

Project Number
20.00088



HUBBELL
Lighting

Date
1/29/2020

Photometric Test Report

Lab 5
Sphere

Test Sample Description

Catalog Number: P400255-009-30
Description: 4-LT LED Edge Lit Chandelier w/ Acrylic Refractor Material

Photometry

Test Method: IES LM-46-04
IES LM-79-08 §10
Preburn Time: 0:20
Time To Stabilize: 0:51
Total Operating Time: 3:15

Input Voltage (Volts): 120.0
Input Current (Amps): 0.168
Input Wattage (Watts): 19.7
Ambient Temp (°C): 25.5

Sphere

Test Method: IES LM-16-93
IES LM-79-08 §12.1
Preburn Time: 1:30
Time To Stabilize: 1:01
Total Operating Time: 2:31

Input Voltage (Volts): 120.0
Input Current (Amps): 0.167
Input Wattage (Watts): 19.7
Ambient Temp (°C): 24.0



Hubbell Lighting, Inc.

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

Checked (sphere): B. LEE
Checked (photometry): M. OLALDE
Approved: L. GENNETTEN

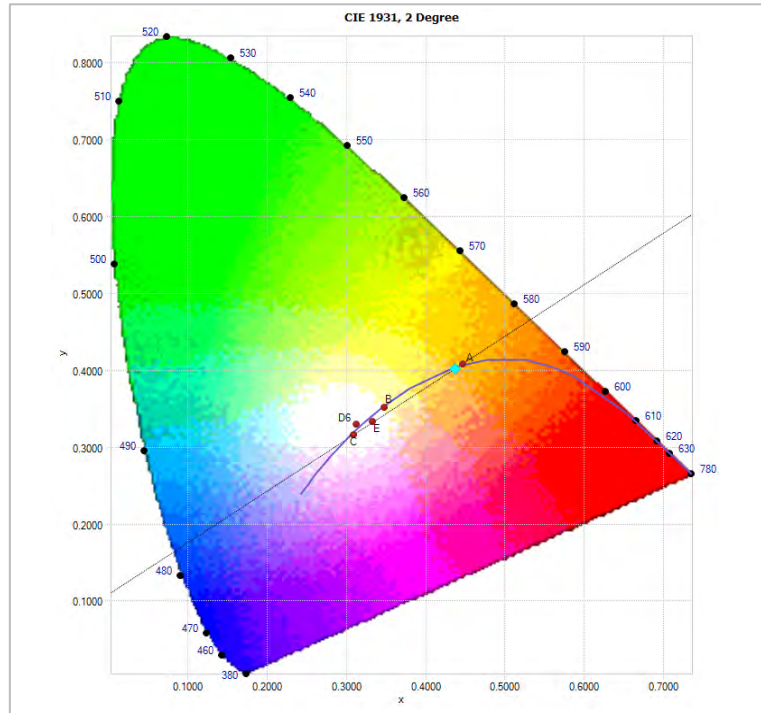


* This customer-provided information was not verified by the laboratory. Note that LED manufacturer and part # are unverifiable by the lab.
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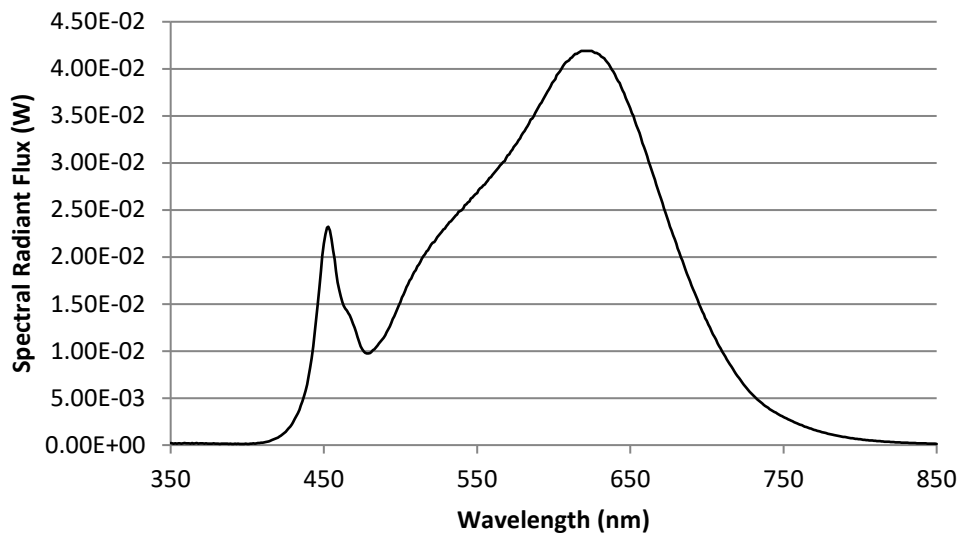
Lamp Cat#: STW9A12D-E1
 Lamp Desc: 120 - Seoul 3000K LEDs
 Driver Desc: 1 - Becky BQE20-0500-40-TD
 Programmed to 500mA
 Efficacy: 106.4 LPW S/P Ratio: 1.4 LM/LM

Spectral Results

Name	Value	Unit
Φ	7.27	watts
$\Phi(v)$	2096	lumens
$\Phi(v')$	2977	lm'
Chrom x	0.4365	
Chrom y	0.4026	
Chrom u	0.2509	
Chrom v	0.3472	
Duv	0.0007	
Chrom u'	0.2509	
Chrom v'	0.5207	
CCT	2994	K
Purity	51.9	%
λ (dom)	583.0	nm
FWHM	162	nm
λ (peak)	620.9	nm
λ (center)	599.9	nm
λ (centroid)	593.3	nm
SDCM	Cool White	
RA	93	
Corr. Coef.	0.000541963	
Correlation	0.0054	
R1	93.6	
R2	96.8	
R3	98.1	
R4	93.2	
R5	93.1	
R6	95.6	
R7	92.4	
R8	83.0	
R9	62.0	
R10	91.3	
R11	93.9	
R12	80.5	
R13	94.6	
R14	98.4	



Spectral Distribution of Radiant Flux



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LUMINAIRE: 4-LT LED Edge Lit Chandelier w/ Acrylic Refractor Material

LAMP CAT. NO.: STW9A12D-E1

LAMP: 120 - Seoul 3000K LEDs

BALLAST CATALOG NUMBER: BQE20-0500-40-TD

BALLAST: 1 - Becky - Programmed to 500mA

MOUNTING: Ceiling

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

SEARCH_CRI:

SEARCH_COLORTEMP:

SEARCH_LPW:

SEARCH_DISTRIBUTION:



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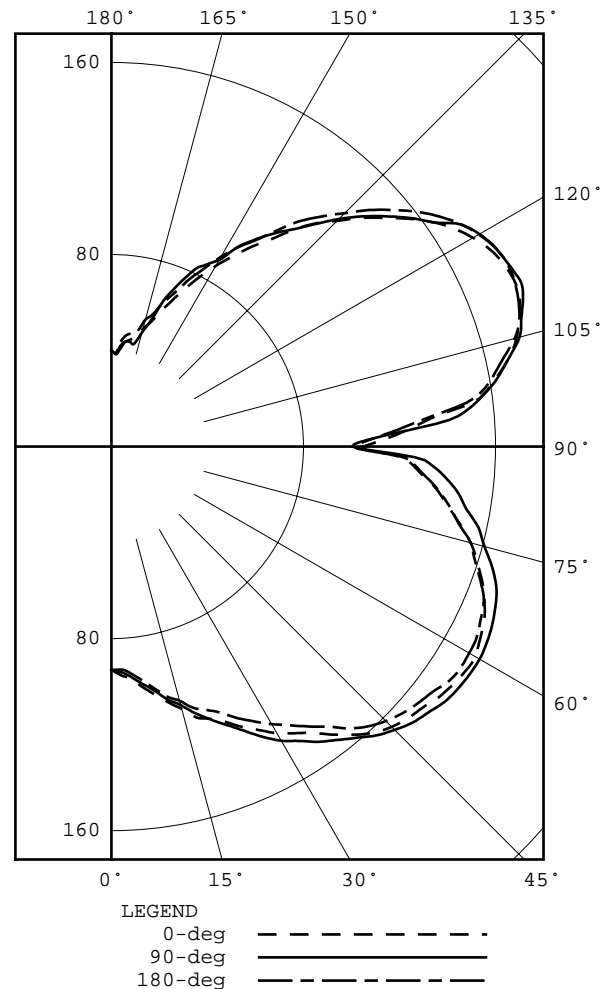
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CANDELA DISTRIBUTION						FLUX
	0.0	45.0	90.0	135.0	180.0	
0	93	93	93	93	93	
5	97	97	97	95	95	9
15	113	112	112	109	110	32
25	129	129	131	127	125	60
35	146	144	150	142	142	91
45	165	154	167	153	162	124
55	173	169	176	168	171	154
65	171	174	175	174	170	172
75	155	159	161	160	155	168
85	130	135	139	137	130	148
90	105	127	100	127	101	
95	133	150	145	150	131	158
105	175	179	176	179	174	186
115	180	183	182	184	182	180
125	163	161	163	162	167	145
135	133	127	134	129	138	102
145	101	104	106	107	105	66
155	73	80	81	83	77	37
165	51	51	49	53	55	15
175	42	41	41	42	44	4
180	40	40	40	40	40	

ZONAL ZONE	LUMEN LUMENS	SUMMARY %FIXT
0- 30	101	5.5
0- 40	192	10.4
0- 60	470	25.4
0- 90	957	51.7
90-120	524	28.3
90-130	669	36.2
90-150	837	45.2
90-180	893	48.3
0-180	1850	100.0

EFFICACY = 93.9 lm/W
CIE TYPE - GENERAL DIFFUSE
PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 2.33 2.36 2.31
SHIELDING ANGLES : 90 90





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LUMINOUS DIAMETER: 22.000
HEIGHT OF SIDE : 0.500

LUMINANCE DATA IN CANDELA/SQ M			
ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 90-DEG	AVERAGE 180-DEG
45	925.	935.	906.
55	1183.	1202.	1167.
65	1556.	1591.	1543.
75	2202.	2288.	2202.
85	4553.	4887.	4581.



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CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5
0.0	93	93	93	93	93	93	93	93	93	93	93	93	93	93
2.5	95	95	95	95	96	95	95	95	95	95	95	95	95	95
5.0	97	98	98	98	98	98	98	97	98	98	98	97	97	97
7.5	101	101	101	101	101	101	101	101	101	101	101	101	101	101
10.0	105	105	105	105	105	105	105	105	105	104	104	104	104	104
12.5	109	109	109	109	109	109	109	109	109	109	109	109	108	108
15.0	113	113	113	113	113	113	113	113	113	112	112	113	113	112
17.5	118	118	118	118	118	118	118	118	118	118	118	118	117	117
20.0	121	121	121	121	121	121	121	121	122	122	122	122	122	122
22.5	124	124	124	125	124	124	124	124	125	125	125	125	125	126
25.0	129	129	129	129	129	129	129	129	129	129	130	129	129	129
27.5	133	133	134	134	134	134	134	134	134	134	134	134	134	133
30.0	138	138	138	138	138	138	139	138	139	138	138	138	138	138
32.5	142	142	142	142	143	143	143	143	143	143	143	143	142	142
35.0	146	146	146	146	147	147	147	147	147	146	146	146	146	146
37.5	151	151	151	152	151	152	151	151	150	150	149	149	149	149
40.0	157	157	157	157	158	157	157	157	156	156	155	154	153	152
42.5	162	162	162	162	162	162	162	161	161	161	160	159	158	157
45.0	165	165	166	166	166	166	166	166	165	165	165	164	163	162
47.5	168	168	168	169	169	169	169	169	169	168	168	167	166	165
50.0	169	170	170	171	171	171	171	171	171	170	170	169	168	167
52.5	172	172	172	173	173	173	173	173	173	172	172	171	171	170
55.0	173	173	174	174	174	174	174	174	174	174	174	174	173	172
57.5	175	175	176	176	176	177	177	177	176	176	175	174	174	174
60.0	175	175	175	176	176	176	177	177	177	176	177	176	176	175
62.5	173	173	174	174	175	175	176	176	176	176	176	175	175	175
65.0	171	171	172	172	173	174	174	174	174	174	174	174	174	174
67.5	168	169	170	170	171	171	171	172	171	171	172	171	171	171
70.0	164	165	166	167	167	168	168	168	167	167	167	167	167	168
72.5	160	160	161	161	163	163	163	163	163	163	163	163	163	163
75.0	155	155	156	157	158	158	158	159	159	159	159	158	158	159
77.5	149	149	150	151	152	153	153	153	153	152	152	152	152	152
80.0	142	143	144	145	146	147	147	147	147	147	146	147	147	146
82.5	137	137	138	139	141	141	142	141	141	141	141	141	140	141
85.0	130	130	131	132	133	134	134	134	134	134	134	134	133	134
87.5	123	124	125	126	127	128	129	129	129	128	129	128	128	129
90.0	105	105	108	109	112	114	117	120	123	125	126	126	126	127
92.5	120	120	125	129	133	134	136	137	137	137	137	137	137	137
95.0	133	136	138	144	146	147	149	149	150	149	149	149	149	149
97.5	155	155	156	157	158	159	160	159	159	159	159	159	159	159
100.0	163	162	163	164	165	166	166	166	167	166	166	166	166	166
102.5	170	170	170	171	171	172	173	173	173	173	173	172	172	172
105.0	175	175	175	175	176	177	178	178	177	178	178	178	178	177
107.5	178	178	179	179	180	180	181	181	181	181	181	181	181	181
110.0	181	181	181	181	182	182	183	183	183	183	183	183	183	183
112.5	182	181	181	181	182	182	183	183	183	183	183	183	183	184
115.0	180	180	180	180	180	181	181	181	182	182	182	182	182	182
117.5	178	178	177	177	178	178	179	179	179	179	179	179	179	179
120.0	174	173	173	173	173	174	175	175	175	175	175	175	175	175
122.5	169	169	169	169	169	169	169	169	169	170	169	169	169	169
125.0	163	163	163	162	162	162	162	162	163	163	163	163	162	162
127.5	156	156	155	155	155	155	155	156	156	156	156	155	155	155
130.0	148	149	148	148	148	148	148	148	148	148	148	148	147	147
132.5	141	141	140	140	140	140	140	140	140	140	140	139	139	138
135.0	133	133	132	131	131	132	132	132	132	132	132	131	131	130
137.5	126	126	125	125	125	124	125	125	125	124	124	124	124	123
140.0	118	117	117	117	117	117	117	117	118	118	118	117	117	117
142.5	109	109	109	108	108	108	109	109	110	110	110	110	111	111
145.0	101	101	100	100	100	100	101	101	101	102	102	103	103	103
147.5	94	94	94	93	94	94	94	94	94	95	96	96	97	97

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CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5
150.0	87	87	87	87	87	87	87	88	88	88	88	89	89	90
152.5	80	80	79	80	80	80	81	81	81	81	82	82	83	83
155.0	73	72	73	73	73	74	74	75	75	76	76	77	77	78
157.5	66	66	66	66	66	67	67	68	69	70	71	71	71	72
160.0	60	59	60	60	61	61	62	63	63	63	63	64	64	64
162.5	54	54	55	55	55	55	55	55	56	56	56	56	57	57
165.0	51	51	51	51	50	50	50	50	50	50	50	50	50	51
167.5	46	46	46	47	47	47	47	47	47	46	46	46	46	45
170.0	45	46	46	45	46	46	46	45	45	44	44	43	42	42
172.5	44	44	44	44	44	43	43	43	42	42	41	41	41	41
175.0	42	42	41	41	41	41	40	40	40	40	40	40	41	41
177.5	38	38	38	38	38	38	38	39	39	40	40	40	40	40
180.0	40	40	40	40	40	40	40	40	40	40	40	40	40	40



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LATERAL ANGLE

	35.0	37.5	40.0	42.5	45.0	47.5	50.0	52.5	55.0	57.5	60.0	62.5	65.0	67.5
0.0	93	93	93	93	93	93	93	93	93	93	93	93	93	93
2.5	94	95	94	95	94	94	94	94	94	94	94	94	94	94
5.0	97	97	97	97	97	97	97	97	97	97	97	96	97	96
7.5	101	100	100	100	100	100	100	100	100	100	100	100	100	100
10.0	104	104	104	104	104	104	104	103	103	103	103	104	103	104
12.5	108	108	108	108	108	108	108	108	108	107	107	107	108	107
15.0	112	112	112	112	112	111	112	111	111	112	111	112	112	112
17.5	117	117	117	117	117	117	117	117	116	117	117	117	117	117
20.0	122	122	122	122	121	121	121	121	121	121	121	121	121	121
22.5	125	126	126	126	125	125	125	125	125	126	125	125	126	126
25.0	129	129	129	129	129	130	130	130	130	130	130	130	130	131
27.5	133	133	133	132	133	133	134	134	134	134	134	134	135	135
30.0	138	138	138	138	137	137	137	138	138	139	139	139	139	139
32.5	142	142	142	141	141	141	141	141	141	142	143	143	143	144
35.0	145	145	145	145	144	144	144	144	144	145	146	146	147	147
37.5	148	148	148	147	146	146	145	146	146	146	147	148	149	151
40.0	151	151	150	150	149	149	148	148	149	149	150	151	152	153
42.5	156	155	154	153	152	151	151	151	151	152	152	154	155	156
45.0	161	159	157	156	154	153	152	152	153	154	155	157	158	159
47.5	164	162	161	159	158	156	154	154	155	155	157	158	160	162
50.0	166	165	163	163	162	161	160	160	160	160	161	161	162	164
52.5	169	168	167	166	165	163	163	162	162	163	164	165	166	167
55.0	172	171	171	170	169	169	168	169	167	168	168	169	170	171
57.5	173	173	173	173	172	172	172	173	173	172	172	172	172	173
60.0	175	174	175	174	174	174	174	174	174	174	174	174	174	175
62.5	175	175	175	175	175	174	174	174	174	174	175	174	175	175
65.0	174	174	175	174	174	173	173	173	174	173	173	173	173	174
67.5	171	172	173	173	172	172	172	172	172	172	172	172	172	172
70.0	168	169	169	169	168	168	168	168	168	168	168	168	168	168
72.5	164	164	164	164	164	163	163	163	163	163	163	163	163	163
75.0	159	159	159	159	159	158	158	158	158	158	158	158	158	158
77.5	153	153	154	154	154	154	154	154	153	153	153	153	153	153
80.0	147	147	148	148	148	148	148	147	147	147	147	147	147	147
82.5	141	141	142	142	142	142	142	141	141	141	141	141	141	141
85.0	134	135	135	135	135	135	135	135	135	135	134	134	135	134
87.5	129	129	129	130	130	130	130	130	130	130	130	130	129	129
90.0	127	127	127	127	127	127	127	127	127	127	127	126	126	125
92.5	138	137	138	137	137	137	137	137	136	136	135	135	134	134
95.0	149	150	150	150	150	150	150	149	149	149	148	148	148	147
97.5	159	159	160	159	160	160	160	159	159	159	158	158	157	157
100.0	167	166	167	167	167	167	167	167	167	166	166	166	165	164
102.5	172	173	173	173	173	173	173	172	173	173	172	172	171	171
105.0	178	178	179	179	179	178	179	178	178	178	178	177	177	177
107.5	181	181	182	182	182	182	182	182	182	182	182	181	180	181
110.0	183	184	184	184	184	184	184	184	184	184	184	184	183	182
112.5	184	184	185	185	185	185	185	185	185	185	185	184	184	183
115.0	182	183	183	183	183	183	183	183	183	183	183	183	182	181
117.5	180	180	180	179	179	179	179	179	179	179	180	179	178	179
120.0	175	175	174	175	175	174	174	174	174	174	174	174	174	174
122.5	169	169	168	168	168	167	168	167	167	167	167	167	166	166
125.0	162	161	161	161	161	161	161	161	160	160	160	159	158	158
127.5	154	154	154	154	152	151	150	148	150	151	151	152	151	151
130.0	146	146	145	145	144	143	142	142	142	142	143	143	144	144
132.5	138	137	137	136	136	135	135	134	134	135	135	135	134	135
135.0	130	129	129	128	127	126	125	125	125	125	126	126	126	127
137.5	123	122	122	120	120	118	118	118	118	119	119	120	119	119
140.0	116	116	115	114	113	113	113	113	113	113	114	113	113	114
142.5	110	110	110	109	108	107	107	107	108	108	108	108	108	108
145.0	104	104	105	104	104	103	102	102	101	102	102	102	103	103
147.5	98	98	99	99	100	100	100	100	99	99	98	97	97	98

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CANDELA DISTRIBUTION
LATERAL ANGLE

	35.0	37.5	40.0	42.5	45.0	47.5	50.0	52.5	55.0	57.5	60.0	62.5	65.0	67.5
150.0	90	91	92	93	94	94	95	95	95	95	95	95	93	92
152.5	84	85	85	86	86	87	88	88	89	89	90	89	88	87
155.0	78	79	80	80	80	81	81	81	80	81	81	81	80	80
157.5	71	72	72	73	73	73	72	73	73	73	73	73	73	72
160.0	65	65	66	66	66	66	66	66	66	66	66	66	66	66
162.5	58	57	58	58	58	58	59	59	59	59	58	58	58	58
165.0	51	51	51	51	51	50	50	50	50	51	51	51	51	51
167.5	45	44	43	43	43	43	43	43	43	44	44	45	45	45
170.0	41	40	40	40	40	39	39	40	40	41	41	41	41	42
172.5	40	40	40	40	40	40	40	39	39	39	39	39	40	40
175.0	41	41	41	41	41	41	40	40	40	40	39	39	39	39
177.5	41	41	41	41	41	41	41	41	41	41	41	41	41	41
180.0	40	40	40	40	40	40	40	40	40	40	40	40	40	40



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	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5	90.0	92.5	95.0	97.5	100.0	102.5
0.0	93	93	93	93	93	93	93	93	93	93	93	93	93	93
2.5	94	95	94	94	94	95	95	94	94	94	94	94	94	94
5.0	97	96	97	97	97	97	97	97	97	97	96	96	96	96
7.5	100	100	100	100	100	100	100	100	100	100	100	100	99	99
10.0	104	104	103	104	104	104	103	103	103	103	103	103	103	103
12.5	108	108	108	108	108	108	108	108	108	108	108	107	107	107
15.0	112	112	112	111	112	111	112	112	112	112	112	111	111	111
17.5	117	117	117	117	117	117	117	116	117	116	116	116	116	116
20.0	121	121	121	121	121	121	121	121	121	121	121	121	120	120
22.5	126	126	126	126	126	126	126	126	126	126	125	125	125	125
25.0	131	131	131	130	131	131	131	131	131	131	130	130	130	130
27.5	135	136	136	136	136	136	136	136	136	136	136	136	135	135
30.0	140	140	140	141	141	141	142	142	142	142	142	141	140	140
32.5	144	144	144	145	145	146	145	146	145	145	145	145	145	144
35.0	148	148	149	149	150	150	150	150	150	150	150	149	149	148
37.5	151	152	152	153	153	154	154	154	154	154	154	154	153	153
40.0	155	156	156	157	158	158	159	159	158	158	158	158	158	157
42.5	158	159	160	162	162	163	163	163	163	163	163	163	162	161
45.0	161	162	163	165	166	166	167	167	167	167	167	167	166	165
47.5	163	165	167	168	169	170	170	170	170	171	170	170	169	168
50.0	166	167	169	170	171	172	172	173	172	172	173	172	172	171
52.5	169	170	172	173	174	174	174	175	175	175	175	175	174	173
55.0	172	173	174	175	176	176	176	176	176	176	176	176	176	175
57.5	174	175	175	176	176	176	177	177	177	177	177	177	177	177
60.0	175	176	176	176	177	177	177	177	177	177	177	178	178	177
62.5	175	176	176	176	176	176	176	176	176	177	177	177	177	177
65.0	174	174	175	175	175	175	175	175	175	176	176	176	176	176
67.5	172	172	173	172	172	173	173	173	173	173	174	174	174	174
70.0	168	169	169	169	169	170	170	171	171	171	171	171	171	171
72.5	163	164	164	164	164	165	165	166	166	166	166	166	166	166
75.0	159	159	159	159	160	160	160	161	161	161	161	162	161	161
77.5	153	153	154	154	155	155	156	156	157	157	157	157	157	157
80.0	147	147	148	148	149	149	150	150	150	151	151	151	151	150
82.5	141	141	141	142	143	144	144	145	146	146	145	145	145	145
85.0	134	135	135	136	136	137	138	139	139	139	139	139	139	138
87.5	129	129	130	130	130	130	130	130	131	131	132	132	132	133
90.0	124	123	119	112	109	105	103	100	100	102	106	113	115	119
92.5	133	133	133	133	133	131	125	119	116	119	126	132	134	134
95.0	147	147	146	147	147	147	145	145	145	146	147	148	149	149
97.5	157	157	157	157	157	156	156	155	155	157	158	158	159	159
100.0	165	164	164	164	163	162	162	162	163	164	164	165	165	166
102.5	171	170	170	170	169	168	168	168	170	169	170	170	171	172
105.0	177	176	176	175	174	174	174	175	176	176	175	176	176	177
107.5	180	180	179	178	178	177	177	177	179	179	178	179	180	181
110.0	182	182	182	181	180	180	180	181	183	182	181	181	182	183
112.5	183	183	183	182	181	180	181	182	184	183	181	182	183	184
115.0	182	182	181	181	180	179	179	180	182	181	180	181	182	183
117.5	178	179	178	178	178	177	177	178	180	179	179	179	180	180
120.0	174	174	174	174	174	173	174	175	177	176	175	175	176	176
122.5	167	167	168	168	168	168	169	170	172	171	170	169	170	170
125.0	159	159	160	160	159	159	160	161	163	162	161	161	162	162
127.5	152	153	153	153	153	153	154	155	157	155	155	155	155	155
130.0	145	144	145	146	146	146	147	148	149	149	148	148	148	148
132.5	136	136	137	138	139	138	139	140	142	141	140	140	140	140
135.0	128	129	130	130	131	131	132	132	134	133	133	132	132	132
137.5	121	121	122	122	123	124	124	125	126	125	125	125	124	124
140.0	114	115	115	115	116	116	117	117	118	118	117	117	117	117
142.5	109	109	109	110	110	110	110	111	112	111	111	111	111	111
145.0	103	103	103	103	104	104	104	105	106	106	105	105	105	105
147.5	98	98	98	98	98	98	98	98	99	99	98	98	99	99



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	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5	90.0	92.5	95.0	97.5	100.0	102.5
150.0	91	91	90	90	89	90	89	90	90	90	90	90	90	91
152.5	87	86	86	85	85	84	85	85	85	86	85	85	86	86
155.0	81	80	80	80	80	79	80	80	81	81	80	80	81	81
157.5	73	73	73	73	73	74	72	73	73	73	73	74	73	73
160.0	66	65	65	65	65	65	65	66	66	66	65	65	66	66
162.5	58	57	57	57	57	56	56	55	55	55	56	57	58	58
165.0	51	51	50	50	50	49	49	49	49	49	50	50	50	50
167.5	46	46	46	46	45	45	44	44	44	44	45	45	46	46
170.0	42	43	43	43	44	44	44	44	44	44	44	44	44	44
172.5	40	40	41	42	42	42	43	44	44	44	44	43	42	42
175.0	39	39	40	40	40	41	41	41	41	41	41	41	40	40
177.5	40	40	40	39	39	38	38	39	39	39	39	39	39	39
180.0	40	40	40	40	40	40	40	40	40	40	40	40	40	40



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	105.0	107.5	110.0	112.5	115.0	117.5	120.0	122.5	125.0	127.5	130.0	132.5	135.0	137.5
0.0	93	93	93	93	93	93	93	93	93	93	93	93	93	93
2.5	93	94	94	94	93	93	93	93	93	93	93	93	93	93
5.0	96	96	96	96	96	95	95	95	95	95	95	95	95	95
7.5	99	99	99	99	99	99	99	99	99	99	98	98	98	98
10.0	103	103	102	102	102	102	102	102	102	102	102	102	102	102
12.5	107	107	106	106	106	106	106	106	106	106	105	106	105	106
15.0	111	111	111	110	110	110	110	110	110	109	109	109	109	109
17.5	116	115	115	115	115	115	115	115	114	114	114	114	114	114
20.0	120	120	120	120	120	120	120	119	119	119	119	119	119	119
22.5	125	124	125	124	124	124	123	123	124	123	123	123	123	123
25.0	130	130	129	129	129	129	128	128	128	128	128	128	127	127
27.5	135	134	134	134	133	133	133	132	132	132	131	131	130	130
30.0	139	139	139	138	138	137	137	137	136	135	135	135	135	135
32.5	144	143	143	142	142	142	141	140	139	139	139	139	139	139
35.0	148	147	147	146	146	145	144	143	142	142	142	142	142	142
37.5	152	151	150	149	148	147	145	144	144	144	143	144	144	144
40.0	156	155	154	152	150	150	149	148	147	147	146	147	147	148
42.5	160	158	157	156	154	153	152	151	150	150	150	150	150	151
45.0	164	162	160	159	157	156	154	153	151	151	151	152	153	154
47.5	167	165	163	161	160	158	156	155	153	153	153	155	156	158
50.0	169	168	166	164	162	161	161	160	160	159	160	160	160	161
52.5	172	171	169	167	166	165	164	163	162	162	162	163	164	165
55.0	175	174	172	171	170	169	169	168	167	166	167	168	168	169
57.5	176	175	175	174	173	172	172	172	172	172	172	172	172	171
60.0	177	177	176	176	175	175	175	174	174	173	174	174	174	174
62.5	177	177	176	176	176	175	175	175	175	175	175	175	175	175
65.0	176	176	176	175	175	175	175	174	174	174	174	174	174	174
67.5	174	174	174	173	173	173	174	173	173	173	172	173	173	173
70.0	170	171	171	170	170	170	170	169	170	170	170	169	170	169
72.5	166	166	165	165	165	165	165	164	164	165	165	165	165	165
75.0	161	161	161	160	160	160	160	160	160	160	160	160	160	160
77.5	156	156	155	155	155	155	155	155	155	155	156	156	155	156
80.0	150	150	149	149	149	149	149	150	150	150	150	150	150	150
82.5	144	144	144	144	143	144	144	144	144	144	144	144	144	144
85.0	138	138	138	138	138	137	137	137	138	138	137	137	137	137
87.5	132	132	132	132	132	132	131	131	132	132	132	132	131	132
90.0	122	125	126	127	127	127	127	127	127	127	127	127	127	127
92.5	135	135	136	136	136	136	137	137	137	137	137	137	138	137
95.0	149	149	149	149	149	149	150	149	150	150	150	150	150	150
97.5	159	159	158	159	159	159	159	159	160	159	160	160	160	160
100.0	166	166	166	166	166	166	167	167	167	167	167	167	167	167
102.5	172	172	172	173	172	173	173	173	173	173	173	173	172	173
105.0	178	178	178	178	179	178	179	179	179	179	179	179	179	179
107.5	181	182	182	182	182	183	183	183	183	183	183	183	183	183
110.0	184	184	184	185	185	185	185	185	185	185	185	185	185	185
112.5	185	185	185	186	186	186	186	186	186	186	186	186	186	186
115.0	183	183	184	183	183	184	185	184	184	184	184	184	184	184
117.5	180	180	181	181	181	181	181	181	181	181	181	181	181	181
120.0	176	176	176	176	176	176	176	176	175	175	175	176	176	176
122.5	170	170	169	169	169	168	169	168	169	169	169	169	169	169
125.0	162	162	161	160	160	161	161	161	161	162	162	162	162	162
127.5	155	155	154	154	153	154	153	152	151	150	150	151	152	154
130.0	148	147	147	146	146	145	146	145	145	145	145	146	146	146
132.5	140	139	138	138	137	137	137	137	137	137	137	137	138	139
135.0	131	131	130	130	129	129	129	127	126	126	126	128	129	131
137.5	124	123	123	122	122	122	122	121	121	121	121	122	123	124
140.0	117	117	116	116	116	117	116	116	116	116	116	116	117	117
142.5	111	111	111	110	110	111	111	110	110	110	110	111	111	112
145.0	105	105	105	105	105	105	105	104	104	105	106	106	107	108
147.5	99	100	100	99	100	100	101	102	102	103	103	103	103	103



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	105.0	107.5	110.0	112.5	115.0	117.5	120.0	122.5	125.0	127.5	130.0	132.5	135.0	137.5
150.0	91	93	93	94	96	97	98	98	98	98	98	97	96	95
152.5	87	88	89	89	90	91	92	92	92	91	90	90	89	89
155.0	81	82	81	81	82	83	82	83	83	83	83	83	83	83
157.5	74	74	74	74	74	75	75	75	75	75	75	75	75	75
160.0	66	67	67	67	68	68	68	68	68	69	69	68	68	69
162.5	58	59	59	59	59	60	60	60	61	61	61	61	61	61
165.0	51	52	52	53	52	53	53	52	52	52	52	53	53	53
167.5	47	47	47	46	47	46	46	45	45	45	45	45	45	45
170.0	44	43	43	43	43	43	42	42	42	41	41	41	41	41
172.5	42	41	41	41	41	40	41	41	41	41	42	42	42	42
175.0	40	40	40	40	40	40	41	41	41	41	42	42	42	43
177.5	40	41	41	41	41	42	42	42	42	42	42	42	42	42
180.0	40	40	40	40	40	40	40	40	40	40	40	40	40	40



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	140.0	142.5	145.0	147.5	150.0	152.5	155.0	157.5	160.0	162.5	165.0	167.5	170.0	172.5
0.0	93	93	93	93	93	93	93	93	93	93	93	93	93	93
2.5	93	93	93	93	93	93	93	93	93	93	93	93	93	93
5.0	95	95	95	95	95	95	95	95	95	95	95	95	95	95
7.5	98	98	98	98	98	98	98	98	98	98	98	98	99	99
10.0	102	102	102	102	102	102	102	102	102	102	102	102	102	102
12.5	106	106	106	106	106	106	106	106	106	106	106	106	106	106
15.0	110	109	109	110	109	110	109	110	110	110	110	110	110	110
17.5	115	114	115	115	115	114	114	114	115	114	115	114	115	114
20.0	119	119	119	119	119	119	118	118	118	117	117	117	117	117
22.5	123	123	122	122	122	121	121	121	121	120	120	120	120	120
25.0	126	126	126	126	126	126	126	125	125	125	125	125	125	125
27.5	130	130	130	130	130	130	130	130	130	130	130	130	130	129
30.0	135	135	135	135	135	135	135	135	135	135	135	134	134	134
32.5	139	139	139	139	139	139	139	139	139	139	139	138	139	138
35.0	142	142	142	142	142	143	143	142	143	143	143	143	143	142
37.5	145	145	145	145	145	146	146	146	147	147	147	148	148	148
40.0	148	148	148	149	150	150	152	152	153	153	153	153	153	153
42.5	152	153	154	155	155	156	157	157	158	158	158	158	158	158
45.0	156	157	158	159	160	161	161	162	162	162	162	162	163	162
47.5	159	160	161	162	164	164	165	165	166	165	166	165	166	165
50.0	162	163	165	165	166	167	167	168	168	168	168	168	168	167
52.5	166	167	168	168	169	169	170	170	170	170	170	170	170	170
55.0	170	170	171	171	171	171	172	172	171	171	172	172	172	172
57.5	172	172	173	173	173	173	174	174	175	174	174	174	174	174
60.0	174	174	175	175	175	175	175	175	175	174	174	174	174	174
62.5	175	175	175	175	175	175	174	174	174	174	174	173	173	173
65.0	175	174	174	174	173	173	173	173	173	173	173	172	172	171
67.5	173	172	172	171	171	171	171	171	171	170	170	170	170	169
70.0	169	169	168	168	168	168	168	168	168	167	167	167	166	166
72.5	166	165	164	164	164	164	163	164	163	163	163	162	162	161
75.0	160	160	160	159	159	159	160	159	159	159	158	158	157	156
77.5	155	155	155	154	153	153	153	154	153	153	152	152	152	151
80.0	150	149	148	148	148	148	148	148	148	148	147	147	146	145
82.5	144	144	143	143	142	142	143	142	142	142	142	142	141	139
85.0	137	137	136	136	136	136	136	136	136	136	135	135	134	133
87.5	132	131	131	131	130	130	130	130	130	130	129	129	128	127
90.0	127	127	126	126	125	124	124	123	121	117	114	112	108	106
92.5	137	136	136	135	135	134	134	132	132	131	130	129	126	124
95.0	150	149	149	148	148	147	147	146	146	146	145	144	143	140
97.5	160	160	159	159	158	158	157	158	157	157	157	156	155	154
100.0	167	167	166	166	165	165	165	164	164	164	163	163	162	161
102.5	173	172	172	171	172	172	171	171	171	171	170	169	169	168
105.0	179	178	178	177	177	177	177	177	176	176	175	175	175	174
107.5	182	182	181	181	181	181	181	180	180	179	179	179	179	178
110.0	185	184	184	183	183	183	183	183	182	182	182	181	181	181
112.5	186	186	185	184	184	184	184	184	183	183	183	182	182	181
115.0	184	184	184	183	183	183	183	183	182	182	182	181	181	181
117.5	181	182	180	180	180	181	180	181	180	180	180	180	180	179
120.0	177	176	177	176	177	177	177	177	177	176	176	176	176	176
122.5	170	170	171	171	171	172	172	172	172	172	171	171	172	171
125.0	162	163	163	164	164	165	165	166	166	165	165	165	165	165
127.5	155	156	156	156	157	158	159	159	159	159	158	158	159	159
130.0	147	148	148	149	150	151	151	152	152	152	152	151	152	152
132.5	139	140	140	141	142	142	143	144	143	143	143	143	143	144
135.0	132	132	133	133	134	134	135	135	136	135	135	135	136	136
137.5	124	125	126	127	127	128	128	128	128	128	128	128	129	129
140.0	119	119	119	120	121	121	121	121	122	121	121	121	120	121
142.5	113	113	114	114	114	114	114	113	113	113	112	112	112	112
145.0	108	108	107	107	106	107	106	106	105	105	105	104	104	104
147.5	102	102	101	100	100	99	99	98	98	98	98	97	97	97

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	140.0	142.5	145.0	147.5	150.0	152.5	155.0	157.5	160.0	162.5	165.0	167.5	170.0	172.5
150.0	95	94	93	93	92	92	92	91	91	91	90	90	91	90
152.5	88	88	87	86	85	86	85	85	84	84	84	84	84	83
155.0	82	82	81	81	80	80	79	79	79	78	78	78	77	77
157.5	75	75	75	74	75	74	74	73	73	72	71	70	70	70
160.0	68	68	68	68	67	68	67	67	67	66	66	65	64	64
162.5	61	61	60	60	60	60	59	59	59	59	59	59	58	58
165.0	54	54	53	53	53	53	53	53	53	53	53	53	54	54
167.5	46	46	47	48	48	49	49	50	50	50	50	50	50	50
170.0	42	42	43	44	44	45	46	47	48	48	48	48	48	48
172.5	43	42	43	42	43	43	44	44	44	45	45	46	46	46
175.0	43	43	43	43	42	43	42	42	42	42	42	42	43	43
177.5	42	42	42	42	42	42	41	41	41	40	40	40	39	39
180.0	40	40	40	40	40	40	40	40	40	40	40	40	40	40



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LATERAL ANGLE

	175.0	177.5	180.0
0.0	93	93	93
2.5	93	93	93
5.0	95	95	95
7.5	98	99	98
10.0	102	102	102
12.5	106	106	107
15.0	110	110	110
17.5	114	115	114
20.0	117	117	117
22.5	120	120	120
25.0	125	125	125
27.5	130	129	129
30.0	134	134	134
32.5	138	138	138
35.0	142	142	142
37.5	148	147	147
40.0	153	153	153
42.5	158	158	158
45.0	162	162	162
47.5	165	165	164
50.0	167	167	167
52.5	169	169	168
55.0	171	170	171
57.5	173	172	172
60.0	173	173	172
62.5	172	172	172
65.0	171	170	170
67.5	169	168	168
70.0	165	164	164
72.5	160	159	159
75.0	156	155	155
77.5	150	149	148
80.0	144	144	143
82.5	139	137	137
85.0	132	131	130
87.5	125	125	124
90.0	106	101	101
92.5	119	115	114
95.0	137	134	131
97.5	153	153	152
100.0	161	161	161
102.5	168	168	167
105.0	174	174	174
107.5	178	178	178
110.0	181	181	180
112.5	181	182	182
115.0	181	181	182
117.5	179	179	180
120.0	176	176	177
122.5	172	172	173
125.0	165	166	167
127.5	160	160	161
130.0	152	153	153
132.5	144	145	146
135.0	137	137	138
137.5	129	130	130
140.0	121	121	123
142.5	113	113	114
145.0	105	105	105
147.5	98	98	99



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CANDELA DISTRIBUTION
LATERAL ANGLE

	175.0	177.5	180.0
150.0	91	91	91
152.5	83	84	84
155.0	76	77	77
157.5	70	70	70
160.0	64	64	64
162.5	58	58	58
165.0	54	54	55
167.5	49	49	49
170.0	48	48	48
172.5	47	47	47
175.0	43	44	44
177.5	39	39	39
180.0	40	40	40



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5-DEGREE ZONAL LUMEN SUMMARY		
0- 5		2
5- 10		7
10- 15		13
15- 20		19
20- 25		26
25- 30		34
30- 35		42
35- 40		50
40- 45		58
45- 50		66
50- 55		73
55- 60		80
60- 65		85
65- 70		87
70- 75		86
75- 80		82
80- 85		77
85- 90		70
90- 95		73
95-100		85
100-105		92
105-110		94
110-115		93
115-120		87
120-125		78
125-130		67
130-135		56
135-140		46
140-145		37
145-150		29
150-155		22
155-160		15
160-165		10
165-170		6
170-175		3
175-180		1

10-DEGREE ZONAL LUMEN SUMMARY		
0- 10		9
0- 20		41
0- 30		101
0- 40		192
0- 50		316
0- 60		470
0- 70		642
0- 80		810
0- 90		957
0-100		1115
0-110		1301
0-120		1481
0-130		1626
0-140		1728
0-150		1794
0-160		1831
0-170		1846
0-180		1850



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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	108	108	108	108	108	99	99	99	99	84	84	84	70	70	70	58	58	58	52
1	94	88	82	77	77	86	81	76	72	68	64	60	56	53	50	44	42	40	35
2	84	74	66	60	60	76	68	61	55	57	51	47	46	42	38	36	33	31	26
3	75	64	55	47	47	69	58	50	44	48	42	37	39	34	30	31	27	24	20
4	68	55	46	39	39	62	51	42	36	42	35	30	34	29	25	27	23	19	16
5	62	49	39	32	32	56	45	36	30	37	30	25	30	25	21	23	19	16	13
6	57	43	34	27	27	52	40	31	25	33	26	21	27	21	17	21	17	14	10
7	52	39	30	23	23	48	35	27	22	30	23	18	24	19	15	19	15	12	9
8	48	35	26	20	20	44	32	24	19	27	20	16	22	17	13	17	13	10	8
9	45	31	23	18	18	41	29	22	16	24	18	14	20	15	11	16	12	9	7
10	42	29	21	16	16	38	26	19	14	22	16	12	18	13	10	14	11	8	6

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.

Project Number
20.00088

Date
1/29/2020

Goniophotometer Calibration

Calibration Lamp: GE 1000W, 120V, T6, CL (FEL)

Lamp Number: ITL78966-1000-66

Calibration Current: 8.300 Amps DC

Total Luminous Flux: 23013.0 Lumens

Calibration Date: 08/20/2019

Test Equipment Used

<i>Instrument</i>	<i>Manufacturer / Model</i>	<i>S/N</i>	<i>Calibration Due:</i>
<i>Goniophotometer</i>	ITL/HLI LAB 5 - Test Distance: 56.0'	N/A	N/A
<i>Power Analyzer</i>	Yokogawa / WT 332	C2QA27072V	10/31/2020
<i>Power Source</i>	Voltage-Regulated House Power	N/A	N/A
<i>Thermometer</i>	National Instruments / USB-TC01	1912722	10/31/2020

3-Meter-Sphere Calibration

Calibration Lamp: EIKO 28V75W/E10

Lamp Number: SCL-1400-K136

Calibration Current: 2.679 Amps

Total Luminous Flux: 1429 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	Calibration Checked Daily
<i>Thermometer</i>	National Instruments / USB TC01	1912751	10/31/2020
<i>Power Analyzer</i>	Yokogawa / WT332	C2QA27075V	10/31/2020
<i>Power Supply</i>	Chroma / 61602	616020002113	N/A
<i>Aux Lamp Supply</i>	GW Instek / PSU 150-10	GER221028	N/A
<i>Cal Lamp Supply</i>	Labsphere / LPS-150-0268	1218148505	N/A
<i>Spectrometer</i>	Labsphere / CDS 1100	0624117792	N/A

Hubbell Lighting, Inc.

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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.