

astro

PHOTOMETRIC
TEST REPORT

astrolighting.co.uk

Report Number	TRN-16797
Customer	Astro Lighting Limited
Contact	Stuart Wells
Product Type	LED Wall mounted luminaire
Test Purpose	Generation of Photometric Data
Sales Order Ref	Q-LUX16-20616
Works Order Number	WO-7444
Test Item Reference	TI-11656
LAB Test Method Reference	TES-10050
Test Standards	LM-79-08
Lab Location Reference	LUX-TSI
Tested by	Mike Sewell
Date of Test	4/21/2016
Analysed by	Andrew Thomas
Number of products tested	1

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Date: 7/1/2016



Eclipse Round 350

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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 $+15^\circ$ to Base Down

H45 - Horizontal to -45° only

VBU - Vertical Base Up $\pm 15^\circ$

VBD - Vertical Base Down $\pm 15^\circ$

HBU - Base Up $\pm 90^\circ$ (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 $\pm 75^\circ$ (bulb should not be operated within 15° of vertical)

U - Universal Burn (burn can be operated in any position)

Test Conditions

Measurements were made with an ambient temperature of $25^\circ\text{C} \pm 1^\circ\text{C}$. 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. The Integrating Sphere Spectrometer System is calibrated using total spectral flux lamp calibrated by NPL.

Test Equipment

UL LSI Custom Far-Field Type C Moving Mirror Goniophotometer measures intensity as a function of angle. 1m Integrating Sphere Spectrometer System for Total Spectral Flux.

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	Eclipse Round 350
Part/Serial Number	7454
Type of Product	LED Wall mounted luminaire
Base Type	Not Applicable - Luminaire
Driver Type	Internal DC
Test Time	30 mins
Operating Orientation	Horizontal
Test Orientation	Horizontal
Ambient Temperature	25.3°C
Manufacturer	Astro Lighting Limited
Date of Manufacture	Not Available
Thermal Management	Passive
Dimmable	No
Pre-Burning Time	0 hours
Stabilisation Time	30 mins
Humidity	33.2% RH
Averaging Applied	NONE

Photometric Measurements	
Luminous Flux	432 lm
Luminous Efficacy	35 lm/W

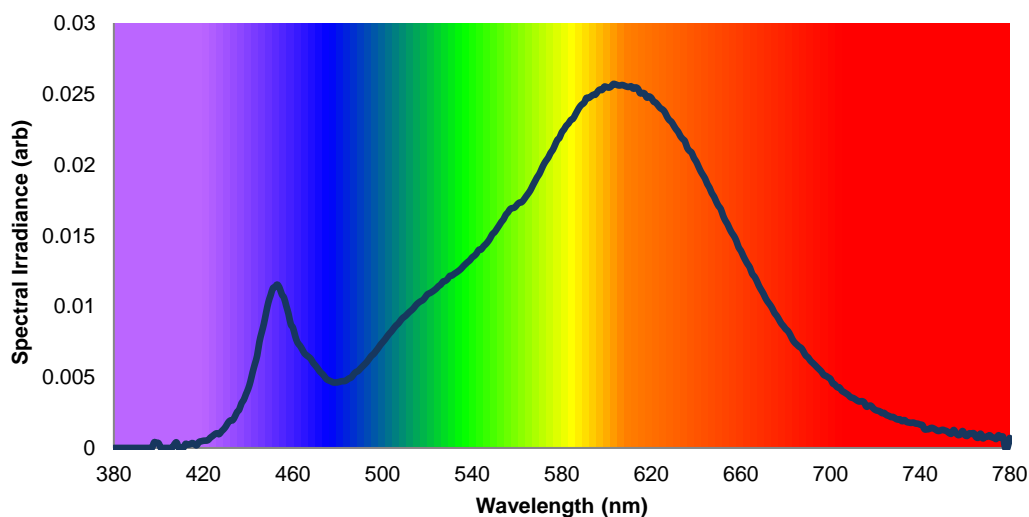
Dimension	Sample	Luminous Opening
Diameter/Width	350 mm Φ	300 mm Φ
Length		
Height/Depth	35 mm	25 mm



Driver Details		
Manufacturer	self	
Model	SLT15-12VF-2	
Part/Serial #	N/A	
Rating	220-240	
Output	Current	1.250 A
	Voltage	12.000 V

Electrical Measurements	
Frequency	50 Hz
Voltage	239.810 V
Current	0.091 A
Power	12.3 W
Power Factor	0.566
Peak Power VA	21.8

Spectral Irradiance versus Wavelength



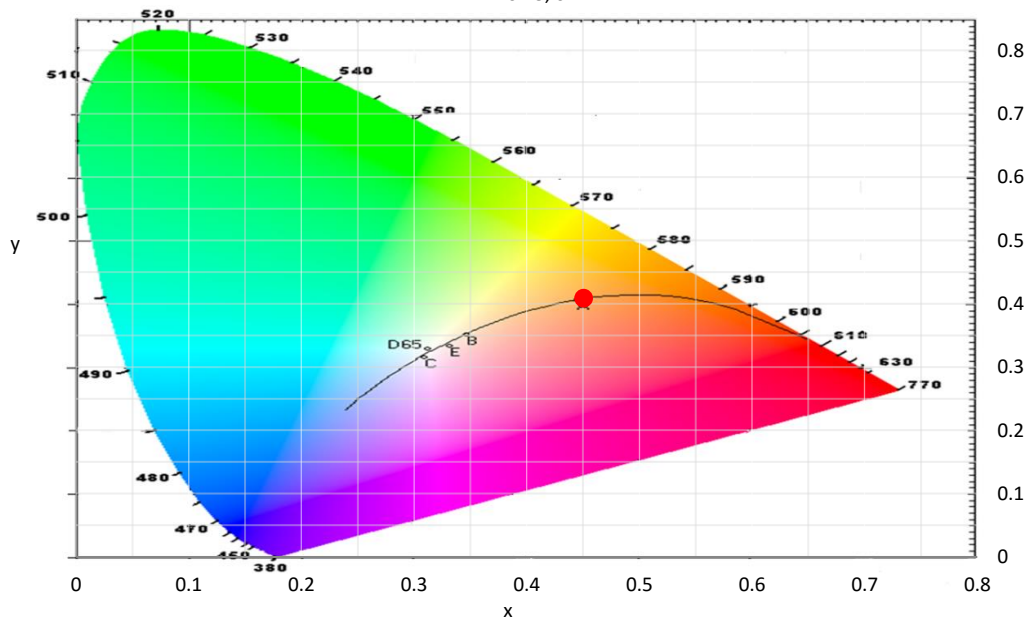
Colour Rendering Index Detail			
R1	81.4	R8	60.6
R2	91.5	R9	13.6
R3	96.4	R10	80.6
R4	80.2	R11	79.1
R5	81.4	R12	72.6
R6	89.8	R13	83.7
R7	83.1	R14	98.7

Colorimetric Details	
CCT	2815K
CRI (Ra)	83

Chromaticity Coordinates		
CIE 1931	x	0.4507
	y	0.4085
CIE 1960	u	0.2575
	v	0.3501
CIE 1976	u'	0.2575
	v'	0.5252
Duv		0.0000

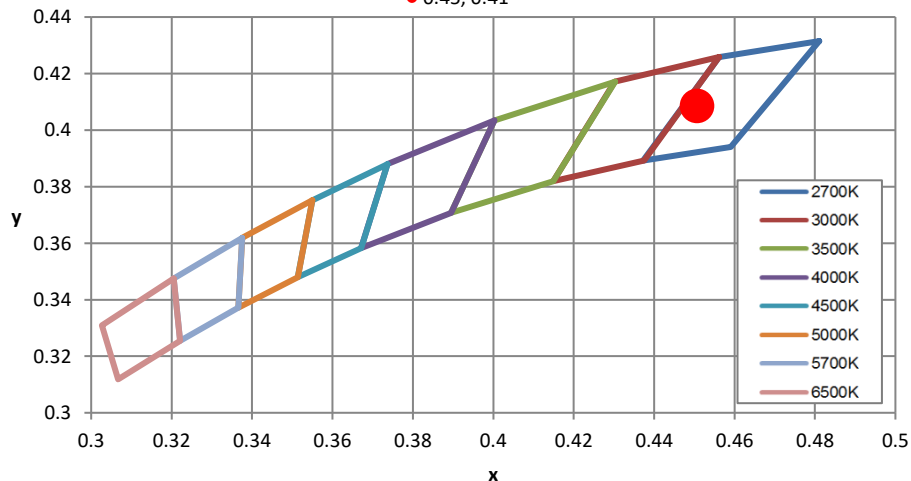
CIE 1931 Colour Chart

• 0.45, 0.41



CIE 1931 x, y Chromaticity Diagram - Nominal CCT Quadrangles

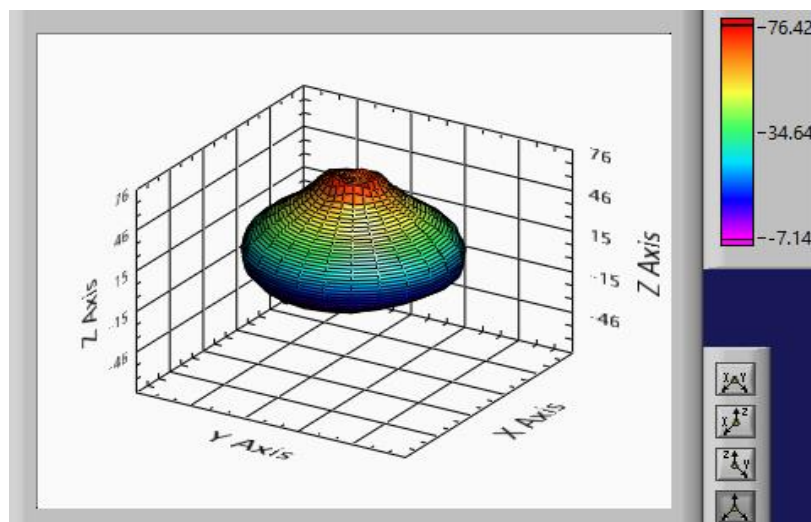
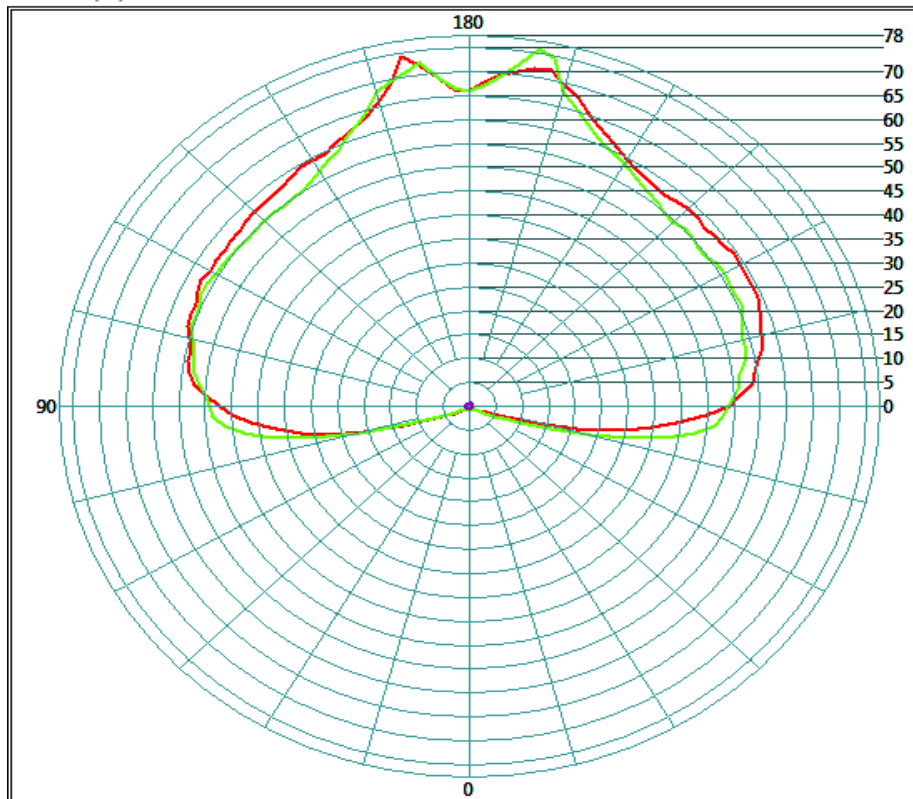
• 0.45, 0.41



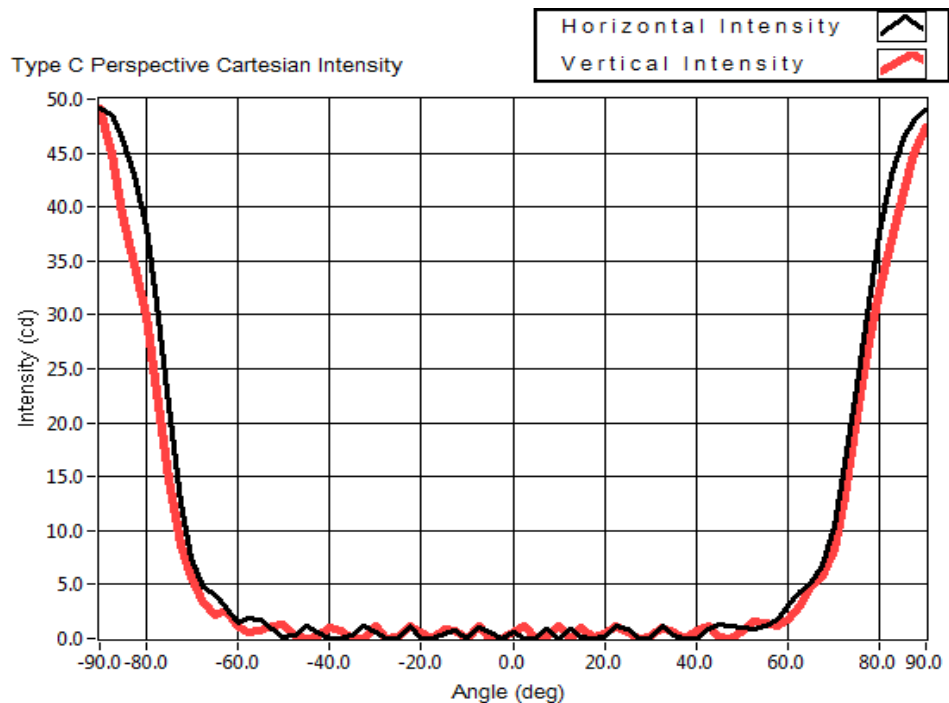
Goniophotometric Measurements

Beam Angle	Horizontal	N/A
	Vertical	N/A
On-axis Intensity		1 cd
Peak Intensity		78 cd
Peak Direction	Horizontal	255°
	Vertical	170°

Polar Plot (cd)



Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
0.5	0.05	0.02	2.4
1	0.10	0.04	0.6
2	0.19	0.09	0.1
3	0.29	0.13	0.1
4	0.39	0.17	0.0
5	0.49	0.22	0.0
6	0.58	0.26	0.0
8	0.78	0.35	0.0
10	0.97	0.44	0.0
20	1.95	0.87	0.0



Spectral Power Distribution

λ (nm)	W	λ (nm)	W	λ (nm)	W	λ (nm)	W
380	0.000000	430	1.52E-03	480	4.64E-03	530	1.21E-02
381	0.00E+00	431	1.78E-03	481	4.68E-03	531	1.22E-02
382	0.00E+00	432	1.94E-03	482	4.72E-03	532	1.23E-02
383	0.00E+00	433	1.95E-03	483	4.72E-03	533	1.24E-02
384	0.00E+00	434	2.20E-03	484	4.80E-03	534	1.25E-02
385	0.00E+00	435	2.52E-03	485	4.91E-03	535	1.26E-02
386	0.00E+00	436	2.71E-03	486	4.97E-03	536	1.28E-02
387	0.00E+00	437	3.15E-03	487	5.18E-03	537	1.30E-02
388	0.00E+00	438	3.40E-03	488	5.35E-03	538	1.31E-02
389	0.00E+00	439	3.80E-03	489	5.42E-03	539	1.33E-02
390	0.00E+00	440	4.18E-03	490	5.59E-03	540	1.35E-02
391	0.00E+00	441	4.70E-03	491	5.75E-03	541	1.36E-02
392	0.00E+00	442	5.36E-03	492	5.91E-03	542	1.37E-02
393	0.00E+00	443	5.94E-03	493	6.08E-03	543	1.40E-02
394	0.00E+00	444	6.52E-03	494	6.29E-03	544	1.40E-02
395	0.00E+00	445	7.49E-03	495	6.50E-03	545	1.42E-02
396	0.00E+00	446	8.15E-03	496	6.63E-03	546	1.44E-02
397	0.00E+00	447	8.77E-03	497	6.84E-03	547	1.46E-02
398	3.97E-04	448	9.56E-03	498	7.04E-03	548	1.48E-02
399	3.66E-04	449	1.03E-02	499	7.27E-03	549	1.51E-02
400	3.32E-04	450	1.08E-02	500	7.46E-03	550	1.52E-02
401	0.00E+00	451	1.13E-02	501	7.65E-03	551	1.55E-02
402	0.00E+00	452	1.14E-02	502	7.87E-03	552	1.57E-02
403	0.00E+00	453	1.15E-02	503	8.07E-03	553	1.60E-02
404	0.00E+00	454	1.13E-02	504	8.24E-03	554	1.61E-02
405	0.00E+00	455	1.09E-02	505	8.45E-03	555	1.65E-02
406	0.00E+00	456	1.06E-02	506	8.64E-03	556	1.66E-02
407	2.58E-04	457	1.00E-02	507	8.78E-03	557	1.69E-02
408	3.93E-04	458	9.46E-03	508	8.99E-03	558	1.69E-02
409	0.00E+00	459	8.74E-03	509	9.18E-03	559	1.70E-02
410	0.00E+00	460	8.47E-03	510	9.29E-03	560	1.72E-02
411	0.00E+00	461	7.89E-03	511	9.44E-03	561	1.73E-02
412	2.88E-04	462	7.45E-03	512	9.60E-03	562	1.73E-02
413	2.40E-04	463	7.24E-03	513	9.73E-03	563	1.75E-02
414	2.62E-04	464	6.99E-03	514	9.90E-03	564	1.77E-02
415	3.49E-04	465	6.71E-03	515	1.01E-02	565	1.80E-02
416	2.72E-04	466	6.55E-03	516	1.02E-02	566	1.82E-02
417	1.87E-04	467	6.43E-03	517	1.04E-02	567	1.85E-02
418	4.21E-04	468	6.28E-03	518	1.04E-02	568	1.88E-02
419	4.68E-04	469	6.01E-03	519	1.06E-02	569	1.91E-02
420	5.08E-04	470	5.82E-03	520	1.08E-02	570	1.93E-02
421	5.19E-04	471	5.62E-03	521	1.09E-02	571	1.97E-02
422	5.49E-04	472	5.40E-03	522	1.10E-02	572	2.00E-02
423	7.15E-04	473	5.24E-03	523	1.11E-02	573	2.03E-02
424	8.32E-04	474	5.06E-03	524	1.13E-02	574	2.05E-02
425	9.59E-04	475	4.86E-03	525	1.14E-02	575	2.08E-02
426	1.04E-03	476	4.77E-03	526	1.15E-02	576	2.10E-02
427	9.74E-04	477	4.70E-03	527	1.17E-02	577	2.14E-02
428	1.16E-03	478	4.63E-03	528	1.18E-02	578	2.17E-02
429	1.32E-03	479	4.62E-03	529	1.19E-02	579	2.19E-02
						580	2.23E-02

Spectral Power Distribution

λ (nm)	W	λ (nm)	W	λ (nm)	W	λ (nm)	W
581	2.25E-02	631	2.25E-02	681	8.25E-03	731	2.02E-03
582	2.27E-02	632	2.23E-02	682	7.99E-03	732	1.88E-03
583	2.29E-02	633	2.20E-02	683	7.67E-03	733	1.97E-03
584	2.32E-02	634	2.18E-02	684	7.44E-03	734	1.84E-03
585	2.32E-02	635	2.17E-02	685	7.29E-03	735	1.80E-03
586	2.35E-02	636	2.12E-02	686	7.15E-03	736	1.77E-03
587	2.38E-02	637	2.10E-02	687	7.04E-03	737	1.80E-03
588	2.41E-02	638	2.08E-02	688	6.78E-03	738	1.72E-03
589	2.43E-02	639	2.05E-02	689	6.51E-03	739	1.71E-03
590	2.44E-02	640	2.02E-02	690	6.39E-03	740	1.65E-03
591	2.47E-02	641	1.99E-02	691	6.17E-03	741	1.62E-03
592	2.47E-02	642	1.95E-02	692	6.01E-03	742	1.32E-03
593	2.48E-02	643	1.93E-02	693	5.86E-03	743	1.31E-03
594	2.49E-02	644	1.90E-02	694	5.70E-03	744	1.34E-03
595	2.49E-02	645	1.86E-02	695	5.54E-03	745	1.42E-03
596	2.52E-02	646	1.84E-02	696	5.38E-03	746	1.38E-03
597	2.53E-02	647	1.80E-02	697	5.15E-03	747	1.29E-03
598	2.53E-02	648	1.77E-02	698	5.09E-03	748	1.20E-03
599	2.55E-02	649	1.74E-02	699	4.98E-03	749	1.23E-03
600	2.55E-02	650	1.71E-02	700	4.87E-03	750	1.28E-03
601	2.54E-02	651	1.69E-02	701	4.56E-03	751	1.24E-03
602	2.55E-02	652	1.64E-02	702	4.47E-03	752	1.18E-03
603	2.57E-02	653	1.61E-02	703	4.29E-03	753	1.05E-03
604	2.57E-02	654	1.58E-02	704	4.27E-03	754	1.01E-03
605	2.56E-02	655	1.55E-02	705	4.05E-03	755	1.27E-03
606	2.56E-02	656	1.52E-02	706	3.94E-03	756	1.06E-03
607	2.56E-02	657	1.49E-02	707	3.84E-03	757	9.07E-04
608	2.56E-02	658	1.46E-02	708	3.73E-03	758	9.67E-04
609	2.55E-02	659	1.42E-02	709	3.57E-03	759	1.20E-03
610	2.55E-02	660	1.39E-02	710	3.53E-03	760	9.15E-04
611	2.55E-02	661	1.36E-02	711	3.44E-03	761	8.47E-04
612	2.54E-02	662	1.33E-02	712	3.33E-03	762	1.03E-03
613	2.55E-02	663	1.30E-02	713	3.28E-03	763	9.93E-04
614	2.54E-02	664	1.27E-02	714	3.30E-03	764	1.04E-03
615	2.50E-02	665	1.23E-02	715	3.22E-03	765	7.65E-04
616	2.51E-02	666	1.21E-02	716	2.92E-03	766	7.31E-04
617	2.50E-02	667	1.18E-02	717	2.96E-03	767	1.01E-03
618	2.47E-02	668	1.15E-02	718	2.99E-03	768	6.80E-04
619	2.48E-02	669	1.12E-02	719	2.81E-03	769	7.84E-04
620	2.47E-02	670	1.09E-02	720	2.69E-03	770	7.93E-04
621	2.45E-02	671	1.06E-02	721	2.63E-03	771	8.98E-04
622	2.44E-02	672	1.03E-02	722	2.59E-03	772	7.59E-04
623	2.42E-02	673	1.01E-02	723	2.46E-03	773	7.18E-04
624	2.40E-02	674	9.85E-03	724	2.47E-03	774	6.35E-04
625	2.39E-02	675	9.53E-03	725	2.32E-03	775	8.96E-04
626	2.37E-02	676	9.33E-03	726	2.27E-03	776	7.24E-04
627	2.34E-02	677	9.06E-03	727	2.18E-03	777	7.96E-04
628	2.32E-02	678	8.79E-03	728	2.19E-03	778	0.00E+00
629	2.30E-02	679	8.61E-03	729	2.08E-03	779	0.00E+00
630	2.28E-02	680	8.39E-03	730	2.01E-03	780	7.08E-04

Measurement Uncertainty

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

Parameter	Uncertainty
Total Luminous Flux (%)	± 3.25
Luminous Intensity (%)	± 3.25
Correlated Color Temperature (K)	± 100
CRI	± 2
Chromaticity x	± 0.005
Chromaticity y	± 0.005
Temperature (°C)	± 0.5
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.

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

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