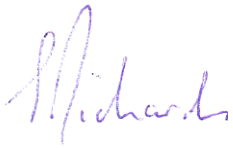
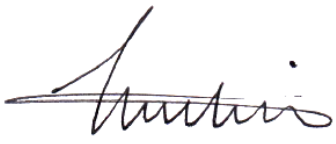
Test Report

Report No	:	**PV132 Final Report Amd 1**
Client:	:	LED Hero Ltd 2-7 Ebor Court Retford Nottinghamshire DN22 7WF
Description	:	LED Panels
Manufacturer	:	LED Hero Ltd
Type/Models	:	BLPDW60X60CWF BLPSM60X60CWF BLP6012CWF
Test Specification	:	As per test report
Date Testing Started	:	15/12/2015
Date of Issue	:	10/06/2016
Date of Expiry	:	02/06/2021

Tested by: **S. RICHARDS**
Position: Photometrics Team Leader



Approved by: **T.MALIK**
Position: Quality & Operations Manager



Registered Office: Stafford Park 7, Telford, Shropshire, TF3 3BQ, United Kingdom
Tel: +44 (0) 1952 290907 **Fax:** +44 (0) 1952 290908 **Email:** lab@thelia.org.uk
Web: www.lialab.org.uk
Web: www.lialabcert.org.uk

Note: This amendment 1 is to add LED Hero as the manufacturer on page 1 of the report.

INTRODUCTION

This test report shows the results of an assessment under the LIA Laboratories Verified Scheme, assessing the performance of lamps and luminaires in accordance with the LIA Laboratories' Technical Scheme Document TSD-004.

REPORT STATUS

Testing is complete. The luminaires have achieved 2,000 hours of operation. No luminaires have failed during testing.

Table 1. ***Product Details – Sample 1***

Product Description	LED Panel
Model No.	BLPDW60X60CWF (with LED Driver, model no. LF-GIRO40Y1950H)
Number of Samples	Three
Condition on Receipt	Good
Nominal Dimensions	L. 595mm; W. 595mm; H. 18mm
Classification	Class IP20, Class III Luminaire with Class II Driver
Product Supply Requirement	220-240V AC 50/60Hz
Lamp Type and Power	LED 40W

Table 2. ***Product Details – Sample 2***

Product Description	LED Panel
Model No.	BLPSM60X60CWF (with LED Driver, model no. LF-GTU022YG940A)
Number of Samples	Two
Condition on Receipt	Good
Nominal Dimensions	L. 595mm; W. 595mm; H. 18mm
Classification	Class IP20, Class III Luminaire with Class II Driver
Product Supply Requirement	100-277V AC 50/60Hz
Lamp Type and Power	LED 40W

Continued on following page

Table 3. ***Product Details – Sample 3***

Product Description	LED Panel
Model No.	BLP6012CWF (with LED Driver, model no. LF-GIR060YE01300A)
Number of Samples	Three
Condition on Receipt	Good
Nominal Dimensions	L. 595mm; W. 595mm; H. 18mm
Classification	Class IP20, Class III Luminaire with Class II Driver
Product Supply Requirement	200-240V AC 50/60Hz
Lamp Type and Power	LED 60W

Table 4. ***Test Sample Details***

Sample ID	Safety Test	Life Test	Colorimetry & Luminous Flux
BLPDW60X60CWF			
A1		✓	✓
A2		✓	✓
A3	✓		
BLPSM60X60CWF			
A4			✓
A5			✓
BLP6012CWF			
A6			✓
A7			✓
A8	✓*		

**Continued on following page*

Thermal test only

Sampling Method: Test samples selected and supplied by client, no sampling method specified.

SAFETY TEST

Table 5. ***Safety Test Procedure and Equipment Used***

Test Standard	IEC 60598-1:2008 and IEC 60598-2-2:2012
Clauses Excluded	Clause 5: External and Internal Wiring Clause 9: Resistance to Dust, Solid Objects and Moisture Clause 13: Resistance to Heat, Fire and Tracking Clause 14: Screw Terminals Clause 15: Screwless Terminals and Electrical Connections

Table 6. ***Safety Test Results***

Clause No.	Title	Sample ID	Pass/Fail
2.6	Marking	BLPDW60X60CWF A3	Pass
2.7	Construction	BLPDW60X60CWF A3	Pass
2.12	Protection against Electric Shock	BLPDW60X60CWF A3	Pass
2.15	Insulation Resistance and Electric Strength, Touch Current and Protective Conductor Current	BLPDW60X60CWF A3	Pass
2.8	Creepage Distances and Clearances	BLPDW60X60CWF A3	Pass
2.13	Thermal Test Only (Normal Operation)	BLP6012CWF A8	Pass

Continued on following page

LIFE TEST

Table 7. *Test Procedure and Equipment Used*

Test Standard	LIA Laboratories Technical Scheme document TSD-004
Equipment Used	Stabilised 240V AC power supply
Switching Cycle	Switched off 8 times per day for 15 minutes

Table 8. *Details of Failures*

Sample ID	Age at failure (Hours)
BLPDW60X60CWF A1	*N/A*
BLPDW60X60CWF A2	*N/A*
Note: NA indicates lamp is still functioning	

Continued on following page

LUMINOUS FLUX & COLORIMETRY

Table 9. ***Test Procedure and Equipment Used***

Test Standard	BS EN 13032-1:2004 Clause 6.1.2
Equipment Used	1.8m diameter 4π Sphere-spectroradiometer (180)
Reference Standard Used	SCL-1400-F124
Standard Traceability	NIST-RF0816
Power Supply	Stabilised 240V AC 50Hz
Power Measurement	3 phase power analyser (280)
Temperature Measurement	Thermocouple reader (143)
Service conversion factor (K_T)	Unspecified

Table 10. ***Lamp Conditioning and Setup at 0 Hours***

Lamp ageing Time (Hrs)	N/A
Stabilisation Time (Hrs)	1.5
Total Operating Time (Hrs)	1.67
Support Structure	Suspended
Orientation in Test	Downwards

Continued on following page

Table 11. ***Colorimetry Results at 0 Hours***

		Sample ID					
		BLPDW60X60CWF		BLPSM60X60CWF		BLP6012CWF	
		A1	A2	A4	A5	A6	A7
COLORIMETRY	x coordinate	0.3153	0.3166	0.3131	0.3112	0.3150	0.3155
	y coordinate	0.3433	0.3451	0.3325	0.3305	0.3374	0.3383
	u coordinate	0.1944	0.1946	0.1968	0.1962	0.1963	0.1963
	v coordinate	0.3174	0.3182	0.3135	0.3126	0.3154	0.3158
	u' coordinate	0.1944	0.1946	0.1968	0.1962	0.1963	0.1963
	v' coordinate	0.4761	0.4773	0.4703	0.4689	0.4731	0.4736
	Dominant Wavelength (nm)	559.0	561.0	556.3	503.7	562.0	563.0
	Purity (%)	4.8	5.8	1.0	0.5	3.0	3.4
	Colour Temperature (K)	6284	6211	6460	6577	6331	6299
	Ra (%)	81.9	81.7	82.5	82.6	80.9	80.8
	R1 (%)	79.3	78.9	80.2	80.3	78.1	77.9
	R2 (%)	90.6	90.2	86.9	87.1	86.2	86.0
	R3 (%)	94.2	94.2	90.9	91.0	90.8	90.8
	R4 (%)	76.0	76.0	82.2	82.1	79.4	79.3
	R5 (%)	79.1	78.8	81.1	81.2	78.6	78.5
	R6 (%)	85.6	85.2	81.4	81.5	79.8	79.7
	R7 (%)	85.7	85.8	88.1	88.1	87.5	87.4
	R8 (%)	64.9	64.5	69.1	69.3	66.6	66.4
	R9 (%)	-1.3	-2.6	3.7	4.0	-2.9	-3.5
	R10 (%)	76.9	76.1	68.4	68.8	66.5	66.3
	R11 (%)	74.9	74.8	81.2	81.2	77.8	77.8
	R12 (%)	55.9	55.6	58.4	58.2	51.7	51.8
	R13 (%)	83.1	82.6	82.1	82.3	80.5	80.3
	R14 (%)	97.0	97.0	95.3	95.3	95.3	95.2
	Lumen Output (lm)	2780	2816	3269	3351	6486	6644
OPERATING CONDITIONS	Ambient Temperature (°C)	24.5	24.0	24.5	24.4	24.3	24.3
	Voltage (V)	240.2	240.0	240.2	240.4	240	240
	Current (mA)	166.45	166.28	162.16	163.90	240.96	242.97
	Power (W)	39.51	38.81	37.91	38.37	57.05	57.47
	Power Factor	0.99	0.97	0.97	0.97	0.99	0.99

Continued on following page

Table 2. ***Colorimetry Results at 1000 Hours***

	Sample ID	BLPDW60X60CWF A1	BLPDW60X60CWF A2
COLORIMETRY	x coordinate	0.3113	0.3118
	y coordinate	0.3386	0.3395
	u coordinate	0.1933	0.1934
	v coordinate	0.3154	0.3158
	u' coordinate	0.1933	0.1934
	v' coordinate	0.4731	0.4737
	Dominant Wavelength (nm)	543.0	547.0
	Purity (%)	2.3	2.7
	Colour Temperature (K)	6510	6475
	Ra (%)	82.2	82.0
	R1 (%)	79.7	79.3
	R2 (%)	90.7	90.2
	R3 (%)	94.1	94.2
	R4 (%)	76.4	76.6
	R5 (%)	79.4	79.2
	R6 (%)	85.6	85.0
	R7 (%)	86.0	86.2
	R8 (%)	65.7	65.5
	R9 (%)	0.1	-1.2
	R10 (%)	77.0	76.0
	R11 (%)	75.4	75.5
	R12 (%)	55.8	55.5
	R13 (%)	83.4	82.9
	R14 (%)	97.0	97.0
	Lumen Output (lm)	2909	2871
OPERATING CONDITIONS	Ambient Temperature (°C)	24.5	24.6
	Voltage (V)	240.1	240.3
	Current (mA)	167.33	167.09
	Power (W)	39.07	39.03
	Power Factor	0.97	0.97

Continued on following page

Table 3. ***Colorimetry Results at 2000 Hours***

	Sample ID	BLPDW60X60CWF A1	BLPDW60X60CWF A2
COLORIMETRY	x coordinate	0.3124	0.3128
	y coordinate	0.3400	0.3407
	u coordinate	0.1936	0.1936
	v coordinate	0.3160	0.3163
	u' coordinate	0.1936	0.1936
	v' coordinate	0.4740	0.4745
	Dominant Wavelength (nm)	550.0	552.0
	Purity (%)	3.3	2.8
	Colour Temperature (K)	6446	6419
	Ra (%)	82.1	82.0
	R1 (%)	79.6	79.3
	R2 (%)	90.8	90.4
	R3 (%)	94.1	94.2
	R4 (%)	76.2	76.3
	R5 (%)	79.3	79.1
	R6 (%)	85.7	85.3
	R7 (%)	85.8	86.0
	R8 (%)	65.4	65.2
	R9 (%)	-0.2	-1.2
	R10 (%)	77.2	76.4
	R11 (%)	75.2	75.2
	R12 (%)	55.8	55.5
	R13 (%)	83.3	82.9
	R14 (%)	97.0	97.0
	Lumen Output (lm)	2993	2937
OPERATING CONDITIONS	Ambient Temperature (°C)	25.1	25.4
	Voltage (V)	240.0	240.0
	Current (mA)	166.66	167.19
	Power (W)	38.96	39.07
	Power Factor	0.97	0.97

Continued on following page

Table 14. ***Summary of Colorimetry Results***

Sample ID	Measured Value	0 hours	1000 hours	% Maintained (0-100hrs)	2000 hours	% Maintained (0-2000hrs)
BLPDW60X60 CWF A1	Colour Temperature (K)	6284	6510	103.6	6446	102.6
	Ra (%)	81.9	82.2	100.4	82.1	100.2
	Luminous Flux (lm)	2780	2909	104.6	2993	107.7
BLPDW60X60 CWF A2	Colour Temperature (K)	6211	6475	104.3	6419	103.3
	Ra (%)	81.7	82.0	100.4	82.0	100.4
	Luminous Flux (lm)	2816	2871	102.0	2937	104.3

Continued on following page

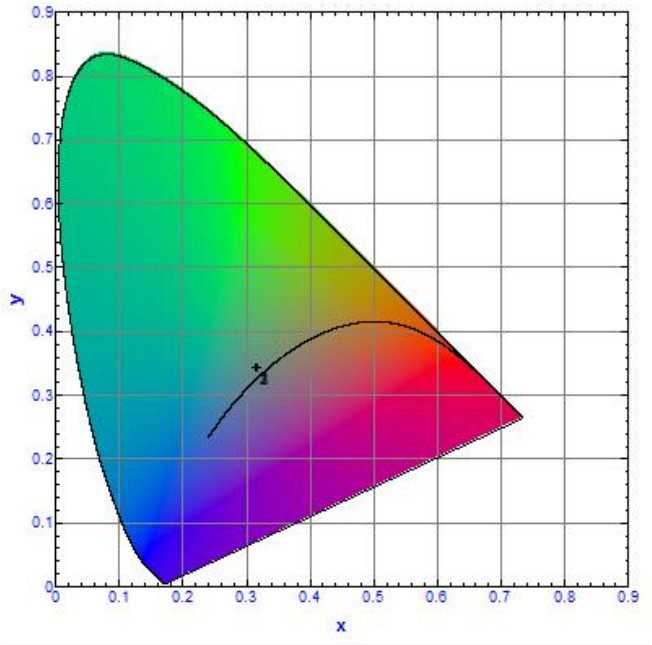


Figure 1. ***CIE 1931 diagram for BLPDW60X60CWF A1***

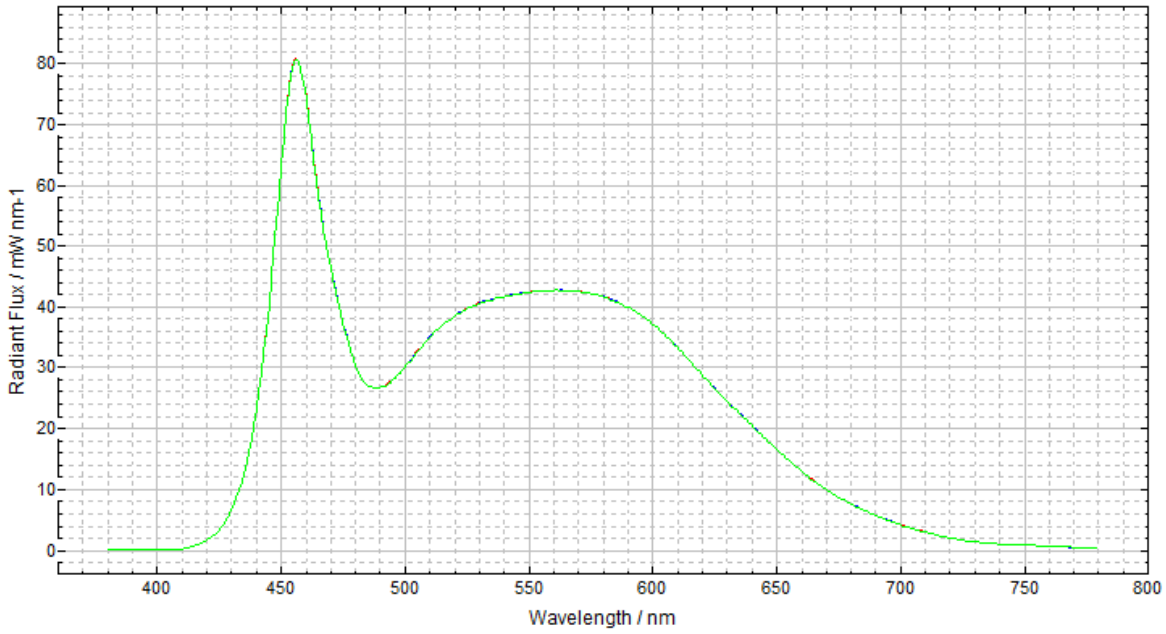


Figure 2. ***Spectral Irradiance for BLPDW60X60CWF A1***

Continued on following page

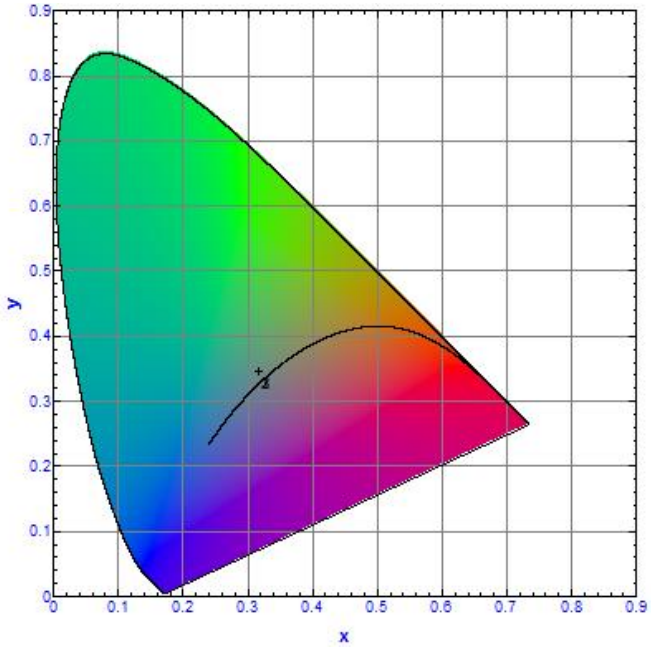


Figure 1. ***CIE 1931 diagram for BLPDW60X60CWF A2***

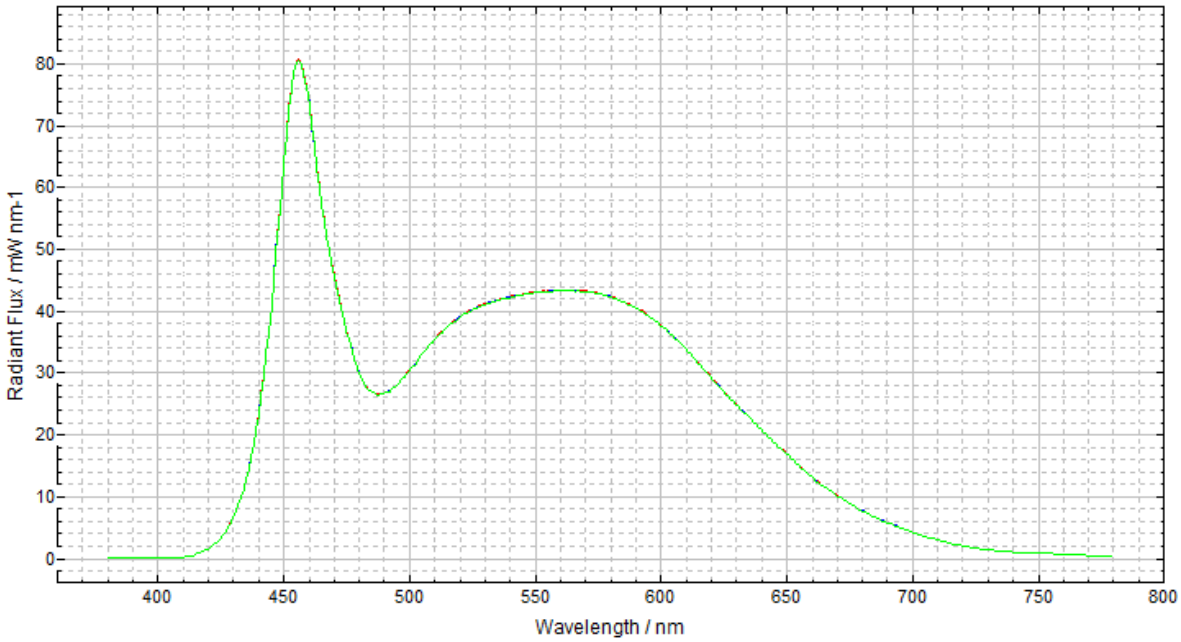


Figure 2. ***Spectral Irradiance for BLPDW60X60CWF A2***

Continued on following page

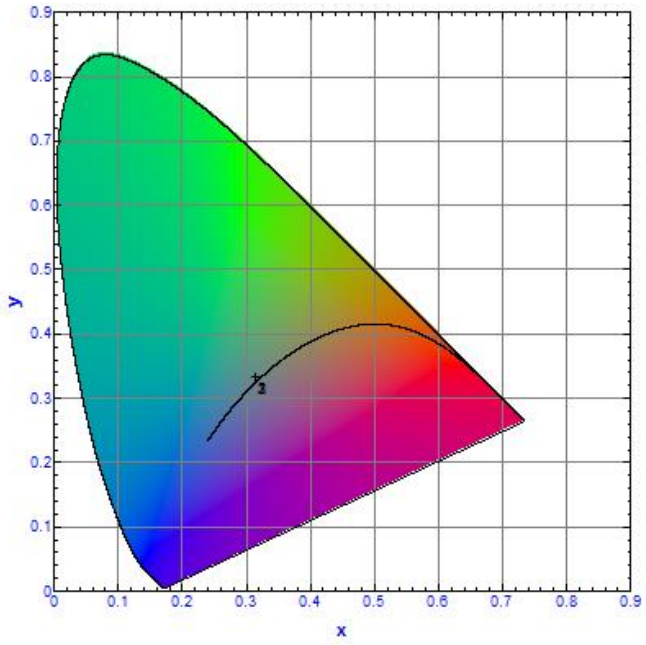


Figure 3. ***CIE 1931 diagram for BLPSM60X60CWF A4***

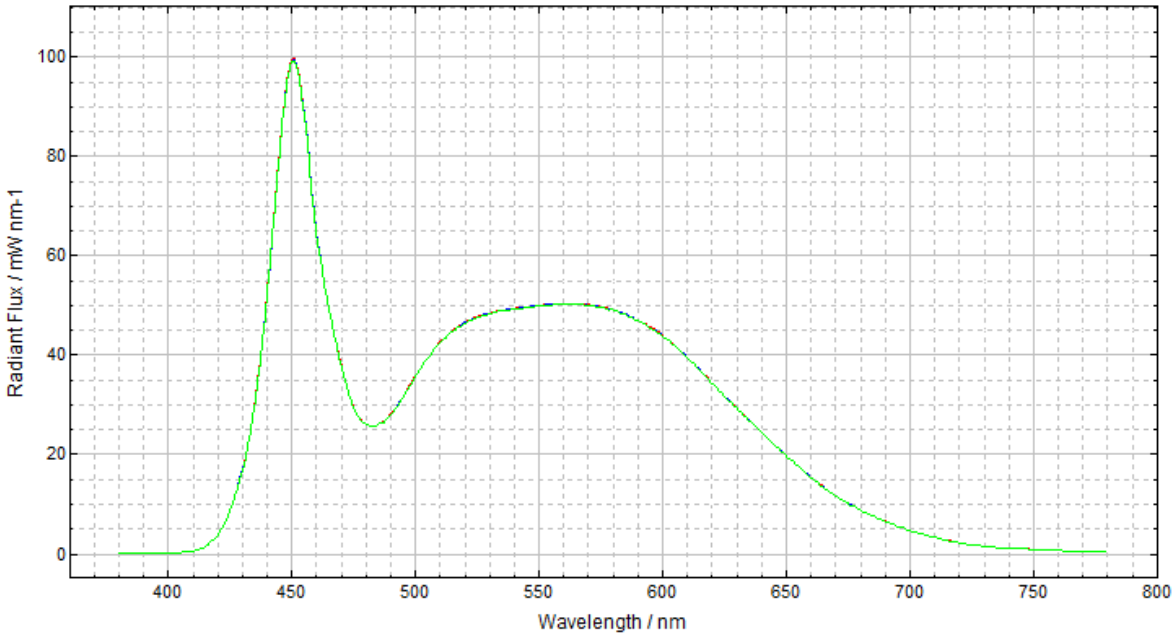


Figure 4. ***Spectral Irradiance for BLPSM60X60CWF A4***

Continued on following page

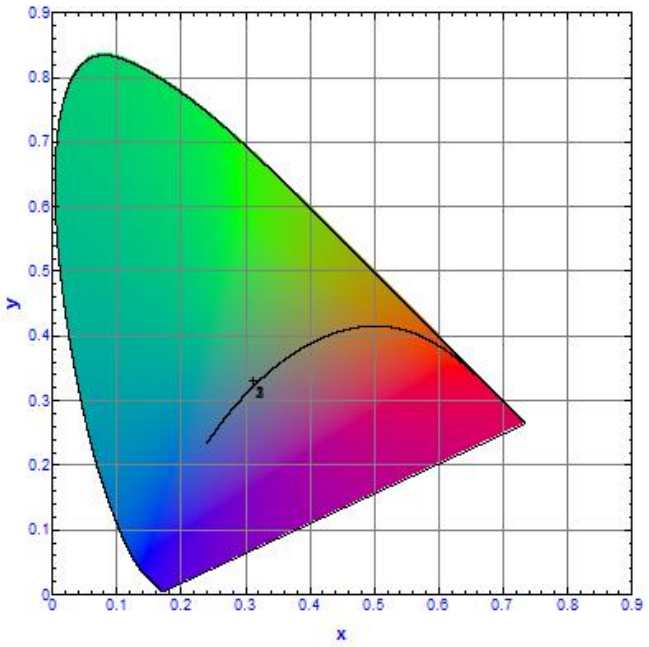


Figure 7. ***CIE 1931 diagram for sample BLPSM60X60CWF A5***

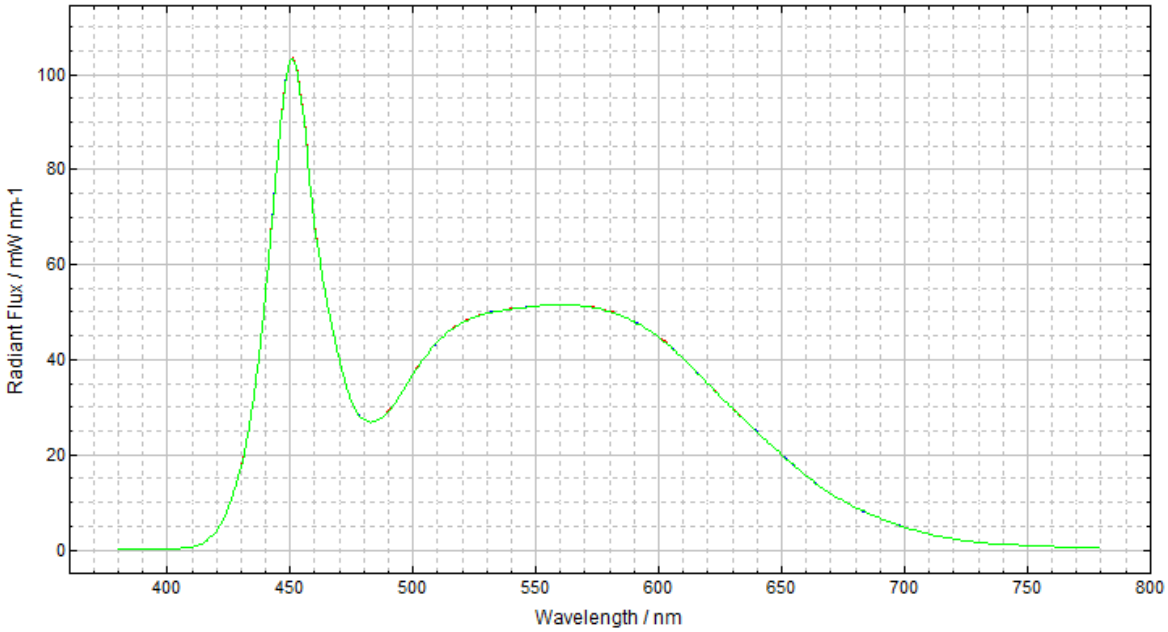


Figure 8. ***Spectral Irradiance for sample BLPSM60X60CWF A5***

Continued on following page

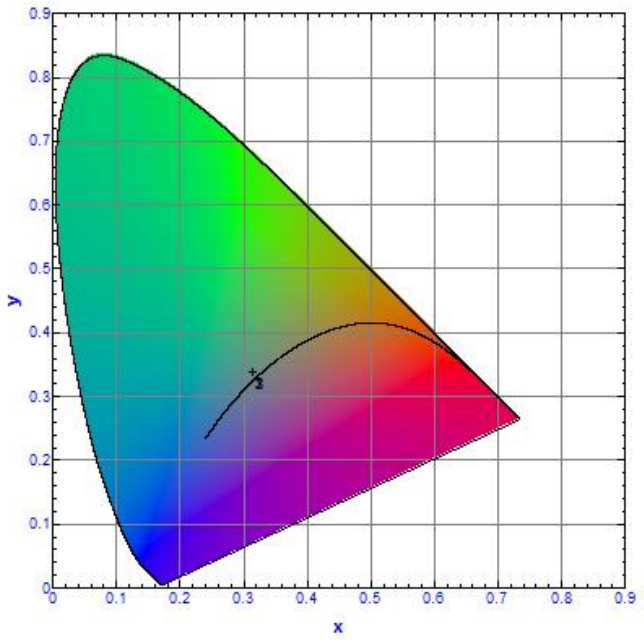


Figure 9. ***CIE 1931 diagram for sample BLP6012CWF A6***

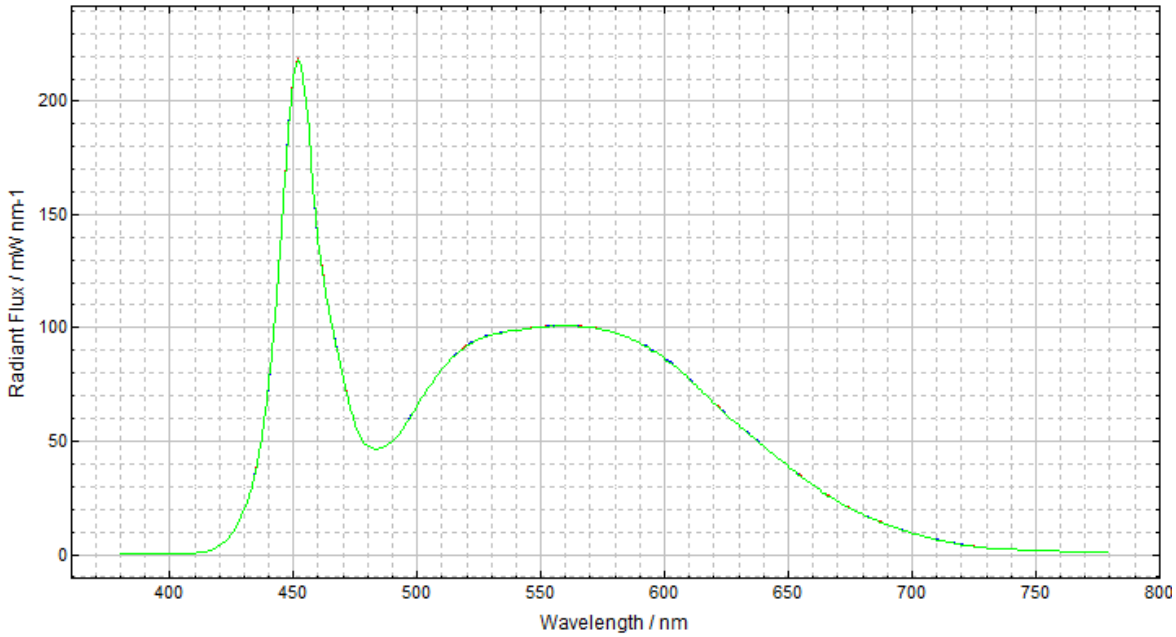


Figure 10. ***Spectral Irradiance for sample BLP6012CWF A6***

Continued on following page

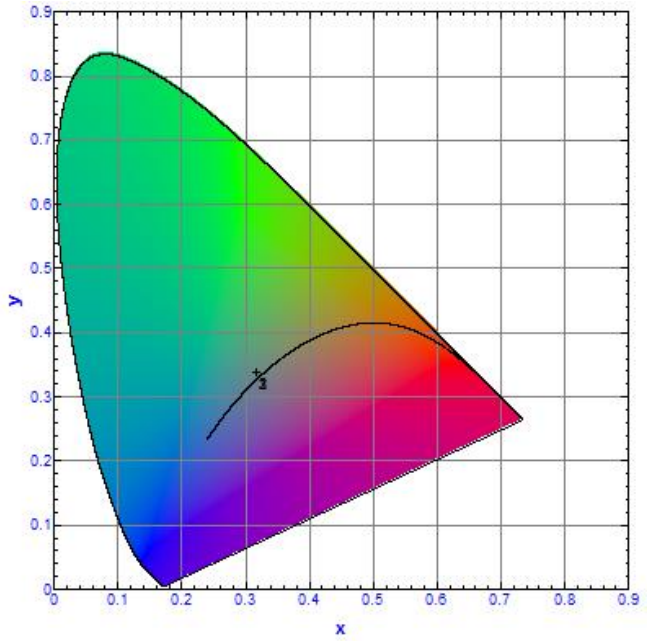


Figure 11. ***CIE 1931 diagram for sample BLP6012CWF A7***

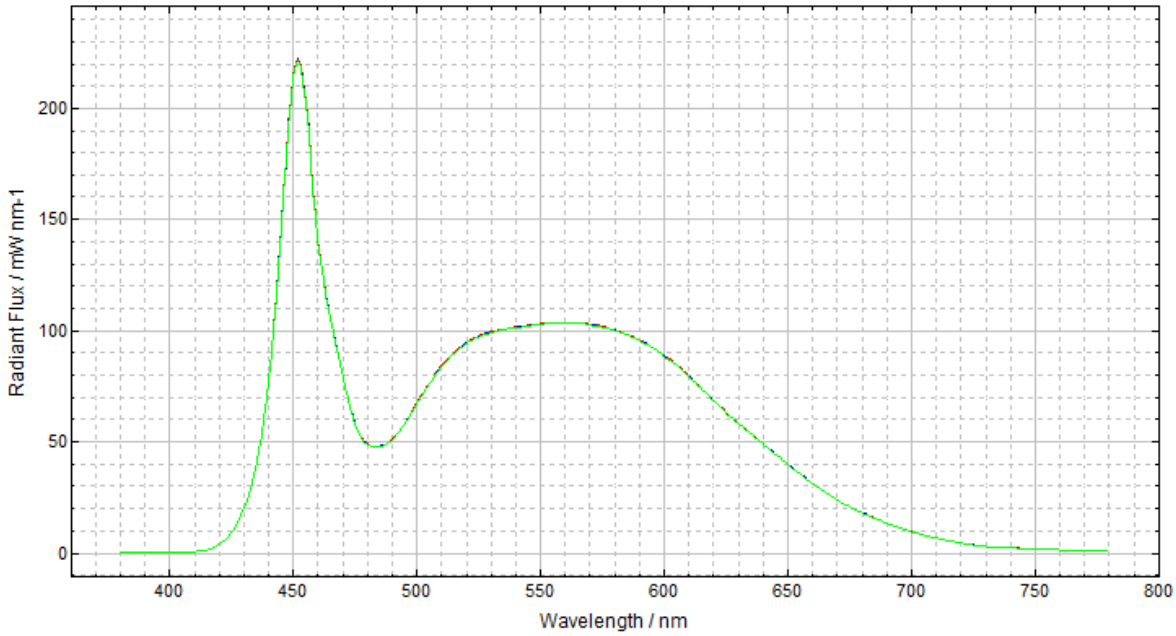


Figure 12. ***Spectral Irradiance for sample BLP6012CWF A7***

Continued on following page

DEVIATION(S) FROM TEST STANDARD

No deviations to report.

MEASUREMENT UNCERTAINTY

The following expanded uncertainties apply to the measurements shown in the results;

Chromaticity x coordinate (x): ±7.0%
Chromaticity y coordinate (y): ±7.0%
Chromaticity u' coordinate (u'): ±7.0%
Chromaticity v' coordinate (v'): ±7.0%
Colour Temperature (K): ±9.08%
Colour Rendering Index (%): ±8.54%
Luminous Flux (lm): ±6.24%

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Continued on following page

SCHEMATIC DIAGRAM & IDENTIFICATION OF PHOTOMETRIC CENTRE

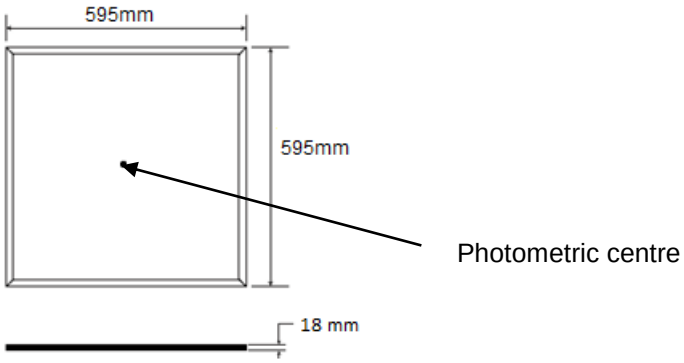


Figure 13. ***Product dimensions and photometric centre - BLPDW60X60CWF & BLPSM60X60CWF***

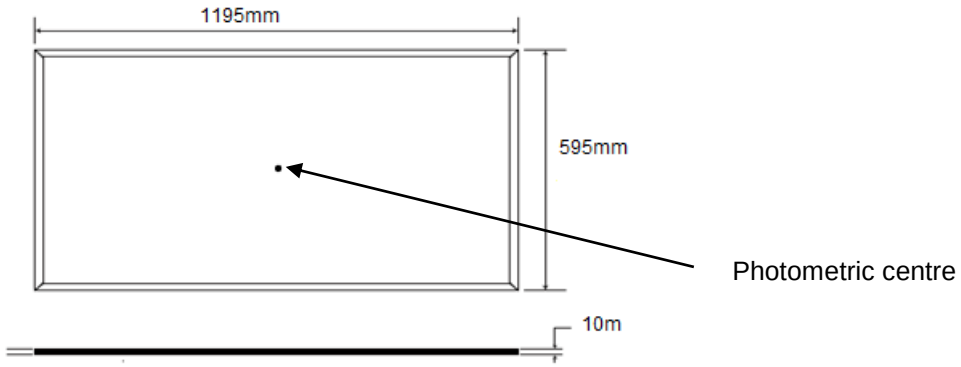


Figure 14. ***Product dimensions and photometric centre - BLP6012CWF***

Continued on following page

ILLUSTRATIONS

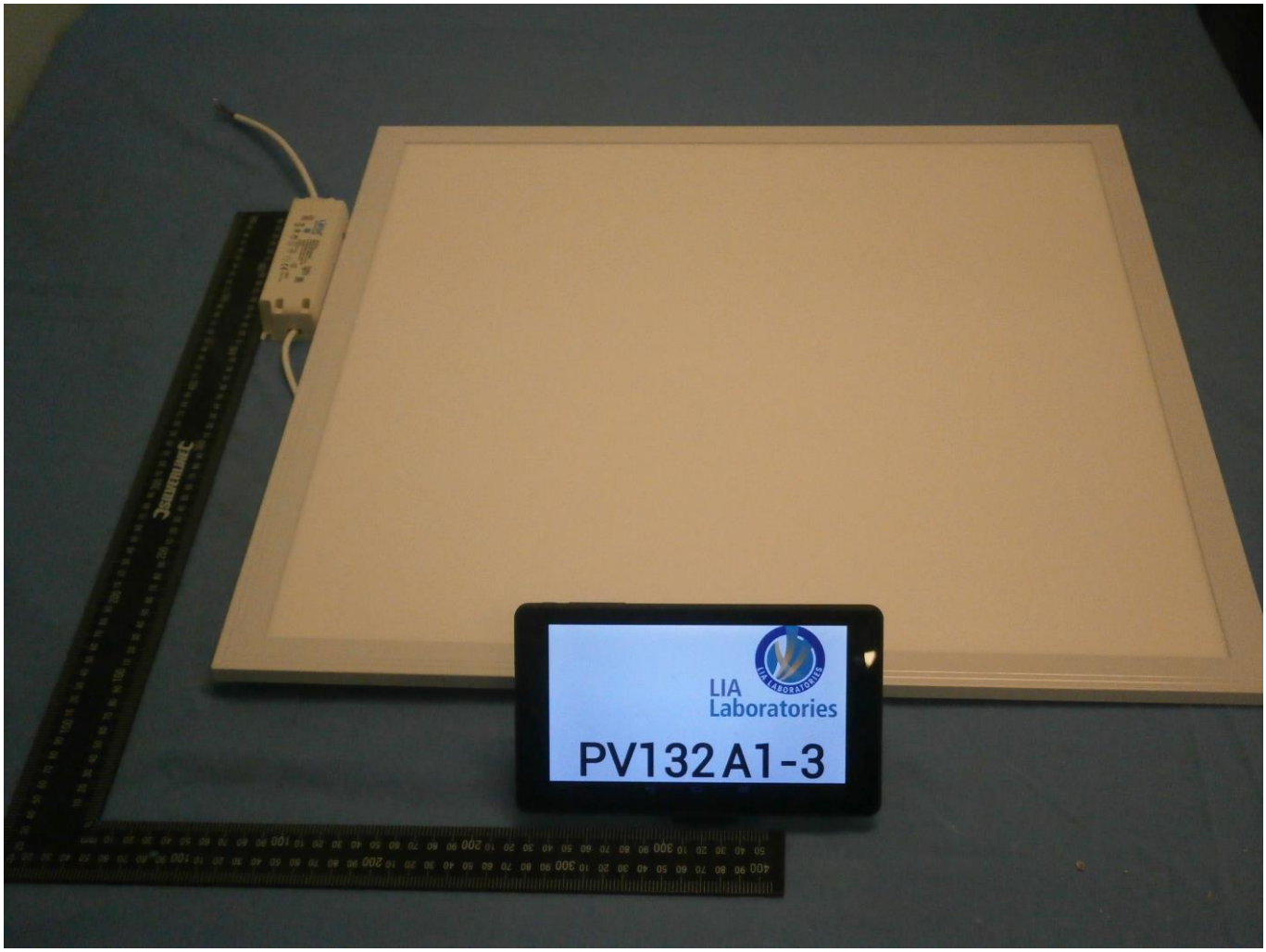


Figure 15. ***Image of sample - BLPDW60X60CWF***

Continued on following page

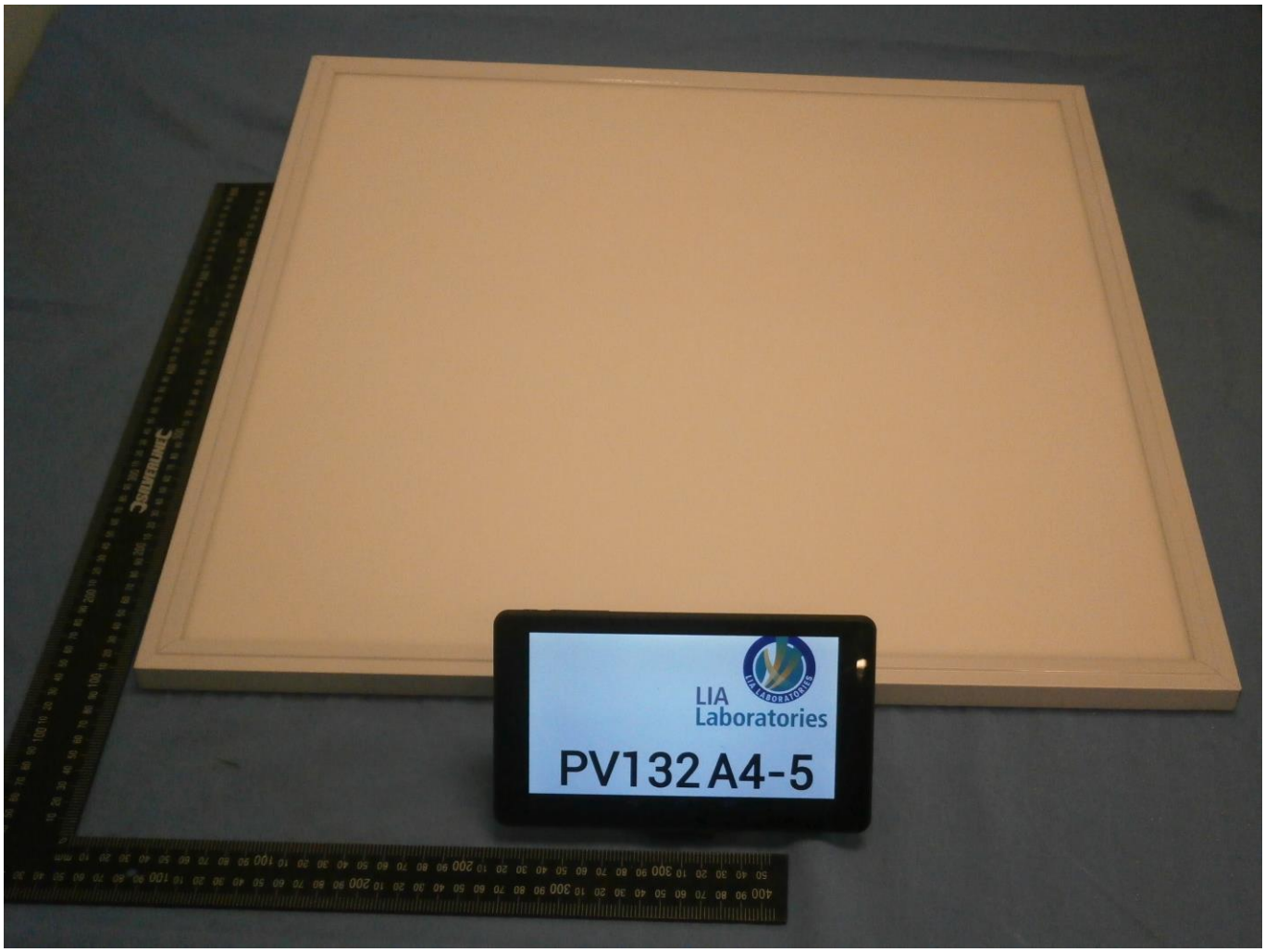


Figure 16. ***Image of sample - BLPSM60X60CWF***

Continued on following page

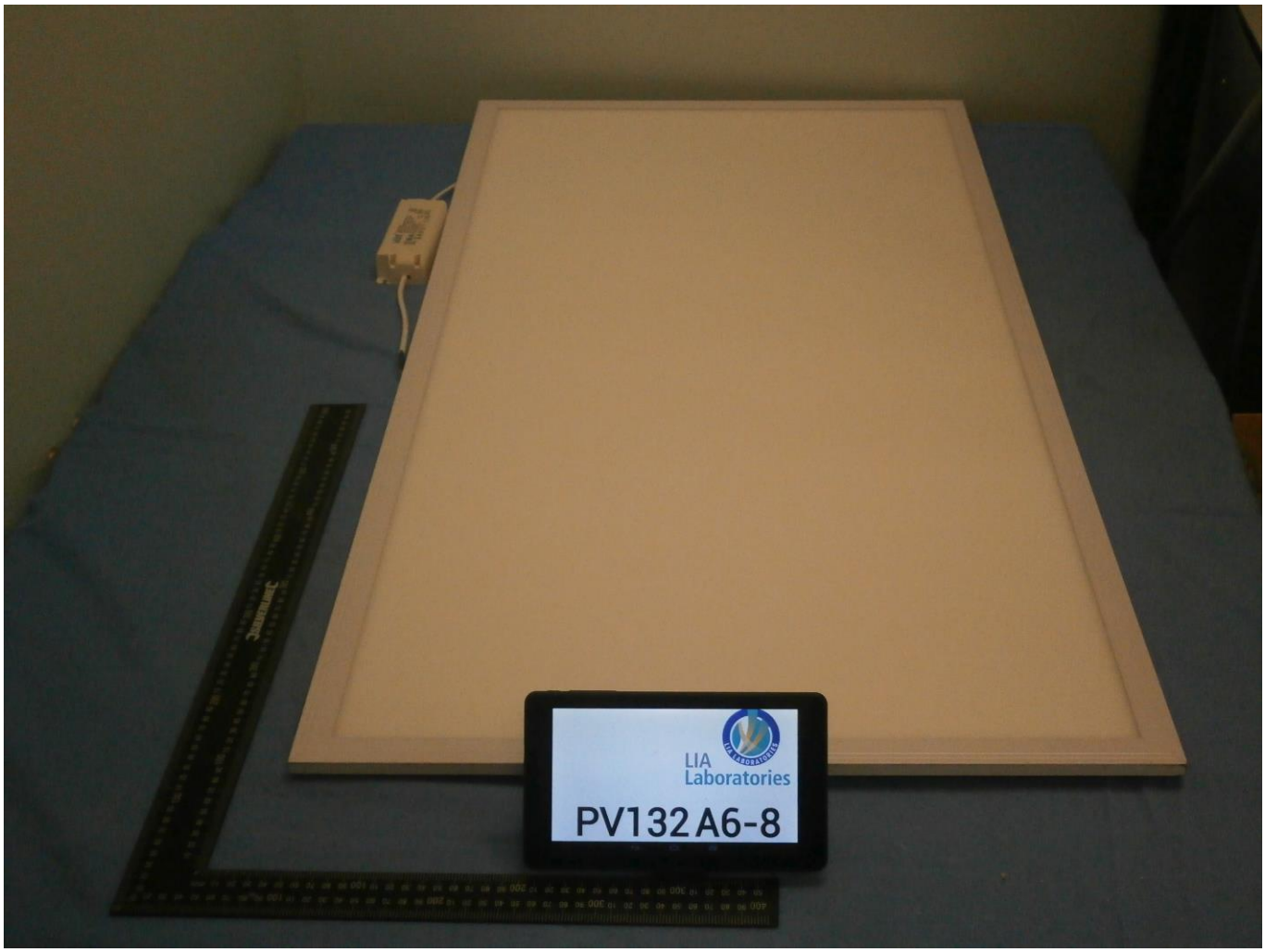


Figure 17. ***Image of sample - BLP6012CWF***

End