



REPORT

545 E. Algonquin Rd., Arlington Heights, IL 60005

Project No. G102171228

Date: August 26, 2016

REPORT NO. 102171228CHI-050

TEST OF ONE LED BOLLARD

MODEL NO. 700OBSTR42SC1UNV830C
LED MODEL NO. CREE XP-G2 XPGBWT-H1-0000-00FE7
DRIVER MODEL NO. LTF DS20W700C1528LI2D010-0000

RENDERED TO

GENERATION BRANDS
7400 LINDER AVE.
SKOKIE, IL, 60077

TEST: Electrical and Photometric tests as required to the IESNA test standard.

AUTHORIZATION: The testing performed was authorized by signed quote number 500606081.

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

ANSI NEMA ANSLG C78.377: 2012: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number 700OBSTR42SC1UNV830C. The sample was received by Intertek on August 22, 2016, in undamaged condition and one sample was tested as received. The sample designation was AH08222016030613-50.

DATES OF TESTS: August 25, 2016 through August 26, 2016.

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SUMMARY

Model No.: 700OBSTR42SC1UNV830C
Description: LED Bollard

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1312	1254
Total Power (W)	19.37	19.42
Luminaire Efficacy (LPW)	67.73	64.57

Criteria	Result
Power Factor	0.973
Current ATHD %	9.91
Correlated Color Temperature (CCT - K)	4095
Color Rendering Index (CRI - Ra)	84.0
Color Rendering Index (CRI - R9)	16.8
DUV	0.000
Chromaticity Coordinate (x)	0.376
Chromaticity Coordinate (y)	0.375
Chromaticity Coordinate (u')	0.223
Chromaticity Coordinate (v')	0.500
BUG Rating	B1-U1-G1
IES Classification	Type II
Longitudinal Classification	Very Short

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/11/16	07/11/17	08/26/16
Omega Newport Thermometer	DPI8-C24	146920	10/09/15	10/09/16	08/26/16
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	08/26/16
Newport Thermohygrometer	iServer	146956	01/04/16	01/04/17	08/26/16
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	08/26/16
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	08/25/16
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	08/25/16
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	08/25/16
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	08/25/16
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	08/25/16
Yokogawa Power Meter	WT1600	146768	01/14/16	01/14/17	08/25/16
Omega Temperature Meter	MDSi8	146139	03/21/16	03/21/17	08/25/16

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 Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot 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 Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer 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 Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

BUG Ratings (Backlight, Uplight, Glare) – for Outdoor Fixtures Only

Zonal Lumens were calculated and grouped using the formula in IESNA TM-15-11 for each zone as defined in the BUG addendum. The maximum lumen rating in each zone was compared against the BUG zonal requirements of Energy Star. Photometric Toolbox software was used to calculate results.

RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

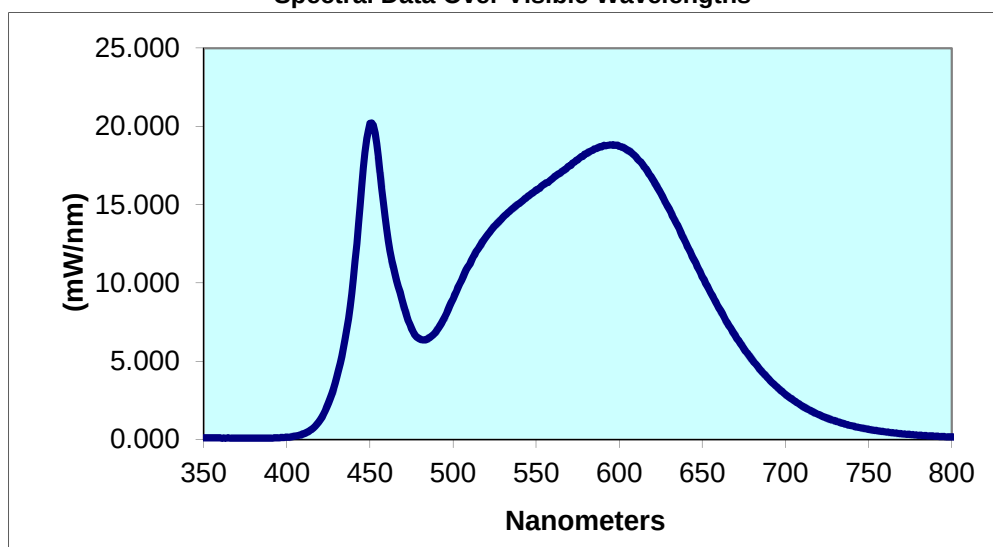
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH08222016030613-50	UP	120.0	165.7	19.37	0.973	9.91	1312	67.73

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
4095	84.0	16.8	0.000	0.376	0.375	0.223	0.500

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.104	440	10.31	530	14.19	620	16.63	710	2.151
355	0.102	445	16.18	535	14.68	625	15.72	715	1.855
360	0.104	450	20.20	540	15.09	630	14.72	720	1.599
365	0.095	455	18.06	545	15.54	635	13.67	725	1.378
370	0.085	460	13.44	550	15.93	640	12.56	730	1.181
375	0.080	465	10.58	555	16.33	645	11.49	735	1.016
380	0.079	470	8.638	560	16.70	650	10.41	740	0.876
385	0.078	475	7.082	565	17.08	655	9.390	745	0.756
390	0.085	480	6.427	570	17.49	660	8.402	750	0.652
395	0.107	485	6.467	575	17.87	665	7.460	755	0.566
400	0.142	490	6.944	580	18.26	670	6.600	760	0.492
405	0.219	495	7.849	585	18.57	675	5.812	765	0.425
410	0.365	500	8.995	590	18.76	680	5.084	770	0.368
415	0.663	505	10.17	595	18.82	685	4.443	775	0.319
420	1.254	510	11.21	600	18.74	690	3.863	780	0.276
425	2.331	515	12.18	605	18.49	695	3.347		
430	3.991	520	12.97	610	18.05	700	2.893		
435	6.415	525	13.64	615	17.41	705	2.498		

Spectral Data Over Visible Wavelengths



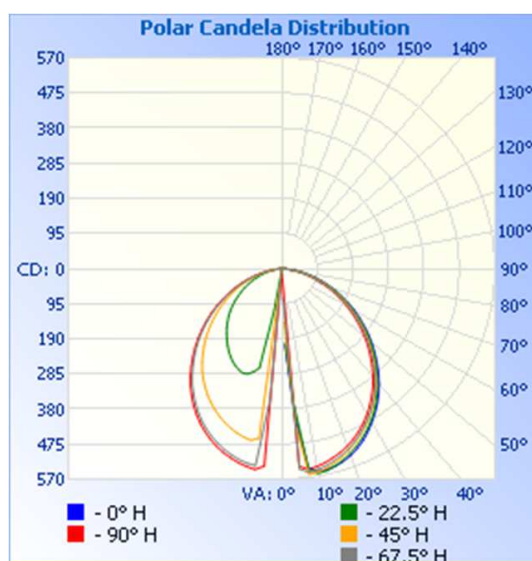
RESULTS OF TEST (cont'd)

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 (LPW)
AH08222016030613-50	UP	120.1	167.3	19.42	0.966	1254	64.57

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	0	0	0	0	0
5	399	366	422	544	536
10	556	562	559	552	543
15	553	553	545	539	530
20	538	533	523	519	511
25	514	507	497	494	486
30	481	477	466	463	455
35	445	440	431	428	420
40	404	398	392	388	380
45	360	355	348	344	336
50	315	310	303	298	291
55	268	264	257	252	245
60	223	218	212	205	200
65	177	173	168	160	155
70	134	130	125	118	114
75	93	88	84	79	74
80	55	51	48	43	40
85	22	20	18	14	12
90	4	3	2	1	0
95	3	2	2	0	0
100	2	2	1	0	0
105	1	2	1	0	0
110	1	1	1	0	0
115	0	1	1	0	0
120	0	1	1	0	0
125	0	1	1	0	0
130	0	1	1	0	0
135	0	1	1	0	0
140	0	0	1	0	0
145	0	0	1	0	0

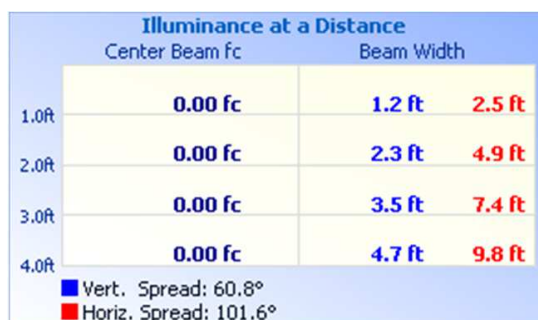


RESULTS OF TEST (cont'd)

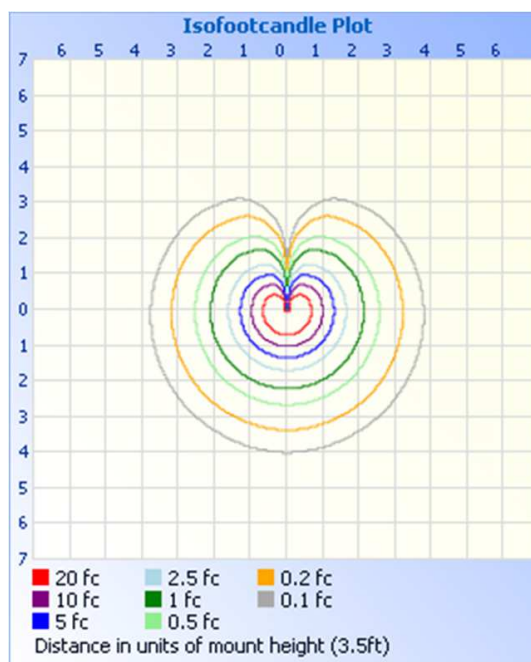
Illumination Plots

Mounting Height: 3.5 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	361.5	28.8
0-40	593.5	47.3
0-60	1020	81.4
60-90	231.1	18.4
0-90	1252	99.8
90-180	2.2	0.2
0-180	1254	100.0

Luminaire Classification System (LCS)

LCS	Zone	Lumens	% Luminaire
FL	(0-30)	213.5	17.0
FM	(30-60)	384.8	30.7
FH	(60-80)	127.3	10.2
FVH	(80-90)	10.8	0.9
BL	(0-30)	147.4	11.8
BM	(30-60)	274.4	21.9
BH	(60-80)	87.2	7.0
BVH	(80-90)	5.9	0.5
UL	(90-100)	0.8	0.1
UH	(100-180)	1.4	0.1
Total		1253.5	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	33.8	2.7
10-20	130.4	10.4
20-30	197.3	15.7
30-40	232.0	18.5
40-50	230.4	18.4
50-60	196.6	15.7
60-70	140.2	11.2
70-80	74.2	5.9
80-90	16.7	1.3
90-100	0.8	0.1
100-110	0.5	0.0
110-120	0.4	0.0
120-130	0.3	0.0
130-140	0.2	0.0
140-150	0.1	0.0

BUG Rating: B1-U1-G1

IES Classification: Type II

Longitudinal Classification: Very Short

PICTURES (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:



Vladimir Kozak
Senior Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley
Engineer
Lighting Division