



Report of Test LLI-17189-1-R01

This test report supersedes test report number LLI-17189-1

LED Roadway Lighting - Pole arm mount roadway luminaire. Product ID: NXT 72M 0 X 2LG 7 XX 4 XX X XX X
Grey painted cast aluminum housing with clear flat glass lens.
72 LEDs with array of 36 on each of two white PCBs with clear plastic sheets of individual lenses
One LED Roadway Lighting driver. Model: J150UNv3 set to 700ma.
Operating at 120 VAC and 60Hz.



Performance Summary

Total Light Output	16490 lm	Min Power Factor	0.96 @ 240 V
Luminaire Power	152.0 W	Max THD(i)*	4.6 % @ 240 V
Luminous Efficacy	108.5 lm/W	0-90° Zonal Flux %	100.0 %
CCT	3080 K	80-90° Zonal Flux %	0.5 %
CIE(x,y) 1931	(0.435, 0.409)	BUG Rating*	B2-U0-G2
CRI	73	Street Classification*	Type II Short

PREPARED FOR : LED Roadway Lighting, Halifax, NS, Canada



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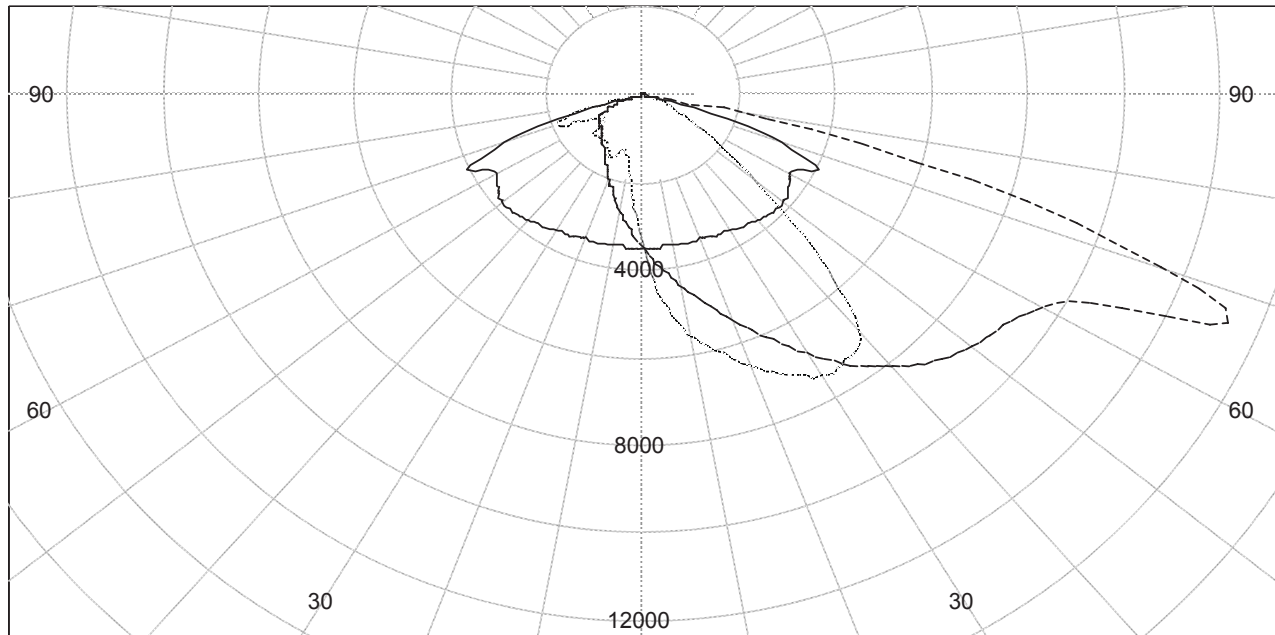
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Polar Light Distribution Curves



House side / L270

L90 / 270 - Solid, Plane of maximum - Dashed, L0 / 180 - Grey (cd)

Street side / L90

Percentage Outputs

	Upward	Downward	Total
Street Side	0.0 %	80.0 %	80.0 %
House Side	0.0 %	20.0 %	20.0 %
	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

14-Jul-2017
17-Jul-2017

RT



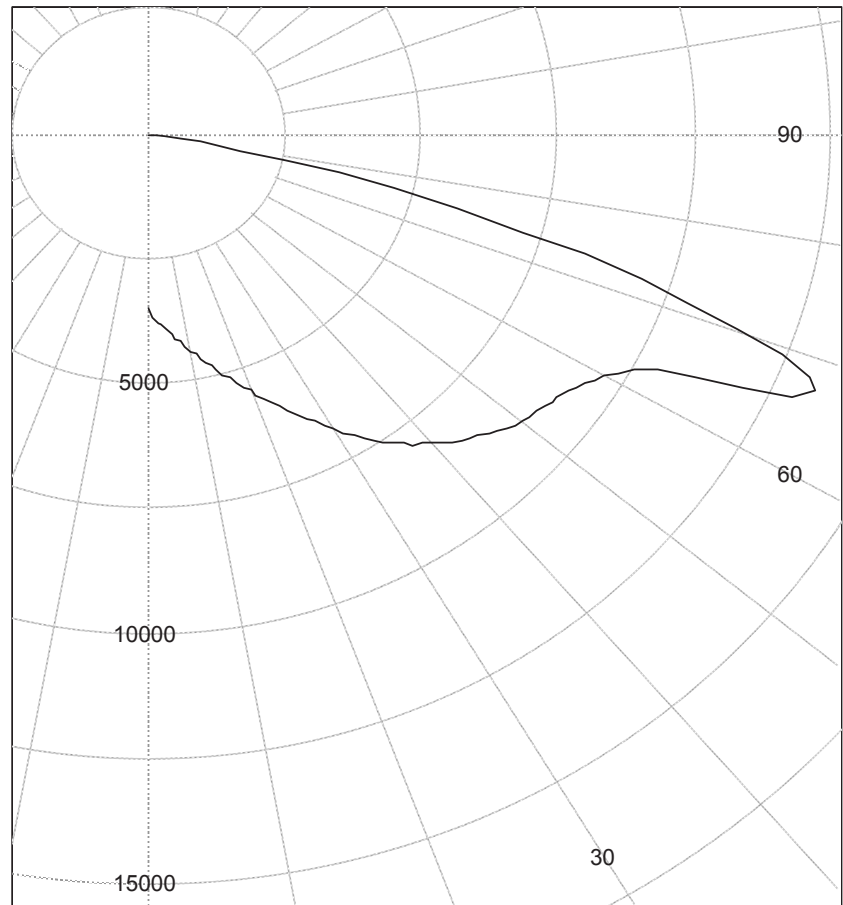
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Intensity
in principal plane

Vertical Angle (°)	Intensity (cd)
0.0	3493.5
10.0	4408.3
20.0	5478.9
30.0	6818.2
35.0	7547.1
40.0	8101.8
45.0	8578.9
47.5	8781.6
50.0	8938.3
52.5	9038.6
55.0	9173.2
57.5	9377.3
60.0	9660.3
62.5	10238.9
65.0	12011.6
67.5	13222.9
70.0	11458.2
72.5	8937.5
75.0	5867.6
77.5	3063.8
80.0	1004.1
82.5	225.7
85.0	22.2
87.5	7.5
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

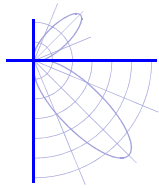


Plane of maximum intensity (cd)

	Maximum Intensity
House Side	4037 cd @ (270.0°, 65.0°)
Street Side	13250 cd @ (290.0°, 67.0°)

Coordinates expressed in the C Type coordinate system

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



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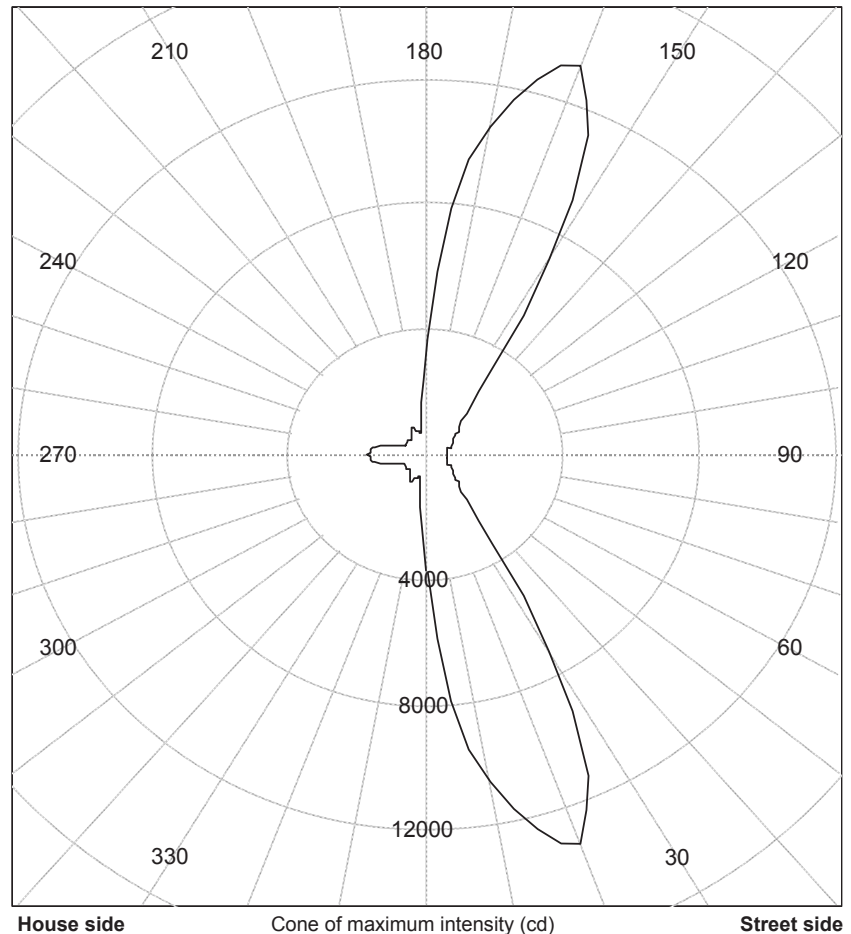
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Operating at 120 VAC and 60Hz.

Intensity
in principal cone

Lateral Plane (°)	Intensity (cd)
0	568.9
15	618.7
30	862.1
40	1068.9
45	1291.5
50	1713.1
55	3397.0
60	7198.3
65	11295.9
70	13250.4
75	12392.0
80	10676.8
85	7876.8
90	3681.5
95	1740.8
100	952.9
105	717.9
110	783.4
115	935.6
120	982.9
125	870.9
130	781.5
135	719.3
140	686.7
150	691.2
165	1204.2
180	1706.8

Principal Conical Surface



Maximum Intensity

House Side 4037 cd @ (270.0°, 65.0°)

Street Side 13250 cd @ (290.0°, 67.0°)

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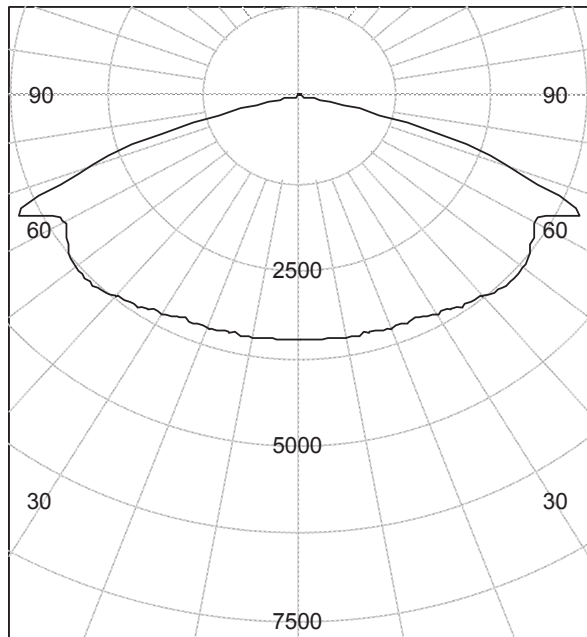
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Polar curve through L90 / L270

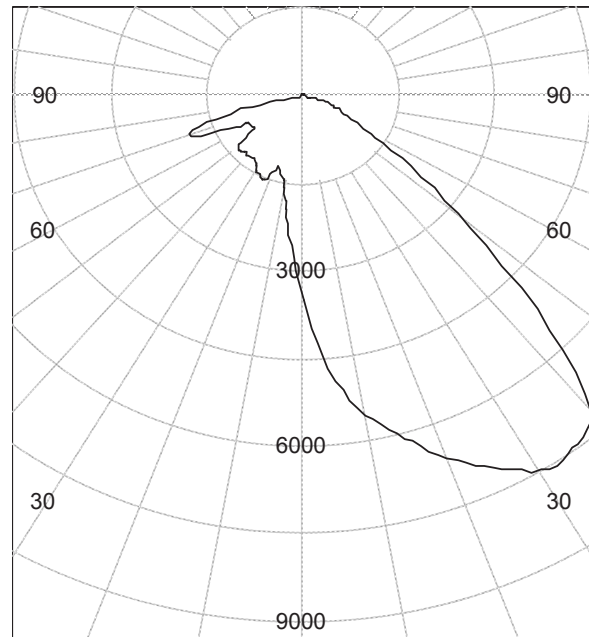


(L90)

(cd)

(L270)

Polar curve through L0 / L180



House side (L180)

(cd)

Street side (L0)



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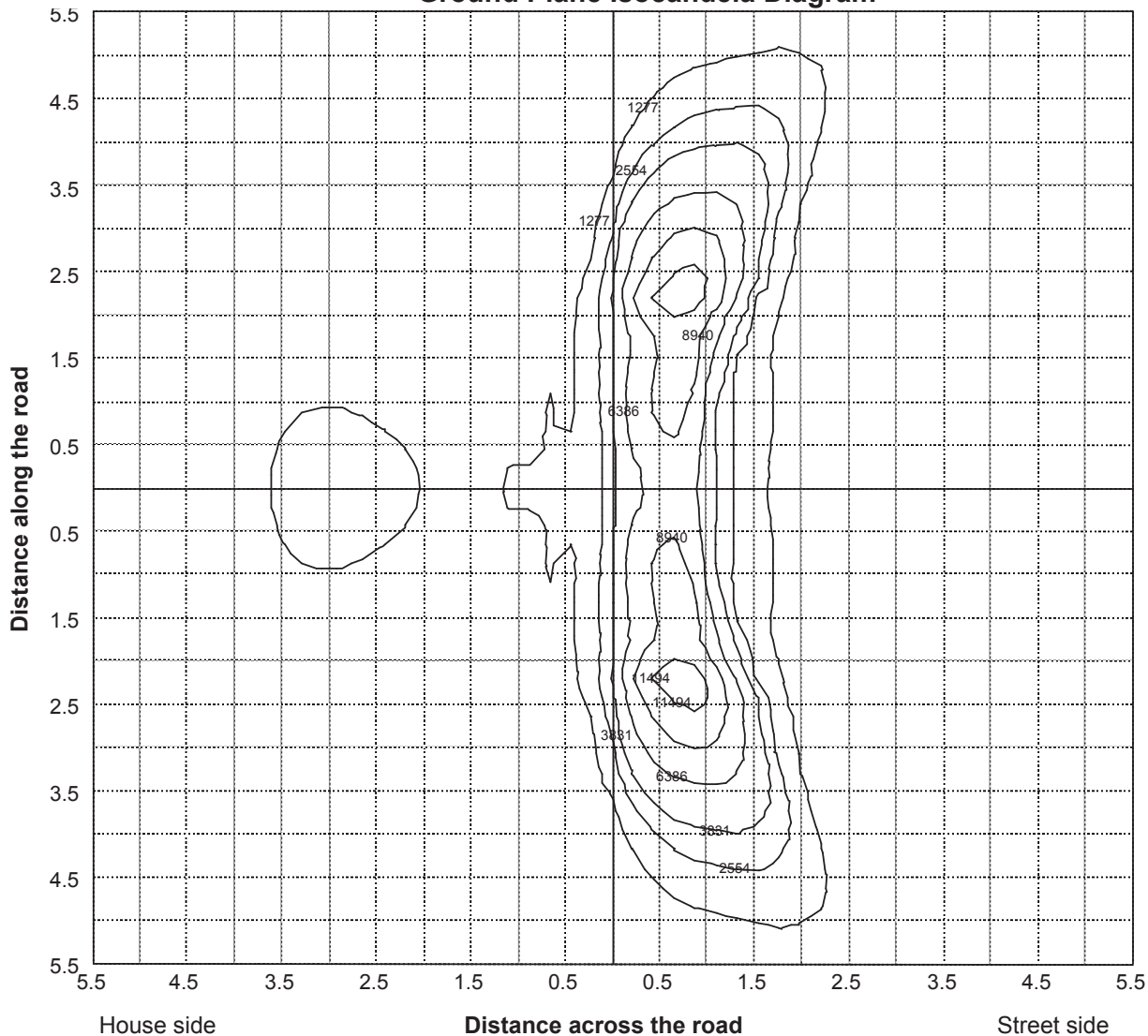
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Ground Plane Isocandela Diagram



The isocandela contour units are expressed as cd

Upstream and downstream sides have been averaged.



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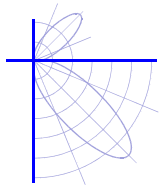
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House side intensity data (cd)

Vertical	L-Plane								
	L180	L195	L210	L220	L225	L230	L235	L240	L245
0.0	3494	3494	3494	3494	3494	3494	3494	3494	3494
10.0	1711	1752	1876	2003	2080	2166	2269	2387	2525
20.0	1376	1319	1274	1321	1375	1449	1547	1683	1859
30.0	1439	1447	1483	1436	1351	1238	1200	1266	1394
35.0	1319	1328	1361	1420	1398	1362	1241	1157	1247
40.0	1326	1303	1260	1308	1366	1355	1332	1206	1156
45.0	1349	1270	1200	1222	1269	1338	1323	1280	1134
47.5	1356	1259	1158	1178	1222	1302	1307	1291	1155
50.0	1244	1228	1101	1128	1172	1245	1298	1284	1181
52.5	1024	1074	1039	1065	1114	1182	1275	1271	1203
55.0	950	939	967	995	1050	1117	1231	1258	1218
57.5	946	899	880	928	985	1054	1176	1241	1218
60.0	982	880	814	860	916	992	1110	1212	1189
62.5	1116	903	757	790	845	926	1035	1171	1135
65.0	1438	1027	714	730	774	849	950	1086	1042
67.5	1758	1243	686	676	707	765	851	954	907
70.0	1887	1428	665	617	643	677	735	801	757
72.5	1635	1382	667	552	570	582	607	644	608
75.0	1168	1077	637	470	474	478	470	484	456
77.5	769	715	503	364	359	358	333	330	308
80.0	419	411	333	241	227	221	202	194	181
82.5	147	202	174	124	112	107	92	83	77
85.0	6	61	56	37	31	26	21	18	17
87.5	1	3	4	4	3	4	4	4	5
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 120 VAC and 60Hz.

Vertical	House side			Intensity data (cd)			Street side		
	L250	L255	L260	L-Plane			L280	L285	L290
0.0	3494	3494	3494	3494	3494	3494	3494	3494	3494
10.0	2684	2870	3067	3274	3493	3731	3967	4199	4408
20.0	2065	2316	2636	3042	3513	4060	4618	5099	5479
30.0	1586	1893	2283	2827	3573	4586	5576	6326	6818
35.0	1432	1742	2193	2785	3655	4943	6158	7015	7547
40.0	1339	1623	2132	2767	3731	5274	6684	7567	8102
45.0	1233	1509	2039	2744	3807	5617	7167	8054	8579
47.5	1178	1455	1975	2714	3821	5757	7358	8248	8782
50.0	1135	1401	1905	2662	3808	5851	7479	8376	8938
52.5	1108	1351	1832	2587	3759	5895	7528	8436	9039
55.0	1101	1300	1758	2493	3689	5922	7531	8441	9173
57.5	1100	1236	1670	2383	3595	5944	7578	8499	9377
60.0	1064	1145	1553	2267	3539	6090	7835	8767	9660
62.5	1000	1031	1399	2121	3676	6749	8799	9704	10239
65.0	892	857	1190	1985	4037	8334	11028	12065	12012
67.5	756	686	896	1627	3520	7629	10365	12121	13223
70.0	628	546	634	1114	2856	6670	9108	10960	11458
72.5	503	422	444	696	2093	5241	7371	8511	8937
75.0	371	309	301	384	1086	2942	4553	5350	5868
77.5	251	208	197	220	471	1223	2051	2599	3064
80.0	148	123	115	119	179	370	587	731	1004
82.5	63	53	49	51	60	77	113	159	226
85.0	17	16	16	16	17	17	19	21	22
87.5	5	6	6	6	7	7	7	8	7
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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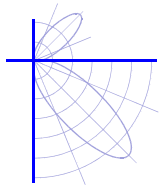
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Street side intensity data (cd)

Vertical	L-Plane								
	L295	L300	L305	L310	L315	L320	L330	L345	L0
0.0	3494	3494	3494	3494	3494	3494	3494	3494	3494
10.0	4598	4768	4914	5037	5143	5227	5363	5484	5532
20.0	5770	5983	6135	6240	6314	6364	6451	6547	6595
30.0	7136	7355	7521	7620	7650	7638	7524	7414	7422
35.0	7896	8119	8255	8309	8305	8226	8000	7499	7371
40.0	8469	8732	8897	8944	8927	8774	8083	7323	7001
45.0	8971	9270	9540	9651	9321	8681	7410	5545	5163
47.5	9173	9556	9920	9784	9076	8192	6055	4375	4028
50.0	9399	9959	10162	9532	8497	7272	4416	3391	3128
52.5	9712	10305	10053	9002	7548	5163	3406	2700	2436
55.0	10049	10384	9647	8148	5479	3749	2718	2097	1867
57.5	10225	10193	8938	6366	3967	2864	2155	1641	1424
60.0	10267	9700	7568	4676	2863	2220	1654	1284	1081
62.5	10251	8741	5966	3363	2055	1728	1327	960	818
65.0	10535	7739	4531	2165	1590	1319	1040	738	656
67.5	11412	7158	3112	1630	1225	1016	822	594	546
70.0	10017	6379	2088	1254	907	784	644	487	487
72.5	7274	3340	1319	846	632	581	488	396	390
75.0	4750	1664	798	482	440	418	353	312	325
77.5	2478	838	422	302	291	284	251	216	216
80.0	954	401	209	172	167	169	164	134	135
82.5	254	139	88	79	79	82	86	77	74
85.0	22	22	23	23	23	25	31	30	30
87.5	7	6	5	5	4	4	5	5	5
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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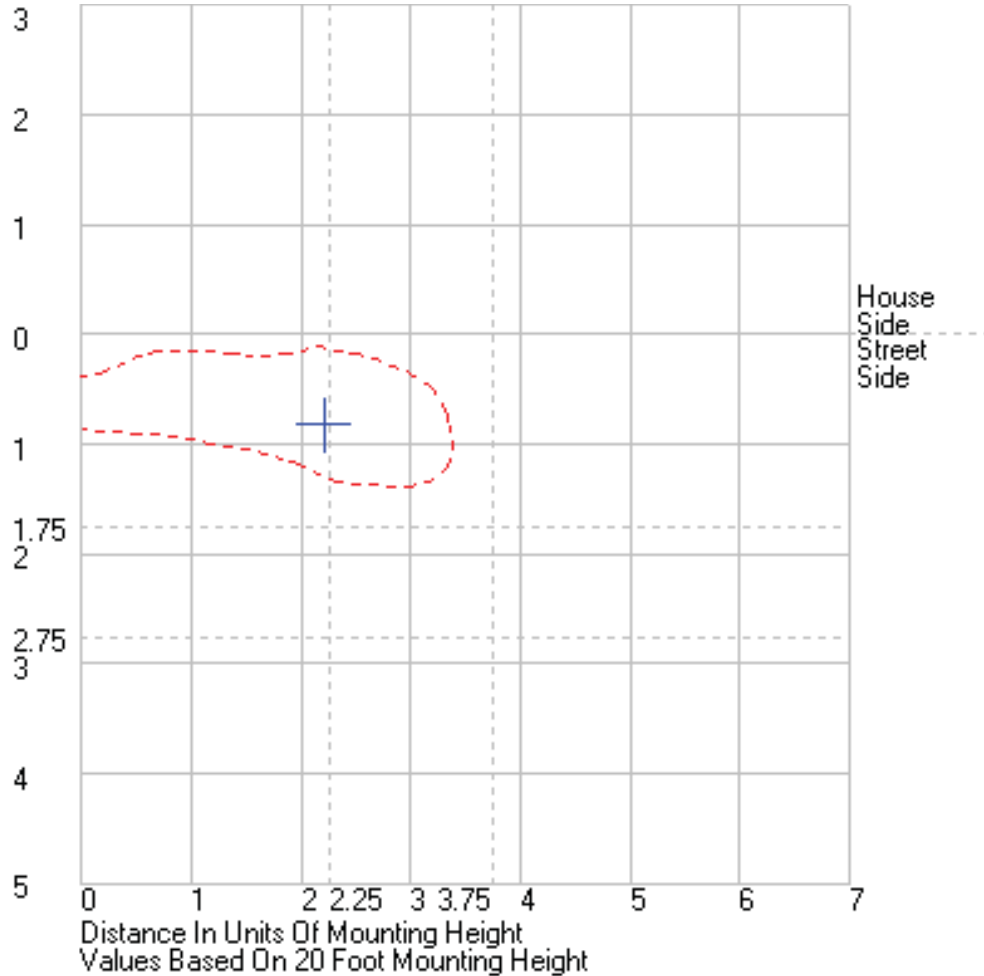
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LM-79 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.435, 0.409)
	CIE 1976 (u', v') ⁽¹⁾	(0.247, 0.523)
	Correlated Color Temperature (CCT) ⁽¹⁾	3080 K
	Spatial Δ (u', v') Uniformity ⁽²⁾	0.0093
	Color Rendering Index (Ra) ⁽¹⁾	72.5
	Special CRI 9 (R ₉) ^{(1),(3)}	-24.8
	Distance from Planckian Locus (Duv) ^{(1),(3)}	0.0024
	Scotopic/Photopic Ratio ^{(1),(3)}	1.20

Electrical	Voltage	120.0 V	(Setpoint 1)
	Frequency	60.0 Hz	
	Current	1.274 A	
	Power	152 W	
	Power Factor	0.994	
	Current THD	3.1 %	
	Voltage	240.0 V	(Setpoint 2)
	Frequency	60.0 Hz	
	Current	0.645 A	
	Power	149 W	
	Power Factor	0.961	
	Current THD	4.6 %	

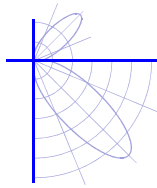
Performance data in accordance with IESNA LM-79-08. Spectral calculations are for a CIE 2° observer

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



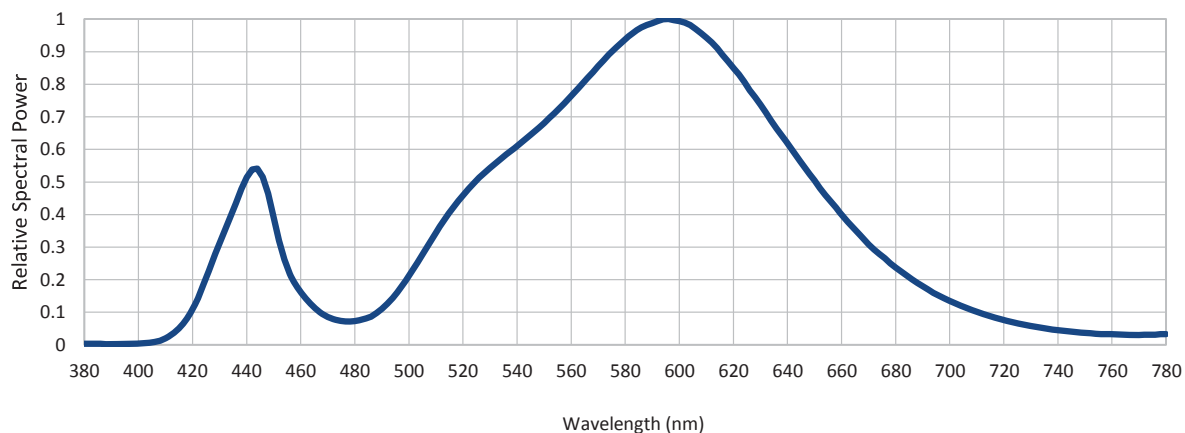
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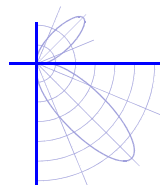
LM-79 Performance Data

Summary relative spectral irradiance distribution (wavelength – nm, irradiance – relative to peak = 1)

380	0.003	480	0.073	580	0.938	680	0.237
385	0.003	485	0.084	585	0.969	685	0.207
390	0.002	490	0.111	590	0.987	690	0.180
395	0.002	495	0.154	595	1.000	695	0.156
400	0.004	500	0.212	600	0.994	700	0.136
405	0.008	505	0.277	605	0.976	705	0.117
410	0.020	510	0.343	610	0.943	710	0.101
415	0.051	515	0.405	615	0.900	715	0.088
420	0.110	520	0.459	620	0.850	720	0.076
425	0.206	525	0.505	625	0.794	725	0.066
430	0.313	530	0.543	630	0.737	730	0.058
435	0.415	535	0.578	635	0.676	735	0.051
440	0.514	540	0.610	640	0.620	740	0.045
445	0.528	545	0.645	645	0.560	745	0.041
450	0.392	550	0.681	650	0.505	750	0.037
455	0.240	555	0.721	655	0.450	755	0.034
460	0.162	560	0.764	660	0.400	760	0.033
465	0.115	565	0.810	665	0.353	765	0.031
470	0.086	570	0.855	670	0.308	770	0.030
475	0.074	575	0.899	675	0.273	775	0.031
						780	0.033



The relative spectral power distribution combines the weighted spectral power distributions of all spatial measurements.



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LM-79 Performance Data

Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0° plane	Horiz. 90° plane
0.0	(0.246, 0.519)	(0.245, 0.518)
10.0	(0.246, 0.519)	(0.244, 0.514)
20.0	(0.246, 0.520)	(0.244, 0.516)
30.0	(0.247, 0.521)	(0.246, 0.520)
40.0	(0.247, 0.522)	(0.247, 0.527)
50.0	(0.248, 0.523)	(0.246, 0.527)
60.0	(0.249, 0.526)	(0.244, 0.524)
70.0	(0.251, 0.530)	I <= 10% peak
80.0	I <= 10% peak	I <= 10% peak
-	-	-

Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0° plane	Horiz. 90° 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 1.5 / 14.25 hours

Equipment and uncertainties

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

Luminous Intensity ± 4 %
Luminous Flux ± 4 %
Horiz., Vert. Angles ± 0.25°

Temperature ± 1 °C
Luminous Efficacy ± 4.5 %

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
CIE (u', v') coordinates ± 0.002
Spatial Δ (u', v') uniformity ± 0.001
Rel. Spectral Irradiance * ± 2 %
Duv * ± 5E-04

CCT ± 100 K
CRI (Ra) ± 2
Scotopic / Photopic Ratio * ± 0.02
R9 * ± 2

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

Voltage ± 0.5 %
Current ± 0.5 %
Current THD * ± 3 %

Frequency * ± 0.1 Hz
Power ± 0.5 %
Power Factor ± 0.02

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Calculator / report version 1.0.7 / 5.7 (30th Jan 2017)

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Test Report No. LLI-17189-1-R01

LED Roadway Lighting - Pole arm mount roadway luminaire. Product ID: NXT 72M 0 X 2LG 7 XX 4 XX X XX X

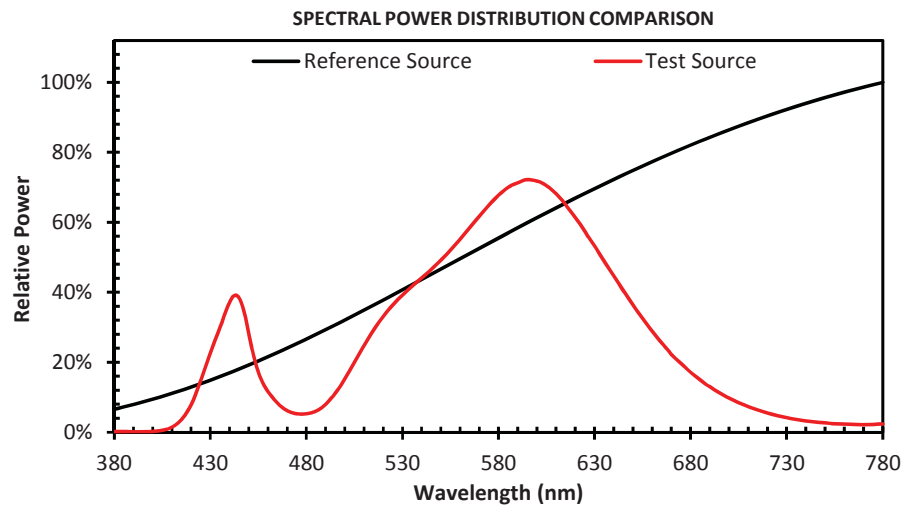
Grey painted cast aluminum housing with clear flat glass lens.

72 LEDs with array of 36 on each of two white PCBs with clear plastic sheets of individual lenses

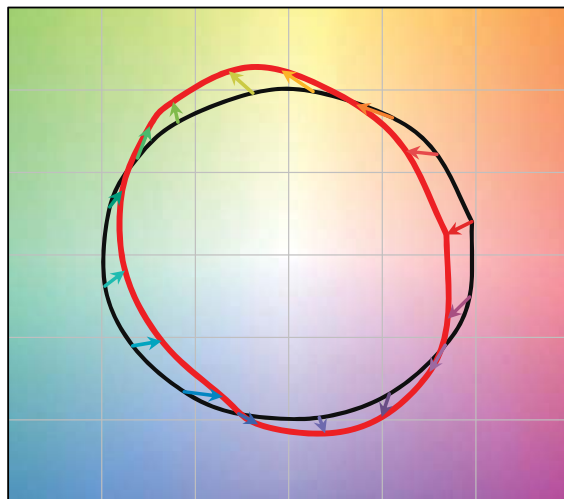
One LED Roadway Lighting driver. Model: J150UNv3 set to 700ma.

Operating at 120 VAC and 60Hz.

R_f	71
R_g	97



COLOR VECTOR GRAPHIC



Reference Illuminant

Test Source

COLOR DISTORTION GRAPHIC



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Test Report No. LLI-17189-1-R01

LED Roadway Lighting - Pole arm mount roadway luminaire. Product ID: NXT 72M 0 X 2LG 7 XX 4 XX X XX X
Grey painted cast aluminum housing with clear flat glass lens.
72 LEDs with array of 36 on each of two white PCBs with clear plastic sheets of individual lenses
One LED Roadway Lighting driver. Model: J150UNv3 set to 700ma.
Operating at 120 VAC and 60Hz.

Test Distance 8.0 m
Test Temperature 24.8 °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 C78.377:2011, ANSI C82.77:2002.

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.

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