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
Tel: 86574-8783 6802
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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): LED13.5A213WAYO950CL13YTL

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	LED13.5A213WAYO950CL13YTL	
Remark	This is a multiple listed report, the Project Number of the original report is STD200465NB-AC	
Representative (Tested) Model	LED13.5A213WAYO950CL13YTL	
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-AC1(5000K)	
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	5000K

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	LED13.5A213WAYO950CL13YTL	**Total Operating Time(min)**	60

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD200465 NB-AC1	120.0	60	0.1081	12.78	0.9852

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4962
Duv	0.0019
Chromaticity (x, y)	x=0.3466 y=0.3566
Chromaticity (u', v')	u'=0.2105 v'=0.4873
Color Rendering Index (CRI)	91.2
R9	50

Special Color Rendering Indices			
R1	90	R9	50
R2	95	R10	86
R3	97	R11	88
R4	89	R12	83
R5	90	R13	92
R6	93	R14	98
R7	93	R15	87
R8	82	--	--

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

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1750.5
Luminous Efficacy (lm/W)	136.93
Beam Angle (°)	313.6
Center Beam Candle Power (cd)	79.3

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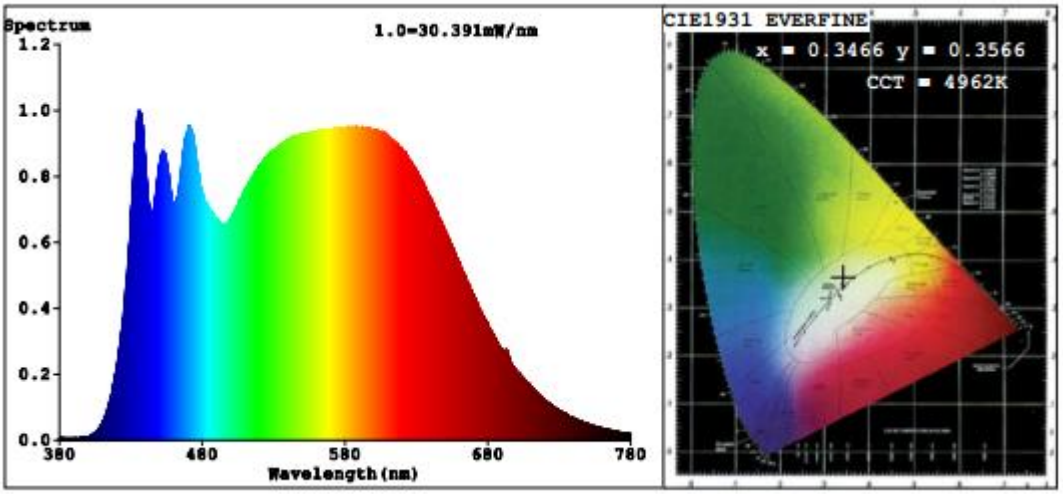
Spectral Power Distribution & Chromaticity Diagram

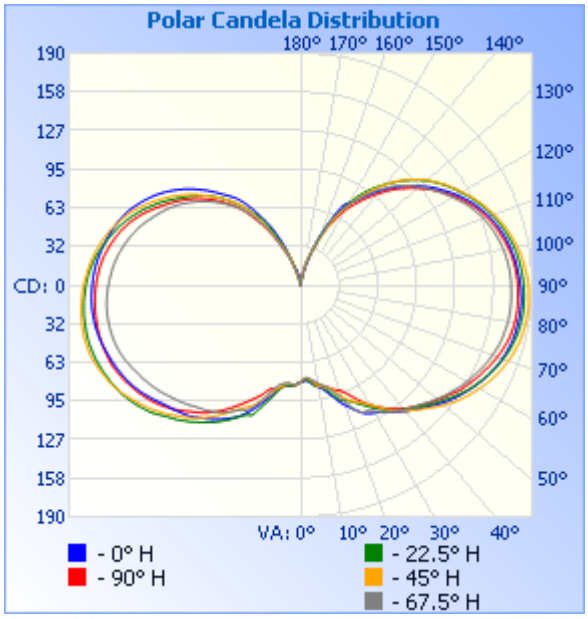


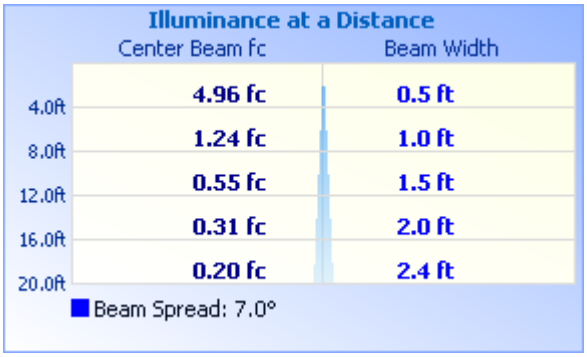
Zonal Lumen Tabulation

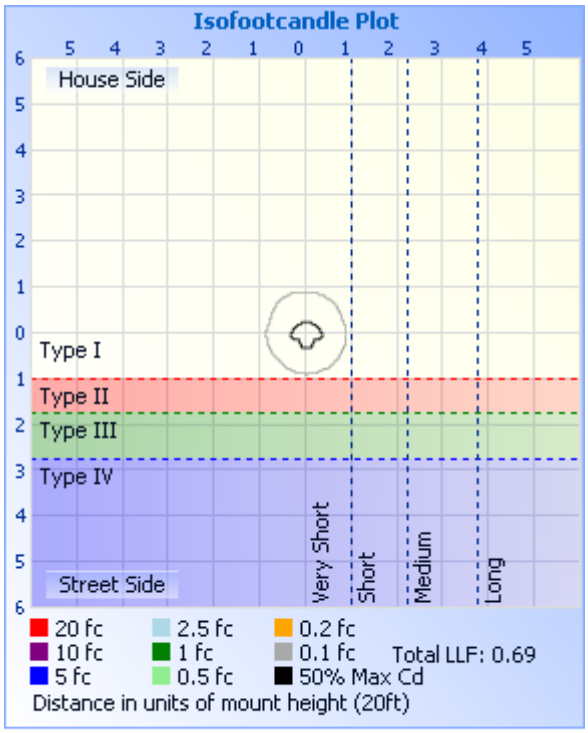
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	85.1	4.9%
0-40	165.2	9.4%
0-60	416.0	23.8%
60-90	545.0	31.1%
70-100	566.2	32.3%
90-120	510.0	29.1%
0-90	960.9	54.9%
90-180	789.7	45.1%
0-180	1,750.7	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	% Total
0-10	7.8	0.4%	90-100	188.2	10.7%
10-20	26.2	1.5%	100-110	173.2	9.9%
20-30	51.1	2.9%	110-120	148.6	8.5%
30-40	80.0	4.6%	120-130	117.5	6.7%
40-50	110.3	6.3%	130-140	84.1	4.8%
50-60	140.5	8.0%	140-150	51.6	2.9%
60-70	167.0	9.5%	150-160	21.8	1.2%
70-80	185.5	10.6%	160-170	4.6	0.3%
80-90	192.5	11.0%	170-180	0.1	0%

Photometric Data







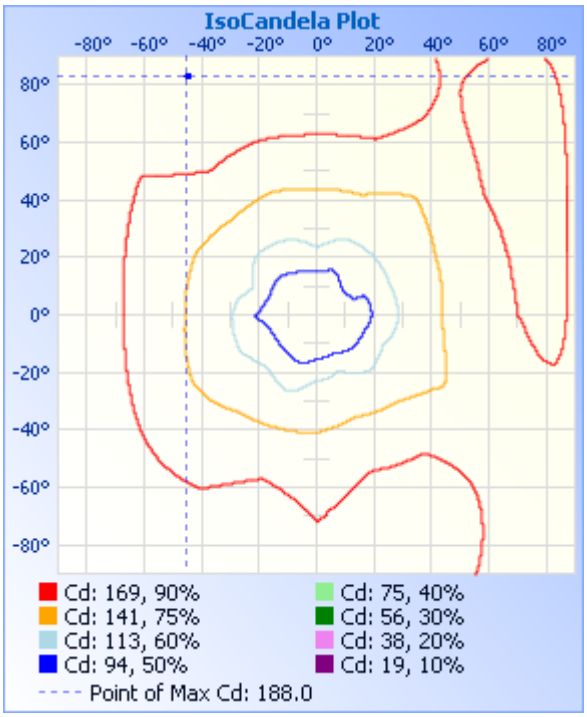


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Table--1 UNIT: cd

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	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3		
5	82.0	82.6	82.0	79.9	79.5	79.0	77.5	76.8	78.1	80.7	82.3	82.3	82.2	82.8	81.6	81.7		
10	84.8	89.5	88.3	86.2	84.8	84.1	84.0	81.7	82.9	80.8	81.8	81.0	84.1	84.5	83.8	81.9		
15	88.1	93.4	101	90.7	92.6	90.7	86.8	87.4	86.8	90.0	89.7	88.7	93.8	96.7	91.1	89.0		
20	96.3	96.7	102	97.1	104	101	96.4	99.5	91.7	103	105	98.9	106	112	103	104		
25	106	108	108	106	115	106	105	115	101	108	113	106	118	119	111	113		
30	117	117	115	115	121	116	113	119	113	114	123	117	127	128	121	120		
35	127	125	120	125	127	125	124	127	123	122	131	129	134	137	132	126		
40	136	133	126	134	135	133	135	133	132	130	138	139	140	146	142	131		
45	144	141	131	142	142	140	143	139	139	137	143	148	145	153	150	136		
50	152	149	138	151	150	148	153	145	146	143	149	156	150	162	159	141		
55	158	156	146	158	158	157	162	152	154	150	155	164	156	168	166	146		
60	163	162	152	165	165	165	170	158	160	158	161	171	161	173	173	151		
65	167	167	158	171	171	171	176	163	166	165	166	177	165	176	177	155		
70	169	171	163	177	176	177	182	168	172	170	171	181	168	179	181	159		
75	170	173	166	180	180	181	185	171	176	175	174	184	171	180	183	160		
80	170	174	167	181	181	183	187	173	178	177	176	185	172	180	182	161		
85	170	173	168	181	182	184	188	173	179	179	175	184	172	179	181	160		
90	168	170	167	180	180	183	187	173	178	178	173	181	171	176	178	158		
95	166	167	164	178	178	181	184	172	177	177	170	178	169	173	174	155		
100	162	163	161	174	175	178	181	169	173	174	164	174	166	167	170	151		
105	156	158	156	169	171	173	176	165	169	169	158	169	162	160	164	146		
110	150	151	150	163	165	168	169	160	163	162	151	162	158	153	157	140		
115	141	143	144	155	157	160	162	153	155	154	142	154	151	144	148	133		
120	131	134	135	146	148	152	153	144	146	145	133	144	143	135	138	126		
125	121	124	126	136	138	143	144	135	135	134	123	133	134	124	127	117		
130	110	112	116	126	126	134	134	126	124	122	113	122	123	114	116	107		
135	98.2	100	106	113	115	121	122	115	111	109	103	110	110	103	103	95.8		
140	84.7	87.9	94.3	98.9	101	108	108	103	97.5	95.3	91.2	96.1	96.6	90.1	90.4	84.2		
145	67.7	86.6	81.0	83.0	87.5	93.8	90.6	88.5	83.2	81.9	86.6	81.0	83.7	75.4	75.4	69.9		
150	50.0	63.5	63.2	67.0	77.5	76.1	72.7	73.9	68.9	66.0	73.3	62.2	64.3	61.6	53.9	51.5		
155	33.3	37.9	42.7	47.3	59.0	56.5	52.5	57.3	52.0	48.7	47.8	46.1	44.4	38.3	34.9	30.7		
160	20.6	21.9	27.1	29.4	35.7	35.1	33.7	33.6	35.0	34.0	30.8	27.3	21.8	21.8	21.7	17.7		
165	9.09	10.5	13.1	15.5	16.4	20.6	21.1	21.3	20.2	20.0	18.9	17.0	12.5	1.79	2.59	4.16		
170	2.18	2.37	3.40	4.19	4.93	6.67	7.65	8.27	7.75	8.17	8.22	7.55	4.22	1.13	1.46	1.37		
175	0.02	0.02	0.03	0.06	0.11	0.16	0.20	0.25	0.32	0.33	0.33	0.27	0.15	0.08	0.05	0.04		
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		

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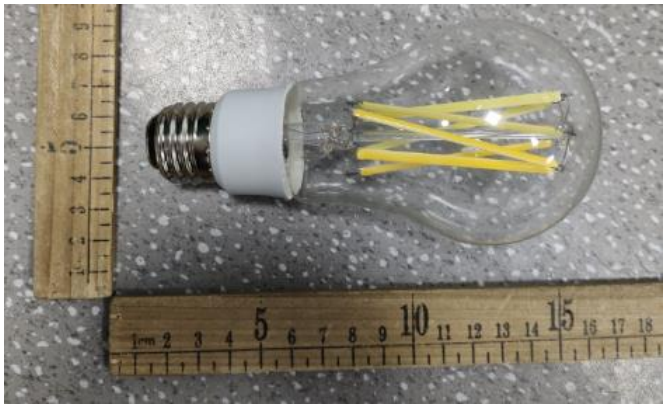
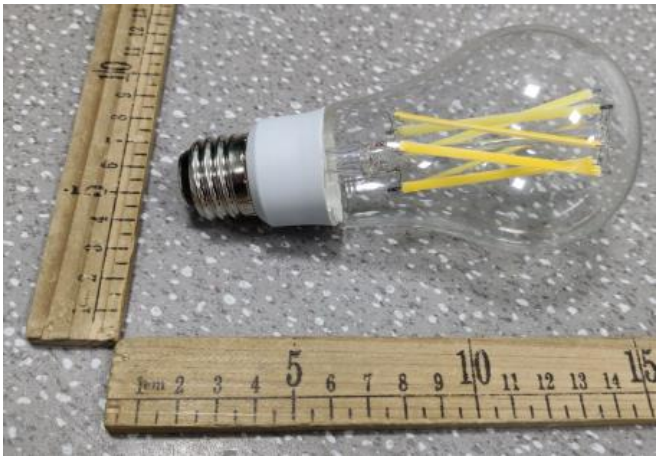
3. Test Equipment

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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