

astro

PHOTOMETRIC
TEST REPORT

Photometric Test Report

Report Number: POTS/GJ13185	Report Date: 30-05-2013	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: Mashiko 600 LED	Serial Number: 1121020
Lamp Type: LED	
Power Supply Used: Uninterruptible AC power supply	
Voltage(AC V) = 243.3	Current (mA)= 98
Power (Watts)= 10.6	Power factor= 0.446

Integrating Sphere Test

Date of Test: 30-05-2013	Ambient Temperature:25°C
Measurement Filename: Mashiko 600 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):657.8	
CIE 1931 Chromaticity Cx: 0.4304	CIE 1931 Chromaticity Cy: 0.3949
CRI (%):88.28	CCT (K): 3034

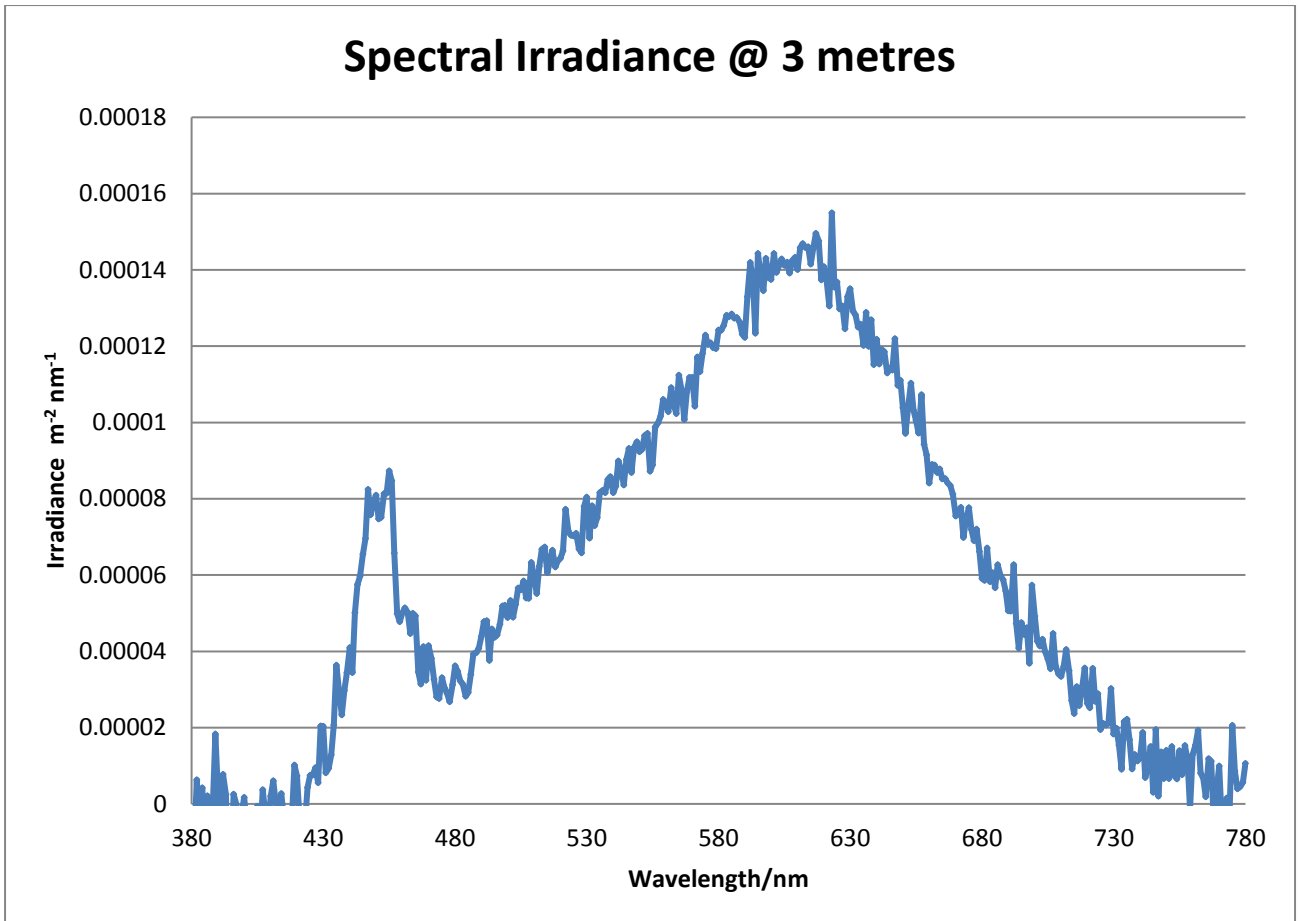


Figure 1: Spectral Irradiance

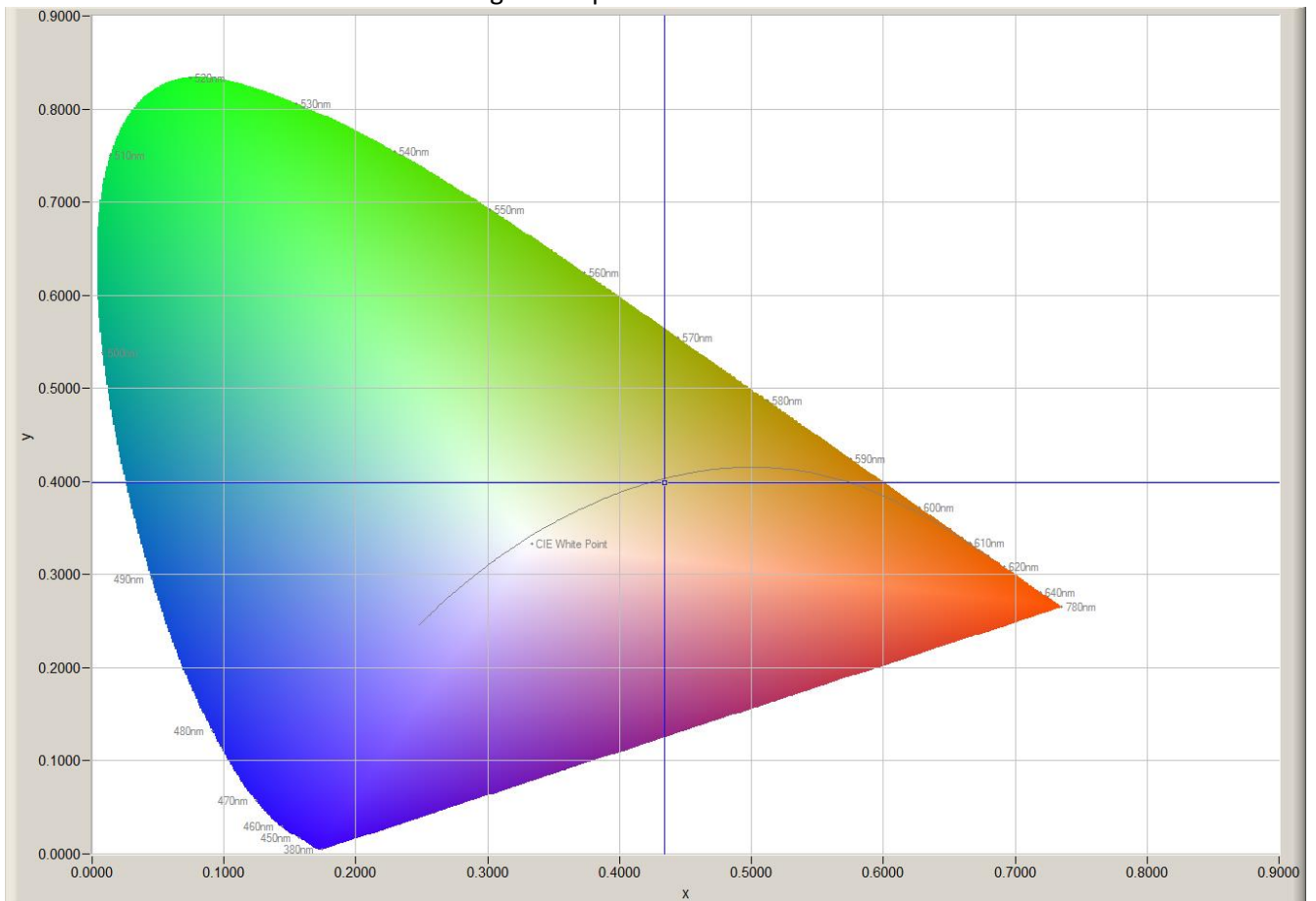


Figure 2: CIE 1931 diagram.

Goniophotometer Test		
Date of Test: 29-05-2013	Ambient Temperature: 25°C	
Measurement Filename: Mashiko 600 LED		
Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer		
Photometer Working Distance:3 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°	3°
Azimuth	0-360°	10°
Results		
Integrated Luminous Flux (lumens):657.7	Peak Intensity (3° Spot, candelas): 126.0	Efficacy (lumens/Watt): 61.877777
Beam Angle (50% of max intensity C0-180, degrees): 110.2		
Photometric Filename (IES LM-63-2002): Mashiko 600 LED		
IES File – Absolute or Relative Format? Absolute		
Photometric Filename (EULUMDAT): Mashiko 600 LED		
EULUMDAT File – Absolute or Relative Format? Absolute		

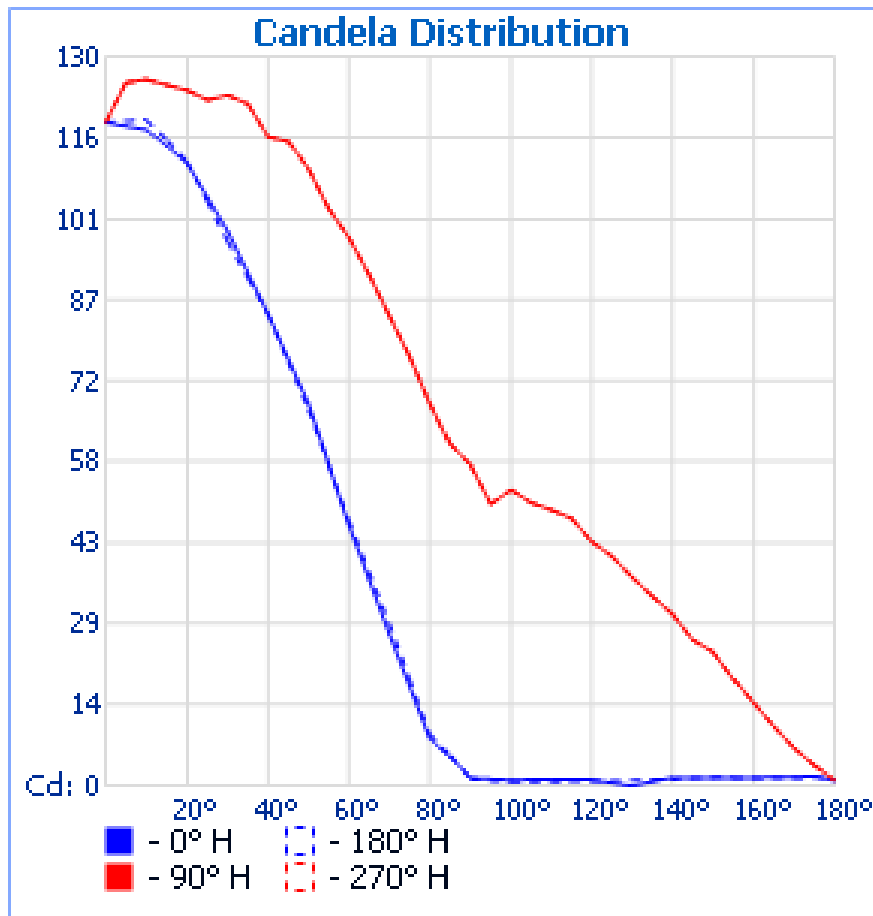


Figure 3: Far-Field Luminous Intensity (C0-180, Cartesian Coordinates)

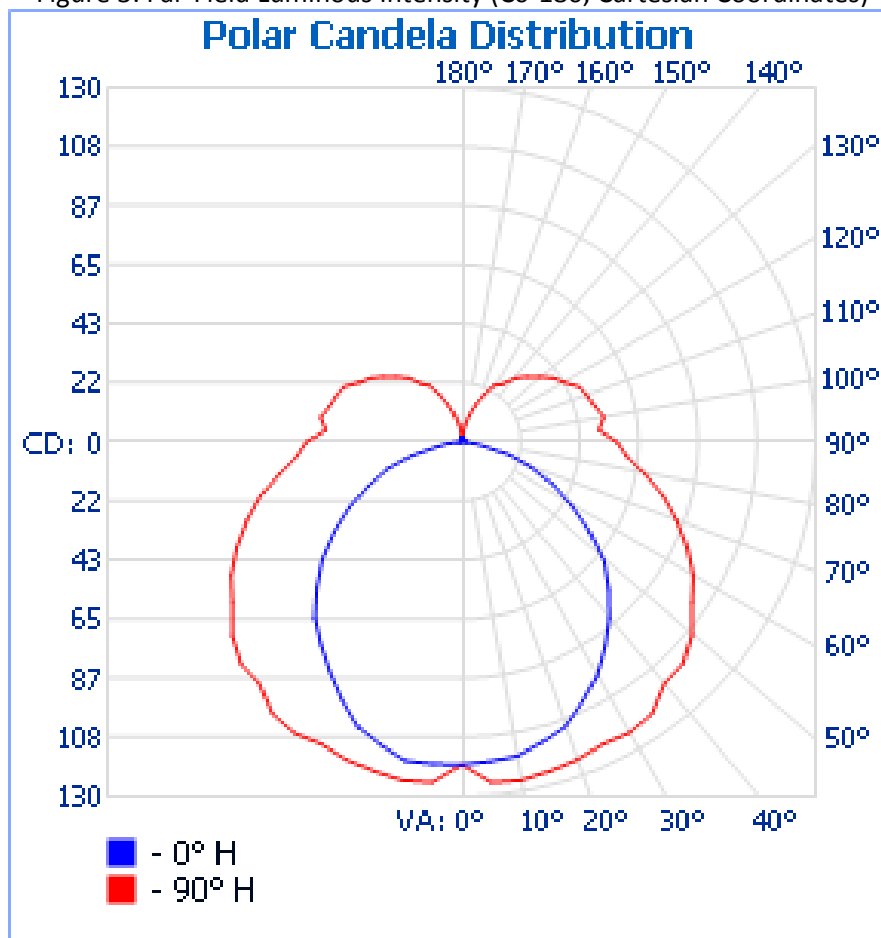


Figure 4: Far-Field Luminous Intensity (C0-180, C90-270, Polar Coordinates)

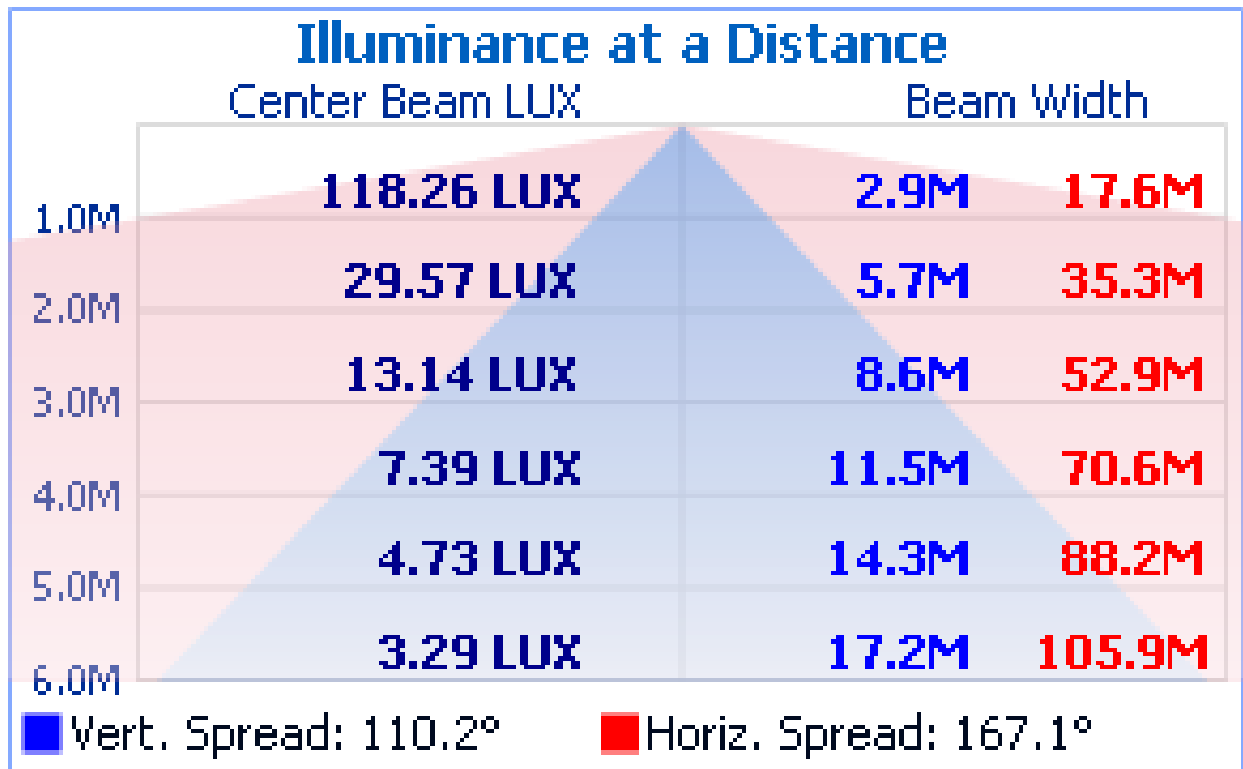


Figure 4. Illuminance cone diagram.

Room dimension		Viewed crosswise					Viewed endwise				
x	y										
2H	2H	10.0	11.3	10.7	12.0	12.8	14.1	15.4	14.8	16.1	16.9
	3H	11.0	12.2	11.7	12.9	13.8	16.7	17.9	17.4	18.6	19.4
	4H	11.3	12.5	12.0	13.2	14.0	18.0	19.1	18.7	19.9	20.7
	6H	11.5	12.5	12.2	13.2	14.1	19.4	20.4	20.1	21.2	22.1
	8H	11.4	12.4	12.1	13.2	14.1	20.0	21.1	20.8	21.8	22.7
	12H	11.4	12.4	12.1	13.1	14.0	20.8	21.7	21.5	22.5	23.4
4H	2H	11.4	12.5	12.1	13.2	14.1	14.5	15.6	15.2	16.3	17.2
	3H	12.7	13.7	13.4	14.4	15.3	17.2	18.2	17.9	18.9	19.8
	4H	13.2	14.1	13.9	14.8	15.8	18.7	19.6	19.5	20.4	21.3
	6H	13.4	14.2	14.2	15.0	15.9	20.2	21.0	21.0	21.8	22.7
	8H	13.5	14.2	14.2	15.0	15.9	21.0	21.8	21.8	22.6	23.5
	12H	13.5	14.2	14.3	15.0	15.9	21.9	22.6	22.7	23.4	24.3
8H	4H	14.2	14.9	15.0	15.7	16.7	18.8	19.6	19.6	20.4	21.3
	6H	14.7	15.3	15.5	16.1	17.1	20.5	21.2	21.3	21.9	22.9
	8H	14.9	15.5	15.7	16.3	17.3	21.5	22.1	22.3	22.9	23.8
	12H	15.0	15.5	15.8	16.4	17.3	22.5	23.0	23.3	23.8	24.8
12H	4H	14.5	15.2	15.3	16.0	16.9	18.9	19.5	19.6	20.3	21.3
	6H	15.2	15.8	16.0	16.6	17.5	20.6	21.2	21.4	22.0	22.9
	8H	15.5	16.0	16.3	16.8	17.8	21.6	22.1	22.4	22.9	23.8

Table 1. UGR values

	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
5	118	120	121	123	125	125	125	125	125	125	125	125	125	124	124	123	122	120	119
10	117	120	122	121	122	123	124	125	126	126	125	125	124	123	122	122	121	120	119
15	114	118	119	120	122	124	124	124	125	125	125	125	125	125	122	120	119	119	115
20	111	116	117	117	118	121	121	123	124	124	124	124	124	122	121	119	115	117	111
25	105	110	112	112	117	118	120	122	122	122	122	123	120	117	116	115	112	110	104
30	99	103	107	110	112	112	117	120	121	123	122	119	117	116	110	109	106	104	97
35	92	96	100	104	105	110	112	117	119	122	119	117	116	110	106	102	100	96	91
40	84	88	92	97	99	104	111	115	116	116	115	114	111	109	102	96	93	90	84
45	76	80	85	90	95	100	107	111	112	115	114	111	107	103	96	89	86	82	76
50	68	71	78	83	89	94	102	107	108	110	105	103	101	97	90	82	78	73	67
55	57	62	70	75	82	89	96	100	103	103	103	101	94	88	83	75	69	64	57
60	47	52	62	68	75	80	91	92	96	98	96	92	90	81	75	68	61	54	47
65	37	43	53	61	68	73	83	87	91	91	90	87	82	76	67	61	53	44	38
70	27	35	44	53	60	66	75	79	83	84	83	79	75	68	60	53	43	34	29
75	18	25	35	45	52	60	67	72	75	77	74	72	66	59	53	44	34	25	19
80	8	15	27	37	46	53	58	64	68	68	67	62	58	52	44	35	25	15	9
85	5	11	22	32	40	47	54	57	61	61	60	57	52	45	38	29	20	11	5
90	1	6	18	27	35	44	49	54	55	57	56	53	47	40	33	24	15	6	1
95	1	5	16	25	33	38	44	51	48	50	54	51	46	39	32	23	14	6	1
100	1	5	14	22	30	37	45	49	52	53	53	50	45	39	31	22	14	5	1
105	1	5	13	21	28	36	44	47	51	51	51	48	43	39	30	22	14	5	1
110	1	5	12	20	27	35	41	46	48	49	49	45	41	36	29	22	13	5	1
115	1	5	12	20	26	33	39	43	46	48	46	43	38	34	27	20	12	5	1
120	1	5	11	18	25	33	36	40	43	44	43	41	36	31	26	19	12	5	1
125	1	5	10	17	23	29	35	37	40	41	39	38	35	30	24	17	11	4	1
130	0	4	9	16	22	28	31	35	37	37	37	35	31	27	22	16	11	4	1
135	1	4	9	14	19	25	29	32	33	34	33	32	29	25	20	15	9	4	1
140	2	3	8	13	18	22	26	28	30	31	30	28	26	22	18	14	8	4	1
145	1	3	7	11	15	19	23	25	26	26	26	25	22	20	16	12	7	3	1
150	1	3	6	10	13	16	19	21	23	24	23	21	19	17	14	10	6	3	2
155	1	3	5	8	11	14	16	18	19	19	18	17	16	14	11	7	4	3	1

160	1	2	4	6	9	11	13	14	14	15	14	13	12	10	8	6	4	2	1
165	2	2	3	5	6	7	9	10	10	10	10	10	9	7	6	5	3	2	1
170	2	2	3	4	4	5	5	6	6	7	6	6	6	5	4	4	3	2	1
175	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
5	120	122	123	125	125	125	125	125	125	125	125	125	124	124	123	121	119
10	120	122	121	122	123	124	125	126	126	125	125	124	123	122	122	121	119
15	118	119	120	122	124	124	124	125	125	125	125	125	125	122	120	119	118
20	116	117	117	118	121	121	123	124	124	124	124	124	122	121	119	115	117
25	110	112	112	117	118	120	122	122	122	122	123	120	117	116	115	112	110
30	103	107	110	112	112	117	120	121	123	122	119	117	116	110	109	106	104
35	96	100	104	105	110	112	117	119	122	119	117	116	110	106	102	100	96
40	88	92	97	99	104	111	115	116	116	115	114	111	109	102	96	93	90
45	80	85	90	95	100	107	111	112	115	114	111	107	103	96	89	86	82
50	71	78	83	89	94	102	107	108	110	105	103	101	97	90	82	78	73
55	62	70	75	82	89	96	100	103	103	103	101	94	88	83	75	69	64
60	52	62	68	75	80	91	92	96	98	96	92	90	81	75	68	61	54
65	43	53	61	68	73	83	87	91	91	90	87	82	76	67	61	53	44
70	35	44	53	60	66	75	79	83	84	83	79	75	68	60	53	43	34
75	25	35	45	52	60	67	72	75	77	74	72	66	59	53	44	34	25
80	15	27	37	46	53	58	64	68	68	67	62	58	52	44	35	25	15
85	11	22	32	40	47	54	57	61	61	60	57	52	45	38	29	20	11
90	6	18	27	35	44	49	54	55	57	56	53	47	40	33	24	15	6
95	5	16	25	33	38	44	51	48	50	54	51	46	39	32	23	14	6
100	5	14	22	30	37	45	49	52	53	53	50	45	39	31	22	14	5
105	5	13	21	28	36	44	47	51	51	51	48	43	39	30	22	14	5
110	5	12	20	27	35	41	46	48	49	49	45	41	36	29	22	13	5
115	5	12	20	26	33	39	43	46	48	46	43	38	34	27	21	12	5
120	5	11	18	25	33	36	40	43	44	43	41	36	31	26	19	12	5
125	5	10	17	23	29	35	37	40	41	39	38	35	30	24	17	11	4
130	4	9	16	22	28	31	35	37	37	37	35	31	27	22	16	11	4

135	4	9	14	19	25	29	32	33	34	33	32	29	25	20	15	9	4
140	3	8	13	18	22	26	28	30	31	30	28	26	22	18	14	8	4
145	3	7	11	15	19	23	25	26	26	26	25	22	20	16	12	7	3
150	3	6	10	13	16	19	21	23	24	23	21	19	17	14	10	6	3
155	3	5	8	11	14	16	18	19	19	18	17	16	14	11	7	4	3
160	2	4	6	9	11	13	14	14	15	14	13	12	10	8	6	4	2
165	2	3	5	6	7	9	10	10	10	10	10	9	7	6	5	3	2
170	2	3	4	4	5	5	6	6	7	6	6	6	5	4	4	3	2
175	2	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	2
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Signature:



Print Name:

GH JOHN

Date:

Partner / Director

Duly authorised to sign on behalf of:

Photometric and Optical Testing Services LLP