Report of Test
LL17347

Empyrean Lighting 600 x 600 mm LED Panel Light. Product ID: Corona-600SS-W40WN.
Extruded aluminium frame, white finish, extent ~ 595 x595 x 10 mm deep.
Opal diffuser forms luminous opening of 556 x 556 mm.
Remote Shinry LRC 1400-30WGE-5D 200-240VAC 50/60Hz LED driver.
Tested at 240 v 50 Hz.

Performance Summary

Luminous flux	3394 lm
Total Luminaire Power (LCP)	38.6 W
Luminous Efficacy	88.0 lm/W
SHR Nominal	1.50
SHR Maximum	1.63

PREPARED FOR : Empyrean Lighting, Sippy Downs. QLD. 4556.

ORIGINAL REPORT

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LM-79 Performance Data

Spectral	CIE 1931 (x, y)	(1)	(0.390, 0.388)
	CIE 1976 (u', v')	(1)	(0.227, 0.508)
	Correlated Colour Temperature (CCT)	(1)	3850 K
	Colour Spatial Uniformity	(2)	0.0009
	Colour Rendering Index (Ra)	(1)	80
	Special CRI 9 (R_9)	(1),(3)	-1
	Distance from Planckian Locus (Duv)	(1),(3)	0.0027
	Scotopic/Photopic Ratio	(1),(3)	1.6

Electrical	Voltage	240 V
	Frequency	50 Hz
	Current	0.168 A
	Power	38.6 W
	Power Factor	0.96
	Current THD	15.9 %

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

(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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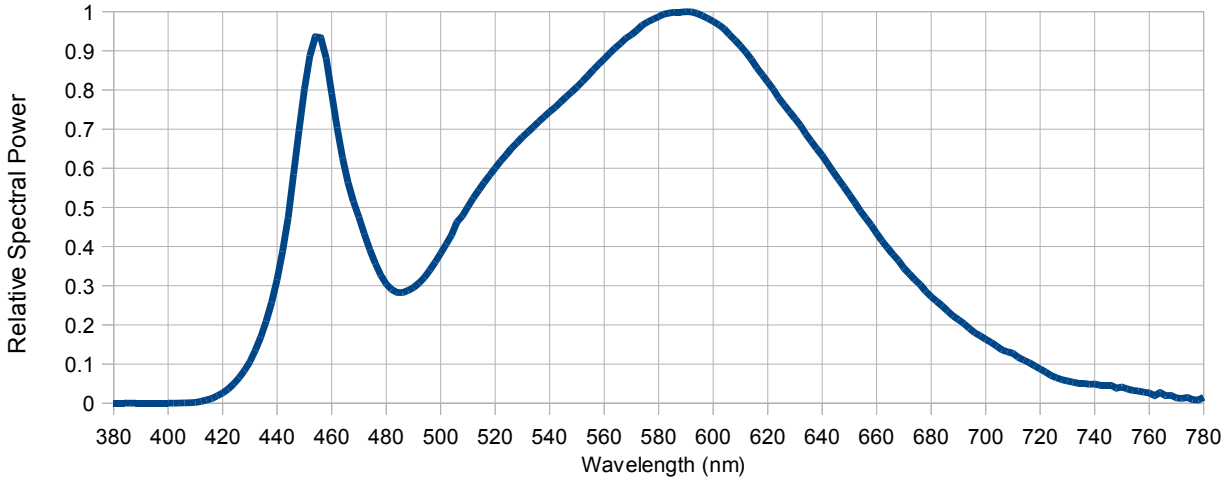
LM-79 Performance Data

Summary Relative Spectral Irradiance Distribution (wavelength – nm, irradiance – relative to peak = 1)

380	4.62E-04	480	3.04E-01	580	9.87E-01	680	2.72E-01
385	2.06E-04	485	2.83E-01	585	9.98E-01	685	2.42E-01
390	5.29E-04	490	2.95E-01	590	1.00E+00	690	2.13E-01
395	3.57E-04	495	3.30E-01	595	9.93E-01	695	1.85E-01
400	4.63E-04	500	3.83E-01	600	9.75E-01	700	1.63E-01
405	5.90E-04	505	4.46E-01	605	9.49E-01	705	1.41E-01
410	2.18E-03	510	5.02E-01	610	9.13E-01	710	1.27E-01
415	1.01E-02	515	5.54E-01	615	8.68E-01	715	1.07E-01
420	2.61E-02	520	6.00E-01	620	8.20E-01	720	8.75E-02
425	5.67E-02	525	6.43E-01	625	7.71E-01	725	6.80E-02
430	1.06E-01	530	6.80E-01	630	7.27E-01	730	5.69E-02
435	1.89E-01	535	7.12E-01	635	6.78E-01	735	5.06E-02
440	3.15E-01	540	7.44E-01	640	6.33E-01	740	4.92E-02
445	5.29E-01	545	7.76E-01	645	5.82E-01	745	4.57E-02
450	8.03E-01	550	8.08E-01	650	5.33E-01	750	4.12E-02
455	9.35E-01	555	8.44E-01	655	4.82E-01	755	3.20E-02
460	7.91E-01	560	8.79E-01	660	4.34E-01	760	2.63E-02
465	5.95E-01	565	9.13E-01	665	3.88E-01	765	2.34E-02
470	4.76E-01	570	9.41E-01	670	3.45E-01	770	1.35E-02
475	3.75E-01	575	9.70E-01	675	3.09E-01	775	1.18E-02
						780	1.52E-02



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

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Empyrean Lighting 600 x 600 mm LED Panel Light. Product ID: Corona-600SS-W40WN.
Extruded aluminium frame, white finish, extent ~ 595 x595 x 10 mm deep.
Opal diffuser forms luminous opening of 556 x 556 mm.
Remote Shinry LRC 1400-30WGE-5D 200-240VAC 50/60Hz LED driver.
Tested at 240 v 50 Hz.

LM-79 Performance Data

Spatial measurements (lower hemisphere)

Gamma angle (deg)	CIE 1976 (u',v') coordinates C 0 plane	C 90 plane
0	(0.226, 0.507)	(0.226, 0.507)
10	(0.226, 0.507)	(0.226, 0.507)
20	(0.226, 0.508)	(0.226, 0.508)
30	(0.227, 0.508)	(0.227, 0.508)
40	(0.227, 0.508)	(0.227, 0.508)
50	(0.227, 0.508)	(0.227, 0.508)
60	(0.227, 0.508)	(0.227, 0.508)
70	(0.227, 0.508)	(0.227, 0.508)
80	(0.226, 0.508)	(0.227, 0.508)
90	I <= 10 %	I <= 10 %

Spatial measurements (upper hemisphere)

Gamma angle (deg)	CIE 1976 (u',v') coordinates C 0 plane	C 90 plane
90	I <= 10 %	I <= 10 %
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

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 two or more C planes at no more than 10º gamma 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.

		Stabilisation Time	15.75 hour
Sample Orientation	Ceiling mount	Total Operation Time	17 hour

Equipment and uncertainties

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 %
C, Gamma Angles	± 0.25º		

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 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)	± 3
Δ (u', v') Colour difference	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Relative Spectral Irradiance *	± 2 %	R9 *	± 3

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

Quantities marked with * : NATA accreditation does not cover the performance of this service.
IESNA LM-79-08 Calculator v4.7 (13th Sep 2013)

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Opal diffuser forms luminous opening of 556 x 556 mm.
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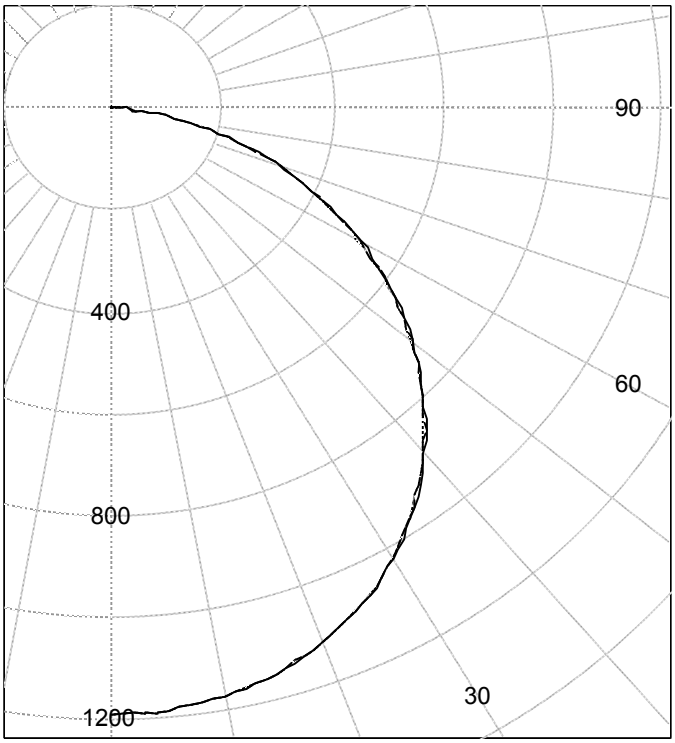
Tested at 240 v 50 Hz.

Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

INTENSITY SUMMARY (cd)

	C-Plane					Flux
Gamma	C0	C22.5	C45	C67.5	C90	(lm)
0.0	1191	1191	1191	1191	1191	
5.0	1187	1187	1187	1187	1187	113
10.0	1174	1173	1173	1173	1173	
15.0	1151	1150	1151	1150	1150	325
20.0	1118	1118	1117	1117	1117	
25.0	1074	1074	1074	1073	1073	495
30.0	1021	1020	1019	1019	1019	
35.0	957	955	955	953	953	597
40.0	882	882	880	880	881	
45.0	801	799	798	796	797	615
50.0	711	708	709	708	705	
55.0	615	615	614	612	612	548
60.0	515	515	516	514	514	
65.0	416	415	413	413	417	411
70.0	314	314	313	314	314	
75.0	219	218	218	220	218	231
80.0	128	129	130	129	130	
85.0	51	52	52	51	51	60
90.0	0	0	0	0	0	

AVERAGE LUMINANCE (cd / sq.m)

Gamma	C0	C45	C90
45.0	3664	3651	3645
55.0	3471	3464	3452
65.0	3184	3165	3190
75.0	2743	2721	2722
85.0	1907	1937	1875

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	932	N / A	27.5
0-40	1529	N / A	45.1
0-60	2693	N / A	79.3
0-90	3394	N / A	100.0
40-90	1865	N / A	54.9
60-90	701	N / A	20.7
90-180	0	N / A	0.0
0-180	3394	N / A	100.0

Light Output Ratio = N / A

SHR-NOM = 1.50
SHR-MAX = 1.63

Calculated using the TM5 fine grid method.

CERTIFIED BY: K Monaghan

Kevin Monaghan
Authorised Signatory

Date of test 30-Jan-2014
Date of report 31-Jan-2014

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Tested at 240 v 50 Hz.

Intensity data (cd)

	C-Plane				
Gamma	**C0**	**C22.5**	**C45**	**C67.5**	**C90**
0.0	1191	1191	1191	1191	1191
2.5	1190	1190	1190	1190	1190
5.0	1187	1187	1187	1187	1187
7.5	1182	1181	1181	1181	1182
10.0	1174	1173	1173	1173	1173
12.5	1164	1163	1163	1163	1163
15.0	1151	1150	1151	1150	1150
17.5	1137	1136	1136	1135	1136
20.0	1118	1118	1117	1117	1117
22.5	1098	1097	1097	1096	1096
25.0	1074	1074	1074	1073	1073
27.5	1049	1049	1048	1047	1047
30.0	1021	1020	1019	1019	1019
32.5	988	989	987	988	987
35.0	957	955	955	953	953
37.5	920	919	919	918	918
40.0	882	882	880	880	881
42.5	842	840	839	839	838
45.0	801	799	798	796	797
47.5	754	755	752	752	752
50.0	711	708	709	708	705
52.5	663	664	662	662	661
55.0	615	615	614	612	612
57.5	568	567	565	564	566
60.0	515	515	516	514	514
62.5	469	466	466	467	464
65.0	416	415	413	413	417
67.5	365	364	366	364	366
70.0	314	314	313	314	314
72.5	264	265	266	265	266
75.0	219	218	218	220	218
77.5	170	172	172	172	172
80.0	128	129	130	129	130
82.5	87	87	89	89	89
85.0	51	52	52	51	51
87.5	18	17	18	18	17
90.0	0	0	0	0	0

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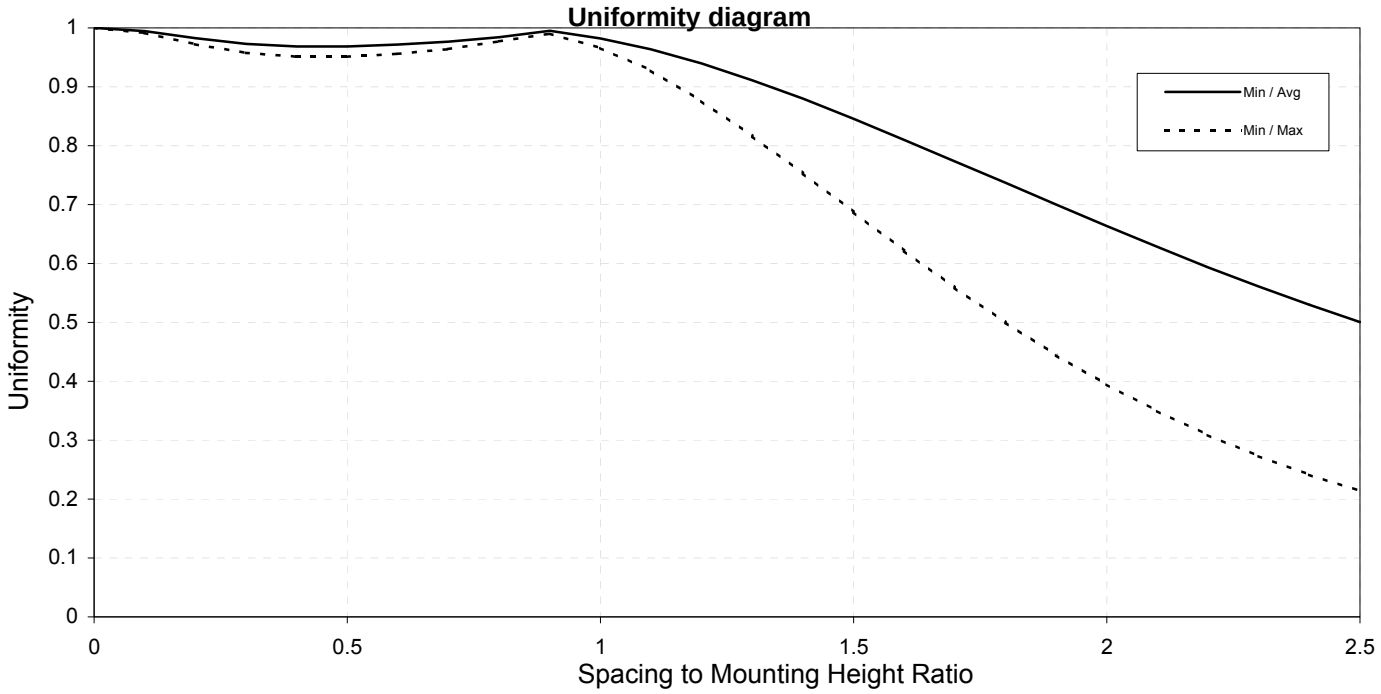

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Test Distance: 8.0 metres

Test Temperature: 24.9 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.
The generic term "LOR" is used in this report, it denotes the "Light Output Ratio Luminaire" as defined in Australian Standard AS1680, Part 3, 1991, Section 1.3.9.
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 Publication Number 121; and with reference to Australian Standard AS1680, Part 3, 1991.

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