

# Report of Test LL15653

Unilumin Group Co., LED Street Light. Product ID: UNISTWF-0009.

Cast aluminium body 230 x 620 x 120 mm (non.) with beige finish and unpainted/finned cover above light opening. Luminous opening of 144 x 150 mm (nom.) contains four rows of seven LED's, total of 28 LED's.

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Tested with L/O in the horizontal position.

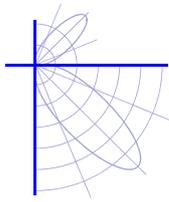
Tested at 240V 50Hz, measured 153 mA, efficacy = 81.4 lm/W.



## Performance Summary

Luminous flux	2704 lm
Luminaire Power	33.2 W

**PREPARED FOR : Unilumin Group Co., Shenzhen, China, 518103.**



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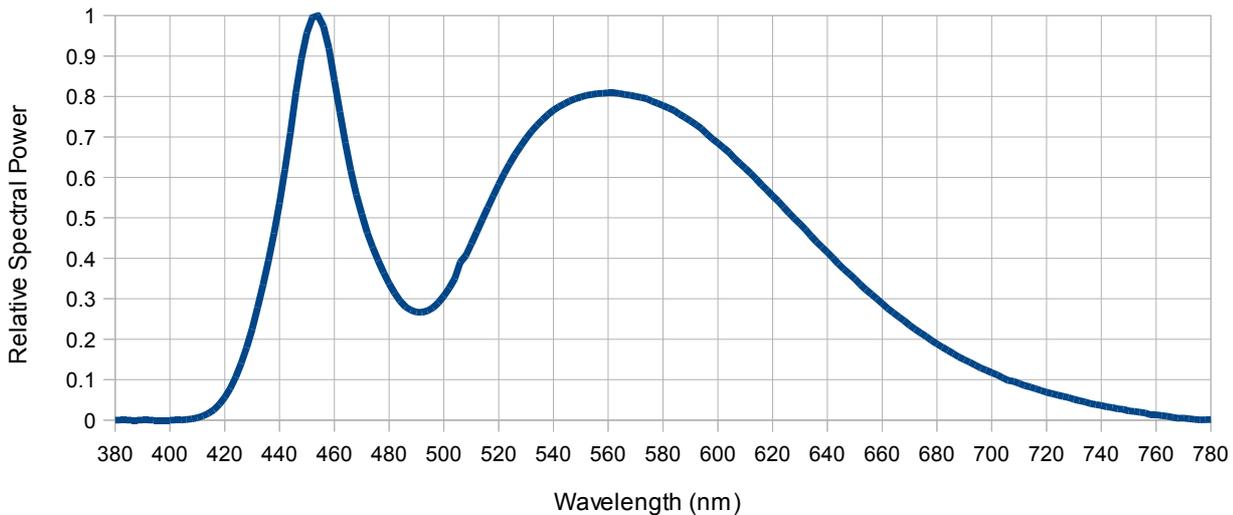
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Performance data in accordance with IESNA LM-79 : 2008

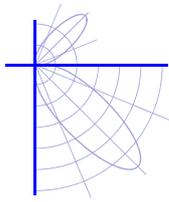
<b>Photometry</b>	Total Luminous Flux	2704 lm
	Luminous efficacy	81.4 lm/W
<b>Electrical</b>	Voltage	240 V
	Frequency	50 Hz
	Current	0.153 A
	Power	33.2 W
	Power Factor	0.90
<b>Spectral</b>	CIE 1931 2 deg observer (x, y) <sup>(1)</sup>	(0.345, 0.364)
	CIE 1976 2 deg observer (u', v') <sup>(1)</sup>	(0.206, 0.491)
	Correlated Colour Temperature (CCT) <sup>(1)</sup>	5050 K
	Colour Rendering Index (CRI) <sup>(1)</sup>	75
	Colour Spatial Uniformity <sup>(2)</sup>	0.0160
	Scotopic/Photopic Ratio <sup>(1),(3)</sup>	1.86

Weighted Spectral Power



\* The spectral power graph combines the weighted spectral power distributions of all spatial measurements.

- (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-79:2008



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### Spatial measurements (lower hemisphere)

Gamma angle (deg)	CIE 1976 (u',v' coordinates)	
	C0 plane	C90 plane
0	(0.205, 0.475)	(0.205, 0.475)
10	(0.205, 0.476)	(0.205, 0.478)
20	(0.205, 0.477)	(0.205, 0.483)
30	(0.206, 0.479)	(0.205, 0.488)
40	(0.206, 0.482)	(0.205, 0.493)
50	(0.207, 0.485)	(0.205, 0.496)
60	(0.207, 0.492)	(0.204, 0.495)
70	(0.208, 0.500)	I <= 10 %
80	(0.207, 0.502)	I <= 10 %
-	-	-

### Spatial measurements (upper hemisphere)

Gamma angle (deg)	CIE 1976 (u',v' coordinates)	
	C plane	C plane
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

### Test procedure

All measurements were performed in an environmentally controlled laboratory employing suitable baffling to minimise stray light. The sample was mounted in its normal operating orientation on a rotating mirror goniophotometer and operated from a stabilised 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 and spectrally flat reflectance tile, spectral irradiance. The distribution locus comprises points in the C0 and C90 planes at 10° gamma intervals from 0. 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	Beam downward	Stabilisation time	4 hour
		Total operation time	6.25 hour

### Equipment and uncertainties

A C-gamma rotating mirror goniophotometer with a test distance of 8 m.

luminous intensity*	± 5 %	temperature*	± 1 °C
C, gamma angles*	± 0.25°	luminous efficacy	± 5 %

A PhotoResearch PR-670 spectroradiometer (380 - 780 nm., 2 nm. per pixel) measuring from a spectrally flat reflectance tile attached to goniophotometer arm at a distance from sample >5 times the maximum observed luminous opening dimension.

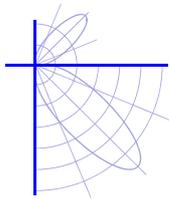
CIE (x, y) coordinates*	± 0.003	CCT*	± 100 K
CIE (u', v') coordinates	± 0.003	CRI	± 3
Δ (u', v') colour difference	± 0.0007	Scotopic / photopic ratio	0.02

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

voltage*	± 0.1 %	frequency	± 0.1 Hz
current*	± 0.1 %	power*	± 0.5 %
		power factor	± 0.01

### Accreditation & traceability





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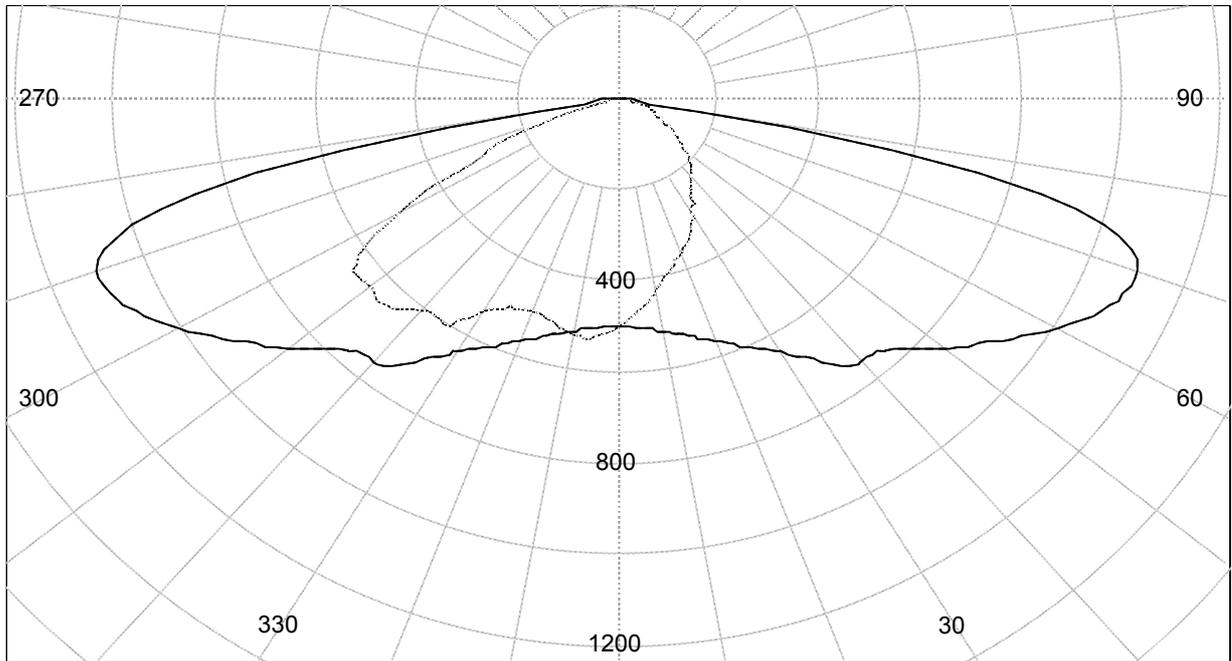
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**Polar Light Distribution Curves**



Kerbside / Downstream C0-Solid, Plane of maximum-Dashed, C90-Grey (cd)

Streetside / Upstream

**Street Lantern Summary:** Report data as tested.

Percentage Outputs

	Upward	Downward	Total
Street Side	N / A	N / A	N / A
House Side	N / A	N / A	N / A

Luminaire Efficiency (Light Output Ratio) N / A

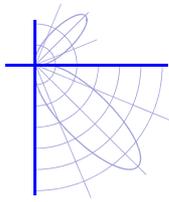
Certified by: *E Southgate*

Eric Southgate  
Authorised Signatory

Date of test  
Date of report

24-Jul-2012  
10-Aug-2012





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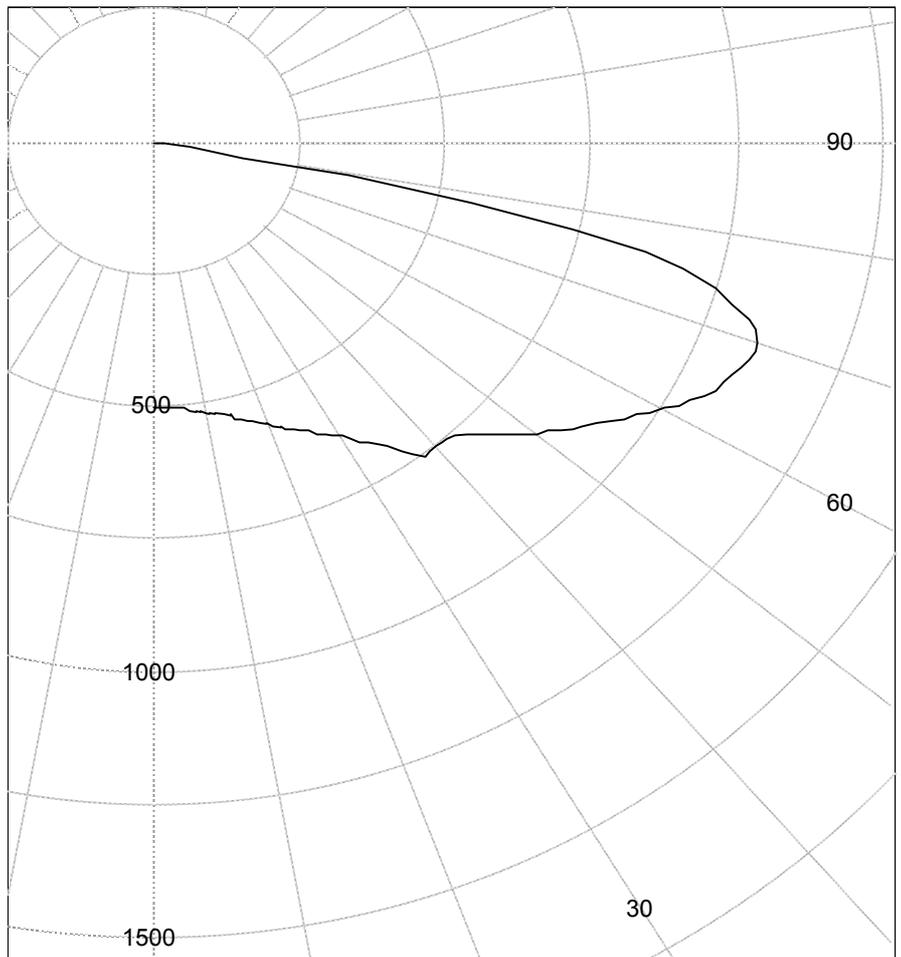
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Intensity  
in principal plane

**Principal Vertical Plane**

Gamma (Degrees)	Intensity (cd)
0.0	501.3
10.0	542.5
20.0	597.0
30.0	649.2
35.0	681.0
40.0	736.8
45.0	860.1
47.5	812.0
50.0	780.4
52.5	793.1
55.0	828.6
57.5	873.2
60.0	947.3
62.5	1082.1
65.0	1269.7
67.5	1518.0
70.0	1774.7
72.5	2033.4
75.0	2211.1
77.5	1769.3
80.0	586.6
82.5	109.8
85.0	50.6
87.5	6.4
90.0	0.1
92.5	0.0
95.0	0.3
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



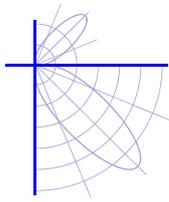
Legend: Plane of maximum intensity (cd)

	Maximum Intensity
House Side	2211.1 cd @ (330.0, 75.0)
Street Side	1101.2 cd @ (0.0, 69.0)

Note: The coordinate pairs in the above table are expressed in degrees and have the format (C plane, Gamma angle).

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





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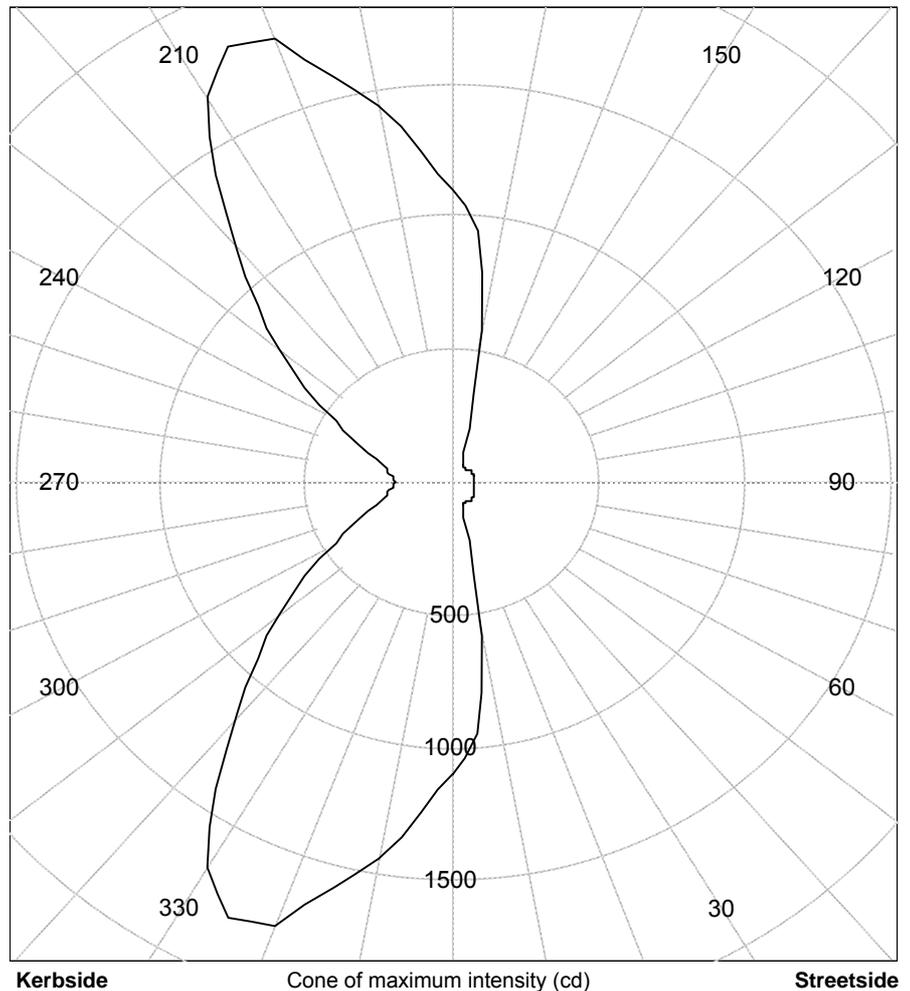
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Intensity  
in principal cone

**Principal Conical Surface**

C-Plane (Degrees)	Intensity (cd)
90.0	50.2
75.0	52.8
60.0	50.5
50.0	47.7
45.0	50.0
40.0	47.9
35.0	43.8
30.0	41.6
25.0	42.6
20.0	46.2
15.0	56.5
10.0	125.4
5.0	593.5
0.0	939.8
355.0	1114.1
350.0	1361.8
345.0	1561.1
340.0	1682.9
335.0	2049.1
330.0	2211.1
325.0	1646.3
320.0	859.8
315.0	385.6
310.0	180.8
300.0	81.8
285.0	27.7
270.0	19.6

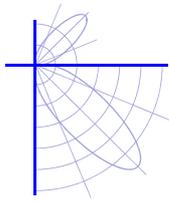


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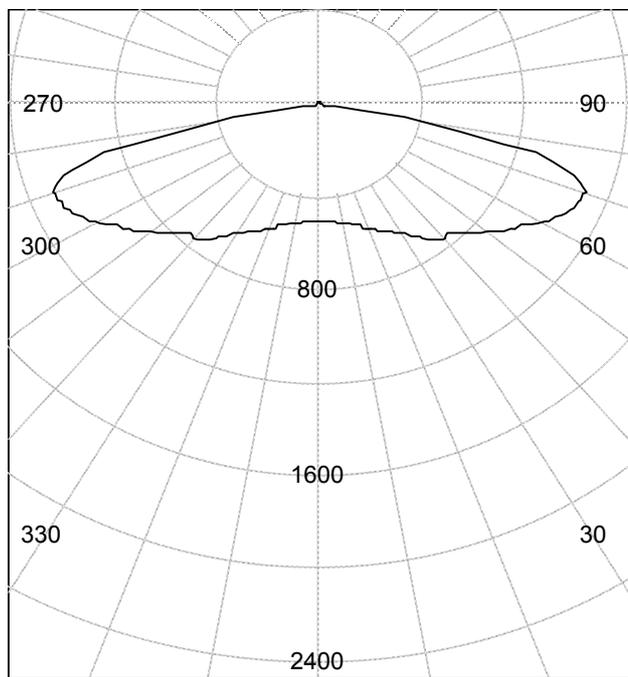
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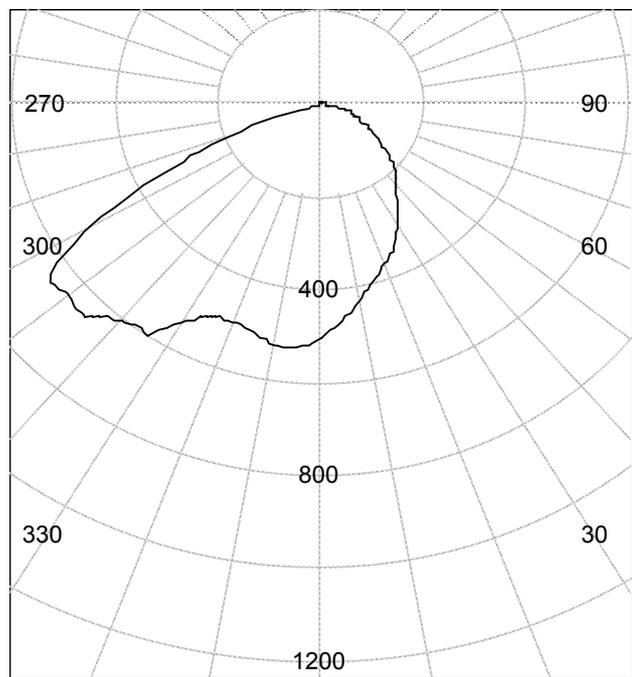
**Polar curve through CIE C0 / C180**



**Downstream (C180)** (cd)

**Upstream (C0)**

**Polar curve through CIE C90 / C270**



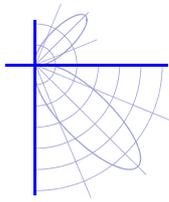
**Kerbside (C270)** (cd)

**Streetside (C90)**

**Performance Parameters**

$I_{80}$	=	159.7 cd
$I_{88}$	=	0.7 cd
$I_{90}$	=	0.1 cd
$I_{80} / I_{88}$	=	233.646

Note: The intensity values listed ( $I_{xx}$ ) are all within the C0 half plane, the subscript refers to the gamma angle.



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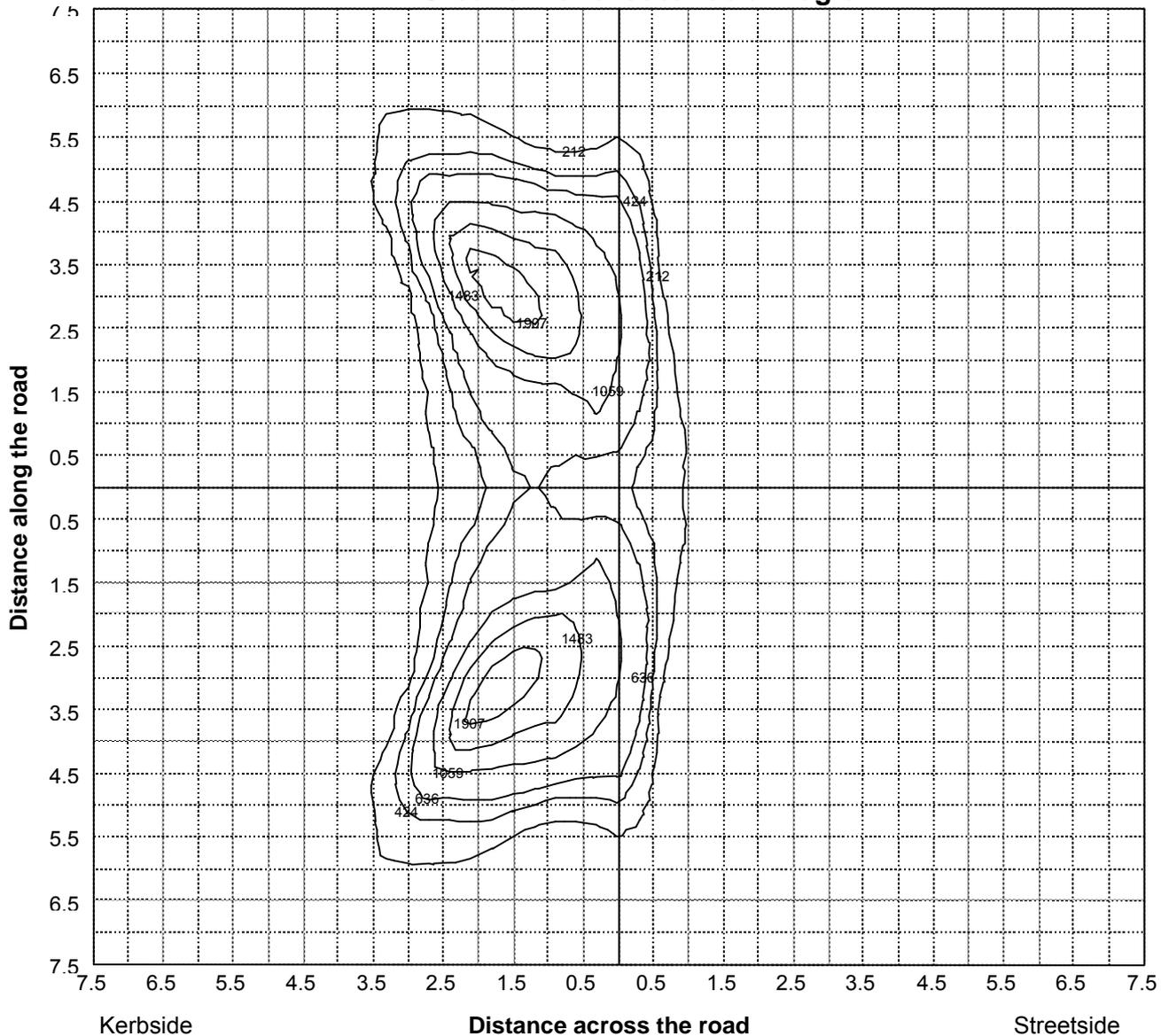
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### Ground Plane Isocandela Diagram

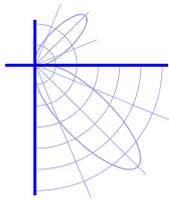


The isocandela contours are set to 10%, 20%, 30%, 50%, 70%, 90% of the maximum.

The isocandela contour units are expressed as candela.

Upstream and downstream sides have been averaged.





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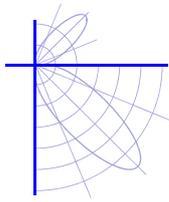
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**KERB SIDE INTENSITY DATA (cd)**

Gamma	C-Plane								
	C270	C285	C300	C310	C315	C320	C325	C330	C335
0.0	501	501	501	501	501	501	501	501	501
10.0	526	527	535	539	541	543	543	543	541
20.0	499	503	526	547	560	574	586	597	603
30.0	545	542	556	576	593	611	629	649	674
35.0	603	606	609	599	609	630	654	681	715
40.0	607	609	635	650	655	665	695	737	783
45.0	646	644	645	656	676	702	765	860	933
47.5	647	656	666	661	680	719	755	812	886
50.0	640	655	696	679	683	704	729	780	895
52.5	648	661	717	711	701	706	735	793	923
55.0	638	670	728	746	736	733	767	829	954
57.5	579	645	744	769	779	790	815	873	996
60.0	494	587	753	797	829	857	895	947	1072
62.5	402	510	729	828	885	933	994	1082	1218
65.0	295	386	678	858	935	1011	1118	1270	1432
67.5	248	307	557	843	959	1091	1287	1518	1674
70.0	168	205	387	702	929	1160	1488	1775	1885
72.5	74	108	197	461	749	1131	1637	2033	2089
75.0	20	28	82	181	386	860	1646	2211	2049
77.5	6	12	38	58	99	388	1095	1769	1496
80.0	1	3	20	30	43	74	382	587	458
82.5	0	0	5	12	17	24	51	110	127
85.0	0	0	1	1	3	6	18	51	55
87.5	0	0	0	1	0	1	1	6	3
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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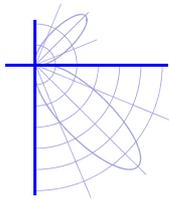
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Gamma	KERB SIDE		INTENSITY DATA (cd)				ROAD SIDE			
	C340	C345	C350	C355	C-Plane		C10	C15	C20	
					C0	C5				
0.0	501	501	501	501	501	501	501	501	501	501
10.0	538	536	531	524	519	513	506	500	494	494
20.0	608	606	598	584	569	553	538	522	505	505
30.0	693	702	696	673	644	617	591	562	529	529
35.0	748	771	772	745	703	670	630	587	540	540
40.0	856	910	919	850	753	693	646	598	545	545
45.0	961	963	953	888	781	722	668	606	541	541
47.5	953	999	1004	941	817	746	681	609	534	534
50.0	1001	1061	1066	998	856	781	697	613	523	523
52.5	1051	1115	1120	1042	892	810	715	616	503	503
55.0	1098	1169	1172	1086	929	848	739	619	470	470
57.5	1148	1218	1218	1126	970	885	764	614	427	427
60.0	1217	1278	1271	1161	1008	923	786	587	367	367
62.5	1323	1353	1324	1196	1047	953	793	519	293	293
65.0	1477	1432	1372	1222	1079	974	757	414	204	204
67.5	1670	1521	1415	1239	1096	971	669	278	129	129
70.0	1834	1616	1455	1246	1100	927	499	163	86	86
72.5	1884	1673	1450	1212	1061	810	288	82	62	62
75.0	1683	1561	1362	1114	940	593	125	56	46	46
77.5	1149	975	794	684	663	296	54	37	32	32
80.0	383	198	109	103	160	70	30	23	21	21
82.5	55	24	15	15	24	28	16	15	14	14
85.0	26	7	6	5	8	10	9	8	10	10
87.5	2	2	2	1	1	2	2	2	4	4
90.0	0	0	0	0	0	0	1	1	1	1
92.5	0	0	0	0	0	0	0	0	1	1
95.0	0	0	0	0	0	0	0	0	0	0
97.5	0	0	0	0	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0	0	0	0
102.5	0	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0	0



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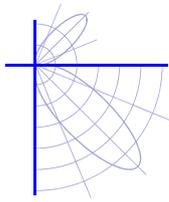
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**ROAD SIDE INTENSITY DATA (cd)**

Gamma	C-Plane								
	C25	C30	C35	C40	C45	C50	C60	C75	C90
0.0	501	501	501	501	501	501	501	501	501
10.0	487	480	474	467	461	455	446	437	432
20.0	488	470	453	437	422	409	389	372	365
30.0	493	459	433	409	390	373	343	313	300
35.0	494	453	422	393	370	349	311	274	260
40.0	492	443	403	369	341	318	275	236	225
45.0	475	414	371	335	303	276	234	201	206
47.5	457	395	349	310	277	252	211	184	190
50.0	431	366	322	280	248	223	188	167	172
52.5	400	335	285	245	216	196	167	151	155
55.0	363	289	243	208	183	165	145	136	139
57.5	313	242	199	169	151	139	126	122	125
60.0	255	191	158	135	123	118	111	109	111
62.5	190	146	124	112	104	101	98	97	98
65.0	136	108	99	92	88	86	90	85	85
67.5	97	86	82	78	77	79	84	78	78
70.0	74	69	67	67	70	72	78	75	68
72.5	58	53	56	57	59	61	65	65	60
75.0	43	42	44	48	50	48	50	53	50
77.5	31	32	34	36	38	40	40	40	40
80.0	22	22	25	29	29	29	29	30	30
82.5	16	18	19	17	17	17	17	21	20
85.0	15	15	10	8	7	7	9	12	11
87.5	5	4	3	3	3	3	4	5	5
90.0	1	1	2	2	2	2	2	2	3
92.5	1	1	1	1	1	1	1	1	1
95.0	0	1	1	1	1	1	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





## Certified Test Report No. LL15653

Unilumin Group Co., LED Street Light. Product ID: UNISTWF-0009.

Cast aluminium body 230 x 620 x 120 mm (non.) with beige finish and unpainted/finned cover above light opening. Luminous opening of 144 x 150 mm (nom.) contains four rows of seven LED's, total of 28 LED's.

Hinged upper section houses "Inventronics, EUV-050S024ST 50W" 100-277Vac 50/60Hz LED driver.

Tested with L/O in the horizontal position.

Tested at 240V 50Hz, measured 153 mA, efficacy = 81.4 lm/W.

**Test Distance:** 8.0 metres  
**Test Temperature:** 25.0 degrees Celsius

**Significance:** This laboratory has no control over 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.

**Special Notes:** The intensity values contained in this report are shown as tested. When using these values in calculations the appropriate Ballast Factor and Manufacturer's rated lumens MUST be taken into account.

It should also be noted that prorating the lumen output for the use of other lamp/ballast combinations, 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 CIE Cgamma coordinate system as described in CIE Publication number 121.

**Uncertainties:** At the 95% confidence interval with a factor k = 2, the uncertainties for this report are :-

Temperature	+/- 1 degree Celsius
Light Output Ratio	+/- 4%
Luminous Intensity	+/- 4%
Angular displacement	+/- 0.25 degrees.

**Testing Procedure:** Tested in accordance with the applicable sections of CIE Publications Numbers 121 (1996) and 34 (1977).

