

Project Number
17.02423



Date
9/6/2017

LAB 6
Sphere

Test Sample Description

Catalog Number: P700002-020-30
Description: 18" Linear Under-cabinet - Bronze

Photometry

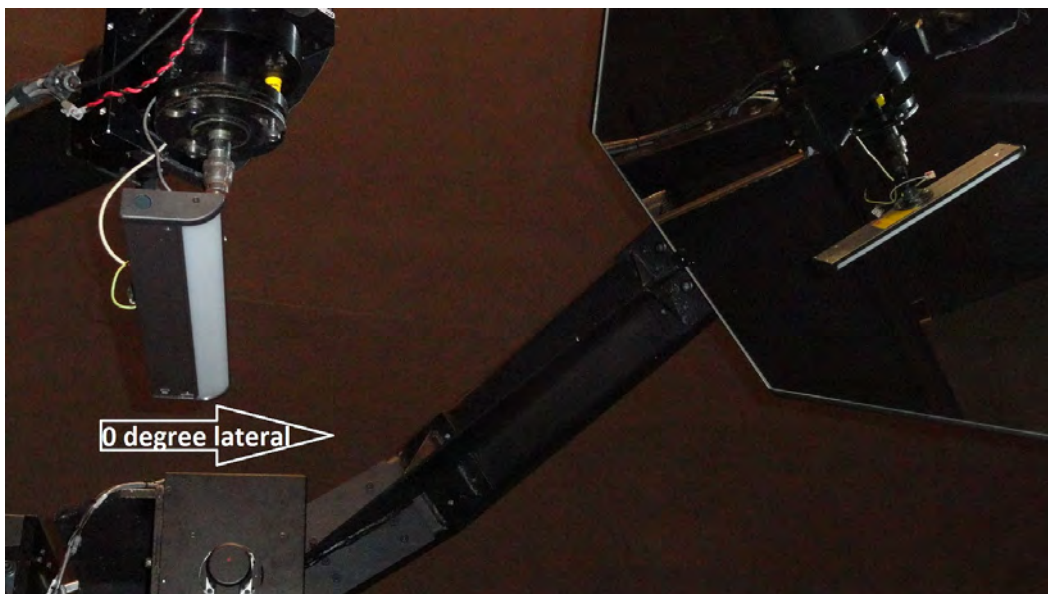
Test Method: IES LM-79-08 § 10
Preburn Time: 0:30
Time To Stabilize: 0:40
Total Operating Time: 2:00

Input Voltage (Volts): 120.0
Input Current (Amps): 0.104
Input Wattage (Watts): 12.4
Ambient Temp (°C): 24.1
PF @120V: 0.992
THD @120V (%): 12.90

Sphere

Test Method: IES LM-79-08 § 9.1 & 12.1
Preburn Time: 8:00
Time To Stabilize: 0:56
Total Operating Time: 8:56

Input Voltage (Volts): 120.0
Input Current (Amps): 0.103
Input Wattage (Watts): 12.3
Ambient Temp (°C): 24.0



Hubbell Lighting, Inc.

701 Millennium Boulevard
Greenville, SC 29607
www.hubbelllighting.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.


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Lamp Cat#: SAW9A32E-E1

Lamp Desc: 42 - Seoul Semiconductor 3000K LEDs

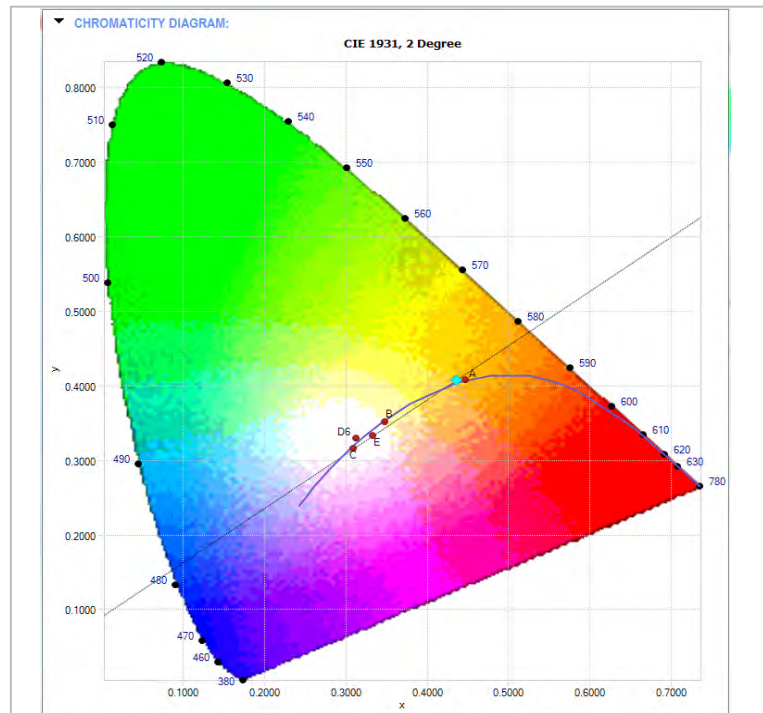
Driver Desc: NA

Efficacy: 70.8 LPW

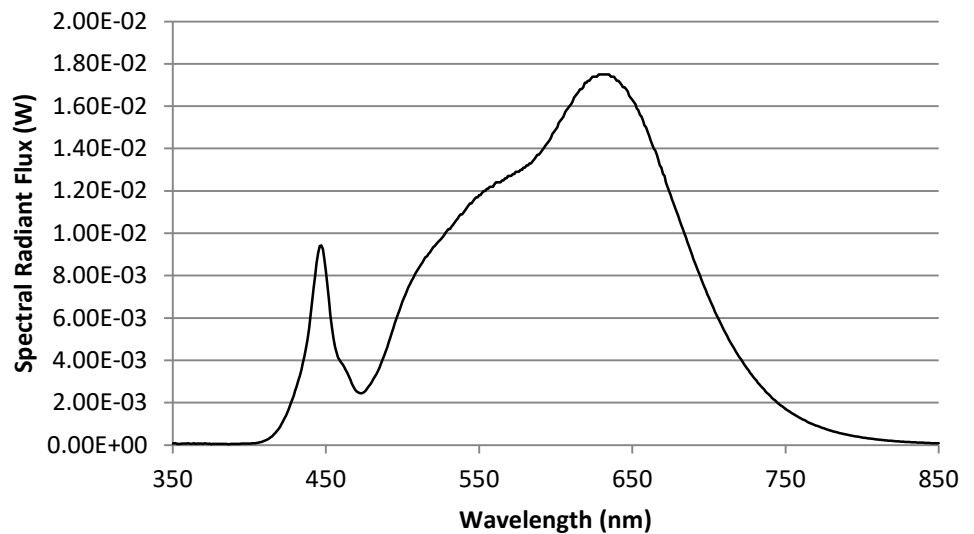
S/P Ratio: 1.4 LM'/LM

Spectral Results

Name	Value	Unit
Φ	3.16	watts
$\Phi(v)$	871	lumens
$\Phi(v')$	1218	lm'
Chrom x	0.4363	
Chrom y	0.4082	
Chrom u	0.2484	
Chrom v	0.3486	
Duv	0.0017	
Chrom u'	0.2484	
Chrom v'	0.5229	
CCT	3042	K
Purity	53.5	%
λ (dom)	582.0	nm
FWHM	176.1	nm
λ (peak)	630.6	nm
λ (center)	602.1	nm
λ (centroid)	598.4	nm
SDCM	Cool White	
RA	93	
Corr. Coef.	0.001727284	
Correlation	0.0054	
R1	95.1	
R2	94.0	
R3	91.5	
R4	94.5	
R5	93.8	
R6	92.0	
R7	94.9	
R8	91.6	
R9	77.8	
R10	85.2	
R11	95.2	
R12	81.3	
R13	94.4	
R14	94.5	



Spectral Distribution of Radiant Flux



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LUMINAIRE: 18" Linear Under-cabinet - Bronze

LAMP CAT. NO.: SAW9A32E-E1

LAMP: 42- Seoul Semiconductor 3000K LEDs

MOUNTING: Surface

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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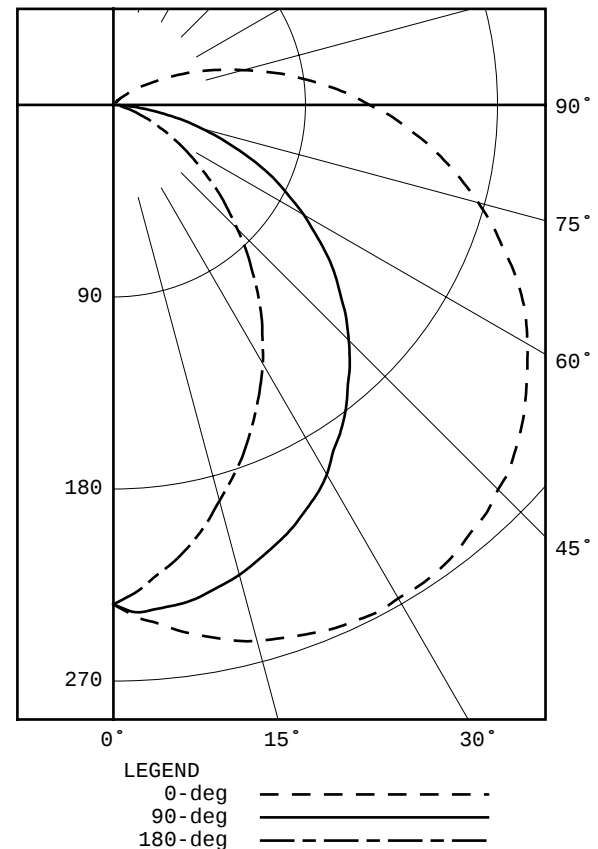
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CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	FLUX
0	234	234	234	234	234	
5	244	241	237	225	222	22
15	260	248	228	201	192	64
25	267	247	211	171	158	97
35	266	239	186	137	121	118
45	255	222	156	99	82	124
55	236	196	122	62	48	117
65	211	167	84	29	22	98
75	177	134	43	9	7	73
85	140	95	8	1	2	49
90	120	76	0	0	1	
95	101	58	0	0	0	30
105	63	27	0	0	0	16
115	33	10	0	0	0	7
125	13	3	0	0	0	2
135	3	1	0	0	0	1
145	1	1	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	SUMMARY LUMENS	%FIXT
0- 30		182	22.4
0- 40		300	36.8
0- 60		541	66.3
0- 90		761	93.3
90-120		52	6.4
90-130		54	6.6
90-150		55	6.7
90-180		55	6.7
0-180		816	100.0

EFFICACY = 65.8 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	234	234	234	234	234	234	234	234	234	234	234	234	234	234
2.5	240	239	239	239	239	237	237	236	235	236	238	235	231	230
5.0	244	244	244	244	243	241	239	237	235	236	237	234	229	227
7.5	249	249	248	248	246	244	241	239	235	235	236	232	226	224
10.0	253	253	253	251	249	246	243	239	235	234	234	230	223	220
12.5	257	256	256	254	251	247	243	238	234	231	231	226	219	215
15.0	260	260	258	256	253	248	244	238	232	229	228	223	215	210
17.5	262	262	261	258	254	249	243	236	230	226	224	219	210	204
20.0	264	264	263	260	255	249	243	235	228	222	220	215	205	198
22.5	266	265	264	260	255	249	242	233	225	218	216	209	199	191
25.0	267	267	264	260	255	247	240	231	221	214	211	204	192	184
27.5	268	267	265	260	254	246	237	227	217	209	206	199	186	177
30.0	267	267	265	260	253	244	234	223	213	203	200	192	180	170
32.5	267	266	264	258	251	242	231	220	208	197	192	185	172	162
35.0	266	265	262	256	249	239	227	215	203	191	186	178	165	154
37.5	264	263	260	254	246	235	223	210	196	184	179	171	157	146
40.0	261	261	257	250	242	231	218	205	190	177	171	164	149	137
42.5	259	258	254	247	238	227	213	198	183	170	164	155	141	128
45.0	255	255	251	243	234	222	207	192	176	163	156	148	132	119
47.5	252	251	247	239	229	216	201	185	170	155	148	139	123	110
50.0	247	246	242	234	224	211	194	178	162	146	139	130	114	100
52.5	242	242	237	229	218	205	188	171	154	138	131	122	105	91
55.0	236	236	231	223	212	196	180	163	146	130	122	112	96	82
57.5	230	230	225	216	205	190	173	156	138	121	112	103	86	71
60.0	224	223	219	210	197	182	166	147	129	111	103	93	76	62
62.5	218	216	212	203	190	175	158	140	120	102	93	84	66	52
65.0	211	210	205	195	183	167	150	131	112	93	84	73	56	43
67.5	203	201	196	187	175	159	142	122	102	83	74	64	47	35
70.0	194	193	188	180	167	151	133	113	93	73	63	53	37	27
72.5	186	185	180	171	158	142	124	104	83	63	53	44	29	20
75.0	177	177	172	162	150	134	115	95	74	53	43	34	20	13
77.5	168	167	163	154	140	124	105	85	63	43	34	25	13	8
80.0	159	159	153	144	132	115	96	76	54	34	24	16	8	5
82.5	150	149	144	135	122	106	87	65	44	24	16	9	3	2
85.0	140	140	135	125	112	95	77	56	35	16	8	4	1	1
87.5	131	130	125	115	103	87	67	47	26	8	2	0	0	0
90.0	120	120	115	106	93	76	58	37	18	3	0	0	0	0
92.5	111	110	105	96	83	67	49	29	11	1	0	0	0	0
95.0	101	101	96	86	74	58	40	22	7	0	0	0	0	0
97.5	91	90	86	78	65	50	33	16	4	0	0	0	0	0
100.0	82	81	77	68	56	41	25	11	2	0	0	0	0	0
102.5	72	72	68	59	48	34	20	8	1	0	0	0	0	0
105.0	63	63	59	51	40	27	15	5	0	0	0	0	0	0
107.5	55	55	51	43	34	22	11	3	0	0	0	0	0	0
110.0	47	46	43	36	27	17	8	2	0	0	0	0	0	0
112.5	40	39	36	30	22	13	6	1	0	0	0	0	0	0
115.0	33	32	30	24	17	10	4	1	0	0	0	0	0	0
117.5	27	27	24	19	13	7	3	1	0	0	0	0	0	0
120.0	21	21	19	15	10	5	2	1	0	0	0	0	0	0
122.5	17	16	14	11	7	4	1	1	0	0	0	0	0	0
125.0	13	13	11	9	5	3	1	0	0	0	0	0	0	0
127.5	10	10	8	6	4	2	1	0	0	0	0	0	0	0
130.0	7	7	6	4	3	1	1	0	0	0	0	0	0	0
132.5	5	5	4	3	2	1	1	0	0	0	0	0	0	0
135.0	3	4	3	2	1	1	1	0	0	0	0	0	0	0
137.5	3	3	2	2	1	1	1	0	0	0	0	0	0	0
140.0	2	2	2	1	1	1	0	0	0	0	0	0	0	0
142.5	1	1	1	1	1	1	0	0	0	0	0	0	0	0
145.0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
147.5	1	1	1	1	1	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	1	1	1	1	0	0	0	0	0	0	0	0	0	0
152.5	1	1	1	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	234	234	234	234	234	234	234
2.5	230	229	229	229	229	229	229
5.0	226	225	224	223	223	222	222
7.5	222	219	218	217	216	216	216
10.0	217	214	212	211	209	209	209
12.5	211	208	205	203	201	201	201
15.0	205	201	197	194	193	192	192
17.5	198	193	190	186	185	184	184
20.0	191	186	182	179	176	176	176
22.5	184	178	174	170	168	167	167
25.0	177	171	166	162	159	158	158
27.5	169	162	157	153	150	149	149
30.0	161	154	149	144	141	140	140
32.5	153	145	140	135	131	130	130
35.0	145	137	130	125	122	120	121
37.5	136	128	121	115	112	111	111
40.0	127	118	111	106	103	101	101
42.5	117	109	102	96	93	92	92
45.0	108	99	92	87	84	82	82
47.5	99	89	83	78	75	74	73
50.0	89	80	73	69	66	65	65
52.5	80	71	64	60	57	56	56
55.0	70	62	56	52	50	48	48
57.5	61	53	47	44	42	41	41
60.0	51	44	40	36	35	34	34
62.5	43	36	32	30	28	27	28
65.0	35	29	26	24	22	22	22
67.5	27	23	20	19	18	17	18
70.0	20	17	15	14	14	13	13
72.5	14	12	11	10	10	10	10
75.0	10	9	8	8	7	7	7
77.5	6	6	5	5	5	5	5
80.0	4	4	4	4	4	4	4
82.5	2	2	2	2	2	2	2
85.0	1	1	1	2	2	2	2
87.5	1	1	1	1	1	1	1
90.0	0	0	1	1	1	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		6
5- 10		17
10- 15		27
15- 20		37
20- 25		45
25- 30		52
30- 35		57
35- 40		61
40- 45		62
45- 50		62
50- 55		60
55- 60		57
60- 65		52
65- 70		46
70- 75		40
75- 80		33
80- 85		27
85- 90		22
90- 95		17
95-100		13
100-105		9
105-110		6
110-115		4
115-120		3
120-125		1
125-130		1
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		22
10- 20		64
20- 30		97
30- 40		118
40- 50		124
50- 60		117
60- 70		98
70- 80		73
80- 90		49
90-100		30
100-110		16
110-120		7
120-130		2
130-140		1
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	102	96	92	88	91	87	84	86	83	80	81	79	76	74
2	95	86	78	72	91	83	76	70	78	73	68	74	69	65	70	66	63	60
3	86	75	66	59	83	73	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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HUBBELL
Lighting

Date
9/6/2017

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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