

astro

PHOTOMETRIC
TEST REPORT

Photometric Test Report

Report Number: POTS/GJ13275	Report Date: 25-07-2013	Prepared By: G John
Test Laboratory: Photometric and Optical Testing Services, Cotswold Business Centre, 42 A P Ellis Road, Rissington Business Park, Upper Rissington, Gloucestershire, GL54 2QB		
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	

Details of Product Tested

Manufacturer: Astro Lighting	Source Type: Domestic light
Model: Belgravia 500 LED	Serial Number: 1110004
Lamp Type: LED	
Power Supply Used: Uninterruptible AC power supply	
Voltage(AC V) = 244.9	Current (mA)= 76
Power (Watts)= 15.63	Power factor= 0.844

Integrating Sphere Test

Date of Test: 19-07-2013	Ambient Temperature: 25°C
Measurement Filename: Belgravia 500 LED	
Instrument Used: Labsphere model CSLMS HALOGEN 4060 integrating sphere spectroradiometer	
Integrating Sphere Size: 1m	Measurement Geometry ($2\pi / 4\pi$): 4π
Sample Orientation: Horizontal	Auxiliary Correction Applied: YES
Comments:	
Date of Last Calibration (Operating Hours): 02-05-2013 (02:42)	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): 877.0	
CIE 1931 Chromaticity Cx: 0.3552	CIE 1931 Chromaticity Cy: 0.3173
CRI (%): 81.51	CCT (K): 4380

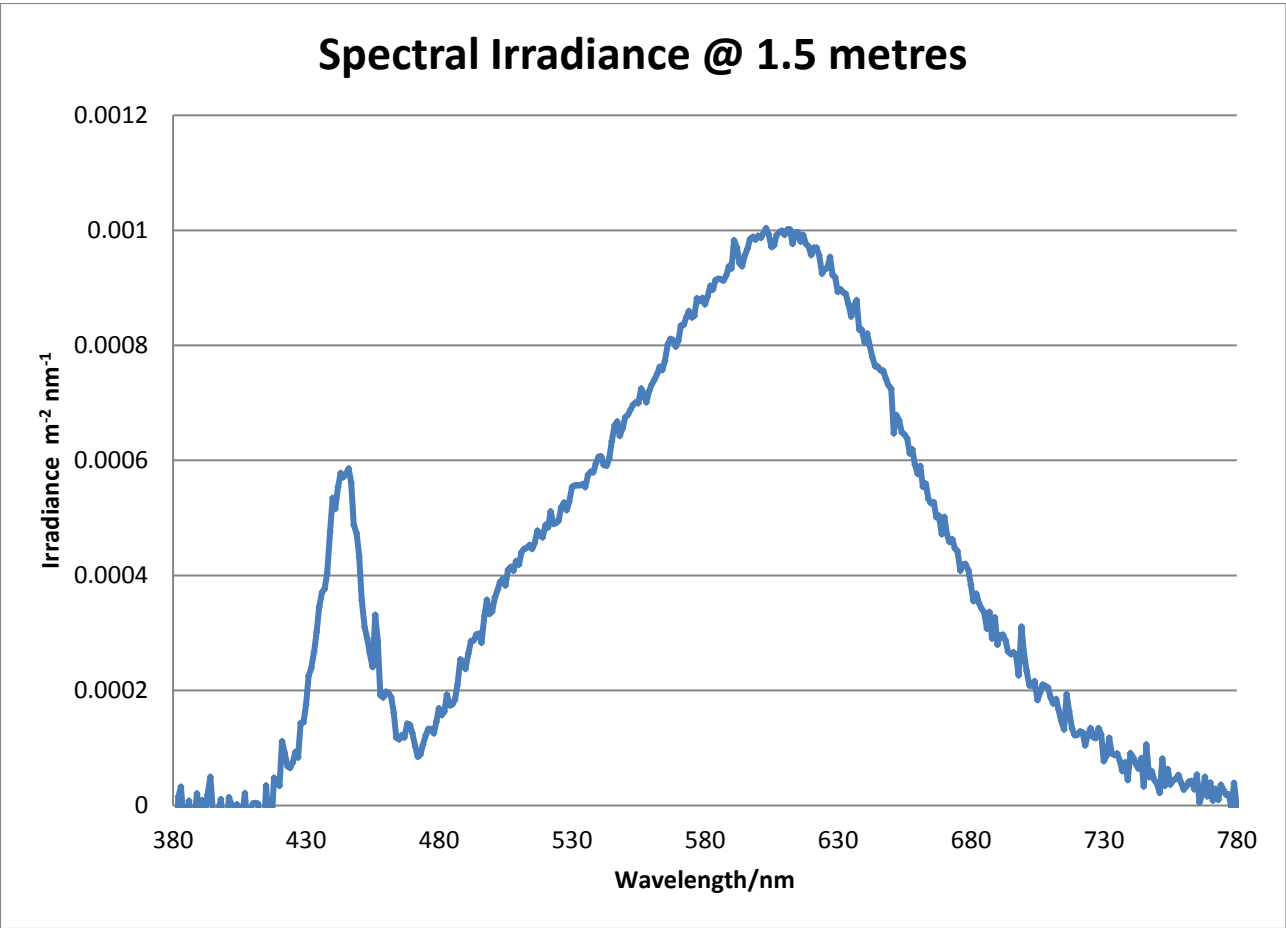


Figure 1: Spectral Irradiance

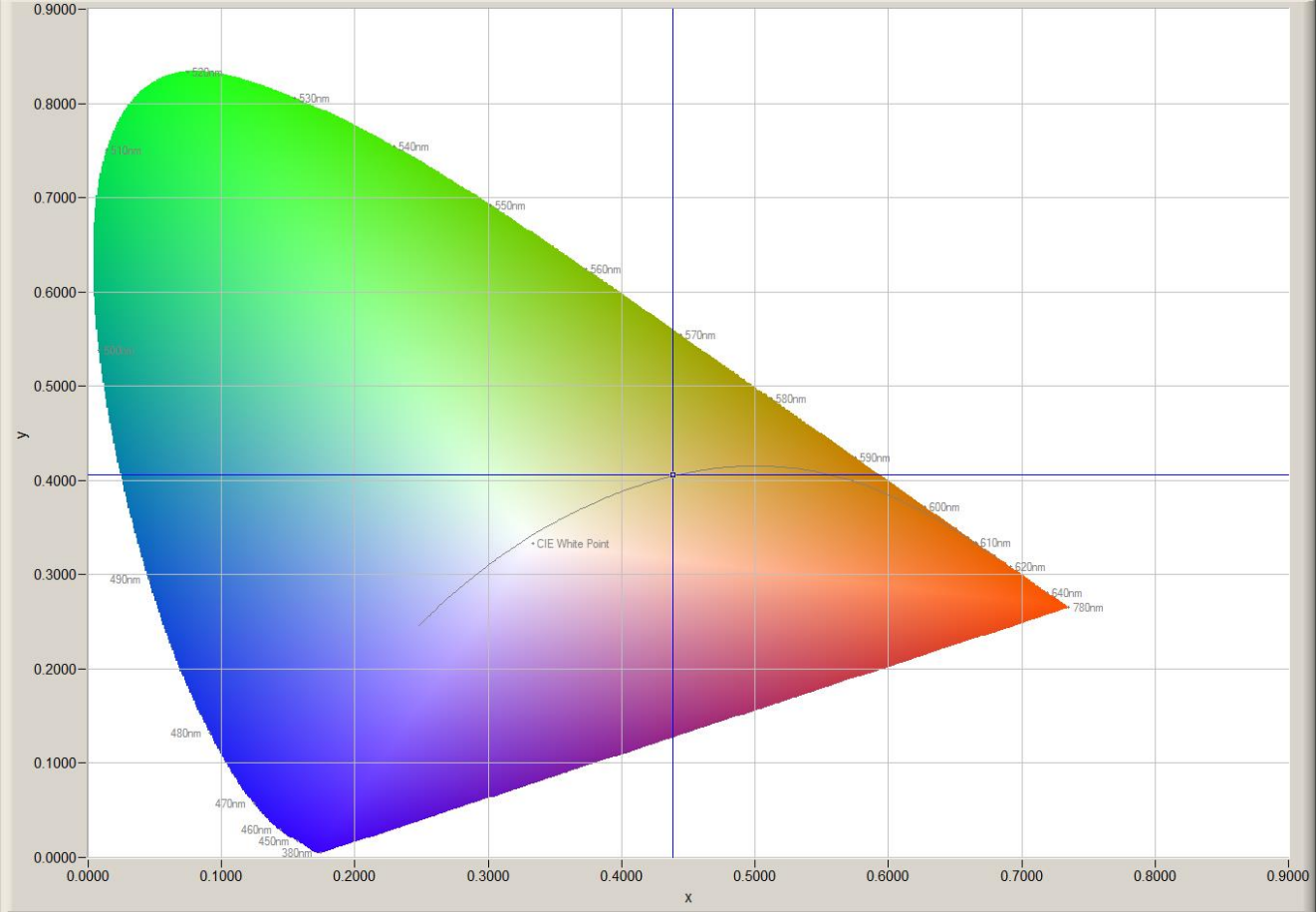


Figure 2: CIE 1931 diagram.

Goniophotometer Test		
Date of Test: 24-07-2013		Ambient Temperature: 25°C
Measurement Filename: Belgravia 500 LED		
Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer		
Photometer Working Distance: 1.5 m		Measurement Geometry: Near-Field
Comments:		
Reference Photometer Used: Specbos1201		Reference Photometer Serial Number: 2911670
Traceable: to NPL standards, UKAS Accredited		Calibration Certificate Number: 13201
Calibration Certificate Date: 15 th March 2013		Sample Stabilisation Time (minutes): 60
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	0-180°	5°
Azimuth	0-360°	10°
Results		
Integrated Luminous Flux (lumens): 877.0	Peak Intensity (3° Spot, candelas): 168.2	Efficacy (lumens/Watt): 56.04
Beam Angle (50% of max intensity C0-180, degrees): 112.5		
Photometric Filename (IES LM-63-2002): Belgravia 500 LED		
IES File – Absolute or Relative Format? Absolute		
Photometric Filename (EULUMDAT): Belgravia 500 LED		
EULUMDAT File – Absolute or Relative Format? Absolute		

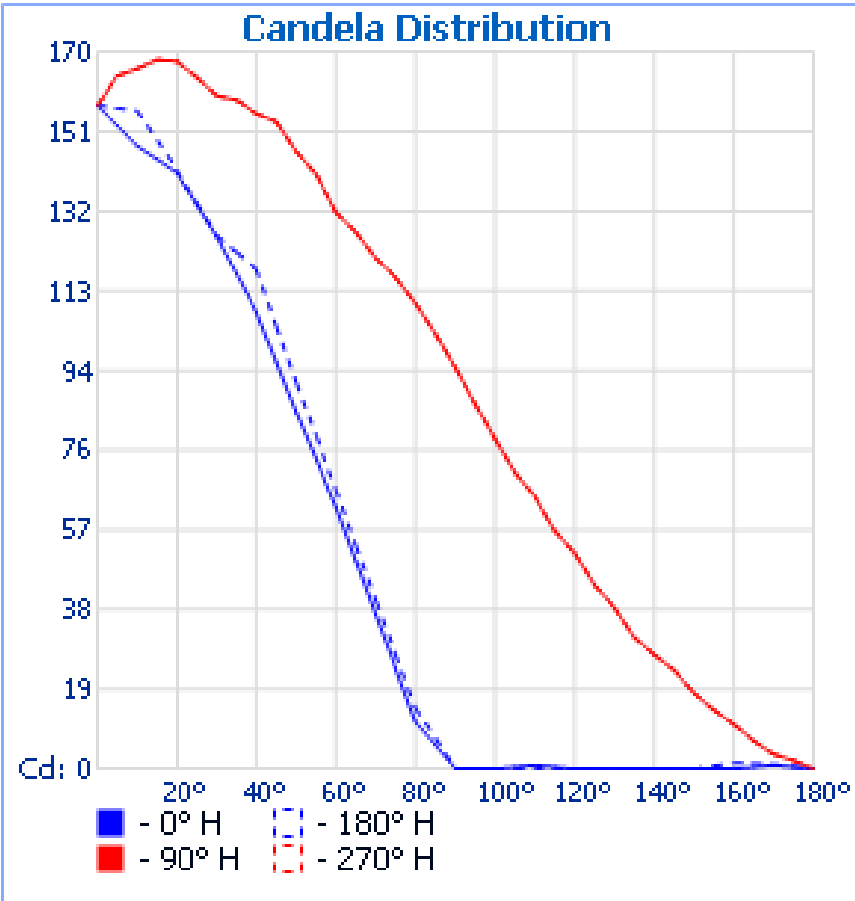


Figure 3: Far-Field Luminous Intensity (C0-180, Cartesian Coordinates)

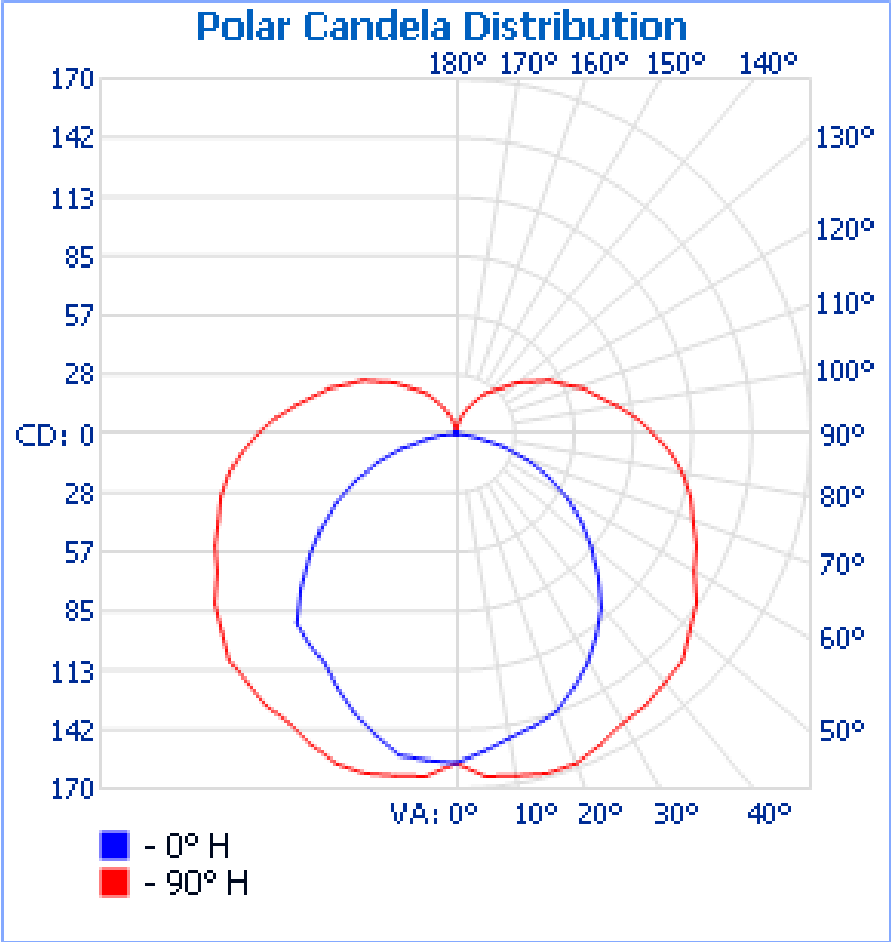


Figure 4: Far-Field Luminous Intensity (C0-180, C90-270, Polar Coordinates)

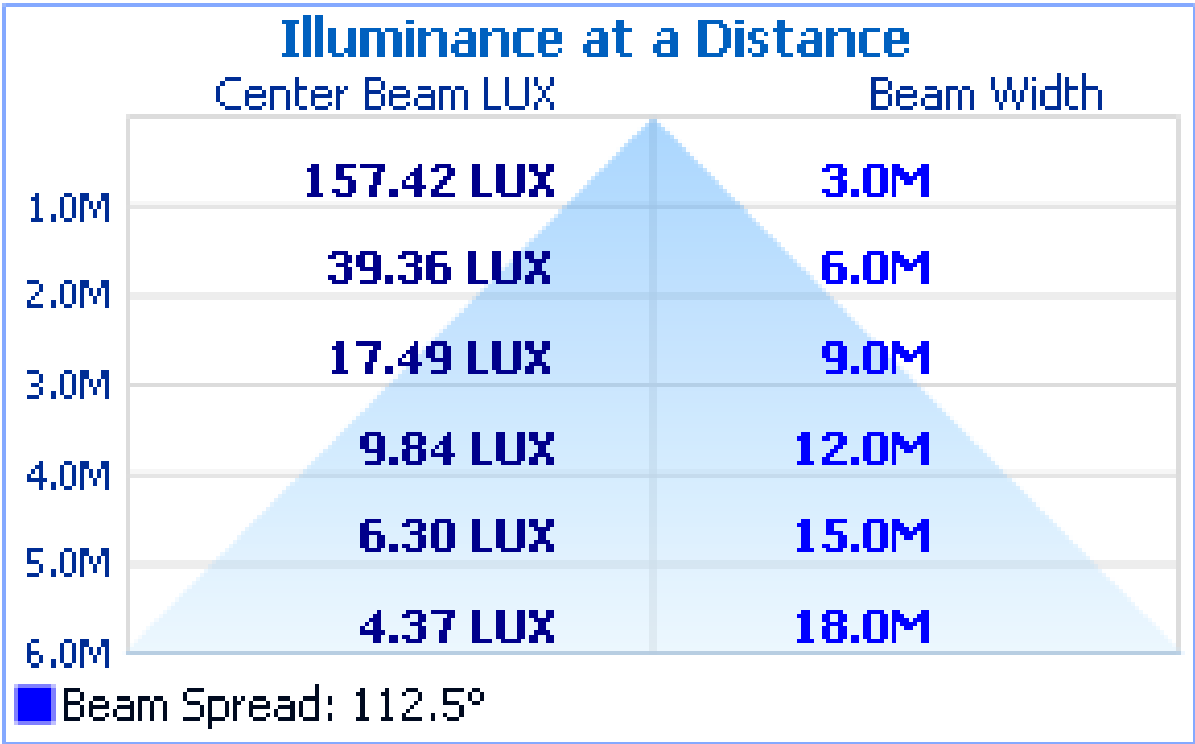


Figure 4. Illuminance cone diagram.

Reflectance of											
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	13.0	14.3	13.6	15.0	15.8	17.4	18.7	18.0	19.4	20.1
	3H	14.0	15.2	14.7	15.9	16.7	20.1	21.3	20.7	22.0	22.8
	4H	14.3	15.5	15.0	16.2	17.0	21.5	22.7	22.2	23.4	24.2
	6H	14.5	15.6	15.1	16.3	17.1	23.1	24.2	23.8	24.9	25.8
	8H	14.4	15.5	15.1	16.2	17.1	23.9	25.0	24.6	25.7	26.5
	12H	14.4	15.4	15.1	16.1	17.0	24.7	25.7	25.4	26.4	27.3
4H	2H	14.4	15.6	15.1	16.3	17.1	17.7	18.9	18.4	19.6	20.4
	3H	15.7	16.8	16.4	17.5	18.3	20.6	21.7	21.3	22.4	23.2
	4H	16.3	17.2	17.0	17.9	18.8	22.3	23.2	23.0	24.0	24.8
	6H	16.5	17.4	17.2	18.1	19.0	24.0	24.9	24.7	25.6	26.5
	8H	16.6	17.4	17.3	18.1	19.0	24.9	25.7	25.7	26.5	27.4
	12H	16.6	17.3	17.3	18.1	19.0	25.9	26.6	26.6	27.4	28.3
8H	4H	17.4	18.2	18.1	19.0	19.8	22.4	23.2	23.2	24.0	24.9
	6H	18.0	18.6	18.7	19.4	20.3	24.3	25.0	25.0	25.8	26.7
	8H	18.2	18.8	19.0	19.6	20.5	25.4	26.0	26.2	26.8	27.7
	12H	18.3	18.9	19.1	19.7	20.6	26.5	27.1	27.3	27.9	28.8
12H	4H	17.8	18.5	18.5	19.3	20.2	22.4	23.2	23.2	23.9	24.8
	6H	18.6	19.2	19.3	20.0	20.9	24.4	25.0	25.2	25.8	26.7
	8H	18.9	19.4	19.7	20.2	21.1	25.5	26.0	26.2	26.8	27.7

Table 1. UGR values

	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
5	153	155	158	161	162	163	164	164	164	164	164	163	163	162	162	161	159	158	157
10	148	157	163	164	165	166	166	166	166	166	165	165	164	163	162	161	161	159	156
15	145	156	159	161	163	164	164	164	166	168	167	166	163	161	160	158	157	155	149
20	141	152	153	157	158	158	162	164	166	168	165	163	163	161	159	156	154	151	142
25	134	145	146	150	154	157	159	160	162	164	162	161	159	156	152	154	147	144	134
30	126	137	138	144	147	151	157	160	160	160	159	159	156	152	148	143	139	137	127
35	117	128	133	136	143	149	153	155	157	159	157	154	152	146	142	136	130	128	123
40	108	120	125	126	137	141	148	151	152	155	153	149	145	139	131	127	120	117	119
45	96	109	115	120	126	137	143	148	151	153	148	144	141	132	124	117	111	106	105
50	85	98	104	110	118	129	138	143	146	146	144	144	136	128	114	107	101	95	92
55	73	87	93	100	110	122	131	136	140	141	138	136	128	119	107	98	90	82	79
60	62	75	81	89	101	114	123	132	132	132	134	128	120	111	100	87	80	69	66
65	49	62	70	80	93	106	118	124	127	127	127	122	113	103	93	78	68	56	53
70	36	49	61	72	84	97	111	117	120	121	119	116	106	95	82	70	55	43	40
75	24	36	51	63	75	86	103	111	116	116	112	108	99	88	72	61	45	32	27
80	11	24	41	55	69	80	92	105	108	110	107	99	93	80	66	52	34	20	14
85	6	17	33	48	63	75	86	95	101	103	100	94	84	73	61	46	29	14	7
90	0	10	26	42	57	70	84	90	93	95	91	88	77	69	56	42	25	8	0
95	0	7	22	37	50	63	72	80	86	87	84	80	71	59	48	35	20	7	0
100	0	5	17	32	44	55	63	73	80	78	76	72	63	52	42	29	15	5	0
105	0	4	15	28	38	48	60	65	70	70	71	66	59	47	37	26	14	4	0
110	1	3	12	24	33	43	53	59	62	64	63	58	51	43	34	23	12	3	0
115	0	3	10	21	28	39	48	53	54	56	55	52	45	38	31	20	10	3	0
120	0	3	9	18	26	33	41	47	49	51	49	45	41	34	26	17	9	3	0
125	0	3	8	15	22	29	36	40	44	43	44	40	35	29	22	14	8	3	0
130	0	3	7	13	19	26	31	35	38	38	36	35	30	25	20	13	7	3	0
135	0	2	6	11	17	21	26	30	31	31	32	29	26	22	16	11	6	2	0
140	0	2	5	9	13	18	22	25	26	27	27	25	22	19	13	9	5	2	0
145	0	2	4	8	11	15	18	20	22	23	22	20	18	15	11	8	4	2	0
150	0	2	4	7	9	13	15	16	17	18	18	17	15	12	9	7	4	2	0
155	0	2	3	5	8	10	11	12	14	14	14	12	11	9	7	6	3	2	1
160	0	2	3	4	5	7	8	9	10	10	10	9	8	7	6	4	3	1	1
165	0	2	2	3	4	5	6	6	7	7	7	6	6	5	4	3	2	1	1
170	1	2	2	2	2	3	3	3	4	4	3	3	3	3	3	2	2	1	1
175	0	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1
180	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	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
5	158	160	161	162	163	164	164	164	164	164	163	163	162	162	160	158	155
10	160	163	164	165	166	166	166	166	166	165	165	164	163	162	161	161	156
15	157	159	161	163	164	164	164	166	168	167	166	163	161	160	158	157	154
20	152	153	157	158	158	162	164	166	168	165	163	163	161	159	156	154	151
25	145	146	150	154	157	159	160	162	164	162	161	159	156	152	154	147	144
30	137	138	144	147	151	157	160	160	160	159	159	156	152	148	143	139	137
35	128	133	136	143	149	153	155	157	159	157	154	152	146	142	136	130	128
40	120	125	126	137	141	148	151	152	155	153	149	145	139	131	127	120	117
45	109	115	120	126	137	143	148	151	153	148	144	141	132	124	117	111	106
50	98	104	110	118	129	138	143	146	146	144	144	136	128	114	107	101	95
55	87	93	100	110	122	131	136	140	141	138	136	128	119	107	98	90	82
60	75	81	89	101	114	123	132	132	132	134	128	120	111	100	87	80	69
65	62	70	80	93	106	118	124	127	127	127	122	113	103	93	78	68	56
70	49	61	72	84	97	111	117	120	121	119	116	106	95	82	70	55	43
75	36	51	63	75	86	103	111	116	116	112	108	99	88	72	61	45	32
80	24	41	55	69	80	92	105	108	110	107	99	93	80	66	52	34	20
85	17	33	48	63	75	86	95	101	103	100	94	84	73	61	46	29	14
90	10	26	42	57	70	84	90	93	95	91	88	77	69	56	42	25	8
95	7	22	37	50	63	72	80	86	87	84	80	71	59	48	35	20	7
100	5	17	32	44	55	63	73	80	78	76	72	63	52	42	29	15	5
105	4	15	28	38	48	60	65	70	70	71	66	59	47	37	26	14	4
110	3	12	24	33	43	53	59	62	64	63	58	51	43	34	23	12	3
115	3	10	21	28	39	48	53	54	56	55	52	45	38	31	20	10	3
120	3	9	18	26	33	41	47	49	51	49	45	41	34	26	17	9	3
125	3	8	15	22	29	36	40	44	43	44	40	35	29	22	14	8	3
130	3	7	13	19	26	31	35	38	38	36	35	30	25	20	13	7	3
135	2	6	11	17	21	26	30	31	31	32	29	26	22	16	11	6	2
140	2	5	9	13	18	22	25	26	27	27	25	22	19	13	9	5	2
145	2	4	8	11	15	18	20	22	23	22	20	18	15	11	8	4	2
150	2	4	7	9	13	15	16	17	18	18	17	15	12	9	7	4	2
155	2	3	5	8	10	11	12	14	14	14	12	11	9	7	6	3	2
160	2	3	4	5	7	8	9	10	10	10	9	8	7	6	4	3	1
165	2	2	3	4	5	6	6	7	7	7	6	6	5	4	3	2	1
170	2	2	2	2	3	3	3	4	4	3	3	3	3	3	2	2	1
175	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1
180	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°

Signature:



Print Name:

GH JOHN

Date:

__25-07-2013__

Partner / Director

Duly authorised to sign on behalf of:

Photometric and Optical Testing Services LLP