



HIGHLANDER Wash Photometric Report

Report 2021-07-14-1

GLP German Light Products GmbH
GLP LightLab

| | |
|-------------------------|--|
| Maximum Total Lumens | 22300 lm |
| Maximum Intensity | 2260000 cd |
| Energy Efficiency Class | C |
| Energy Efficiency Index | 1.03 |
| Power Consumption | 1740 $\frac{\text{kWh}}{1000 \text{ h}}$ |
| Measurement Date | 2021-07-14 10:30 |
| Measurement SW Version | 2.4.0 |
| Analysis SW Version | 2.4.1 |





Contents

| | | |
|----------|---|----------|
| 1 | Light Distribution | 2 |
| 1.1 | Wide, Full - Focus tracking medium Beam | 3 |
| 1.2 | Medium, Full - Focus tracking medium Beam | 4 |
| 1.3 | Narrow, Full - Focus tracking medium Beam | 5 |

1 Light Distribution

Table 1: Summary of beam opening angles for different fixture configurations.

| Beam | Beam Angle (50 %) | | Field Angle (10 %) | | Cutoff Angle (3 %) | |
|--------------------------------------|-------------------|------|--------------------|------|--------------------|-----|
| | C0 | C90 | C0 | C90 | C0 | C90 |
| Wide, Full - Focus tracking medium | 45° | 45° | 61° | 60° | 69° | 67° |
| Medium, Full - Focus tracking medium | 16° | 16° | 23° | 23° | 31° | 30° |
| Narrow, Full - Focus tracking medium | 4.5° | 4.4° | 8.9° | 8.8° | 13° | 13° |

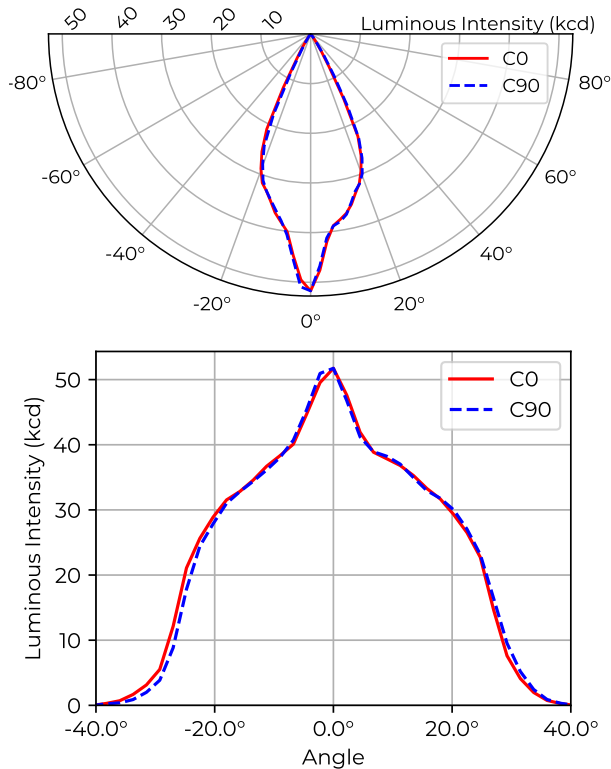
Table 2: Summary of luminous flux and intensity for different fixture configurations.

| Beam | Total Lumen Output | Peak Luminous Intensity) |
|--------------------------------------|--------------------|--------------------------|
| Wide, Full - Focus tracking medium | 22.3 klm | 54.1 kcd |
| Medium, Full - Focus tracking medium | 22.1 klm | 327 kcd |
| Narrow, Full - Focus tracking medium | 17.5 klm | 2.26 Mcd |

Table 3: Approximate illuminance and beam diameter at different projection distances, calculated with the inverse-square law. The approximation is valid only for large distances, compared to the size of the fixture output port.

| Beam | Parameter | Factor | Projection Distance [m] | | | | | | | | | |
|--------------------------------------|------------------|--------|-------------------------|------|------|------|------|------|------|------|------|--|
| | | | 5 | 7.5 | 10 | 12.5 | 15 | 17.5 | 20 | 22.5 | 25 | |
| Wide, Full - Focus tracking medium | Diameter [m] | 1.7 | 8.3 | 12 | 17 | 21 | 25 | 29 | 33 | 37 | 42 | |
| | Illuminance [lx] | 51.7k | 2.1k | 920 | 520 | 330 | 230 | 170 | 130 | 100 | 83 | |
| Medium, Full - Focus tracking medium | Diameter [m] | 0.56 | 2.8 | 4.2 | 5.6 | 7.0 | 8.3 | 9.7 | 11 | 13 | 14 | |
| | Illuminance [lx] | 325k | 13k | 5.8k | 3.2k | 2.1k | 1.4k | 1.1k | 810 | 640 | 520 | |
| Narrow, Full - Focus tracking medium | Diameter [m] | 0.16 | 0.78 | 1.2 | 1.6 | 2.0 | 2.3 | 2.7 | 3.1 | 3.5 | 3.9 | |
| | Illuminance [lx] | 2.22M | 89k | 39k | 22k | 14k | 9.9k | 7.2k | 5.5k | 4.4k | 3.5k | |

1.1 Wide, Full - Focus tracking medium Beam



Type B measurement, 1296 data points.

Table 4: Opening angles for different intensity thresholds. Wide, Full - Focus tracking medium

| | C0 | C90 |
|------------------|-----|-----|
| Beam Angle 50 % | 45° | 45° |
| Field Angle 10 % | 61° | 60° |
| Cutoff Angle 3 % | 69° | 67° |

Table 5: Luminous flux, integrated over the beam for several minimum threshold intensities. Wide, Full - Focus tracking medium

| | Flux (lm) |
|-------------------------|-----------|
| Half-Peak Output @50 % | 15 200 |
| Tenth-Peak Output @10 % | 21 600 |
| Total Lumen Output @3 % | 22 300 |

$$\text{diameter} = 1.7 \times \text{distance}$$

$$\text{illuminance} = \frac{51\,700 \text{ lx}}{(\text{distance [m]})^2}$$

Figure 1: Polar and cartesian light intensity distributions. Wide, Full - Focus tracking medium

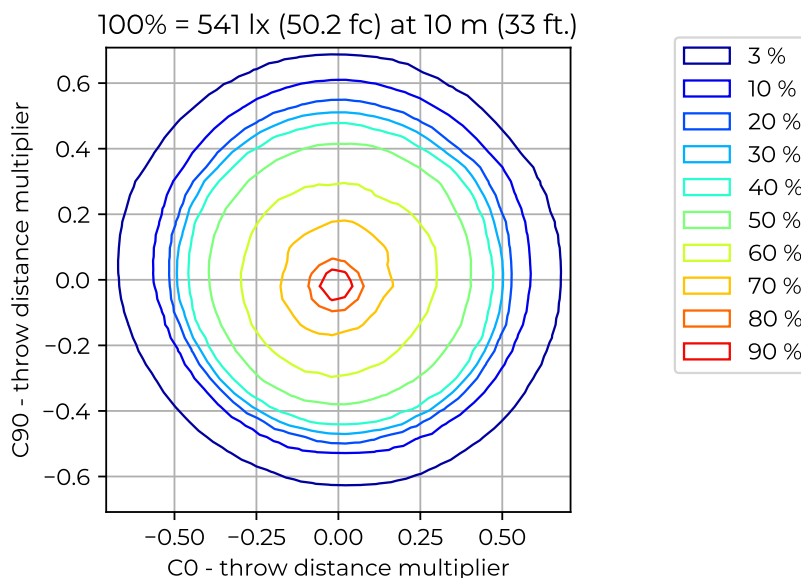
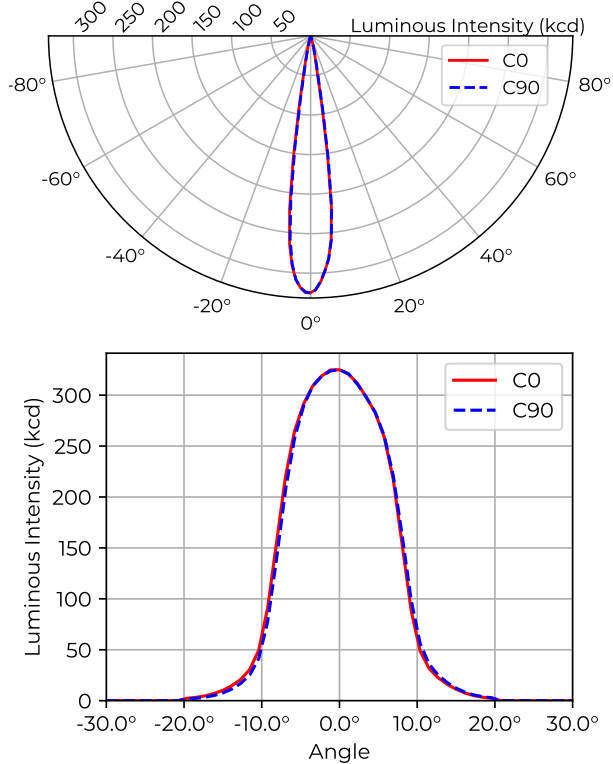


Figure 2: Iso-illuminance diagram of projected beam. Wide, Full - Focus tracking medium
dist. from origin = throw dist. × throw dist. multiplier

Table 6: Quick calculation diagram for illuminance and beam diameter. Wide, Full - Focus tracking medium

| Parameter | Factor | Projection Distance [m] | | | | | | | | | |
|------------------|--------|-------------------------|-----|-----|------|-----|------|-----|------|----|--|
| | | 5 | 7.5 | 10 | 12.5 | 15 | 17.5 | 20 | 22.5 | 25 | |
| Diameter [m] | 1.7 | 8.3 | 12 | 17 | 21 | 25 | 29 | 33 | 37 | 42 | |
| Illuminance [lx] | 51.7k | 2.1k | 920 | 520 | 330 | 230 | 170 | 130 | 100 | 83 | |

1.2 Medium, Full - Focus tracking medium Beam



Type B measurement, 1296 data points.

Table 7: Opening angles for different intensity thresholds. Medium, Full - Focus tracking medium

| | | C0 | C90 |
|--------------|------|-----|-----|
| Beam Angle | 50 % | 16° | 16° |
| Field Angle | 10 % | 23° | 23° |
| Cutoff Angle | 3 % | 31° | 30° |

Table 8: Luminous flux, integrated over the beam for several minimum threshold intensities. Medium, Full - Focus tracking medium

| | | Flux (lm) |
|--------------------|-------|-----------|
| Half-Peak Output | @50 % | 15 500 |
| Tenth-Peak Output | @10 % | 20 400 |
| Total Lumen Output | @3 % | 22 100 |

$$\text{diameter} = 0.56 \times \text{distance}$$

$$\text{illuminance} = \frac{325\,000 \text{ lx}}{(\text{distance [m]})^2}$$

Figure 3: Polar and cartesian light intensity distributions. Medium, Full - Focus tracking medium

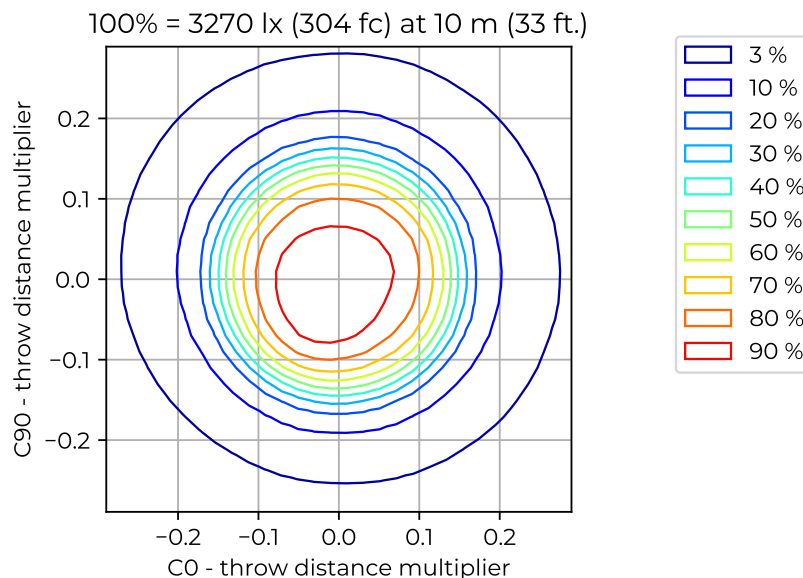
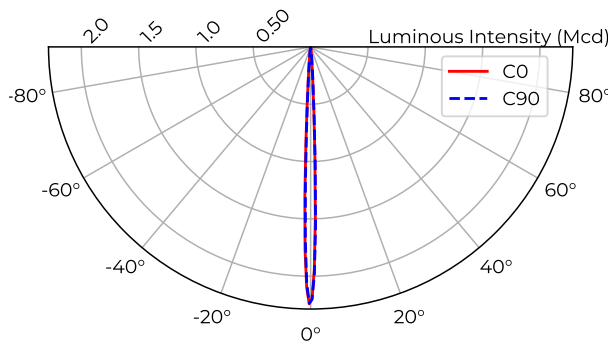


Figure 4: Iso-illuminance diagram of projected beam. Medium, Full - Focus tracking medium
dist. from origin = throw dist. × throw dist. multiplier

Table 9: Quick calculation diagram for illuminance and beam diameter. Medium, Full - Focus tracking medium

| Parameter | Factor | Projection Distance [m] | | | | | | | | | |
|------------------|--------|-------------------------|------|------|------|------|------|-----|------|-----|--|
| | | 5 | 7.5 | 10 | 12.5 | 15 | 17.5 | 20 | 22.5 | 25 | |
| Diameter [m] | 0.56 | 2.8 | 4.2 | 5.6 | 7.0 | 8.3 | 9.7 | 11 | 13 | 14 | |
| Illuminance [lx] | 325k | 13k | 5.8k | 3.2k | 2.1k | 1.4k | 1.1k | 810 | 640 | 520 | |

1.3 Narrow, Full - Focus tracking medium Beam



Type B measurement, 1296 data points.

Table 10: Opening angles for different intensity thresholds. Narrow, Full - Focus tracking medium

| | | C0 | C90 |
|--------------|------|------|------|
| Beam Angle | 50 % | 4.5° | 4.4° |
| Field Angle | 10 % | 8.9° | 8.8° |
| Cutoff Angle | 3 % | 13° | 13° |

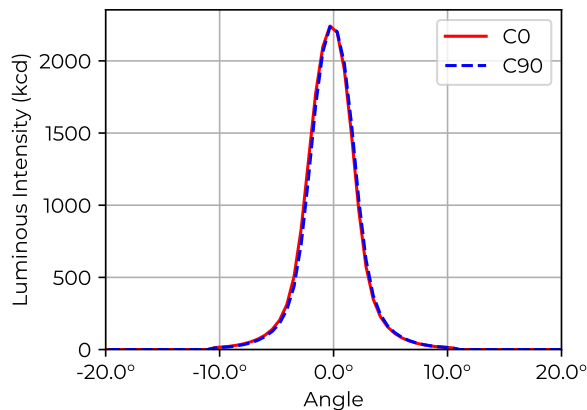


Table 11: Luminous flux, integrated over the beam for several minimum threshold intensities. Narrow, Full - Focus tracking medium

| | | Flux (lm) |
|--------------------|-------|-----------|
| Half-Peak Output | @50 % | 7850 |
| Tenth-Peak Output | @10 % | 14 700 |
| Total Lumen Output | @3 % | 17 500 |

$$\text{diameter} = 0.16 \times \text{distance}$$

$$\text{illuminance} = \frac{2\,220\,000 \text{ lx}}{(\text{distance [m]})^2}$$

Figure 5: Polar and cartesian light intensity distributions. Narrow, Full - Focus tracking medium

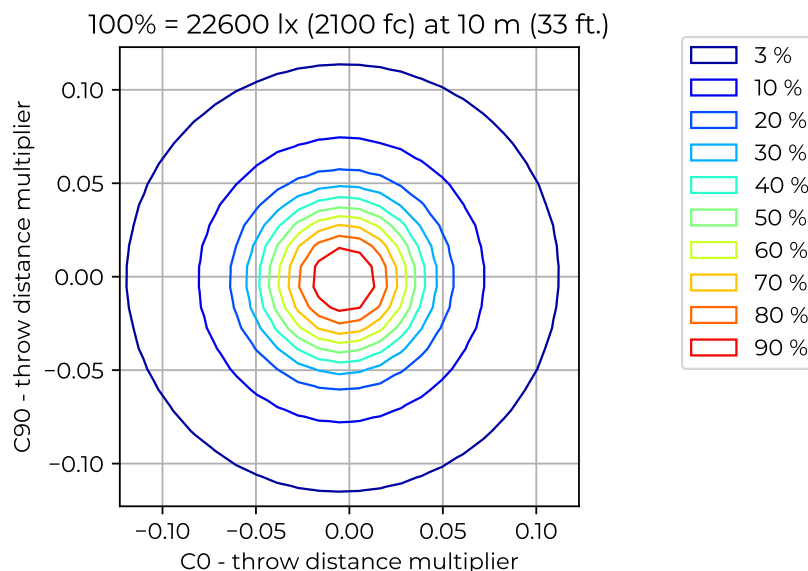


Figure 6: Iso-illuminance diagram of projected beam. Narrow, Full - Focus tracking medium
dist. from origin = throw dist. × throw dist. multiplier

Table 12: Quick calculation diagram for illuminance and beam diameter. Narrow, Full - Focus tracking medium

| Parameter | Factor | Projection Distance [m] | | | | | | | | | |
|------------------|--------|-------------------------|-----|-----|------|------|------|------|------|------|--|
| | | 5 | 7.5 | 10 | 12.5 | 15 | 17.5 | 20 | 22.5 | 25 | |
| Diameter [m] | 0.16 | 0.78 | 1.2 | 1.6 | 2.0 | 2.3 | 2.7 | 3.1 | 3.5 | 3.9 | |
| Illuminance [lx] | 2.22M | 89k | 39k | 22k | 14k | 9.9k | 7.2k | 5.5k | 4.4k | 3.5k | |