

Project Number
17.02414



Date
8/31/2017

LAB 6
Sphere

Test Sample Description

Catalog Number: P700003-028-30
Description: 24" Linear Under-Cabinet. White

Photometry

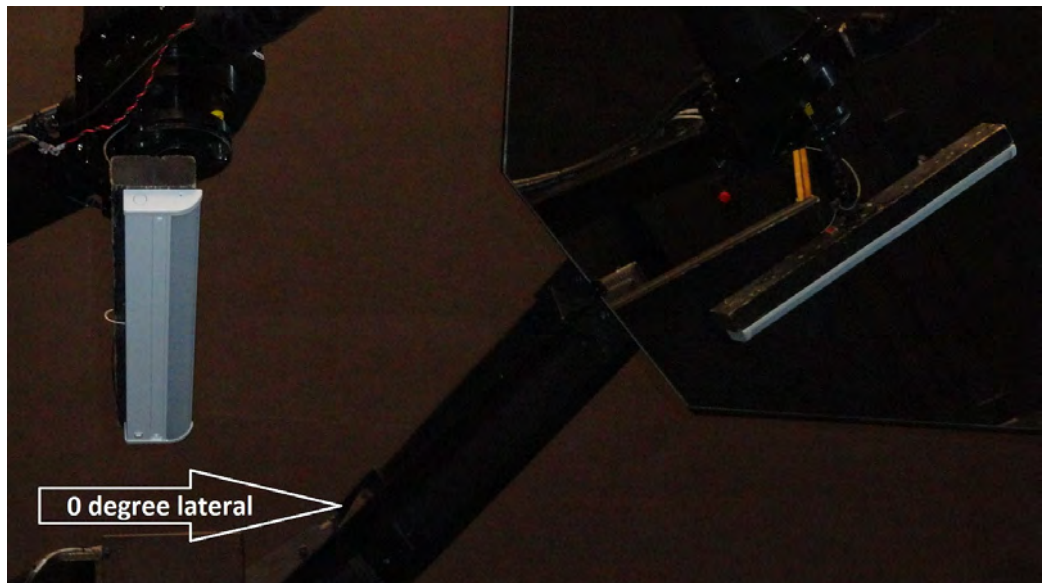
Test Method: IES LM-79-08 § 10
Preburn Time: 23:15
Time To Stabilize: 0:55
Total Operating Time: 27:00

Input Voltage (Volts): 119.9
Input Current (Amps): 0.124
Input Wattage (Watts): 14.8
Ambient Temp (°C): 24.2
PF @120V: 0.992
THD @120V (%): 13.53

Sphere

Test Method: IES LM-79-08 § 9.1 & 12.1
Preburn Time: 0:10
Time To Stabilize: 0:58
Total Operating Time: 1:08

Input Voltage (Volts): 120.0
Input Current (Amps): 0.123
Input Wattage (Watts): 14.6
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: 56 - Seoul Semiconductor 3000K LEDs

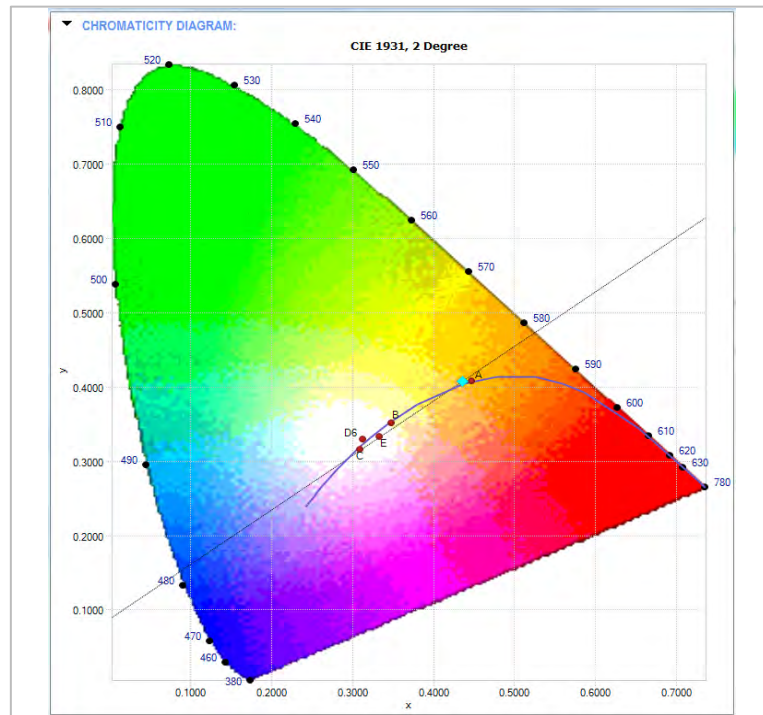
Driver Desc: NA

Efficacy: 77.5 LPW

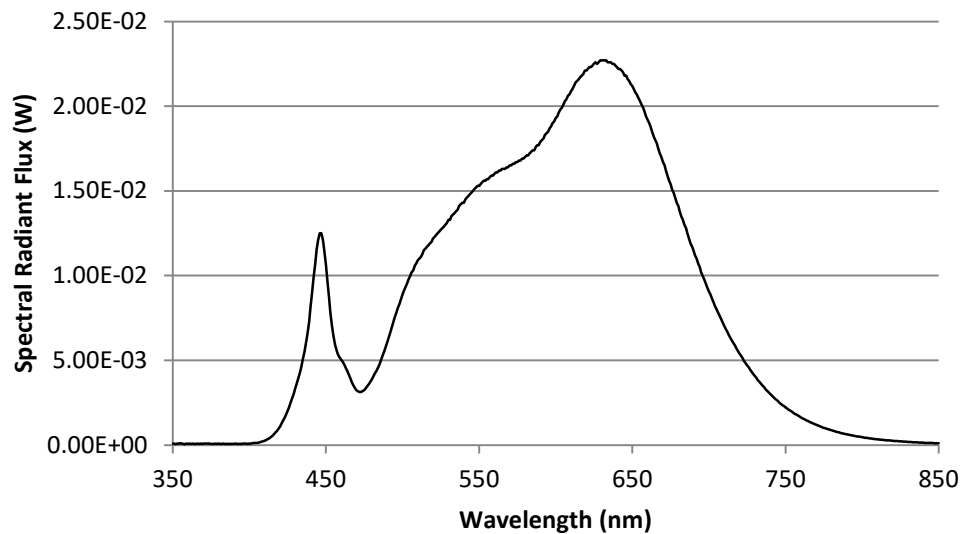
S/P Ratio: 1.4 LM'/LM

Spectral Results

Name	Value	Unit
Φ	4.11	watts
$\Phi(v)$	1132	lumens
$\Phi(v')$	1588	lm'
Chrom x	0.4356	
Chrom y	0.4083	
Chrom u	0.2479	
Chrom v	0.3486	
Duv	0.0018	
Chrom u'	0.2479	
Chrom v'	0.5228	
CCT	3055	K
Purity	53.3	%
λ (dom)	581.9	nm
FWHM	177.2	nm
λ (peak)	630.5	nm
λ (center)	601.9	nm
λ (centroid)	598.3	nm
SDCM	Cool White	
RA	93	
Corr. Coef.	0.001874702	
Correlation	0.0054	
R1	95.2	
R2	94.0	
R3	91.4	
R4	94.5	
R5	93.9	
R6	91.9	
R7	94.9	
R8	91.8	
R9	78.3	
R10	85.2	
R11	95.2	
R12	81.3	
R13	94.5	
R14	94.4	



Spectral Distribution of Radiant Flux



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LUMINAIRE: 24" Linear Under-Cabinet. White

LAMP: 56- Seoul 3000K LEDs

MOUNTING: Surface

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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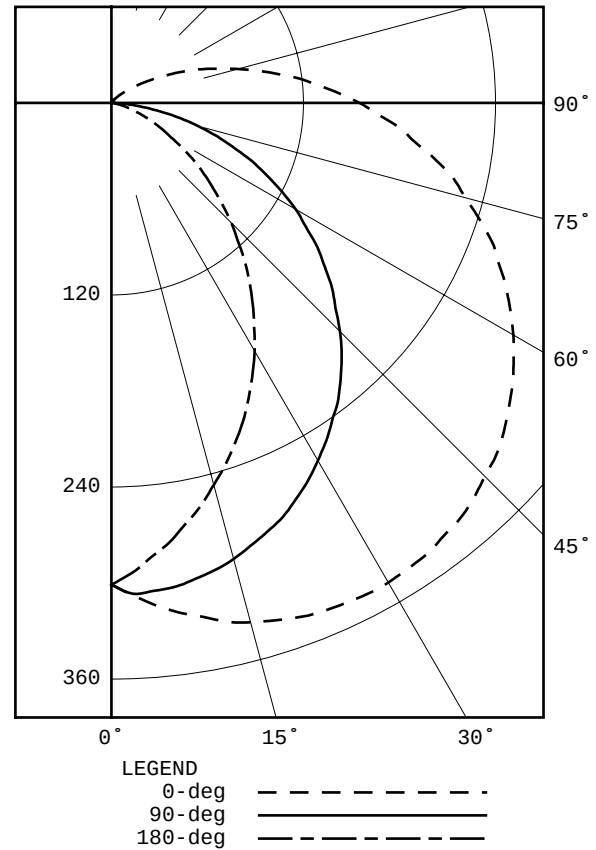
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CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	FLUX
0	301	301	301	301	301	
5	315	309	306	288	285	28
15	336	320	295	258	247	82
25	345	319	273	219	203	125
35	344	308	241	174	154	152
45	330	286	202	127	106	160
55	306	256	157	79	63	151
65	272	218	107	38	29	127
75	229	172	56	11	9	95
85	181	123	11	2	2	63
90	155	99	0	1	1	
95	129	75	0	0	0	38
105	82	37	0	0	0	20
115	44	14	0	0	0	9
125	18	4	0	0	0	3
135	6	1	0	0	0	1
145	2	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 LUMENS	SUMMARY LUMENS	%FIXT
0- 30		235	22.3
0- 40		386	36.6
0- 60		697	66.1
0- 90		982	93.1
90-120		68	6.4
90-130		71	6.7
90-150		72	6.9
90-180		72	6.9
0-180		1054	100.0

EFFICACY = 71.2 lm/W
CIE TYPE - DIRECT
PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.69 1.27 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	301	301	301	301	301	301	301	301	301	301	301	301	301	301
2.5	308	308	308	308	307	305	304	302	299	303	307	301	295	295
5.0	315	315	314	313	312	309	308	305	300	302	306	299	292	292
7.5	321	321	320	319	316	313	311	306	301	301	305	297	289	287
10.0	326	326	325	323	320	316	312	307	300	300	302	294	284	281
12.5	332	331	330	327	324	318	314	307	299	297	299	290	280	276
15.0	336	335	334	330	326	320	314	306	297	294	295	286	274	269
17.5	339	339	337	333	328	320	314	305	295	290	290	281	268	262
20.0	342	341	339	335	329	321	313	303	292	285	285	275	262	255
22.5	344	343	341	336	330	321	312	301	288	280	280	269	255	246
25.0	345	344	342	337	329	319	309	297	283	274	273	262	247	238
27.5	346	345	342	337	329	318	306	294	279	268	266	255	239	228
30.0	346	345	342	336	326	315	302	288	273	261	258	247	230	219
32.5	345	344	341	334	324	312	298	283	267	254	250	239	222	210
35.0	344	343	339	332	322	308	294	278	260	246	241	230	213	199
37.5	341	341	337	329	318	304	289	271	254	238	233	220	202	187
40.0	339	338	334	325	313	298	282	264	246	229	223	211	191	175
42.5	335	334	330	320	308	293	276	257	237	220	213	200	180	164
45.0	330	330	325	315	302	286	268	248	228	209	202	189	169	153
47.5	326	325	320	309	296	280	261	240	219	200	190	178	158	141
50.0	320	318	314	304	289	272	253	232	210	188	180	166	146	129
52.5	313	313	307	297	282	264	243	222	200	177	168	156	135	117
55.0	306	306	300	289	274	256	235	213	188	166	157	143	122	104
57.5	298	298	292	281	265	247	225	202	177	155	144	132	110	92
60.0	290	289	284	273	256	238	216	191	167	143	133	119	98	79
62.5	281	281	274	263	247	227	205	179	155	131	120	108	85	67
65.0	272	272	267	254	237	218	194	169	143	119	107	95	73	56
67.5	262	261	256	244	227	206	183	158	132	106	95	81	60	45
70.0	253	251	246	233	216	195	171	146	119	94	81	69	48	35
72.5	241	240	234	223	205	183	160	134	107	81	69	56	37	25
75.0	229	229	223	211	192	172	147	122	94	68	56	44	27	18
77.5	219	217	212	200	181	160	136	110	83	56	44	32	18	11
80.0	206	206	199	186	169	147	123	97	69	43	31	22	10	6
82.5	192	192	186	173	156	136	112	85	56	31	20	12	5	3
85.0	181	180	173	162	145	123	99	72	45	21	11	5	2	1
87.5	167	167	161	149	132	111	86	60	33	11	4	1	0	0
90.0	155	154	149	137	119	99	75	49	24	4	0	0	0	0
92.5	142	141	135	124	107	86	63	38	15	1	0	0	0	0
95.0	129	129	123	111	95	75	52	29	9	0	0	0	0	0
97.5	118	116	111	100	84	64	43	21	5	0	0	0	0	0
100.0	105	104	99	88	73	54	34	15	3	0	0	0	0	0
102.5	93	93	87	77	62	45	27	11	1	0	0	0	0	0
105.0	82	82	76	67	53	37	20	7	1	0	0	0	0	0
107.5	71	71	66	57	44	30	16	5	1	0	0	0	0	0
110.0	62	61	56	48	37	23	12	3	1	0	0	0	0	0
112.5	53	52	48	40	30	19	9	2	0	0	0	0	0	0
115.0	44	43	40	33	24	14	6	2	0	0	0	0	0	0
117.5	36	36	32	26	18	11	4	1	0	0	0	0	0	0
120.0	29	29	26	21	14	8	3	1	0	0	0	0	0	0
122.5	23	23	21	16	11	6	2	1	0	0	0	0	0	0
125.0	18	18	16	12	8	4	2	1	0	0	0	0	0	0
127.5	14	14	12	9	6	3	2	1	0	0	0	0	0	0
130.0	11	10	9	7	5	3	1	1	0	0	0	0	0	0
132.5	8	8	7	5	3	2	1	0	0	0	0	0	0	0
135.0	6	6	5	4	2	1	1	0	0	0	0	0	0	0
137.5	4	4	4	3	2	1	1	0	0	0	0	0	0	0
140.0	3	3	3	2	1	1	1	0	0	0	0	0	0	0
142.5	3	2	2	2	1	1	0	0	0	0	0	0	0	0
145.0	2	2	2	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	1	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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LATERAL ANGLE

	125.0	135.0	145.0	155.0	165.0	175.0	180.0
0.0	301	301	301	301	301	301	301
2.5	295	294	294	293	294	294	294
5.0	290	288	287	286	285	286	285
7.5	285	282	280	278	277	277	277
10.0	278	274	271	269	268	268	267
12.5	272	267	263	260	259	259	258
15.0	264	258	254	251	249	248	247
17.5	256	249	244	241	239	237	237
20.0	247	240	235	230	228	226	226
22.5	238	230	224	219	216	215	215
25.0	228	219	213	208	205	203	203
27.5	219	209	203	196	192	191	191
30.0	208	198	190	183	180	179	179
32.5	197	186	178	172	168	166	166
35.0	185	174	166	160	156	154	154
37.5	174	163	155	147	144	142	142
40.0	162	151	142	136	132	130	130
42.5	150	139	130	123	120	117	117
45.0	138	127	118	112	108	106	106
47.5	126	114	106	100	97	94	94
50.0	114	103	95	88	85	83	83
52.5	102	91	83	78	74	73	73
55.0	90	79	72	66	64	63	63
57.5	78	68	61	57	55	53	53
60.0	66	57	51	47	45	44	43
62.5	55	47	42	39	37	36	36
65.0	45	38	34	31	30	29	29
67.5	36	30	26	24	23	23	23
70.0	27	22	20	18	18	17	17
72.5	20	16	15	13	13	13	13
75.0	13	11	10	10	9	9	9
77.5	8	7	7	6	6	6	6
80.0	5	5	4	4	4	4	4
82.5	3	3	3	3	3	3	3
85.0	2	2	2	2	2	2	2
87.5	1	1	1	1	2	2	2
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		7
5- 10		21
10- 15		35
15- 20		47
20- 25		58
25- 30		67
30- 35		74
35- 40		78
40- 45		80
45- 50		80
50- 55		78
55- 60		73
60- 65		67
65- 70		60
70- 75		52
75- 80		43
80- 85		35
85- 90		28
90- 95		22
95-100		16
100-105		12
105-110		8
110-115		6
115-120		4
120-125		2
125-130		1
130-135		1
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		28
10- 20		82
20- 30		125
30- 40		152
40- 50		160
50- 60		151
60- 70		127
70- 80		95
80- 90		63
90-100		38
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	88	91	87	84	86	83	80	81	78	76	73
2	95	86	78	72	91	83	76	70	78	72	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	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	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	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	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
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.