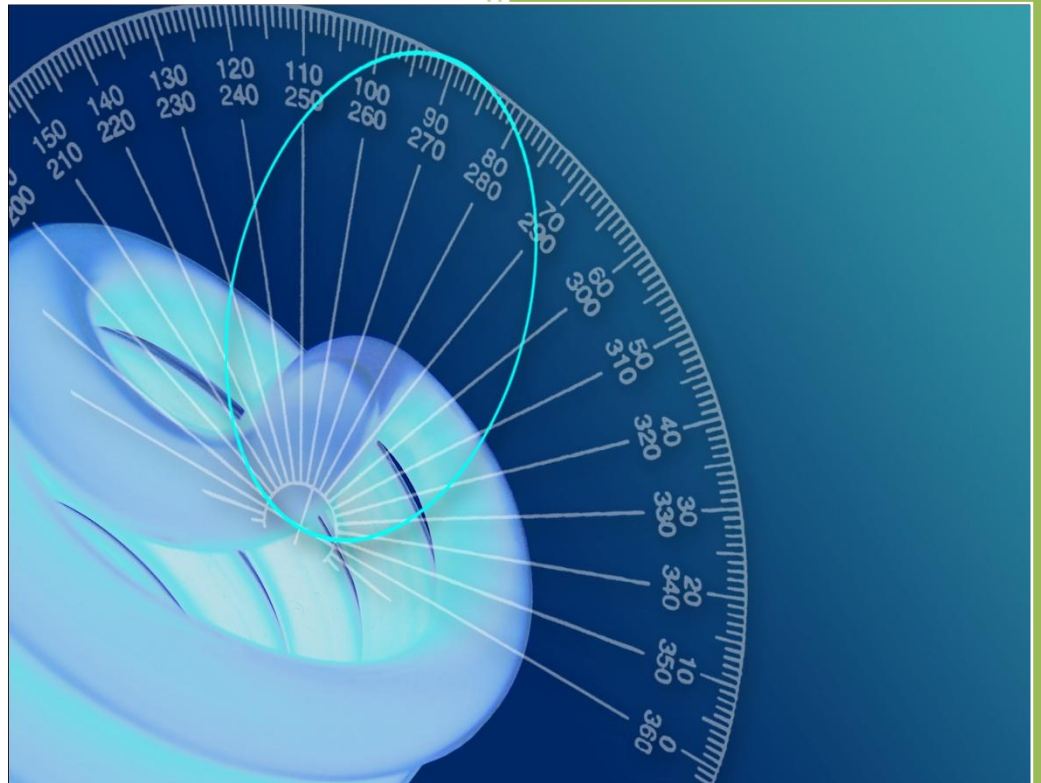


Photometric Test Report



Photometric and Optical Testing
Services
Cheltenham Film and Photographic
Studios
Hatherley Lane
Cheltenham
Gloucestershire
GL51 6PN
UK
Tel: 01242 701300

Photometric Test Report

Report Number: POTS/DC15228	Report Date: 01/12/2015	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: TLC Southern Ltd	
Address: The TLC Building, 5 Newton Road, Crawley, West Sussex, RH10 9TS	

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: LEDLITE	Source Type: LED
Model LTSP50CW	Luminaire Type: DOWNLIGHT
Power Supply Used: Kikusui PCR1000M Voltage Stabiliser S/N SM01191	
Voltage(AC V) = 230	Current (mA)= 220
Power (Watts)= 49.06	Power factor= 0.969

Integrating Sphere Test

Date of Test: 26/11/2015	Ambient Temperature:25°C
Measurement Filename: 50W LED COOL WHITE	
Instrument Used: Labsphere model 2m integrating sphere spectroradiometer AS-02949-012	
Integrating Sphere Size: 2m	Measurement Geometry (2π / 4π): 4π
Sample Orientation: Horizontal	Auxiliary Correction Applied: YES
Comments:	
Date of Last Calibration (Operating Hours): 12-10-2015 (0:57)	Spectral Flux Standard Lamp Used: SCL-600
Standard Lamp Serial Number: L123	Traceable: to NIST standards
Calibration Certificate Number: SCL-600-L123	Calibration Certificate Date: 29/01/2014
Calibration Lamp Uncertainty: $\pm 0.67\%$ ($k=2$)	
Results	
Flux (lumens): 4715	
CIE 1931 Chromaticity Cx: 0.3555	CIE 1931 Chromaticity Cy: 0.3716
CRI (%):83.05	CCT (K): 4712

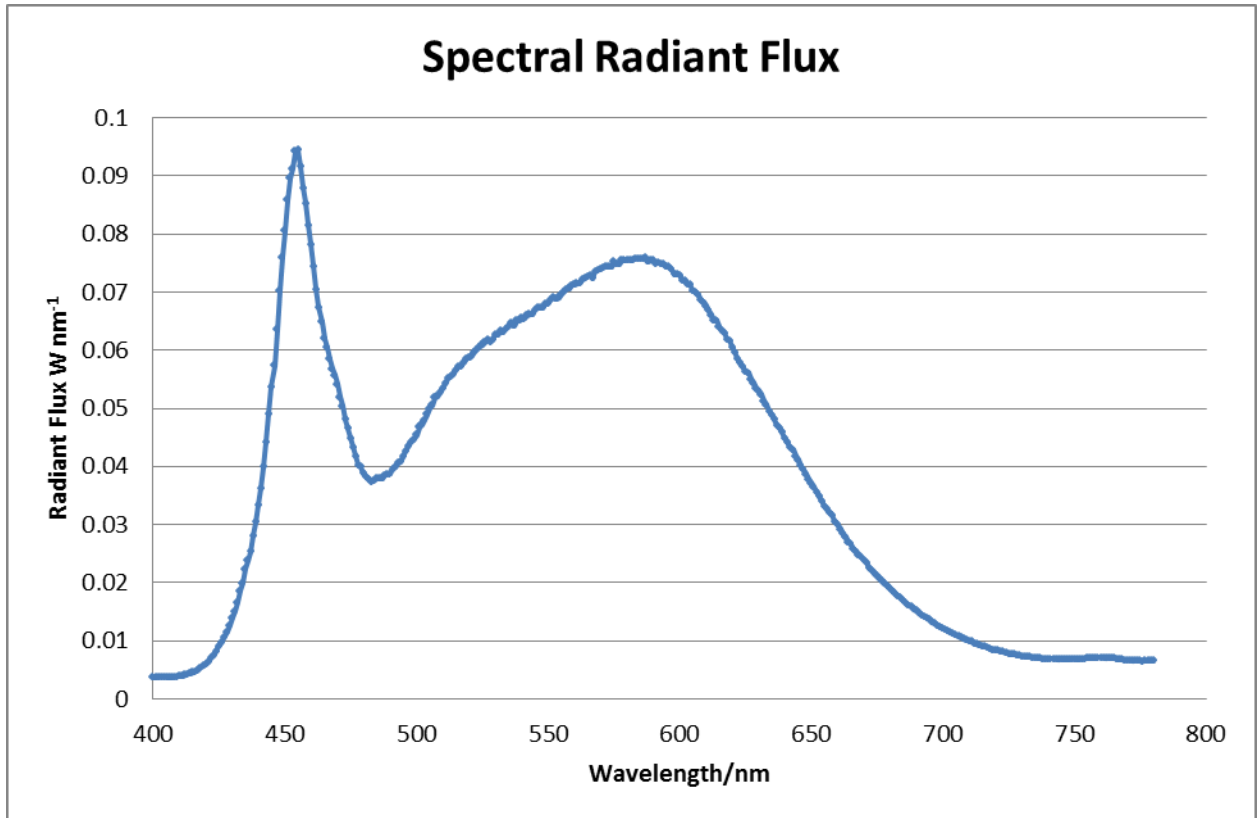


Figure 1: Spectral Flux

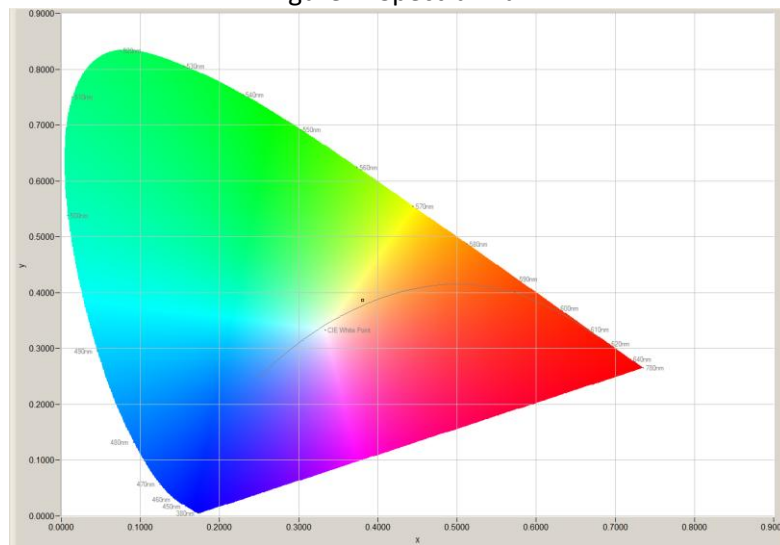


Figure 2: CIE 1931 diagram.

Goniophotometer Test		
Date of Test: 25/11/2015	Ambient Temperature: 25°C	
Measurement Filename: 50W LED WHITE		
Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer		
Photometer Working Distance: 3m	Measurement Geometry: Near-Field	
Comments:		
Reference Photometer Used: Specbos1211	Reference Photometer Serial Number: 2014754	
Traceable: to NIST standards		
Calibration Certificate Date: 18 June 2015	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):	Peak Intensity (3° Spot, candelas):	Efficacy (lumens/Watt):
Beam Angle (50% of max intensity C0-180, degrees):		
Photometric Filename (IES LM-63-2002): 50W LED WHITE		
IES File – Absolute or Relative Format? ABSOLUTE		
Photometric Filename (EULUMDAT): 50W LED WHITE		
EULUMDAT File – Absolute or Relative Format? ABSOLUTE		

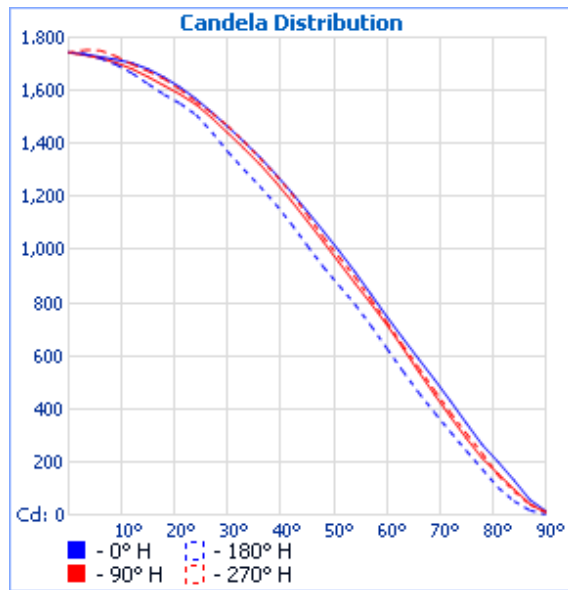


Figure 3: Far-Field Luminous Intensity (C0-180, Cartesian Coordinates)

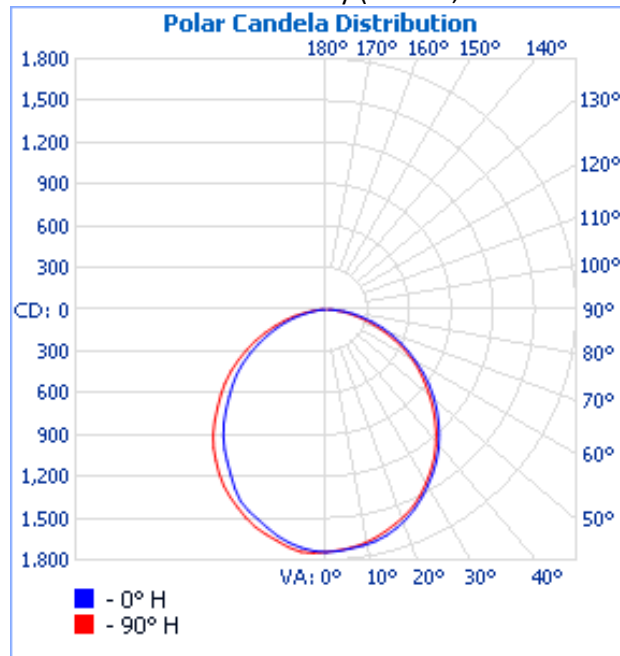


Figure 4: Far-Field Luminous Intensity (C0-180, C90-270, Polar Coordinates)

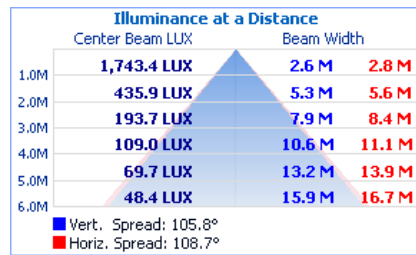


Figure 5. Cone diagram for mounting height of 6 metres.

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)				
6H	6H	21.1	22.4	21.5	22.8	23.2	20.7	22.0	21.1	22.4	22.8
	8H	21.3	22.5	21.7	22.9	23.3	20.8	22.0	21.2	22.4	22.8
	12H	21.4	22.6	21.9	23.0	23.4	20.9	22.1	21.3	22.4	22.8
4H	2H	19.0	20.4	19.4	20.7	21.1	18.8	20.2	19.2	20.5	20.9
	3H	20.7	21.9	21.2	22.3	22.7	20.5	21.7	20.9	22.1	22.5
	4H	21.6	22.6	22.0	23.1	23.5	21.3	22.3	21.7	22.7	23.2
	6H	22.2	23.1	22.7	23.6	24.0	21.8	22.7	22.2	23.2	23.6
	8H	22.5	23.3	22.9	23.8	24.2	21.9	22.8	22.4	23.3	23.7
	12H	22.7	23.5	23.2	23.9	24.4	22.1	22.9	22.5	23.3	23.8
8H	4H	21.8	22.7	22.3	23.2	23.6	21.5	22.4	22.0	22.8	23.3
	6H	22.6	23.3	23.1	23.8	24.3	22.1	22.9	22.6	23.3	23.8
	8H	23.0	23.6	23.5	24.1	24.6	22.4	23.1	22.9	23.6	24.1
	12H	23.2	23.8	23.8	24.3	24.8	22.6	23.1	23.1	23.6	24.1
12H	4H	21.9	22.7	22.4	23.1	23.6	21.6	22.4	22.0	22.8	23.3
	6H	22.7	23.3	23.2	23.8	24.3	22.3	22.9	22.8	23.4	23.9
	8H	23.1	23.6	23.6	24.1	24.6	22.5	23.0	23.0	23.6	24.1

Distance between luminaires: 0.25

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

Table 1. UGR values

	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	
0																				
3																				
6																				
9																				
12																				
15																				
18																				
21																				
24																				
27																				
30																				
33																				
36																				
39																				
42																				
45																				
48	1071	1056	1058	1054	1059	1045	1050	1046	1042	1031	1029	1015	1007	984	975	967	961	955	936	
51	995	985	985	979	980	969	970	968	966	952	952	938	929	912	902	893	883	884	865	
54	916	910	918	888	890	893	884	891	880	873	865	865	845	843	824	806	811	800	794	
57	833	832	831	806	812	814	805	808	799	797	785	788	765	765	748	731	725	716	714	
60	748	747	741	723	730	726	720	720	719	718	707	702	678	681	663	653	638	633	628	
63	667	665	664	642	642	635	637	635	636	631	628	613	597	599	576	573	563	551	543	
66	589	582	573	566	561	556	552	552	546	541	542	528	521	519	503	497	476	466	461	
69	510	498	488	478	472	473	466	470	458	454	453	447	442	433	424	413	401	385	385	
72	429	413	409	396	390	389	386	389	379	370	370	368	362	353	350	338	332	310	313	
75	346	333	326	314	308	310	304	306	299	289	290	286	280	279	273	266	257	241	242	
78	264	256	246	238	233	229	229	225	222	213	216	209	208	205	200	199	188	175	173	
81	200	187	186	179	176	169	169	167	158	155	151	147	142	140	136	133	128	107	103	
84	131	120	106	111	98	96	104	97	94	97	93	83	83	79	74	77	69	60	52	
87	58	52	45	44	46	40	40	35	40	41	38	32	28	31	30	24	25	23	17	
90	14	16	14	13	13	12	8	8	7	9	5	5	6	4	6	6	6	6	2	

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																	
3																	
6																	
9																	
12																	
15																	
18																	
21																	
24																	
27																	
30																	
33																	
36																	
39																	
42																	
45																	
48																	
51																	
54																	
57																	
60	629	649	654	669	682	697	707	721	726	739	739	736	749	743	754	748	753
63	548	576	572	587	602	615	626	640	640	652	654	652	656	652	669	674	670
66	467	487	498	512	525	535	543	559	555	562	565	567	570	572	583	582	584
69	389	404	415	430	439	449	463	472	469	476	480	481	479	483	483	496	500
72	314	331	342	357	359	368	382	386	386	397	398	399	394	404	402	414	417
75	235	257	269	279	286	289	295	302	307	314	310	314	314	318	324	328	336
78	173	190	201	206	211	218	215	226	232	233	228	236	233	235	245	247	256
81	102	126	132	133	136	138	143	143	150	149	157	158	160	162	171	179	184
84	59	66	76	72	75	79	83	84	89	90	94	93	95	89	101	100	119
87	19	23	24	29	28	30	33	36	39	37	36	38	37	40	36	38	54
90	1	1	4	4	5	4	3	7	11	9	7	7	5	6	6	8	11

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

Zone	Lumens	% Total
0-5		
05-10		
10-15		
15-20		
20-25		
25-30		
30-35		
35-40		
40-45		
45-50		
50-55		
55-60		
60-65		
65-70	250.3	5.30%
70-75	187.9	4.00%
75-80	126.1	2.70%
80-85	64.9	1.40%
85-90	17.7	0.40%

Table 3. Zonal Flux Table

Effective Floor Cavity Reflectance: 20%																		
RCC %:	80				70				50			30			10			0
RW %:	<u>70</u>	<u>50</u>	<u>30</u>	<u>0</u>	<u>70</u>	<u>50</u>	<u>30</u>	<u>0</u>	<u>50</u>	<u>30</u>	<u>20</u>	<u>50</u>	<u>30</u>	<u>20</u>	<u>50</u>	<u>30</u>	<u>20</u>	<u>0</u>
RCR: 0																		
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Table 4. Utilisation Factor Table

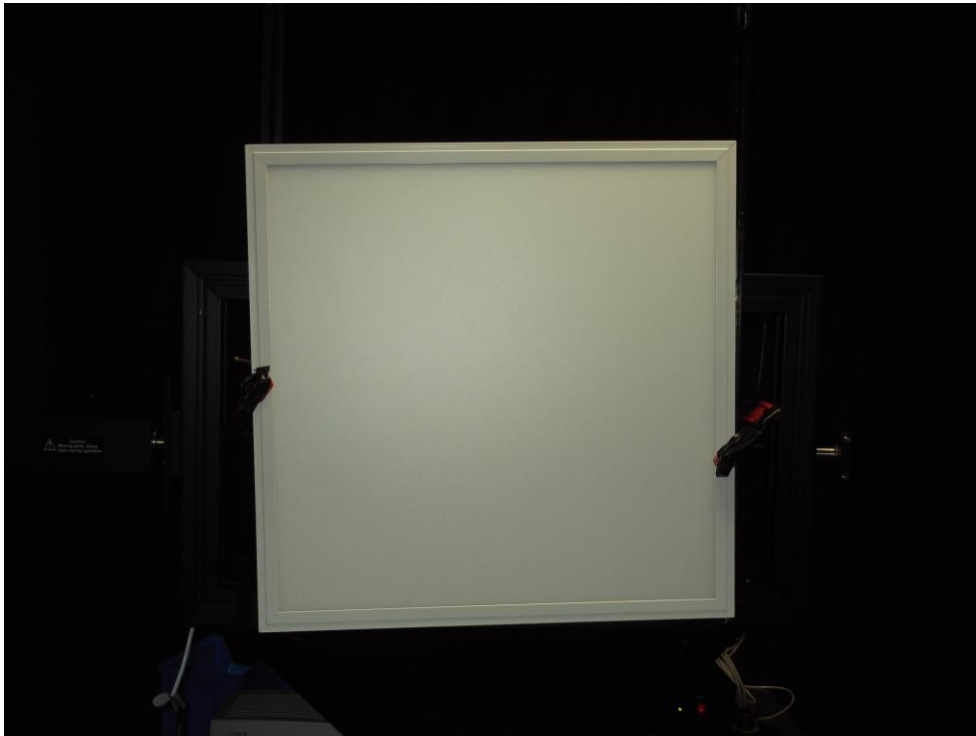


Photo 1: Luminaire on goniometer mount

Signature:

Print Name:

D CHAMBERS

Date:

01/12/2015

Test Engineer

Duly authorised to sign on behalf of:
Photometric and Optical Testing Services LLP