



# REPORT

25800 COMMERCE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: January 11, 2016

REPORT NO. 102406056LAX-019

TEST OF ONE BRILLIANT 2700K 80CRI 7.5W 10 DEGREE

MODEL NO. SM16GW-07-10D-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-07-10D-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 LAN1512180812-009.

DATES OF TESTS: January 6, 2016 through January 8, 2016.

---

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

## SUMMARY

Model No.:	SM16GW-07-10D-827-03-S3
Description:	Brilliant 2700K 80CRI 7.5W 10 degree

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	463.5	477.4
Total Power (W)	7.620	7.619
Luminaire Efficacy (LPW)	60.83	62.66

Criteria	Result
Power Factor	0.781
Current ATHD %	39.68
Correlated Color Temperature (CCT - K)	2581
Color Rendering Index (CRI - Ra)	82.5
Color Rendering Index (CRI - R9)	6.3
DUV	0.000
Chromaticity Coordinate (x)	0.469
Chromaticity Coordinate (y)	0.412
Chromaticity Coordinate (u')	0.268
Chromaticity Coordinate (v')	0.529

## 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	000834	01/04/16	02/04/16
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	11/16/16
Temp & HR Meter	971	001178	12/18/15	12/18/16
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

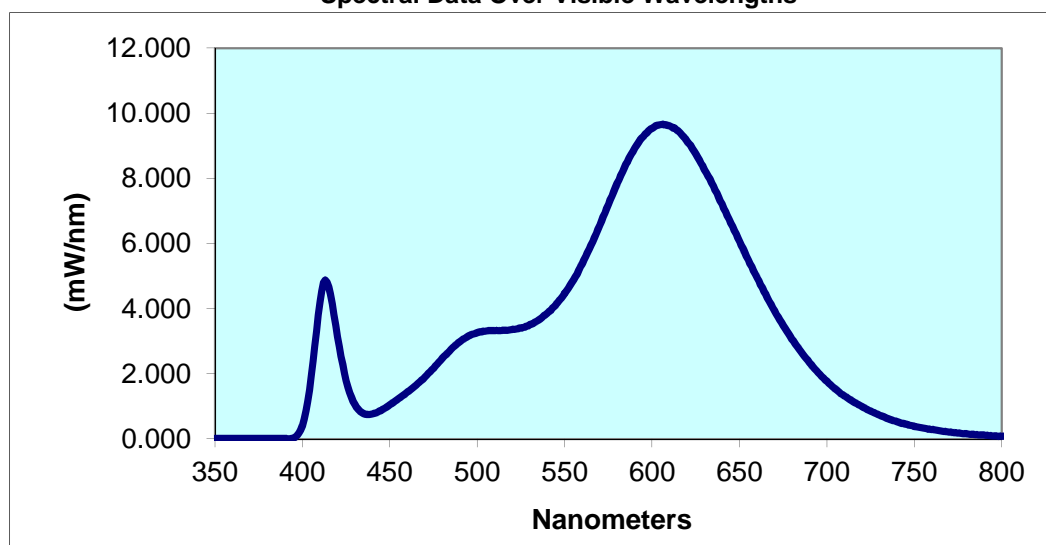
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1512180812-009	UP	230.0	42.41	7.620	0.781	39.68	463.5	60.83

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')
2581	82.5	6.3	0.000	0.469	0.412	0.268	0.529

### Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.009	440	0.769	530	3.508	620	9.133	710	1.318
355	0.009	445	0.875	535	3.650	625	8.748	715	1.145
360	0.009	450	1.055	540	3.861	630	8.268	720	0.990
365	0.009	455	1.238	545	4.133	635	7.758	725	0.857
370	0.009	460	1.443	550	4.472	640	7.209	730	0.730
375	0.009	465	1.653	555	4.884	645	6.627	735	0.624
380	0.009	470	1.898	560	5.380	650	6.060	740	0.532
385	0.009	475	2.173	565	5.953	655	5.498	745	0.456
390	0.009	480	2.476	570	6.566	660	4.957	750	0.389
395	0.034	485	2.755	575	7.203	665	4.431	755	0.335
400	0.419	490	2.988	580	7.847	670	3.934	760	0.288
405	1.916	495	3.163	585	8.438	675	3.480	765	0.247
410	4.231	500	3.265	590	8.930	680	3.062	770	0.211
415	4.662	505	3.318	595	9.293	685	2.685	775	0.180
420	3.145	510	3.324	600	9.539	690	2.338	780	0.155
425	1.795	515	3.335	605	9.650	695	2.034		
430	1.050	520	3.363	610	9.618	700	1.767		
435	0.780	525	3.400	615	9.453	705	1.523		

**Spectral Data Over Visible Wavelengths**



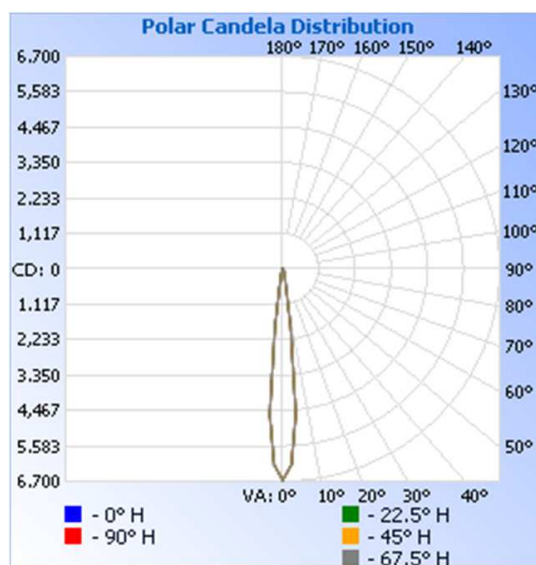
## RESULTS OF TEST (cont'd)

### 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)
LAN1512180812-009	UP	230.0	42.50	7.619	0.779	477.4	62.66

### Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	6661	6661	6661	6661	6661
5	4596	4596	4596	4596	4596
10	589	589	589	589	589
15	228	228	228	228	228
20	109	109	109	109	109
25	74	74	74	74	74
30	59	59	59	59	59
35	52	52	52	52	52
40	38	38	38	38	38
45	23	23	23	23	23
50	18	18	18	18	18
55	15	15	15	15	15
60	14	14	14	14	14
65	17	17	17	17	17
70	16	16	16	16	16
75	10	10	10	10	10
80	8	8	8	8	8
85	4	4	4	4	4
90	4	4	4	4	4

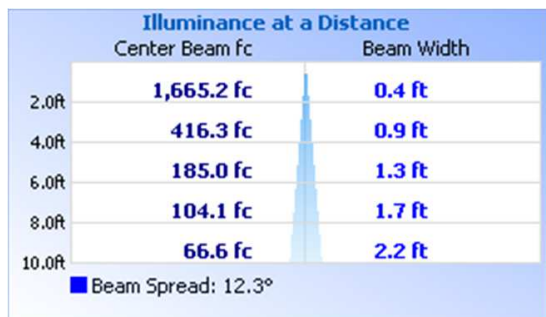


# RESULTS OF TEST (cont'd)

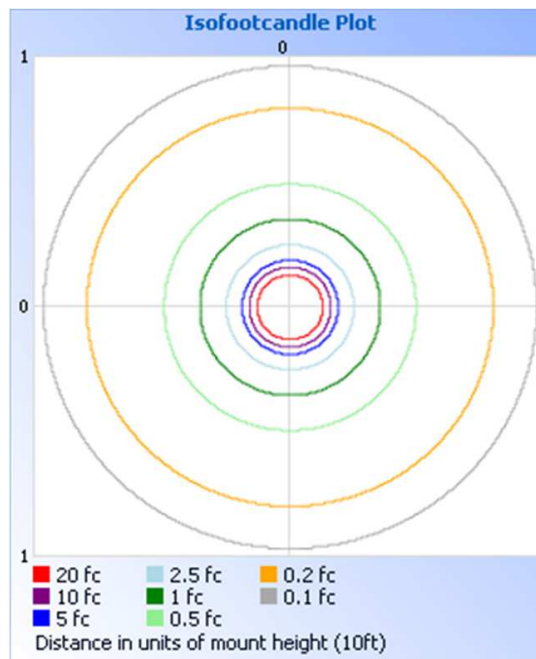
## Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



## Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	378.4	79.3
0-40	409.4	85.7
0-60	444.1	93.0
60-90	32.8	6.9
0-90	476.9	99.9
90-180	0.5	0.1
0-180	477.4	100.0

## Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	273.3	57.2
10-20	69.6	14.6
20-30	35.5	7.4
30-40	31.0	6.5
40-50	19.9	4.2
50-60	14.8	3.1
60-70	15.2	3.2
70-80	12.1	2.5
80-90	5.4	1.1
90-100	0.5	0.1

## Flood Summary at 25°C

	Efficiency (%)	Lumens	Horizontal Spread (°)	Vertical Spread (°)
Field 10%	57.6	275.1	19.7	19.7
Beam 50%	32.2	153.6	12.3	12.3
Total	100.5	479.9		

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.

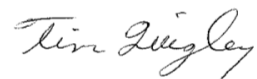
In Charge Of Tests:



Kenda Branch  
Lighting Performance Team Lead  
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley  
Engineer  
Lighting Division