REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056 Date: December 28, 2015

REPORT NO. 102406056LAX-010

TEST OF ONE BRILLIANT 2700K 80CRI 7.5W 60 DEGREE

MODEL NO. SM16GW-07-60D-827-03-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-07-60D-827-03-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 LAN1512180812-010.

DATES OF TESTS: December 23, 2015

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SUMMARY

Model No.:	SM16GW-07-60D-827-03-S3
Description:	Brilliant 2700K 80CRI 7.5W 60 degree

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	515.4	531.6
Total Power (W)	7.600	7.611
Luminaire Efficacy (LPW)	67.82	69.85

Criteria	Result
Power Factor	0.756
Current ATHD %	41.44
Correlated Color Temperature (CCT - K)	2635
Color Rendering Index (CRI - Ra)	83.0
Color Rendering Index (CRI - R9)	7.8
DUV	0.001
Chromaticity Coordinate (x)	0.463
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.266
Chromaticity Coordinate (v')	0.527

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	11/30/15	12/30/15
LabSphere Spectrometer	CDS-3020	000834	11/30/15	12/30/15
California Instruments Power Supply	CSW5550	001339	VBU	VBU
Yokogawa Power Meter	WT333	001320	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	12/07/15	01/07/16
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

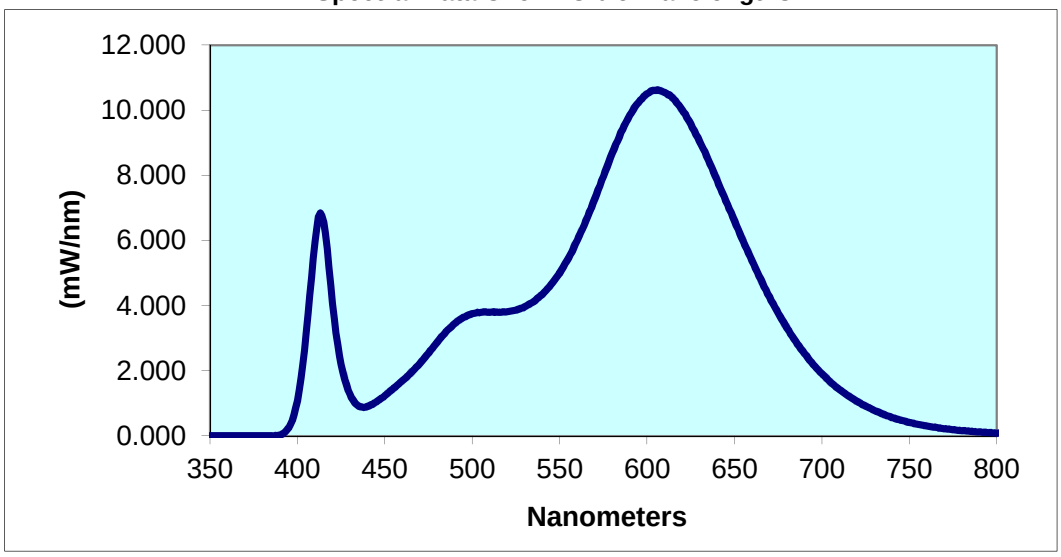
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1512180812-010	UP	230.1	43.75	7.600	0.756	41.44	515.4	67.82

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')
2635	83.0	7.8	0.001	0.463	0.408	0.266	0.527

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.006	440	0.905	530	3.973	620	10.010	710	1.422
355	0.006	445	1.042	535	4.125	625	9.573	715	1.233
360	0.006	450	1.240	540	4.348	630	9.045	720	1.061
365	0.006	455	1.469	545	4.649	635	8.469	725	0.920
370	0.006	460	1.700	550	5.008	640	7.858	730	0.782
375	0.006	465	1.945	555	5.465	645	7.215	735	0.669
380	0.006	470	2.227	560	6.006	650	6.587	740	0.566
385	0.006	475	2.542	565	6.618	655	5.972	745	0.485
390	0.029	480	2.884	570	7.287	660	5.381	750	0.417
395	0.255	485	3.206	575	7.974	665	4.803	755	0.359
400	1.078	490	3.464	580	8.672	670	4.265	760	0.303
405	3.168	495	3.652	585	9.323	675	3.766	765	0.263
410	5.991	500	3.758	590	9.850	680	3.316	770	0.221
415	6.559	505	3.799	595	10.230	685	2.902	775	0.189
420	4.077	510	3.796	600	10.500	690	2.523	780	0.162
425	2.197	515	3.795	605	10.610	695	2.194		
430	1.275	520	3.820	610	10.550	700	1.904		
435	0.913	525	3.862	615	10.360	705	1.642		

Spectral Data Over Visible Wavelengths



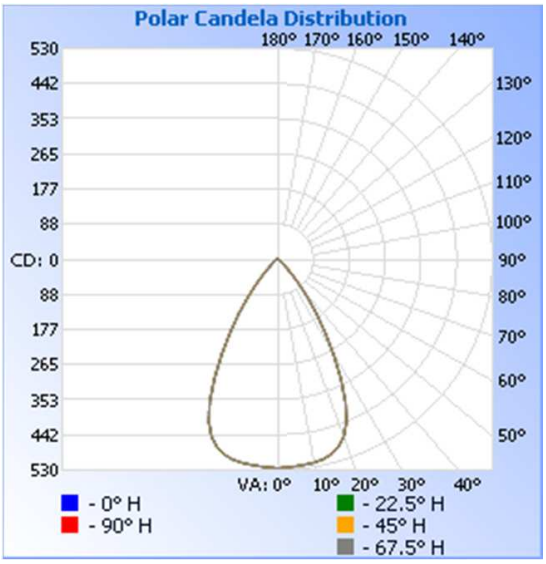
RESULTS OF TEST (cont'd)

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)
LAN1512180812-010	UP	230.0	43.80	7.611	0.755	531.6	69.85

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	525	525	525	525	525
5	522	522	522	522	522
10	518	518	518	518	518
15	508	508	508	508	508
20	475	475	475	475	475
25	396	396	396	396	396
30	275	275	275	275	275
35	167	167	167	167	167
40	87	87	87	87	87
45	38	38	38	38	38
50	19	19	19	19	19
55	13	13	13	13	13
60	10	10	10	10	10
65	7	7	7	7	7
70	6	6	6	6	6
75	4	4	4	4	4
80	2	2	2	2	2
85	1	1	1	1	1
90	0	0	0	0	0

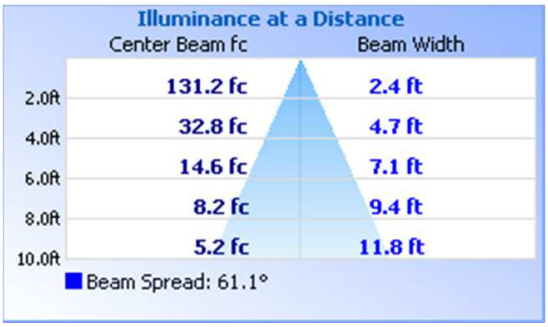


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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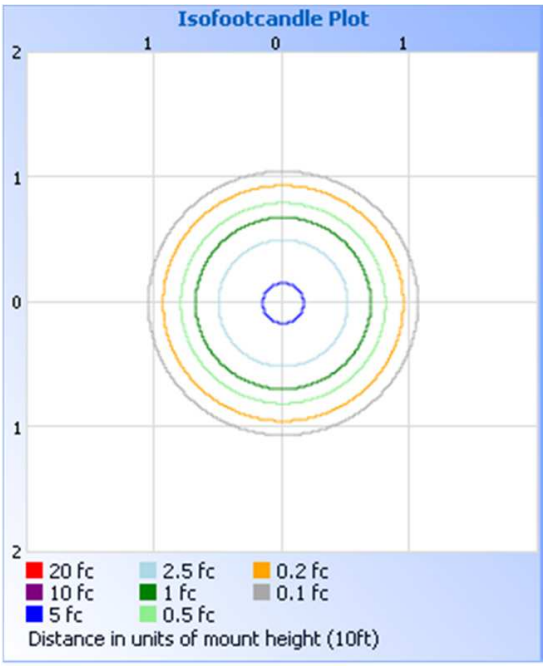

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	368.2	69.3
0-40	473.8	89.1
0-60	519.0	97.6
60-90	12.6	2.4
0-90	531.6	100.0
90-180	0.0	0.0
0-180	531.6	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	49.7	9.4
10-20	142.1	26.7
20-30	176.4	33.2
30-40	105.7	19.9
40-50	33.3	6.3
50-60	11.8	2.2
60-70	7.3	1.4
70-80	4.2	0.8
80-90	1.2	0.2

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:

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Technician
Lighting Division

Report Reviewed By:

Kenda Branch
Lighting Performance Team Lead
Lighting Division

Attachment: None