

Project Number
17.02422



Date
9/5/2017

LAB 6
Sphere

Test Sample Description

Catalog Number: P700001-020-30
Description: 12" Linear Under-Cabinet - Bronze

Photometry

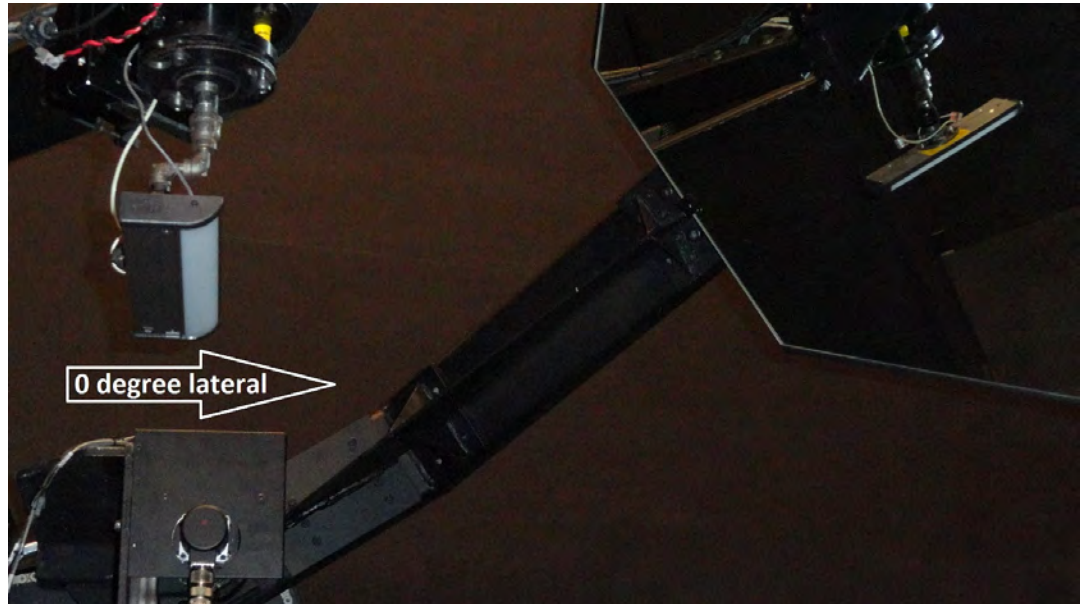
Test Method: IES LM-79-08 § 10
Preburn Time: 0:30
Time To Stabilize: 0:50
Total Operating Time: 3:20

Input Voltage (Volts): 120.0
Input Current (Amps): 0.065
Input Wattage (Watts): 7.8
Ambient Temp (°C): 24.2
PF @120V: 0.994
THD @120V (%): 11.07

Sphere

Test Method: IES LM-79-08 § 9.1 & 12.1
Preburn Time: 2:00
Time To Stabilize: 1:08
Total Operating Time: 3:08

Input Voltage (Volts): 120.0
Input Current (Amps): 0.064
Input Wattage (Watts): 7.7
Ambient Temp (°C): 24.0



Hubbell Lighting, Inc.

701 Millennium Boulevard
Greenville, SC 29607
www.hubbellighting.com

Checked (sphere): B. LEE
Checked (photometry): M. ELLMANN
Approved: P. McCARTHY



This report shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

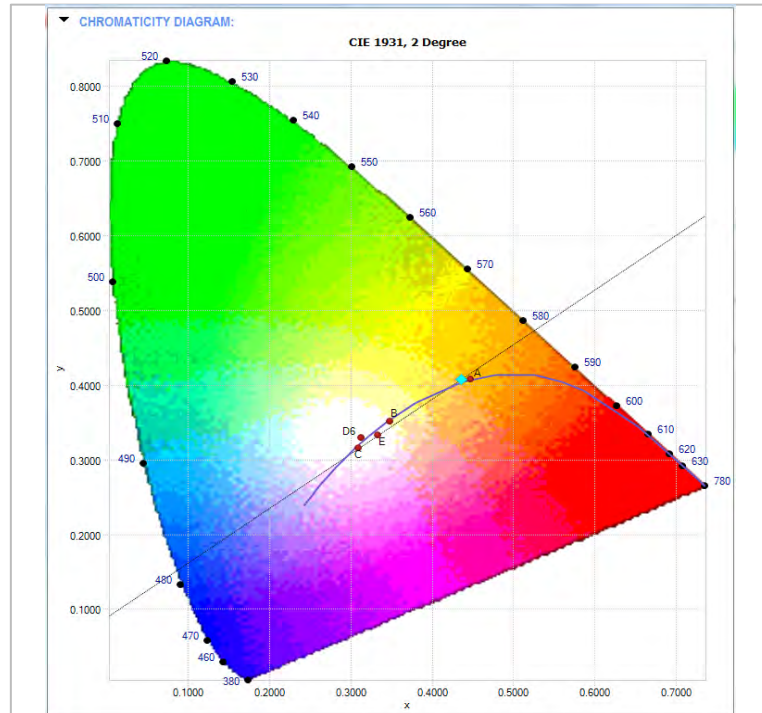


Lamp Cat#: SAW9A32E-E1
 Lamp Desc: 28 - Seoul Semiconductor 3000K LEDs
 Driver Desc: NA

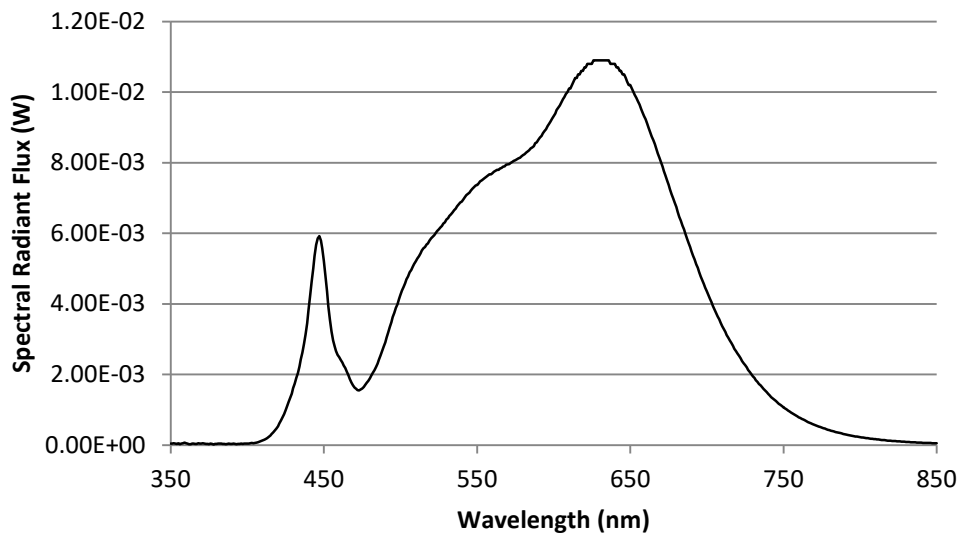
Efficacy: 70.9 LPW S/P Ratio: 1.4 LM/LM

Spectral Results

Name	Value	Unit
Φ	1.98	watts
Φ(v)	546	lumens
Φ(v')	766	lm'
Chrom x	0.4355	
Chrom y	0.4079	
Chrom u	0.248	
Chrom v	0.3484	
Duv	0.0017	
Chrom u'	0.248	
Chrom v'	0.5227	
CCT	3054	K
Purity	53.2	%
λ (dom)	582.0	nm
FWHM	176.7	nm
λ (peak)	631.3	nm
λ (center)	601.8	nm
λ (centroid)	598.2	nm
SDCM	Cool White	
RA	93	
Corr. Coef.	0.00174163	
Correlation	0.0054	
R1	95.1	
R2	94.1	
R3	91.6	
R4	94.6	
R5	93.8	
R6	92.0	
R7	94.9	
R8	91.6	
R9	77.7	
R10	85.3	
R11	95.2	
R12	81.3	
R13	94.4	
R14	94.5	



Spectral Distribution of Radiant Flux



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LUMINAIRE: 12" Linear Under-Cabinet - Bronze

LAMP CAT. NO.: SAW9A32E-E1

LAMP: 28- Seoul Semi 3000K LEDs

MOUNTING: Surface

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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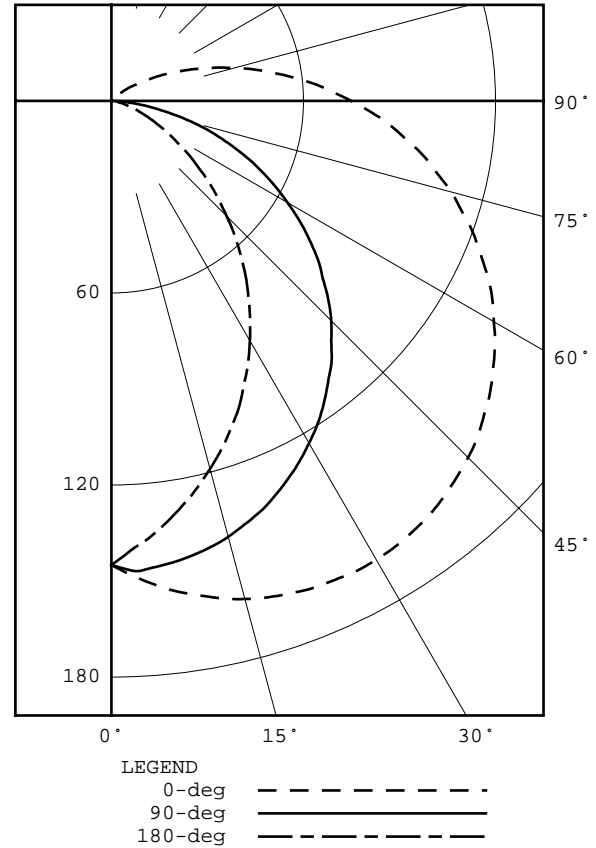
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CANDELA DISTRIBUTION						FLUX
	0.0	45.0	90.0	135.0	180.0	
0	145	145	145	145	145	
5	152	149	146	139	137	14
15	161	154	141	125	119	39
25	165	153	130	106	98	60
35	164	147	116	85	75	73
45	158	137	97	62	51	77
55	146	122	76	38	30	72
65	130	104	52	18	14	61
75	110	83	27	6	5	45
85	87	60	5	1	1	31
90	75	48	0	0	1	
95	63	37	0	0	0	19
105	40	18	0	0	0	10
115	21	6	0	0	0	4
125	8	2	0	0	0	1
135	2	1	0	0	0	0
145	1	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	0

ZONAL ZONE	LUMEN LUMENS	SUMMARY %FIXT
0- 30	113	22.3
0- 40	186	36.7
0- 60	335	66.2
0- 90	472	93.1
90-120	33	6.5
90-130	34	6.7
90-150	35	6.8
90-180	35	6.9
0-180	507	100.0

EFFICACY = 65.4 lm/W
CIE TYPE - DIRECT
PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.68 1.26 0.94





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CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	95.0	105.0	115.0
0.0	145	145	145	145	145	145	145	145	145	145	145	145	145	145
2.5	148	148	148	148	147	147	147	146	146	147	147	146	144	143
5.0	152	152	151	151	150	149	148	147	146	147	146	145	143	141
7.5	155	154	154	153	152	150	149	148	146	146	146	144	141	139
10.0	157	157	156	155	154	152	150	148	146	145	144	143	139	136
12.5	159	159	158	157	155	153	151	148	145	144	143	141	137	134
15.0	161	161	160	159	156	154	151	148	145	142	141	139	134	131
17.5	163	163	162	160	157	154	151	147	143	140	139	136	131	127
20.0	164	164	163	161	158	154	150	146	142	138	136	134	128	123
22.5	165	165	164	161	158	154	149	145	140	136	134	130	124	119
25.0	165	165	164	161	158	153	148	143	138	133	130	127	120	115
27.5	166	166	164	161	157	152	147	141	135	130	127	123	117	111
30.0	166	165	164	160	156	151	145	139	132	126	124	120	112	106
32.5	165	165	163	160	155	149	143	136	129	123	120	116	108	101
35.0	164	164	162	158	153	147	141	134	126	119	116	111	103	96
37.5	163	163	161	157	151	145	138	130	122	115	111	107	98	91
40.0	162	161	159	155	149	142	135	127	118	111	107	102	93	86
42.5	160	159	157	153	147	140	132	123	114	106	102	97	88	80
45.0	158	157	155	151	144	137	128	119	110	102	97	92	82	75
47.5	155	155	152	148	141	134	125	115	106	97	92	87	77	69
50.0	152	152	150	145	138	130	121	111	101	91	86	81	71	62
52.5	149	149	146	141	134	126	117	107	96	86	81	76	65	57
55.0	146	146	143	138	131	122	112	102	91	81	76	70	60	50
57.5	142	142	139	134	126	118	108	97	86	75	70	64	53	44
60.0	138	138	135	130	122	113	103	92	80	69	64	58	47	38
62.5	134	134	131	126	118	109	98	87	75	64	58	52	41	33
65.0	130	129	127	121	113	104	93	81	69	57	52	46	35	27
67.5	125	125	122	117	109	99	88	76	64	51	46	39	29	21
70.0	120	120	117	112	103	94	82	70	58	45	39	33	23	16
72.5	115	115	112	107	98	88	77	64	52	39	33	27	17	12
75.0	110	109	107	101	93	83	72	59	46	33	27	21	12	8
77.5	104	104	101	96	87	77	65	53	39	27	20	15	8	5
80.0	99	98	96	90	82	71	60	47	33	21	15	10	4	3
82.5	93	93	90	84	76	66	54	41	27	15	9	6	2	1
85.0	87	87	84	78	70	60	48	35	22	10	5	2	1	1
87.5	81	81	78	72	64	54	42	29	16	5	2	0	0	0
90.0	75	75	72	66	58	48	36	23	11	2	0	0	0	0
92.5	69	69	66	60	52	42	31	19	7	0	0	0	0	0
95.0	63	62	60	54	46	37	25	14	4	0	0	0	0	0
97.5	57	57	54	48	40	31	21	10	2	0	0	0	0	0
100.0	51	51	48	43	36	26	16	7	1	0	0	0	0	0
102.5	46	45	42	37	30	22	13	5	1	0	0	0	0	0
105.0	40	40	37	33	26	18	9	3	0	0	0	0	0	0
107.5	35	34	32	28	21	14	7	2	0	0	0	0	0	0
110.0	29	30	27	23	18	11	5	1	0	0	0	0	0	0
112.5	25	25	23	19	14	8	4	1	0	0	0	0	0	0
115.0	21	21	19	15	11	6	3	1	0	0	0	0	0	0
117.5	17	17	15	12	8	4	2	0	0	0	0	0	0	0
120.0	13	13	12	10	6	3	1	0	0	0	0	0	0	0
122.5	11	10	9	7	5	2	1	0	0	0	0	0	0	0
125.0	8	8	7	5	3	2	1	0	0	0	0	0	0	0
127.5	6	6	5	4	2	1	1	0	0	0	0	0	0	0
130.0	4	4	4	3	2	1	0	0	0	0	0	0	0	0
132.5	3	3	3	2	1	1	0	0	0	0	0	0	0	0
135.0	2	2	2	1	1	1	0	0	0	0	0	0	0	0
137.5	2	2	1	1	1	1	0	0	0	0	0	0	0	0
140.0	1	1	1	1	1	0	0	0	0	0	0	0	0	0
142.5	1	1	1	1	0	0	0	0	0	0	0	0	0	0
145.0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
147.5	1	0	0	0	0	0	0	0	0	0	0	0	0	0



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	CANDELA DISTRIBUTION													
	LATERAL ANGLE													
	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	95.0	105.0	115.0
150.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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CANDELA DISTRIBUTION
LATERAL ANGLE

	125.0	135.0	145.0	155.0	165.0	175.0	180.0
0.0	145	145	145	145	145	145	145
2.5	143	142	142	141	141	141	141
5.0	140	139	138	138	138	137	137
7.5	137	136	135	134	133	133	133
10.0	134	132	131	130	129	129	128
12.5	131	129	127	126	125	124	124
15.0	127	125	123	121	120	119	119
17.5	123	120	118	116	115	114	114
20.0	119	116	113	111	110	109	109
22.5	115	111	108	106	105	104	104
25.0	110	106	103	101	99	98	98
27.5	106	101	98	95	93	93	92
30.0	101	96	92	89	88	87	87
32.5	96	91	87	84	82	81	81
35.0	90	85	81	78	76	75	75
37.5	85	79	75	72	70	69	69
40.0	79	74	69	66	64	63	63
42.5	73	67	63	60	58	57	57
45.0	67	62	57	54	52	51	51
47.5	61	56	51	48	47	46	45
50.0	55	50	45	43	41	40	40
52.5	49	44	40	37	36	35	35
55.0	43	38	34	32	31	30	30
57.5	37	33	29	27	26	25	25
60.0	32	27	24	22	21	21	21
62.5	26	22	20	18	18	17	17
65.0	22	18	16	15	14	14	14
67.5	17	14	12	12	11	11	11
70.0	13	11	10	9	8	8	8
72.5	9	8	7	6	6	6	6
75.0	6	6	5	5	5	5	5
77.5	4	4	3	3	3	3	3
80.0	2	2	2	2	2	2	2
82.5	1	1	1	1	2	2	1
85.0	1	1	1	1	1	1	1
87.5	0	1	1	1	1	1	1
90.0	0	0	0	0	0	1	1
92.5	0	0	0	0	0	0	0
95.0	0	0	0	0	0	0	0
97.5	0	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0
102.5	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0
107.5	0	0	0	0	0	0	0
110.0	0	0	0	0	0	0	0
112.5	0	0	0	0	0	0	0
115.0	0	0	0	0	0	0	0
117.5	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0
122.5	0	0	0	0	0	0	0
125.0	0	0	0	0	0	0	0
127.5	0	0	0	0	0	0	0
130.0	0	0	0	0	0	0	0
132.5	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0
137.5	0	0	0	0	0	0	0
140.0	0	0	0	0	0	0	0
142.5	0	0	0	0	0	0	0
145.0	0	0	0	0	0	0	0
147.5	0	0	0	0	0	0	0



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	CANDELA DISTRIBUTION						
	LATERAL ANGLE						
	125.0	135.0	145.0	155.0	165.0	175.0	180.0
150.0	0	0	0	0	0	0	0
152.5	0	0	0	0	0	0	0
155.0	0	0	0	0	0	0	0
157.5	0	0	0	0	0	0	0
160.0	0	0	0	0	0	0	0
162.5	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0
167.5	0	0	0	0	0	0	0
170.0	0	0	0	0	0	0	0
172.5	0	0	0	0	0	0	0
175.0	0	0	0	0	0	0	0
177.5	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0



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5-DEGREE ZONAL LUMEN SUMMARY		
0- 5		3
5- 10		10
10- 15		17
15- 20		23
20- 25		28
25- 30		32
30- 35		35
35- 40		38
40- 45		39
45- 50		38
50- 55		37
55- 60		35
60- 65		32
65- 70		29
70- 75		25
75- 80		21
80- 85		17
85- 90		14
90- 95		11
95-100		8
100-105		6
105-110		4
110-115		3
115-120		2
120-125		1
125-130		0
130-135		0
135-140		0
140-145		0
145-150		0
150-155		0
155-160		0
160-165		0
165-170		0
170-175		0
175-180		0

10-DEGREE ZONAL LUMEN SUMMARY		
0- 10		14
10- 20		39
20- 30		60
30- 40		73
40- 50		77
50- 60		72
60- 70		61
70- 80		45
80- 90		31
90-100		19
100-110		10
110-120		4
120-130		1
130-140		0
140-150		0
150-160		0
160-170		0
170-180		0



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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	117	117	117	117	114	114	114	114	107	107	107	101	101	101	96	96	96	93
1	105	99	94	90	101	96	92	88	91	87	84	86	83	80	81	78	76	73
2	95	86	78	72	91	83	76	70	78	73	67	74	69	65	70	66	62	60
3	86	75	66	59	83	72	64	58	68	62	56	65	59	54	61	56	52	50
4	79	66	56	49	76	64	55	49	61	53	47	57	51	46	54	49	44	42
5	72	59	49	42	69	57	48	42	54	46	41	51	45	39	49	43	38	36
6	66	53	43	37	64	51	43	36	49	41	35	46	40	34	44	38	34	31
7	62	48	39	32	59	46	38	32	44	37	31	42	35	30	40	34	30	28
8	57	43	35	29	55	42	34	28	40	33	28	39	32	27	37	31	27	25
9	53	40	31	26	52	39	31	25	37	30	25	36	29	24	34	28	24	22
10	50	37	29	23	48	36	28	23	34	27	23	33	27	22	32	26	22	20

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.

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Date
9/5/2017

Goniophotometer Calibration

Calibration Lamp: GE 1000W, 120V, T6, CL (FEL)

Lamp Number: ITL78966-1000-38

Calibration Current: 8.300 Amps DC

Total Luminous Flux: 25889.0 Lumens

Calibration Date: 09/2/2016

Test Equipment Used

<i>Instrument</i>	<i>Manufacturer / Model</i>	<i>S/N</i>	<i>Calibration Due:</i>
<i>Goniophotometer</i>	ITL/HLI LAB 6 - Test Distance: 31.3'	N/A	N/A
<i>Power Analyzer</i>	Yokogawa / WT 332	C2QA27076V	11/2/2017
<i>Power Source</i>	Voltage-Regulated House Power	N/A	N/A
<i>Thermometer</i>	National Instruments / USB-TC01	1912745	11/7/2017

Sphere Calibration

Calibration Lamp: EIKO 28V75W/E10

Lamp Number: SCL-1400-J136

Calibration Current: 2.679 Amps

Total Luminous Flux: 1427 Lumens

Test Equipment Used - Color & SPD; THD & Power Factor

<i>Instrument</i>	<i>Manufacturer / Model</i>	<i>S/N</i>	<i>Calibration Due:</i>
<i>3-Meter Sphere</i>	Labsphere / LMS-3M	N/A	Calibrated Weekly
<i>Thermometer</i>	National Instruments / USB TC01	1912751	11/2/2017
<i>LAMP Power Meter</i>	Yokogawa / WT332	C2QA27075V	11/1/2017
<i>Power Supply</i>	Chroma / 61602	616020002113	N/A
<i>Aux Lamp Supply</i>	Labsphere / LPS-100-0833	031159372	10/31/2017
<i>Cal Lamp Supply</i>	Labsphere / LPS-150-0268	1218148505	12/1/2017
<i>Spectrometer</i>	Labsphere / CDS 1100	0624117792	N/A

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