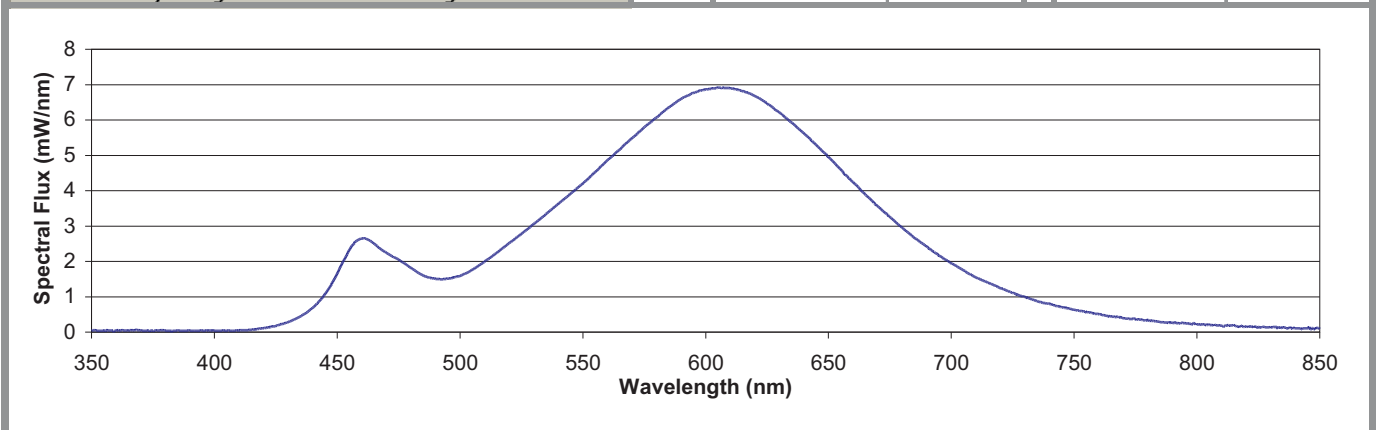




LTL Number: 17167  
 Prepared For: LEDnovation  
 Catalog Number: LED A19-40-1W-I  
 Lamp: One VBU 40 Watt A19 LED Replacement Lamp  
 Lamp Catalog Number: LED A19-40-1W-I  
 LED Power Supply: Internal  
 Lamp Efficacy: 60.6 Lumens/Watt

Date: 11-23-2009

Lamp Input Voltage	Lamp Current	Lamp Watts	Power Factor	Wavelength in nm	Spectral Flux in mW/nm	Wavelength in nm	Spectral Flux in mW/nm
120.0VAC	0.0495A	5.512W	0.929	350	0.0342	610	6.8936
Radiant Flux mW	Luminous Flux lumen	Corr. Color Temperature K	Color Rend. Index Ra	360	0.0356	620	6.6813
1111.221	333.822	2732	81.6	370	0.0457	630	6.2093
Chroma x	Chroma y	Chroma u	Chroma v	380	0.0350	640	5.6186
0.4584	0.4121	0.2609	0.3518	390	0.0404	650	4.9566
<p>Chromaticity Diagram CIE 1931. 2 degree</p>				400	0.0351	660	4.2415
				410	0.0431	670	3.5628
				420	0.1086	680	2.9520
				430	0.2807	690	2.4187
				440	0.6880	700	1.9490
				450	1.6575	710	1.5492
				460	2.6447	720	1.2427
				470	2.2476	730	0.9909
				480	1.8187	740	0.7933
				490	1.5058	750	0.6347
				500	1.5890	760	0.5074
				510	1.9955	770	0.3927
				520	2.5174	780	0.3371
				530	3.0547	790	0.2643
				540	3.6292	800	0.2193
				550	4.2063	810	0.1778
560	4.8593	820	0.1630				
570	5.4853	830	0.1478				
580	6.0738	840	0.1044				
590	6.5976	850	0.0868				
600	6.8587						





# LUMINAIRE TESTING LABORATORY, INC.

SUSTAINING  
MEMBER  
of the  
IESNA

905 Harrison Street · Allentown, PA 18103 · 610-770-1044 · Fax 610-770-8912 · www.LuminaireTesting.com

LTL NUMBER: 17164

DATE: 12-01-2009

PREPARED FOR: LEDNOVATION

CATALOG NUMBER: LED A19-40-1W-I

LUMINAIRE: CAST ALUMINUM HOUSING, TRANSLUCENT WHITE PLASTIC ENCLOSURE.

LAMP: ONE VBU 40 WATT A19 LED REPLACEMENT LAMP

LAMP CATALOG NUMBER: LEDNOVATION LED A19-40-1W-I

LED POWER SUPPLY: INTERNAL

ELECTRICAL VALUES: 120.0VAC, 0.0496A, 5.526W, PF=0.928

NOTE: THIS TEST WAS PERFORMED USING THE CALIBRATED

PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY.\*

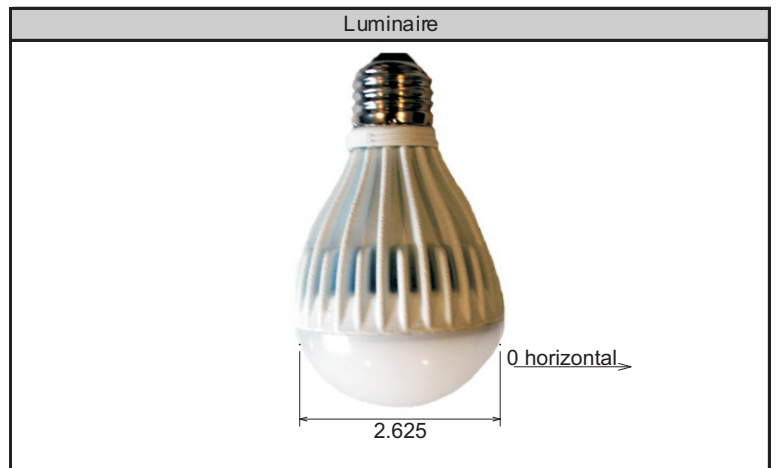
### Candela Distribution

	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	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	
5	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	6.2
15	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	17.9
25	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	27.8
35	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	35.1
45	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	39.3
55	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	40.3
65	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.3
75	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	34.1
85	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	28.3
90	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	
95	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	22.0
105	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.9
115	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
125	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.1
135	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.0
145	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.1
155	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	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	51.9	N/A	15.9%
0-40	87.0	N/A	26.7%
0-60	166.5	N/A	51.0%
0-90	267.2	N/A	81.9%
90-180	58.9	N/A	18.1%
0-180	326.1	N/A	100.0%

Total lumen Output: 326.1 Lumens  
 Luminaire efficacy: 59.0 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.



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	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4
5	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1
10	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4
15	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4
20	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9
25	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2
30	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
35	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
40	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5
45	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
50	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
55	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
60	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8
65	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7
70	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5
75	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
80	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
85	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9
90	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
95	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
100	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
105	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
110	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
115	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
120	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
125	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
130	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
135	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
140	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
145	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
150	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
155	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
160	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	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	1.6	45-50	20.0	90-95	11.8	135-140	1.2
5-10	4.6	50-55	20.2	95-100	10.2	140-145	0.7
10-15	7.6	55-60	20.1	100-105	8.7	145-150	0.4
15-20	10.3	60-65	19.6	105-110	7.2	150-155	0.2
20-25	12.8	65-70	18.8	110-115	5.9	155-160	0.1
25-30	15.0	70-75	17.7	115-120	4.6	160-165	0.0
30-35	16.8	75-80	16.4	120-125	3.5	165-170	0.0
35-40	18.3	80-85	14.9	125-130	2.6	170-175	0.0
40-45	19.3	85-90	13.4	130-135	1.8	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	390.5	390.5	390.5	390.5	374.2	374.2	374.2	374.2	358.7	358.7	358.7	358.7
1	345.4	322.6	302.4	284.2	329.1	308.6	290.3	273.8	313.6	295.2	278.7	263.7
2	310.2	274.5	245.4	221.1	294.7	262.6	236	213.7	279.9	251.1	227	206.5
3	280.5	237.2	204.2	178.2	266	227	196.7	172.6	252.4	217.2	189.5	167.2
4	255.3	207.6	173.3	147.5	242	198.9	167.3	143.2	229.4	190.4	161.4	138.9
5	233.6	183.7	149.5	124.6	221.4	176.1	144.5	121.1	210	168.9	139.6	117.7
6	214.7	164	130.7	107.1	203.7	157.5	126.5	104.2	193.3	151.2	122.3	101.4
7	198.3	147.7	115.5	93.26	188.3	141.9	111.9	90.86	178.8	136.4	108.4	88.49
8	183.9	133.9	103	82.15	174.8	128.9	99.96	80.12	166.2	124	96.93	78.09
9	171.2	122.2	92.71	73.09	162.9	117.7	90.04	71.34	155.1	113.4	87.4	69.6
10	160	112.1	84.01	65.55	152.4	108.2	81.67	64.04	145.3	104.4	79.37	62.53

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	329.6	329.6	329.6	329.6	303.1	303.1	303.1	278.7	278.7	278.7	267.2
1	284.8	270.1	256.7	244.4	247	236.3	226.4	225.8	217.3	209.4	198
2	252.8	229.6	209.8	192.6	209.7	193.6	179.4	191.4	178.4	166.8	155.8
3	227.2	198.6	175.6	156.7	181.5	162.5	146.5	165.6	150	136.6	126.3
4	206.4	174.5	150	130.6	159.7	139.1	122.5	145.9	128.8	114.6	105
5	189	155.1	130.1	111	142.2	121	104.4	130.2	112.3	97.91	88.96
6	174.2	139.2	114.3	95.79	127.9	106.6	90.31	117.5	99.21	84.93	76.61
7	161.5	125.9	101.5	83.79	116.1	94.93	79.16	106.8	88.56	74.61	66.87
8	150.4	114.8	91.02	74.09	106.1	85.31	70.15	97.89	79.79	66.26	59.05
9	140.7	105.2	82.26	66.15	97.53	77.28	62.75	90.25	72.45	59.38	52.65
10	132.1	97.06	74.86	59.54	90.18	70.49	56.58	83.67	66.24	53.66	47.36

Average Luminance Table (cd/m<sup>2</sup>)

	0	45	90
0	18730	18730	18730
45	20556	20556	20556
55	23149	23149	23149
65	21802	21802	21802
75	20640	20640	20640
85	20000	20000	20000

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.

