astro

PHOTOMETRIC TEST REPORT

Report Number	GNC-19599
Customer	Astro Lighting Limited
Contact	Ross Dickson
Product Type	LED Wall light
Test Purpose	Generation of Photometric Data
Sales Order Ref	Q-LUX17-21659
Works Order Number	WO-10246
Test Item Reference	TI-13826
LAB Test Method Reference	TES-102000
Test Standards	LM-79-08; (BS) EN 13032-4:2015; CIE S025:2015
Lab Location Reference	LUX-TSI
Tested by	Mike Sewell
Date of Test	27/06/2017
Reviewed by	Menno Schakel
Number of products tested	1

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Authorised by: Gareth Jones
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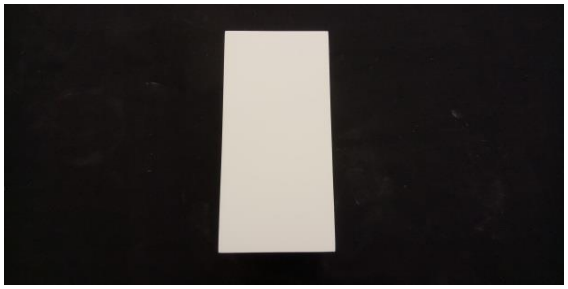
Signed:

Date: 28/07/2017



8052 - Parma 210 LED 2700K Phase Dimmable

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Nomenclature

Lamp Orientation described below relates to the position in which a lamp is designed to operate for maximum performance and safety, these include:
BD - Base Down (bulb is vertically positioned with the metal base at the bottom, glass up)
BU - Base Up (bulb is vertically positioned with the metal base at the top, glass hanging down)
HBD - Horizontal +15º to Base Down
H45 - Horizontal to -45º only
VBU - Vertical Base Up ±15º
VBD - Vertical Base Down ±15º
HBU - Base Up +/- 90º (bulb can be operated in a base up or horizontal position)
HOR - Horizontal Burn (bulb is positioned with the metal base parallel to the ground)
H75 - Horizontal +/- 75º (bulb should not be operated within 15º of vertical)
U - Universal Burn (burn can be operated in any position)

Test Conditions

Measurements were made with an ambient temperature of 25°C +/- 1°C. Measurements were taken only after sufficient time for thermal stabilisation has been allowed. Thermal stabilisation according to LM-79-08 was achieved before measurements are measured and reported.

Calibrations

The far field Type C Goniophotometer is calibrated using an intensity lamp calibrated by a NVLAP accredited calibration laboratory.

Test Equipment

UL LSI Custom Far-Field Type C Moving Mirror Goniophotometer measures intensity as a function of angle. On-axis spectral measurements taken using spectrometer, for which these measurements and outputs are not accredited.

Data Formats

IES (15 deg azimuth and 2.5 deg inclination) and LDT (15 deg C planes and 2.5 deg gamma angles)

Spectral Data file from which the calculation of chromaticity and CRI etc. have been performed and the derived results from the LightMtrX software are provided as a text file format.

All photometric data for LED products will be provided in ABSOLUTE photometric format and all non-LED data will be in relative photometric format with lamp lumens measured separately, where possible, for LOR estimation.

Product Name	8052 - Parma 210 LED 2700K Phase Dimmable
Part/Serial Number	Pre-production sample (*)
Type of Product	LED Wall light
Base Type	Not Applicable - Luminaire
Driver Type	Internal
Test Time	30 mins
Operating Orientation	Base Up
Test Orientation	Base Up
Ambient Temperature	24.6°C
Manufacturer	Astro Lighting Limited
Date of Manufacture	Not Available
Thermal Management	Passive
Dimmable	No
Pre-Burning Time	0 hours
Stabilisation Time	45 mins
Humidity	48.1% RH
Averaging Applied	NONE

Driver Details		
Manufacturer		N/A
Model		N/A
Part/Serial #		N/A
Rated Voltage		N/A
Output	Current	N/A
	Voltage	N/A

Photometric Measurements	
Luminous Flux	550 lm
Luminous Efficacy	69 lm/W

Dimension	**Sample**	**Luminous Opening**
Diameter/Width	90 mm	75 mm
Length	110 mm	100 mm
Height/Depth	210 mm	210 mm

Electrical Measurements	
Frequency	50 Hz
Voltage	230.060 V
Current	0.036 A
Power	8.0 W
Power Factor	0.969
Apparent Power	8.2 VA

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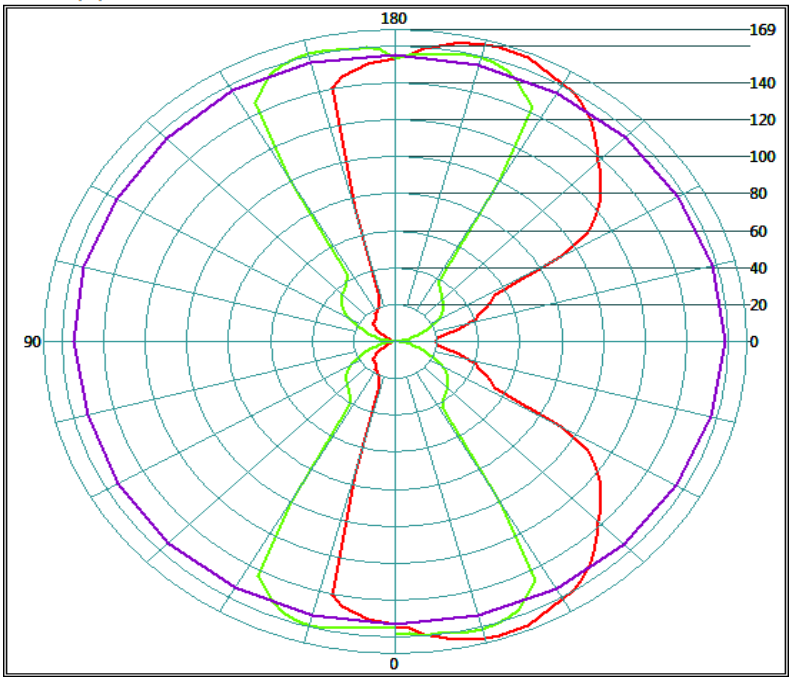
Goniophotometric Measurements		
Beam Angle	Horizontal	62º
	Vertical	75º
On-axis Intensity		153 cd
Peak Intensity		169 cd
Peak Direction	Horizontal	225º
	Vertical	15º

Polar Plot (cd)

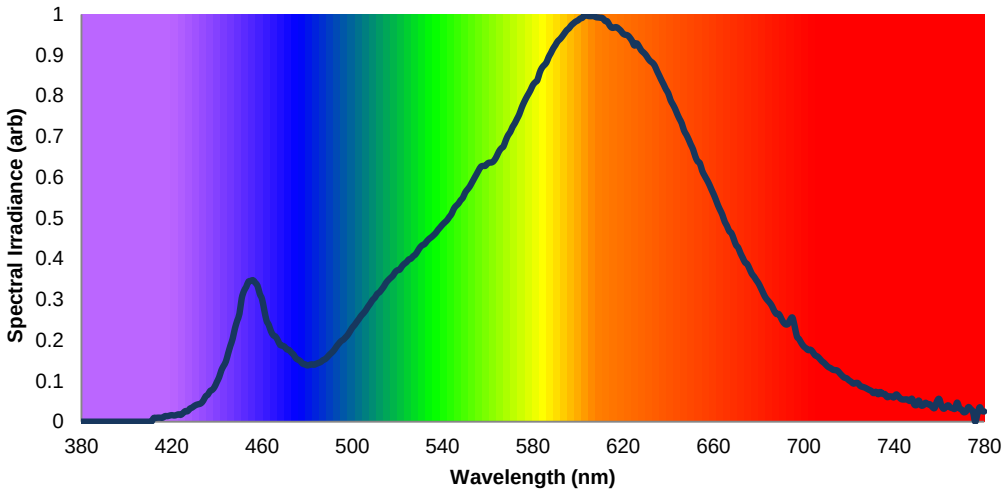


Appendices

On-axis Spectral Measurement

The following data was determined from an on-axis spectral measurement using a SP1000 spectrometer at a distance of 500mm, for which these measurements and outputs are not accredited.

Spectral Irradiance versus Wavelength



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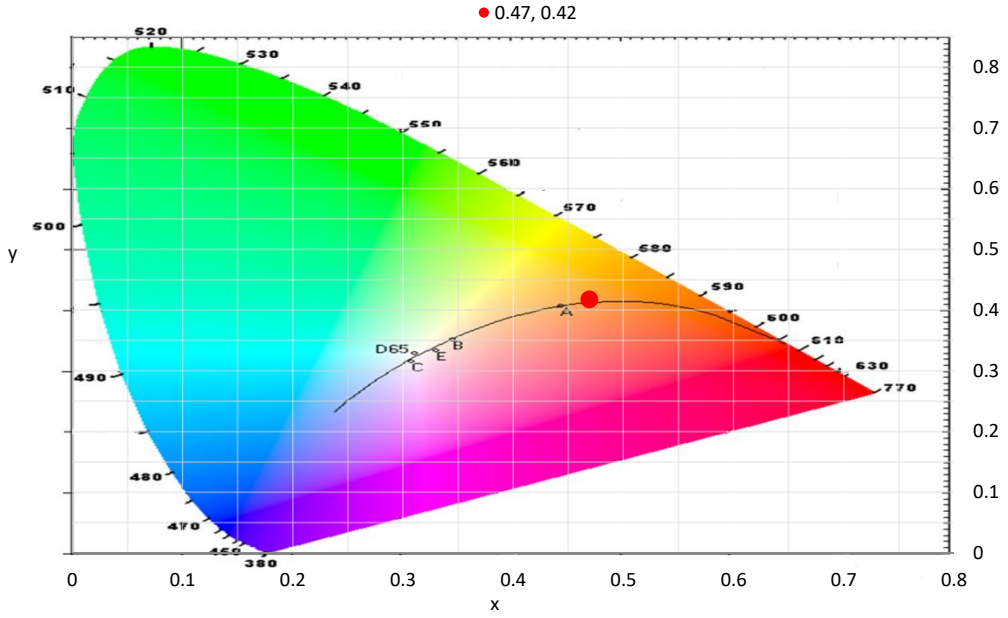
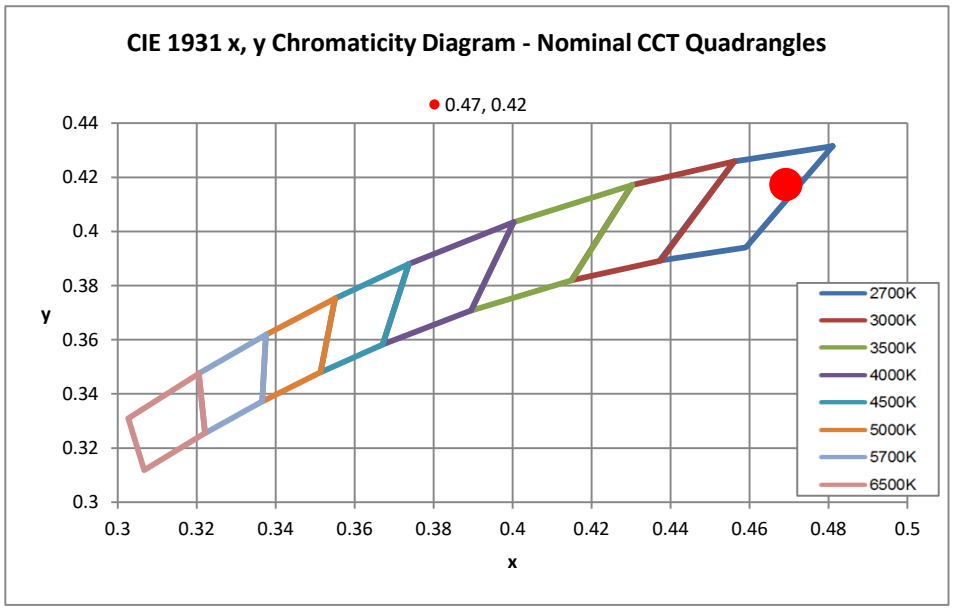
Colour Rendering Index Detail			
R1	80	R8	59
R2	90	R9	10
R3	97	R10	78
R4	79	R11	77
R5	79	R12	69
R6	88	R13	82
R7	83	R14	99

Colorimetric Details	
CCT	2624K
CRI (Ra)	82

Chromaticity Coordinates		
CIE 1931	x	0.4692
	y	0.4173
CIE 1960	u	0.2655
	v	0.3542
CIE 1976	u'	0.2655
	v'	0.5313
Duv		0.0017

CIE 1931 Colour Chart





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Spectral Power Distribution

λ (nm)	Arb units	λ (nm)	Arb units	λ (nm)	Arb units	λ (nm)	Arb units
380	0.00E+00	430	3.86E-02	480	1.38E-01	530	4.28E-01
381	0.00E+00	431	4.15E-02	481	1.39E-01	531	4.33E-01
382	0.00E+00	432	4.32E-02	482	1.41E-01	532	4.36E-01
383	0.00E+00	433	4.53E-02	483	1.40E-01	533	4.43E-01
384	0.00E+00	434	5.20E-02	484	1.42E-01	534	4.49E-01
385	0.00E+00	435	6.21E-02	485	1.44E-01	535	4.53E-01
386	0.00E+00	436	6.65E-02	486	1.47E-01	536	4.58E-01
387	0.00E+00	437	7.53E-02	487	1.51E-01	537	4.64E-01
388	0.00E+00	438	7.85E-02	488	1.54E-01	538	4.71E-01
389	0.00E+00	439	8.58E-02	489	1.59E-01	539	4.78E-01
390	0.00E+00	440	9.75E-02	490	1.65E-01	540	4.84E-01
391	0.00E+00	441	1.09E-01	491	1.70E-01	541	4.89E-01
392	0.00E+00	442	1.26E-01	492	1.76E-01	542	4.95E-01
393	0.00E+00	443	1.37E-01	493	1.85E-01	543	5.03E-01
394	0.00E+00	444	1.48E-01	494	1.92E-01	544	5.10E-01
395	0.00E+00	445	1.68E-01	495	1.98E-01	545	5.23E-01
396	0.00E+00	446	1.87E-01	496	2.01E-01	546	5.30E-01
397	0.00E+00	447	2.04E-01	497	2.07E-01	547	5.35E-01
398	0.00E+00	448	2.29E-01	498	2.13E-01	548	5.44E-01
399	0.00E+00	449	2.48E-01	499	2.22E-01	549	5.50E-01
400	0.00E+00	450	2.65E-01	500	2.31E-01	550	5.62E-01
401	0.00E+00	451	3.03E-01	501	2.37E-01	551	5.70E-01
402	0.00E+00	452	3.21E-01	502	2.45E-01	552	5.77E-01
403	0.00E+00	453	3.31E-01	503	2.53E-01	553	5.87E-01
404	0.00E+00	454	3.44E-01	504	2.61E-01	554	5.97E-01
405	0.00E+00	455	3.46E-01	505	2.67E-01	555	6.07E-01
406	0.00E+00	456	3.48E-01	506	2.74E-01	556	6.17E-01
407	0.00E+00	457	3.41E-01	507	2.83E-01	557	6.26E-01
408	0.00E+00	458	3.34E-01	508	2.90E-01	558	6.28E-01
409	0.00E+00	459	3.14E-01	509	2.99E-01	559	6.28E-01
410	0.00E+00	460	3.01E-01	510	3.05E-01	560	6.35E-01
411	0.00E+00	461	2.74E-01	511	3.13E-01	561	6.36E-01
412	8.98E-03	462	2.48E-01	512	3.18E-01	562	6.37E-01
413	9.42E-03	463	2.37E-01	513	3.25E-01	563	6.43E-01
414	9.91E-03	464	2.22E-01	514	3.32E-01	564	6.52E-01
415	9.84E-03	465	2.12E-01	515	3.41E-01	565	6.64E-01
416	9.81E-03	466	2.09E-01	516	3.48E-01	566	6.71E-01
417	1.39E-02	467	2.00E-01	517	3.53E-01	567	6.76E-01
418	1.35E-02	468	1.89E-01	518	3.59E-01	568	6.91E-01
419	1.49E-02	469	1.87E-01	519	3.67E-01	569	7.03E-01
420	1.61E-02	470	1.84E-01	520	3.72E-01	570	7.11E-01
421	1.52E-02	471	1.78E-01	521	3.73E-01	571	7.24E-01
422	1.62E-02	472	1.76E-01	522	3.82E-01	572	7.33E-01
423	1.81E-02	473	1.70E-01	523	3.87E-01	573	7.44E-01
424	1.67E-02	474	1.65E-01	524	3.92E-01	574	7.55E-01
425	2.11E-02	475	1.56E-01	525	3.98E-01	575	7.70E-01
426	2.60E-02	476	1.52E-01	526	4.00E-01	576	7.83E-01
427	2.56E-02	477	1.49E-01	527	4.07E-01	577	7.94E-01
428	3.19E-02	478	1.42E-01	528	4.11E-01	578	8.04E-01
429	3.46E-02	479	1.41E-01	529	4.19E-01	579	8.14E-01
						580	8.26E-01

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581	8.33E-01	631	8.93E-01	681	3.29E-01	731	6.99E-02
582	8.38E-01	632	8.86E-01	682	3.17E-01	732	7.36E-02
583	8.57E-01	633	8.81E-01	683	3.06E-01	733	6.74E-02
584	8.69E-01	634	8.74E-01	684	2.98E-01	734	7.30E-02
585	8.75E-01	635	8.61E-01	685	2.92E-01	735	6.81E-02
586	8.82E-01	636	8.50E-01	686	2.83E-01	736	6.78E-02
587	8.95E-01	637	8.38E-01	687	2.72E-01	737	6.03E-02
588	9.05E-01	638	8.27E-01	688	2.64E-01	738	6.22E-02
589	9.16E-01	639	8.16E-01	689	2.64E-01	739	6.16E-02
590	9.25E-01	640	8.06E-01	690	2.54E-01	740	5.96E-02
591	9.34E-01	641	7.90E-01	691	2.44E-01	741	6.70E-02
592	9.39E-01	642	7.79E-01	692	2.39E-01	742	6.22E-02
593	9.46E-01	643	7.69E-01	693	2.40E-01	743	5.62E-02
594	9.54E-01	644	7.55E-01	694	2.50E-01	744	5.45E-02
595	9.61E-01	645	7.43E-01	695	2.56E-01	745	5.47E-02
596	9.66E-01	646	7.32E-01	696	2.35E-01	746	5.43E-02
597	9.73E-01	647	7.15E-01	697	2.09E-01	747	5.09E-02
598	9.78E-01	648	7.05E-01	698	2.02E-01	748	5.64E-02
599	9.83E-01	649	6.93E-01	699	1.93E-01	749	4.21E-02
600	9.85E-01	650	6.80E-01	700	1.85E-01	750	4.11E-02
601	9.90E-01	651	6.68E-01	701	1.81E-01	751	5.20E-02
602	9.92E-01	652	6.51E-01	702	1.76E-01	752	4.02E-02
603	1.00E+00	653	6.39E-01	703	1.77E-01	753	4.02E-02
604	9.97E-01	654	6.35E-01	704	1.71E-01	754	4.65E-02
605	9.96E-01	655	6.16E-01	705	1.63E-01	755	4.29E-02
606	9.96E-01	656	6.05E-01	706	1.61E-01	756	4.26E-02
607	9.96E-01	657	5.95E-01	707	1.55E-01	757	3.60E-02
608	9.93E-01	658	5.85E-01	708	1.49E-01	758	3.35E-02
609	9.93E-01	659	5.72E-01	709	1.45E-01	759	4.92E-02
610	9.92E-01	660	5.60E-01	710	1.39E-01	760	5.60E-02
611	9.91E-01	661	5.46E-01	711	1.34E-01	761	3.98E-02
612	9.84E-01	662	5.32E-01	712	1.31E-01	762	3.17E-02
613	9.83E-01	663	5.20E-01	713	1.27E-01	763	3.65E-02
614	9.73E-01	664	5.08E-01	714	1.27E-01	764	4.03E-02
615	9.67E-01	665	4.91E-01	715	1.25E-01	765	3.49E-02
616	9.68E-01	666	4.81E-01	716	1.19E-01	766	3.30E-02
617	9.69E-01	667	4.68E-01	717	1.13E-01	767	3.18E-02
618	9.65E-01	668	4.63E-01	718	1.08E-01	768	4.69E-02
619	9.60E-01	669	4.49E-01	719	1.07E-01	769	3.34E-02
620	9.53E-01	670	4.34E-01	720	1.02E-01	770	2.94E-02
621	9.50E-01	671	4.27E-01	721	9.81E-02	771	2.30E-02
622	9.49E-01	672	4.14E-01	722	9.35E-02	772	2.57E-02
623	9.43E-01	673	4.02E-01	723	9.49E-02	773	3.59E-02
624	9.34E-01	674	3.91E-01	724	9.48E-02	774	3.09E-02
625	9.24E-01	675	3.87E-01	725	8.80E-02	775	2.44E-02
626	9.29E-01	676	3.76E-01	726	8.57E-02	776	0.00E+00
627	9.22E-01	677	3.63E-01	727	8.40E-02	777	1.92E-02
628	9.12E-01	678	3.56E-01	728	8.11E-02	778	3.55E-02
629	9.07E-01	679	3.48E-01	729	7.81E-02	779	2.64E-02
630	9.01E-01	680	3.40E-01	730	7.54E-02	780	2.50E-02

Measurement Uncertainty

The following is the reported expanded uncertainty of the UL 6440T Type C Mirror Goniophotometer.

Parameter	Uncertainty
Total Luminous Flux (%)	± 4.9
Luminous Intensity (%)	± 4.9
Temperature (°C)	± 1.0
Voltage DC TY720 (%)	± 0.02
Current DC TY720 (%)	± 0.10
Voltage AC WT210 (%)	± 0.0585
Current AC WT210 (%)	± 0.0251
Power AC WT210 (%)	± 0.2261
Frequency (50/60 Hz) WT210 (%)	± 0.0040
Power Factor WT210 (%)	± 0.0601

The reported expanded uncertainty is based on the combined standard uncertainty multiplied by a coverage factor of k = 2. This value of k gives a coverage probability of approximately 95%, assuming a normal distribution. This determination of the measurement uncertainty has been done in accordance with international requirements including UKAS, BIPM Guide to the Expression of Uncertainty in Measurement and CIE 198:2011 and CIE S 025/E:2015.

Electrical measurement equipment used for the determination of results for this report, are compliant and meet the performance requirements of the measurement standards used.

(*) The measurements wer performed on a pre-production sample provided by the customer. Final samples may show different results. This may affect final photometric results (luminous flux, used power, intensity distribution) as well as colour results (colour point, CCT, CRI).

---------- END OF REPORT ----------