

REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G104428502

Original Issue Date: August 27, 2020

Revision Date: September 1, 2020

REPORT NO. 104428502LAX-002

TEST OF ONE LED UNDERCABINET/TASK LUMINAIRE

MODEL NO. FC7-M-35K-FO-4'
FOCUS 7- SERIES (EX. ALX7)
" FORWARD OPTICS "

LED MODEL NO. OSRAM
DRIVER MODEL NO. OSRAM OTI50

RENDERED TO

PRIMUS LIGHTING INC
3570 LEXINGTON AVE
EL MONTE, CA 91731

Revision Note: September 1, 2020: This report was revised to update the model number information.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

TEST: Electrical and Photometric tests as required to the IESNA test standard.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-01099826-1.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2015: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number FC7-M-35K-FO-4' FOCUS 7- SERIES (EX. ALX7) " FORWARD OPTICS ". The sample was received by Intertek on August 26, 2020, in undamaged condition and one sample was tested as received. The sample designation was LAN2008261110-001.

DATES OF TESTS: August 26, 2020 through August 27, 2020.

SUMMARY

Model No.:	FC7-M-35K-FO-4'
	FOCUS 7- SERIES (EX. ALX7)
	" FORWARD OPTICS "
Description:	LED Undercabinet/Task Luminaire

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	2616	2589
Total Power (W)	29.93	29.86
Luminaire Efficacy (LPW)	87.40	86.70

Criteria	Result
Power Factor at 120Vac	0.968
Power Factor at 277Vac	0.912
Current ATHD % at 120Vac	13.58
Current ATHD % at 277Vac	16.58
Correlated Color Temperature (CCT - K)	3870
Color Rendering Index (CRI - Ra)	83.2
Color Rendering Index (CRI - R9)	11.1
DUV	0.002
Chromaticity Coordinate (x)	0.388
Chromaticity Coordinate (y)	0.385
Chromaticity Coordinate (u')	0.226
Chromaticity Coordinate (v')	0.506

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Goniophotometer	6440T	000943	VBV	VBV	08/27/20
AC Source	CW1251P	000944	VBV	VBV	08/27/20
Power Analyzer	WT210	000945	10/02/19	10/02/20	08/27/20
Tape Measure	33-428	001491	VBV	VBV	08/27/20
Magnetic Level	581-9	001610	10/11/19	10/11/20	08/27/20
Temp. & RH Meter	Testo 622	001912	04/22/20	04/22/21	08/27/20
Thermometer	DPI8-C24	001782	10/15/19	10/15/20	08/27/20
3m Sphere	CSTM-LMS-3M-3020	000830	VBV	VBV	08/26/20
Spectrometer	CDS-3020-T	000834	VBV	VBV	08/26/20
Power Supply (AC 3P / DC)	CSW5550-208-LAN	001339	VBV	VBV	08/26/20
Power Meter	WT330	001319	07/13/20	07/13/21	08/26/20
Temp. & RH Meter	Testo 622	001910	04/15/20	04/15/21	08/26/20
DC Power Supply	LPS-100-0833	000832	04/22/20	04/22/21	08/26/20
Network TC Reader	iSD-TC	000824	02/08/20	02/08/21	08/26/20

TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS-3020 High Sensitivity Multi Channel Spectrometer and Two Meter or Three Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

RESULTS OF TEST

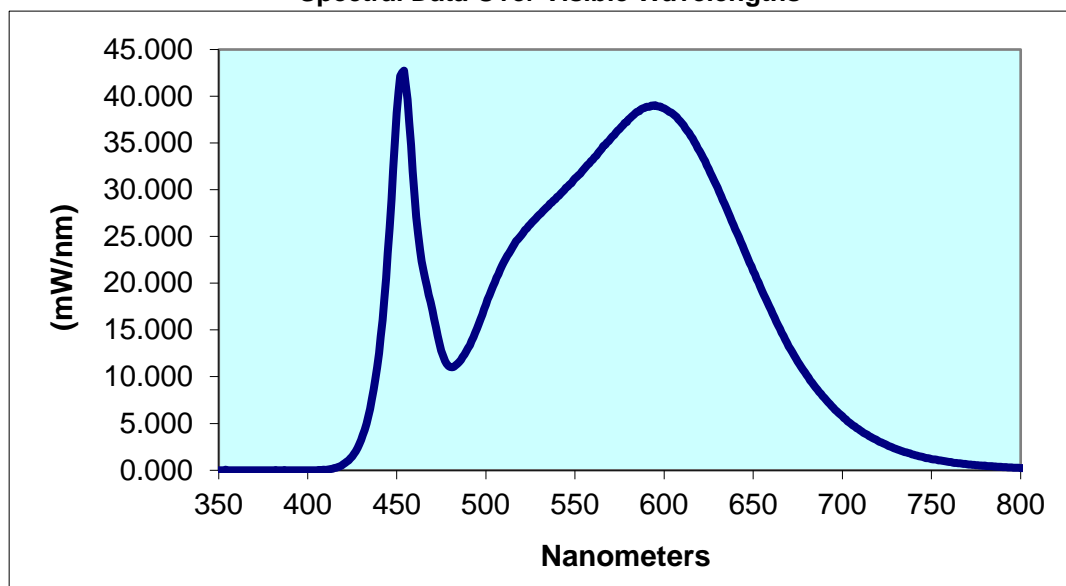
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN2008261110-001	Up	120.0 277.0	257.7 119.2	29.93 30.12	0.968 0.912	13.58 16.58	2616	87.40
Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')	
3870	83.2	11.1	0.002	0.388	0.385	0.226	0.506	

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.000	440	12.51	530	27.33	620	34.09	710	4.265
355	0.000	445	23.23	535	28.26	625	32.22	715	3.667
360	0.000	450	38.22	540	29.20	630	30.19	720	3.144
365	0.000	455	41.28	545	30.21	635	27.99	725	2.701
370	0.000	460	29.32	550	31.19	640	25.74	730	2.292
375	0.000	465	21.31	555	32.19	645	23.57	735	1.955
380	0.000	470	17.08	560	33.21	650	21.30	740	1.657
385	0.000	475	12.78	565	34.36	655	19.17	745	1.417
390	0.000	480	11.05	570	35.47	660	17.12	750	1.206
395	0.000	485	11.55	575	36.47	665	15.13	755	1.043
400	0.000	490	13.05	580	37.47	670	13.24	760	0.891
405	0.000	495	15.16	585	38.33	675	11.62	765	0.751
410	0.042	500	17.71	590	38.85	680	10.19	770	0.642
415	0.216	505	20.12	595	39.02	685	8.859	775	0.553
420	0.628	510	22.21	600	38.68	690	7.716	780	0.491
425	1.461	515	23.85	605	38.11	695	6.677		
430	3.229	520	25.15	610	37.11	700	5.770		
435	6.548	525	26.32	615	35.73	705	4.959		

Spectral Data Over Visible Wavelengths



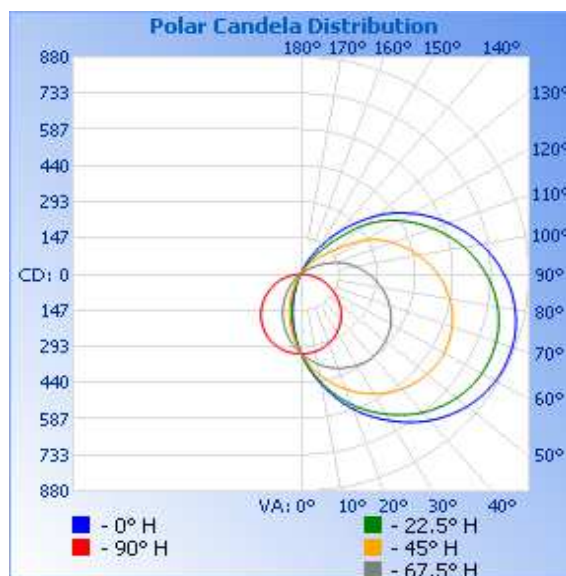
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN2008261110-001	Up	120.0	257.6	29.86	0.967	2589	86.70

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	322	322	322	322	322
5	388	385	368	347	322
10	454	446	413	370	318
15	519	505	456	389	312
20	581	561	495	406	302
25	636	611	530	418	290
30	686	656	560	428	276
35	734	697	586	436	259
40	775	732	607	435	239
45	809	761	623	431	219
50	836	783	633	425	196
55	856	798	639	414	172
60	868	806	639	401	148
65	871	808	632	383	122
70	868	802	621	363	97
75	859	791	605	341	73
80	840	771	584	316	48
85	816	747	558	289	25
90	784	715	528	262	0
95	748	680	495	233	0
100	705	638	458	203	0
105	658	592	417	172	0
110	606	542	375	136	0
115	552	490	331	99	0
120	493	435	270	63	0
125	432	376	195	38	0
130	362	302	136	22	0
135	288	212	91	13	0
140	219	139	57	0	0
145	149	82	36	0	0
150	94	45	20	0	0
155	47	20	10	0	0
160	18	0	0	0	0

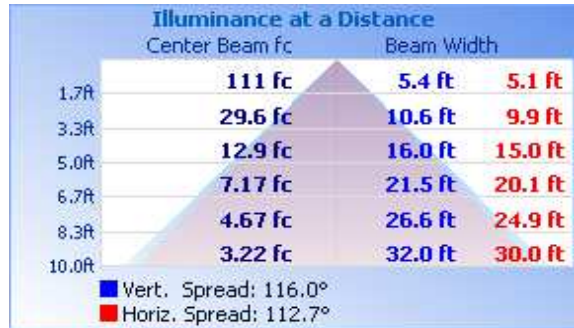


RESULTS OF TEST (cont'd)

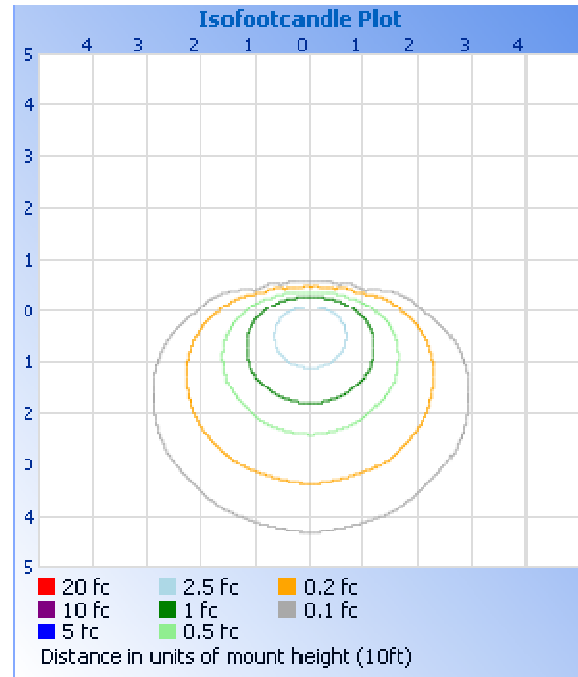
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



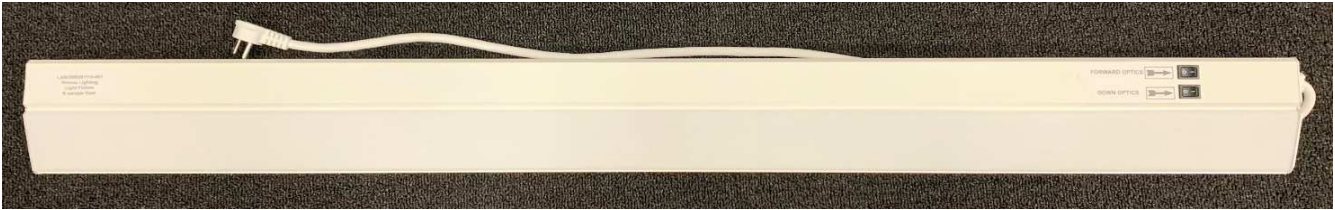
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	263.1	10.2
0-40	458.0	17.7
0-60	974.5	37.6
60-90	866.4	33.5
0-90	1841	71.1
90-180	748.4	28.9
0-180	2589	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	30.5	1.2
10-20	89.2	3.4
20-30	143.3	5.5
30-40	194.9	7.5
40-50	240.5	9.3
50-60	276.1	10.7
60-70	294.9	11.4
70-80	295.5	11.4
80-90	276.0	10.7
90-100	242.6	9.4
100-110	199.5	7.7
110-120	148.1	5.7
120-130	93.0	3.6
130-140	45.6	1.8
140-150	16.0	0.6
150-160	3.4	0.1
160-170	0.1	0.0

PICTURES (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:

A handwritten signature in black ink, appearing to read 'Kellen Murakami'.

Kellen Murakami
Technician
Lighting Division

Attachment: None

Report Reviewed By:

A handwritten signature in black ink, appearing to read 'Vladimir Kozak'.

Vladimir Kozak
Engineering Supervisor
Lighting Division