



REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: January 11, 2016

REPORT NO. 102406056LAX-011

TEST OF ONE BRILLIANT 3000K 80CRI 7.5W 25 DEGREE

MODEL NO. SM16GW-07-25D-830-03-S3

RENDERED TO

SORAA INC
6500 KAISER DR
FREMONT, CA 94555-3661

TEST: Electrical and Photometric tests as required to the IESNA test standard.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00660665.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number SM16GW-07-25D-830-03-S3. The sample was received by Intertek on December 18, 2015, in undamaged condition and one sample was tested as received. The sample designation was LAN1512180812-001.

DATES OF TESTS: January 6, 2016 through January 7, 2016

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SUMMARY

Model No.:	SM16GW-07-25D-830-03-S3
Description:	Brilliant 3000K 80CRI 7.5W 25 degree

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	512.1	525.6
Total Power (W)	7.710	7.706
Luminaire Efficacy (LPW)	66.42	68.21

Criteria	Result
Power Factor	0.778
Current ATHD %	39.54
Correlated Color Temperature (CCT - K)	2942
Color Rendering Index (CRI - Ra)	85.7
Color Rendering Index (CRI - R9)	16.7
DUV	0.000
Chromaticity Coordinate (x)	0.441
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.253
Chromaticity Coordinate (v')	0.522

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	01/04/16	02/04/16
LabSphere Spectrometer	CDS-3020	000833	01/04/16	02/04/16
California Instruments Power Supply	CSW5550	001338	VBU	VBU
Yokogawa Power Meter	WT333	001319	06/03/15	06/03/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/19/16
Temperature Humidity Meter	971	001180	05/26/15	05/26/16
DC Power Supply	LPS-100-0833	000836	05/07/15	05/07/16
LSI High Speed Mirror Goniometer	6440T	000943	01/07/16	02/07/16
Elgar Power Supply	CW1251	000944	VBU	VBU
Yokogawa Power Analyzer	WT210	000945	12/04/15	12/04/16
Temperature Humidity Meter	971	001180	05/26/15	05/26/16
Extech Instruments Stop Watch	9/23/2900	001379	11/19/15	11/19/16
Tape Measure	C1-25	000915	12/04/15	12/04/16



TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere CDS 3020 Spectrometer and Three Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The calibration of the sphere spectrometer system is traceable to the National Institute of Standards and Technology.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

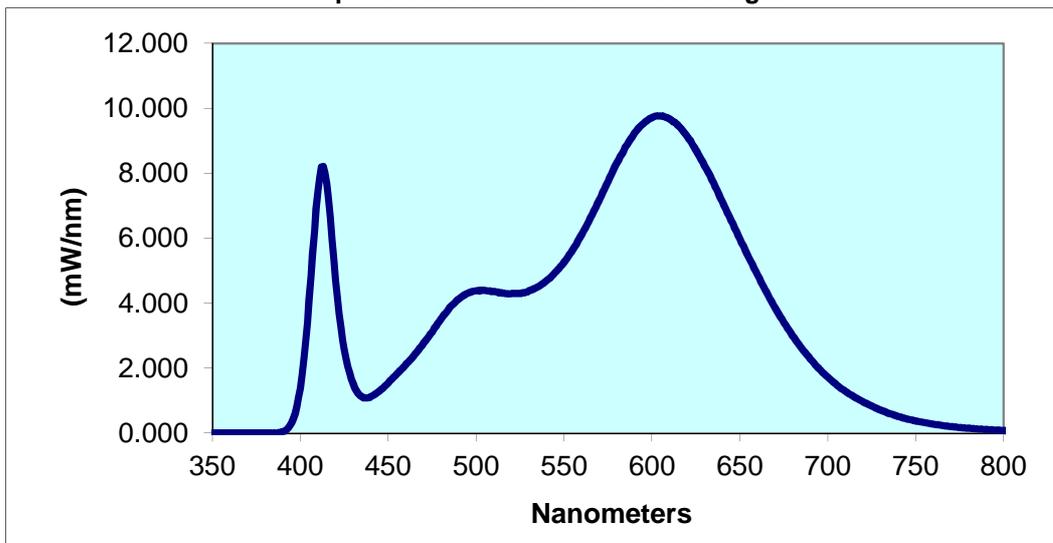
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1512180812-001	UP	230.1	43.08	7.710	0.778	39.54	512.1	66.42

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
2942	85.7	16.7	0.000	0.441	0.405	0.253	0.522

Spectral Distribution over Visible Wavelengths

nm	mW/nm								
350	0.001	440	1.120	530	4.382	620	9.133	710	1.290
355	0.001	445	1.298	535	4.500	625	8.711	715	1.115
360	0.001	450	1.548	540	4.697	630	8.230	720	0.965
365	0.001	455	1.828	545	4.951	635	7.696	725	0.833
370	0.001	460	2.115	550	5.260	640	7.128	730	0.709
375	0.001	465	2.418	555	5.658	645	6.543	735	0.605
380	0.001	470	2.760	560	6.113	650	5.972	740	0.516
385	0.007	475	3.121	565	6.631	655	5.412	745	0.438
390	0.046	480	3.515	570	7.189	660	4.874	750	0.378
395	0.325	485	3.871	575	7.750	665	4.344	755	0.324
400	1.389	490	4.130	580	8.316	670	3.857	760	0.277
405	4.089	495	4.310	585	8.822	675	3.401	765	0.236
410	7.503	500	4.386	590	9.239	680	2.992	770	0.202
415	7.683	505	4.393	595	9.525	685	2.620	775	0.172
420	4.721	510	4.353	600	9.715	690	2.284	780	0.149
425	2.574	515	4.311	605	9.762	695	1.983		
430	1.522	520	4.293	610	9.675	700	1.723		
435	1.119	525	4.301	615	9.469	705	1.489		

Spectral Data Over Visible Wavelengths



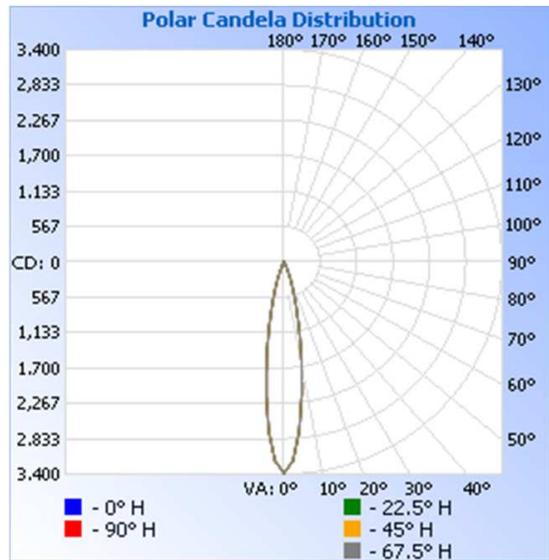
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
LAN1512180812-001	UP	230.0	43.10	7.706	0.777	525.6	68.21

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3383	3383	3383	3383	3383
5	2720	2720	2720	2720	2720
10	1570	1570	1570	1570	1570
15	723	723	723	723	723
20	302	302	302	302	302
25	89	89	89	89	89
30	36	36	36	36	36
35	22	22	22	22	22
40	17	17	17	17	17
45	15	15	15	15	15
50	13	13	13	13	13
55	10	10	10	10	10
60	8	8	8	8	8
65	6	6	6	6	6
70	4	4	4	4	4
75	3	3	3	3	3
80	1	1	1	1	1
85	1	1	1	1	1
90	0	0	0	0	0



RESULTS OF TEST (cont'd)

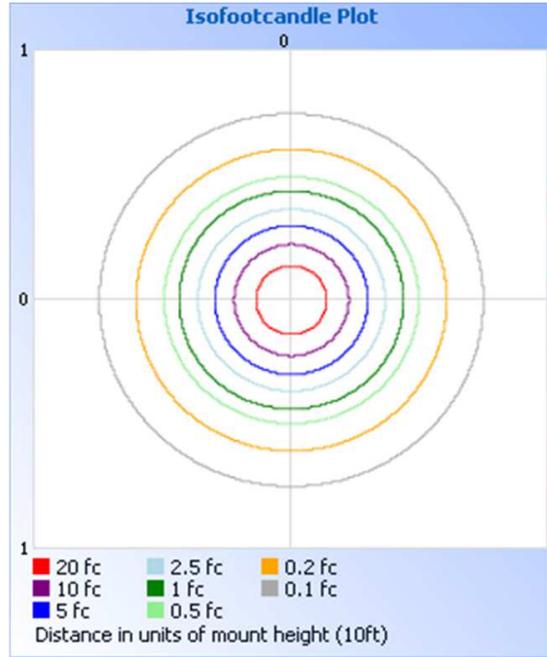
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	480.3	91.4
0-40	494.8	94.2
0-60	515.8	98.1
60-90	9.8	1.9
0-90	525.6	100.0
90-180	0.0	0.0
0-180	525.6	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	219.5	41.8
10-20	209.5	39.9
20-30	51.3	9.8
30-40	14.6	2.8
40-50	11.7	2.2
50-60	9.3	1.8
60-70	6.1	1.2
70-80	2.9	0.6
80-90	0.7	0.1

Flood Summary at 25°C

	Efficiency (%)	Horizontal Lumens	Horizontal Spread (°)	Vertical Spread (°)
Field 10%	80.3	422.2	39.0	39.0
Beam 50%	37.6	197.7	18.9	18.9
Total	100.2	526.8		

PICTURE (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:



Kenda Branch
Lighting Performance Team Lead
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley
Engineer
Lighting Division