
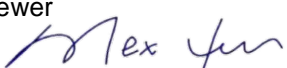


<b>Prüfbericht</b> Test report			<b>Auftragsnr. / order no.:</b> 244268555 <b>Berichtsnr. / report no.:</b> 60397064 001		
<b>Auftraggeber</b> client:			<b>Auftragsdatum /</b> date of order: 23.09.2020		
<b>NISKO GROUP LTD.</b> 41 HAMAAYAN MODI'IN, Israel.			<b>AG-Referenz-Nr. /</b> client reference no.: -		
<b>Inhalt des Auftrags</b> content of order:			Electrical and Photometric Measurement to LM-79-08		
<b>Prüfgrundlagen</b> test specifications:			IES LM-79-08		
<b>Prüfgegenstand</b> test item:			LED Street Light		
<b>Bezeichnung</b> identification:			EL-SL18LA-160W CLASS I T2STF 4000K		
<b>Eingang Prüfgegenstand</b> receipt of test item:			23.09.2020		
<b>Prüfgegenstands-Nr.</b> test item no.:			A002073542-016		
<b>Prüfzeitraum und -ort</b> period of test and location:			23.09.2020-28.08.2020, Shanghai Xingshang Photoelectric technology Co., Ltd		
<b>Prüflaboratorium</b> testing laboratory:			TÜV Rheinland (Shanghai) Co., Ltd.		
<b>Prüfergebnis</b> test result *):			N/A		
<b>Sonstiges / other aspects:</b>			Tests at client's request and there is only test data available in this report and no further ratings for test result. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government..		
<b>geprüft / tested by:</b>			<b>kontrolliert / reviewed by:</b>		
06.11.2020 Fernando Dai /PE			06.11.2020 Alex Yan /Reviewer		
					
<b>Datum</b> Date	<b>Name/Stellung</b> Name/Position	<b>Unterschrift</b> Signature	<b>Datum</b> Date	<b>Name/Stellung</b> Name/Position	<b>Unterschrift</b> Signature
<p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> Dieser Prüfbericht wird neben der Dokumentation der Einzelergebnisse durch eine Bewertung des Produktes ergänzt. Diese Bewertung stützt sich nicht in jedem Fall auf ein durchgängiges Punkte- oder Bewertungssystem, wohl aber auf die Erfahrung der Experten des TÜV Rheinland. Die Bewertung ist keine rechtsverbindliche Interpretation der Mängelfreiheit eines Produktes.</p> <p><b>This test report relates to the a. m. test sample. Without permission of the testing laboratory this report is not permitted to be duplicated in extracts.</b> This test report does not entitle to carry any safety or other mark on this product. Besides single test results this test report contains an assessment of the product. This assessment is not always based on a continuous rating system, but on experience of the experts of TÜV Rheinland Group. This assessment is not a legally binding interpretation of the flawlessness of the product.</p>					

**General Remarks:**

Factory: NINGBO SKYZON ENERGY CO., LTD  
Address: No.19, Ke San Road, Ninghai 315600, Ningbo China

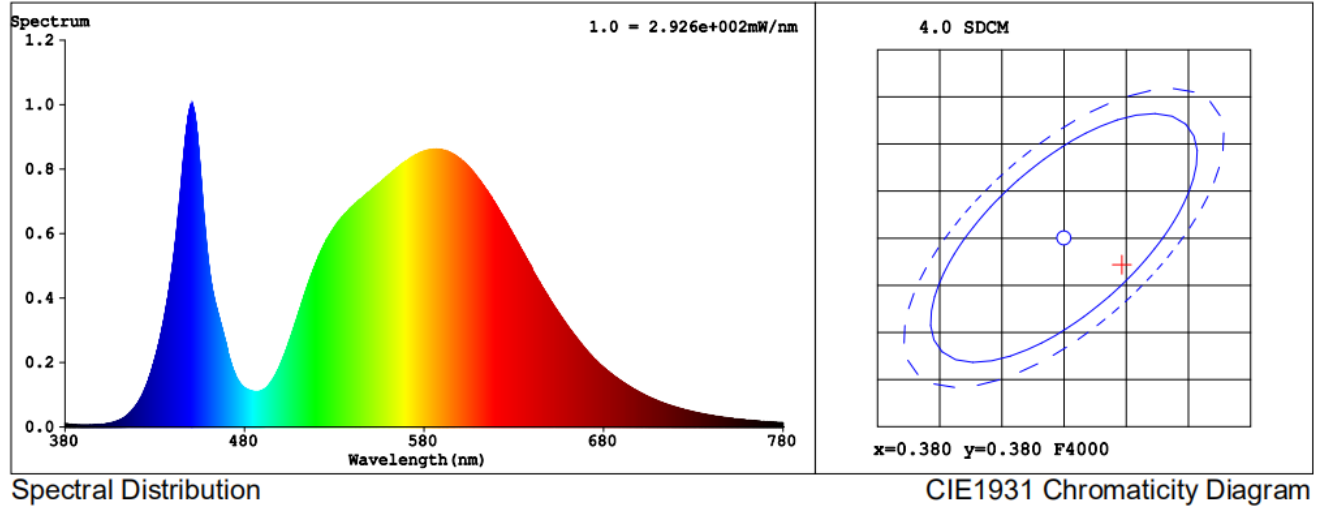
**Product Information**

Model name	Sample number	Rated voltage, frequency (V, Hz)	Nominal CCT (K)	Rated Wattage (W)	Type of LED Chip
EL-SL18LA-160W CLASS I T2STF 4000K	A002073542-016	200-240Vac, 50/60Hz	4000K	160W	LUMILEDS LUXEON 5050- L15040705006000 00 18S2P 2MODULE

<b>Test conditions:</b>	
<b>Number of hours operated prior to measurement</b>	<b><u>0</u> hours</b>
<b>Total operating time of the product for measurements including stabilization</b>	<b><u>2</u> hours and <u>30</u> minutes</b>
<b>Ambient</b>	<b>25 °C</b>
<b>Orientation</b>	<b>As normal use</b>
<b>Stabilization time</b>	<b><u>90</u> minutes</b>
<b>Test method</b>	<b>Type C Gonio-photometer with moving mirror was used for photometric measurement (C- <math>\gamma</math> system)</b>
<b>Designation and type of reference standard lamp</b>	<b>For standard luminous flux lamp</b> <b>Current: 1.389A</b> <b>Reference luminous flux: 4310 lm</b> <b>Lamp type: Filament lamp</b> <b>Intensity distribution type: Omni-directional</b>
	<b>For standard luminous intensity lamp:</b> <b>Current: 9.6217A</b> <b>Reference luminous intensity: 571.9 cd</b> <b>Lamp type: Tungsten halogen lamp</b> <b>Intensity distribution type: Omni-directional</b>
<b>Correction factor applied</b>	<b>N/A</b>
<b>Photometric distance</b>	<b>3.0m for photometric measurement</b>
	<b>8.98m for luminous intensity measurement</b>

<b>Measured Results</b>	
	EL-SL18LA-160W CLASS I T2STF 4000K
<b>Total luminous flux (lm)</b>	23139
<b>Input wattage (W)</b>	158.98
<b>Input current (A)</b>	0.7299
<b>Frequency (Hz)</b>	50
<b>Power factor</b>	0.9905
<b>Efficacy (Lm/W)</b>	145.55
<b>CCT (K)</b>	3890
<b>Chromaticity x</b>	0.3846
<b>Chromaticity y</b>	0.3772
<b>Chromaticity u'</b>	0.2277
<b>Chromaticity v'</b>	0.5024
<b>CRI</b>	73.6
<b>R9</b>	0
<b>Du'v' (Max.)</b>	-0.00101
<b>THDI(%)</b>	4.672
<b>LCS BUG Rating</b>	B3-U0-G2, Full cut-off

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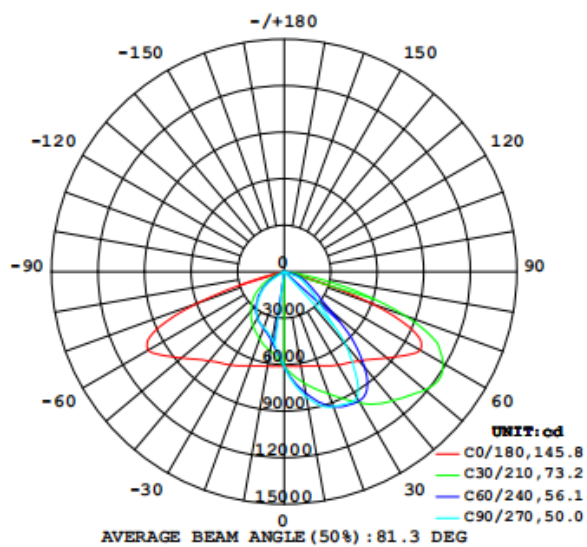
**Spectral power distribution: (Clause 10 of LM-79)**
**EL-SL18LA-160W CLASS I T2STF 4000K**

**Dominant WL: 580.0nm**  
**Peak WL: 451nm**
**Luminous Intensity Distribution, Ambient temperature: 25°C (Clause 10 of LM-79)**

Description	Data
<b>Model</b>	EL-SL18LA-160W CLASS I T2STF 4000K
<b>Test voltage (V)</b>	220VAC
<b>Test current (A)</b>	0.7299
<b>Test wattage (W)</b>	158.98
<b>Frequency (Hz)</b>	50
<b>Power factor</b>	0.9905
<b>Central luminous intensity (cd)</b>	6104
<b>Max. luminous intensity(cd)</b>	14698.25 (C=70,Gamma=63)

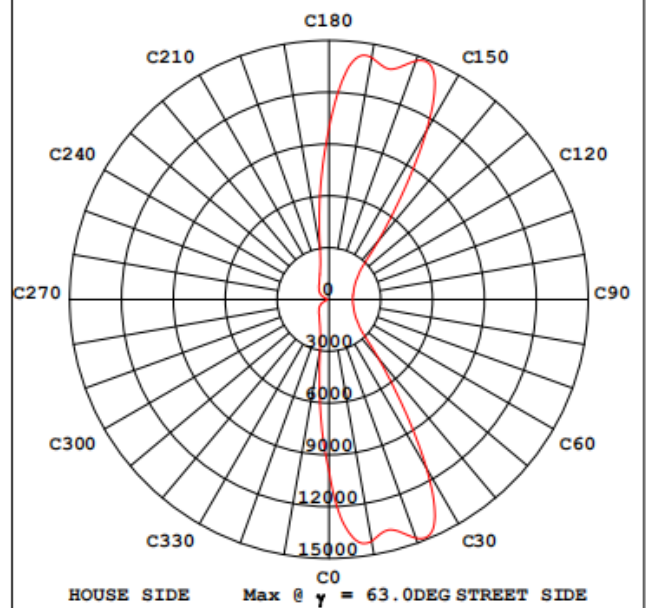
**For the distribution curve see next page.**
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DATA OF LAMP		PHOTOMETRIC DATA				Eff: 145.55 lm/W
MODEL	EL-SL18LA	I <sub>max</sub> (cd)	14698.25	η street_up (%)	0.0	
NOMINAL POWER (W)	160	LOR (%)	100.0	η street_down (%)	73.4	
RATED VOLTAGE (V)	220-240	TOTAL FLUX (lm)	23139	η house_up (%)	0.0	
NOMINAL FLUX (lm)	23139.3	MAXIMUM @ (C, γ )	70, 63.0	η house_down (%)	26.6	
LAMPS INSIDE	1	η up (%)	0.0	76 FLASHAREA (m2)	0.05000	
TEST VOLTAGE (V)	220	η down (%)	100.0	SLI	21.323	

**INTENSITY DISTRIBUTION DIAGRAM  
IN C PLANS**



**MAX INTENSITY CONE SURFACE  
DISTRIBUTION DIAGRAM**



**Zonal Lumen Summary and Percentages****Zonal Lumen Summary**

Zone	Lumens	%Lamp	%Fixt
0-20	2408.85	10.40	10.40
0-30	5485.26	23.70	23.70
0-40	9564.3	41.30	41.30
0-60	18103.74	78.20	78.20
0-80	23049.71	99.60	99.60
0-90	23139.32	100.00	100.00
10-90	22548.57	97.40	97.40
20-40	7155.45	30.90	30.90
20-50	11499.01	49.70	49.70
40-70	12079.35	52.20	52.20
60-80	4945.95	21.40	21.40
70-80	1406.04	6.10	6.10
80-90	89.63	0.40	0.40
90-110	0.00	0.00	0.00
90-120	0.00	0.00	0.00
90-130	0.00	0.00	0.00
90-150	0.00	0.00	0.00
90-180	0.00	0.00	0.00
110-180	0.00	0.00	0.00
0-180	23139.32	100.00	100.00

Total Luminaire Efficiency = 100.00%



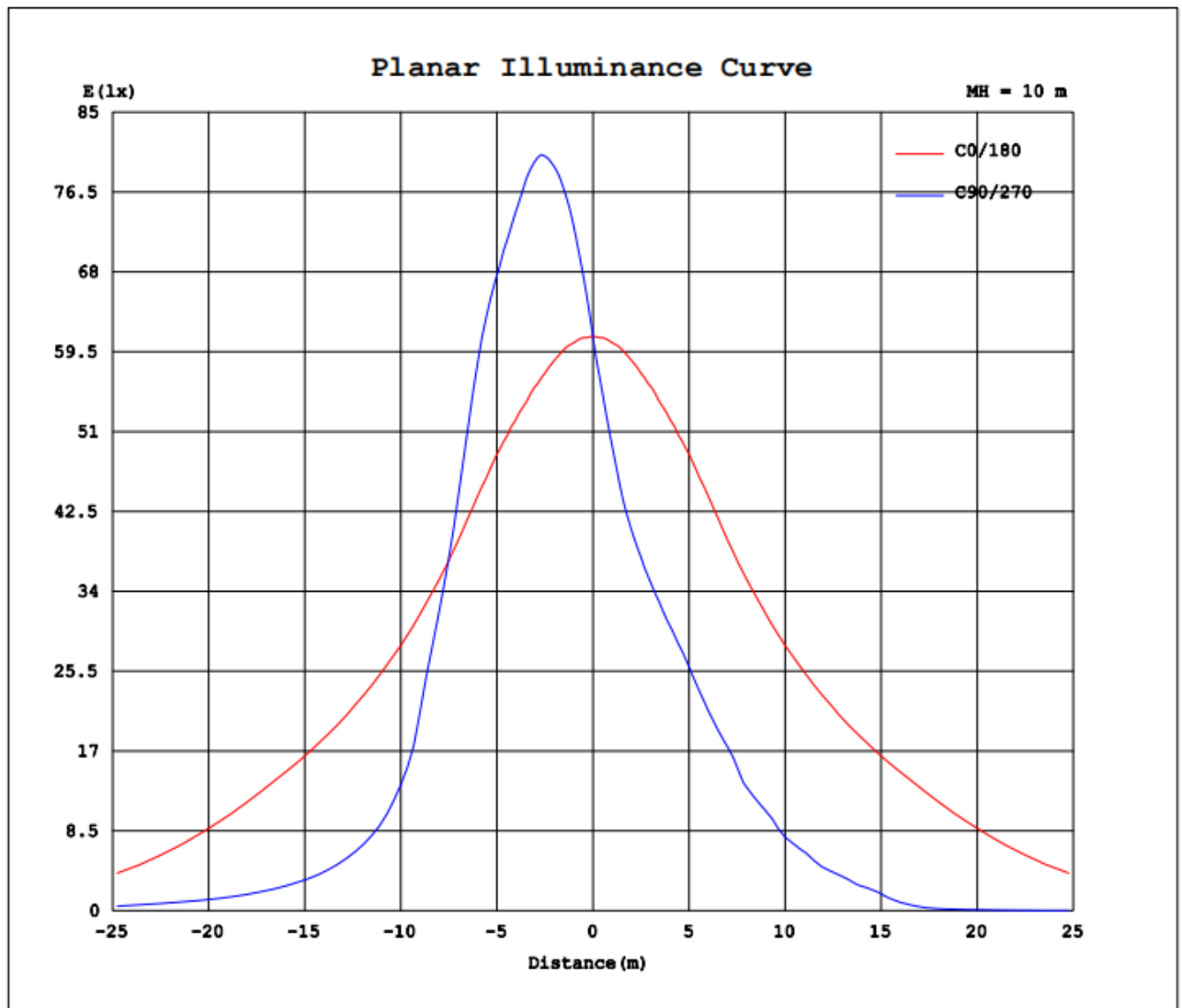
## Prüfbericht Nr. / Test report no. 60397064 001

## Luminous Intensity Distribution Data

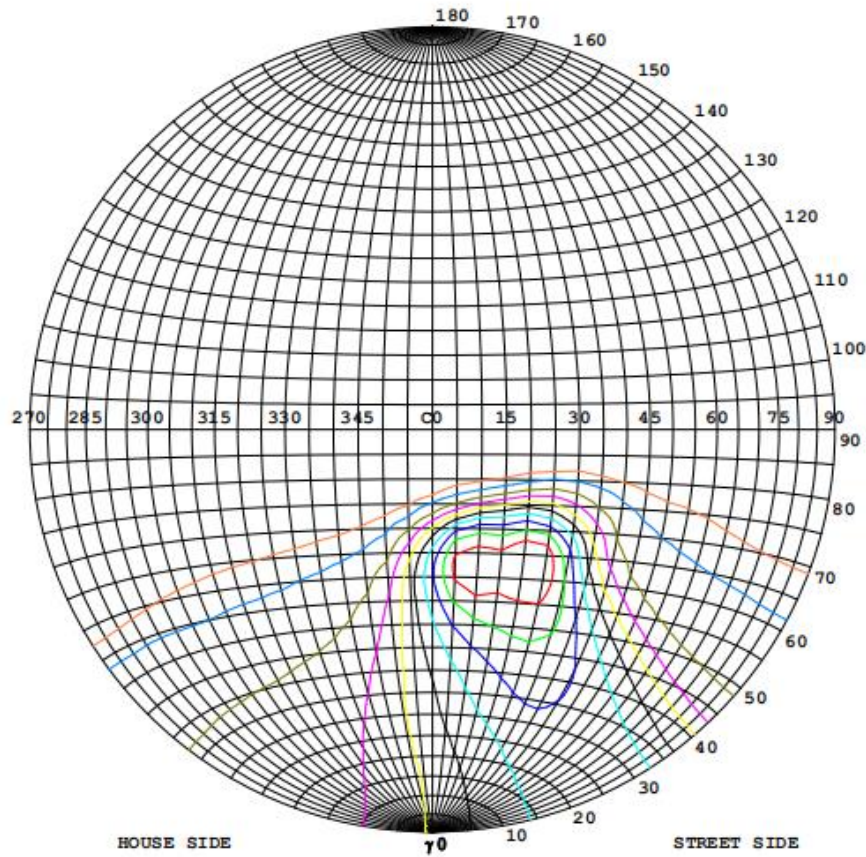
Total View EL-S18LA 160W CLASS I T25TF 400																								
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Tool_View EL-S184L 160W CLASS 1 T2STF 4000J.EES																					
Keywords				Candela				20				30									
Vertical Angles		Horizontal Angles		Multiplier=1	Max. Cand.																
255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360
42	4595.60	5491.49	6525.18	7688.55	8781.29	9614.63	10251.83	10760.72	11045.90	11046.21	10783.19	10321.28	9678.70	8152.84	7373.67	6727.98	6191.50	5776.13	5441.78	5211.25	5136.13
43	4506.57	5447.94	6552.49	7776.37	8941.79	9802.75	10433.50	10918.62	11163.34	11046.21	10831.08	10274.14	9520.13	8058.39	7304.31	7015.80	6325.11	5756.80	5254.49	4817.28	4567.34
44	4413.26	5396.77	6561.91	7879.29	9108.64	9983.54	10666.19	11075.68	11341.36	11236.67	10847.31	10254.89	9351.72	8402.98	7459.62	6645.56	5913.82	5252.96	4656.02	4178.56	4118.92
45	4324.36	5348.70	6580.10	7989.90	9279.00	10191.60	10778.17	11236.20	11443.60	11330.13	10846.22	10092.52	9131.49	8089.45	7153.12	6360.86	5428.22	4705.97	4175.97	3892.61	3805.39
46	4228.92	5289.89	6606.71	8120.40	9452.65	10404.78	10973.44	11411.73	11598.08	11420.20	10861.66	9975.18	8864.82	7766.28	6760.40	5824.90	4888.97	4212.56	3816.00	3631.31	3532.02
47	4124.86	5225.63	6625.79	8247.63	9665.92	10638.56	11181.75	11566.32	11738.08	11522.63	10864.82	9831.22	8601.59	7441.75	6362.20	5311.16	4418.15	3804.56	3525.47	3343.70	3272.06
48	4025.30	5126.73	6645.99	8367.27	9807.22	10781.73	11330.75	11751.03	11892.29	11638.38	10865.55	9803.20	8387.78	7084.76	5972.72	4788.96	3952.21	3212.32	3072.37	3055.49	3002.42
49	3914.20	5017.23	6665.99	8507.99	10034.49	11132.71	11581.96	11930.64	12066.57	11829.68	10862.03	9368.73	7868.78	6708.20	5424.68	4341.94	3586.43	3267.23	3098.24	2931.44	2863.46
50	3812.77	5103.20	6686.07	8657.99	10388.91	11413.37	11891.91	12101.24	12246.72	11875.39	10749.93	9162.82	7627.98	6299.87	4912.31	3891.19	3336.47	3046.75	2876.64	2760.25	2700.00
51	3692.23	4966.45	6709.70	8822.56	10631.39	11684.76	12129.71	12271.61	12361.71	11957.83	10608.97	8955.74	7291.72	5915.07	4481.82	3530.06	3105.93	2857.17	2706.80	2600.07	2548.23
52	3582.86	4862.11	6709.05	8962.53	10899.68	11944.64	12217.28	12449.48	12566.18	12057.87	10481.23	8650.56	6925.96	5311.80	4047.17	3260.03	2906.14	2632.73	2561.96	2464.96	2420.77
53	3471.43	4783.29	6714.25	9107.33	11219.55	12240.59	12540.52	12670.81	12782.19	12092.69	10290.05	8238.53	6120.88	4655.82	3624.47	3037.65	2734.33	2543.26	2420.51	2330.55	2296.66
54	3361.13	4683.13	6736.97	9277.23	11532.91	12570.47	12684.61	12875.27	13005.96	12139.93	10081.17	7913.21	6035.40	4439.07	3242.13	2847.56	2580.96	2400.14	2296.51	2232.92	2175.86
55	3206.36	4575.77	6746.96	9450.45	11880.84	12884.92	12891.21	13123.13	13212.94	12169.97	9823.30	7587.01	5818.14	4019.95	3085.03	2681.52	2437.27	2278.62	2173.33	2102.52	2061.32
56	3065.23	4451.73	6746.96	9640.46	12241.95	13175.48	13074.23	13341.25	13432.59	12143.94	9560.33	7205.04	5089.41	3607.74	2874.07	2526.45	2303.14	2165.05	2063.68	1991.59	1956.86
57	2908.09	4316.64	6808.31	9761.80	12597.91	13468.92	13238.42	13560.73	13649.18	12112.25	9308.55	6789.31	4747.29	3297.61	2695.40	2385.74	2178.68	2053.29	1967.80	1897.53	1864.41
58	2764.26	4161.32	6815.08	9924.78	12899.99	13724.72	13425.08	13813.98	13857.31	12035.00	9049.56	6295.05	4371.50	3047.17	2534.84	2252.00	2067.78	1948.34	1875.22	1810.05	1784.07
59	2611.45	4006.96	6773.96	10055.38	13145.51	13968.77	13604.20	14057.21	14069.90	11944.84	8781.28	5826.74	3947.12	2842.42	2385.09	2135.47	1962.32	1858.53	1787.16	1726.05	1699.99
60	2457.08	3814.60	6653.29	10103.60	13348.30	14103.57	13690.48	14262.98	14242.91	11822.77	8477.33	5471.37	3560.96	2667.29	2285.09	2025.71	1875.25	1773.69	1704.19	1648.14	1618.98
61	2313.19	3567.75	6521.43	10108.57	13507.35	14245.68	13809.83	14487.17	14345.56	11655.47	8116.73	5144.28	3328.01	2509.23	2143.42	1924.37	1781.23	1694.24	1623.81	1565.88	1534.26
62	2152.22	3329.62	6314.62	10020.37	13584.91	14283.47	13871.02	14601.33	14414.77	11495.23	7690.42	4538.27	3002.77	2368.40	2033.50	1828.58	1694.80	1614.01	1544.43	1484.81	1454.89
63	1970.21	3030.36	6045.79	9900.90	13575.33	14217.13	13870.20	14588.29	14400.51	11286.91	7267.70	4482.00	2806.69	2233.94	1918.90	1741.08	1609.47	1529.16	1466.59	1412.73	1383.34
64	1794.29	2753.37	5763.97	9664.27	13403.05	14026.10	13630.44	14648.13	14261.32	11111.16	6927.70	4115.20	2650.62	2111.48	1819.41	1653.07	1524.49	1450.59	1395.00	1341.54	1310.71
65	1611.26	2476.14	5362.99	9300.13	13115.10	13722.18	13419.83	14441.70	14053.93	10877.32	6646.67	3797.56	2498.96	1992.96	1726.14	1570.54	1447.83	1370.53	1324.24	1270.37	1237.03
66	1446.82	2185.99	4925.81	8880.16	12765.07	13406.73	13149.73	14101.38	13697.99	10471.30	6381.24	3508.85	2352.73	1885.09	1637.39	1486.93	1373.22	1296.22	1252.25	1201.06	1171.01
67	1278.04	1912.26	4408.70	8272.88	12253.36	12949.95	12747.49	13658.55	13326.84	10016.14	6131.46	3300.08	2217.70	1783.93	1549.25	1405.26	1300.94	1221.40	1174.75	1123.93	1091.92
68	1108.37	1672.62	3887.63	7635.85	11599.22	12429.83	12182.47	13142.52	12572.90	9493.48	5865.55	3012.66	2097.68	1667.62	1463.97	1327.13	1226.49	1142.44	1075.14	1022.10	994.90
69	936.14	1435.63	3316.68	6987.78	10774.06	11834.64	11545.56	12430.33	11874.50	8918.54	5519.23	2941.68	1975.43	1584.12	1378.19	1241.05	1132.18	1037.34	933.80	826.75	795.90
70	793.72	1208.29	2697.06	6382.78	9806.63	11077.34	10918.88	11735.51	11073.35	8289.47	5144.03	2792.06	1871.60	1475.33	1286.32	1137.33	1033.69	912.64	774.34	644.67	566.56
71	677.70	1018.96	2133.16	5398.93	8657.89	10200.56	10170.95	11004.95	10169.08	7594.71	4720.73	2609.64	1756.38	1376.83	1166.93	1042.09	929.05	774.46	617.40	487.76	419.40
72	558.85	860.28	1607.28	4339.65	7201.06	9123.35	9296.26	10126.30	9252.63	6898.56	4263.28	2425.76	1522.12	1253.54	1063.81	958.61	808.46	646.89	483.93	380.24	335.65
73	450.54	731.51	1204.53	2963.20	5659.51	7731.54	8317.99	9078.17	8277.64	6101.05	3804.68	2221.81	1470.12	1150.24	985.28	854.86	701.79	527.35	386.81	302.36	300.63
74	371.69	630.65	948.70	2710.63	4795.63	6779.88	7367.98	8047.48	7297.64	5727.03	3739.92	1998.81	1277.49	1041.45	979.65	787.91	617.94	473.76	341.49	267.96	279.91





## STREETLIGHT ISOCANDELA DIAGRAM

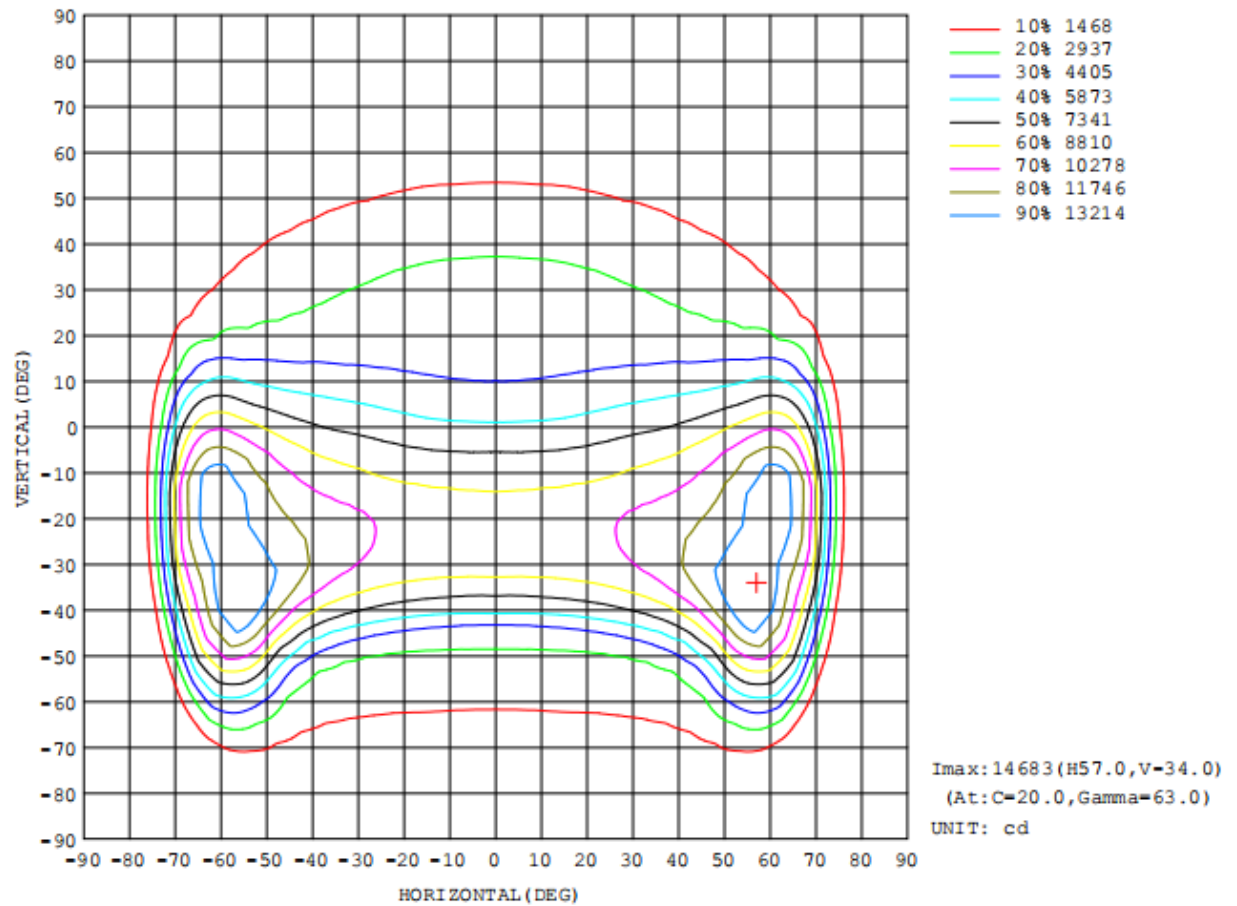


Classification:

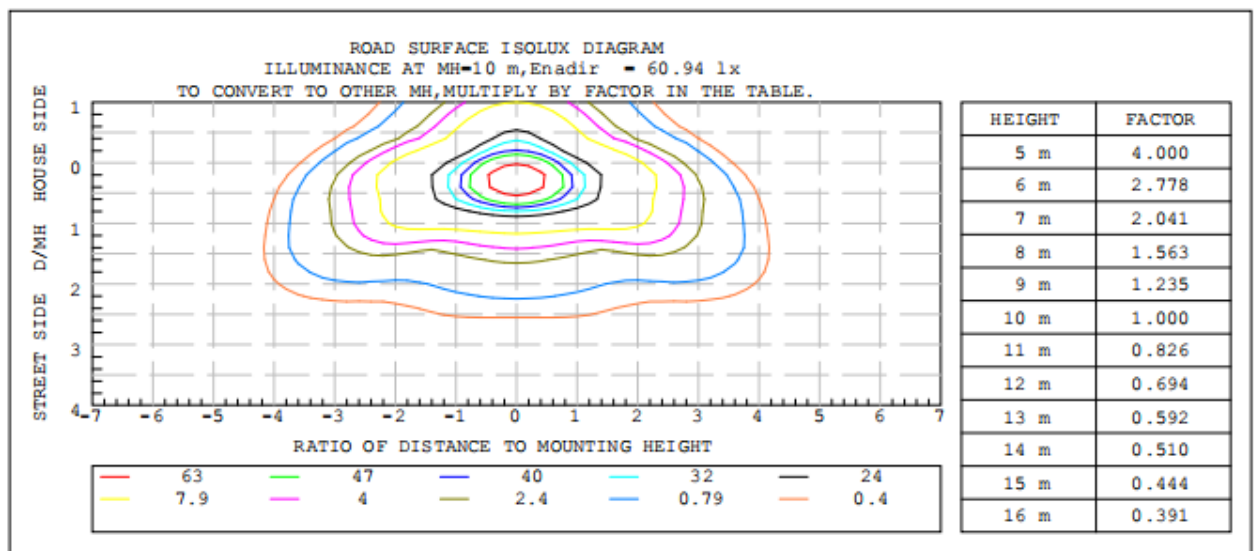
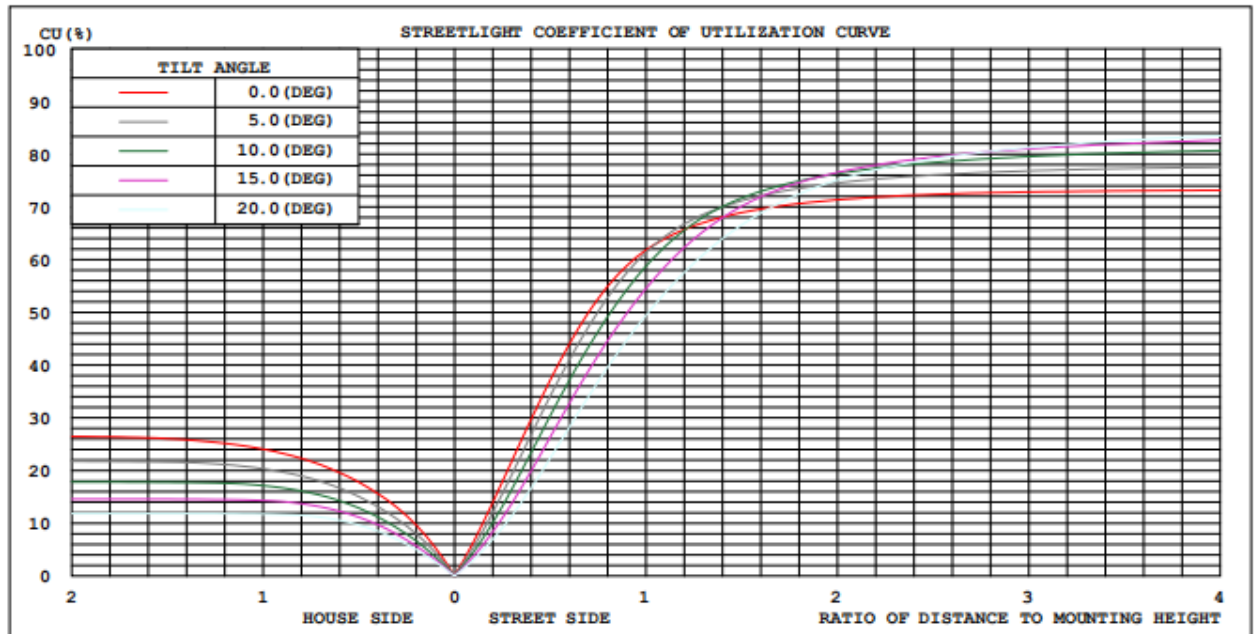
IES: Type II - Short  
 CIE: Narrow - Intermediate  
 IES: Full cut-off  
 CIE: Semi-cut-off  
 Max. At 80: 67.71cd/klm  
 Max. At 90: 0cd/klm  
 Max. 80-90: 67.71cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	14698
90%	13228
80%	11759
70%	10289
60%	8819
50%	7349
40%	5879
30%	4409
20%	2940
10%	1470
5%	735

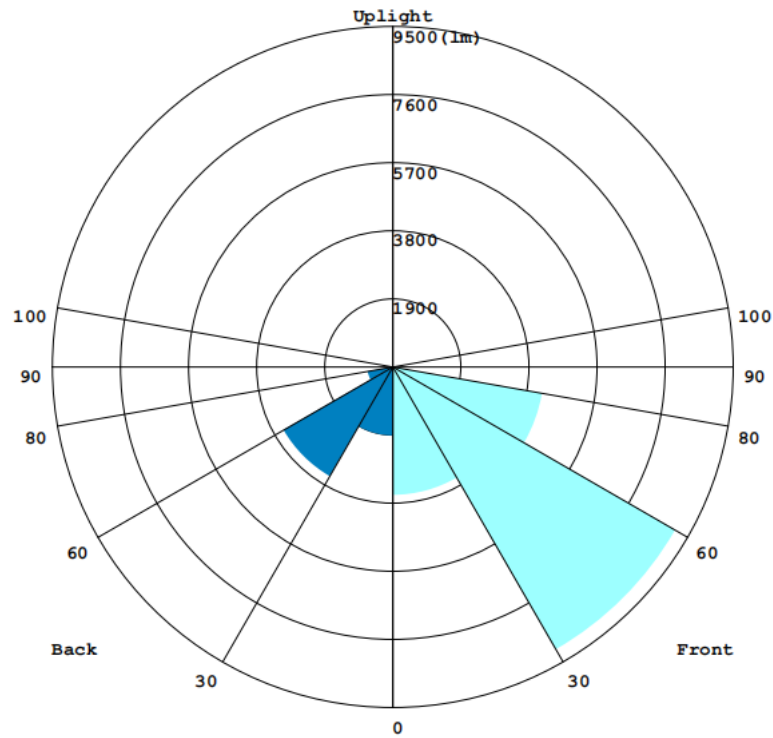
## ISOCANDELA DIAGRAM



### COEFFICIENT OF UTILIZATION CURVE AND ISOLUX DIAGRAM



## LCS REPORT



**IESNA Luminaire Flux Distribution Table:**

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	3569.3	15.4
FM - Front-Medium(30-60)	9099.5	39.3
FH - Front-High(60-80)	4232.5	18.3
FVH - Front-Very High(80-90)	85.118	0.4
Total Forward Light	16986	73.4

BL - Back-Low(0-30)	1915.9	8.3
BM - Back-Medium(30-60)	3518.9	15.2
BH - Back-High(60-80)	713.45	3.1
BVH - Back-Very High(80-90)	4.5132	0.0
Total Back Light	6152.9	26.6

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
----------------------------	----------

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	6152.9	0	6152.9
Street Side	16986	0	16986

**Photo**



**overview**



**Back-side**

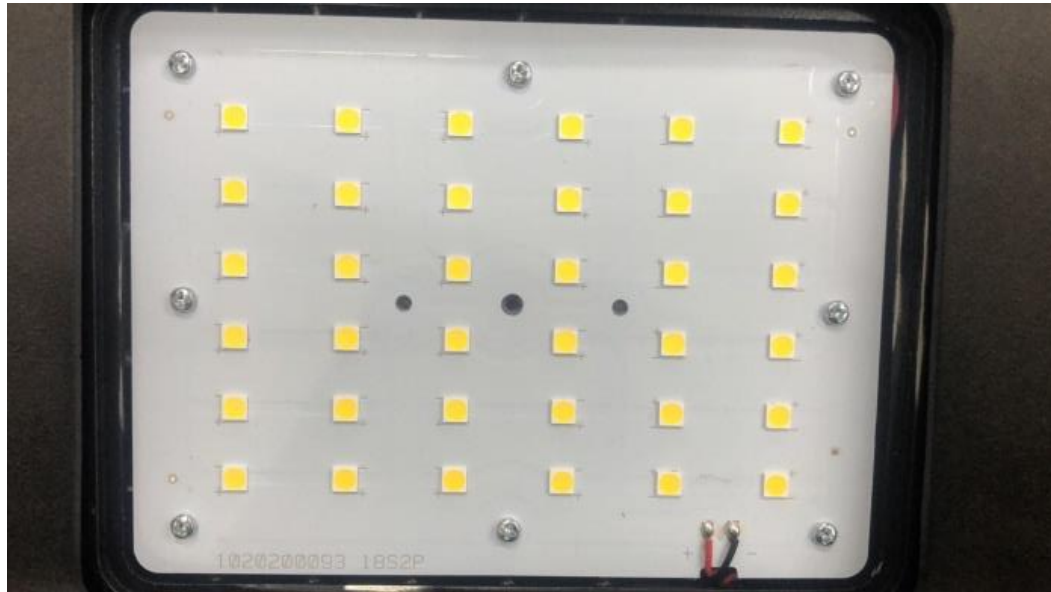




LED Driver + SPD



Optical lens



**LED module**

United States Department of Commerce  
National Institute of Standards and Technology



## Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 201063-0

**TUV Rheinland (Shanghai) Co., Ltd**  
Jing'An District, Shanghai  
China

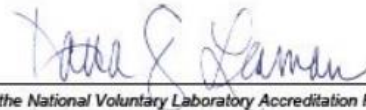
*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

### Energy Efficient Lighting Products

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2020-06-09 through 2021-06-30  
Effective Dates



  
For the National Voluntary Laboratory Accreditation Program