



T e s t R e p o r t

Report No : **PV120 Final Report**
Client: : BSS LED Lighting
Unit 5 Ashwood Business Park
Ashington
Northumberland
NE63 0XD
Description : 100W LED Low Bay
Manufacturer : BSS LED Lighting
Type/Models : 80001
Test Specification : As per test report
Date Testing Started : 17/02/15
Date of Issue : 26/06/15
Date of Expiry : 25/06/20

Tested by: **S. RICHARDS**
Position: Photometrics Engineer

A handwritten signature in purple ink, appearing to read 'S. Richards'.

Approved by: **J. ADAMS**
Position: Laboratory Supervisor

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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

Product Description	100W LED Low Bay
Model No.	80001
Number of Samples	Three
Condition on Receipt	Good
Nominal Dimensions	L. 605mm; H. 190mm; W. 320mm
Classification	Class I
Product Supply Requirement	240V AC 50Hz
Lamp Type and Power	LED 100W

Table 2. Test Sample Details

Sample ID	Safety Test	Life Test	Beam Angle	Colorimetry & Luminous Flux
001*		✓	N/A	✓
002*		✓	N/A	✓
003	✓			

** CIE 1931 Diagram and Spectral Irradiance curve shown for these samples only*

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

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SAFETY TEST

Table 3. Safety Test Procedure and Equipment Used

Test Standard	IEC 60598-1:2008 and IEC 60598-2-1:1989
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 4. Safety Test Results

Clause No.	Title	Sample ID	Pass/Fail
1.3	Marking	003	PASS
1.4	Construction	003	PASS
1.8	Protection against Electric Shock	003	PASS
1.10	Insulation Resistance and Electric Strength, Touch Current and Protective Conductor Current	003	PASS
1.11	Creepage Distances and Clearances	003	PASS
1.12.4	Thermal Test Only (Normal Operation)	003	PASS

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LIFE TEST

Table 5. 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 6. Details of Failures

Sample ID	Age at failure (Hours)
001	N/A
002	N/A

Note: NA indicates lamp is still functioning

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LUMINOUS FLUX & COLORIMETRY

Table 7. Test Procedure and Equipment Used

Test Standard	BS EN 13032-1:2004 Clause 6.1.2
Equipment Used	1.8m diameter 4 π Integrating Sphere (105)
Reference Standard Used	SCL-1400 F124
Standard Traceability	NIST-RF0816
Power Supply	Stabilised 240V AC
Power Measurement	3 Phase Power Analyser (280)
Temperature Measurement	Testo925 Thermocouple reader (143)
Service conversion factor (K_T)	Unspecified

Table 8. Lamp Conditioning and Setup at 0 Hours

Sample ID	001	002
Lamp ageing Time (Hrs)	N/A	N/A
Stabilisation Time (Hrs)	1.5	1.5
Total Operating Time (Hrs)	1.67	1.67
Support Structure	None	
Orientation in Test	Downwards	

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Table 9. Colorimetry Results at 0 Hours

Sample ID		001	002
COLORIMETRY	x coordinate	0.3331	0.3337
	y coordinate	0.3348	0.3356
	u coordinate	0.2098	0.2099
	v coordinate	0.3163	0.3166
	u' coordinate	0.2098	0.2099
	v' coordinate	0.4744	0.4749
	Dominant Wavelength (nm)	593.0	592.0
	Purity (%)	7.3	7.7
	Colour Temperature (K)	5467	5438
	Ra (%)	87.1	87.0
	R1 (%)	87.3	87.1
	R2 (%)	92.1	91.9
	R3 (%)	93.2	93.1
	R4 (%)	87.4	87.3
	R5 (%)	87.5	87.4
	R6 (%)	86.4	86.3
	R7 (%)	88.4	88.3
	R8 (%)	74.8	74.6
	R9 (%)	29.6	29.0
	R10 (%)	79.5	79.2
R11 (%)	87.0	86.9	
R12 (%)	67.7	67.7	
R13 (%)	88.9	88.6	
R14 (%)	96.4	96.4	
Lumen Output (lm)	12820	13015	
OPERATING CONDITIONS	Ambient Temperature	25.9	24.9
	Voltage, V	240.1	240.4
	Current, mA	434.16	429.15
	Power, W	101.71	100.55
	Power Factor	0.98	0.97

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Table 10. Colorimetry Results at 100 Hours

Sample ID		001	002
COLORIMETRY	x coordinate	0.3335	0.3334
	y coordinate	0.3357	0.3355
	u coordinate	0.2097	0.2097
	v coordinate	0.3166	0.3166
	u' coordinate	0.2097	0.2097
	v' coordinate	0.4749	0.4749
	Dominant Wavelength (nm)	591.0	592.0
	Purity (%)	7.7	7.6
	Colour Temperature (K)	5450	5454
	Ra (%)	86.9	87.0
	R1 (%)	87.0	87.1
	R2 (%)	91.9	92.0
	R3 (%)	93.1	93.2
	R4 (%)	87.2	87.2
	R5 (%)	87.2	87.3
	R6 (%)	86.2	86.3
	R7 (%)	88.3	88.3
	R8 (%)	74.5	74.5
	R9 (%)	28.6	28.8
	R10 (%)	79.1	79.4
	R11 (%)	86.8	86.8
R12 (%)	67.5	67.5	
R13 (%)	88.6	88.7	
R14 (%)	96.4	96.5	
Lumen Output (lm)	12960	12985	
OPERATING CONDITIONS	Ambient Temperature	24.7	24.7
	Voltage, V	240.0	240.0
	Current, mA	436.45	432.50
	Power, W	102.27	101.51
	Power Factor	0.98	0.98

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Table 11. Colorimetry Results at 2000 Hours

Sample ID		001	002
COLORIMETRY	x coordinate	0.3335	0.3336
	y coordinate	0.3359	0.3362
	u coordinate	0.2096	0.2096
	v coordinate	0.3167	0.3168
	u' coordinate	0.2096	0.2096
	v' coordinate	0.4750	0.4752
	Dominant Wavelength (nm)	591.0	590.7
	Purity (%)	7.7	7.9
	Colour Temperature (K)	5450	5442
	Ra (%)	86.8	86.8
	R1 (%)	86.8	86.8
	R2 (%)	91.8	91.8
	R3 (%)	93.1	93.1
	R4 (%)	87.1	87.0
	R5 (%)	87.1	87.1
	R6 (%)	86.2	86.2
	R7 (%)	88.3	88.2
	R8 (%)	74.2	74.2
	R9 (%)	28.0	27.8
	R10 (%)	79.0	78.9
R11 (%)	86.6	86.6	
R12 (%)	67.4	67.3	
R13 (%)	88.4	88.4	
R14 (%)	96.4	96.4	
Lumen Output (lm)	13046	13200	
OPERATING CONDITIONS	Ambient Temperature	26.8	26.8
	Voltage, V	240.0	240.0
	Current, mA	435.27	433.55
	Power, W	102.12	101.92
	Power Factor	0.98	0.98

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Table 12. Summary of Colorimetry Results

Sample ID	Measured Value	0 hours	100 hours	% Maintained (0-100hrs)	2000 hours	% Maintained (0-2000hrs)
001	Colour Temperature (K)	5467	5450	99.7	5450	99.7
	Ra (%)	87.1	86.9	99.8	86.8	99.7
	Luminous Flux (lm)	12820	12960	101.1	13046	101.8
002	Colour Temperature (K)	5438	5454	100.3	5442	100.1
	Ra (%)	87.0	87.0	100.0	86.8	99.8
	Luminous Flux (lm)	13015	12985	99.8	13200	101.4

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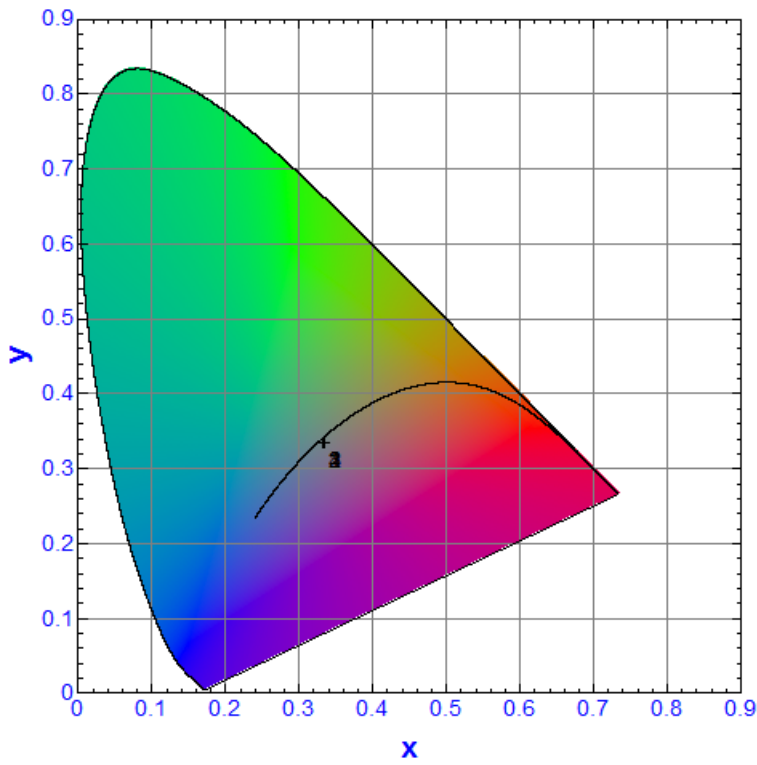


Figure 1. *CIE 1931 diagram for Sample 001*

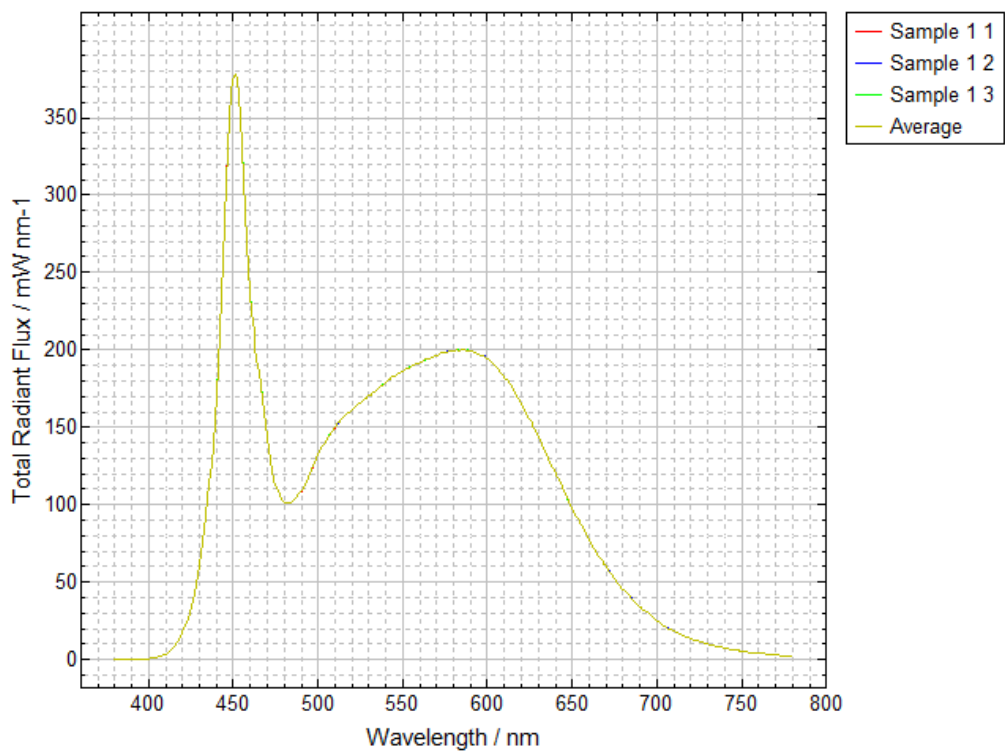


Figure 2. *Spectral Irradiance for Sample 001*

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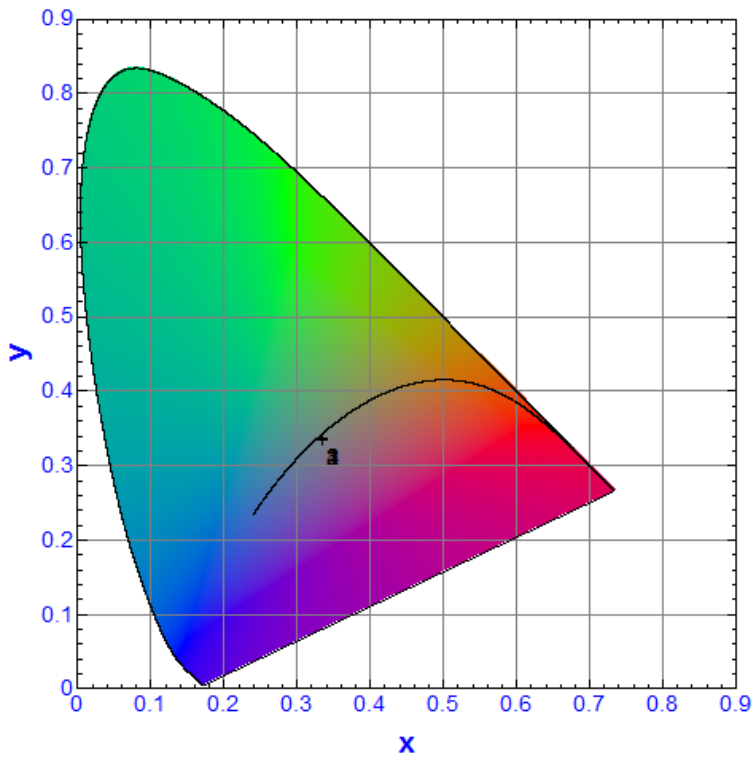


Figure 3. *CIE 1931 diagram for Sample 002*

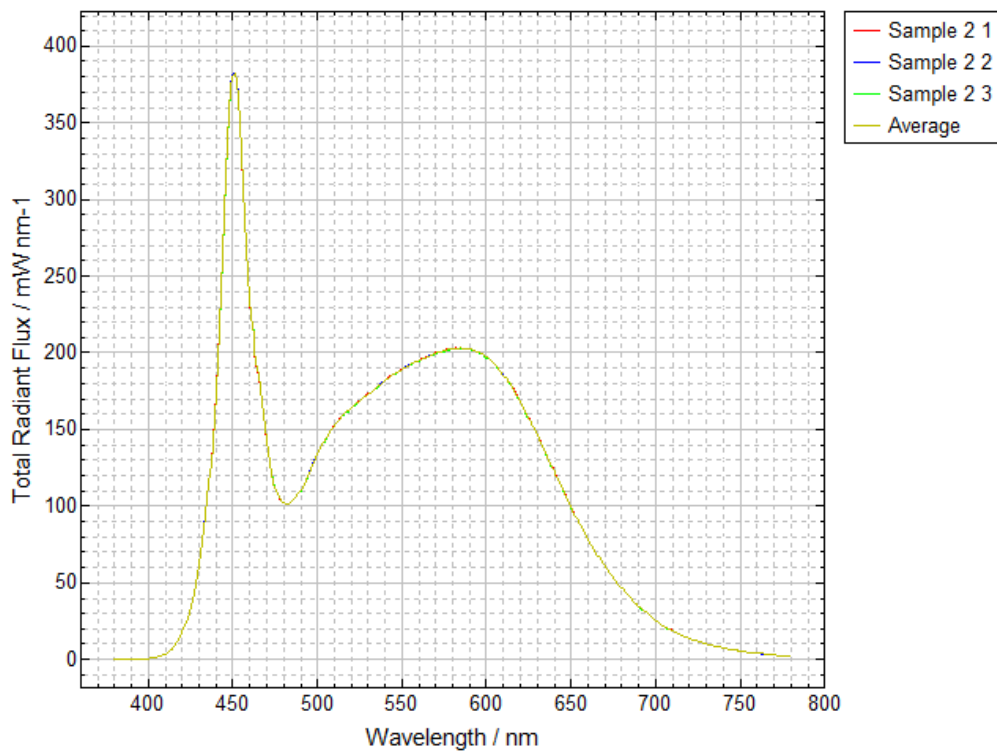


Figure 4. *Spectral Irradiance for Sample 002*

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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): $\pm 6.71\%$
Chromaticity y coordinate (y): $\pm 6.71\%$
Chromaticity u' coordinate (u'): $\pm 6.71\%$
Chromaticity v' coordinate (v'): $\pm 6.71\%$
Colour Temperature (K): $\pm 8.85\%$
Colour Rendering Index (%): $\pm 8.30\%$
Luminous Flux (lm): $\pm 5.91\%$

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.

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SCHEMATIC DIAGRAM & IDENTIFICATION OF PHOTOMETRIC CENTRE

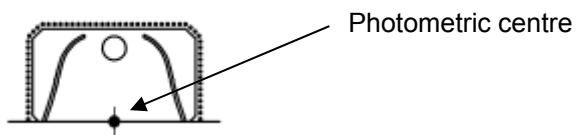


Figure 5. *Product photometric centre*

ILLUSTRATION



Figure 6. *Image of tested samples*

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