



REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102406056

Date: January 11, 2016

REPORT NO. 102406056LAX-015

TEST OF ONE BRILLIANT 3000K 80CRI 7.5W 36 DEGREE

MODEL NO. SM16GW-07-36D-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-07-36D-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 LAN1512180812-005.

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

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SUMMARY

Model No.:	SM16GW-07-36D-830-03-S3
Description:	Brilliant 3000K 80CRI 7.5W 36 degree

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	486.1	494.9
Total Power (W)	7.570	7.575
Luminaire Efficacy (LPW)	64.21	65.33

Criteria	Result
Power Factor	0.770
Current ATHD %	40.33
Correlated Color Temperature (CCT - K)	2914
Color Rendering Index (CRI - Ra)	85.3
Color Rendering Index (CRI - R9)	15.9
DUV	0.001
Chromaticity Coordinate (x)	0.442
Chromaticity Coordinate (y)	0.403
Chromaticity Coordinate (u')	0.254
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	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

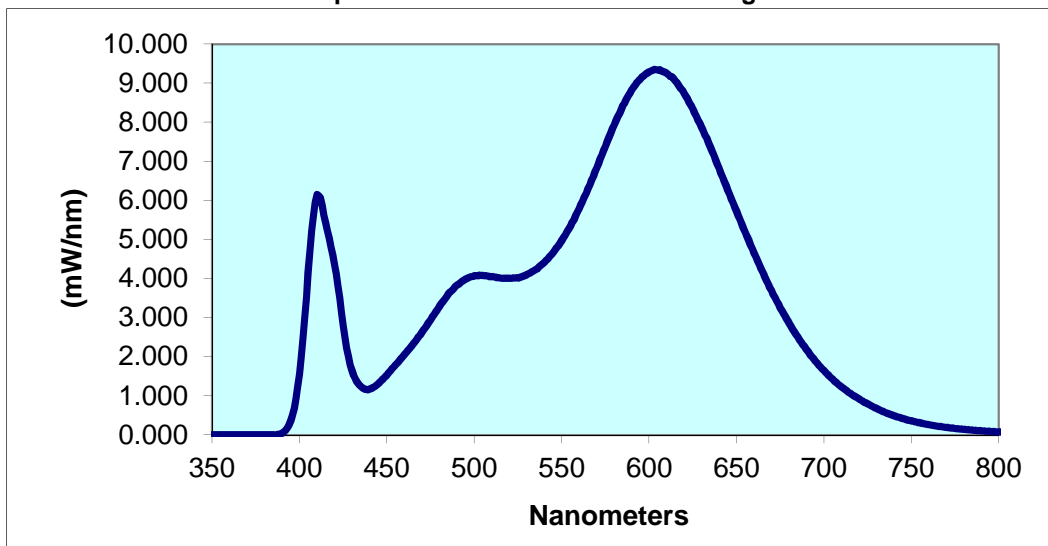
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1512180812-005	UP	230.0	42.74	7.570	0.770	40.33	486.1	64.21

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')
2914	85.3	15.9	0.001	0.442	0.403	0.254	0.522

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.000	440	1.173	530	4.108	620	8.731	710	1.233
355	0.000	445	1.310	535	4.229	625	8.338	715	1.064
360	0.000	450	1.536	540	4.420	630	7.873	720	0.923
365	0.000	455	1.797	545	4.664	635	7.359	725	0.793
370	0.000	460	2.061	550	4.972	640	6.823	730	0.677
375	0.000	465	2.325	555	5.349	645	6.257	735	0.578
380	0.000	470	2.625	560	5.795	650	5.712	740	0.492
385	0.002	475	2.946	565	6.298	655	5.178	745	0.419
390	0.039	480	3.286	570	6.838	660	4.658	750	0.364
395	0.368	485	3.595	575	7.389	665	4.156	755	0.309
400	1.557	490	3.831	580	7.931	670	3.687	760	0.264
405	4.151	495	3.989	585	8.429	675	3.256	765	0.226
410	6.150	500	4.069	590	8.835	680	2.865	770	0.193
415	5.412	505	4.082	595	9.109	685	2.507	775	0.166
420	4.374	510	4.048	600	9.293	690	2.179	780	0.139
425	2.815	515	4.013	605	9.340	695	1.893		
430	1.651	520	4.008	610	9.260	700	1.645		
435	1.247	525	4.019	615	9.059	705	1.423		

Spectral Data Over Visible Wavelengths



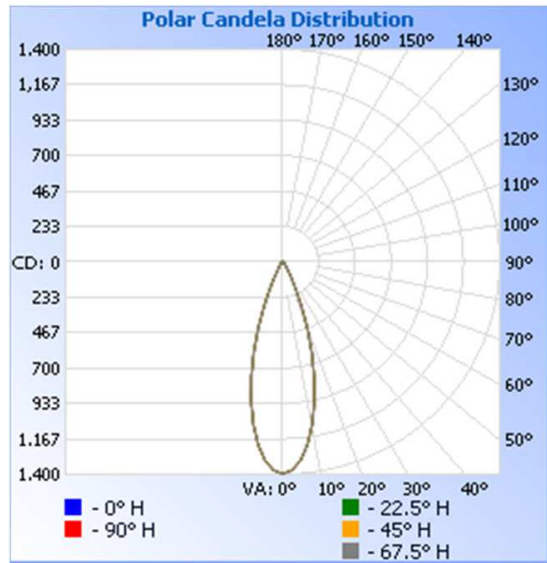
RESULTS OF TEST (cont'd)

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)
LAN1512180812-005	UP	230.0	42.80	7.575	0.770	494.9	65.33

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	1368	1368	1368	1368	1368
5	1285	1285	1285	1285	1285
10	1066	1066	1066	1066	1066
15	772	772	772	772	772
20	458	458	458	458	458
25	207	207	207	207	207
30	83	83	83	83	83
35	40	40	40	40	40
40	25	25	25	25	25
45	19	19	19	19	19
50	16	16	16	16	16
55	13	13	13	13	13
60	12	12	12	12	12
65	9	9	9	9	9
70	7	7	7	7	7
75	5	5	5	5	5
80	2	2	2	2	2
85	1	1	1	1	1
90	0	0	0	0	0

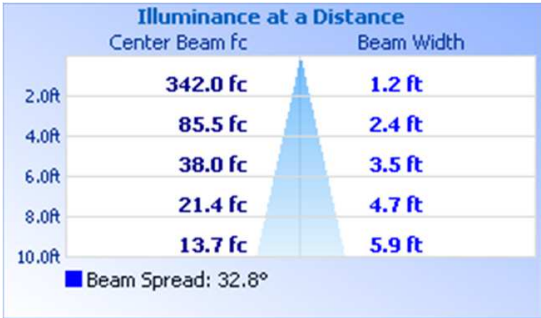


RESULTS OF TEST (cont'd)

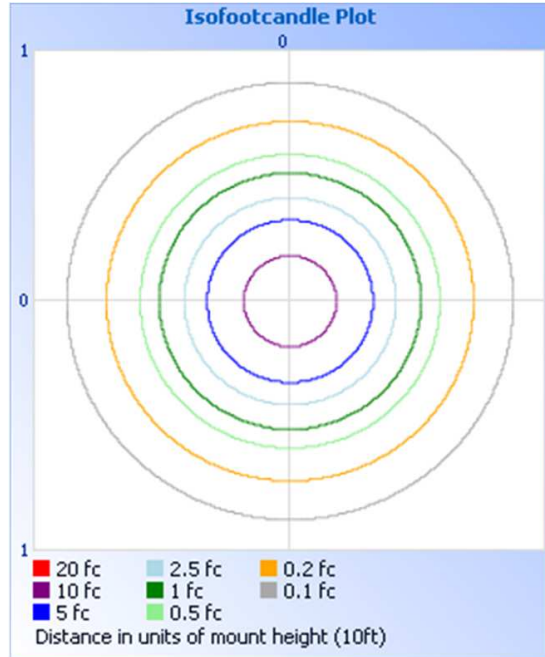
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	424.7	85.8
0-40	452.3	91.4
0-60	479.6	96.9
60-90	15.3	3.1
0-90	494.9	100.0
90-180	0.0	0.0
0-180	494.9	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	115.2	23.3
10-20	207.9	42.0
20-30	101.5	20.5
30-40	27.6	5.6
40-50	15.1	3.0
50-60	12.2	2.5
60-70	9.3	1.9
70-80	4.9	1.0
80-90	1.1	0.2

Flood Summary at 25°C

	Efficiency (%)	Horizontal Lumens	Horizontal Spread (°)	Vertical Spread (°)
Field 10%	82.9	410.3	54.6	54.6
Beam 50%	52.0	257.6	32.8	32.8
Total	100.1	495.3		

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