

Project Number
17.02413



Date
8/31/2017

LAB 6
Sphere

Test Sample Description

Catalog Number: P700002-028-30
Description: 18" Linear Under-Cabinet. White

Photometry

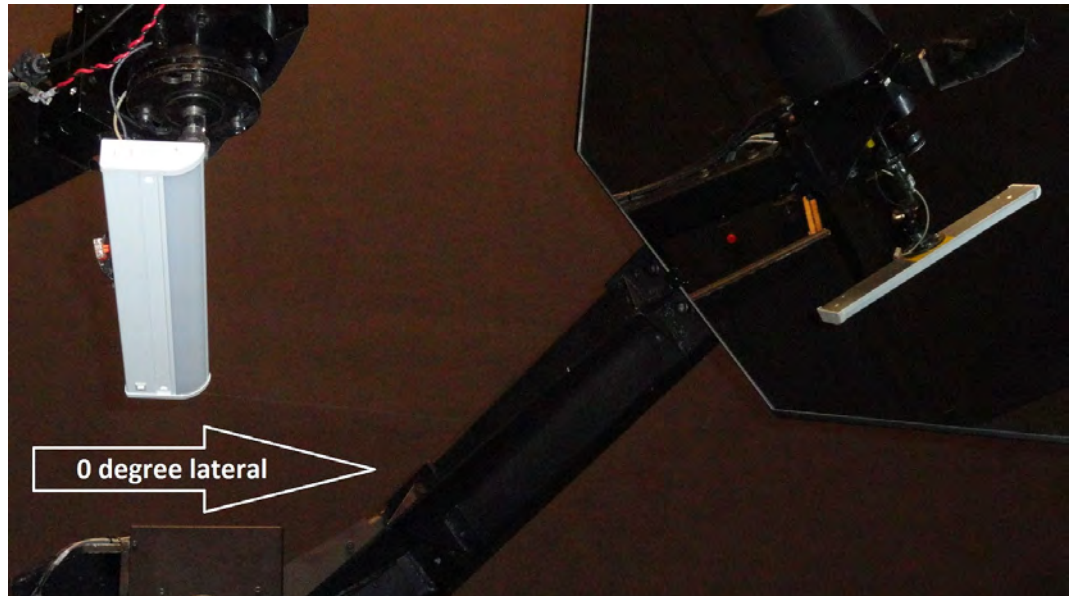
Test Method: IES LM-79-08 § 10
Preburn Time: 6:20
Time To Stabilize: 0:40
Total Operating Time: 7:55

Input Voltage (Volts): 120.1
Input Current (Amps): 0.105
Input Wattage (Watts): 12.6
Ambient Temp (°C): 24.2
PF @120V: 0.992
THD @120V (%): 13.35

Sphere

Test Method: IES LM-79-08 § 9.1 & 12.1
Preburn Time: 1:00
Time To Stabilize: 0:58
Total Operating Time: 1:58

Input Voltage (Volts): 120.0
Input Current (Amps): 0.104
Input Wattage (Watts): 12.4
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.

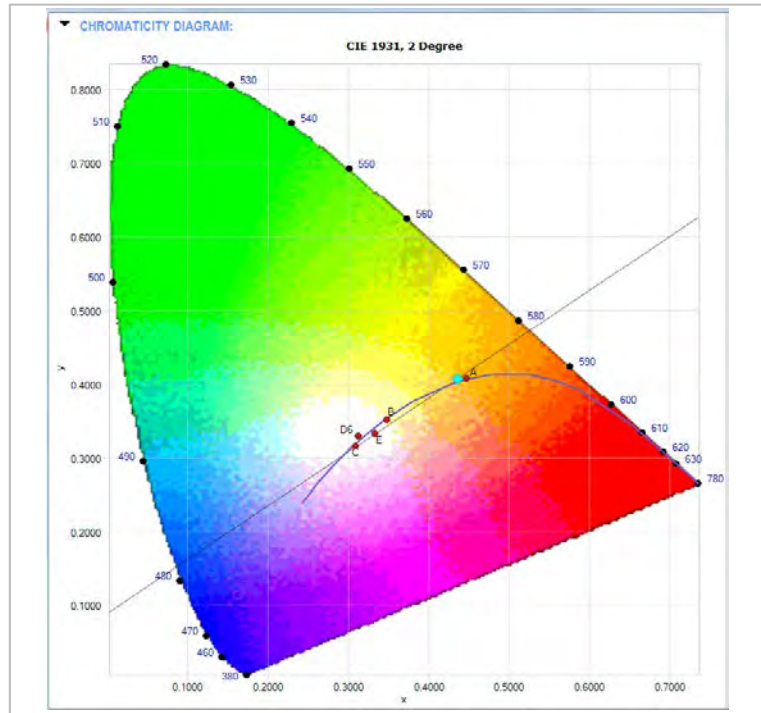


Lamp Cat#: SAW9A32E-E1
 Lamp Desc: 42 - Seoul Semiconductor 3000K LEDs
 Driver Desc: NA

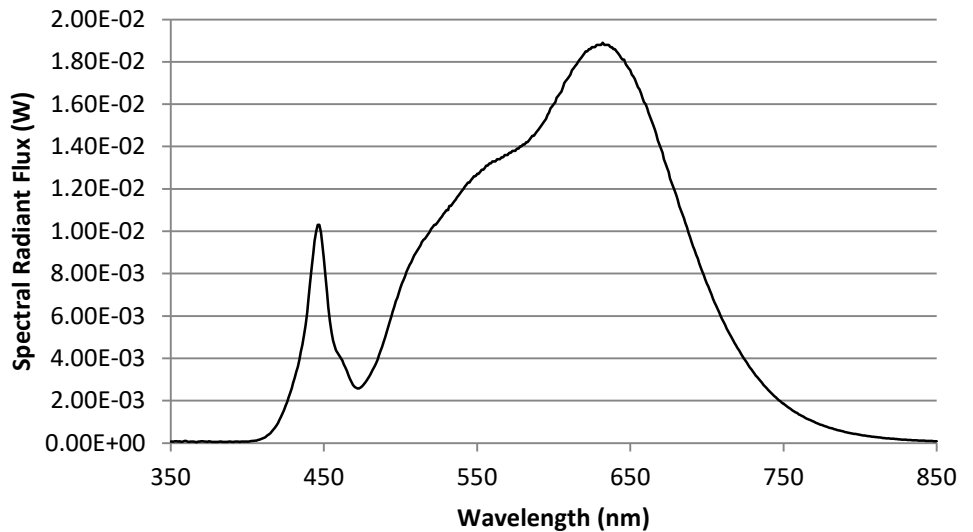
Efficacy: 75.6 LPW S/P Ratio: 1.4 LM/LM

Spectral Results

Name	Value	Unit
Φ	3.41	watts
Φ(v)	938	lumens
Φ(v')	1313	lm'
Chrom x	0.4358	
Chrom y	0.4081	
Chrom u	0.2481	
Chrom v	0.3485	
Duv	0.0017	
Chrom u'	0.2481	
Chrom v'	0.5228	
CCT	3049	K
Purity	53.3	%
λ (dom)	582.0	nm
FWHM	176.8	nm
λ (peak)	631.5	nm
λ (center)	602.0	nm
λ (centroid)	598.4	nm
SDCM	Cool White	
RA	93	
Corr. Coef.	0.001764257	
Correlation	0.0054	
R1	95.2	
R2	94.0	
R3	91.4	
R4	94.4	
R5	93.9	
R6	92.0	
R7	94.8	
R8	91.8	
R9	78.4	
R10	85.2	
R11	95.1	
R12	81.5	
R13	94.5	
R14	94.4	



Spectral Distribution of Radiant Flux



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LUMINAIRE: 18" Linear Under-Cabinet. White

LAMP: 42- Seoul 3000K LEDs

MOUNTING: Surface

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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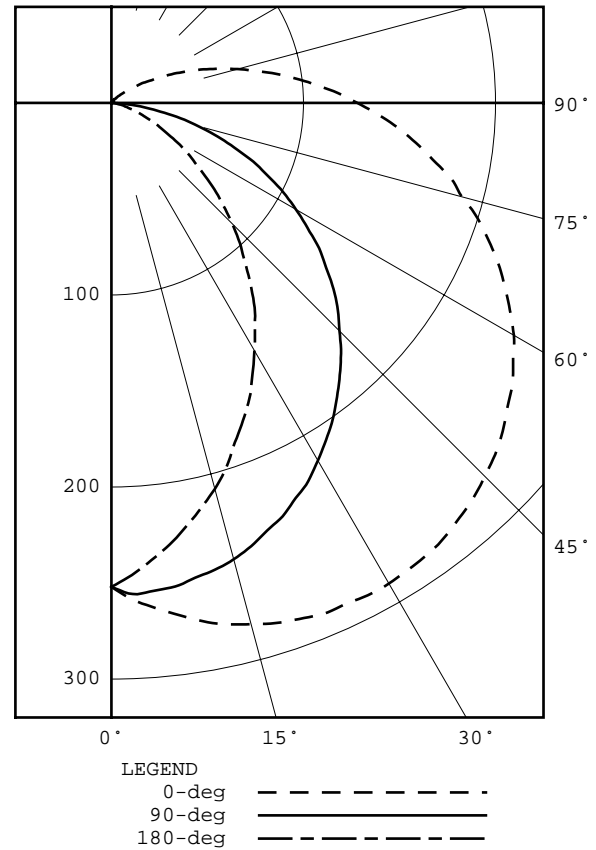
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CANDELA DISTRIBUTION						FLUX
	0.0	45.0	90.0	135.0	180.0	
0	252	252	252	252	252	
5	264	260	255	242	239	24
15	281	268	246	216	208	69
25	288	267	227	183	170	104
35	287	257	201	146	130	127
45	275	239	168	106	89	134
55	255	213	132	67	52	126
65	226	180	90	32	25	106
75	189	143	47	10	8	79
85	150	103	9	2	2	53
90	128	82	0	1	1	
95	107	62	0	0	0	32
105	68	30	0	0	0	17
115	36	11	0	0	0	7
125	14	3	0	0	0	3
135	4	1	0	0	0	1
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	197		22.4
0- 40	323		36.8
0- 60	583		66.3
0- 90	821		93.3
90-120	56		6.4
90-130	58		6.6
90-150	59		6.7
90-180	59		6.7
0-180	880		100.0

EFFICACY = 69.8 lm/W
CIE TYPE - DIRECT
PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.69 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	252	252	252	252	252	252	252	252	252	252	252	252	252	252
2.5	259	259	258	258	258	256	255	254	253	255	256	253	250	249
5.0	264	264	264	263	261	260	258	255	254	254	255	252	247	245
7.5	269	269	268	267	265	263	260	257	254	253	254	250	244	241
10.0	274	273	273	271	268	265	262	257	253	251	251	247	240	236
12.5	278	278	276	275	271	267	263	257	253	250	249	244	237	232
15.0	281	280	279	277	273	268	263	257	251	247	246	240	232	226
17.5	284	284	282	279	275	269	263	255	248	244	242	236	227	220
20.0	286	285	283	280	276	269	262	254	246	240	237	231	221	214
22.5	288	287	285	281	276	268	261	251	243	236	233	226	215	207
25.0	288	288	285	281	275	267	258	248	238	230	227	220	208	200
27.5	289	289	286	281	274	265	257	245	235	225	222	214	202	191
30.0	289	288	285	280	273	263	253	241	230	220	215	208	194	183
32.5	288	287	284	278	271	260	250	237	224	213	208	200	186	174
35.0	287	286	282	277	269	257	246	232	219	207	201	192	178	166
37.5	285	284	280	274	265	253	241	227	213	200	193	184	169	157
40.0	282	281	277	271	262	249	236	221	206	191	185	176	161	148
42.5	279	278	274	267	257	244	230	215	199	183	177	167	152	138
45.0	275	274	270	263	252	239	224	208	191	175	168	159	143	128
47.5	271	270	266	258	247	233	218	201	182	167	160	150	133	118
50.0	266	265	261	253	241	227	211	192	175	158	151	140	123	108
52.5	260	260	255	247	234	220	203	184	167	149	141	131	113	97
55.0	255	254	249	241	228	213	195	176	158	140	132	121	104	88
57.5	248	248	243	234	221	206	187	168	149	130	121	111	93	77
60.0	242	241	236	227	213	197	179	159	140	120	111	100	83	67
62.5	234	234	228	219	205	188	170	150	130	110	101	90	71	56
65.0	226	226	220	211	197	180	161	141	120	100	90	79	61	47
67.5	218	217	212	203	188	171	152	131	111	89	80	69	51	38
70.0	209	209	203	193	179	162	143	122	100	79	68	58	40	29
72.5	200	200	193	184	170	153	133	112	90	68	58	47	31	22
75.0	189	189	184	174	161	143	124	102	79	58	47	37	22	15
77.5	181	180	174	165	151	134	113	91	69	47	37	27	15	10
80.0	170	170	164	155	141	123	103	81	58	36	26	18	9	6
82.5	160	159	154	144	131	113	93	71	47	26	17	10	4	3
85.0	150	149	144	134	120	103	82	60	38	17	9	4	2	1
87.5	139	139	133	124	110	92	72	50	28	9	3	1	0	0
90.0	128	128	123	113	99	82	62	41	20	4	0	0	0	0
92.5	118	117	112	103	89	72	52	31	13	1	0	0	0	0
95.0	107	107	102	92	79	62	44	24	7	0	0	0	0	0
97.5	97	97	92	83	69	53	35	18	4	0	0	0	0	0
100.0	87	86	81	73	60	45	28	12	2	0	0	0	0	0
102.5	77	77	72	64	52	37	22	9	1	0	0	0	0	0
105.0	68	67	63	55	44	30	17	6	1	0	0	0	0	0
107.5	59	58	54	47	36	24	13	4	0	0	0	0	0	0
110.0	51	50	46	39	30	19	9	3	0	0	0	0	0	0
112.5	43	42	39	33	24	15	7	2	0	0	0	0	0	0
115.0	36	35	32	26	19	11	5	1	0	0	0	0	0	0
117.5	29	29	26	21	15	8	3	1	0	0	0	0	0	0
120.0	23	23	21	17	11	6	2	1	0	0	0	0	0	0
122.5	19	18	16	13	8	4	2	1	0	0	0	0	0	0
125.0	14	14	12	10	6	3	1	1	0	0	0	0	0	0
127.5	11	11	9	7	5	2	1	1	0	0	0	0	0	0
130.0	8	8	7	5	3	2	1	0	0	0	0	0	0	0
132.5	6	6	5	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	1	0	0	0	0	0	0	0
142.5	2	2	1	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	252	252	252	252	252	252	252
2.5	248	247	247	246	246	246	246
5.0	243	242	241	240	239	239	239
7.5	238	236	235	233	232	232	232
10.0	233	230	228	226	224	224	224
12.5	228	224	221	219	217	217	216
15.0	221	216	213	210	209	207	208
17.5	214	209	206	202	200	199	199
20.0	207	201	196	192	190	189	188
22.5	200	192	187	183	180	179	179
25.0	190	183	178	174	171	170	170
27.5	182	174	169	164	161	160	159
30.0	174	166	159	154	151	150	149
32.5	164	156	149	144	141	139	139
35.0	155	146	139	134	131	129	130
37.5	146	137	130	123	121	118	119
40.0	136	127	119	114	110	109	108
42.5	126	117	109	103	101	98	99
45.0	116	106	99	94	91	89	89
47.5	105	96	89	84	80	79	79
50.0	95	86	79	74	71	69	70
52.5	85	76	69	65	62	61	60
55.0	76	67	60	56	54	52	52
57.5	65	57	51	48	46	45	45
60.0	56	48	43	40	38	37	37
62.5	47	40	35	33	31	31	30
65.0	38	32	29	26	25	25	25
67.5	30	25	23	21	20	20	19
70.0	22	19	17	16	15	15	15
72.5	17	14	13	12	12	11	11
75.0	12	10	9	9	8	8	8
77.5	8	7	6	6	6	6	6
80.0	5	4	4	4	4	4	4
82.5	3	3	3	3	3	3	3
85.0	1	2	2	2	2	2	2
87.5	1	1	1	1	1	1	1
90.0	0	1	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	18
10- 15	29
15- 20	39
20- 25	48
25- 30	56
30- 35	61
35- 40	65
40- 45	67
45- 50	67
50- 55	65
55- 60	61
60- 65	56
65- 70	50
70- 75	43
75- 80	36
80- 85	29
85- 90	23
90- 95	18
95-100	14
100-105	10
105-110	7
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	24
10- 20	69
20- 30	104
30- 40	127
40- 50	134
50- 60	126
60- 70	106
70- 80	79
80- 90	53
90-100	32
100-110	17
110-120	7
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	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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Date
8/31/2017

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