



Report of Test LLI-21176-9

LED Roadway Lighting - Roadway luminaire. Product ID: "NXT-12S-5-X-3LM-3-XX-4-XX-X-XX"

Grey cast aluminum housing with clear flat glass lens.

12 LEDs in one square array with clear plastic sheet of individual lenses.

One Philips Xitanium LED driver. Model: 929000708803 set to 350ma

Operating at 120v AC and 60 Hz.



Performance Summary

Total Light Output	1741 lm	Min Power Factor	0.76 @ 277 V
Luminaire Power	14.7 W	Max THD(i)*	17.0 % @ 277 V
Luminous Efficacy	118.4 lm/W	0-90° Zonal Flux %	100.0 %
CCT	2980 K	80-90° Zonal Flux %	1.2 %
CIE(x,y) 1931	(0.439, 0.408)	BUG Rating*	B1-U0-G1
CRI	73	Street Classification*	Type II Very Short

This report contains data that are not covered by the NVLAP accreditation. Data marked with * are not covered.

Prepared for : LED Roadway Lighting Ltd, 84 Chain Lake Drive, Halifax. NS Canada

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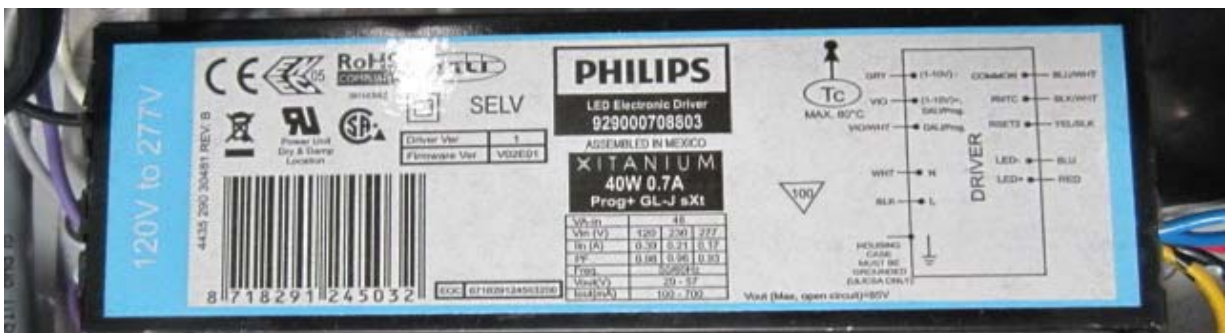
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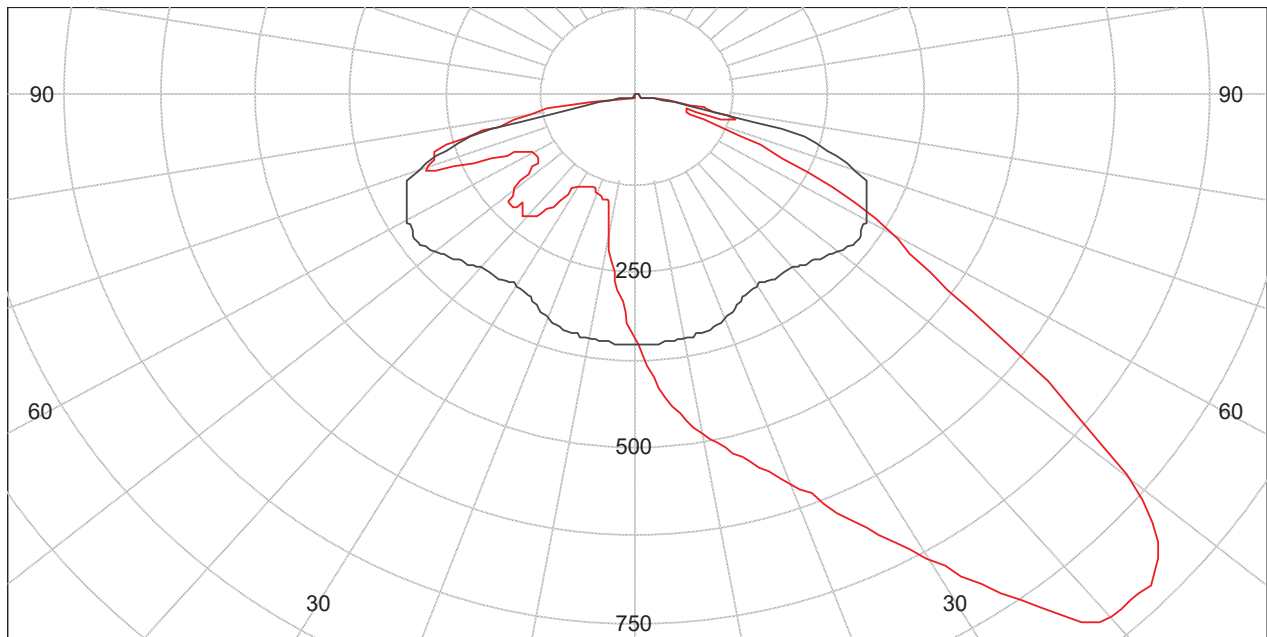
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Polar Light Distribution Curves



House side / L270

L90 / 270 - Black, Plane of maximum - Red, L0 / 180 - Blue (cd)

Street side / L90

Percentage Outputs

	Upward	Downward	Total
Street Side	0.0 %	77.1 %	77.1 %
House Side	0.0 %	22.9 %	22.9 %
	0.0 %	100.0 %	100.0 %

Report data based on absolute values as measured.

Signed:

Ryder Tunney
Ryder Tunney
Authorized Signatory

Date of test
Date of report

16-Jul-2021
16-Jul-2021

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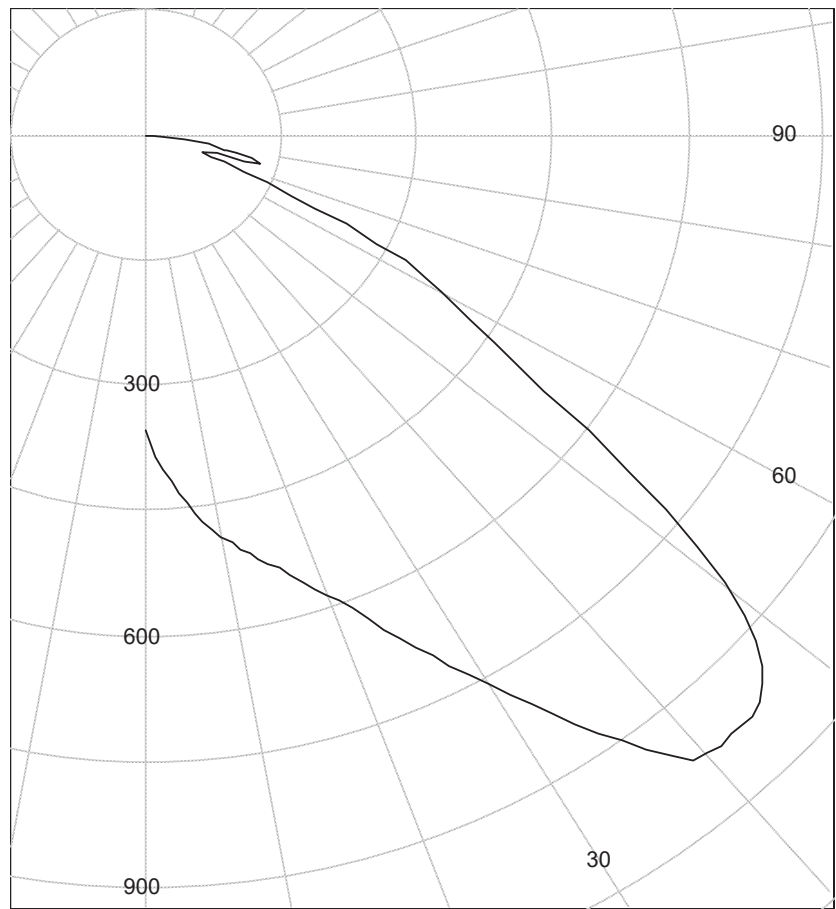
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Intensity in principal plane
(based on overall max intensity)

Vertical Angle (°)	Intensity (cd)
0.0	352.5
10.0	487.6
20.0	585.7
30.0	759.2
35.0	874.3
40.0	966.0
45.0	958.8
47.5	919.7
50.0	834.3
52.5	700.6
55.0	536.9
57.5	440.5
60.0	377.2
62.5	306.6
65.0	209.5
67.5	132.6
70.0	76.4
72.5	71.6
75.0	132.2
77.5	97.1
80.0	71.5
82.5	15.4
85.0	1.6
87.5	0.5
90.0	0.0
92.5	0.0
95.0	0.0
97.5	0.0
100.0	0.0
102.5	0.0
105.0	0.0
120.0	0.0
135.0	0.0
150.0	0.0
165.0	0.0
180.0	0.0

Principal Vertical Plane



House side max intensity
354.2 cd @ (90.0°, 55.0°)

Street side max intensity
968.0 cd @ (0.0°, 40.5°)

Coordinates expressed in the C Type coordinate system

Data for the two symmetric halves of the luminaire has been averaged.



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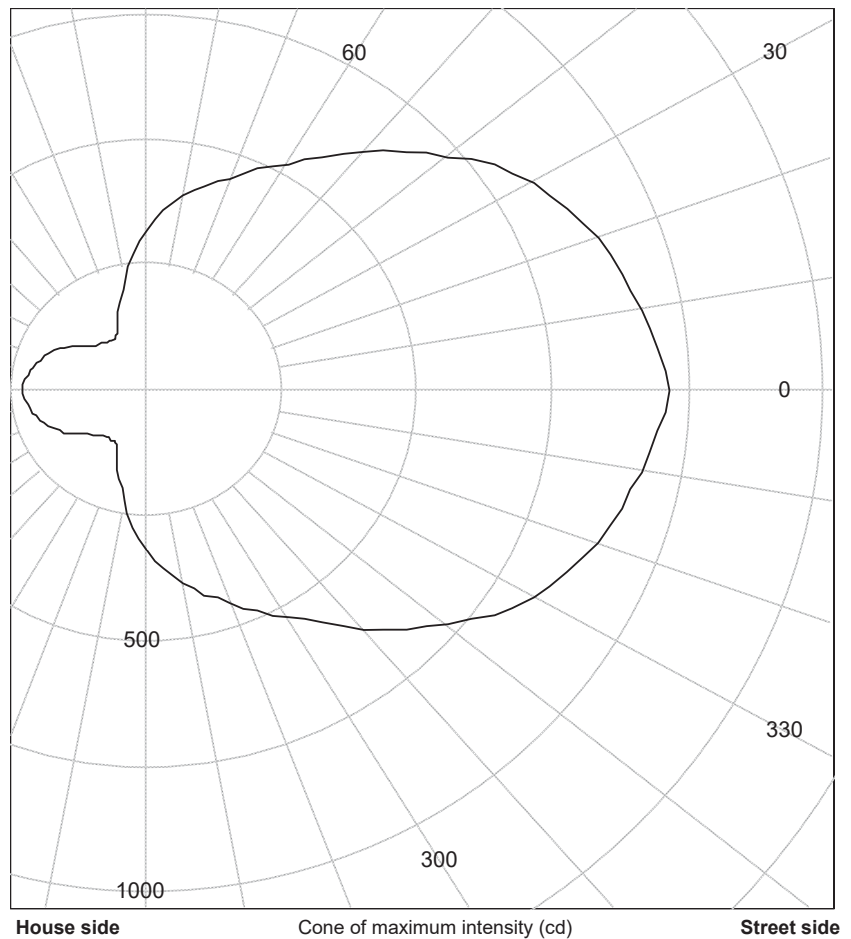
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Operating at 120v AC and 60 Hz.

Intensity in principal cone
(based on overall max intensity)

Lateral Plane (°)	(V40.5) (cd)
0	968.0
15	908.0
30	823.2
40	725.1
45	673.9
50	621.7
55	566.7
60	521.2
65	485.7
70	448.8
75	421.3
80	391.6
85	358.5
90	319.3
95	274.6
100	224.2
105	181.8
110	151.2
115	122.5
120	117.3
125	117.6
130	119.9
135	127.2
140	136.6
150	169.3
165	208.4
180	225.8

Principal Conical Surface



House side

Cone of maximum intensity (cd)

Street side

House side max intensity
354.2 cd @ (90.0°, 55.0°)

Street side max intensity
968.0 cd @ (0.0°, 40.5°)

Coordinates expressed in the C Type coordinate system

Data for the two symmetric halves of the luminaire has been averaged.



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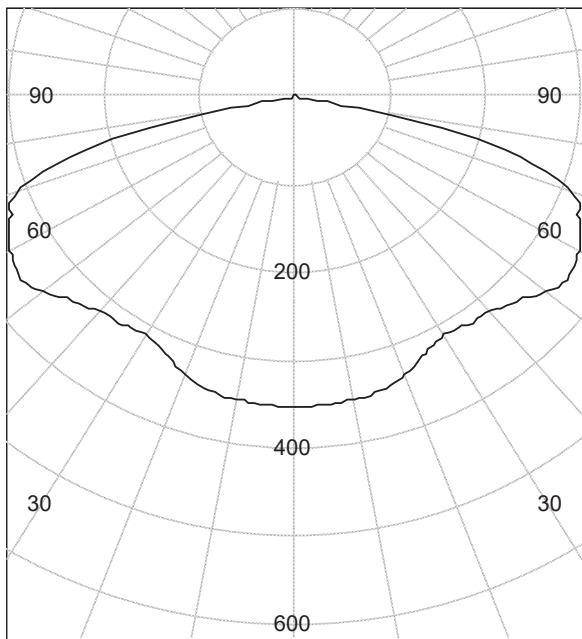
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Polar curve through L90 / L270

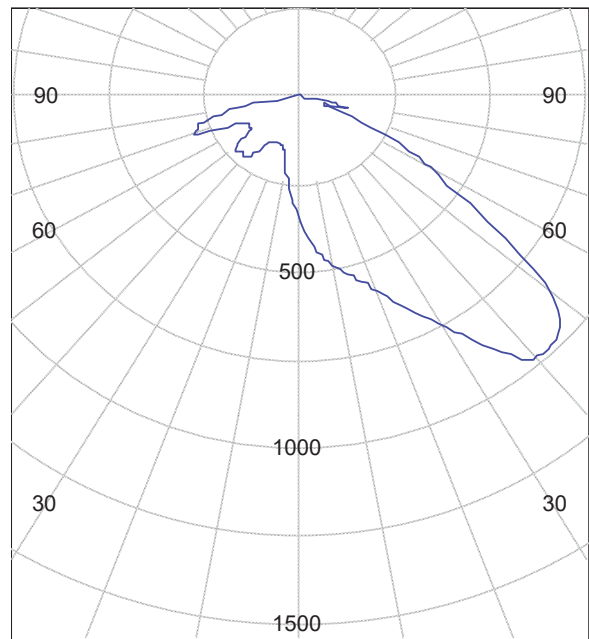


(L90)

(cd)

(L270)

Polar curve through L0 / L180



House side (L180)

(cd)

Street side (L0)



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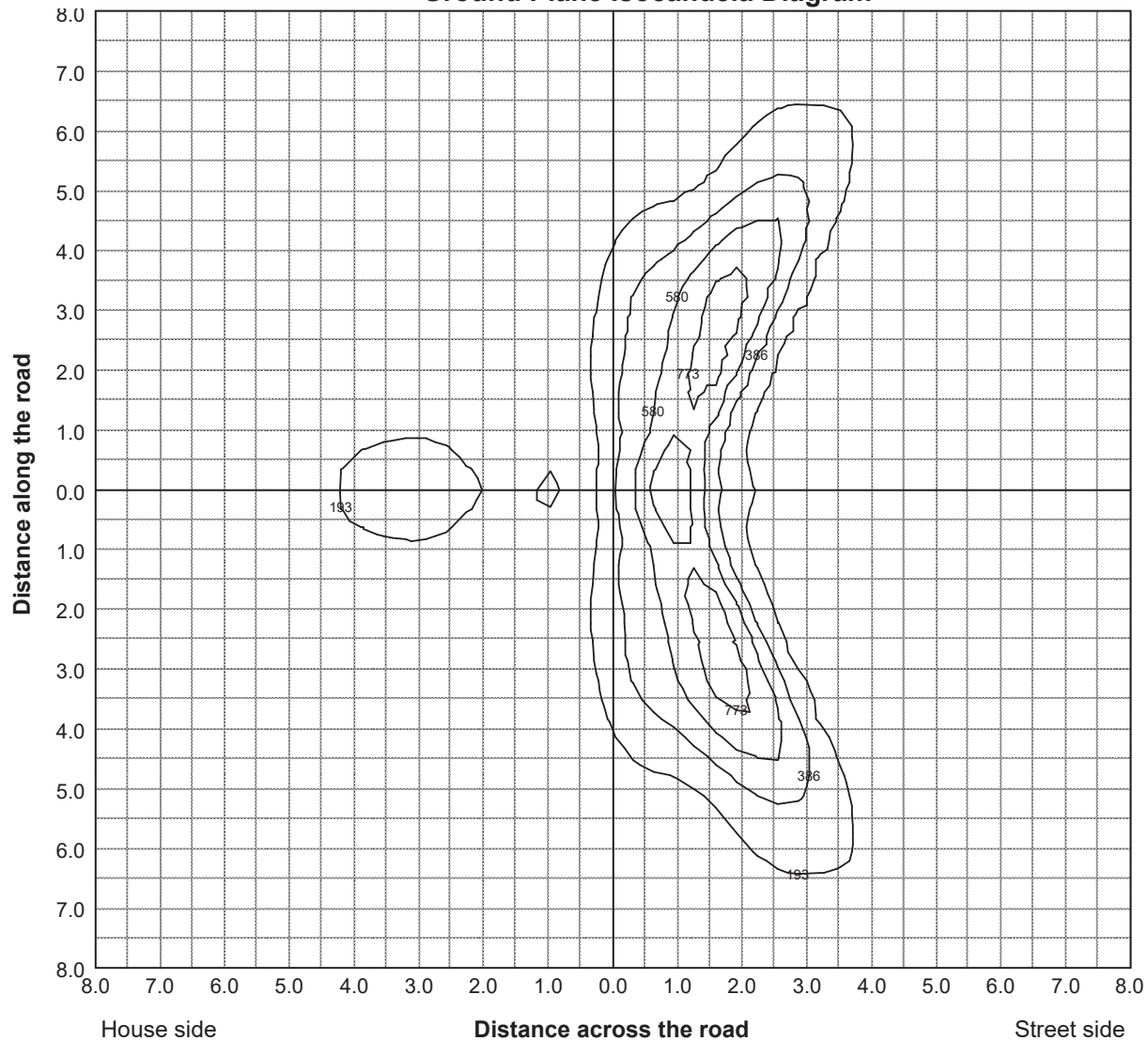
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Ground Plane Isocandela Diagram



The isocandela contour units are expressed as cd

Upstream and downstream sides have been averaged.



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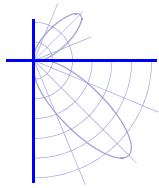
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Intensity data (cd)									
Vertical	L-Plane								
	L0	L15	L30	L40	L45	L50	L55	L60	L65
0.0	352	352	352	352	352	352	352	352	352
10.0	488	483	470	458	450	443	434	425	414
20.0	586	573	549	529	517	503	487	470	450
30.0	759	718	660	617	585	551	514	482	453
35.0	874	815	733	671	628	582	536	502	468
40.0	966	904	817	722	669	619	564	521	484
45.0	959	927	869	769	707	648	590	539	499
47.5	920	906	878	781	725	665	605	558	515
50.0	834	851	872	791	737	680	627	581	530
52.5	701	748	842	792	750	696	649	599	540
55.0	537	623	789	785	759	715	674	621	558
57.5	441	463	699	774	763	737	703	654	582
60.0	377	362	581	753	768	759	737	690	604
62.5	307	280	431	706	769	783	773	722	629
65.0	209	180	326	609	757	805	806	756	654
67.5	133	109	235	477	705	822	836	782	677
70.0	76	70	159	318	585	796	846	799	714
72.5	72	52	112	199	376	682	823	844	775
75.0	132	36	78	135	207	472	759	856	793
77.5	97	24	54	92	116	260	584	747	689
80.0	71	14	30	49	65	97	303	454	407
82.5	15	6	9	19	21	43	106	152	139
85.0	2	1	2	3	4	5	8	15	10
87.5	0	1	1	1	1	1	1	1	1
90.0	0	0	0	0	0	0	0	0	0
92.5	0	0	0	0	0	0	0	0	0
95.0	0	0	0	0	0	0	0	0	0
97.5	0	0	0	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0	0	0
102.5	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0



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Operating at 120v AC and 60 Hz.

Intensity data (cd)									
Vertical	L-Plane								
	L70	L75	L80	L85	L90	L95	L100	L105	L110
0.0	352	352	352	352	352	352	352	352	352
10.0	401	389	377	364	351	336	323	309	297
20.0	428	407	385	361	336	310	284	259	237
30.0	428	400	373	344	313	279	242	209	182
35.0	437	408	380	350	316	276	233	194	165
40.0	448	420	390	357	319	274	225	183	152
45.0	468	438	409	374	330	278	220	173	139
47.5	479	449	420	383	337	281	219	171	132
50.0	487	456	427	391	343	283	216	165	129
52.5	498	466	439	402	352	286	215	161	125
55.0	510	477	448	408	354	284	212	156	121
57.5	521	483	450	409	351	278	205	150	118
60.0	530	485	450	407	347	271	197	145	118
62.5	541	486	448	403	339	262	189	139	117
65.0	551	483	444	396	331	252	179	129	113
67.5	568	482	439	391	326	236	157	115	107
70.0	602	495	447	397	305	203	133	98	94
72.5	636	516	458	381	269	169	100	73	76
75.0	621	473	397	329	226	116	59	52	56
77.5	499	335	262	213	129	46	31	33	37
80.0	272	143	105	95	50	15	16	17	19
82.5	104	48	33	38	18	7	8	8	7
85.0	5	4	3	3	3	3	3	3	2
87.5	1	1	1	1	1	1	1	1	1
90.0	0	0	0	0	0	0	0	0	0
92.5	0	0	0	0	0	0	0	0	0
95.0	0	0	0	0	0	0	0	0	0
97.5	0	0	0	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0	0	0
102.5	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0



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Operating at 120v AC and 60 Hz.

Intensity data (cd)									
Vertical	L-Plane								
	L115	L120	L125	L130	L135	L140	L150	L165	L180
0.0	352	352	352	352	352	352	352	352	352
10.0	285	273	264	254	245	236	222	207	203
20.0	216	198	181	164	152	145	144	144	147
30.0	160	137	127	126	126	126	133	142	149
35.0	139	123	122	122	123	127	139	173	189
40.0	124	118	118	120	127	135	167	207	224
45.0	115	112	113	118	127	141	163	198	220
47.5	112	109	110	117	124	134	151	208	226
50.0	110	108	108	115	121	125	147	210	207
52.5	109	105	108	113	117	118	146	185	174
55.0	106	102	108	112	113	112	140	157	156
57.5	104	99	107	111	107	107	123	144	157
60.0	103	96	106	110	104	101	109	140	163
62.5	105	95	104	107	98	95	98	135	175
65.0	103	93	100	99	92	90	92	139	209
67.5	97	90	102	92	85	85	90	171	274
70.0	87	84	97	86	77	79	98	207	289
72.5	74	72	79	74	66	72	101	198	282
75.0	57	53	57	55	54	61	92	171	234
77.5	35	34	37	37	40	47	74	137	175
80.0	18	18	19	21	25	31	55	99	120
82.5	7	7	8	10	12	16	35	53	2
85.0	2	3	3	4	4	5	6	3	0
87.5	1	1	1	1	1	1	0	0	0
90.0	0	0	0	0	0	0	0	0	0
92.5	0	0	0	0	0	0	0	0	0
95.0	0	0	0	0	0	0	0	0	0
97.5	0	0	0	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0	0	0
102.5	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0



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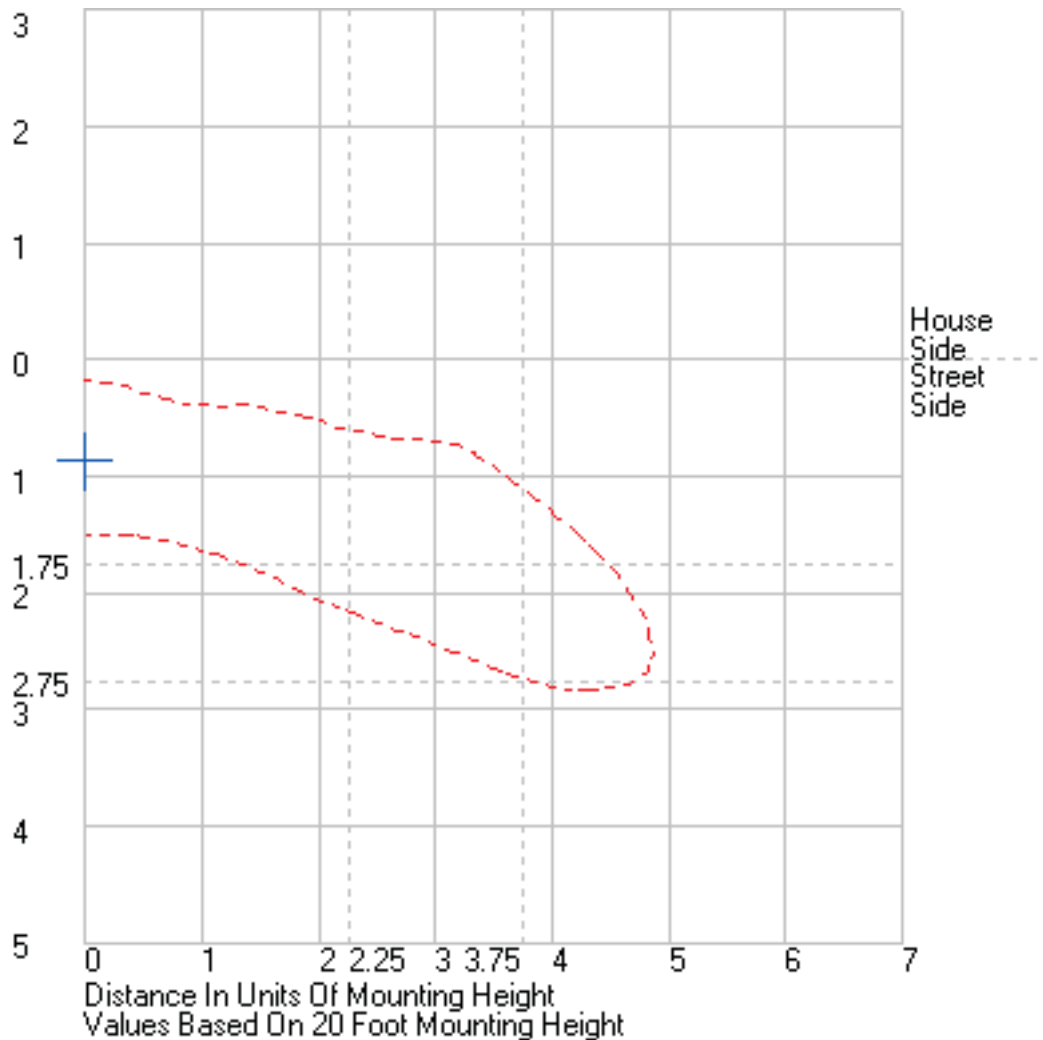
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LM-79-08 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.439, 0.408)
	CIE 1976 (u', v') ⁽¹⁾	(0.251, 0.523)
	Correlated Color Temperature (CCT) ⁽¹⁾	2980 K
	Spatial Δ (u', v') Uniformity ⁽²⁾	0.0118
	Color Rendering Index (Ra) ⁽¹⁾	73.4
	Special CRI 9 (R ₉) ^{(1),(3)}	-23.7
	Distance from Planckian Locus (Duv) ^{(1),(3)}	1.01E-03
	Scotopic/Photopic Ratio ^{(1),(3)}	1.18

Electrical	Voltage	120.0 V	(Setpoint 1)
	Frequency	60.0 Hz	
	Current	0.127 A	
	Power	14.7 W	
	Power Factor	0.96	
	Current THD	9.5 %	
	Voltage	277.0 V	(Setpoint 2)
	Frequency	60.0 Hz	
	Current	0.072 A	
	Power	15.2 W	
	Power Factor	0.76	
	Current THD	17 %	

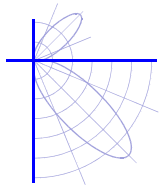
Performance data in accordance with IESNA LM-79-08. Spectral calculations are for a CIE 2° observer

Photometric and spectral values were measured at Setpoint 1

(1) Value is computed from the weighted average of the spatial measurements

(2) Value is the maximum deviation of the spatial u' and v' measurements from the weighted average

(3) Quantity is in addition to the scope of IESNA LM-79-08



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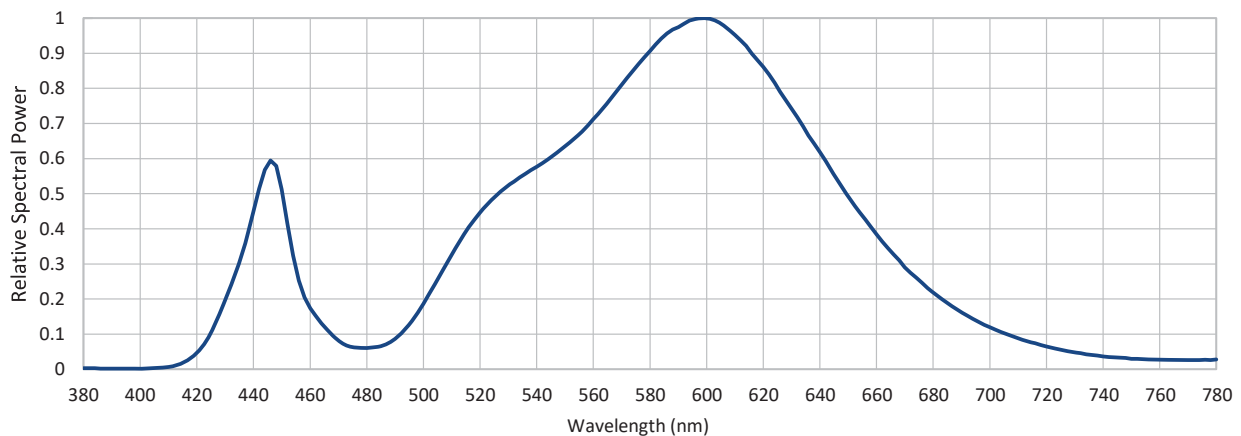
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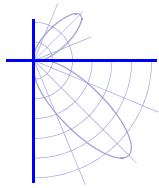
LM-79-08 Performance Data

Relative spectral power distribution

(Relative to peak = 1, weighted average of spatial measurements)

λ (nm)	Relative Power	λ (nm)	Relative Power	λ (nm)	Relative Power	λ (nm)	Relative Power	λ (nm)	Relative Power
380	0.003	460	0.174	540	0.577	620	0.861	700	0.120
385	0.002	465	0.122	545	0.604	625	0.803	705	0.103
390	0.002	470	0.082	550	0.635	630	0.742	710	0.088
395	0.002	475	0.063	555	0.670	635	0.679	715	0.076
400	0.002	480	0.061	560	0.712	640	0.619	720	0.065
405	0.003	485	0.066	565	0.759	645	0.553	725	0.056
410	0.007	490	0.087	570	0.810	650	0.493	730	0.048
415	0.019	495	0.128	575	0.860	655	0.437	735	0.042
420	0.046	500	0.187	580	0.907	660	0.385	740	0.037
425	0.106	505	0.256	585	0.949	665	0.336	745	0.034
430	0.196	510	0.326	590	0.974	670	0.290	750	0.030
435	0.306	515	0.392	595	0.995	675	0.254	755	0.029
440	0.449	520	0.446	600	1.000	680	0.218	760	0.027
445	0.582	525	0.490	605	0.984	685	0.189	765	0.027
450	0.512	530	0.524	610	0.952	690	0.162	770	0.026
455	0.289	535	0.552	615	0.910	695	0.139	775	0.027
								780	0.028





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LM-79-08 Performance Data

Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0.0° plane	Horiz. ° plane
0.0	(0.250, 0.518)	(0.250, 0.517)
10.0	(0.250, 0.519)	(0.249, 0.514)
20.0	(0.250, 0.519)	(0.249, 0.512)
30.0	(0.250, 0.519)	(0.249, 0.515)
40.0	(0.251, 0.521)	(0.250, 0.519)
50.0	(0.251, 0.524)	(0.251, 0.526)
60.0	(0.253, 0.528)	(0.252, 0.535)
70.0	(0.254, 0.534)	I <= 10% peak
80.0	I <= 10% peak	I <= 10% peak
-	-	-

Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0.0° plane	Horiz. ° plane
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Test procedure

All measurements were performed in an environmentally controlled laboratory employing suitable baffling to minimize stray light. The sample was mounted in its normal operating orientation on a rotating mirror goniophotometer and operated from a stabilized supply. The photometric output was monitored and measurements were performed once stability was achieved.

The goniophotometer was used to measure the spatial distribution of both luminous intensity and, in conjunction with a spectroradiometer, spectral irradiance. The distribution locus comprises points in two or more planes (as indicated in the table above) at no more than 10° vertical intervals. The CIE (x,y) coordinates and other derived metrics (CIE (u', v'), CCT and CRI) are calculated from the weighted sum (weighted for intensity and represented solid angle) of the measured spectral irradiances.

Sample Orientation

Horizontal

Stabilization & total operation time 1.0 / 3.5 hours

Equipment and uncertainties

LightLab International R80A C-gamma rotating mirror goniophotometer with a test distance of 8 m.

Luminous Intensity	± 4 %	Temperature	± 1 °C
Luminous Flux	± 4 %	Luminous Efficacy	± 4.5 %
Horiz., Vert. Angles	± 0.25°		

PhotoResearch PR-670 spectroradiometer (grating with 380 - 780 nm range, 2 nm / pixel, 5 nm bandwidth, incandescent/halogen calibration source). Measured at a distance from the sample deemed >5 times the maximum observed luminous opening dimension.

CIE (x, y) coordinates	± 0.003	CCT	± 100 K
CIE (u', v') coordinates	± 0.002	CRI (Ra)	± 2
Spatial Δ (u', v') uniformity	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Rel. Spectral Irradiance *	± 2 %	R9 *	± 2
Duv *	± 5E-04		

Yokogawa WT210 power meter connected in circuit to the sample electrical supply

Voltage	± 0.5 %	Frequency *	± 0.1 Hz
Current	± 0.5 %	Power	± 0.5 %
Current THD	± 3 %	Power Factor	± 0.02

This report contains data that are not covered by the NVLAP accreditation. Quantities marked with * are not covered.

Calculator / report version 1.0.10 / 5.9 (14th Dec 2017)

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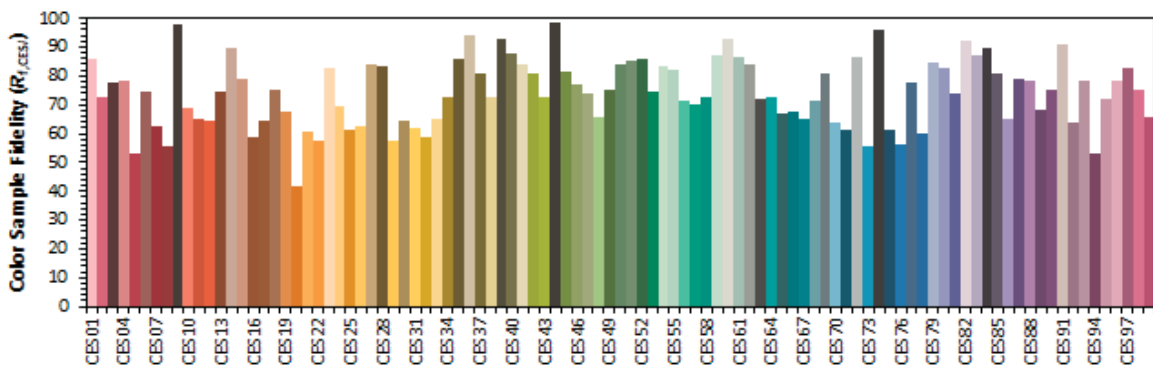
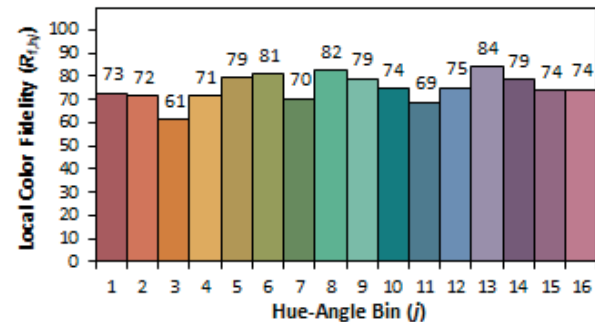
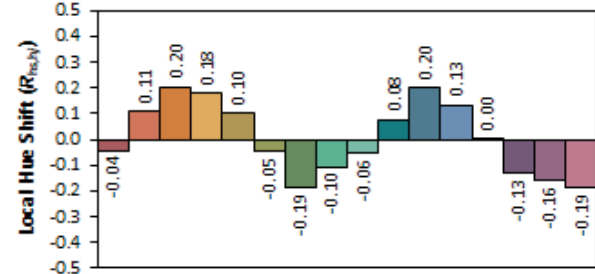
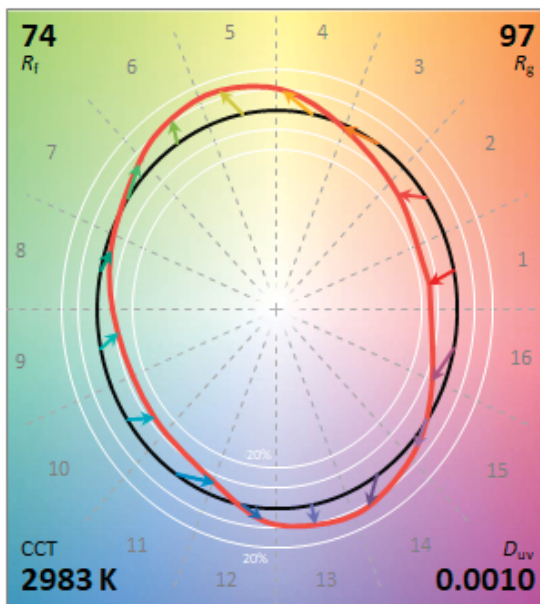
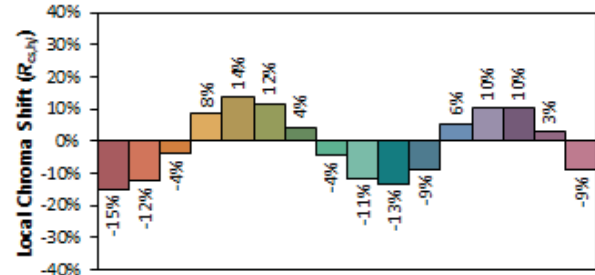
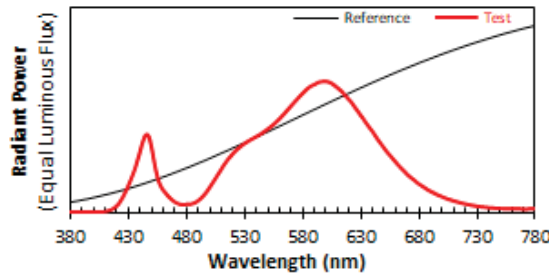
LED Roadway Lighting - Roadway luminaire. Product ID: "NXT-12S-5-X-3LM-3-XX-4-XX-X-XX"

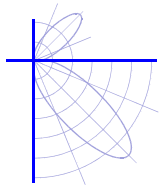
Grey cast aluminum housing with clear flat glass lens.

12 LEDs in one square array with clear plastic sheet of individual lenses.

One Philips Xitanium LED driver. Model: 929000708803 set to 350ma

Operating at 120v AC and 60 Hz.





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Grey cast aluminum housing with clear flat glass lens.

12 LEDs in one square array with clear plastic sheet of individual lenses.

One Philips Xitanium LED driver. Model: 929000708803 set to 350ma

Operating at 120v AC and 60 Hz.

Test Distance 8.0 m
Test Temperature 25.3 °C

Notes The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of publications: IES LM-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2015, ANSI C82.77-10:2014.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the IESNA Type C coordinate system (L, V) as defined in IESNA publication LM-75.

Customer supplied information is identified in this report by enclosing it in double quotes

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.