Ningbo TengLi Testing Co., Ltd

2nd floor, Block B, Ningbo Testing and Certification Base, No. 66
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ACCREDITED
Certificate#4703.02

LM-79-08 Test Report

For

LEDVANCE LLC

(Brand Name: N/A)

200 Ballardvale St. Wilmington MA 01887, USA

Model name(s): LED13.5A213WAYO927CL13YTL

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	Lamps
Report Date:	2020-06-04
Prepared By:	Ningbo TengLi Testing Co., Ltd 2nd floor, Block B, Ningbo Testing and Certification Base, No. 66 Qingyi Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang

Test & Report By:

Xeon Ren

Engineer: Xeon Ren

Review By:

Johnson Sun

Manager: Johnson Sun

Note: 1. The results contained in this report pertain only to the tested samples

2. This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.

1.1 Product Information:		
Model Number	LED13.5A213WAYO927CL13YTL	
Remark	This is a multiple listed report, the Project Number of the original report is STD200465NB-AB	
Representative (Tested) Model	LED13.5A213WAYO927CL13YTL	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Lamps	
LED Manufacturer	N/A	
LED Model	N/A	
Dimming	N/A	
Sample Number	STD200465NB-AB1(2700K)	
Date of Receipt	May.24, 2020	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120Vac,60 Hz
Nominal Power	13.5W
Rated Initial Lamp Lumen	--
Declared CCT	2700K

1.3 Test Specifications:

Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.4 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 ℃ ±1 ℃, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 °vertical intervals and 22.5 °horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 ºC ±1 ºC. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25 ºC ±1 ºC. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Electrical, Photometric and Chromaticity Measurements

Test date	2020-05-26	**Test Ambient:**	25.2 ºC
Test Orientation	As intended	**Stabilization Time (min)**	45
Model Number	LED13.5A213WAYO927CL13YTL	**Total Operating Time(min)**	60

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD200465 NB-AB1	120.0	60	0.1085	12.84	0.9859

Chromaticity Measurement - Sphere-Spectroradiometer Method(Self-absorption:1.0024):

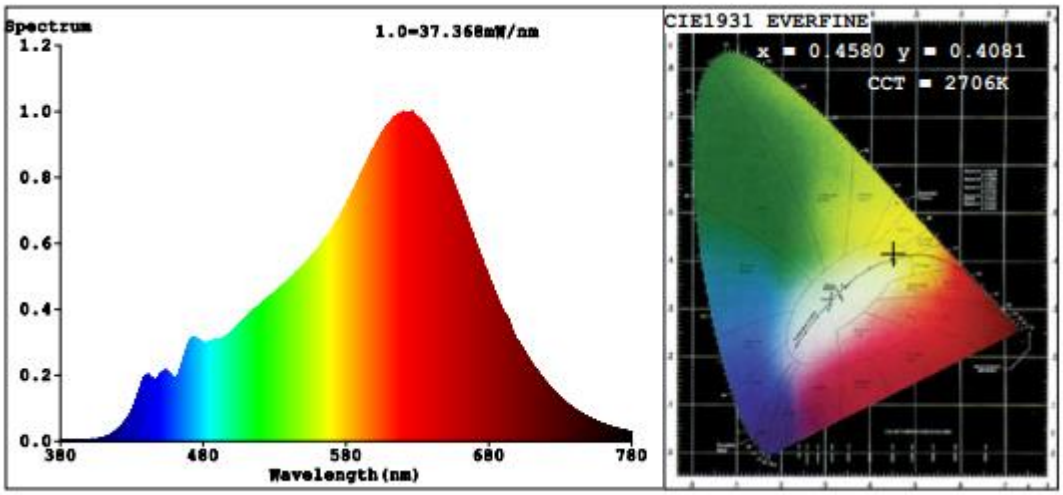
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2706
Duv	0.0008
Chromaticity (x, y)	x=0.4580 y=0.4081
Chromaticity (u', v')	u'=0.2625 v'=0.5261
Color Rendering Index (CRI)	91.1
R9	62

Special Color Rendering Indices			
R1	96	R9	62
R2	99	R10	100
R3	95	R11	97
R4	94	R12	93
R5	97	R13	97
R6	95	R14	98
R7	90	R15	90
R8	81	--	--

Photometric Measurement – Goniophotometer Method(Test distance: 1.877m):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1482.8
Luminous Efficacy (lm/W)	115.51
Beam Angle (°)	315.6
Center Beam Candle Power (cd)	57.2

Spectral Power Distribution & Chromaticity Diagram

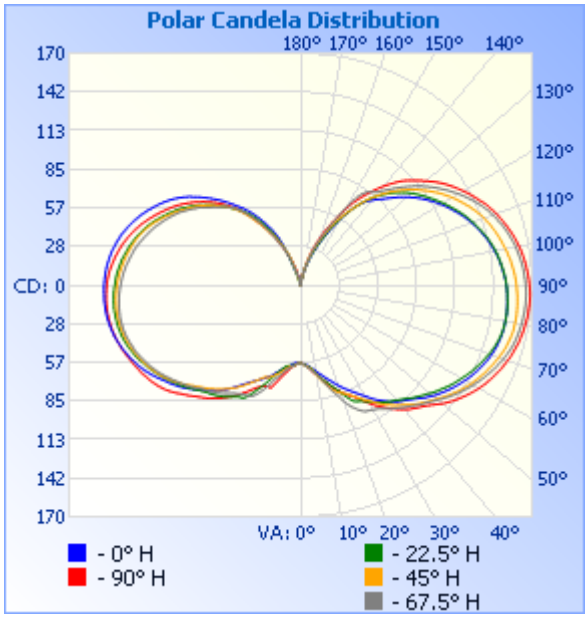


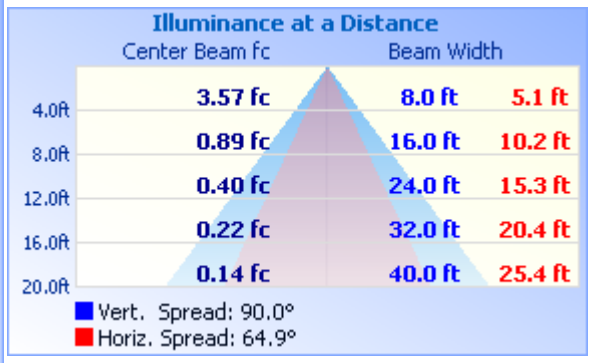
Zonal Lumen Tabulation

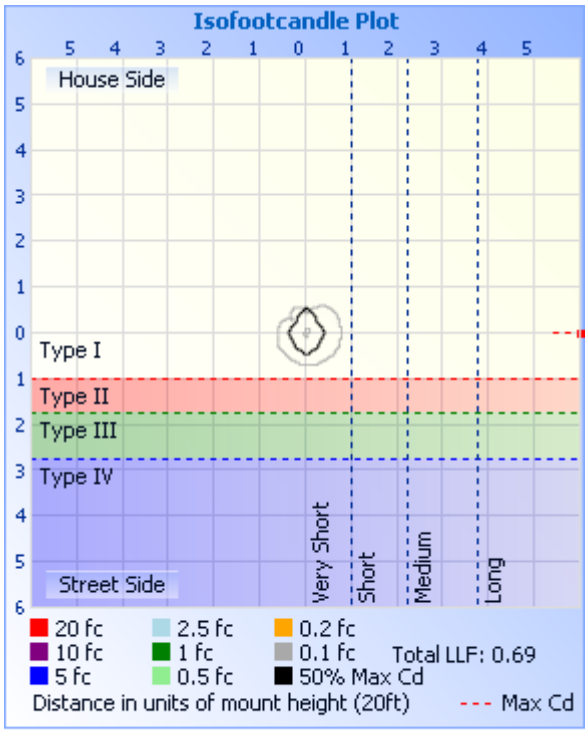
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	67.4	4.5%
0-40	132.3	8.9%
0-60	340.7	23%
60-90	464.4	31.3%
70-100	485.2	32.7%
90-120	439.1	29.6%
0-90	805.1	54.3%
90-180	677.7	45.7%
0-180	1,482.9	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	% Total
0-10	5.8	0.4%	90-100	162.0	10.9%
10-20	20.6	1.4%	100-110	149.2	10.1%
20-30	40.9	2.8%	110-120	127.9	8.6%
30-40	64.9	4.4%	120-130	101.3	6.8%
40-50	90.8	6.1%	130-140	72.2	4.9%
50-60	117.6	7.9%	140-150	43.6	2.9%
60-70	141.2	9.5%	150-160	18.0	1.2%
70-80	158.1	10.7%	160-170	3.6	0.2%
80-90	165.2	11.1%	170-180	0.1	0%

Photometric Data







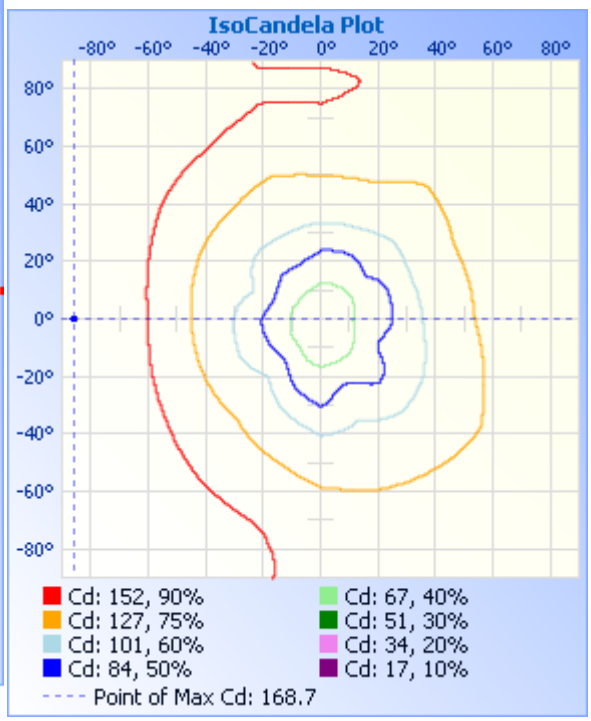


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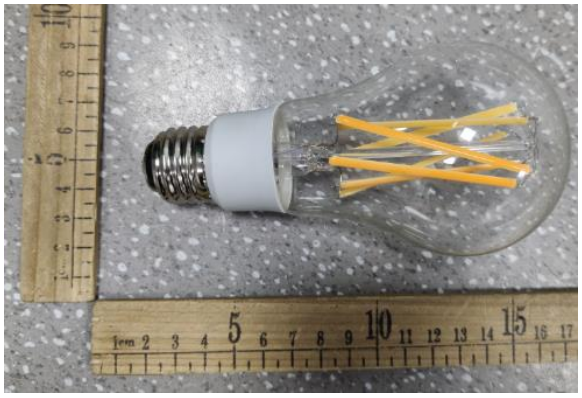
Table--1 UNIT: cd

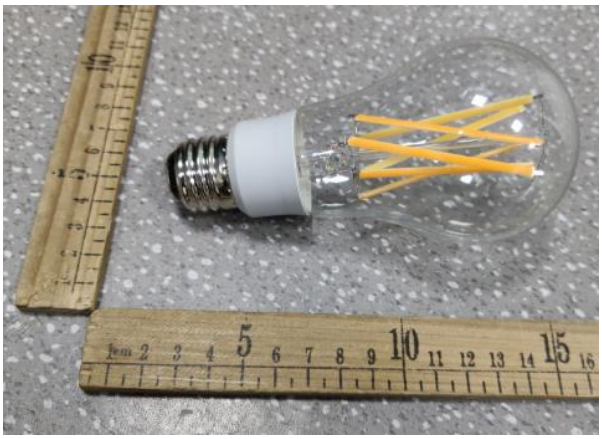
γ (DEG) \ C (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5		
0	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2		
5	59.8	59.6	59.2	59.3	59.3	59.9	60.2	60.5	60.2	59.3	58.7	57.5	57.7	59.0	59.4	59.6		
10	65.6	64.3	63.2	63.8	64.1	65.8	66.9	66.3	66.4	65.6	64.2	62.8	61.4	60.4	62.3	63.6		
15	75.7	71.0	70.9	70.5	70.2	73.7	76.4	76.7	74.3	74.3	74.8	67.8	66.0	66.8	67.9	71.0		
20	78.8	79.0	81.8	77.1	77.7	82.8	83.9	89.7	82.6	84.4	89.2	75.4	71.9	77.2	72.0	82.3		
25	84.5	84.0	87.2	84.6	85.4	93.8	89.4	101	89.8	90.2	99.6	83.8	77.2	89.2	77.4	89.7		
30	93.1	94.0	93.8	93.5	93.9	98.5	97.5	106	99.7	99.5	107	92.7	84.1	94.4	85.1	92.0		
35	101	103	99.4	103	103	105	107	111	110	110	115	102	92.9	99.8	92.7	96.8		
40	108	110	105	111	111	110	115	117	119	120	121	111	101	104	99.4	102		
45	115	116	111	119	118	117	123	124	126	127	128	119	108	108	106	107		
50	122	124	118	126	126	124	130	131	135	135	134	126	116	114	113	113		
55	128	131	124	133	133	130	138	139	144	144	140	133	122	120	120	118		
60	132	136	130	138	140	137	145	146	151	150	146	140	129	126	125	124		
65	136	141	135	142	145	142	150	153	157	156	151	145	134	130	129	128		
70	139	144	140	146	149	147	155	158	162	161	156	150	139	134	133	132		
75	142	147	143	149	152	151	158	163	165	165	159	152	142	137	135	134		
80	143	149	145	151	153	153	160	165	168	167	161	154	144	138	136	135		
85	143	149	145	151	152	153	160	166	169	168	162	154	145	138	136	134		
90	142	147	145	150	151	151	159	165	168	168	161	154	145	137	135	132		
95	140	145	143	148	148	149	156	164	166	166	159	153	143	134	133	130		
100	137	142	141	145	145	145	153	161	163	163	156	149	141	131	130	126		
105	132	137	137	140	140	141	149	156	159	159	151	145	137	127	126	122		
110	126	132	132	134	134	135	144	150	153	154	145	140	132	122	121	117		
115	119	125	126	127	127	128	137	143	146	147	137	133	126	115	114	111		
120	112	117	119	119	119	121	128	134	138	139	129	126	119	108	107	105		
125	104	109	111	111	110	113	119	124	129	130	120	117	111	100	99.0	97.4		
130	95.1	99.7	103	102	101	105	109	113	119	119	110	108	101	91.5	91.1	88.7		
135	84.9	88.8	93.8	90.5	90.1	95.9	97.5	101	108	107	97.9	97.9	89.2	81.6	82.2	81.4		
140	73.3	77.4	82.8	78.7	81.3	84.4	84.9	89.6	94.7	93.3	89.6	86.0	77.3	72.5	71.8	72.9		
145	58.9	71.9	69.7	65.4	70.4	70.3	70.2	83.1	79.4	77.7	78.0	70.8	66.2	62.3	57.9	60.1		
150	44.8	53.3	52.3	50.1	52.9	53.4	55.8	64.2	62.4	61.3	60.6	55.6	52.8	48.4	44.4	44.3		
155	30.3	32.4	35.1	35.4	36.3	37.3	41.0	43.3	45.7	47.0	44.7	40.8	38.0	33.2	32.3	29.9		
160	19.7	19.0	21.5	22.7	23.5	24.5	27.8	29.3	30.7	30.8	28.9	26.0	12.4	11.1	20.3	16.9		
165	9.11	9.03	10.2	12.2	12.3	13.9	15.2	15.1	16.5	16.4	14.6	13.9	6.55	2.00	2.19	4.50		
170	2.03	2.17	2.59	3.40	4.04	4.31	4.68	5.38	5.20	5.26	5.24	4.35	2.07	1.57	1.75	1.66		
175	0.04	0.05	0.06	0.09	0.12	0.14	0.17	0.19	0.22	0.23	0.21	0.16	0.09	0.06	0.05	0.03		
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-705	Standard Lamp	2020-02-06	2021-02-05
ST-R-704	Power Meter for Integrating Sphere	2020-01-05	2021-01-04
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp	2020-02-11	2021-02-10
ST-R-711	Power Meter for Goniophotometer	2020-01-05	2021-01-04
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

4. Product Photo





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