

Project Number  
18.00945



**HUBBELL**  
Lighting

Date  
6/7/2018

Lab 1  
Sphere

*Test Sample Description*

Catalog Number: P300223-009-30  
Description: 2ft LED Circular-Cross-Section Vanity w/ Acrylic Refractor

**Photometry**  
Test Method: IES LM-41-14  
IES LM-79-08 §10  
Preburn Time: 0:30  
Time To Stabilize: 1:15  
Total Operating Time: 2:54

Input Voltage (Volts): 119.8  
Input Current (Amps): 0.189  
Input Wattage (Watts): 22.1  
Ambient Temp (°C): 25.1

**Sphere**  
Test Method: IES LM-16-93  
IES LM-79-08 §12.1  
Preburn Time: 8:00  
Time To Stabilize: 0:59  
Total Operating Time: 8:59

Input Voltage (Volts): 120.0  
Input Current (Amps): 0.187  
Input Wattage (Watts): 22.0  
Ambient Temp (°C): 24.4



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Checked (sphere): B. LEE  
Checked (photometry): D. ROBBINS  
Approved: P. McCARTHY



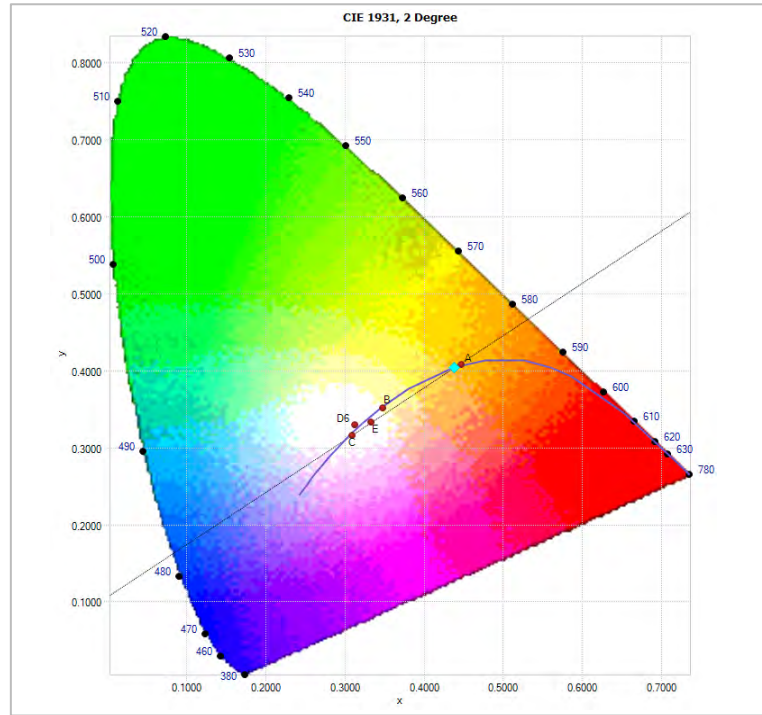
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Lamp Cat#: 2835 0.5W  
 Lamp Desc: 44 - Edison 3000K LEDs  
 Driver Desc: 1 - Becky BQE36-0550-40-TD  
 Programmed to 550mA

Efficacy: 76.6 LPW      S/P Ratio: 1.4 LM/LM

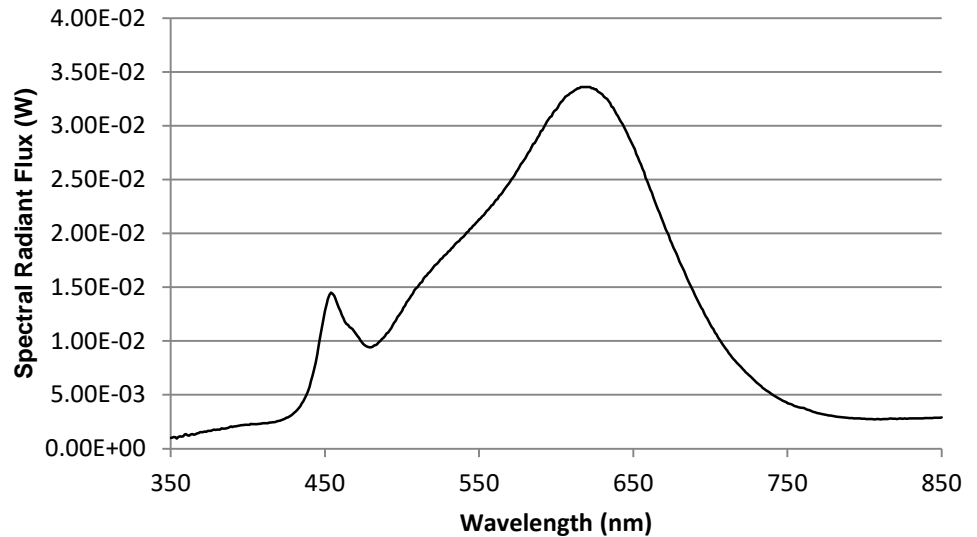
**Chromaticity Diagram**



**Spectral Results**

Name	Value	Unit
Φ	6.27	watts
Φ(v)	1685	lumens
Φ(v')	2404	lm'
Chrom x	0.4379	
Chrom y	0.4043	
Chrom u	0.2511	
Chrom v	0.3477	
Duv	0.0002	
Chrom u'	0.2511	
Chrom v'	0.5216	
CCT	2984	K
Purity	52.8	%
λ (dom)	582.9	nm
FWHM	161.8	nm
λ (peak)	619.2	nm
λ (center)	601.0	nm
λ (centroid)	598.9	nm
SDCM	Cool White	
RA	93	
Corr. Coef.	0.000186554	
Correlation	0.0054	
R1	93.0	
R2	97.3	
R3	98.5	
R4	92.3	
R5	93.0	
R6	97.0	
R7	91.2	
R8	80.7	
R9	57.7	
R10	93.0	
R11	93.2	
R12	86.3	
R13	94.3	
R14	99.7	

**Spectral Distribution of Radiant Flux**





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**REPORT NUMBER:** 18.00945

**PAGE:** 3 OF 9

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**LUMINAIRE:** 2ft LED Circular-Cross-Section  
Vanity w/ Acrylic Refractor

**LAMP CAT. NO.:** 2835 0.5W

**LAMP:** 44- Edison 3000K LEDs

**BALLAST CATALOG NUMBER:** BQE36-0550-40-TD

**BALLAST:** 1- Becky - Programmed to 550mA

**MOUNTING:** Wall

**NOTE:** DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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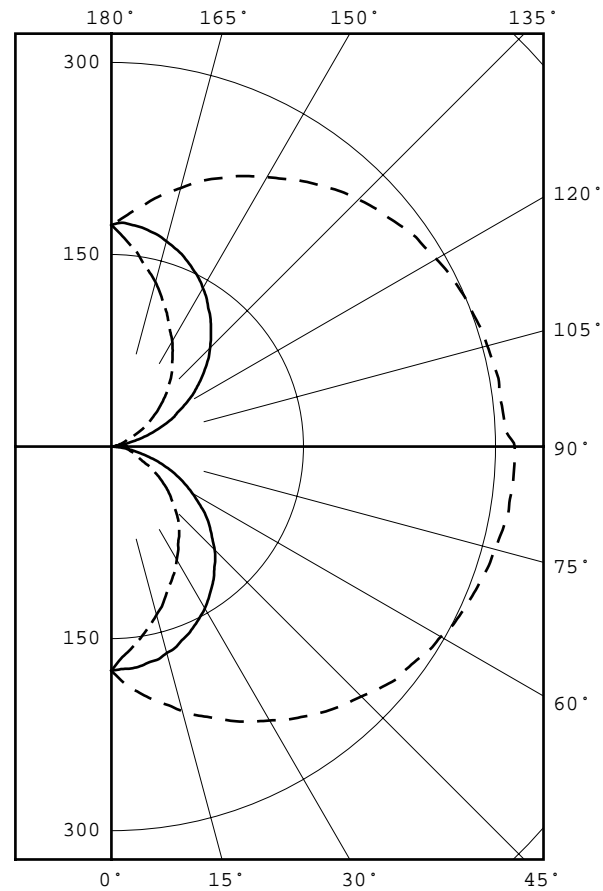
**PAGE:** 4 OF 9

**CANDELA DISTRIBUTION**

	0.0	45.0	90.0	135.0	180.0	FLUX
0	175	175	175	175	175	
5	190	185	174	164	160	17
15	214	199	167	145	136	49
25	237	209	154	123	113	76
35	258	214	136	99	91	98
45	276	216	114	76	71	112
55	291	214	88	55	49	118
65	303	211	59	33	27	116
75	310	207	29	13	17	110
85	315	204	5	8	13	106
90	315	205	0	7	13	
95	307	196	0	0	4	99
105	304	200	22	4	7	102
115	298	205	53	23	18	109
125	288	210	82	46	39	112
135	273	212	109	68	62	108
145	254	211	132	92	83	95
155	233	205	152	118	106	74
165	209	196	166	141	133	48
175	184	181	174	163	159	16
180	173	173	173	173	173	

ZONAL ZONE	LUMEN LUMENS	SUMMARY %FIXT
0- 30	141	9.0
0- 40	239	15.3
0- 60	470	30.0
0- 90	802	51.2
90-120	311	19.8
90-130	423	27.0
90-150	625	39.9
90-180	764	48.8
0-180	1566	100.0

EFFICACY = 70.9 lm/W  
CIE TYPE - GENERAL DIFFUSE  
PLANE : 0-DEG 90-DEG 180-DEG  
SPACING CRITERIA : 2.17 1.24 0.89  
SHIELDING ANGLES : 90 90





®

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**PREPARED FOR:** PROGRESS  
**CATALOG NUMBER:** P300223-009-30

**PAGE:** 5 OF 9

PLANE : 0-DEG 90-DEG  
LUMINOUS LENGTH : 22.500 2.000  
HEIGHT OF SIDE : 2.000 2.000

LUMINANCE DATA IN CANDELA/SQ M  
ANGLE AVERAGE AVERAGE AVERAGE  
IN DEG 0-DEG 90-DEG 180-DEG  
45 12347. 2777. 3176.  
55 15507. 2176. 2611.  
65 20742. 1529. 1848.  
75 30979. 816. 1699.  
85 61751. 159. 2548.



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**REPORT NUMBER:** 18.00945

**PAGE:** 6 OF 9

**ISSUE DATE:** 06/06/18

**PREPARED FOR:** PROGRESS

**CATALOG NUMBER:** P300223-009-30

CANDELA DISTRIBUTION  
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	175	175	175	175	175	175	175	175	175
5.0	190	188	185	179	174	169	164	161	160
10.0	202	199	192	182	171	162	155	150	148
15.0	214	209	199	184	167	155	145	139	136
20.0	225	219	205	183	161	146	134	127	124
25.0	237	229	209	181	154	136	123	115	113
30.0	247	238	212	178	146	125	111	104	102
35.0	258	245	214	173	136	113	99	93	91
40.0	268	253	215	167	125	101	88	83	82
45.0	276	259	216	160	114	88	76	72	71
50.0	286	265	215	153	101	76	66	62	60
55.0	291	270	214	144	88	63	55	51	49
60.0	297	274	213	134	73	50	43	39	38
65.0	303	278	211	125	59	39	33	28	27
70.0	307	280	209	115	44	27	21	19	20
75.0	310	282	207	106	29	16	13	15	17
80.0	314	283	205	99	16	7	10	13	14
85.0	315	284	204	94	5	3	8	12	13
90.0	315	285	205	93	0	3	7	12	13
95.0	307	277	196	87	0	0	0	2	4
100.0	307	277	198	93	9	0	1	3	4
105.0	304	275	200	100	22	7	4	6	7
110.0	301	274	203	110	37	18	12	10	11
115.0	298	272	205	120	53	30	23	19	18
120.0	293	270	208	131	67	42	34	30	29
125.0	288	266	210	140	82	54	46	41	39
130.0	280	262	212	150	96	68	57	52	50
135.0	273	256	212	157	109	81	68	64	62
140.0	264	250	212	165	121	94	80	74	73
145.0	254	242	211	171	132	107	92	85	83
150.0	243	234	208	175	143	120	105	97	95
155.0	233	226	205	179	152	131	118	110	106
160.0	222	216	201	181	160	141	130	122	119
165.0	209	206	196	181	166	151	141	135	133
170.0	197	195	189	181	171	160	152	147	145
175.0	184	184	181	178	174	167	163	160	159
180.0	173	173	173	173	173	173	173	173	173



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**CATALOG NUMBER:** P300223-009-30

**PAGE:** 7 OF 9

5-DEGREE ZONAL LUMEN SUMMARY		
0- 5		4
5- 10		12
10- 15		20
15- 20		28
20- 25		35
25- 30		41
30- 35		47
35- 40		51
40- 45		55
45- 50		57
50- 55		59
55- 60		59
60- 65		59
65- 70		57
70- 75		56
75- 80		54
80- 85		53
85- 90		53
90- 95		50
95-100		49
100-105		50
105-110		52
110-115		54
115-120		55
120-125		56
125-130		56
130-135		55
135-140		53
140-145		49
145-150		45
150-155		40
155-160		34
160-165		27
165-170		20
170-175		12
175-180		4

10-DEGREE ZONAL LUMEN SUMMARY		
0- 10		17
0- 20		65
0- 30		141
0- 40		239
0- 50		352
0- 60		470
0- 70		586
0- 80		696
0- 90		802
0-100		901
0-110		1003
0-120		1112
0-130		1225
0-140		1332
0-150		1427
0-160		1502
0-170		1549
0-180		1566



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**CATALOG NUMBER:** P300223-009-30

**PAGE:** 8 OF 9

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	107	107	107	107	107	99	99	99	99	84	84	84	70	70	70	57	57	57	51
1	95	89	84	80	80	87	82	78	74	69	66	62	57	54	52	46	44	42	37
2	85	76	69	63	63	78	70	64	58	59	54	49	48	44	41	39	36	33	28
3	77	66	58	51	51	70	61	53	47	51	45	40	42	37	34	33	30	27	23
4	70	58	49	42	42	64	53	45	39	45	39	34	37	32	28	29	26	23	19
5	64	51	42	36	36	59	47	39	33	40	33	29	33	28	24	26	22	19	16
6	59	46	37	31	31	54	42	34	29	36	29	25	29	24	21	23	20	17	14
7	54	41	33	27	27	50	38	30	25	32	26	21	27	22	18	21	18	15	12
8	50	37	29	23	23	46	34	27	22	29	23	19	24	19	16	19	16	13	10
9	47	34	26	21	21	43	31	24	19	27	21	17	22	17	14	18	14	12	9
10	44	31	23	18	18	40	29	22	17	24	19	15	20	16	13	17	13	10	8

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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### *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: 07/10/2017

### *Test Equipment Used*

<i>Instrument</i>	<i>Manufacturer / Model</i>	<i>S/N</i>	<i>Calibration Due:</i>
<i>Goniophotometer</i>	ITL/HLI LAB 1 - Test Distance: 31.74'	N/A	N/A
<i>Power Analyzer</i>	Yokogawa / WT 332	C2QA27071V	10/25/2018
<i>Power Source</i>	Voltage-Regulated House Power	N/A	N/A
<i>Thermometer</i>	National Instruments / USB-TC01	176F4E3	10/26/2018

### *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	Checked Daily
<i>Thermometer</i>	National Instruments / USB TC01	1912751	10/26/2018
<i>LAMP Power Meter</i>	Yokogawa / WT332	C2QA27075V	10/25/2018
<i>Power Supply</i>	Chroma / 61602	616020002113	N/A
<i>Aux Lamp Supply</i>	Labsphere / LPS-100-0833	0331159372	N/A
<i>Cal Lamp Supply</i>	Labsphere / LPS-150-0268	1218148505	N/A
<i>Spectrometer</i>	Labsphere / CDS 1100	0624117792	N/A

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