



REPORT

25800 COMMERCE DRIVE, LAKE FOREST, CA 92630

Project No. G103858894

Date: March 13, 2019

REPORT NO. 103858894LAX-002

TEST OF ONE DL FRL H/H 35K 4'

MODEL NO. DL- FRL- H/H- 35K- 4' (DOUBLE-LED FRL LENS)
LED MODEL NO. OSRAM SYLVANIA
DRIVER MODEL NO. OSRAM SYLVANIA

RENDERED TO

PRIMUS LIGHTING INC
3570 LEXINGTON AVE
EL MONTE, CA 91731

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

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00958862-6.

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 DL- FRL- H/H- 35K- 4' (DOUBLE-LED FRL LENS). The sample was received by Intertek on March 5, 2019, in undamaged condition and one sample was tested as received. The sample designation was LAN1903051054-001B.

DATES OF TESTS: March 7, 2019 through March 8, 2019.

SUMMARY

Model No.:	DL- FRL- H/H- 35K- 4' (DOBLE-LED FRL LENS)
Description:	DL FRL H/H 35K 4'

Criteria	Result
Total Lumen Output (Lumens)	8191
Total Power (W)	109.1
Luminaire Efficacy (LPW)	75.08
Power Factor at 120Vac	0.998
Power Factor at 277Vac	0.978
Current ATHD % at 120Vac	5.92
Current ATHD % at 277Vac	12.20
Correlated Color Temperature (CCT - K)	3454
Color Rendering Index (CRI - Ra)	81.6
Color Rendering Index (CRI - R9)	9.6
DUV	0.001
Chromaticity Coordinate (x)	0.407
Chromaticity Coordinate (y)	0.391
Chromaticity Coordinate (u')	0.237
Chromaticity Coordinate (v')	0.511

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Goniophotometer	6440T	000943	VBV	VBV	03/07/19
AC Source	CW1251P	000944	VBV	VBV	03/07/19
Power Analyzer	WT210	000945	11/28/18	11/28/19	03/07/19
Tape Measure	33-428	001491	04/24/18	04/24/19	03/07/19
Magnetic Level	581-9	001610	10/31/18	10/31/19	03/07/19
Thermometer	DPI8-C24	001782	09/21/18	09/21/19	03/07/19
Temp. & RH Meter	971	001177	01/29/19	01/29/20	03/07/19
3m Sphere	CSTM-LMS-3M-3020	000830	VBV	VBV	03/08/19
Spectrometer	CDS-3020-T	000834	VBV	VBV	03/08/19
Power Supply (AC 3P / DC)	CSW5550-208-LAN	001339	VBV	VBV	03/08/19
Power Meter	WT330	001319	08/13/18	08/13/19	03/08/19
Temp. & RH Meter	971	001177	01/29/19	01/29/20	03/08/19
DC Power Supply	LPS-100-0833	000832	01/31/19	01/31/20	03/08/19
Network TC Reader	iSD-TC	000824	02/01/19	02/01/20	03/08/19



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

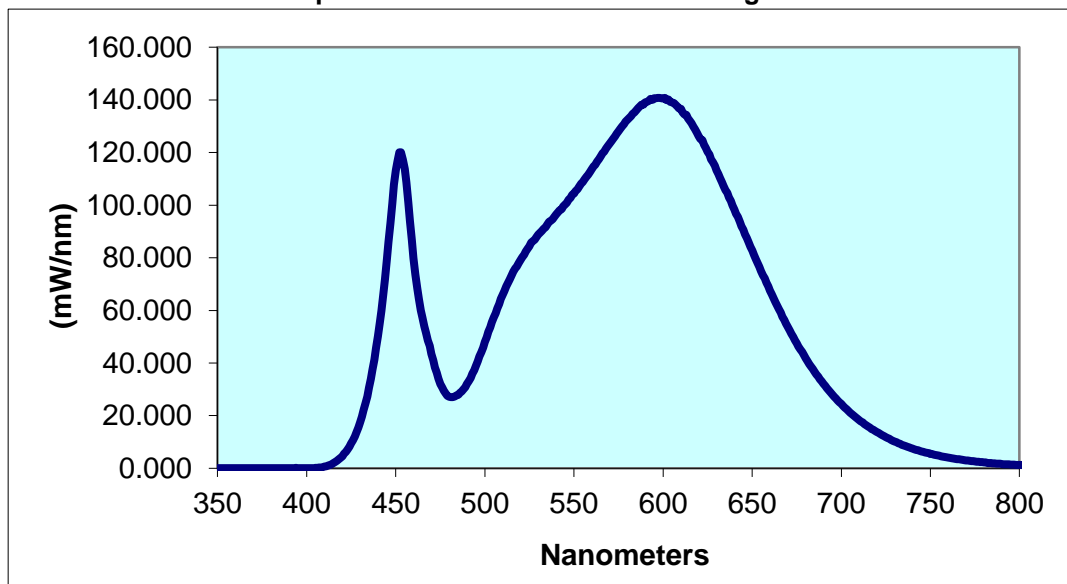
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

Intertek				Input	Input	Input	Input	Current
Sample No.		Base		Voltage	Current	Power	Power	ATHD (%)
		Orientation		{Vac}	(mA)	(Watts)	Factor	
LAN1903051054-001B		Up		120.0	918.5	110.0	0.998	5.92
				276.9	398.5	108.0	0.978	12.20
				CIE 31'		CIE 31'		CIE 76'
Correlated Color	CRI	CRI		Chromaticity	Chromaticity	Chromaticity		Chromaticity
Temperature (K)	-Ra	-R9	DUV	Coordinate (x)	Coordinate (y)	Coordinate (u')		Coordinate (v')
3454	81.6	9.6	0.001	0.407	0.391	0.237		0.511

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.000	440	50.15	530	88.85	620	126.3	710	18.34
355	0.000	445	79.37	535	92.64	625	120.4	715	15.89
360	0.000	450	113.2	540	96.48	630	113.3	720	13.73
365	0.000	455	113.7	545	100.3	635	105.8	725	11.86
370	0.000	460	79.86	550	104.5	640	98.29	730	10.14
375	0.000	465	57.34	555	108.8	645	90.60	735	8.698
380	0.017	470	43.50	560	113.6	650	82.72	740	7.491
385	0.000	475	32.07	565	118.6	655	74.94	745	6.405
390	0.000	480	27.21	570	123.4	660	67.56	750	5.521
395	0.000	485	27.93	575	128.1	665	60.52	755	4.736
400	0.000	490	32.06	580	132.5	670	53.63	760	4.084
405	0.128	495	38.87	585	136.1	675	47.47	765	3.467
410	0.634	500	47.95	590	139.0	680	41.79	770	2.993
415	1.943	505	57.37	595	140.6	685	36.76	775	2.557
420	4.564	510	65.98	600	140.5	690	32.16	780	2.215
425	9.391	515	73.44	605	139.1	695	27.97		
430	17.35	520	79.26	610	136.7	700	24.44		
435	30.58	525	84.27	615	132.0	705	21.14		

Spectral Data Over Visible Wavelengths



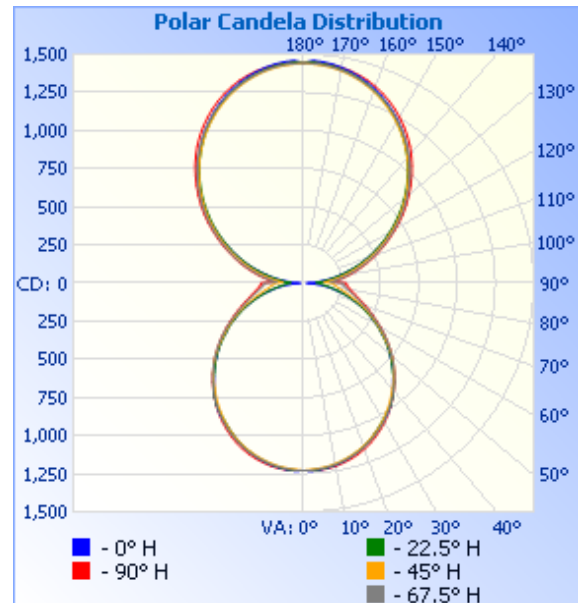
RESULTS OF TEST (cont'd)

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)
LAN1903051054-001B	Up	120.0	911.3	109.1	0.998	8191	75.08

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	1228	1228	1228	1228	1228
5	1228	1225	1218	1223	1228
10	1210	1207	1201	1207	1218
15	1181	1178	1174	1181	1192
20	1142	1140	1137	1146	1158
25	1093	1092	1091	1101	1111
30	1041	1035	1035	1047	1053
35	985	984	972	984	987
40	908	911	901	914	914
45	828	823	832	836	836
50	738	741	752	753	753
55	652	648	655	665	666
60	561	555	564	577	580
65	464	457	474	491	497
70	362	361	387	414	426
75	270	271	309	352	368
80	179	189	250	304	323
85	94	130	210	270	291
90	21	102	190	256	278
95	92	118	170	209	223
100	194	204	248	285	298
105	302	305	338	372	383
110	414	413	437	467	477
115	527	524	543	567	577
120	641	636	651	672	682
125	754	747	760	778	790
130	864	855	863	882	894
135	967	958	962	980	996
140	1063	1054	1054	1071	1093
145	1150	1141	1139	1153	1178
150	1229	1219	1214	1227	1253
155	1298	1287	1280	1291	1319
160	1355	1344	1335	1344	1371
165	1401	1389	1380	1387	1410
170	1436	1422	1413	1418	1434
175	1456	1443	1433	1437	1445
180	1447	1447	1447	1447	1447

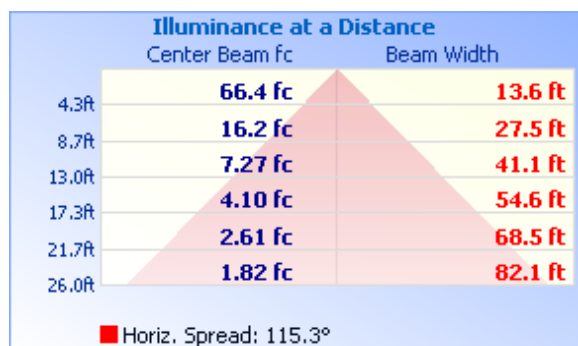


RESULTS OF TEST (cont'd)

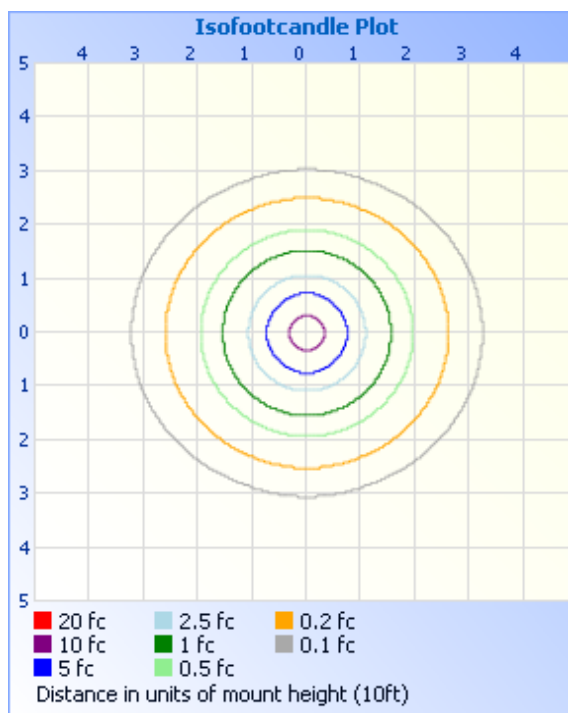
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	954.4	11.7
0-40	1568	19.1
0-60	2796	34.1
60-90	1028	12.5
0-90	3824	46.7
90-180	4367	53.3
0-180	8191	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	116.2	1.4
10-20	332.9	4.1
20-30	505.2	6.2
30-40	613.2	7.5
40-50	640.8	7.8
50-60	587.5	7.2
60-70	471.8	5.8
70-80	332.7	4.1
80-90	223.1	2.7
90-100	192.4	2.3
100-110	359.9	4.4
110-120	541.4	6.6
120-130	683.0	8.3
130-140	748.2	9.1
140-150	718.6	8.8
150-160	594.9	7.3
160-170	392.2	4.8
170-180	136.9	1.7

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:



Vladimir Kozak
Engineering Supervisor
Lighting Division

Attachment: None

Report Reviewed By:



Erik Linares
Associate Engineer
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