

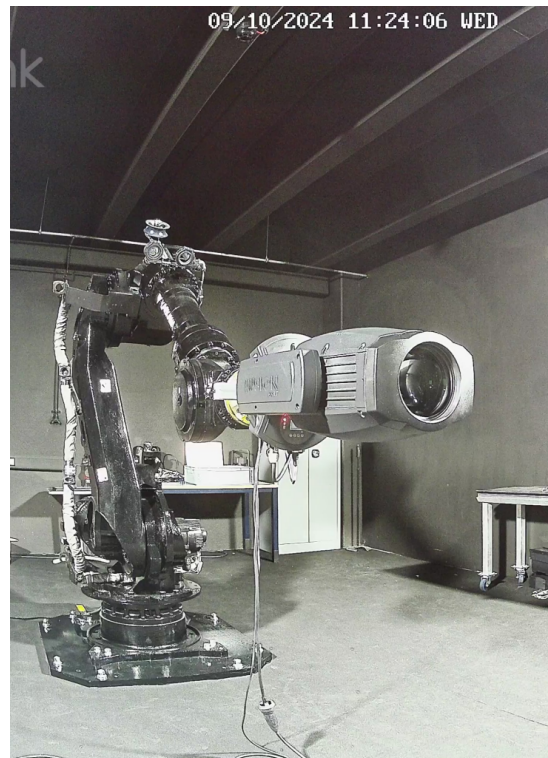


FUSION EXO Hybrid 40  
Before endurance test  
Photometric Report

Report 2024-10-11-1

GLP German Light Products GmbH  
GLP LightLab

Maximum Total Lumens	10600	lm
Maximum Intensity	1850000	cd
Energy Efficiency Class	B	
Energy Efficiency Index	0.56	
Power Consumption	438	$\frac{\text{kWh}}{1000\text{h}}$
Serial Number	23070000002	
Measurement Date	2024-10-11 19:14	
Analysis Date	2024-10-14 07:54	





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# 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
Narrow, TLO	4.4°	4.4°	4.7°	4.7°	4.8°	4.8°
Medium, TLO	14°	14°	15°	15°	15°	15°
Wide, TLO	40°	40°	44°	43°	45°	44°

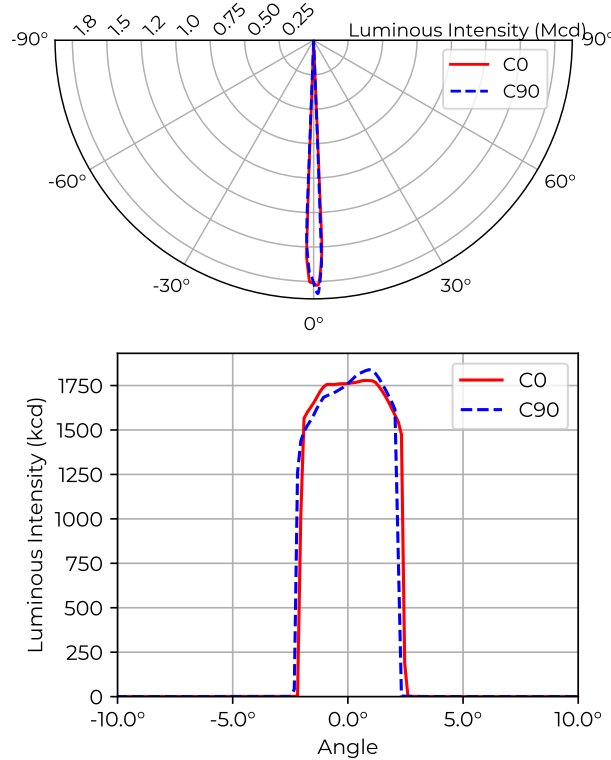
Table 2: Summary of luminous flux and intensity for different fixture configurations.

Beam	Total Lumen Output	Peak Luminous Intensity)
Narrow, TLO	7.81 klm	1.85 Mcd
Medium, TLO	10.4 klm	244 kcd
Wide, TLO	10.6 klm	32.0 kcd

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	
Narrow, TLO	Diameter [m]	0.077	0.39	0.58	0.77	0.96	1.2	1.3	1.5	1.7	1.9	
	Illuminance [lx]	1.76M	70k	31k	18k	11k	7.8k	5.8k	4.4k	3.5k	2.8k	
Medium, TLO	Diameter [m]	0.25	1.3	1.9	2.5	3.1	3.8	4.4	5.0	5.6	6.3	
	Illuminance [lx]	232k	9.3k	4.1k	2.3k	1.5k	1.0k	760	580	460	370	
Wide, TLO	Diameter [m]	0.72	3.6	5.4	7.2	9.0	11	13	14	16	18	
	Illuminance [lx]	31.4k	1.3k	560	310	200	140	100	79	62	50	

## 1.1 Narrow, TLO Beam



Type B measurement, 5184 data points.

Table 4: Opening angles for different intensity thresholds. Narrow, TLO

		C0	C90
Beam Angle	50 %	4.4°	4.4°
Field Angle	10 %	4.7°	4.7°
Cutoff Angle	3 %	4.8°	4.8°

Table 5: Luminous flux, integrated over the beam for several minimum threshold intensities. Narrow, TLO

		Flux (lm)
Half-Peak Output	@50 %	7530
Tenth-Peak Output	@10 %	7790
Total Lumen Output	@3 %	7810

$$\text{diameter} = 0.077 \times \text{distance}$$

$$\text{illuminance} = \frac{1\,760\,000 \text{ lx}}{(\text{distance [m]})^2}$$

Figure 1: Polar and cartesian light intensity distributions. Narrow, TLO

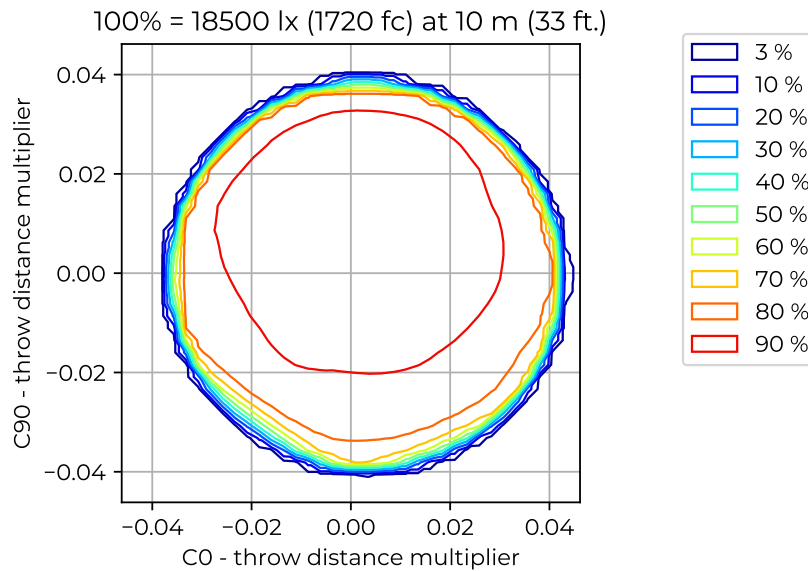
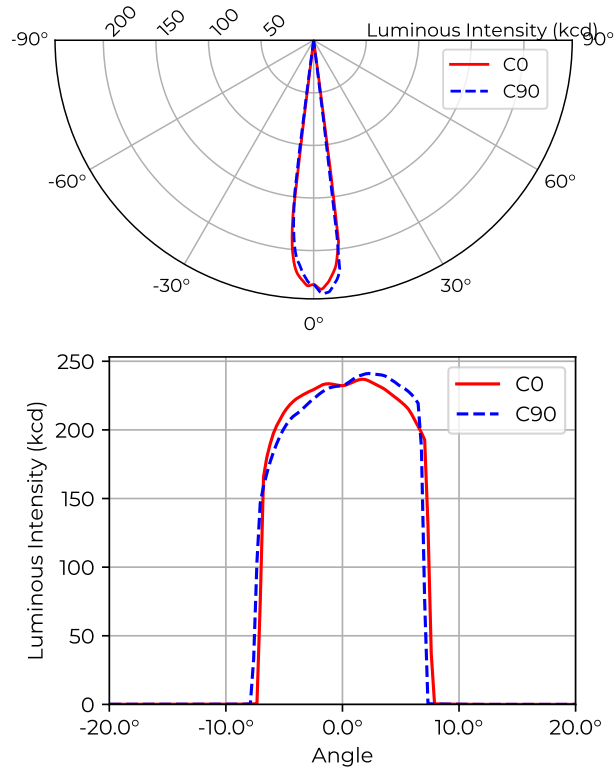


Figure 2: Iso-illuminance diagram of projected beam. Narrow, TLO  
dist. from origin = throw dist. × throw dist. multiplier

Table 6: Quick calculation diagram for illuminance and beam diameter. Narrow, TLO

Parameter	Factor	Projection Distance [m]									
		5	7.5	10	12.5	15	17.5	20	22.5	25	
Diameter [m]	0.077	0.39	0.58	0.77	0.96	1.2	1.3	1.5	1.7	1.9	
Illuminance [lx]	1.76M	70k	31k	18k	11k	7.8k	5.8k	4.4k	3.5k	2.8k	

## 1.2 Medium, TLO Beam



Type B measurement, 5184 data points.

Table 7: Opening angles for different intensity thresholds. Medium, TLO

		C0	C90
Beam Angle	50 %	14°	14°
Field Angle	10 %	15°	15°
Cutoff Angle	3 %	15°	15°

Table 8: Luminous flux, integrated over the beam for several minimum threshold intensities. Medium, TLO

		Flux (lm)
Half-Peak Output	@50 %	10 100
Tenth-Peak Output	@10 %	10 400
Total Lumen Output	@3 %	10 400

$$\text{diameter} = 0.25 \times \text{distance}$$

$$\text{illuminance} = \frac{232\,000 \text{ lx}}{(\text{distance [m]})^2}$$

Figure 3: Polar and cartesian light intensity distributions. Medium, TLO

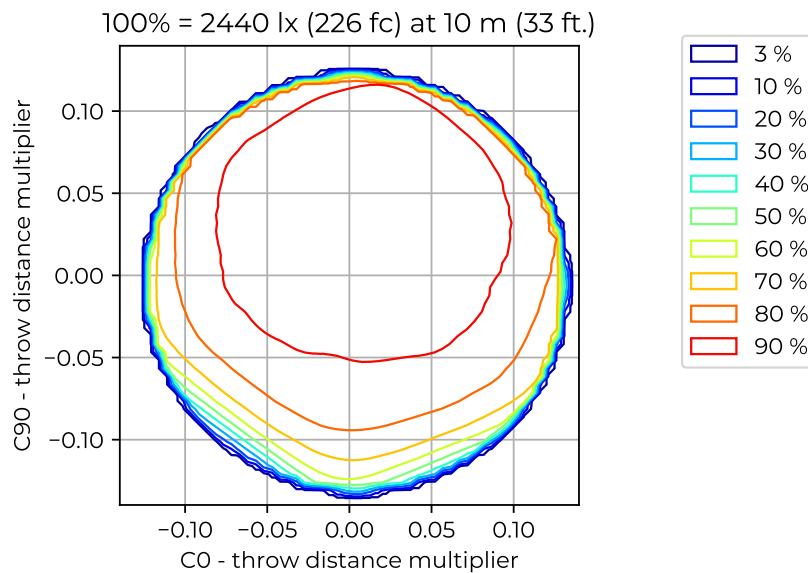
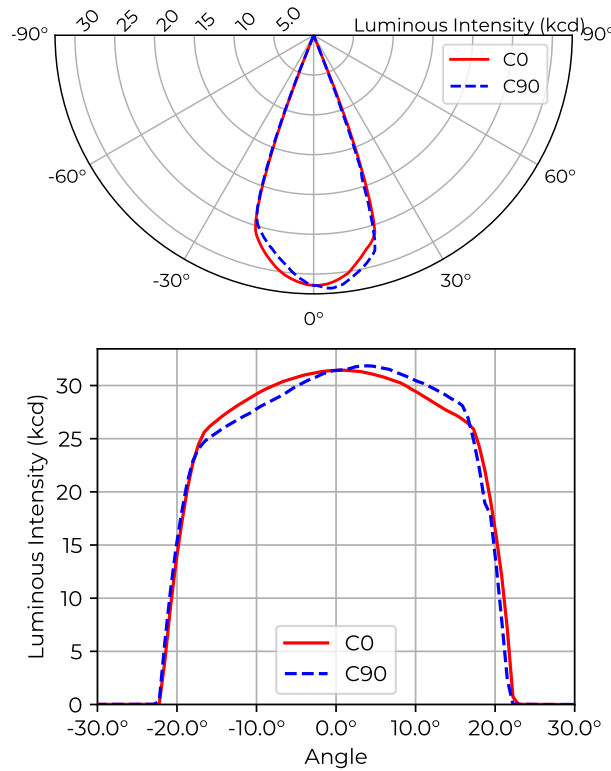


Figure 4: Iso-illuminance diagram of projected beam. Medium, TLO  
dist. from origin = throw dist. × throw dist. multiplier

Table 9: Quick calculation diagram for illuminance and beam diameter. Medium, TLO

Parameter	Factor	Projection Distance [m]									
		5	7.5	10	12.5	15	17.5	20	22.5	25	
Diameter [m]	0.25	1.3	1.9	2.5	3.1	3.8	4.4	5.0	5.6	6.3	
Illuminance [lx]	232k	9.3k	4.1k	2.3k	1.5k	1.0k	760	580	460	370	

### 1.3 Wide, TLO Beam



Type B measurement, 5184 data points.

Table 10: Opening angles for different intensity thresholds. Wide, TLO

		C0	C90
Beam Angle	50 %	40°	40°
Field Angle	10 %	44°	43°
Cutoff Angle	3 %	45°	44°

Table 11: Luminous flux, integrated over the beam for several minimum threshold intensities. Wide, TLO

		Flux (lm)
Half-Peak Output	@50 %	9750
Tenth-Peak Output	@10 %	10 600
Total Lumen Output	@3 %	10 600

$$\text{diameter} = 0.72 \times \text{distance}$$

$$\text{illuminance} = \frac{31\,400 \text{ lx}}{(\text{distance [m]})^2}$$

Figure 5: Polar and cartesian light intensity distributions. Wide, TLO

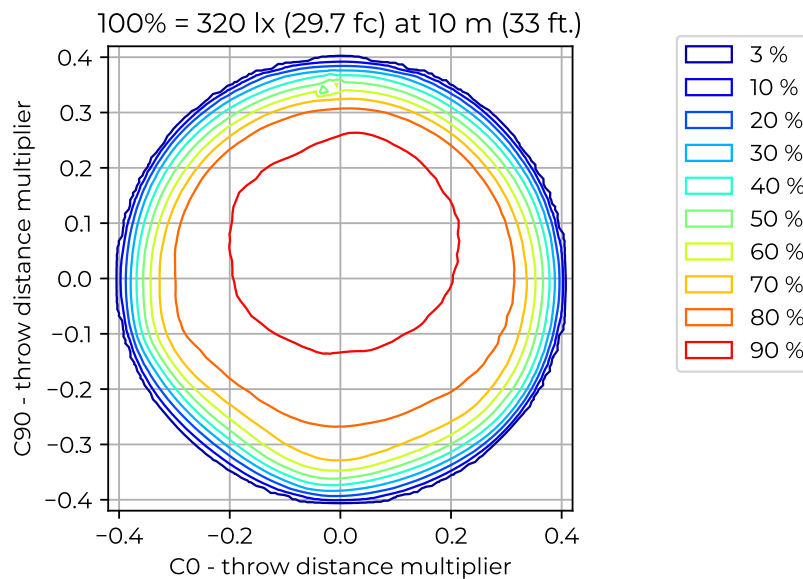


Figure 6: Iso-illuminance diagram of projected beam. Wide, TLO  
dist. from origin = throw dist. × throw dist. multiplier

Table 12: Quick calculation diagram for illuminance and beam diameter. Wide, TLO

Parameter	Factor	Projection Distance [m]									
		5	7.5	10	12.5	15	17.5	20	22.5	25	
Diameter [m]	0.72	3.6	5.4	7.2	9.0	11	13	14	16	18	
Illuminance [lx]	31.4k	1.3k	560	310	200	140	100	79	62	50	