



LTL Number: 16894

Date: 10-09-2009

Prepared For: LEDnovation

Catalog Number: LED A19-100-1D-I

Lamp: One VBU 100 Watt A19 LED Replacement Lamp

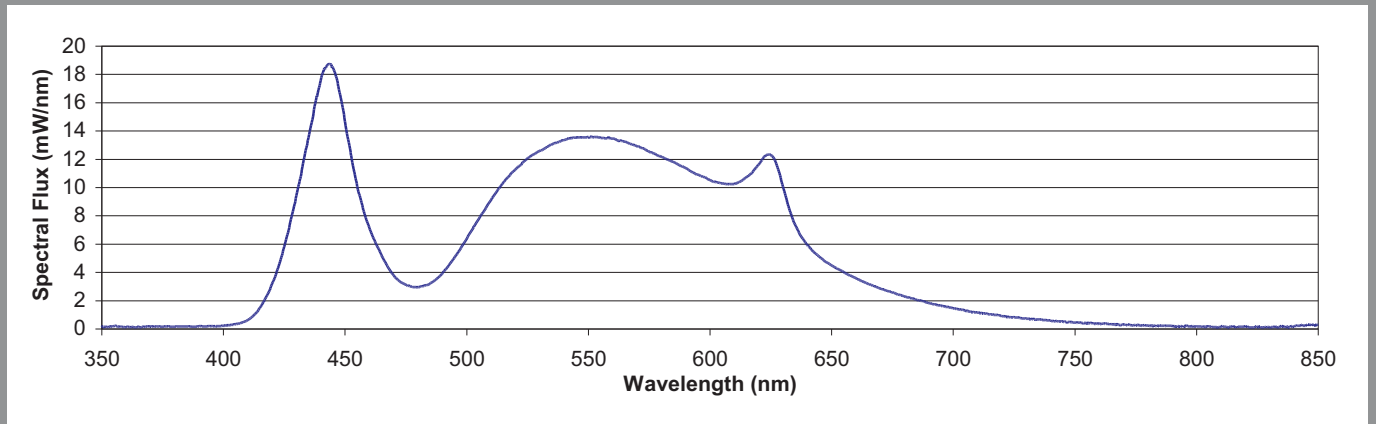
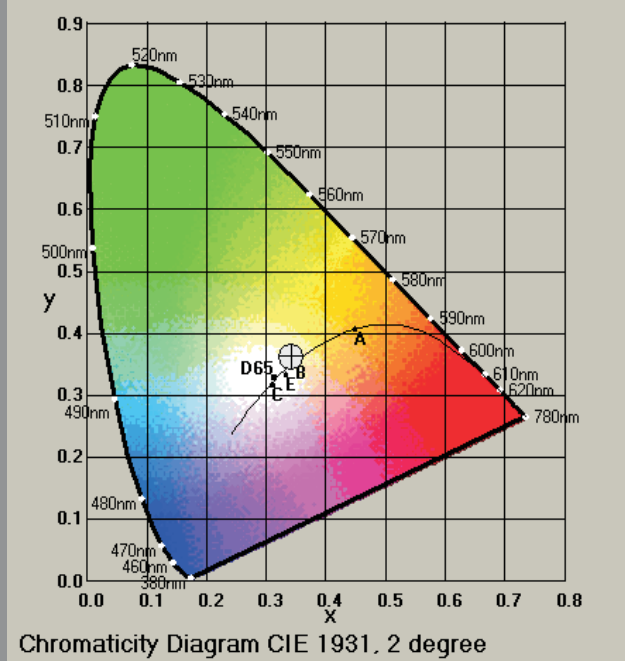
Lamp Catalog Number: LED A19-100-1D-I

LED Power Supply: Internal

Lamp Efficacy: 83.7 Lumens/Watt

Lamp Input Voltage	Lamp Current	Lamp Watts	Power Factor
120.0VAC	0.0881A	9.843W	0.931
Radiant Flux mW	Luminous Flux lumen	Corr. Color Temperature K	Color Rend. Index Ra
2516.84	823.908	5145	75.5
Chroma x	Chroma y	Chroma u	Chroma v
0.342	0.3626	0.2052	0.3263

Wavelength in nm	Spectral Flux in mW/nm	Wavelength in nm	Spectral Flux in mW/nm
350	0.2385	610	10.2550
360	0.1212	620	11.6260
370	0.1718	630	10.0630
380	0.1648	640	5.9354
390	0.1922	650	4.4996
400	0.2320	660	3.5981
410	0.6299	670	2.8544
420	3.1968	680	2.2998
430	9.4303	690	1.8386
440	17.5600	700	1.4417
450	14.6550	710	1.1502
460	7.1489	720	0.9053
470	3.7787	730	0.7237
480	2.9535	740	0.5869
490	3.9419	750	0.4469
500	6.3969	760	0.3742
510	9.1465	770	0.2901
520	11.2820	780	0.2397
530	12.6100	790	0.2024
540	13.3580	800	0.1702
550	13.5670	810	0.1453
560	13.4530	820	0.2163
570	12.9270	830	0.0906
580	12.1730	840	0.1625
590	11.3830	850	0.3173
600	10.5340		





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LTL NUMBER: 16893
 PREPARED FOR: LEDNOVATION
 CATALOG NUMBER: LED A19-100-1D-I
 LUMINAIRE: CAST ALUMINUM HOUSING, TRANSLUCENT WHITE PLASTIC ENCLOSURE.
 LAMP: ONE VBU 100 WATT A19 LED REPLACEMENT LAMP
 LAMP CATALOG NUMBER: LEDNOVATION LED A19-100-1D-I
 LED POWER SUPPLY: INTERNAL
 ELECTRICAL VALUES: 120.0VAC, 0.0887A, 9.880W, PF=0.929
 NOTE: THIS TEST WAS PERFORMED USING THE CALIBRATED
 PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY.*

DATE: 10-09-2009

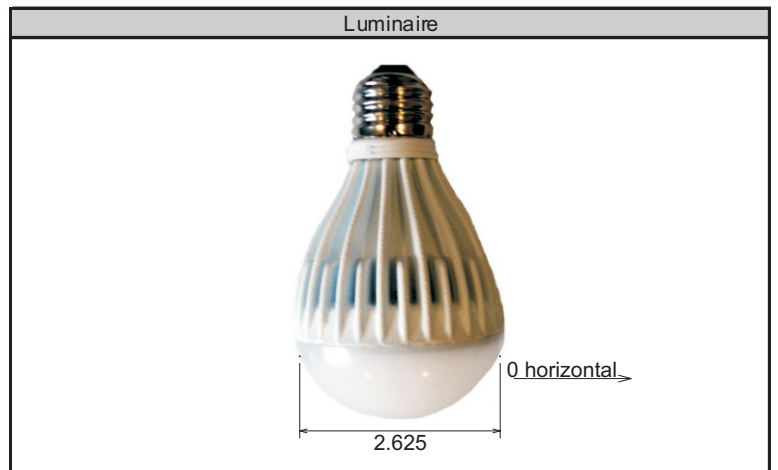
Candela Distribution

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	
5	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	15.8
15	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	46.0
25	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	71.3
35	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143	89.7
45	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	100.2
55	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	102.5
65	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97.0
75	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	85.5
85	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	70.5
90	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	
95	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	54.4
105	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	38.9
115	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25.4
125	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14.6
135	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7.1
145	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2.7
155	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
175	0	0	0	0	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	0	

Zonal Lumen Summary

Zone	Lumens	% of Lamp	% of Luminaire
0-30	133.1	N/A	16.2%
0-40	222.9	N/A	27.1%
0-60	425.5	N/A	51.7%
0-90	678.5	N/A	82.5%
90-180	143.8	N/A	17.5%
0-180	822.4	N/A	100.0%

Total lumen Output: 822.4 Lumens
 Luminaire efficacy: 83.2 Lumens per Watt
 CIE Type: Semi-Direct
 Spacing Criterion: 1.33



Approved By: MG

*DATA WAS ACQUIRED USING THE CALIBRATED PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY. A UDT MODEL #211 PHOTODETECTOR AND UDT MODEL #S370 OPTOMETER COMBINATION WERE USED AS A STANDARD. A SPECTRAL MISMATCH CORRECTION FACTOR WAS EMPLOYED BASED ON THE SPECTRAL RESPONSIVITY OF THE PHOTODETECTOR AND THE SPECTRAL POWER DISTRIBUTION OF THE TEST SUBJECT.

TESTING WAS PERFORMED IN ACCORDANCE WITH IES LM-79-08.
 TEST ANGULAR INCREMENTS AND REPORT FORMATTING WAS BASED ON IES LM-41-98 AND LM-46-04.



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Candela Tabulation (5 degree Vertical Increments)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168
5	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167
10	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165
15	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163
20	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159
25	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154
30	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149	149
35	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143
40	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137	137
45	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130
50	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123
55	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114
60	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
65	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
70	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
75	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
80	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
85	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
90	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
95	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
100	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
105	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
110	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
115	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
120	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
125	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
130	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
135	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
140	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
145	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
150	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
155	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
160	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
165	0	0	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	0
175	0	0	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	0

Zonal Lumen Tabulation (5 degree zones)

Zone	Lumens	Zone	Lumens	Zone	Lumens	Zone	Lumens
0-5	4.0	45-50	50.9	90-95	29.3	135-140	2.8
5-10	11.9	50-55	51.6	95-100	25.2	140-145	1.7
10-15	19.4	55-60	50.9	100-105	21.3	145-150	0.9
15-20	26.5	60-65	49.6	105-110	17.6	150-155	0.4
20-25	32.9	65-70	47.4	110-115	14.2	155-160	0.2
25-30	38.4	70-75	44.5	115-120	11.2	160-165	0.1
30-35	43.1	75-80	41.0	120-125	8.5	165-170	0.0
35-40	46.7	80-85	37.2	125-130	6.1	170-175	0.0
40-45	49.4	85-90	33.3	130-135	4.3	175-180	0.0



Utilization of Lumens - Zonal Cavity Method												
Effective Floor Cavity Reflectance 20%												
Ceiling Cavity Reflectance	90				80				70			
Wall Reflectance	70	50	30	10	70	50	30	10	70	50	30	10
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **											
0	985.4	985.4	985.4	985.4	944.8	944.8	944.8	944.8	906.1	906.1	906.1	906.1
1	872.1	814.9	764	718.3	831.4	780	734	692.5	792.8	746.7	705.1	667.4
2	783.4	693.7	620.3	559.2	744.7	664	597.2	541	708.1	635.5	574.8	523.2
3	708.6	599.6	516.5	451	672.5	574.1	498	437.3	638.4	549.7	480.1	423.9
4	644.9	524.9	438.6	373.5	611.7	503.1	423.6	362.8	580.5	482.1	408.9	352.3
5	590.1	464.5	378.4	315.7	559.9	445.7	366	307.1	531.4	427.6	353.8	298.7
6	542.5	414.8	330.8	271.3	515.1	398.6	320.4	264.3	489.2	382.9	310.2	257.3
7	501	373.5	292.4	236.4	476.1	359.3	283.6	230.5	452.6	345.6	274.9	224.7
8	464.7	338.6	261	208.3	442	326.2	253.4	203.3	420.7	314.2	245.9	198.4
9	432.6	309	234.9	185.4	412.1	298.1	228.2	181.1	392.6	287.4	221.7	176.8
10	404.3	283.6	212.8	166.3	385.6	273.9	207.1	162.6	367.8	264.5	201.4	158.9

Ceiling Cavity Reflectance	50				30			10			0
Wall Reflectance	70	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **										
0	833.8	833.8	833.8	833.8	767.8	767.8	767.8	707.1	707.1	707.1	678.5
1	721.2	684.3	650.6	619.7	626.9	600	575	574.1	552.8	532.9	504.4
2	640.4	582	532	488.9	532.6	491.9	456.2	487	454.2	424.9	397.6
3	575.8	503.8	445.7	397.9	461.2	413.1	372.7	421.8	382.3	348.4	322.7
4	523.1	442.5	380.7	331.8	405.8	353.9	311.8	371.6	328.3	292.4	268.3
5	479.1	393.4	330.4	282.1	361.5	307.9	265.8	331.8	286.4	250	227.5
6	441.6	353.1	290.4	243.6	325.3	271.3	230.1	299.3	253.1	216.9	196.1
7	409.3	319.5	258	213.2	295.1	241.7	201.8	272.2	225.9	190.6	171.2
8	381.3	291.2	231.3	188.5	269.7	217.2	178.9	249.4	203.6	169.3	151.2
9	356.7	267.1	209.1	168.4	248	196.8	160	230	184.9	151.8	134.9
10	335	246.4	190.3	151.6	229.3	179.5	144.3	213.2	169	137.2	121.3

Average Luminance Table (cd/m²)

	0	45	90
0	48126	48126	48126
45	52421	52421	52421
55	58954	58954	58954
65	55198	55198	55198
75	51841	51841	51841
85	49700	49700	49700

THIS TEST WAS CONDUCTED USING PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IES PROCEDURES. THE USER MUST THEREFORE USE CAUTION IN THE FOLLOWING SITUATIONS: 1) THIS TEST WAS PERFORMED USING A SPECIFIC BALLAST/LAMP COMBINATION. EXTRAPOLATION OF THESE DATA FOR OTHER BALLAST/LAMP COMBINATIONS MAY PRODUCE ERRONEOUS RESULTS. 2) THIS TEST WAS CONDUCTED IN A CONTROLLED LABORATORY ENVIRONMENT WHERE THE AMBIENT TEMPERATURE WAS HELD AT 25°C ±1°C. FIELD PERFORMANCE MAY DIFFER PARTICULARLY IN REGARDS TO CHANGE IN LUMINOUS OUTPUT AS A RESULT OF DIFFERENCE IN AMBIENT TEMPERATURE AND METHOD OF MOUNTING THE LUMINAIRE.

