REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056 Date: December 28, 2015

REPORT NO. 102406056LAX-002

TEST OF ONE BRILLIANT 2700K 80CRI 7.5W 36 DEGREE

MODEL NO. SM16GW-07-36D-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-07-36D-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 LAN1512180812-002.

DATES OF TESTS: December 22, 2015

SUMMARY

Model No.:	SM16GW-07-36D-827-03-S3
Description:	Brilliant 2700K 80CRI 7.5W 36 degree

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	532.0	533.3
Total Power (W)	7.670	7.682
Luminaire Efficacy (LPW)	69.36	69.42

Criteria	Result
Power Factor	0.775
Current ATHD %	39.62
Correlated Color Temperature (CCT - K)	2648
Color Rendering Index (CRI - Ra)	83.5
Color Rendering Index (CRI - R9)	11.3
DUV	0.002
Chromaticity Coordinate (x)	0.461
Chromaticity Coordinate (y)	0.406
Chromaticity Coordinate (u')	0.265
Chromaticity Coordinate (v')	0.526

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

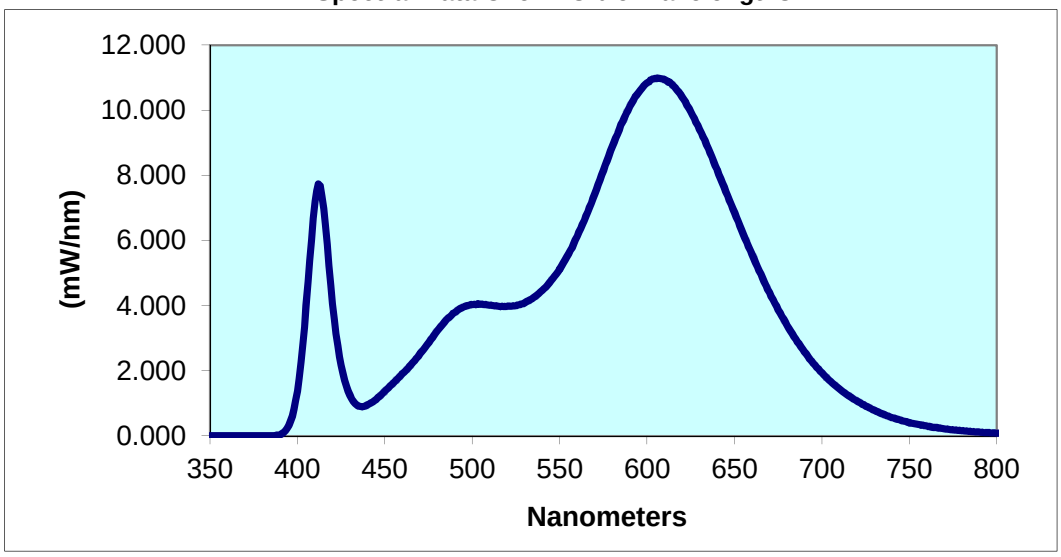
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1512180812-002	UP	230.0	43.07	7.670	0.775	39.62	532.0	69.36

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')
2648	83.5	11.3	0.002	0.461	0.406	0.265	0.526

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.001	440	0.952	530	4.095	620	10.400	710	1.444
355	0.001	445	1.123	535	4.245	625	9.950	715	1.243
360	0.001	450	1.374	540	4.473	630	9.417	720	1.070
365	0.001	455	1.638	545	4.766	635	8.814	725	0.920
370	0.001	460	1.913	550	5.125	640	8.178	730	0.784
375	0.001	465	2.196	555	5.590	645	7.500	735	0.667
380	0.001	470	2.518	560	6.131	650	6.840	740	0.565
385	0.001	475	2.859	565	6.759	655	6.188	745	0.486
390	0.034	480	3.231	570	7.438	660	5.571	750	0.407
395	0.322	485	3.557	575	8.148	665	4.964	755	0.354
400	1.382	490	3.800	580	8.873	670	4.395	760	0.301
405	4.015	495	3.963	585	9.551	675	3.870	765	0.257
410	7.217	500	4.036	590	10.120	680	3.402	770	0.217
415	6.980	505	4.045	595	10.540	685	2.965	775	0.185
420	4.061	510	4.011	600	10.850	690	2.578	780	0.159
425	2.172	515	3.979	605	10.980	695	2.234		
430	1.242	520	3.978	610	10.940	700	1.934		
435	0.920	525	4.002	615	10.760	705	1.671		

Spectral Data Over Visible Wavelengths



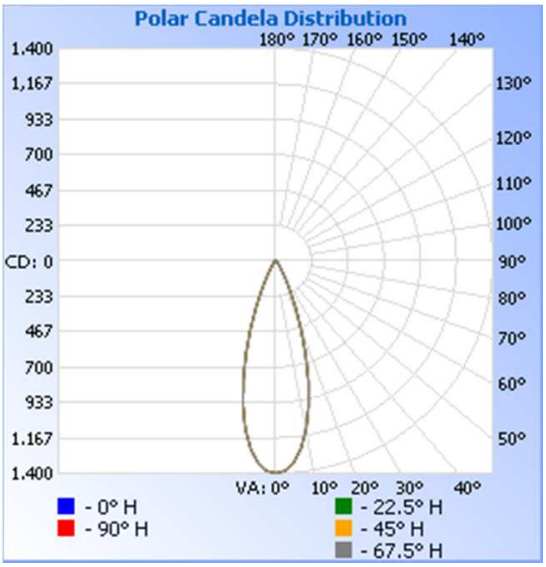
RESULTS OF TEST (cont'd)

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)
LAN1512180812-002	UP	230.0	43.10	7.682	0.774	533.3	69.42

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	1398	1398	1398	1398	1398
5	1332	1332	1332	1332	1332
10	1125	1125	1125	1125	1125
15	811	811	811	811	811
20	477	477	477	477	477
25	228	228	228	228	228
30	100	100	100	100	100
35	49	49	49	49	49
40	31	31	31	31	31
45	23	23	23	23	23
50	18	18	18	18	18
55	15	15	15	15	15
60	13	13	13	13	13
65	11	11	11	11	11
70	9	9	9	9	9
75	6	6	6	6	6
80	3	3	3	3	3
85	1	1	1	1	1
90	0	0	0	0	0

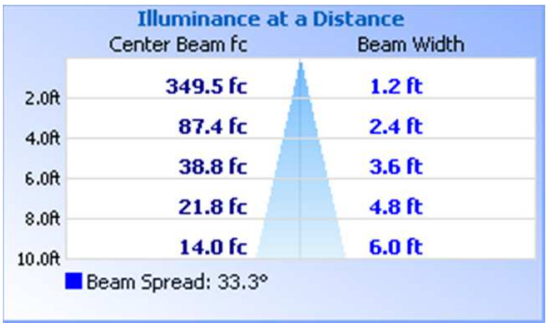


RESULTS OF TEST (cont'd)

Illumination Plots

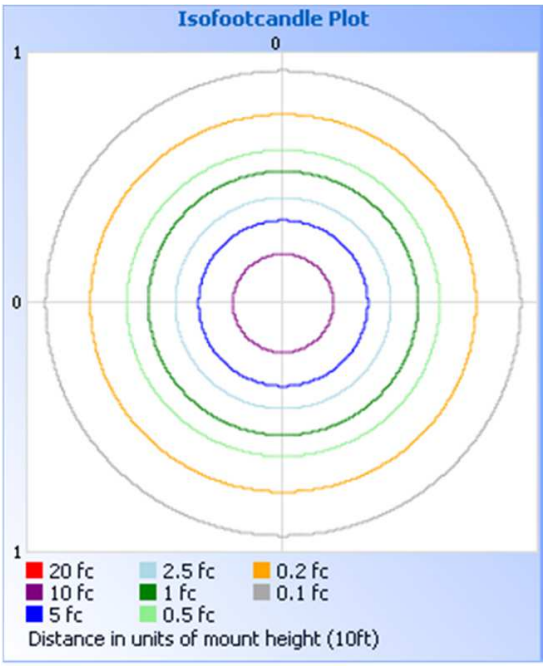
Mounting Height: 10 ft.

Illuminance - Cone of Light



Beam Angle - 33.3

Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	449.1	84.2
0-40	482.8	90.5
0-60	514.8	96.5
60-90	18.5	3.5
0-90	533.3	100.0
90-180	0.1	0.0
0-180	533.3	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	120.2	22.5
10-20	218.3	40.9
20-30	110.7	20.7
30-40	33.7	6.3
40-50	18.2	3.4
50-60	13.8	2.6
60-70	10.9	2.0
70-80	6.1	1.1
80-90	1.5	0.3
90-100	0.1	0.0

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:

Ameet Alawi
Technician
Lighting Division

Report Reviewed By:

Kenda Branch
Lighting Performance Team Lead
Lighting Division

Attachment: None