

astro

PHOTOMETRIC
TEST REPORT

Photometric Test Report

Report Number: POTS/DC14285	Report Date: 21-11-2014	Prepared By: D CHAMBERS
Test Laboratory: Photometric and Optical Testing Services, Cheltenham Film and Photographic Studios, Hatherley Lane, Cheltenham, Gloucestershire, GL51 6PN		
Company Registration Number: Registered in England & Wales No. OC352911		
Registered Address: Thistle Down Barn, Holcot Lane, Sywell, Northampton, NN6 0BG		

Client Details

Company: Astro Lighting	Email: technical@astrolighting.co.uk
Address: Astro Lighting Limited, G2 River Way, Harlow CM20 2DP, Great Britain	

Test Method(s) Used

POTS Standard Operating Procedure:	INTEGRATING SPHERE PROCEDURE POTS016
POTS Standard Operating Procedure:	NFMS OPERATION GUIDE
Standard:	LM79 08

Details of Product Tested

Manufacturer: ASTRO LIGHTING	Source Type: LED
Model: 1248010 - Trimless Round Adjustable LED	Luminaire Type: SPOTLIGHT
Power Supply Used: Kikusui PCR1000M Voltage Stabiliser S/N SM01191	
Voltage(AC V) = 230.0	Current (mA)= 48
Power (Watts)= 10.21	Power factor= 0.919

Integrating Sphere Test

Date of Test: 18/11/2014	Ambient Temperature: 25°C
Measurement Filename Trimless Round Adjustable LED	
Instrument Used: Labsphere model CSLMS HALOGEN 4060 integrating sphere spectroradiometer	
Integrating Sphere Size: 1m	Measurement Geometry ($2\pi / 4\pi$): 2π
Sample Orientation: Horizontal	Auxiliary Correction Applied: YES
Comments:	
Date of Last Calibration (Operating Hours): 28-10-2014 (03:42)	Spectral Flux Standard Lamp Used: SCL-1400
Standard Lamp Serial Number: K75	Traceable: to NIST standards
Calibration Certificate Number: DM-02008-001	Calibration Certificate Date: 19 th February 2010
Calibration Lamp Uncertainty: $\pm 0.67\%$ ($k=2$)	
Results	
Flux (lumens): 527.8	
CIE 1931 Chromaticity Cx: 0.4612	CIE 1931 Chromaticity Cy: 0.4111
CRI (%): 81.67	CCT (K): 2683

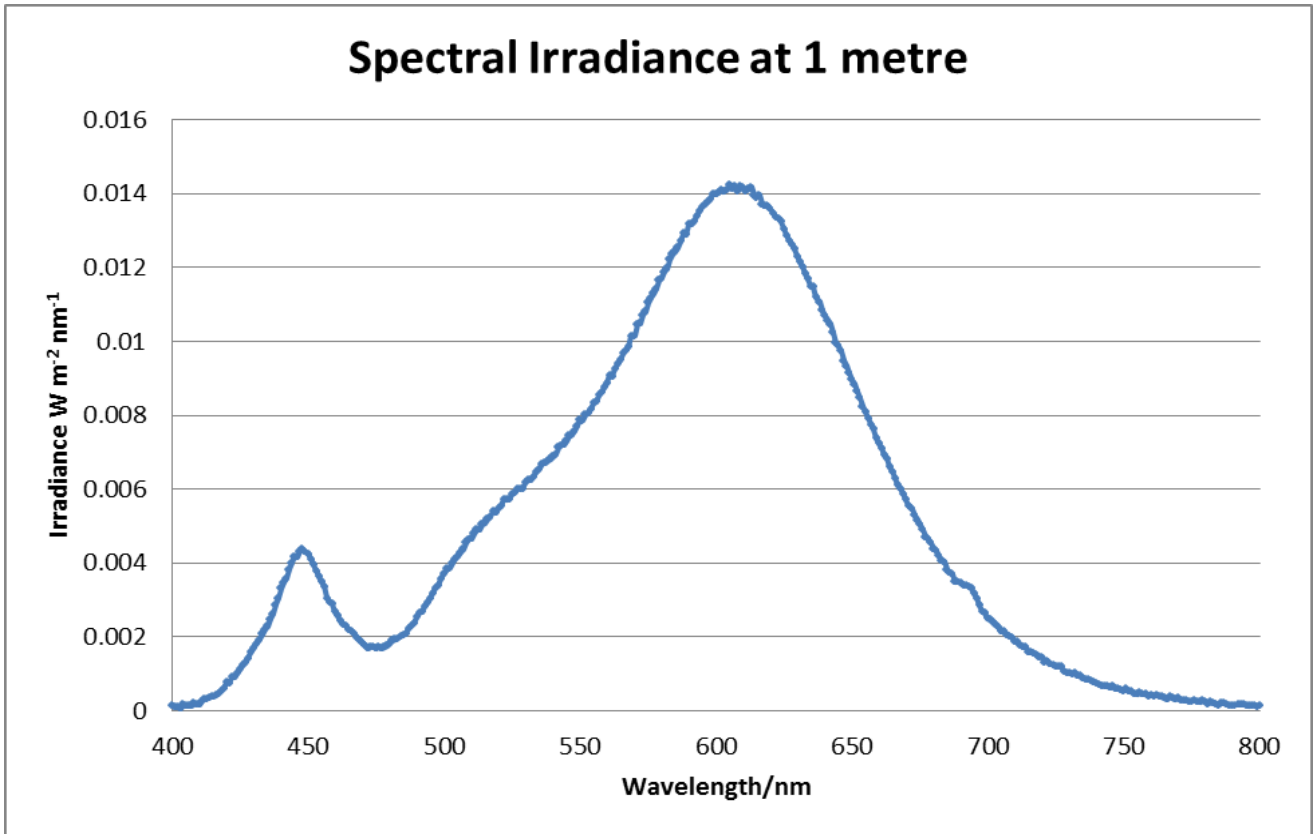


Figure 1: Spectral Irradiance



Figure 2: CIE 1931 diagram.

Goniophotometer Test		
Date of Test: 17/11/2014		Ambient Temperature: 25°C
Measurement Filename: Trimless Round Adjustable LED		
Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer		
Photometer Working Distance: 1m		Measurement Geometry: Near-Field
Comments:		
Reference Photometer Used: Specbos1211		Reference Photometer Serial Number: 2014754
Traceable: to NIST standards		Calibration Certificate Number: 2129 WK-L 2014-02
Calibration Certificate Date: 13 February 2014		Sample Stabilisation Time (minutes): 45
Reference Photometer Calibration Uncertainty: $\pm 2.4\%$ ($k=2$, 20-200 lux, CIE illuminant A source)		
Scan Set Up		
Direction	Range	Increment
Inclination Zone 1	0-90°	3°
Azimuth	0-360°	10°
Results		
Integrated Luminous Flux (lumens):527.8	Peak Intensity (3° Spot, candelas): 984.7	Efficacy (lumens/Watt): 51.7
Beam Angle (50% of max intensity C0-180, degrees): 37.6		
Photometric Filename (IES LM-63-2002): Trimless Round Adjustable LED		
IES File – Absolute or Relative Format? ABSOLUTE		
Photometric Filename (EULUMDAT): Trimless Round Adjustable LED		
EULUMDAT File – Absolute or Relative Format? ABSOLUTE		

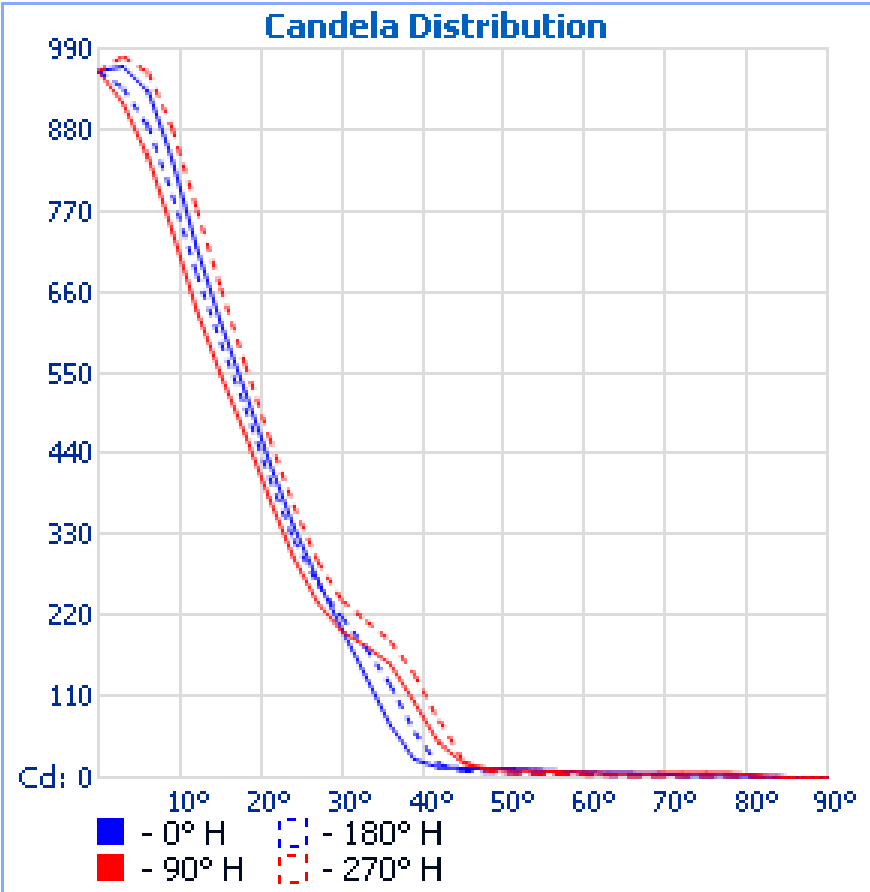


Figure 3: Far-Field Luminous Intensity (C0-180, Cartesian Coordinates)

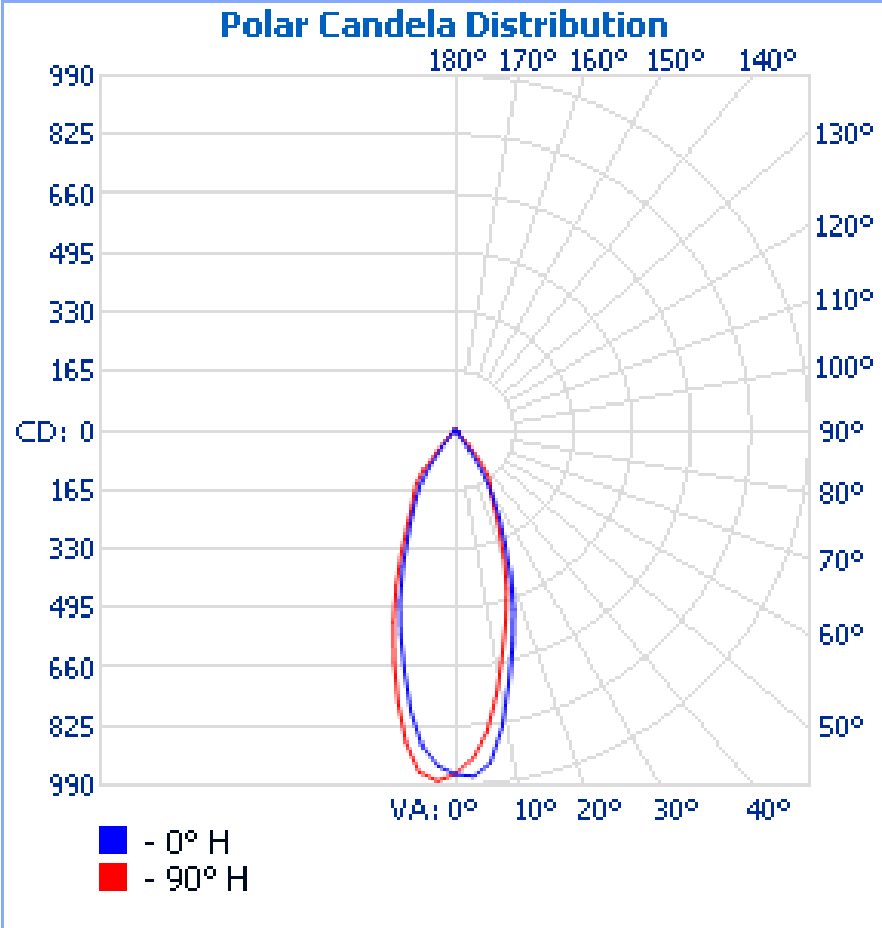


Figure 4: Far-Field Luminous Intensity (C0-180, C90-270, Polar Coordinates)

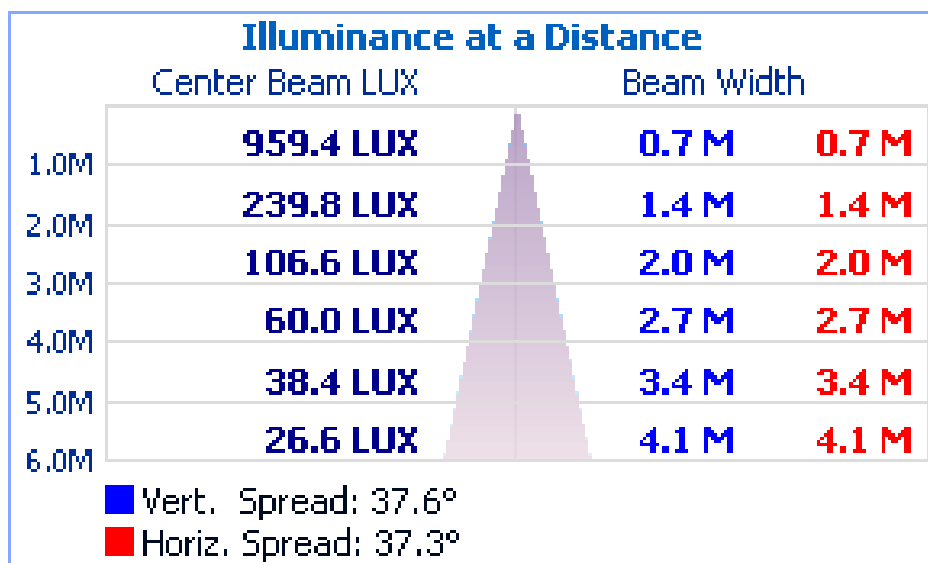


Figure 5. Cone diagram for mounting height of 6 metres.

Reflectance of		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Ceiling		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Floor Cavity		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimension		View endwise (C0)					View crosswise (C90)				
x	y										
2H	2H	19.8	20.7	20.2	21.1	21.4	21.1	22.1	21.5	22.4	22.7
	3H	19.9	20.7	20.3	21.0	21.4	21.0	21.9	21.4	22.2	22.6
	4H	19.9	20.7	20.3	21.1	21.4	21.0	21.8	21.4	22.1	22.5
	6H	20.1	20.8	20.5	21.2	21.6	21.1	21.8	21.5	22.2	22.6
	8H	20.1	20.8	20.5	21.1	21.6	21.1	21.7	21.5	22.1	22.5
	12H	20.1	20.7	20.5	21.1	21.5	21.0	21.7	21.4	22.1	22.5
4H	2H	19.6	20.4	20.0	20.8	21.1	20.9	21.7	21.3	22.0	22.4
	3H	19.8	20.5	20.2	20.8	21.3	20.8	21.5	21.3	21.9	22.3
	4H	20.0	20.6	20.5	21.0	21.5	21.0	21.5	21.4	21.9	22.4
	6H	20.3	20.8	20.8	21.2	21.7	21.1	21.6	21.6	22.1	22.5
	8H	20.4	20.8	20.9	21.3	21.8	21.2	21.7	21.7	22.1	22.6
	12H	20.4	20.8	20.9	21.3	21.8	21.2	21.6	21.7	22.1	22.6
8H	4H	20.3	20.7	20.7	21.2	21.7	20.9	21.4	21.4	21.9	22.3
	6H	20.7	21.1	21.2	21.6	22.1	21.3	21.7	21.8	22.2	22.7
	8H	21.0	21.3	21.5	21.8	22.3	21.5	21.8	22.0	22.4	22.9
	12H	21.0	21.3	21.6	21.8	22.4	21.6	21.8	22.1	22.4	22.9
12H	4H	20.3	20.7	20.8	21.2	21.7	20.9	21.4	21.4	21.8	22.3
	6H	20.9	21.3	21.5	21.8	22.3	21.4	21.7	21.9	22.2	22.7
	8H	21.2	21.4	21.7	21.9	22.5	21.6	21.9	22.1	22.4	22.9

Distance between luminaires: 0.25

Due to missing symmetry characteristics the values apply only to the indicated line of sight.

	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959
3	966	960	953	946	939	932	927	922	918	916	913	912	912	912	915	921	923	930	937
6	933	918	909	895	880	868	862	854	849	844	840	838	837	837	844	854	865	871	885
9	839	819	807	785	773	764	756	750	747	742	740	736	734	735	740	749	767	775	792
12	721	702	687	676	676	664	653	642	637	635	633	634	640	648	657	657	664	673	685
15	618	602	594	584	577	572	561	556	548	547	543	547	554	566	571	575	581	582	591
18	525	521	505	502	492	487	479	477	474	466	465	463	468	479	483	491	492	503	503
21	430	427	420	418	409	399	397	397	389	380	379	381	384	389	397	403	404	408	409
24	342	338	332	320	321	315	310	311	305	300	298	300	302	309	312	311	319	322	324
27	269	269	258	252	252	248	246	243	240	238	238	242	247	252	254	254	257	262	263
30	202	205	211	209	206	203	205	204	201	199	201	211	216	216	218	223	220	212	218
33	137	144	172	183	183	181	182	178	179	178	178	186	194	194	197	201	181	144	176
36	71	91	132	154	159	158	154	149	153	154	149	151	159	167	166	163	131	61	126
39	25	51	89	109	119	115	106	109	108	102	100	103	99	104	102	97	81	21	61
42	14	25	52	64	69	62	60	57	51	47	43	42	41	37	37	34	28	11	19
45	13	16	26	28	28	24	22	20	19	20	18	15	15	14	14	13	12	8	9
48	13	13	15	16	16	14	13	10	12	13	11	9	8	9	8	8	8	7	7
51	13	12	13	13	13	11	10	10	10	10	10	8	7	6	7	7	7	7	7
54	11	11	12	11	11	10	9	10	9	10	8	7	6	6	6	6	7	6	6
57	9	10	10	10	10	9	8	8	8	8	7	6	5	5	5	5	5	5	5
60	8	8	8	8	8	8	7	7	7	7	6	5	5	5	5	4	5	4	5
63	7	7	7	7	7	7	7	6	6	6	5	4	4	4	4	4	4	4	4
66	6	6	5	6	6	6	6	6	6	6	5	4	4	4	4	3	3	4	4
69	5	5	4	5	6	6	6	6	6	6	6	5	5	4	4	3	3	3	3
72	4	4	4	5	6	7	6	7	7	7	6	5	5	4	4	3	2	2	3
75	4	3	4	5	6	7	7	7	7	7	6	6	5	5	4	3	2	2	3
78	3	3	4	5	6	7	7	6	7	6	5	5	5	4	4	3	2	2	3
81	2	2	3	4	4	5	4	4	4	4	3	3	3	3	2	2	1	1	1
84	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0
87	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2a. Luminous intensity values, azimuth 0-180°

	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
0	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959	959
3	942	947	956	959	965	970	974	977	980	982	984	985	985	983	981	976	972
6	895	912	924	930	935	943	949	953	959	963	967	970	969	968	965	957	942
9	801	821	827	842	852	861	869	876	881	887	891	893	891	886	873	869	848
12	691	702	717	740	746	751	756	765	774	778	780	784	783	780	757	742	730
15	593	605	613	623	636	639	649	656	666	668	672	668	667	655	645	637	623
18	512	510	520	521	532	539	550	559	562	571	570	564	559	548	548	536	537
21	417	421	430	432	435	446	457	460	462	472	475	465	456	455	455	446	440
24	329	334	331	341	347	352	364	367	371	378	373	355	355	354	349	355	349
27	266	263	266	272	276	282	286	291	294	297	284	266	265	267	270	275	275
30	222	223	227	227	229	235	238	240	241	242	231	207	199	203	214	219	211
33	192	197	205	204	205	208	207	212	213	212	200	176	168	171	179	178	151
36	157	164	173	176	179	178	180	184	185	187	173	151	150	151	153	140	102
39	98	121	110	116	121	121	131	133	140	143	133	116	121	120	114	103	51
42	32	41	44	52	54	62	60	70	77	79	77	75	77	79	73	59	24
45	12	15	14	15	16	17	18	19	22	24	31	34	34	35	33	24	15
48	7	8	8	9	9	10	9	9	9	9	14	18	18	18	18	15	13
51	6	6	6	6	6	7	6	6	6	7	12	14	13	13	13	12	13
54	6	6	6	6	6	6	5	5	5	5	12	12	12	12	11	11	11
57	5	5	5	5	5	5	5	5	5	5	10	10	10	10	9	9	9
60	5	4	4	4	4	4	4	4	4	5	9	9	9	8	8	8	8
63	4	4	4	4	4	4	4	4	4	5	7	7	7	7	6	6	7
66	4	3	3	3	3	3	3	3	3	4	6	6	6	6	5	5	6
69	3	3	3	3	3	3	3	3	3	4	5	5	5	5	5	5	5
72	3	3	3	3	3	3	3	3	3	4	5	5	5	5	4	4	4
75	3	3	3	3	3	3	3	3	3	3	5	6	5	5	5	4	4
78	3	3	3	3	3	3	3	3	3	3	5	6	6	6	5	4	4
81	2	2	2	3	3	2	2	2	2	2	4	5	5	5	4	4	3
84	1	1	1	1	1	1	1	1	1	1	2	3	3	2	2	2	2
87	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2b. Luminous intensity values, azimuth 190-350°



Photo 1: Luminaire on goniometer mount

Signature:

Print Name:

D CHAMBERS

Date:

19/11/2014

Test Engineer

Duly authorised to sign on behalf of:

Photometric and Optical Testing Services LLP

Checked by:

Signature:



Print Name:

G John

Date: 27/11/2014

Technical Director

Duly authorised to sign on behalf of:

Photometric and Optical Testing Services LLP