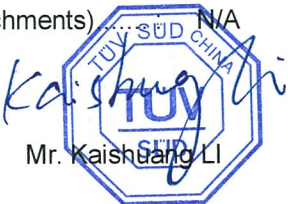
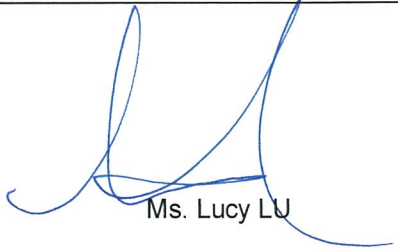




TEST REPORT IES LM-79-08

TÜV SÜD Test Report for Electrical and Photometric Measurements of Solid-State Lighting Products

Report reference No. :	70.402.17.014.42-20
Date of issue..... :	2018-11-05
Project handler..... :	Mr. Kaishuang LI
Testing laboratory..... :	TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch
Address	No. 151 Hengtong Road, 200070, Shanghai, P.R.China.
Testing procedure	<input type="checkbox"/> TMP <input type="checkbox"/> WMTL <input type="checkbox"/> SMTL <input type="checkbox"/> LTR
Testing location..... :	No. 1999, Duhui Road, Shanghai, 201108, P. R. China
Client	Everlite LED Lighting Co., Limited
Client number..... :	91783
Address	Room 2105, Trend Centre, 29-31, Cheung Lee Street, Chaiwan, Hong Kong
Contact person..... :	Jackie ZHANG
Standard	This TÜV SÜD test program is based on the following requirements: IES LM-79-08
TRF originated by..... :	TÜV SÜD Product Service GmbH, Mr. Kenneth Lau
Copyright blank test report..... :	This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TÜV SÜD Product Service GmbH. TUV SUD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
Test procedure	<input type="checkbox"/> TÜV Mark <input checked="" type="checkbox"/> without certification
Non-standard test method..... :	N/A
National deviations	N/A
Number of pages (Report)	18
Number of pages (Attachments)	N/A
Compiled by :	Approved by :
(+ signature)  Mr. Kaishuang LI	(+ signature)  Ms. Lucy LU



Test sample	1 pre-production sample from factory		
Type of test object	LED Luminaire (LED Street Light)		
Trade mark	N/A		
Model and/or type reference	EL-SL18LA-160W-4000K		
Lens type	TYPE II		
Rating(s)	220-240V AC, 50/60Hz, 160W, Class II, IP66		
Manufacturer	Ningbo Shishang Photoelectricity Technology Co., Ltd.		
Manufacturer number	92974		
Address	No.19, KeSan Road, Ninghai, 315600, Ningbo, Zhejiang, People's Republic of China		
Sub-contractors/ tests (clause)	N/A		
Name	N/A		
Order description	<input type="checkbox"/>	Complete test according to TRF	
	<input checked="" type="checkbox"/>	Partial test according to manufacturer's specifications	
	<input type="checkbox"/>	Preliminary test	
	<input type="checkbox"/>	Spot check	
	<input type="checkbox"/>	Other:	
Date of order	2017-12-29		
Date of receipt of test item	2018-10-22		
Date(s) of performance of test	2018-10-30 to 2018-10-31		
Test item particulars (delared):			
Lamp type :	<input type="checkbox"/>	Bare lamp	
	<input type="checkbox"/>	Covered lamp, no reflector	
	<input type="checkbox"/>	Lamp with reflector	
	<input checked="" type="checkbox"/>	other: LED Street Light	
Lamp cap installed :	N/A		
Rated Votage (V) :	220-240		
Rated Power (W) :	160		
Rated Power Factor :	N/A		
Rated Luminous Flux (lm) :	N/A		
Rated CCT (K) :	4000		
Rated CRI :	N/A		



Attachments:

1. Test Equipment List

General remarks:

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

Summary of testing:

☐ deviation(s) found

☒ no deviations found

The test was operated at 230V, 50Hz, in accordance with the applicant's instruction.

Model	Luminous Efficacy (Lumens/Watt)	Total Luminous Flux (Lumens)	Input Power (Watts)
EL-SL18LA-160W-4000K	148,86	22938,17	154,1
Power Factor	CCT (K)	CRI	Stabilisation Time (minutes)
0,9891	4073	71,5	90

Copy of marking plate:

Not provide

Picture of the product:



Characteristic data

Dimension (mm, Height x Width x Length): 260mm*380mm*830mm

Weight: approximately : 12,5Kg

Purpose of the product

LED Street light for generally lighting purpose.

Possible test case verdicts:

- test case does not apply to the test object:: N(A.) / not included in the order
- test object does meet the requirement.....: P(ass)
- test object does not meet the requirement:: F(ail)

Possible suffixes to the verdicts:

- suffix for detailed information for the client.....: - C(omment)
- suffix for important information for factory inspection...: - M(anufacturing)

Clause	Requirement	Test	Measuring result	Remark	Verdict
2.0	Ambient Conditions				P
2.1	General				P
2.2	Air Temperature				P
2.3	Thermal Condition for Mounting SSL Products				P
2.4	Air Movement				P
3.0	Power Supply Characteristics				P
3.1	Waveshape of AC power supply				P
3.2	Voltage regulation				P
4.0	Seasoning of SSL Product		No seasoning of SSL product		P
5.0	Stabilisation of SSL Product		Sufficiently satbilised before measurment		P
6.0	Operation Orientation				P
	SSL product shall be stabilized and measured in intended operating orientation				P
7.0	Electrical Settings				P
	SSL product shall be operated at rated voltage				P
	SSL product with dimming capability are tested at maximum input power condition				N/A
	SSL product with different modes are measured in all relvant modes				N/A
8.0	Electrical Instrumentations				P
8.1	Circuits				P
8.2	Uncertainties				P
9.0	Test methodes for Luminous Flux measurment				P
9.1	Integrating sphere with a spectroradiometer (Sphere-spectroradiometer system)				N/A
9.2	Integrating sphere with a photometer head (Sphere-photometer system)				N/A
9.3	Goniophotometer				P
10.0	Luminous Intensity Distribution				P
	Reporting acc. to IEC LM-63		See table 3		P
11.0	Luminous Efficay		See table 1		P
12.0	Test Methodes for Color Characteristics of SSL Products				P
	Measurments		See table 1		P
13.0	Uncertainty statement				P

Table 1	Test data		
Model	EL-SL18LA-160W-4000K		
Rated Voltage (V):	AC 220-240	Rated Power (W):	160
Rated luminous flux (lm):	N/A	Ambient temperature 25 ±1°C (°C):	25,3
Test item		Measured Value	
		Integrating Sphere	Goniophotometer
Key Photometric Results			
Luminous Efficacy (Lumens/Watt)	-	148,86	
Total Luminous Flux (Lumens)	-	22938,17	
Correlated Color Temperature (CCT)	4073	-	
Color Rendering Index (CRI)	71,5	-	
Chromaticity (Chroma x / Chroma y)	0,3786/0,3797	-	
Chromaticity (Chroma u / Chroma v)	-	-	
Chromaticity (Chroma u' / Chroma v')	0,2227/0,5026	-	
Duv Value	0,0019	-	
SDCM	0,79	-	
Color Angular Uniformity (Max. du'v')	-	-	
Stabilization Time (Light and Power) (Minutes)	90		
Total Run Time – Goniophotometer (Minutes)	150		
Spacing Criteria		C=15° / γ=1°	
Electrical Input Results			
Input Power (Watts)	-	154,1	
Input Voltage (Volts AC)	-	230,1	
Input Current (Amps)	-	0,6771	
Input Frequency (Hertz)	-	50,0	
Power Factor	-	0,9891	
A-THD (Current – Total Harmonic Distortion)	-	-	
Additional Information			
Ambient Temperature (°C):	25,3	25,3	
Photometric measurement condition	-	Photometric distance: 26m	
Number of hours operated prior to measurement	0h		
Orientation (burning position)	Base up, center of the Goniophotometer		
Supplementary Information:			
- Absorbtion Correction used: Yes			
Stabilisation was considered reached by: the variation (maximum-minimum) of at least 3 readings			
- of the light output and electrical power over a period of 30 minutes is less than 0.5%.			

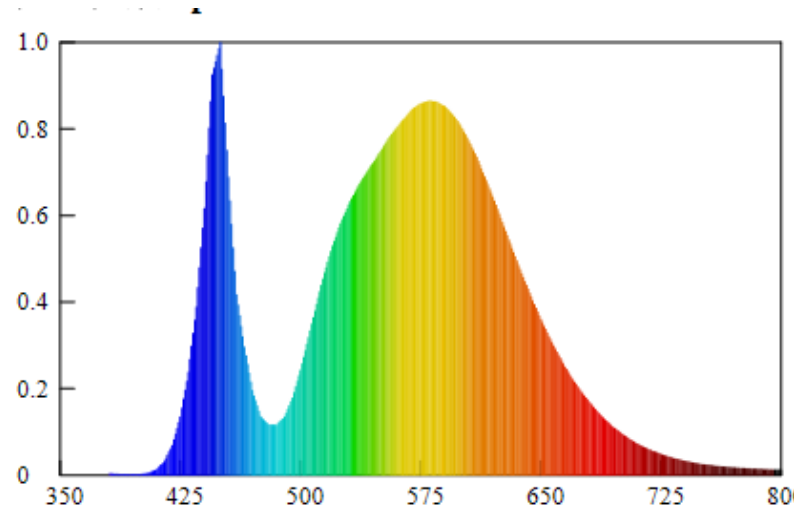
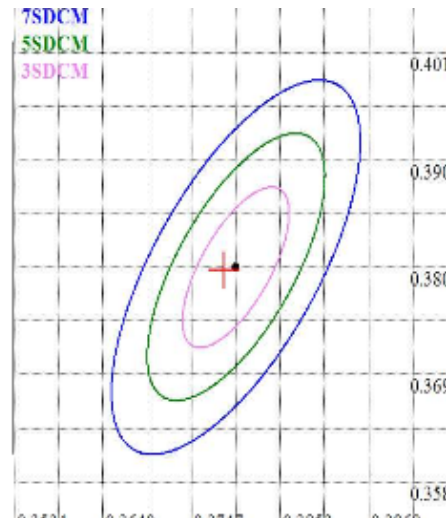
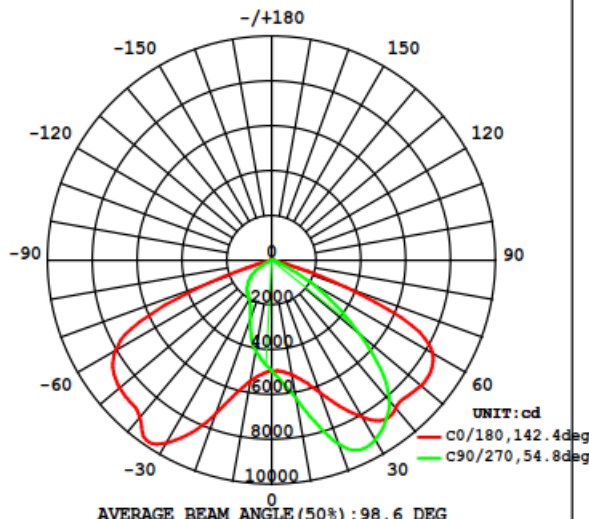
Table 2	SPECTRAL DISTRIBUTION and CHROMATICITY DIAGRAM- CIE 1931
Model	EL-SL18LA-160W-4000K
The following graph shows the spectral response curve of the radiant flux for the sample: (350nm to 780nm – calibrated range of the Spectroradiometer)	
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>光谱分布 Spectral Distribution</p> </div> <div style="text-align: center;">  <p>7SDCM 5SDCM 3SDCM</p> <p>Nominal CCT:IEC_F4000 x0=0.3786 y0=0.3797</p> </div> </div>	

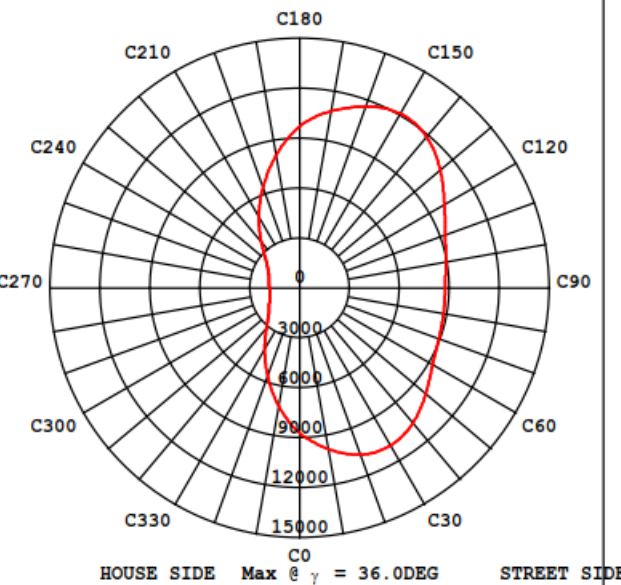
Table 3		LIGHT DISTRIBUTION DIAGRAM			
Model:		EL-SL18LA-160W-4000K			
DATA OF LAMP		PHOTOMETRIC DATA Eff: 148.86 lm/W			
MODEL		I _{max} (cd)	12114	η street_up (%)	0.0
NOMINAL POWER (W)	160	LOR (%)	100	η street_down (%)	70.6
RATED VOLTAGE (V)	220-240	TOTAL FLUX (lm)	22938.17	η house_up (%)	0.0
NOMINAL FLUX (lm)	22938.17	MAXIMUM @ (C, γ)	150,36.0	η house_down (%)	29.4
LAMPS INSIDE	1	η up (%)	0.0	76 FLASHAREA (m2)	
TEST VOLTAGE (V)	230	η down (%)	100	SLI	

**INTENSITY DISTRIBUTION DIAGRAM
IN C PLANS**



UNIT: cd
— C0/180, 142.4deg
— C90/270, 54.8deg
AVERAGE BEAM ANGLE (50%): 98.6 DEG

**MAX INTENSITY CONE SURFACE
DISTRIBUTION DIAGRAM**



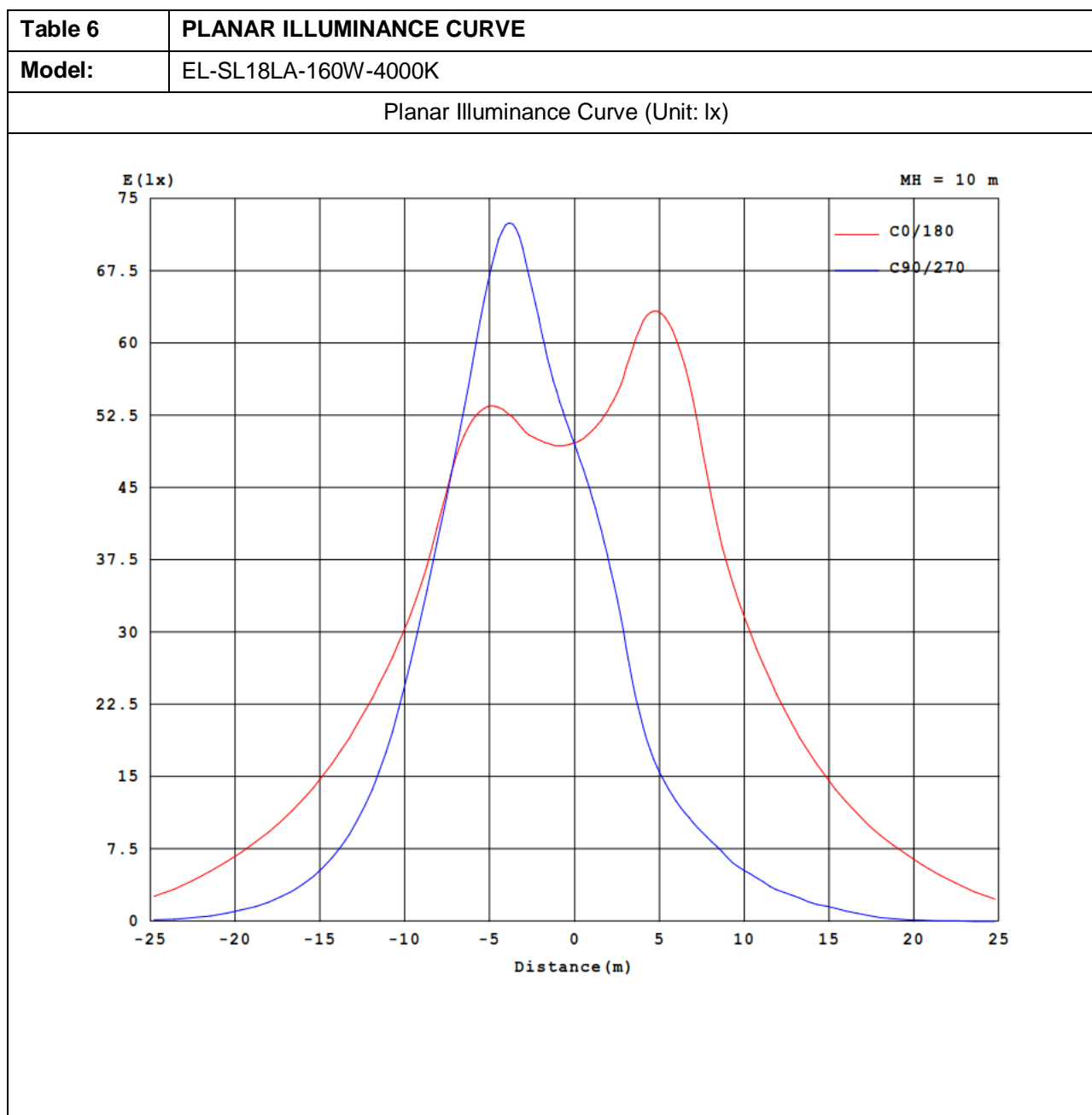
HOUSE SIDE Max @ γ = 36.0DEG STREET SIDE

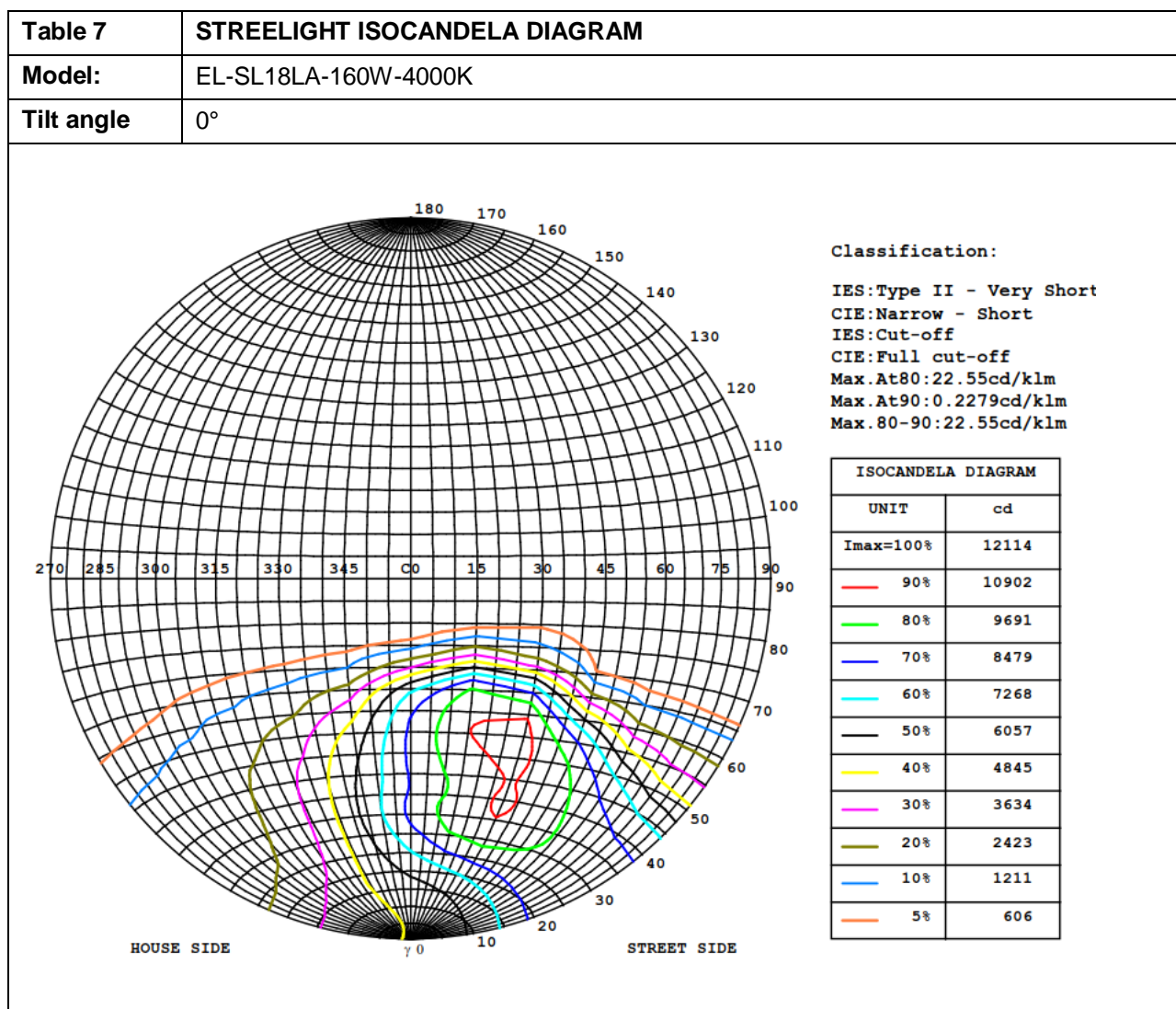
Table 4a		LUMINOUS DISTRIBUTION INTENSITY DATA (unit: cd)							
Model:		EL-SL18LA-160W-4000K							
y \ C		0	15	30	45	60	75	90	105
0		4954.78	4954.78	4954.78	4954.78	4954.78	4954.78	4954.78	4954.78
5		5462.20	5468.34	5435.41	5380.91	5310.33	5222.02	5112.67	4998.38
10		6261.78	6258.75	6166.67	6037.37	5882.09	5709.11	5481.82	5228.16
15		7442.39	7423.23	7279.80	7072.32	6849.69	6559.40	6143.07	5657.54
20		8715.10	8747.45	8720.68	8664.09	8507.73	8078.54	7279.64	6307.92
25		9339.76	9516.53	9824.97	10269.79	10427.39	9766.55	8487.16	6971.39
30		9256.91	9580.95	10213.40	11163.45	11706.79	11060.98	9419.42	7365.58
35		8847.47	9191.15	10109.02	11482.67	12097.66	11327.44	9795.70	7356.86
40		8190.54	8511.63	9708.53	11394.62	11911.93	10617.62	9166.91	6989.53
45		6911.77	7359.95	9027.11	10972.15	11517.68	10554.41	8933.11	6568.75
50		5161.98	5603.01	7682.83	10297.97	11606.33	10751.26	8870.66	6024.47
55		3498.67	3701.23	5460.04	8999.70	11537.26	10747.17	8637.67	5229.32
60		2046.84	2067.32	2946.45	6392.96	10678.18	10446.84	8019.70	4169.37
65		802.20	872.66	1107.60	3027.88	8140.16	9309.27	6495.87	2663.85
70		318.21	331.16	386.50	767.92	3746.27	5241.10	2894.87	1056.83
75		202.24	196.40	232.12	351.46	1068.90	1419.49	683.86	357.63
80		81.60	90.11	93.66	137.49	346.56	283.35	114.09	86.05
85		11.67	12.10	13.23	14.88	22.34	23.98	6.80	4.39
90		0	0	0	0	0	0	0	0
95		0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0
105		0	0	0	0	0	0	0	0
110		0	0	0	0	0	0	0	0
115		0	0	0	0	0	0	0	0
120		0	0	0	0	0	0	0	0
125		0	0	0	0	0	0	0	0
130		0	0	0	0	0	0	0	0
135		0	0	0	0	0	0	0	0
140		0	0	0	0	0	0	0	0
145		0	0	0	0	0	0	0	0
150		0	0	0	0	0	0	0	0
155		0	0	0	0	0	0	0	0
160		0	0	0	0	0	0	0	0
165		0	0	0	0	0	0	0	0
170		0	0	0	0	0	0	0	0
175		0	0	0	0	0	0	0	0
180		0	0	0	0	0	0	0	0

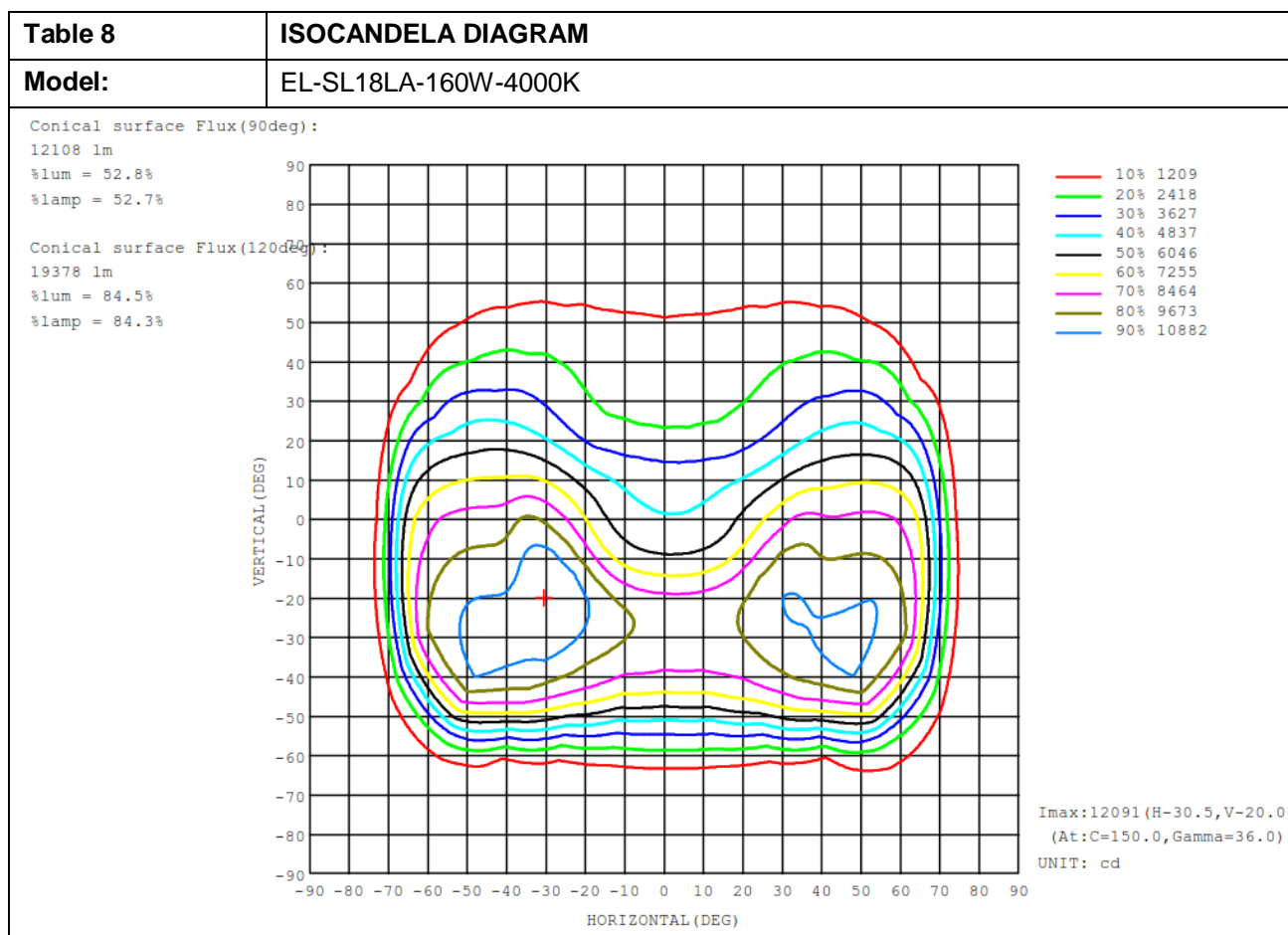
Table 4b		LUMINOUS DISTRIBUTION INTENSITY DATA (unit: cd)							
Model:		EL-SL18LA-160W-4000K							
y \ C		120	135	150	165	180	195	210	225
0		4954.78	4954.78	4954.78	4954.78	4954.78	4954.78	4954.78	4954.78
5		4882.02	4769.01	4669.36	4595.28	4552.61	4558.35	4595.41	4668.64
10		4943.39	4657.13	4397.11	4213.06	4114.35	4135.96	4257.27	4466.06
15		5092.50	4510.82	4025.95	3699.00	3551.91	3597.94	3842.49	4241.08
20		5138.51	4113.38	3384.17	2958.68	2785.72	2864.40	3199.86	3805.23
25		5128.47	3608.52	2785.43	2397.16	2265.74	2339.24	2639.06	3310.86
30		5127.01	3226.18	2419.11	2106.57	2013.83	2077.97	2327.92	2946.55
35		4996.43	3098.41	2244.41	1947.16	1868.24	1925.12	2162.97	2760.88
40		4783.73	3030.64	2144.95	1820.18	1737.93	1792.74	2053.10	2689.71
45		4406.99	2904.31	2033.24	1585.36	1502.10	1553.88	1923.97	2622.91
50		3859.49	2621.48	1797.22	1356.83	1252.44	1330.08	1708.39	2430.52
55		3187.11	2095.13	1458.05	1080.96	958.11	1066.97	1403.31	2028.78
60		2322.70	1518.00	1079.84	732.12	519.70	726.63	1060.42	1521.04
65		1473.31	997.08	647.55	197.55	118.79	202.37	655.44	1013.38
70		703.43	479.34	267.73	93.06	35.40	93.02	273.19	499.26
75		259.37	173.82	100.23	67.68	22.25	68.09	102.42	186.30
80		42.81	65.01	30.58	2.22	0.46	2.41	29.38	72.41
85		2.95	1.24	0.63	0.45	0.41	0.56	1.49	1.49
90		0	0	0	0	0	0	0	0
95		0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0
105		0	0	0	0	0	0	0	0
110		0	0	0	0	0	0	0	0
115		0	0	0	0	0	0	0	0
120		0	0	0	0	0	0	0	0
125		0	0	0	0	0	0	0	0
130		0	0	0	0	0	0	0	0
135		0	0	0	0	0	0	0	0
140		0	0	0	0	0	0	0	0
145		0	0	0	0	0	0	0	0
150		0	0	0	0	0	0	0	0
155		0	0	0	0	0	0	0	0
160		0	0	0	0	0	0	0	0
165		0	0	0	0	0	0	0	0
170		0	0	0	0	0	0	0	0
175		0	0	0	0	0	0	0	0
180		0	0	0	0	0	0	0	0

Table 4c		LUMINOUS DISTRIBUTION INTENSITY DATA (unit: cd)							
Model:		EL-SL18LA-160W-4000K							
y \ C		240	255	270	285	300	315	330	345
0		4954.78	4954.78	4954.78	4954.78	4954.78	4954.78	4954.78	4954.78
5		4763.01	4865.27	4980.39	5089.51	5192.77	5292.82	5376.53	5435.01
10		4712.44	4950.69	5194.40	5402.11	5610.87	5821.29	6019.81	6181.42
15		4716.81	5176.23	5592.57	5917.94	6269.11	6655.80	7004.05	7296.04
20		4644.42	5539.34	6288.35	6847.35	7355.91	7841.05	8276.67	8559.53
25		4470.75	5883.92	7162.54	8246.31	8876.67	9047.83	9167.53	9237.39
30		4338.12	6221.53	8069.37	9557.89	10081.88	9785.84	9372.96	9177.37
35		4261.56	6442.93	8719.68	10239.91	10827.44	10216.94	9282.84	8915.34
40		4187.16	6413.37	8615.97	10083.24	11128.36	10326.78	8965.52	8370.16
45		4021.52	6233.86	8567.96	10185.27	11006.15	10194.78	8432.48	7262.64
50		3675.23	5904.95	8715.73	10601.38	11269.05	9726.05	7258.35	5553.82
55		3141.18	5314.83	8673.24	10873.66	11325.00	8590.10	5248.23	3763.24
60		2341.89	4357.44	8285.31	10740.99	10662.85	6170.80	2951.47	2170.69
65		1546.09	2867.92	6910.57	9804.37	8398.44	2939.47	1170.55	919.26
70		774.14	1203.62	3532.19	6159.70	4272.61	699.28	400.67	341.88
75		288.19	433.43	916.79	2283.65	1414.62	354.82	236.80	213.69
80		46.19	101.85	142.65	427.02	518.49	156.95	102.00	99.58
85		3.28	5.68	7.10	39.08	52.96	20.92	15.72	12.74
90		0	0	0	0	0	0	0	0
95		0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0
105		0	0	0	0	0	0	0	0
110		0	0	0	0	0	0	0	0
115		0	0	0	0	0	0	0	0
120		0	0	0	0	0	0	0	0
125		0	0	0	0	0	0	0	0
130		0	0	0	0	0	0	0	0
135		0	0	0	0	0	0	0	0
140		0	0	0	0	0	0	0	0
145		0	0	0	0	0	0	0	0
150		0	0	0	0	0	0	0	0
155		0	0	0	0	0	0	0	0
160		0	0	0	0	0	0	0	0
165		0	0	0	0	0	0	0	0
170		0	0	0	0	0	0	0	0
175		0	0	0	0	0	0	0	0
180		0	0	0	0	0	0	0	0

Table 5		ZONAL FLUX DIAGRAM											
Model:		EL-SL18LA-160W-4000K											
γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp	
10	519.4	582.1	626.2	603.7	548.2	465.7	411.4	446.6	0- 10	487.1	487.1	2.12,2.12	
20	628.8	784.1	871.5	866.4	728.0	411.3	278.6	380.5	10- 20	1624	2111	9.2,9.2	
30	806.9	978.6	925.7	1116	941.9	322.6	201.4	294.7	20- 30	3103	5214	22.7,22.7	
40	861.6	1033	819.1	1139	916.7	303.1	173.8	269.0	30- 40	4418	9632	42,42	
50	871.6	972.6	516.2	1030	887.1	262.1	125.2	243.1	40- 50	5019	14651	63.9,63.9	
60	828.5	617.1	204.7	639.3	802.0	151.8	51.97	152.1	50- 60	4726	19378	84.5,84.5	
70	353.2	69.93	31.82	76.79	289.5	47.93	3.540	49.93	60- 70	2913	22291	97.2,97	
80	14.26	15.69	8.160	13.75	11.41	6.501	0.0463	7.241	70- 80	613.5	22904	99.9,99.9	
90	0.3560	0.2263	0.1057	0.1526	0.3680	0.2065	0.0685	0.2122	80- 90	33.84	22938	100,100	
100	0	0	0	0	0	0	0	0	90-100	0	22938	100,100	
110	0	0	0	0	0	0	0	0	100-110	0	22938	100,100	
120	0	0	0	0	0	0	0	0	110-120	0	22938	100,100	
130	0	0	0	0	0	0	0	0	120-130	0	22938	100,100	
140	0	0	0	0	0	0	0	0	130-140	0	22938	100,100	
150	0	0	0	0	0	0	0	0	140-150	0	22938	100,100	
160	0	0	0	0	0	0	0	0	150-160	0	22938	100,100	
170	0	0	0	0	0	0	0	0	160-170	0	22938	100,100	
180	0	0	0	0	0	0	0	0	170-180	0	22938	100,100	
DEG	LUMINOUS INTENSITY:×10cd Less than 25% Percent = 6.2 %									UNIT:lm			







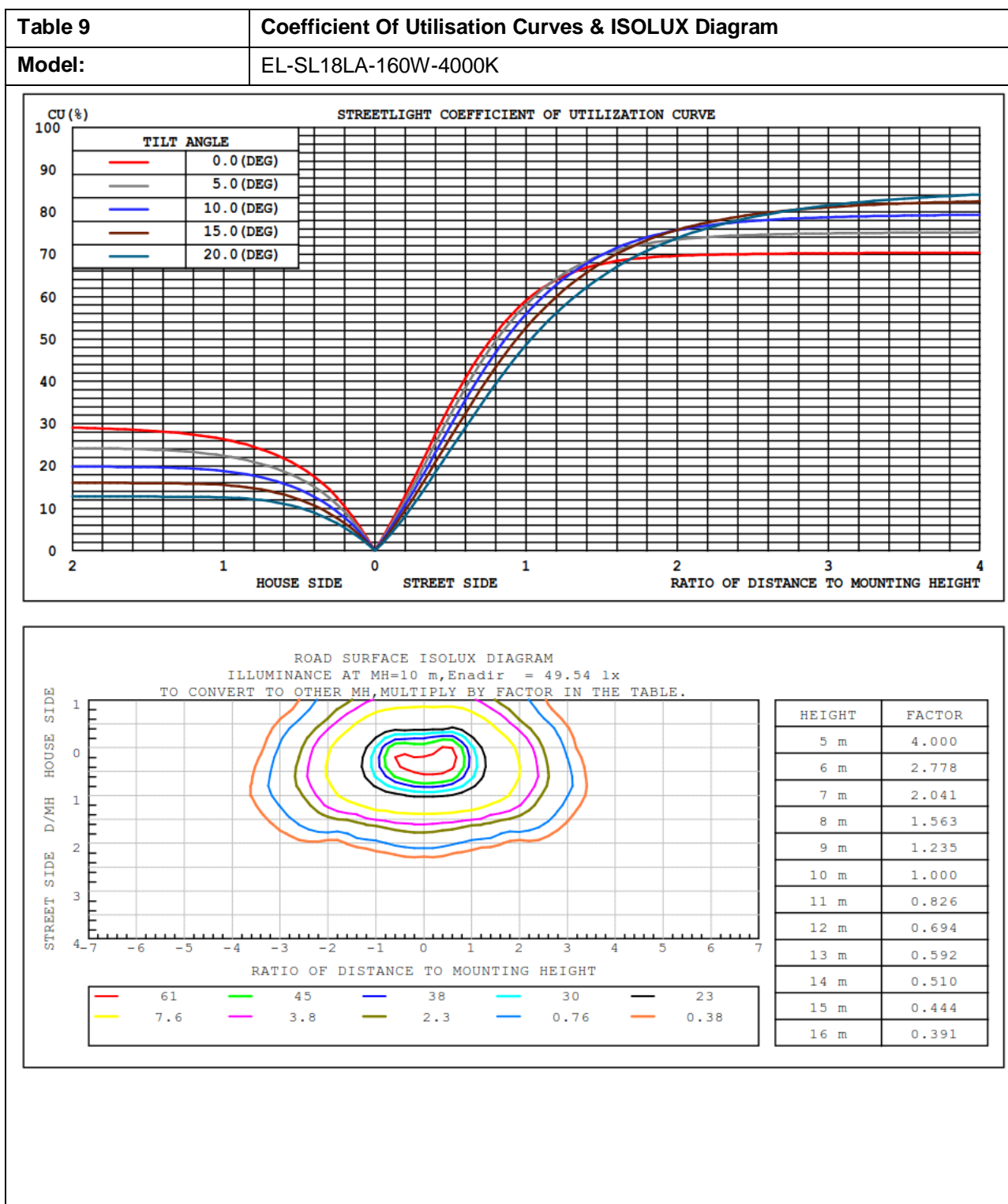
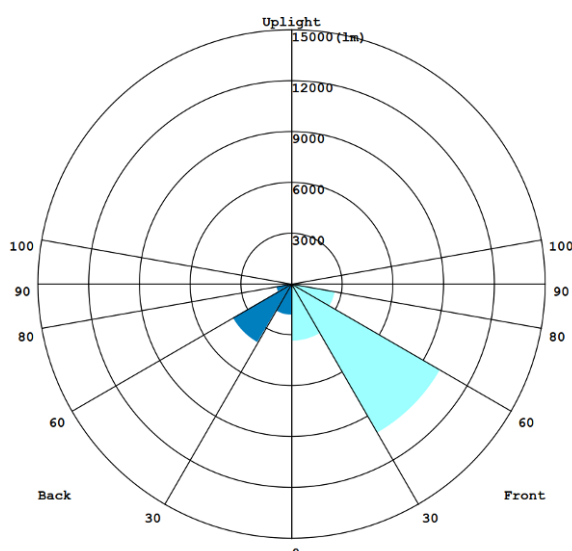


Table 10	LCS
Model:	EL-SL18LA-160W-4000K



The diagram is a circular IESNA luminaire flux distribution plot. The vertical axis is labeled 'Uplight' at the top and '0' at the bottom. The horizontal axis is labeled 'Back' on the left and 'Front' on the right. Concentric circles represent lumens, with values 3000, 6000, 9000, 12000, and 15000 (lm) marked. Radial lines indicate angles from 0 to 100 degrees. The plot shows a primary beam of light directed towards the 'Front' (right side), with a smaller beam directed towards the 'Back' (left side). The 'Uplight' area (top) shows no light distribution.

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	3379.9	14.7
FM - Front-Medium(30-60)	10156	44.3
FH - Front-High(60-80)	2618.4	11.4
FVH - Front-Very High(80-90)	28.422	0.1
Total Forward Light	16183	70.6

BL - Back-Low(0-30)	1833.7	8.0
BM - Back-Medium(30-60)	4007.7	17.5
BH - Back-High(60-80)	908.22	4.0
BVH - Back-Very High(80-90)	5.419	0.0
Total Back Light	6755.1	29.4

UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G2
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Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	16183	0	16183
Street Side	6755	0	6755.1

Attachment 1: Equipment List

No.	Type	Manufacture	Model	Equipment ID	Next Calibration
1	Full-field Speed Goniophotometer	Everfine	GO-R5000	S1207714-YQ	May. 18.2019
2	High-accuracy Digital Photometer Head	Everfine	ID-1000_P-B/ID-1000_P-C	S1207714a-YQ	May. 18.2019
3	High-accuracy Digital Photometer Head	Everfine	ID-1000_P-B/ID-1000_P-C	S1207714b-YQ	May. 18.2019
4	High Accuracy Array Spectroradio Meter	Labsphere	CDS-600	S1312826-YQ	May. 18.2019
5	Standard Light Source	Everfine	D908	S1207714d-YQ	May. 18.2019
6	Digital Power Meter	Yokogawa	WT310	S1310805-YQ	May. 18.2019
7	Digital CC & CV DC Power Supply	Everfine	WY12010	S1207714f-YQ	May. 18.2019
8	Intelligent AC Power Source	Everfine	DPS1060	S1207714g-YQ	May. 18.2019
10	DC Power Supply	Everfine	WY3010	S1108624-YQ	May. 18.2019
11	Flux Reference Lamp	Labsphere	SCL-1400	S1602991-YQ	May. 18.2019
12	luminance Source	Everfine	SLS-150	S1108626-YQ	May. 18.2019
13	Thermometer	Fluke	Fluke 52-II	S0712414-YQ	May. 18.2019

-- END OF TEST REPORT --