

Report Number	GNC-31168
Customer	Encapsulite International Ltd
Contact	Jordan Waumsley
Product Type	ECO LED Stick-Lite
Test Purpose	Generation of photometric data
Quote Reference	Q-LUX-301840
Works Order Number	WO-31168
LAB Test Method Reference	Goniometric (Type C) Intensity Scan - IES/LDT Files & Report - Scan Increments 15 degrees Azimuth by 2.5 degrees Inclination
Test Standards	LM-79-19; (BS) EN 13032-4:2015 + A1 2019; CIE S025:2015
Lab Location Reference	LUX-TSI
Tested by	Andrew Boon
Date of Test	14-06-22
Reviewed by	Gareth Jones
Number of products tested	1

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Signed:



ECO-LED Stick-Lite 4ft

Date: 15/06/2022

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TRCL_GC_R17

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

VBV - 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-79-19 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.

Test Equipment

UL LSI Custom Far-Field Type C Moving Mirror Goniophotometer measures intensity as a function of angle. On-axis spectral measurements taken using spectrometer, for which these measurements and outputs are not accredited.

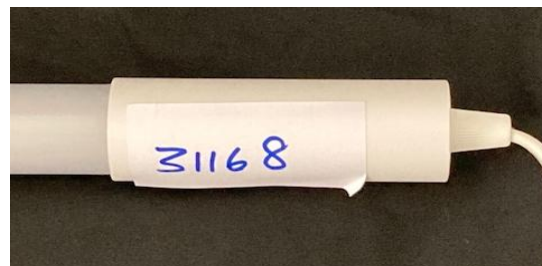
Data Formats

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	ECO-LED Stick-Lite 4ft
Part/Serial Number	N/A
Type of Product	ECO LED Stick-Lite
Base Type	Not Applicable - Luminaire
Driver Type	Internal
Test Time	14 mins
Operating Orientation	Horizontal
Test Orientation	Horizontal
Ambient Temperature	24.8°C
Manufacturer	Encapsulite International Ltd
Date of Manufacture	N/A
Thermal Management	Passive
Dimmable	Unknown
Pre-Burning Time	0 hours
Stabilisation Time	20 mins
Humidity	51.9% RH
Averaging Applied	NONE



Driver Details		
Manufacturer	Philips	
Model	N/A	
Part/Serial #	N/A	
Rated Voltage	220-240V	
Output	Current	N/A
	Voltage	N/A

Photometric Measurements	
Luminous Flux	1654 lm
Luminous Efficacy	123 lm/W

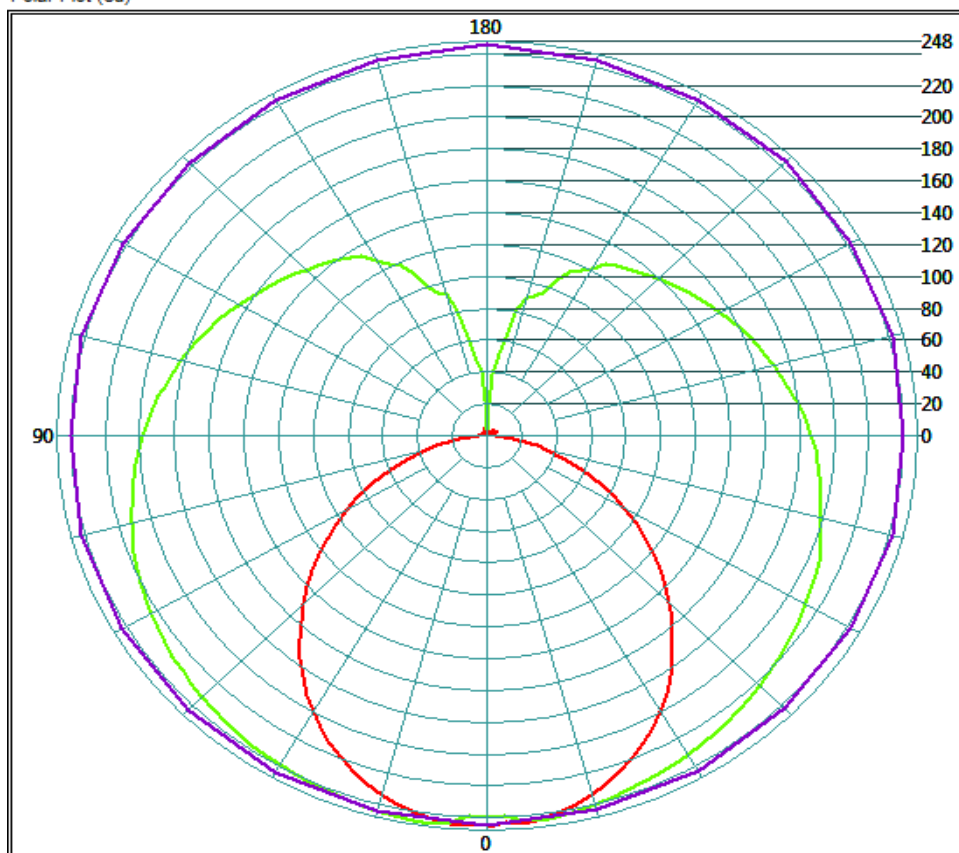
Dimension	Sample	Luminous Opening
Diameter/Width	35 mm	30 mm
Length	1260 mm	1100 mm
Height/Depth	35 mm	30 mm

Electrical Measurements	
Frequency	50 Hz
Voltage	231.2 V
Current	0.062 A
Power	13.5 W
Power Factor	0.946
Apparent Power	14.4 VA

Goniophotometric Measurements

Beam Angle	Horizontal	180°
	Vertical	106°
On-axis Intensity		245 cd
Peak Intensity		248 cd
Peak Direction	Horizontal	105°
	Vertical	8°

Polar Plot (cd)



Appendices & non-accredited results

On-axis Spectral Measurement

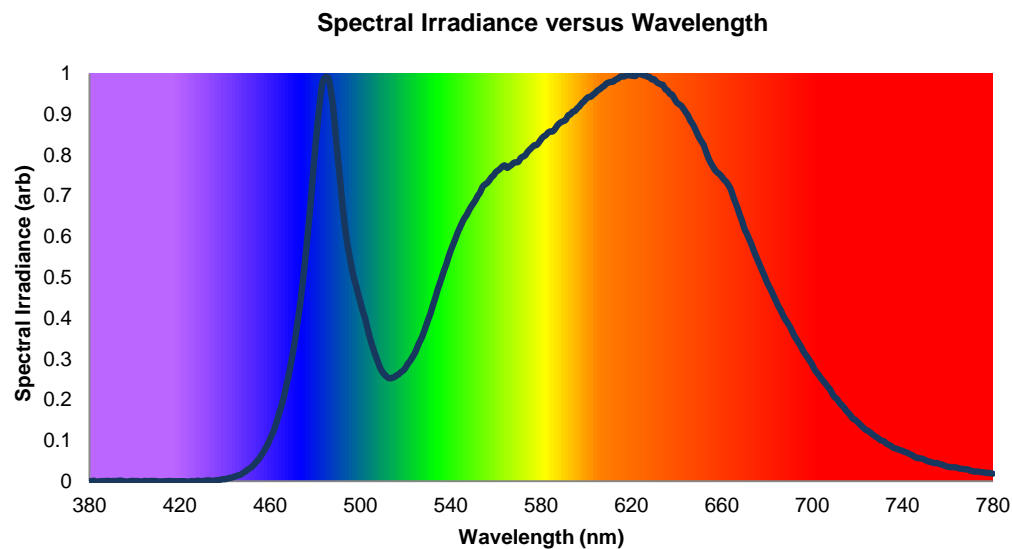
The following data was determined from an on-axis spectral measurement using a SP1000 spectrometer at a distance of mm, for which these measurements and outputs are not accredited.

Results may differ if compared to spatially averaged colourimetric result (e.g. measured in an integrating sphere).

LM79 requires spatially averaged colourimetric results (i.e. from a sphere, or from a full gonio colourimetric scan).

The colourimetric results in this report do not follow those requirements.

BS (EN) 13032 and CIE S025 do not state this requirement.



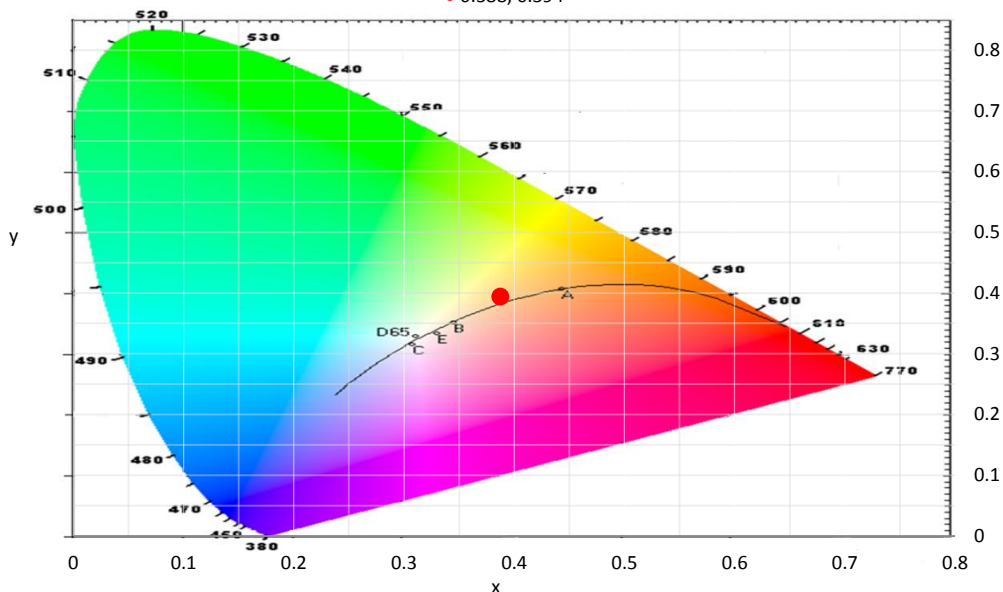
Colour Rendering Index Detail			
R1	77	R8	61
R2	86	R9	-3
R3	94	R10	67
R4	78	R11	76
R5	76	R12	51
R6	81	R13	79
R7	86	R14	97

Colorimetric Details	
CCT	3937K
CRI (Ra)	80

Chromaticity Coordinates		
CIE 1931	x	0.3876
	y	0.3941
CIE 1960	u	0.2229
	v	0.3400
CIE 1976	u'	0.2229
	v'	0.5101
Duv		0.0058

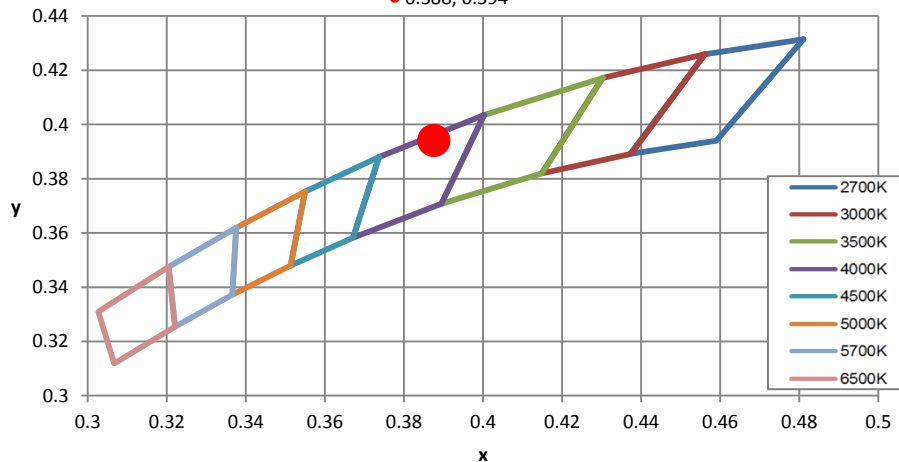
CIE 1931 Colour Chart

• 0.388, 0.394



CIE 1931 x, y Chromaticity Diagram - Nominal CCT Quadrangles

• 0.388, 0.394



Spectral Power Distribution

λ (nm)	Arb units	λ (nm)	Arb units	λ (nm)	Arb units	λ (nm)	Arb units
380	3.61E-04	430	6.64E-04	480	8.18E-01	530	3.96E-01
381	4.36E-04	431	1.21E-03	481	8.75E-01	531	4.11E-01
382	1.70E-03	432	2.31E-03	482	9.27E-01	532	4.30E-01
383	-5.20E-04	433	2.20E-03	483	9.72E-01	533	4.47E-01
384	-2.07E-04	434	1.69E-03	484	9.88E-01	534	4.66E-01
385	5.40E-04	435	1.35E-03	485	9.92E-01	535	4.83E-01
386	5.50E-04	436	2.52E-03	486	9.86E-01	536	5.00E-01
387	6.53E-04	437	3.07E-03	487	9.56E-01	537	5.17E-01
388	1.13E-03	438	3.92E-03	488	9.12E-01	538	5.32E-01
389	5.70E-04	439	5.32E-03	489	8.52E-01	539	5.50E-01
390	5.22E-04	440	5.24E-03	490	7.93E-01	540	5.66E-01
391	9.71E-04	441	6.79E-03	491	7.39E-01	541	5.80E-01
392	6.49E-04	442	7.96E-03	492	6.80E-01	542	5.94E-01
393	1.61E-03	443	9.26E-03	493	6.32E-01	543	6.09E-01
394	1.80E-03	444	1.09E-02	494	5.89E-01	544	6.22E-01
395	4.53E-04	445	1.28E-02	495	5.58E-01	545	6.34E-01
396	-2.01E-05	446	1.49E-02	496	5.28E-01	546	6.45E-01
397	-3.52E-04	447	1.64E-02	497	5.01E-01	547	6.53E-01
398	5.63E-04	448	2.02E-02	498	4.81E-01	548	6.64E-01
399	1.11E-03	449	2.36E-02	499	4.60E-01	549	6.73E-01
400	7.47E-04	450	2.83E-02	500	4.39E-01	550	6.81E-01
401	7.83E-04	451	3.18E-02	501	4.18E-01	551	6.90E-01
402	3.35E-04	452	3.59E-02	502	4.01E-01	552	7.01E-01
403	-5.48E-04	453	4.16E-02	503	3.78E-01	553	7.08E-01
404	6.17E-04	454	4.82E-02	504	3.56E-01	554	7.21E-01
405	8.11E-04	455	5.42E-02	505	3.37E-01	555	7.27E-01
406	3.53E-04	456	6.29E-02	506	3.20E-01	556	7.31E-01
407	1.02E-03	457	7.15E-02	507	3.04E-01	557	7.37E-01
408	8.93E-04	458	8.11E-02	508	2.89E-01	558	7.46E-01
409	7.44E-04	459	9.15E-02	509	2.75E-01	559	7.50E-01
410	5.01E-04	460	1.04E-01	510	2.66E-01	560	7.59E-01
411	-5.73E-04	461	1.16E-01	511	2.60E-01	561	7.63E-01
412	4.83E-06	462	1.30E-01	512	2.55E-01	562	7.67E-01
413	2.99E-04	463	1.48E-01	513	2.53E-01	563	7.73E-01
414	2.88E-04	464	1.66E-01	514	2.54E-01	564	7.75E-01
415	8.04E-04	465	1.85E-01	515	2.56E-01	565	7.69E-01
416	6.95E-04	466	2.05E-01	516	2.60E-01	566	7.72E-01
417	3.78E-04	467	2.30E-01	517	2.63E-01	567	7.76E-01
418	3.97E-04	468	2.55E-01	518	2.68E-01	568	7.81E-01
419	2.03E-04	469	2.82E-01	519	2.72E-01	569	7.82E-01
420	3.57E-04	470	3.13E-01	520	2.79E-01	570	7.84E-01
421	4.27E-04	471	3.45E-01	521	2.88E-01	571	7.93E-01
422	2.82E-04	472	3.84E-01	522	2.95E-01	572	7.96E-01
423	-1.88E-04	473	4.22E-01	523	3.04E-01	573	8.00E-01
424	-7.18E-04	474	4.67E-01	524	3.14E-01	574	8.08E-01
425	6.59E-04	475	5.16E-01	525	3.26E-01	575	8.14E-01
426	2.32E-04	476	5.68E-01	526	3.40E-01	576	8.19E-01
427	5.38E-04	477	6.25E-01	527	3.50E-01	577	8.24E-01
428	1.65E-03	478	6.85E-01	528	3.65E-01	578	8.25E-01
429	7.87E-04	479	7.53E-01	529	3.81E-01	579	8.31E-01
						580	8.39E-01

Spectral Power Distribution

λ (nm)	Arb units	λ (nm)	Arb units	λ (nm)	Arb units	λ (nm)	Arb units
581	8.45E-01	631	9.80E-01	681	4.78E-01	731	9.98E-02
582	8.48E-01	632	9.76E-01	682	4.67E-01	732	9.77E-02
583	8.54E-01	633	9.74E-01	683	4.54E-01	733	9.22E-02
584	8.58E-01	634	9.72E-01	684	4.43E-01	734	8.96E-02
585	8.58E-01	635	9.62E-01	685	4.30E-01	735	8.66E-02
586	8.63E-01	636	9.58E-01	686	4.21E-01	736	8.21E-02
587	8.71E-01	637	9.50E-01	687	4.09E-01	737	8.07E-02
588	8.77E-01	638	9.48E-01	688	3.98E-01	738	7.87E-02
589	8.81E-01	639	9.39E-01	689	3.90E-01	739	7.63E-02
590	8.84E-01	640	9.30E-01	690	3.81E-01	740	7.49E-02
591	8.87E-01	641	9.25E-01	691	3.71E-01	741	7.22E-02
592	8.97E-01	642	9.21E-01	692	3.58E-01	742	7.04E-02
593	9.00E-01	643	9.14E-01	693	3.49E-01	743	6.76E-02
594	9.06E-01	644	9.05E-01	694	3.40E-01	744	6.49E-02
595	9.08E-01	645	8.98E-01	695	3.31E-01	745	6.20E-02
596	9.15E-01	646	8.85E-01	696	3.20E-01	746	5.80E-02
597	9.20E-01	647	8.77E-01	697	3.12E-01	747	5.71E-02
598	9.27E-01	648	8.67E-01	698	3.04E-01	748	5.63E-02
599	9.32E-01	649	8.55E-01	699	2.95E-01	749	5.51E-02
600	9.38E-01	650	8.43E-01	700	2.87E-01	750	5.25E-02
601	9.42E-01	651	8.33E-01	701	2.75E-01	751	4.99E-02
602	9.43E-01	652	8.25E-01	702	2.67E-01	752	4.79E-02
603	9.48E-01	653	8.09E-01	703	2.60E-01	753	4.69E-02
604	9.53E-01	654	7.94E-01	704	2.52E-01	754	4.45E-02
605	9.58E-01	655	7.82E-01	705	2.45E-01	755	4.51E-02
606	9.61E-01	656	7.73E-01	706	2.39E-01	756	4.34E-02
607	9.66E-01	657	7.63E-01	707	2.31E-01	757	4.18E-02
608	9.70E-01	658	7.58E-01	708	2.25E-01	758	4.00E-02
609	9.76E-01	659	7.53E-01	709	2.14E-01	759	3.78E-02
610	9.78E-01	660	7.47E-01	710	2.07E-01	760	3.58E-02
611	9.80E-01	661	7.40E-01	711	2.02E-01	761	3.52E-02
612	9.80E-01	662	7.34E-01	712	1.94E-01	762	3.47E-02
613	9.85E-01	663	7.26E-01	713	1.88E-01	763	3.43E-02
614	9.87E-01	664	7.16E-01	714	1.82E-01	764	3.38E-02
615	9.92E-01	665	6.99E-01	715	1.74E-01	765	3.18E-02
616	9.93E-01	666	6.84E-01	716	1.68E-01	766	3.09E-02
617	9.93E-01	667	6.70E-01	717	1.62E-01	767	3.04E-02
618	9.96E-01	668	6.53E-01	718	1.54E-01	768	2.94E-02
619	9.96E-01	669	6.38E-01	719	1.51E-01	769	2.93E-02
620	9.95E-01	670	6.20E-01	720	1.46E-01	770	2.64E-02
621	9.94E-01	671	6.09E-01	721	1.41E-01	771	2.54E-02
622	9.94E-01	672	5.96E-01	722	1.35E-01	772	2.39E-02
623	1.00E+00	673	5.83E-01	723	1.30E-01	773	2.43E-02
624	1.00E+00	674	5.68E-01	724	1.26E-01	774	2.34E-02
625	9.96E-01	675	5.55E-01	725	1.23E-01	775	2.25E-02
626	9.96E-01	676	5.41E-01	726	1.19E-01	776	2.22E-02
627	9.92E-01	677	5.28E-01	727	1.14E-01	777	2.06E-02
628	9.92E-01	678	5.15E-01	728	1.10E-01	778	2.09E-02
629	9.86E-01	679	5.03E-01	729	1.07E-01	779	2.02E-02
630	9.86E-01	680	4.88E-01	730	1.02E-01	780	1.87E-02

Measurement Uncertainty

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

Parameter	Uncertainty
Total Luminous Flux (%)	± 4.9
Luminous Intensity (%)	± 4.9
Temperature ($^{\circ}\text{C}$)	± 0.13
Voltage DC TY720 (%)	± 0.017
Current DC TY720 (%)	± 0.10
Voltage AC WT210 (%)	± 0.059
Current AC WT210 (%)	± 0.025
Power AC WT210 (%)	± 0.23
Frequency (50/60 Hz) WT210 (%)	± 0.004
Power Factor WT210 (%)	± 0.06

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 and CIE S 025/E:2015.

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 -----