



Report of Test LLI-21208-15

LED Roadway Lighting - Roadway luminaire. Product ID: "NXT-24S-0-X-3LM-7-XX-4-XX-X-XX-0424"

Grey cast aluminum housing with clear flat glass lens.

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

One LED Roadway LED driver. Model: J100UNv2 1-10V set to 700ma.

Operating at 120v AC and 60 Hz.

With black plastic back light shield.



Performance Summary

Total Light Output	3870 lm	Min Power Factor	0.90 @ 240 V
Luminaire Power	54.1 W	Max THD(i)*	6.3 % @ 240 V
Luminous Efficacy	71.5 lm/W	0-90° Zonal Flux %	100.0 %
CCT	3150 K	80-90° Zonal Flux %	0.6 %
CIE(x,y) 1931	(0.423, 0.394)	BUG Rating*	B1-U0-G1
CRI	74	Street Classification*	Type III Medium

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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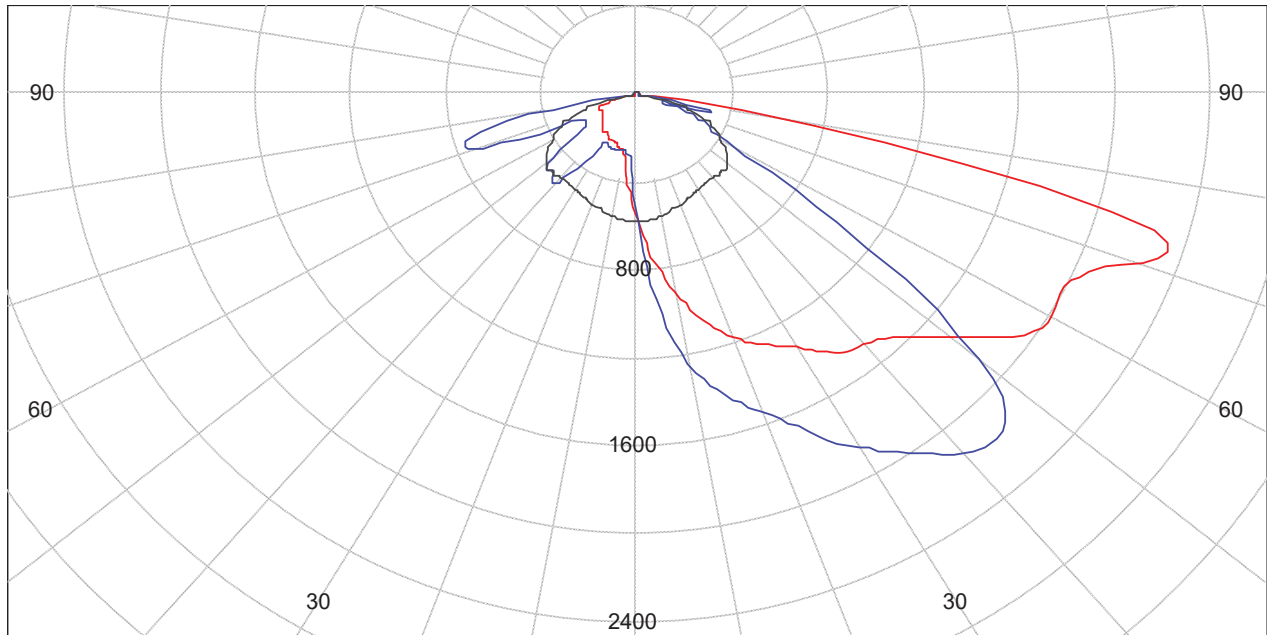
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Polar Light Distribution Curves



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 %	83.1 %	83.1 %
House Side	0.0 %	16.9 %	16.9 %
	0.0 %	100.0 %	100.0 %

Report data based on absolute values as measured.

Signed:


Ryder Tunney
Authorized Signatory

Date of test
Date of report

23-Aug-2021
26-Aug-2021

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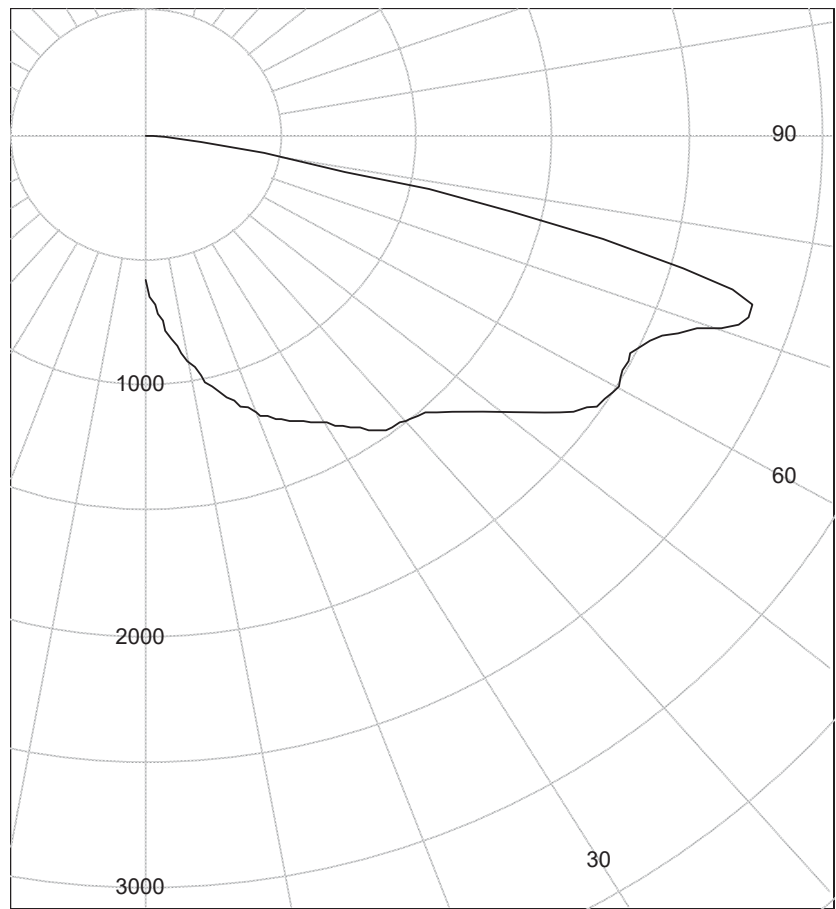
Operating at 120v AC and 60 Hz.

With black plastic back light shield.

Intensity in principal plane
(based on overall max intensity)

Vertical Angle (°)	Intensity (cd)
0.0	583.4
10.0	915.4
20.0	1180.6
30.0	1331.1
35.0	1438.8
40.0	1486.0
45.0	1562.3
47.5	1632.9
50.0	1722.1
52.5	1823.2
55.0	1927.2
57.5	1990.7
60.0	2008.1
62.5	1992.2
65.0	2007.7
67.5	2087.7
70.0	2251.3
72.5	2340.5
75.0	2050.2
77.5	1225.3
80.0	447.6
82.5	48.1
85.0	7.5
87.5	2.1
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)

House side max intensity

761.8 cd @ (180.0°, 72.0°)

Street side max intensity

2340.5 cd @ (60.0°, 72.5°)

Coordinates expressed in the C Type coordinate system

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

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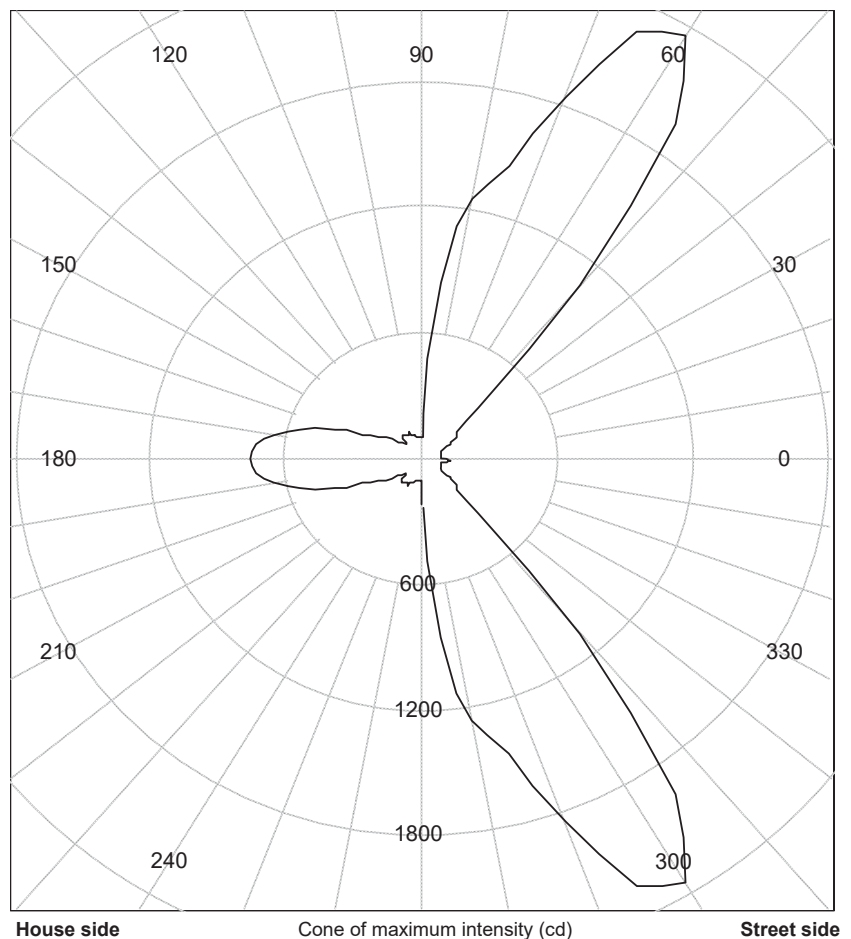
Operating at 120v AC and 60 Hz.

With black plastic back light shield.

Intensity in principal cone
(based on overall max intensity)

Lateral Plane (°)	(V72.5) (cd)
0	120.8
15	79.9
30	139.5
40	191.2
45	340.3
50	1072.4
55	1950.4
60	2340.5
65	2245.9
70	1837.5
75	1447.0
80	1259.3
85	843.1
90	216.0
95	99.6
100	102.0
105	113.8
110	124.7
115	138.0
120	129.3
125	137.2
130	122.3
135	105.8
140	123.0
150	213.3
165	552.3
180	758.8

Principal Conical Surface



House side max intensity

761.8 cd @ (180.0°, 72.0°)

Street side max intensity

2340.5 cd @ (60.0°, 72.5°)

Coordinates expressed in the C Type coordinate system

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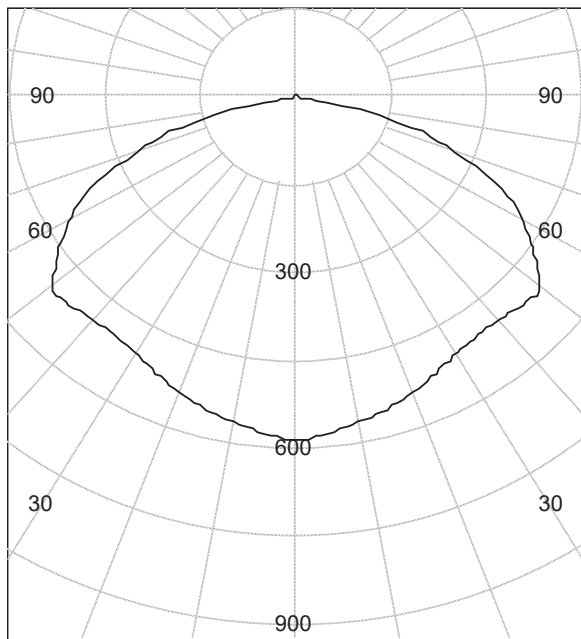
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Polar curve through L90 / L270

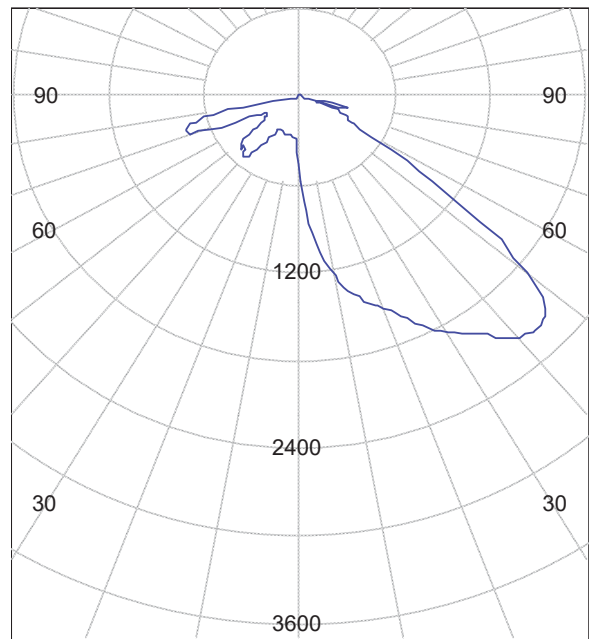


(L90)

(cd)

(L270)

Polar curve through L0 / L180



House side (L180)

(cd)

Street side (L0)



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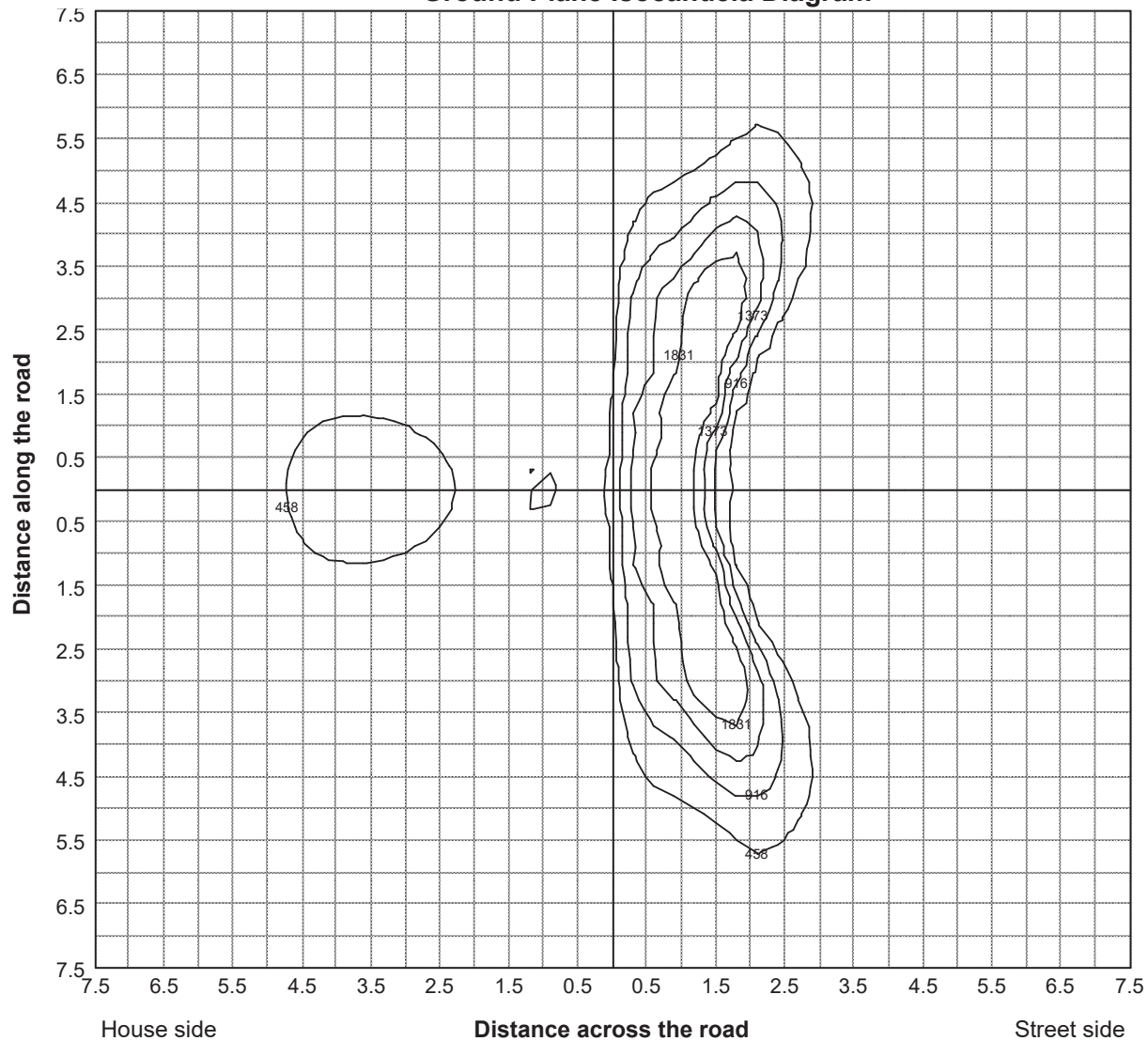
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Ground Plane Isocandela Diagram



The isocandela contour units are expressed as cd

Upstream and downstream sides have been averaged.



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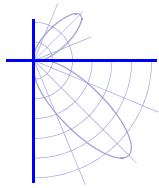
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Intensity data (cd)									
Vertical	L-Plane								
	L0	L15	L30	L40	L45	L50	L55	L60	L65
0.0	583	583	583	583	583	583	583	583	583
10.0	1246	1220	1163	1095	1059	1015	966	915	862
20.0	1540	1507	1454	1387	1348	1300	1245	1181	1094
30.0	1855	1821	1720	1584	1523	1456	1395	1331	1264
35.0	1990	1966	1877	1738	1651	1565	1493	1439	1366
40.0	2135	2109	2020	1851	1773	1687	1578	1486	1419
45.0	2164	2132	2088	1960	1881	1786	1684	1562	1470
47.5	2090	2085	2102	2004	1940	1852	1750	1633	1525
50.0	1866	1944	2093	2040	2000	1927	1837	1722	1581
52.5	1509	1676	2046	2078	2062	2016	1940	1823	1643
55.0	1026	1265	1939	2104	2132	2115	2055	1927	1692
57.5	737	787	1689	2118	2209	2229	2162	1991	1720
60.0	437	397	1254	2112	2276	2304	2199	2008	1734
62.5	351	196	595	1894	2247	2278	2179	1992	1729
65.0	312	152	243	1322	1950	2184	2158	2008	1773
67.5	234	126	149	618	1342	1975	2171	2088	1879
70.0	140	106	157	263	726	1633	2145	2251	2054
72.5	121	80	140	191	340	1072	1950	2340	2246
75.0	323	53	129	160	224	611	1450	2050	2142
77.5	194	31	92	177	188	300	715	1225	1588
80.0	64	17	22	66	106	86	214	448	639
82.5	8	7	11	18	19	22	33	48	82
85.0	3	3	3	4	5	6	7	7	7
87.5	1	1	2	2	2	2	2	2	2
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.

With black plastic back light shield.

Intensity data (cd)									
Vertical	L-Plane								
	L70	L75	L80	L85	L90	L95	L100	L105	L110
0.0	583	583	583	583	583	583	583	583	583
10.0	805	745	685	623	565	507	452	402	360
20.0	997	888	774	655	537	426	333	273	249
30.0	1177	1031	861	685	505	347	251	228	225
35.0	1259	1110	919	710	497	319	232	220	217
40.0	1327	1191	990	750	496	292	220	211	208
45.0	1404	1284	1085	808	503	271	210	200	199
47.5	1443	1330	1138	839	505	265	208	196	192
50.0	1483	1373	1179	856	497	251	195	190	188
52.5	1514	1378	1179	845	477	236	185	181	180
55.0	1505	1350	1158	829	453	218	177	175	176
57.5	1471	1308	1131	811	429	199	169	169	173
60.0	1438	1275	1122	810	406	180	162	169	177
62.5	1441	1284	1164	834	380	164	157	172	185
65.0	1507	1332	1222	860	344	150	153	178	189
67.5	1614	1381	1260	873	297	136	144	172	185
70.0	1737	1429	1285	881	251	119	125	154	165
72.5	1837	1447	1259	843	216	100	102	114	125
75.0	1650	1168	960	673	162	78	76	81	96
77.5	1276	813	608	422	89	50	49	57	72
80.0	617	324	202	150	33	27	29	33	37
82.5	98	64	45	69	15	11	14	14	14
85.0	8	9	7	6	5	4	4	4	4
87.5	2	2	2	2	2	2	1	1	2
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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One LED Roadway LED driver. Model: J100UNv2 1-10V set to 700ma.

Operating at 120v AC and 60 Hz.

With black plastic back light shield.

Intensity data (cd)									
Vertical	L-Plane								
	L115	L120	L125	L130	L135	L140	L150	L165	L180
0.0	583	583	583	583	583	583	583	583	583
10.0	325	299	282	273	269	267	267	268	270
20.0	245	245	245	246	249	253	259	264	269
30.0	224	227	231	232	233	235	238	249	259
35.0	218	221	221	224	227	230	241	323	371
40.0	210	210	212	217	223	240	324	471	531
45.0	199	198	198	203	220	253	331	442	491
47.5	192	192	189	194	208	231	294	465	514
50.0	185	185	182	184	193	209	284	482	454
52.5	177	177	177	174	180	193	293	426	352
55.0	170	168	169	165	171	183	280	360	279
57.5	166	160	158	159	163	172	244	309	250
60.0	170	158	155	157	156	159	208	279	243
62.5	178	164	155	153	146	148	176	248	254
65.0	187	171	154	144	135	138	157	256	353
67.5	189	175	161	137	125	133	154	354	574
70.0	172	163	175	138	118	130	181	489	729
72.5	138	129	137	122	106	123	213	552	759
75.0	105	96	96	86	85	105	208	521	671
77.5	69	63	59	58	62	79	169	420	514
80.0	34	32	33	35	40	53	99	187	179
82.5	14	13	13	15	19	20	23	26	11
85.0	4	4	4	4	4	4	3	4	1
87.5	1	1	1	1	1	1	1	1	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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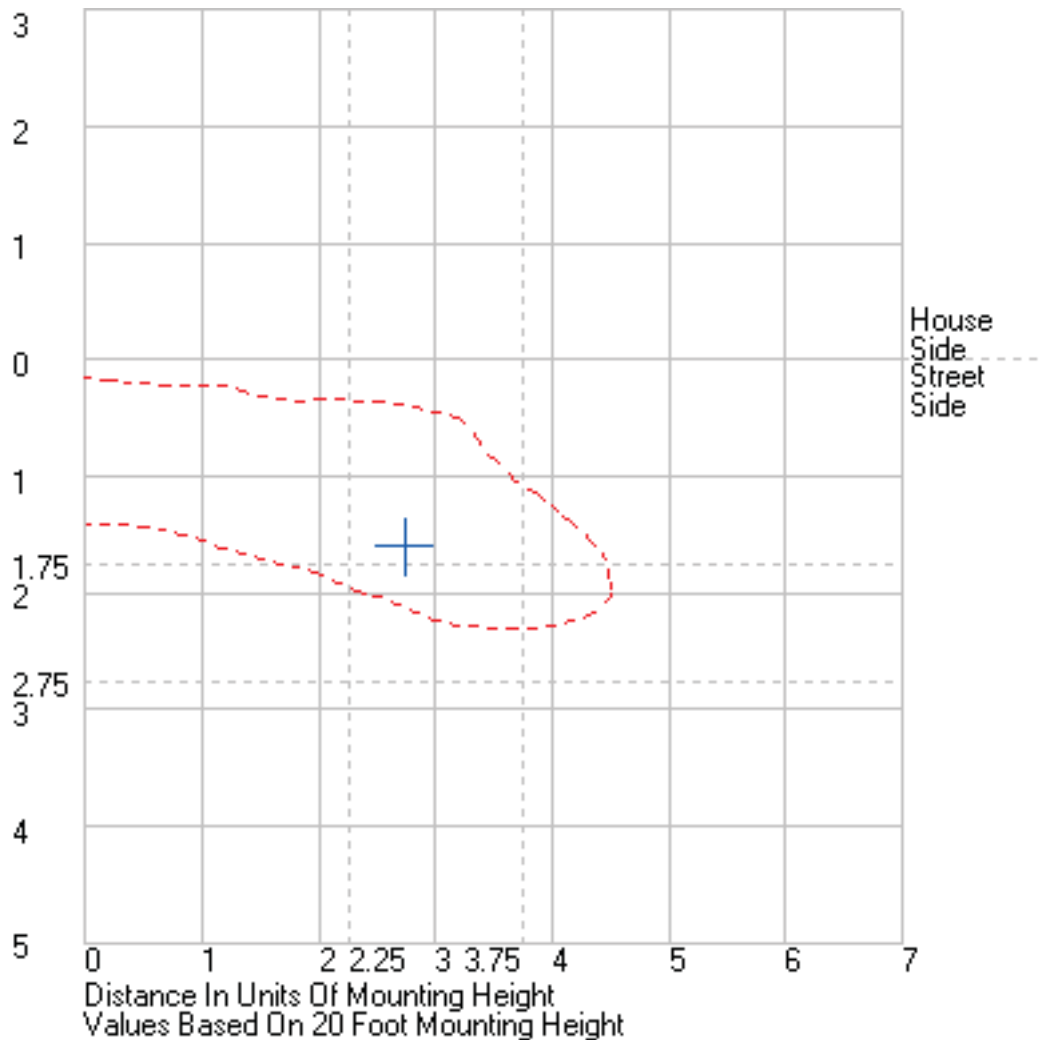
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LM-79-08 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.423, 0.394)
	CIE 1976 (u', v') ⁽¹⁾	(0.247, 0.515)
	Correlated Color Temperature (CCT) ⁽¹⁾	3150 K
	Spatial Δ (u', v') Uniformity ⁽²⁾	0.0162
	Color Rendering Index (Ra) ⁽¹⁾	73.6
	Special CRI 9 (R ₉) ^{(1),(3)}	-22.1
	Distance from Planckian Locus (Duv) ^{(1),(3)}	-2.31E-03
	Scotopic/Photopic Ratio ^{(1),(3)}	1.26

Electrical	Voltage	120.0 V	(Setpoint 1)
	Frequency	60.0 Hz	
	Current	0.458 A	
	Power	54.1 W	
	Power Factor	0.99	
	Current THD	3.5 %	
	Voltage	240.0 V	(Setpoint 2)
	Frequency	60.0 Hz	
	Current	0.248 A	
	Power	53.3 W	
	Power Factor	0.90	
	Current THD	6.3 %	

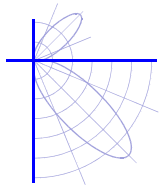
Performance data in accordance with IESNA LM-79-08. Spectral calculations are for a CIE 2° observer

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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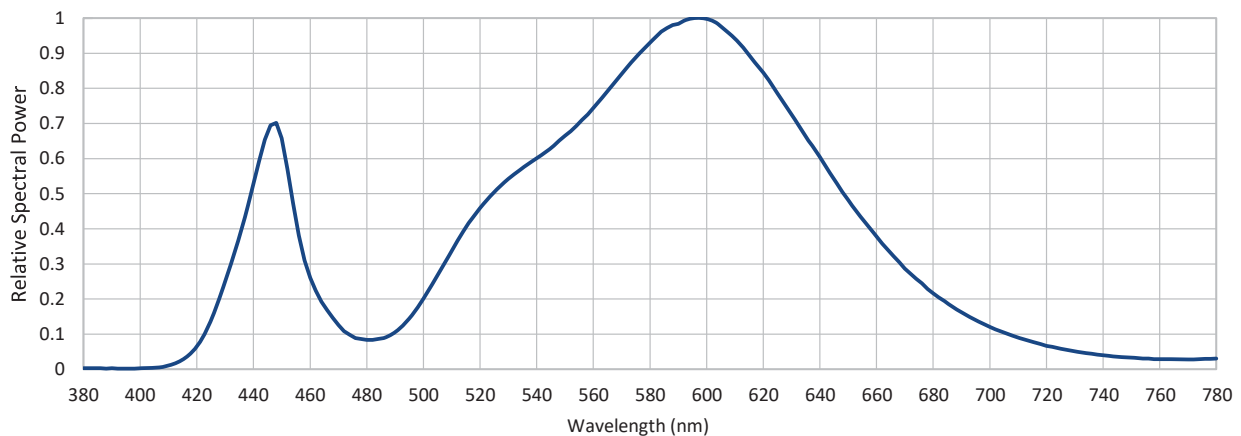
With black plastic back light shield.

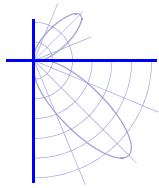
LM-79-08 Performance Data

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	0.260	540	0.601	620	0.845	700	0.121
385	0.003	465	0.181	545	0.631	625	0.786	705	0.105
390	0.003	470	0.126	550	0.665	630	0.725	710	0.091
395	0.002	475	0.093	555	0.702	635	0.663	715	0.078
400	0.003	480	0.084	560	0.744	640	0.605	720	0.067
405	0.004	485	0.087	565	0.792	645	0.540	725	0.059
410	0.011	490	0.106	570	0.841	650	0.482	730	0.051
415	0.028	495	0.145	575	0.888	655	0.428	735	0.045
420	0.065	500	0.201	580	0.930	660	0.378	740	0.040
425	0.141	505	0.268	585	0.967	665	0.331	745	0.036
430	0.249	510	0.337	590	0.984	670	0.287	750	0.033
435	0.378	515	0.404	595	0.999	675	0.251	755	0.031
440	0.528	520	0.459	600	0.998	680	0.217	760	0.029
445	0.674	525	0.505	605	0.977	685	0.188	765	0.029
450	0.658	530	0.542	610	0.941	690	0.162	770	0.028
455	0.427	535	0.573	615	0.895	695	0.140	775	0.029
								780	0.031





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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	(0.247, 0.516)	(0.246, 0.513)
10.0	(0.247, 0.516)	(0.245, 0.504)
20.0	(0.247, 0.517)	(0.244, 0.502)
30.0	(0.247, 0.519)	(0.245, 0.504)
40.0	(0.248, 0.521)	(0.245, 0.510)
50.0	(0.249, 0.523)	(0.247, 0.521)
60.0	(0.249, 0.526)	(0.249, 0.531)
70.0	(0.249, 0.529)	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
-	-	-
-	-	-
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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 2.5 / 17.5 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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Test Report No. LLI-21208-15

LED Roadway Lighting - Roadway luminaire. Product ID: "NXT-24S-0-X-3LM-7-XX-4-XX-X-XX-0424"

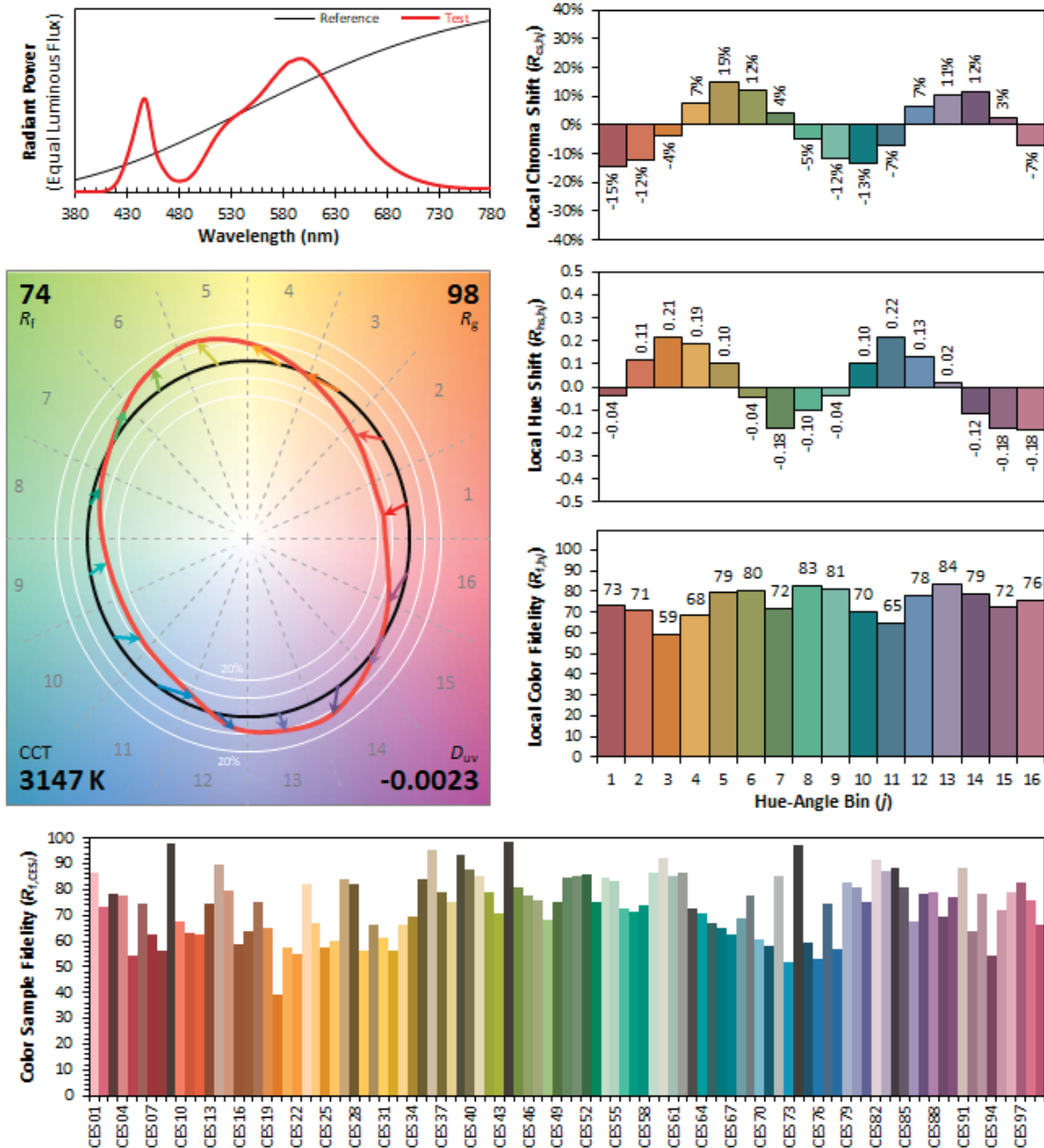
Grey cast aluminum housing with clear flat glass lens.

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

One LED Roadway LED driver. Model: J100UNv2 1-10V set to 700ma.

Operating at 120v AC and 60 Hz.

With black plastic back light shield.





Test Report No. LLI-21208-15

LED Roadway Lighting - Roadway luminaire. Product ID: "NXT-24S-0-X-3LM-7-XX-4-XX-X-XX-0424"

Grey cast aluminum housing with clear flat glass lens.

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

One LED Roadway LED driver. Model: J100UNv2 1-10V set to 700ma.

Operating at 120v AC and 60 Hz.

With black plastic back light shield.

Test Distance 8.0 m
Test Temperature 25.2 °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.