

Project Number
17.02424



Date
9/6/2017

LAB 6
Sphere

Test Sample Description

Catalog Number: P700003-020-30
Description: 24" Linear Under-Cabinet - Bronze

Photometry

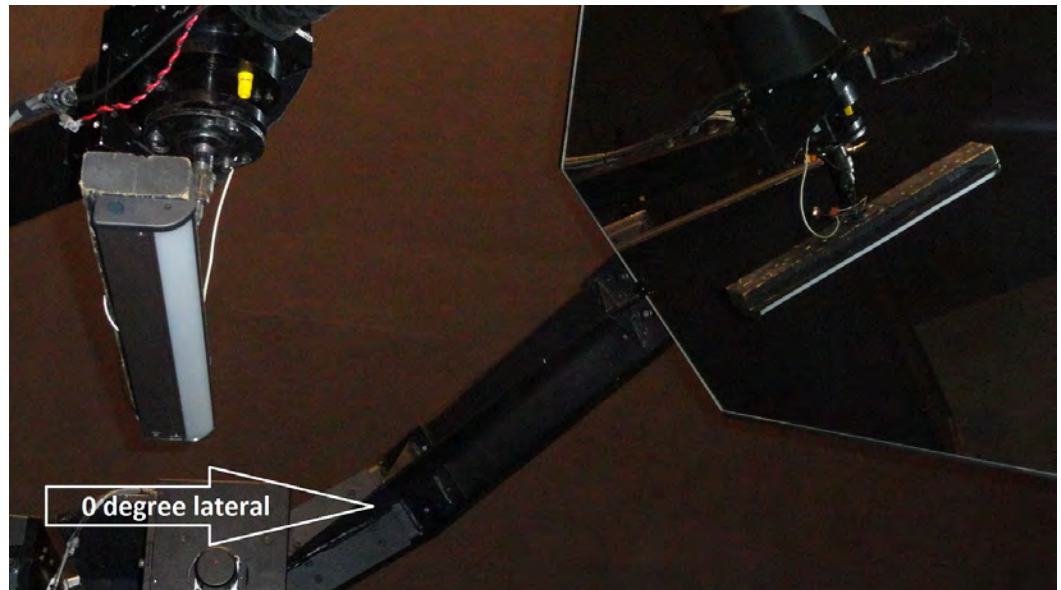
Test Method: IES LM-79-08 § 10
Preburn Time: 0:30
Time To Stabilize: 0:50
Total Operating Time: 5:20

Input Voltage (Volts): 120.0
Input Current (Amps): 0.123
Input Wattage (Watts): 14.6
Ambient Temp (°C): 24.2
PF @120V: 0.992
THD @120V (%): 13.25

Sphere

Test Method: IES LM-79-08 § 9.1 & 12.1
Preburn Time: 8:00
Time To Stabilize: 1:01
Total Operating Time: 9:01

Input Voltage (Volts): 120.0
Input Current (Amps): 0.121
Input Wattage (Watts): 14.5
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.



Lamp Cat#: SAW9A32E-E1

Lamp Desc: 56 - Seoul Semiconductor 3000K LEDs

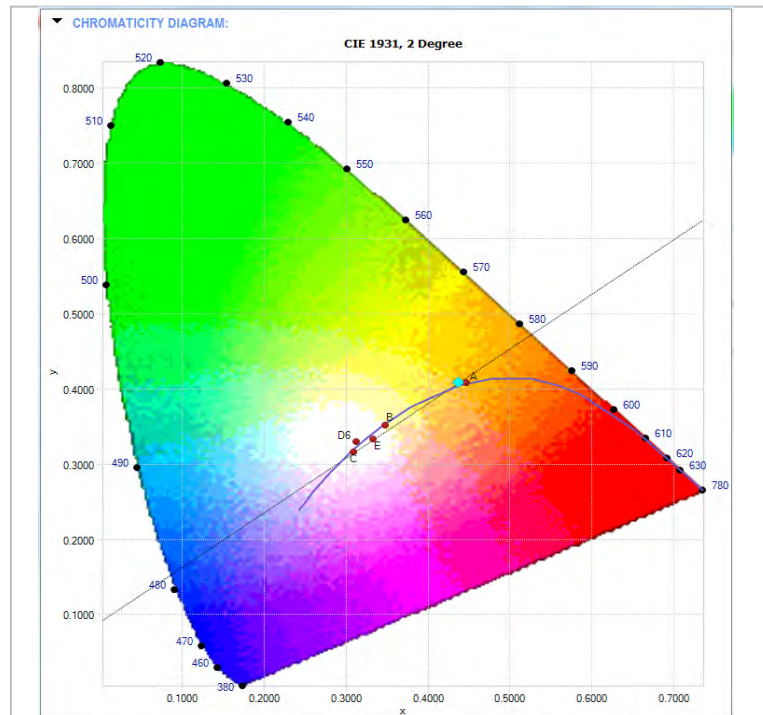
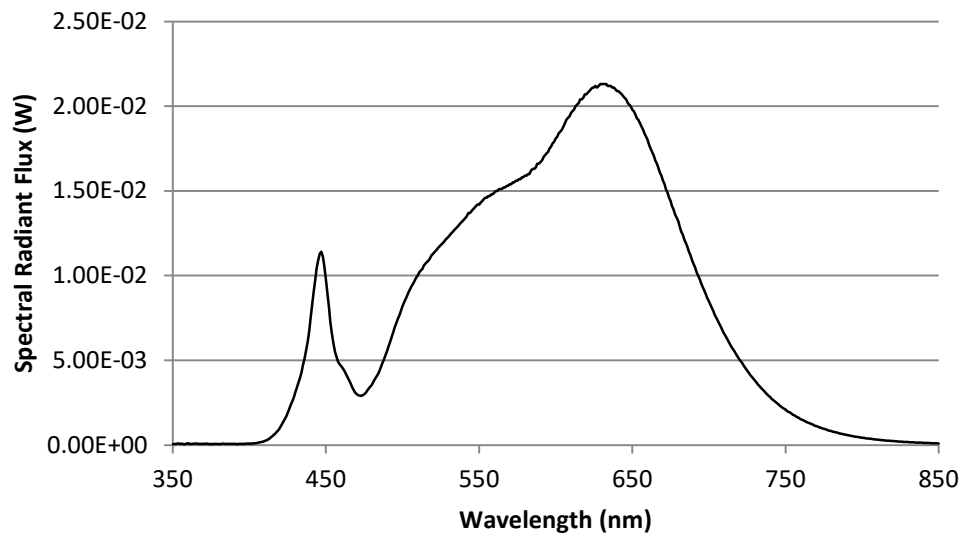
Driver Desc: NA

Efficacy: 72.8 LPW

S/P Ratio: 1.4 LM'/LM

Spectral Results

Name	Value	Unit
Φ	3.83	watts
$\Phi(v)$	1055	lumens
$\Phi(v')$	1470	lm'
Chrom x	0.437	
Chrom y	0.4085	
Chrom u	0.2487	
Chrom v	0.3488	
Duv	0.0017	
Chrom u'	0.2487	
Chrom v'	0.5231	
CCT	3033	K
Purity	53.8	%
λ (dom)	582.1	nm
FWHM	175.8	nm
λ (peak)	630.7	nm
λ (center)	602.3	nm
λ (centroid)	598.7	nm
SDCM	Cool White	
RA	93	
Corr. Coef.	0.001775074	
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	81.4	
R13	94.4	
R14	94.5	

**Spectral Distribution of Radiant Flux**

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LUMINAIRE: 24" Linear Under-Cabinet - Bronze

LAMP CAT. NO.: SAW9A32E-E1

LAMP: 56- Seoul Semi 3000K LEDs

MOUNTING: Surface

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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CANDELA DISTRIBUTION

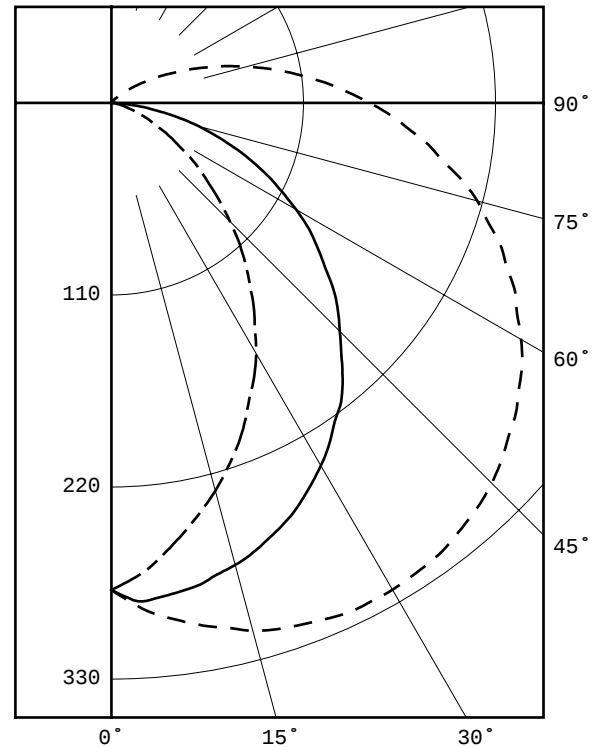
	0.0	45.0	90.0	135.0	180.0	FLUX
0	279	279	279	279	279	26
5	294	288	285	268	266	76
15	313	297	274	239	230	116
25	322	297	254	204	187	140
35	320	286	223	161	142	148
45	308	266	185	116	96	139
55	285	237	144	72	56	117
65	255	202	99	33	25	88
75	217	161	52	9	8	60
85	171	117	9	1	2	37
90	148	94	0	0	1	20
95	125	72	0	0	0	9
105	80	35	0	0	0	3
115	42	13	0	0	0	1
125	17	3	0	0	0	0
135	4	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	SUMMARY LUMENS	%FIXT
0- 30		218	22.3
0- 40		358	36.6
0- 60		645	65.9
0- 90		911	92.9
90-120		65	6.7
90-130		68	7.0
90-150		69	7.0
90-180		69	7.1
0-180		980	100.0

EFFICACY = 67.1 lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.70 1.27 0.93





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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	279	279	279	279	279	279	279	279	279	279	279	279	279	279
2.5	287	287	287	286	285	284	283	281	278	281	285	280	274	275
5.0	294	294	293	292	290	288	286	283	279	281	285	278	272	271
7.5	299	299	298	297	295	291	289	285	279	280	283	276	269	267
10.0	304	305	302	301	298	294	290	285	279	278	281	273	265	262
12.5	308	309	306	304	301	295	291	285	277	275	277	270	260	257
15.0	313	313	311	308	303	297	292	285	276	273	274	265	255	251
17.5	316	316	313	310	305	299	292	283	274	269	270	261	250	244
20.0	318	318	315	311	306	298	291	281	270	265	265	255	243	236
22.5	320	320	317	313	306	297	289	279	267	260	260	249	236	229
25.0	322	322	318	313	306	297	287	276	263	255	254	243	230	221
27.5	322	322	318	312	305	295	284	272	258	249	247	236	222	212
30.0	322	322	318	311	303	292	281	268	253	242	240	229	213	203
32.5	321	321	316	310	301	289	277	262	247	235	232	221	206	193
35.0	320	320	315	308	298	286	273	257	241	228	223	213	196	183
37.5	318	318	313	305	295	282	267	252	235	221	216	205	186	173
40.0	315	315	309	301	291	277	262	245	227	211	206	194	177	163
42.5	312	311	306	297	286	272	256	238	220	203	195	184	166	152
45.0	308	307	302	293	281	266	249	230	211	193	185	174	156	141
47.5	303	302	297	288	275	259	241	222	203	184	176	164	146	130
50.0	297	298	291	282	269	252	234	215	193	174	166	154	134	118
52.5	292	292	286	276	262	245	226	205	183	164	154	143	124	107
55.0	285	285	279	268	254	237	218	195	174	153	144	133	112	95
57.5	279	278	272	261	246	229	209	186	164	143	134	121	101	84
60.0	271	271	265	254	239	221	201	177	155	132	122	110	89	72
62.5	262	262	256	245	230	212	189	166	143	121	110	98	78	61
65.0	255	254	248	236	221	202	180	157	133	110	99	86	66	50
67.5	245	245	239	228	212	191	170	146	122	99	87	75	54	40
70.0	237	236	230	218	203	182	159	136	111	87	75	63	43	30
72.5	226	226	219	209	191	171	149	125	99	74	63	52	33	22
75.0	217	216	210	199	181	161	138	113	88	63	52	40	23	15
77.5	206	205	199	187	170	150	128	103	77	51	40	29	15	9
80.0	193	193	187	176	160	139	117	91	65	40	28	19	9	5
82.5	183	183	176	165	149	129	106	80	53	29	19	11	4	3
85.0	171	171	164	154	137	117	94	68	42	19	9	4	1	1
87.5	160	160	153	142	126	106	83	57	32	10	3	0	0	0
90.0	148	148	141	131	114	94	71	47	22	4	0	0	0	0
92.5	136	136	129	119	103	83	60	37	14	1	0	0	0	0
95.0	125	124	119	107	92	72	51	28	9	0	0	0	0	0
97.5	113	113	107	97	81	62	41	21	4	0	0	0	0	0
100.0	102	101	95	85	71	52	33	14	2	0	0	0	0	0
102.5	91	90	85	75	61	43	26	10	1	0	0	0	0	0
105.0	80	80	74	65	51	35	19	7	1	0	0	0	0	0
107.5	70	69	65	55	43	29	14	4	0	0	0	0	0	0
110.0	60	59	55	47	35	22	10	3	0	0	0	0	0	0
112.5	51	51	47	38	29	17	8	2	0	0	0	0	0	0
115.0	42	42	38	31	22	13	5	1	0	0	0	0	0	0
117.5	35	34	31	25	17	9	3	1	0	0	0	0	0	0
120.0	28	28	25	19	13	7	2	1	0	0	0	0	0	0
122.5	22	22	19	15	10	5	2	0	0	0	0	0	0	0
125.0	17	17	15	11	7	3	1	0	0	0	0	0	0	0
127.5	13	12	11	8	5	2	1	0	0	0	0	0	0	0
130.0	9	9	8	6	3	2	1	0	0	0	0	0	0	0
132.5	7	7	6	4	2	1	1	0	0	0	0	0	0	0
135.0	4	4	4	3	2	1	1	0	0	0	0	0	0	0
137.5	3	3	3	2	1	1	1	0	0	0	0	0	0	0
140.0	2	2	2	2	1	1	0	0	0	0	0	0	0	0
142.5	2	2	2	1	1	1	0	0	0	0	0	0	0	0
145.0	1	1	1	1	1	0	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	1	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	279	279	279	279	279	279	279
2.5	275	273	273	273	273	273	273
5.0	270	268	267	266	265	265	266
7.5	265	262	260	259	257	257	257
10.0	259	255	253	251	249	249	248
12.5	252	247	244	242	240	239	239
15.0	245	239	236	233	231	231	230
17.5	237	231	228	224	221	221	220
20.0	229	222	218	213	211	210	210
22.5	220	213	208	203	200	200	199
25.0	212	204	198	192	189	188	187
27.5	202	193	186	182	178	176	177
30.0	192	183	176	171	167	165	166
32.5	182	172	165	159	155	153	153
35.0	171	161	154	147	143	142	142
37.5	160	150	142	136	132	131	130
40.0	150	139	131	124	120	119	119
42.5	138	128	119	113	109	107	108
45.0	127	116	108	101	98	96	96
47.5	115	104	96	90	87	85	85
50.0	103	93	85	80	76	75	74
52.5	93	82	75	69	66	65	65
55.0	81	72	64	60	57	56	56
57.5	70	60	54	50	48	47	46
60.0	60	51	45	42	40	39	39
62.5	49	42	37	34	32	31	31
65.0	39	33	29	27	26	25	25
67.5	31	26	23	21	20	20	20
70.0	23	19	17	16	15	15	15
72.5	17	14	13	12	11	11	11
75.0	11	9	9	8	8	8	8
77.5	7	6	6	6	6	6	6
80.0	4	4	4	4	4	4	4
82.5	2	2	3	3	3	3	3
85.0	1	1	2	2	2	2	2
87.5	0	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		7
5- 10		20
10- 15		32
15- 20		44
20- 25		54
25- 30		62
30- 35		68
35- 40		72
40- 45		74
45- 50		74
50- 55		72
55- 60		67
60- 65		62
65- 70		55
70- 75		48
75- 80		40
80- 85		33
85- 90		27
90- 95		21
95-100		16
100-105		12
105-110		8
110-115		5
115-120		3
120-125		2
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		26
10- 20		76
20- 30		116
30- 40		140
40- 50		148
50- 60		139
60- 70		117
70- 80		88
80- 90		60
90-100		37
100-110		20
110-120		9
120-130		3
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	101	96	92	87	91	87	83	85	82	80	81	78	76	73
2	95	85	78	71	91	83	76	70	78	72	67	74	69	65	70	66	62	60
3	86	75	66	59	83	72	64	58	68	61	56	65	59	54	61	56	52	49
4	78	66	56	49	76	64	55	49	60	53	47	57	51	46	54	49	44	42
5	72	59	49	42	69	57	48	42	54	46	40	51	45	39	49	43	38	36
6	66	53	43	37	64	51	42	36	49	41	35	46	40	34	44	38	33	31
7	61	48	38	32	59	46	38	32	44	37	31	42	35	30	40	34	30	27
8	57	43	35	29	55	42	34	28	40	33	28	39	32	27	37	31	26	24
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	22	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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