



# REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: January 11, 2016

REPORT NO. 102406056LAX-017

TEST OF ONE BRILLIANT 3000K 80CRI 7.5W 10 DEGREE

MODEL NO. SM16GW-07-10D-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-07-10D-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 LAN1512180812-007.

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

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SUMMARY

Model No.:	SM16GW-07-10D-830-03-S3
Description:	Brilliant 3000K 80CRI 7.5W 10 degree

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	479.4	490.0
Total Power (W)	7.580	7.585
Luminaire Efficacy (LPW)	63.25	64.60

Criteria	Result
Power Factor	0.756
Current ATHD %	41.94
Correlated Color Temperature (CCT - K)	2868
Color Rendering Index (CRI - Ra)	84.8
Color Rendering Index (CRI - R9)	12.9
DUV	0.000
Chromaticity Coordinate (x)	0.448
Chromaticity Coordinate (y)	0.410
Chromaticity Coordinate (u')	0.255
Chromaticity Coordinate (v')	0.525

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**

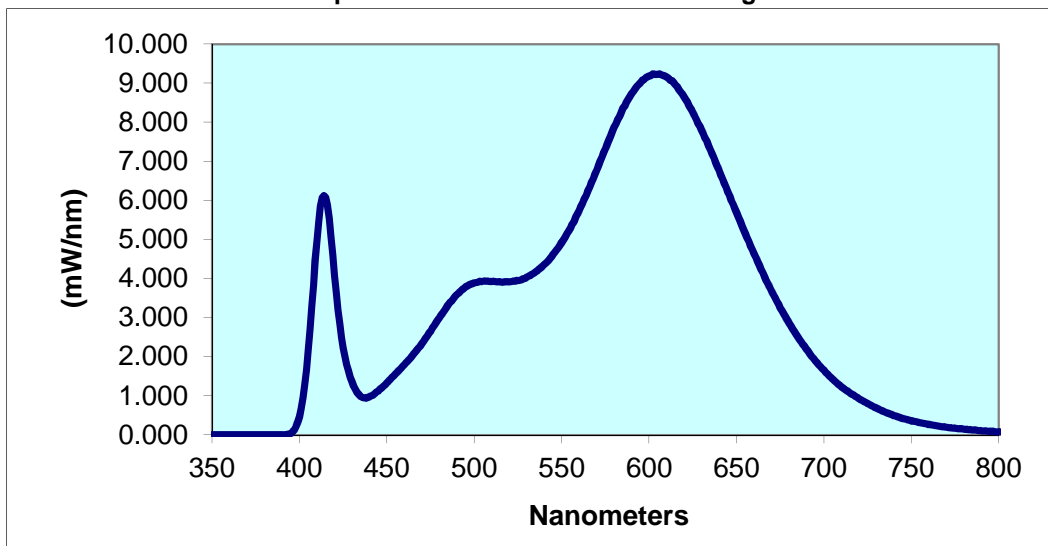
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1512180812-007	UP	230.0	43.59	7.580	0.756	41.94	479.4	63.25

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')
2868	84.8	12.9	0.000	0.448	0.410	0.255	0.525

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.000	440	0.980	530	4.040	620	8.639	710	1.233
355	0.000	445	1.126	535	4.167	625	8.254	715	1.067
360	0.000	450	1.332	540	4.364	630	7.796	720	0.929
365	0.000	455	1.563	545	4.618	635	7.294	725	0.805
370	0.000	460	1.804	550	4.926	640	6.768	730	0.688
375	0.000	465	2.058	555	5.304	645	6.215	735	0.583
380	0.000	470	2.339	560	5.749	650	5.680	740	0.496
385	0.000	475	2.653	565	6.252	655	5.148	745	0.421
390	0.000	480	3.001	570	6.787	660	4.641	750	0.366
395	0.045	485	3.328	575	7.330	665	4.144	755	0.315
400	0.464	490	3.597	580	7.870	670	3.680	760	0.264
405	2.166	495	3.791	585	8.357	675	3.257	765	0.232
410	5.010	500	3.892	590	8.740	680	2.868	770	0.199
415	6.061	505	3.934	595	9.011	685	2.511	775	0.173
420	4.099	510	3.923	600	9.182	690	2.188	780	0.146
425	2.235	515	3.915	605	9.230	695	1.901		
430	1.357	520	3.920	610	9.155	700	1.652		
435	0.985	525	3.945	615	8.966	705	1.429		

**Spectral Data Over Visible Wavelengths**



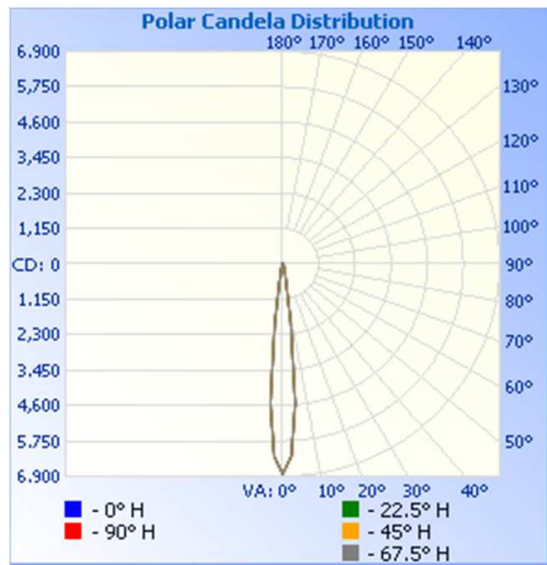
RESULTS OF TEST (cont'd)

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)
LAN1512180812-007	UP	230.0	43.70	7.585	0.754	490.0	64.60

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	6829	6829	6829	6829	6829
5	4539	4539	4539	4539	4539
10	656	656	656	656	656
15	217	217	217	217	217
20	111	111	111	111	111
25	73	73	73	73	73
30	61	61	61	61	61
35	54	54	54	54	54
40	41	41	41	41	41
45	26	26	26	26	26
50	18	18	18	18	18
55	17	17	17	17	17
60	18	18	18	18	18
65	18	18	18	18	18
70	15	15	15	15	15
75	15	15	15	15	15
80	8	8	8	8	8
85	2	2	2	2	2
90	4	4	4	4	4

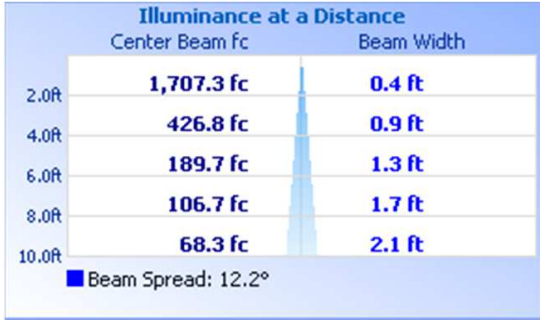


**RESULTS OF TEST (cont'd)**

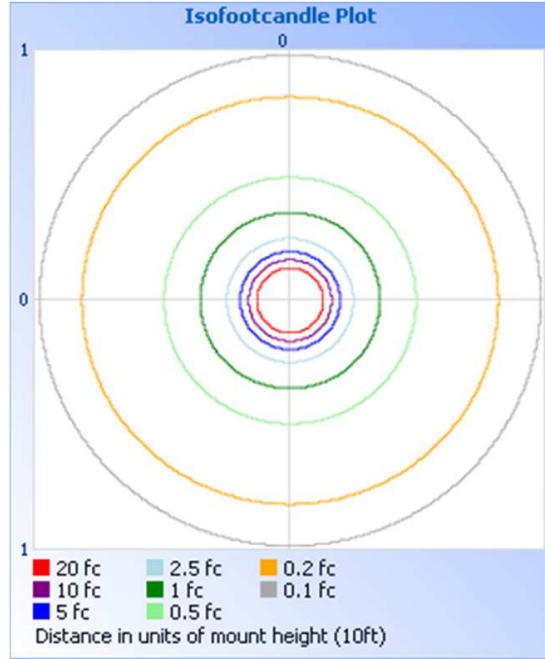
**Illumination Plots**

Mounting Height: 10 ft.

**Illuminance - Cone of Light**



**Isoillumination Plot**



**Zonal Lumen Summary and Percentages at 25°C**

Zone	Lumens	% Luminaire
0-30	382.1	78.0
0-40	414.6	84.6
0-60	453.7	92.6
60-90	35.8	7.3
0-90	489.5	99.9
90-180	0.5	0.1
0-180	490.0	100.0

**Zonal Lumens and Percentages at 25°C**

Zone	Lumens	% Luminaire
0-10	277.1	56.5
10-20	69.8	14.3
20-30	35.2	7.2
30-40	32.5	6.6
40-50	21.4	4.4
50-60	17.7	3.6
60-70	17.1	3.5
70-80	13.1	2.7
80-90	5.6	1.1
90-100	0.5	0.1

**Flood Summary at 25°C**

	Efficiency (%)	Horizontal Lumens	Horizontal Spread (°)	Vertical Spread (°)
Field 10%	56.9	279.0	19.9	19.9
Beam 50%	31.5	154.3	12.2	12.2
Total	100.5	492.6		

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.

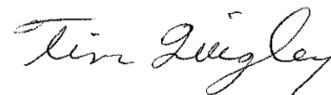
In Charge Of Tests:



Kenda Branch  
Lighting Performance Team Lead  
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley  
Engineer  
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