

Project Number
17.02415



Date
8/31/2017

LAB #6
Sphere

Test Sample Description

Catalog Number: P700004-028-30
Description: 36" Linear Under-Cabinet. White

Photometry

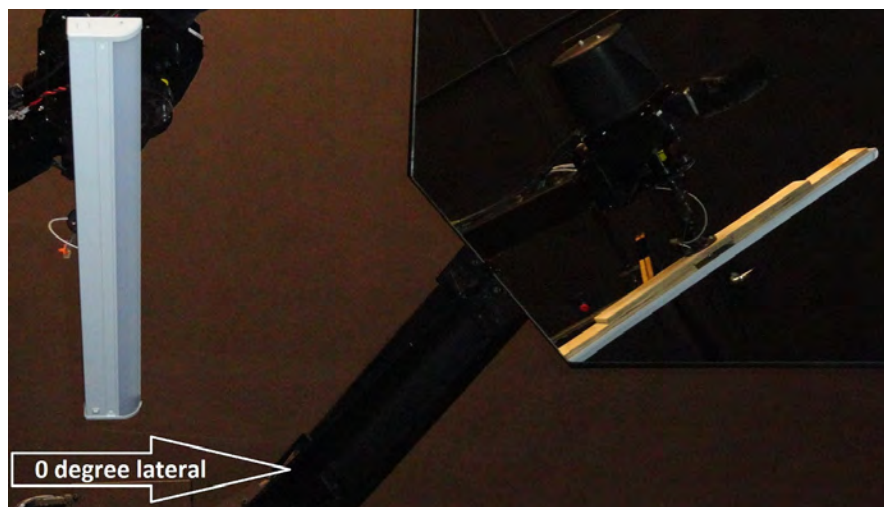
Test Method: IES LM-79-08 § 10
Preburn Time: 28:50
Time To Stabilize: 0:45
Total Operating Time: 30:15

Input Voltage (Volts): 120.1
Input Current (Amps): 0.175
Input Wattage (Watts): 20.8
Ambient Temp (°C): 24.2
PF @120V: 0.99
THD @120V (%): 15.19

Sphere

Test Method: IES LM-79-08 § 9.1 & 12.1
Preburn Time: 1:00
Time To Stabilize: 0:50
Total Operating Time: 1:50

Input Voltage (Volts): 120.0
Input Current (Amps): 0.173
Input Wattage (Watts): 20.5
Ambient Temp (°C): 24.0



Hubbell Lighting, Inc.

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

Checked (sphere): M. ELLMANN
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: 84 - Seoul Semiconductor 3000K LEDs

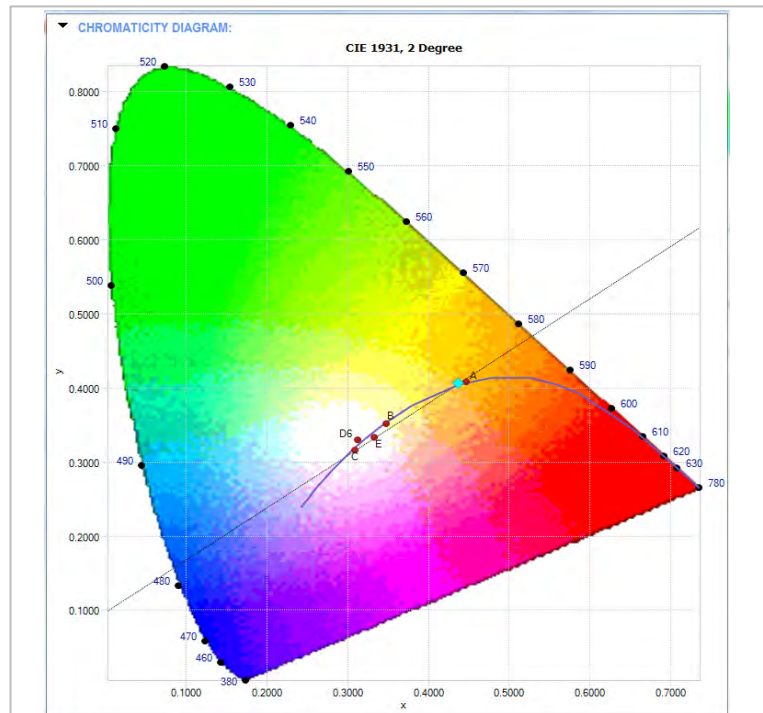
Driver Desc: NA

Efficacy: 72.4 LPW

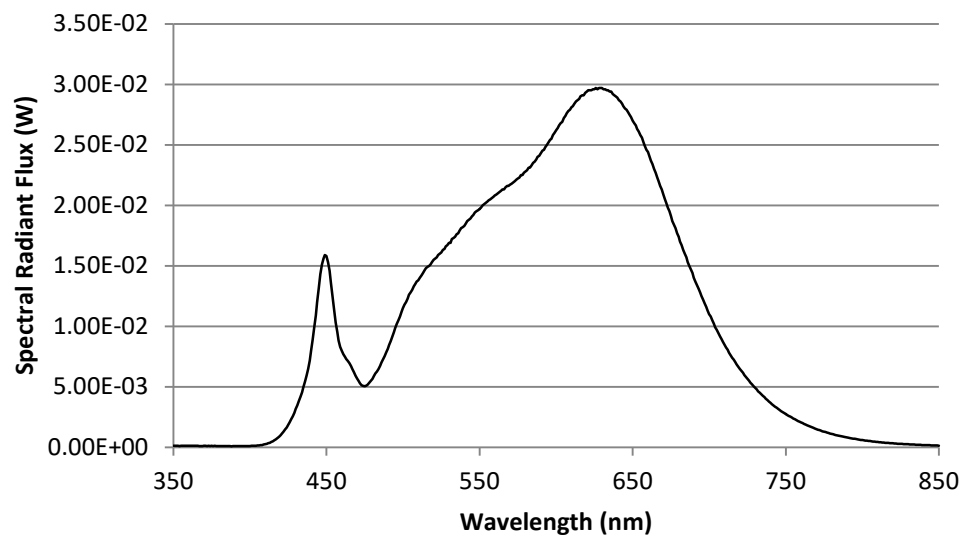
S/P Ratio: 1.4 LM'/LM

Spectral Results

Name	Value	Unit
Φ	5.32	watts
$\Phi(v)$	1485	lumens
$\Phi(v')$	2085	lm'
Chrom x	0.437	
Chrom y	0.4065	
Chrom u	0.2496	
Chrom v	0.3482	
Duv	0.0009	
Chrom u'	0.2496	
Chrom v'	0.5224	
CCT	3016	K
Purity	53.2	%
λ (dom)	582.4	nm
FWHM	171.6	nm
λ (peak)	629.1	nm
λ (center)	601.7	nm
λ (centroid)	597.2	nm
SDCM	Cool White	
RA	94	
Corr. Coef.	0.000978607	
Correlation	0.0054	
R1	94.5	
R2	95.1	
R3	94.2	
R4	95.0	
R5	93.7	
R6	93.5	
R7	95.3	
R8	88.7	
R9	71.9	
R10	87.6	
R11	95.6	
R12	81.7	
R13	94.4	
R14	96.0	



Spectral Distribution of Radiant Flux



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REPORT NUMBER: 17.02415

PAGE: 3 OF 11

ISSUE DATE: 08/30/17

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CATALOG NUMBER: P700004-028-30

LUMINAIRE: 36" Linear Under-Cabinet. White

LAMP: 84- Seoul 3000K LEDs

MOUNTING: Surface

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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ISSUE DATE: 08/30/17
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CATALOG NUMBER: P700004-028-30

PAGE: 4 OF 11

CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	
0	438	438	438	438	438	
5	463	452	442	421	420	42
15	492	468	425	377	365	119
25	506	466	394	323	299	182
35	502	447	349	257	228	221
45	480	414	294	186	157	233
55	444	368	230	117	94	219
65	393	312	155	58	44	183
75	331	248	80	18	15	137
85	261	175	16	3	4	91
90	225	140	0	1	2	
95	185	106	0	0	0	54
105	117	51	0	0	0	29
115	61	18	0	0	0	12
125	24	5	0	0	0	4
135	7	2	0	0	0	1
145	2	1	1	0	0	0
155	1	0	0	0	0	0
165	0	0	1	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	0

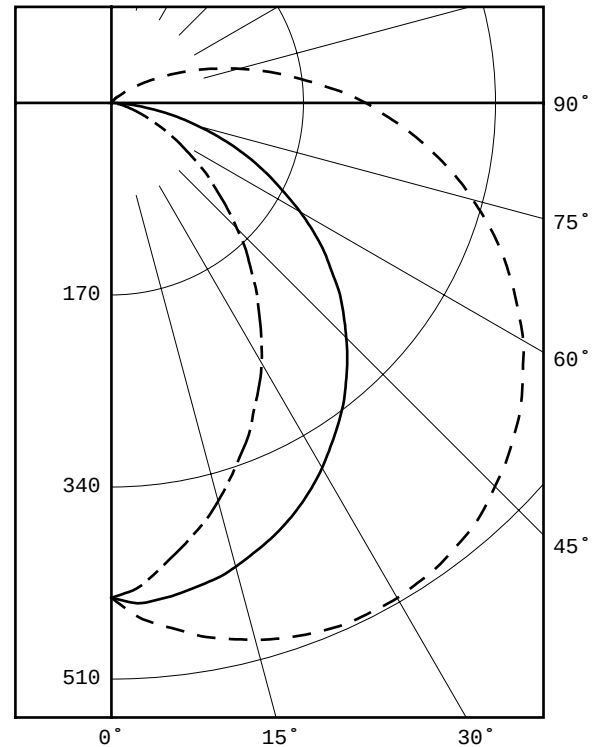
FLUX

ZONAL ZONE	LUMEN LUMENS	SUMMARY LUMENS	%FIXT
0- 30		342	22.4
0- 40		563	36.9
0- 60		1014	66.4
0- 90		1426	93.4
90-120		96	6.3
90-130		100	6.5
90-150		101	6.6
90-180		101	6.6
0-180		1527	100.0

EFFICACY = 73.4 lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.70 1.26 0.95



LEGEND
0-deg - - - - -
90-deg - - - - -
180-deg - - - - -



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REPORT NUMBER: 17.02415

PAGE: 5 OF 11

ISSUE DATE: 08/30/17

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CATALOG NUMBER: P700004-028-30

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	438	438	438	438	438	438	438	438	438	438	438	438	438	438
2.5	453	453	451	448	448	446	444	442	437	439	443	437	431	432
5.0	463	463	460	457	456	452	449	444	438	438	442	435	427	426
7.5	471	471	468	464	462	457	453	446	438	436	439	431	421	419
10.0	480	479	475	471	467	462	455	448	437	434	435	426	416	411
12.5	486	486	481	476	472	465	457	447	436	430	431	421	408	402
15.0	492	492	487	481	475	468	458	446	433	425	425	415	400	393
17.5	497	496	491	484	478	468	457	444	429	420	418	407	391	382
20.0	501	500	495	487	479	469	456	441	424	413	411	399	383	371
22.5	504	503	497	489	480	468	453	437	419	406	403	389	372	359
25.0	506	505	499	489	479	466	450	432	412	397	394	379	360	347
27.5	506	506	498	488	477	462	445	427	405	388	384	369	348	334
30.0	506	505	498	487	474	458	440	420	397	378	373	357	336	320
32.5	504	503	496	484	470	453	433	412	387	367	361	344	322	305
35.0	502	500	493	480	465	447	425	403	377	355	349	331	308	290
37.5	498	497	489	476	460	440	418	393	366	343	337	318	295	274
40.0	494	492	484	470	452	431	408	383	355	330	323	304	278	257
42.5	488	487	478	463	445	423	399	371	342	316	309	289	264	241
45.0	480	479	471	456	436	414	388	359	329	301	294	273	246	224
47.5	473	472	464	448	427	403	377	347	315	287	279	258	230	206
50.0	464	464	454	438	417	392	364	334	302	271	264	241	214	187
52.5	455	453	446	429	406	381	352	320	288	256	246	225	196	171
55.0	444	443	435	418	394	368	339	306	273	240	230	209	178	152
57.5	432	432	423	406	382	355	325	292	257	223	212	189	159	134
60.0	421	419	411	393	368	341	311	275	241	206	193	172	142	116
62.5	407	406	397	379	354	326	295	260	225	188	173	154	123	99
65.0	393	392	383	366	340	312	280	244	207	170	155	136	105	82
67.5	379	378	369	351	325	296	264	227	189	152	137	118	88	66
70.0	364	364	353	336	310	280	247	210	170	135	118	99	70	51
72.5	348	346	337	320	294	264	230	192	154	116	99	82	54	38
75.0	331	330	321	304	278	248	212	173	135	97	80	63	38	27
77.5	315	313	303	286	261	229	193	155	117	79	63	46	26	17
80.0	297	295	286	269	243	212	176	137	99	62	45	31	15	10
82.5	279	279	269	252	226	193	158	120	80	45	29	17	8	5
85.0	261	260	250	233	208	175	140	102	64	29	16	7	3	2
87.5	242	241	232	215	188	158	123	85	47	16	6	1	1	1
90.0	225	223	214	195	171	140	106	69	34	6	0	0	0	0
92.5	206	204	194	177	152	122	89	53	21	1	0	0	0	0
95.0	185	185	176	159	135	106	73	40	12	0	0	0	0	0
97.5	167	167	158	141	119	90	59	29	7	0	0	0	0	0
100.0	150	149	141	125	103	76	47	21	4	0	0	0	0	0
102.5	133	132	124	109	88	62	37	14	2	0	0	0	0	0
105.0	117	116	108	94	74	51	28	10	1	0	0	0	0	0
107.5	101	100	93	80	61	40	21	6	1	0	0	0	0	0
110.0	87	86	79	67	50	32	15	4	1	0	0	0	0	0
112.5	73	72	66	55	40	24	11	3	1	0	0	0	0	0
115.0	61	60	55	44	32	18	8	2	1	0	0	0	0	0
117.5	49	49	44	36	24	14	5	1	0	0	0	0	0	0
120.0	40	39	35	27	18	10	4	1	0	0	0	0	0	0
122.5	31	31	28	21	14	7	3	1	0	0	0	0	0	0
125.0	24	24	21	16	10	5	2	1	0	0	0	0	0	0
127.5	18	18	16	12	7	4	2	1	0	0	0	0	0	0
130.0	13	13	11	8	5	3	1	1	0	0	0	0	0	0
132.5	9	9	8	6	4	2	1	1	0	0	0	0	0	0
135.0	7	7	6	4	3	2	1	0	1	0	0	0	0	0
137.5	5	5	4	3	2	1	1	0	0	0	0	0	0	0
140.0	3	3	3	2	2	1	1	0	0	0	0	0	0	0
142.5	2	2	2	2	1	1	0	0	0	0	0	0	0	0
145.0	2	2	2	2	1	1	0	0	0	0	1	0	0	0
147.5	2	2	1	1	1	1	0	0	0	0	0	0	0	0

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REPORT NUMBER: 17.02415

PAGE: 6 OF 11

ISSUE DATE: 08/30/17

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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	2	1	1	1	0	0	0	1	1	1	1	0	0
152.5	1	1	1	1	1	0	0	1	1	1	1	1	1	1
155.0	1	1	1	0	0	0	0	0	0	1	0	0	0	0
157.5	0	0	0	0	0	0	0	0	1	0	1	0	0	0
160.0	0	0	0	0	0	0	0	1	0	1	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	1	1	1	1	0	0	0
167.5	0	0	0	0	0	0	0	1	0	1	0	0	0	0
170.0	0	0	0	0	0	0	1	1	1	0	0	1	0	0
172.5	0	0	0	0	0	0	0	1	1	0	1	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	1	1	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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REPORT NUMBER: 17.02415

PAGE: 7 OF 11

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CANDELA DISTRIBUTION
LATERAL ANGLE

	125.0	135.0	145.0	155.0	165.0	175.0	180.0
0.0	438	438	438	438	438	438	438
2.5	430	430	430	428	430	432	432
5.0	423	421	420	417	418	420	420
7.5	414	412	409	405	405	407	406
10.0	405	401	398	393	392	393	393
12.5	395	390	385	380	379	379	380
15.0	384	377	372	366	364	365	365
17.5	372	364	358	350	350	348	349
20.0	360	352	344	336	334	333	333
22.5	346	337	328	321	318	317	318
25.0	333	323	313	304	302	299	299
27.5	318	306	296	288	284	283	283
30.0	303	290	280	271	267	265	266
32.5	288	274	263	253	250	246	247
35.0	272	257	244	235	232	229	228
37.5	255	240	227	219	214	211	211
40.0	238	222	209	200	196	192	192
42.5	221	204	190	182	177	174	176
45.0	204	186	173	164	161	157	157
47.5	185	169	156	147	144	140	140
50.0	167	151	139	131	127	124	123
52.5	150	134	122	115	111	109	109
55.0	131	117	106	100	96	94	94
57.5	115	101	91	84	82	79	79
60.0	98	85	76	72	68	67	67
62.5	82	70	63	59	57	55	55
65.0	67	58	51	47	46	44	44
67.5	52	45	40	37	36	35	35
70.0	41	34	31	29	28	27	27
72.5	29	25	23	21	20	20	20
75.0	21	18	16	15	15	15	15
77.5	13	12	11	11	11	11	11
80.0	8	8	8	7	8	8	8
82.5	5	5	5	5	5	5	5
85.0	3	3	3	4	4	4	4
87.5	2	2	2	3	3	3	3
90.0	1	1	2	2	2	2	2
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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CATALOG NUMBER: P700004-028-30

PAGE: 8 OF 11

	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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CATALOG NUMBER: P700004-028-30

PAGE: 9 OF 11

5-DEGREE		
ZONAL	LUMEN	SUMMARY
0- 5		10
5- 10		31
10- 15		51
15- 20		69
20- 25		84
25- 30		97
30- 35		107
35- 40		114
40- 45		117
45- 50		116
50- 55		113
55- 60		106
60- 65		97
65- 70		86
70- 75		75
75- 80		62
80- 85		51
85- 90		40
90- 95		31
95-100		23
100-105		17
105-110		12
110-115		8
115-120		5
120-125		3
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		42
10- 20		119
20- 30		182
30- 40		221
40- 50		233
50- 60		219
60- 70		183
70- 80		137
80- 90		91
90-100		54
100-110		29
110-120		12
120-130		4
130-140		1
140-150		0
150-160		0
160-170		0
170-180		0



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PAGE: 10 OF 11

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC RW	80				70				50			30			10			0
	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	97	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	69	62	56	65	59	54	61	57	52	50
4	79	66	57	49	76	64	55	49	61	53	47	57	51	46	55	49	45	42
5	72	59	49	42	69	57	48	42	54	47	41	51	45	40	49	43	39	36
6	67	53	43	37	64	51	43	36	49	41	35	46	40	35	44	38	34	31
7	62	48	39	32	59	47	38	32	44	37	31	42	36	31	40	34	30	28
8	57	43	35	29	55	42	34	28	41	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
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.