5.0deg/s C-Gamma (TYPE C)  
Humidity:65.0%  
Test Distance:5.150 m  
Remarks: