

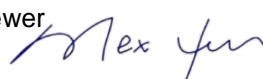


<b>Prüfbericht</b> <i>Test report</i>		<b>Auftragsnr. / order no.:</b> 244268555 <b>Berichtsnr. / report no.:</b> 60397063 001	
<b>Auftraggeber</b> <i>client:</i>		<b>Auftragsdatum /</b> <i>date of order:</i> 23.09.2020	
<b>NISKO GROUP LTD.</b> 41 HAMAAYAN MODI'IN, Israel.		<b>AG-Referenz-Nr. /</b> <i>client reference no.:</i> -	
<b>Inhalt des Auftrags</b> <i>content of order:</i>		Electrical and Photometric Measurement to LM-79-08	
<b>Prüfgrundlagen</b> <i>test specifications:</i>		IES LM-79-08	
<b>Prüfgegenstand</b> <i>test item:</i>		LED Street Light	
<b>EAN-Nr. / no.:</b>		N/A	
<b>Bezeichnung</b> <i>identification:</i>	EL-SL18LA-160W CLASS I T2STF 3000K		
<b>Eingang Prüfgegenstand</b> <i>receipt of test item:</i>	23.09.2020		
<b>Prüfgegenstands-Nr.</b> <i>test item no.:</i>	A002073542-015		
<b>Prüfzeitraum und -ort</b> <i>period of test and location:</i>	14.09.2020-28.08.2020, Shanghai Xingshang Photoelectric technology Co., Ltd		
<b>Prüflaboratorium</b> <i>testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.		
<b>Prüfergebnis</b> <i>test result *):</i>	<div style="border: 1px solid black; padding: 5px; text-align: center;">N/A</div>		
<b>Sonstiges / other aspects:</b>		<i>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..</i>	
<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> <i>Date</i>	<b>Name/Stellung</b> <i>Name/Position</i>	<b>Unterschrift</b> <i>Signature</i>	<b>Datum</b> <i>Date</i>
<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 3000K	A002073542-015	200-240Vac, 50/60Hz	3000K	160W	LUMILEDS LUXEON 5050- L15030705006000 00 18S2P 2MODULE

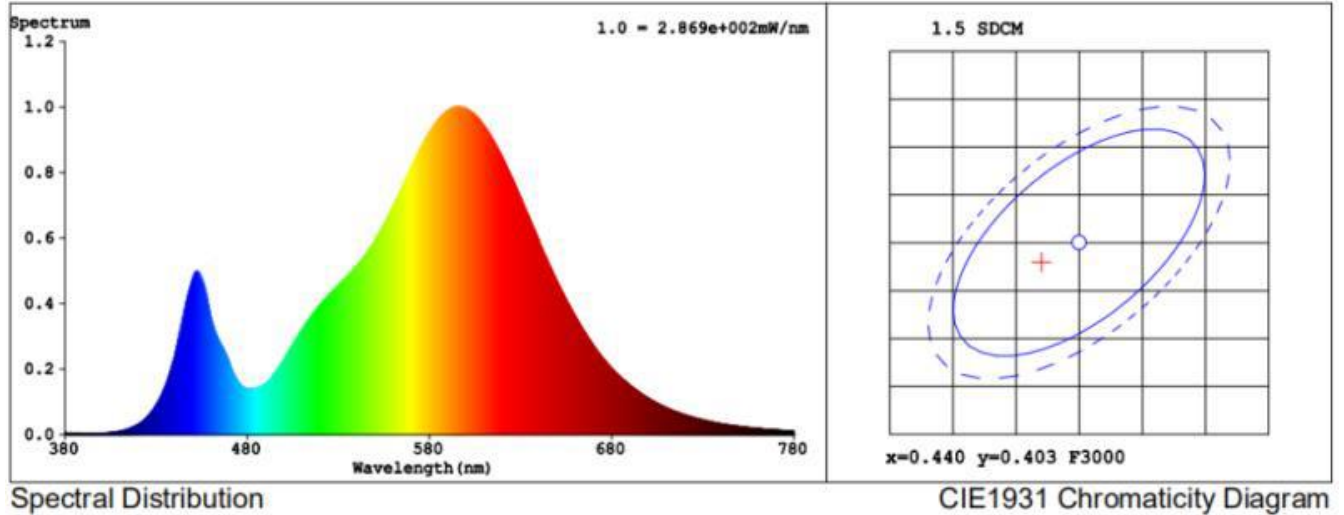
<b>Test conditions:</b>	
<b>Number of hours operated prior to measurement</b>	<b><u>0</u> hours</b>
<b>Total operating time of the product for measurements including stabilization</b>	<b><u>2</u> hours and <u>30</u> minutes</b>
<b>Ambient</b>	<b>25 °C</b>
<b>Orientation</b>	<b>As normal use</b>
<b>Stabilization 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 3000K
<b>Total luminous flux (lm)</b>	22699
<b>Input wattage (W)</b>	156.36
<b>Input current (A)</b>	0.7172
<b>Frequency (Hz)</b>	50
<b>Power factor</b>	0.9914
<b>Efficacy (Lm/W)</b>	145.17
<b>CCT (K)</b>	2973
<b>Chromaticity x</b>	0.4370
<b>Chromaticity y</b>	0.4010
<b>Chromaticity u'</b>	0.2520
<b>Chromaticity v'</b>	0.5202
<b>CRI</b>	74.1
<b>R9</b>	0
<b>Du'v' (Max.)</b>	-0.00125
<b>THDI(%)</b>	4.126
<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 3000K



**Dominant WL: 583.4nm**  
**Peak WL: 596nm**

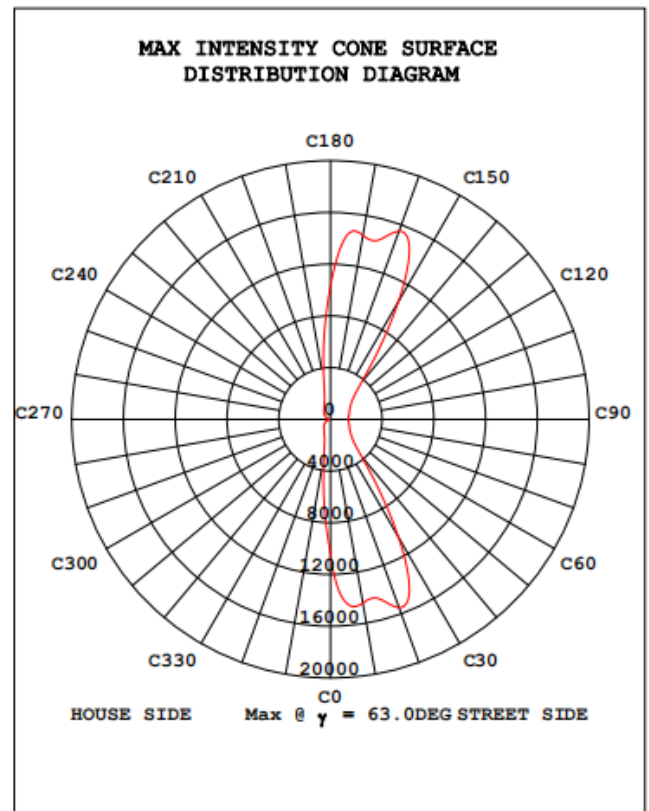
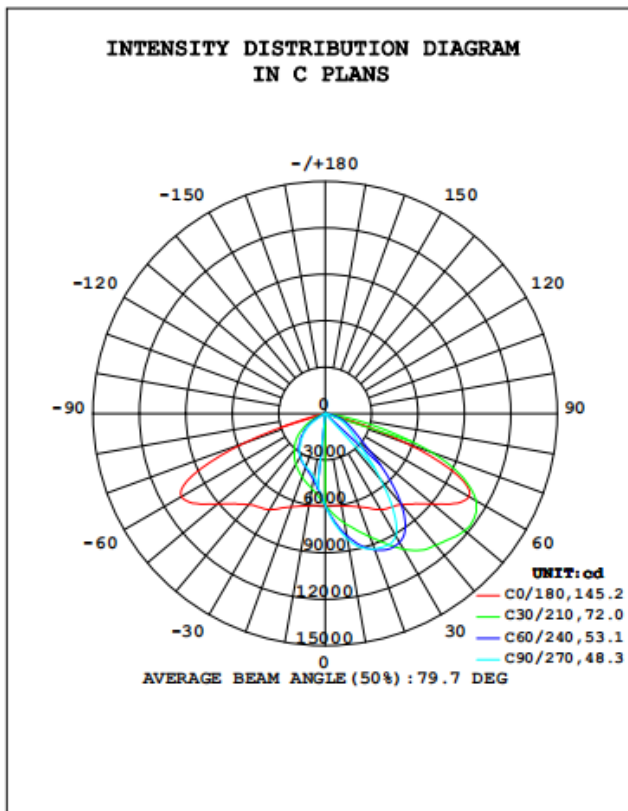
**Luminous Intensity Distribution, Ambient temperature: 25°C (Clause 10 of LM-79)**

Description	Data
<b>Model</b>	EL-SL18LA-160W CLASS I T2STF 3000K
<b>Test voltage (V)</b>	220VAC
<b>Test current (A)</b>	0.7172
<b>Test wattage (W)</b>	156.36
<b>Frequency (Hz)</b>	50
<b>Power factor</b>	0.9914
<b>Central luminous intensity (cd)</b>	5920
<b>Max. luminous intensity(cd)</b>	15491.45 (C=70,Gamma=63)

**For the distribution curve see next page.**

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DATA OF LAMP		PHOTOMETRIC DATA				Eff: 145.17 lm/W
MODEL	EL-SL18LA	I <sub>max</sub> (cd)	15491.45	η street_up (%)	0.0	
NOMINAL POWER (W)	160	LOR (%)	100.0	η street_down (%)	74.3	
RATED VOLTAGE (V)	220-240	TOTAL FLUX (lm)	22699	η house_up (%)	0.0	
NOMINAL FLUX (lm)	22699	MAXIMUM @ (C, γ )	70, 63.0	η house_down (%)	25.7	
LAMPS INSIDE	1	η up (%)	0.0	76 FLASHAREA (m2)	0.05000	
TEST VOLTAGE (V)	220	η down (%)	100.0	SLI	21.107	



## Zonal Lumen Summary and Percentages

**Zonal Lumen Summary**

Zone	Lumens	%Lamp	%Fixt
0-20	2362.01	10.40	10.40
0-30	5416.59	23.90	23.90
0-40	9436.96	41.60	41.60
0-60	17853.78	78.70	78.70
0-80	22616.49	99.60	99.60
0-90	22698.99	100.00	100.00
10-90	22124.93	97.50	97.50
20-40	7074.95	31.20	31.20
20-50	11328.94	49.90	49.90
40-70	11895.15	52.40	52.40
60-80	4762.66	21.00	21.00
70-80	1284.34	5.70	5.70
80-90	82.54	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	22698.99	100.00	100.00

Total Luminaire Efficiency = 100.00%



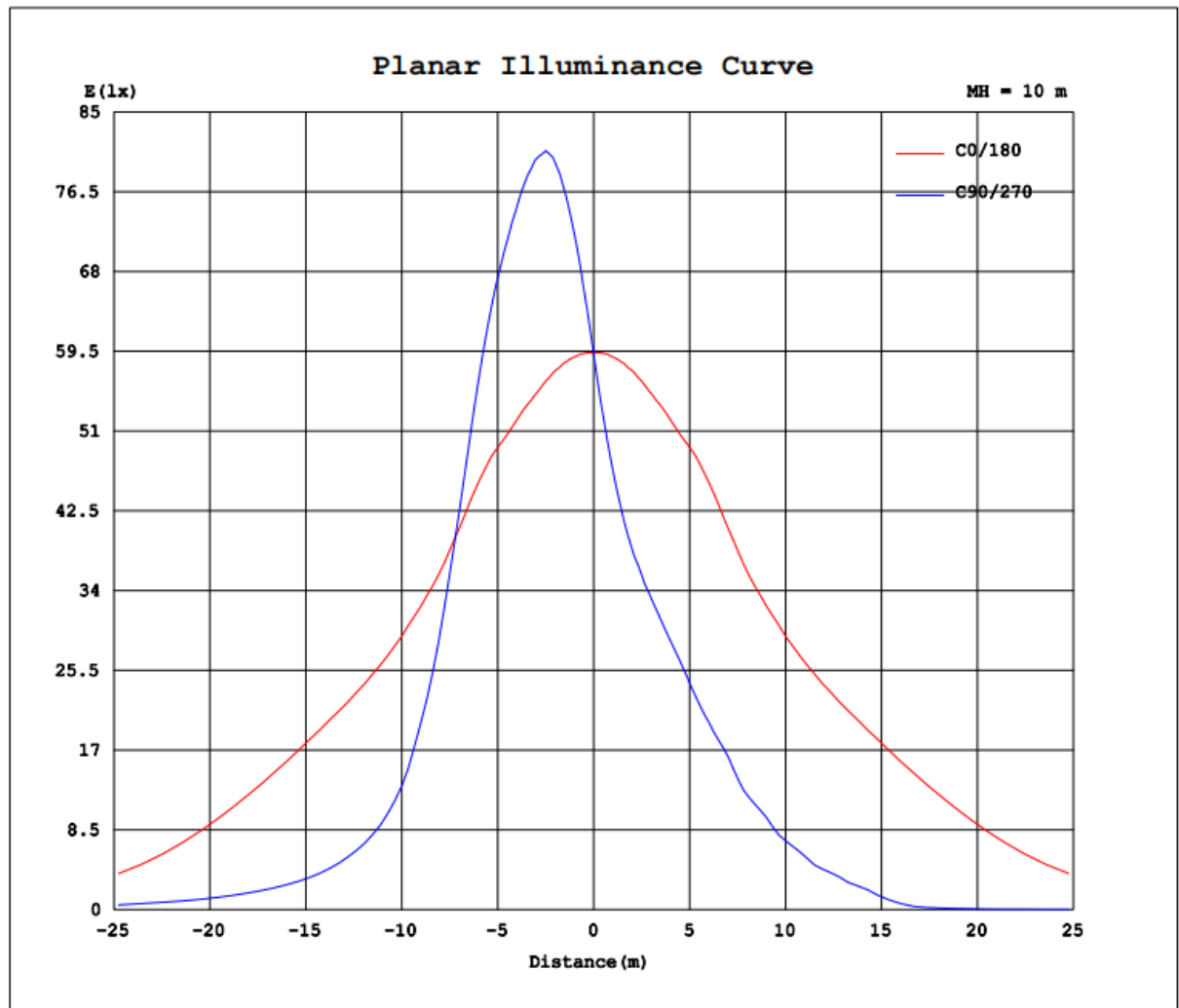
**Prüfbericht Nr. / Test report no. 60397063 001**

## Luminous Intensity Distribution Data

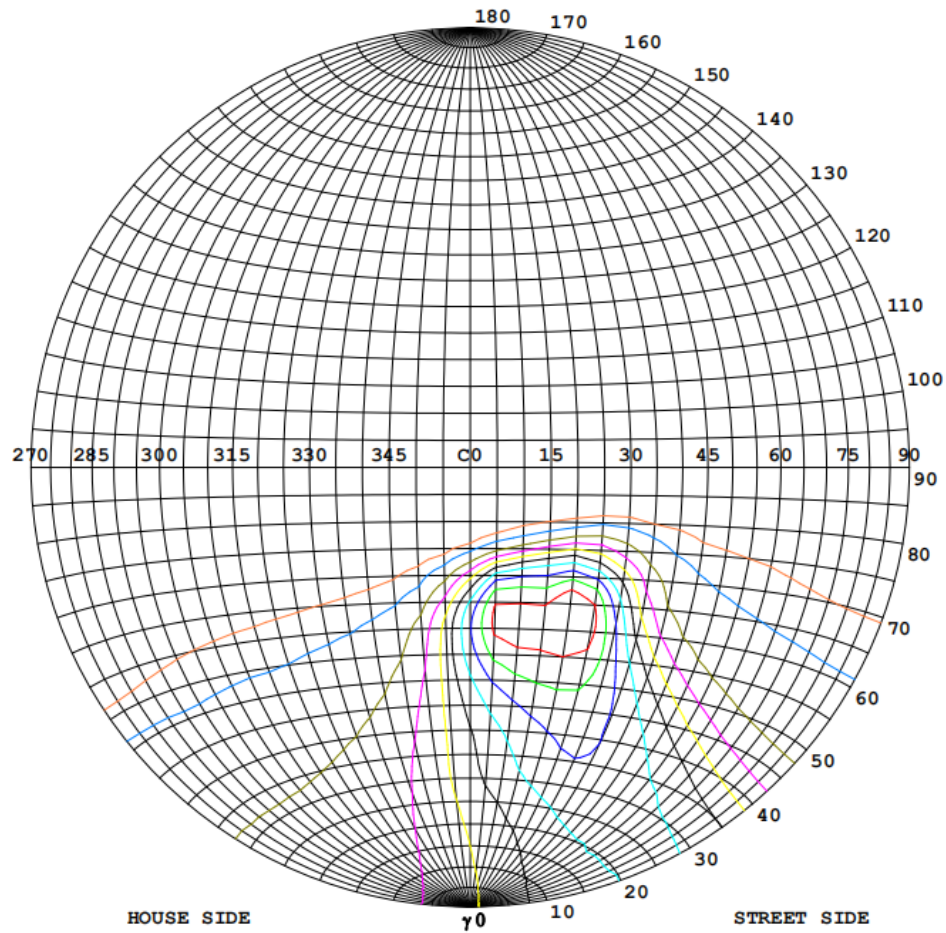
Keywords				Candela										2D										3D										
Vertical Angles	Horizontal Angles		Multipliers=1	Max	Candela										2D										3D									
	0	5			10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105										
37	6932.98	6948.32	7091.07	7334.64	7664.08	8096.49	8563.57	9014.81	9511.35	9995.53	10441.96	10808.70	10644.11	10818.03	10400.25	9844.29	9150.57	8455.42	7485.63	6426.31	5436.40	4707.22	407											
38	6495.45	6518.20	6655.69	6936.15	7289.34	7773.59	8286.23	8812.50	9373.11	9908.79	10406.38	10817.88	10615.78	11041.65	10522.68	9963.60	9305.39	8532.75	7522.40	6446.60	5470.25	4652.89	398											
39	6044.33	6096.18	6235.05	6515.33	6867.32	7316.23	7834.94	8384.58	8973.53	9598.53	10249.24	10808.24	10471.73	11017.35	10650.08	10120.21	9418.05	8626.35	7593.50	6485.23	5421.98	4572.17	389											
40	5617.05	5678.52	5815.36	6100.32	6466.70	7003.36	7588.89	8209.12	8873.52	9585.52	10331.24	10840.96	11112.71	11106.45	10933.62	10256.97	9571.34	8767.82	7671.36	6498.56	5381.96	4498.13	380											
41	5216.32	5265.69	5411.67	5684.44	6093.85	6601.43	7268.94	8014.94	8798.07	9577.98	10295.19	10822.57	11163.78	11220.88	10793.67	10346.78	9729.15	8936.83	7796.18	6518.32	5349.32	4423.08	372											
42	4869.10	4886.69	5024.62	5294.66	5683.73	6213.97	6826.67	7680.93	8543.01	9424.98	10198.95	10816.63	11234.67	11343.82	11029.89	10625.59	9903.21	9088.77	7876.85	6524.31	5299.60	4337.28	367											
43	4450.77	4501.60	4647.89	4939.75	5263.48	5784.70	6439.73	7314.64	8243.95	9214.36	10084.54	10798.93	11289.15	11462.41	11289.40	10816.83	10098.56	9281.88	8006.35	6569.58	5295.15	4263.57	359											
44	4027.63	4078.64	4253.29	4530.22	4875.20	5377.13	6030.12	6926.12	7945.51	8998.14	9960.43	10794.69	11351.24	11596.20	11456.84	11039.63	10321.13	9435.09	8134.40	6586.25	5205.35	4167.10	350											
45	3747.33	3748.19	3858.77	4133.77	4504.43	4982.23	5635.06	6535.83	7604.50	8747.88	9805.76	10775.64	11443.24	11758.19	11658.83	11255.72	10563.27	9641.00	8239.39	6581.76	5151.47	4075.61	341											
46	3474.70	3481.73	3566.35	3795.60	4130.16	4614.31	5294.76	6100.06	7140.32	8363.64	9631.64	10745.93	11515.62	11903.23	11866.16	11508.14	10802.51	9857.04	8392.94	6647.32	5100.15	3980.54	332											
47	3242.05	3249.76	3325.12	3479.37	3749.08	4240.88	4952.14	5721.03	6850.93	8157.52	9460.63	10678.17	11612.90	12064.02	12081.38	11742.90	11089.13	10110.47	8548.74	6658.81	5028.92	3864.26	323											
48	3024.75	3041.14	3109.59	3247.63	3458.78	3864.67	4525.63	5319.10	6431.20	7811.70	9233.27	10593.60	11663.20	12226.78	12257.07	11958.59	11384.01	10384.47	8720.24	6697.07	4976.27	3763.42	314											
49	2804.41	2860.63	2917.33	3036.70	3224.21	3543.82	4151.63	4938.33	6012.62	7439.65	8984.19	10513.21	11723.54	12416.77	12475.07	12207.29	11696.66	10680.20	8905.45	6732.72	4907.03	3660.61	305											
50	2677.98	2700.76	2748.87	2853.13	3017.92	3265.58	3790.90	4556.35	5592.73	7031.02	8685.71	10326.10	11776.62	12571.69	12704.51	12467.97	11964.74	10975.04	9078.42	6753.78	4825.15	3648.50	296											
51	2546.80	2551.12	2599.03	2686.06	2837.15	3067.76	3491.46	4168.51	5195.48	6607.66	8366.51	10232.15	11791.87	12726.34	12921.44	12729.50	12306.42	11265.25	9301.53	6813.25	4749.21	3464.53	287											
52	2420.52	2471.31	2462.14	2542.40	2676.76	2879.57	3221.01	3814.19	4816.77	6193.90	8008.75	10048.78	11843.10	12916.15	13170.13	12967.68	12625.59	11605.47	9495.30	6846.90	4652.33	3346.28	278											
53	2281.14	2298.26	2340.13	2407.09	2523.51	2704.91	3017.11	3485.93	4293.41	5757.18	7632.88	9784.13	11817.48	13139.70	13410.61	13210.35	12395.18	11286.25	9724.45	6874.66	4566.79	3232.22	271											
54	2168.80	2176.87	2219.84	2287.06	2396.76	2564.20	2821.19	3215.50	4051.41	5349.89	7233.73	9526.80	11794.28	13331.07	13671.19	13445.99	13254.01	12428.57	9959.71	6895.74	4474.64	3117.14	264											
55	2067.63	2068.61	2114.78	2178.58	2279.07	2427.32	2659.28	2993.60	3706.49	4962.78	6803.90	9256.29	11773.40	13585.18	13944.46	13694.95	13537.20	12710.90	10814.96	6892.91	4356.42	2999.15	259											
56	1958.54	1972.89	2006.29	2070.49	2169.93	2309.75	2516.43	2799.25	3383.19	4580.73	6370.24	8921.03	11700.80	13802.46	14215.42	13262.87	13809.95	12310.99	10356.31	6822.02	4258.32	2871.19	252											
57	1865.44	1879.80	1912.36	1971.93	2057.62	2192.44	2387.25	2641.96	3126.83	4199.14	5964.97	8586.18	11645.71	14015.13	14496.80	14082.73	14100.39	13456.44	10498.57	6880.74	4154.26	2738.38	247											
58	1786.31	1794.22	1819.76	1875.92	1961.25	2081.15	2257.33	2499.62	2912.67	3830.50	5542.80	8179.40	11500.84	14173.96	14475.85	14257.82	14332.82	13751.52	10611.08	6849.78	3995.51	2587.57	240											
59	1714.57	1716.01	1740.64	1784.96	1869.95	1974.82	2145.59	2364.36	2732.25	3505.59	5159.72	7816.11	10931.13	14328.29	14987.83	14391.28	14492.73	14014.28	10709.71	6820.75	3868.25	2444.47	237											
60	1635.08	1642.87	1667.52	1715.55	1785.54	1883.02	2041.62	2236.61	2575.15	3288.95	4787.16	7417.10	11271.84	14465.13	15212.12	14468.63	14630.88	14235.47	10717.88	6695.23	3670.66	2306.00	234											
61	1559.26	1565.27	1590.75	1639.67	1704.15	1792.37	1937.17	2123.77	2425.97	3030.03	4390.17	7018.67	11041.24	14553.10	15374.81	14513.51	14674.23	14344.17	10681.72	6554.85	3490.96	2155.30	227											
62	1478.02	1486.71	1513.76	1564.88	1631.79	1705.58	1843.64	2018.49	2299.78	2802.39	4054.45	6685.90	10807.04	14544.79	15448.40	14490.57	14618.86	14329.79	10542.64	6323.33	3251.44	1985.59	220											
63	1408.50	1409.95	1439.13	1493.53	1553.57	1627.05	1718.97	1914.63	2174.28	2637.39	3742.81	6323.03	10511.72	14445.18	15949.05	14347.71	14446.45	14255.48	10291.06	5975.61	3278.10	1805.89	213											
64	1323.19	1333.19	1364.54	1420.15	1474.95	1550.09	1664.49	1812.11	2053.76	2485.86	3466.60	5984.98	10170.52	14234.40	15421.04	14138.06	14168.71	14110.12	9945.99	5628.29	2699.09	1632.76	208											
65	1243.51	1260.34	1289.95	1340.77	1398.51	1471.37	1585.42	1719.91	1945.43	2346.12	3245.27	5642.26	9598.23	13935.19	15180.03	13781.51	13875.06	13605.72	9460.37	5123.30	2405.65	1462.48	203											
66	1182.57	1190.70	1222.86	1277.45	1322.09	1395.48	1502.92	1628.31	1847.86	2212.79	3037.26	5271.87	9415.58	13549.89	14820.19	13377.96	13491.83	13304.17	8834.44	4639.42	2089.77	1296.72	197											
67	1109.38	1112.30	1149.49	1203.26	1249.85	1319.62	1425.07	1552.14	1745.84	2092.47	2859.43	4594.67	9018.17	12985.98	14350.39	12905.50	12942.30	12741.37	8113.03	4130.80	1805.17	1122.67	192											
68	1002.52	1015.73	1058.63	1122.87	1173.90	1243.35	1345.23	1467.90	1643.58	1975.39	2698.38	4373.80	8490.71	12308.23	13687.83	12265.63	12308.10	11955.01	7336.07	3090.90	1514.88	958.50	187											
69	700.26	747.16	815.40	915.40	1021.97	1098.15	1177.90	1265.34	1383.13	1563.98	1793.67	2640.82	4637.03	7926.63	11446.77	13074.03	11643.15	11649.95	11085.01	6536.73	3090.90	1514.88	915											

[illegible]





## STREETLIGHT ISOCANDELA DIAGRAM

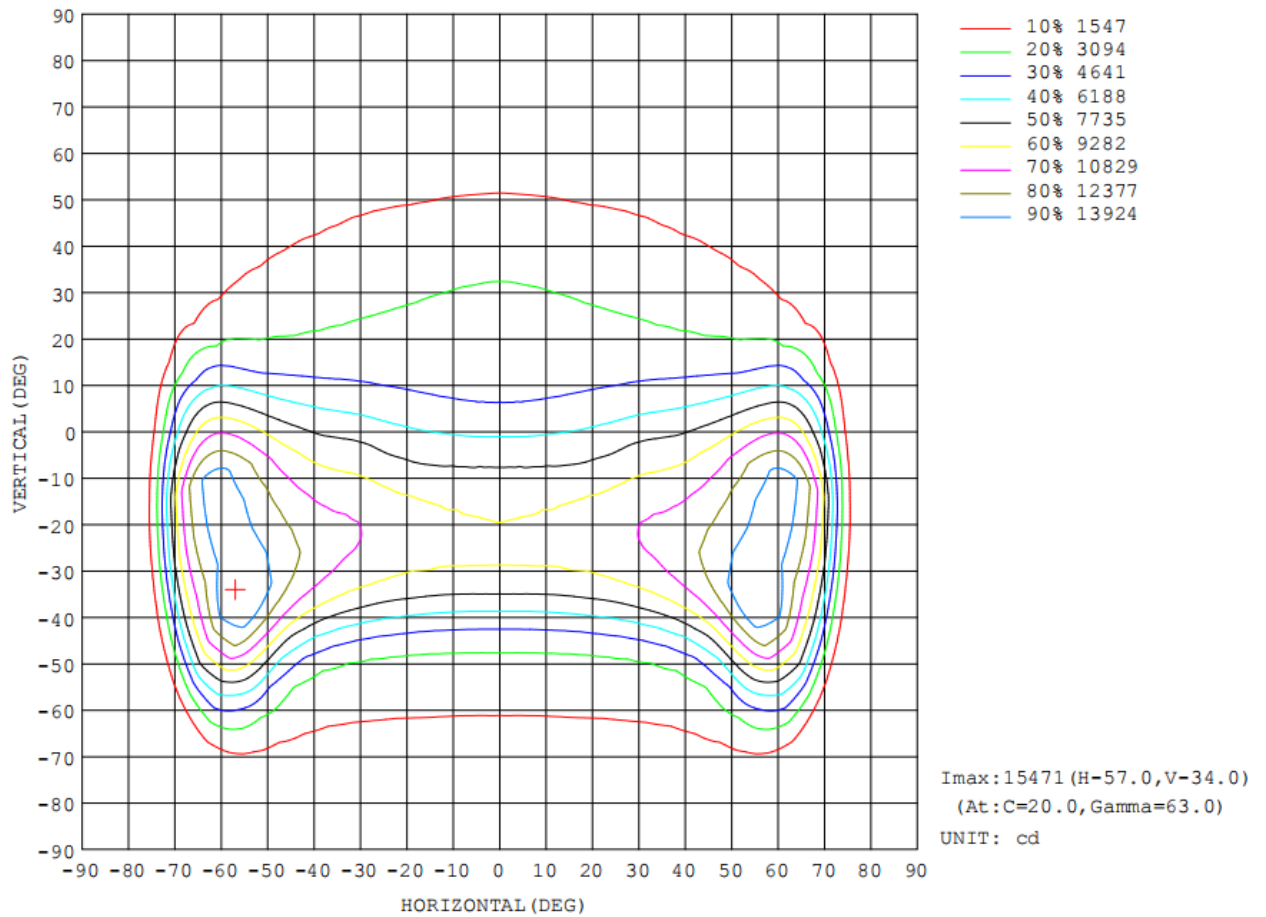


### Classification:

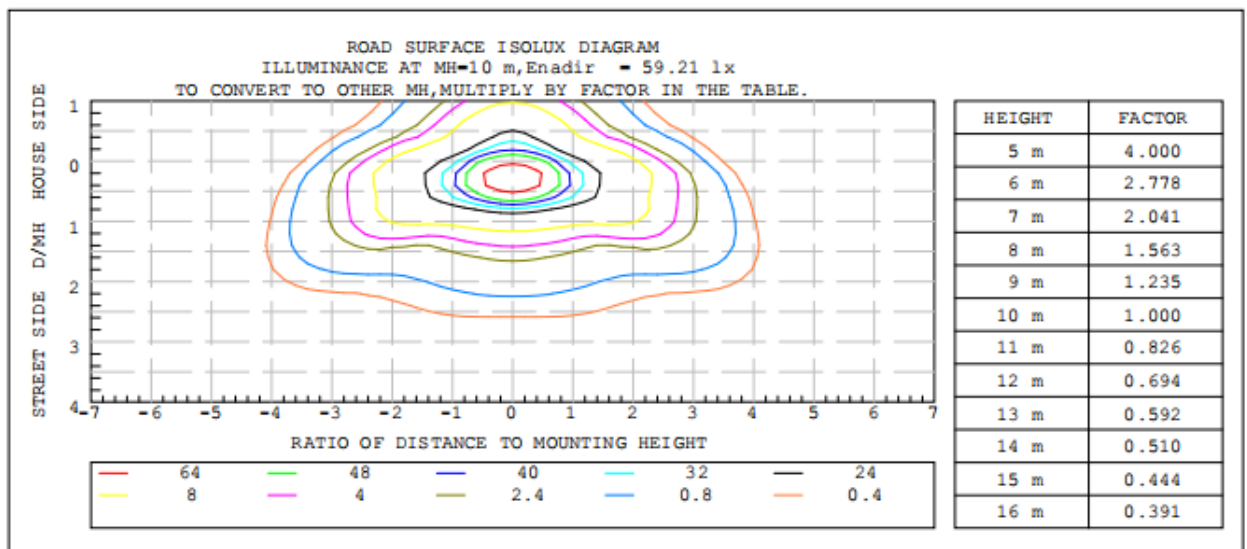
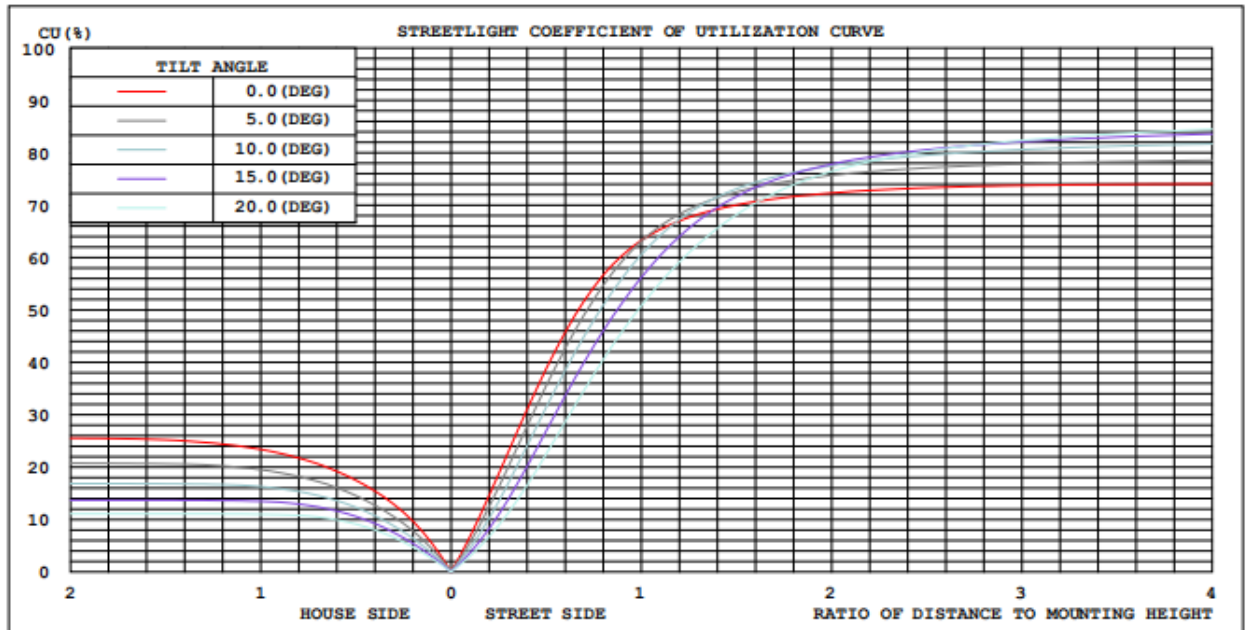
IES: Type II - Short  
CIE: Narrow - Intermediate  
IES: Full cut-off  
CIE: Semi-cut-off  
Max. At80: 59.07cd/klm  
Max. At90: 0cd/klm  
Max. 80-90: 59.07cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	15491
90%	13942
80%	12393
70%	10844
60%	9295
50%	7746
40%	6197
30%	4647
20%	3098
10%	1549
5%	775

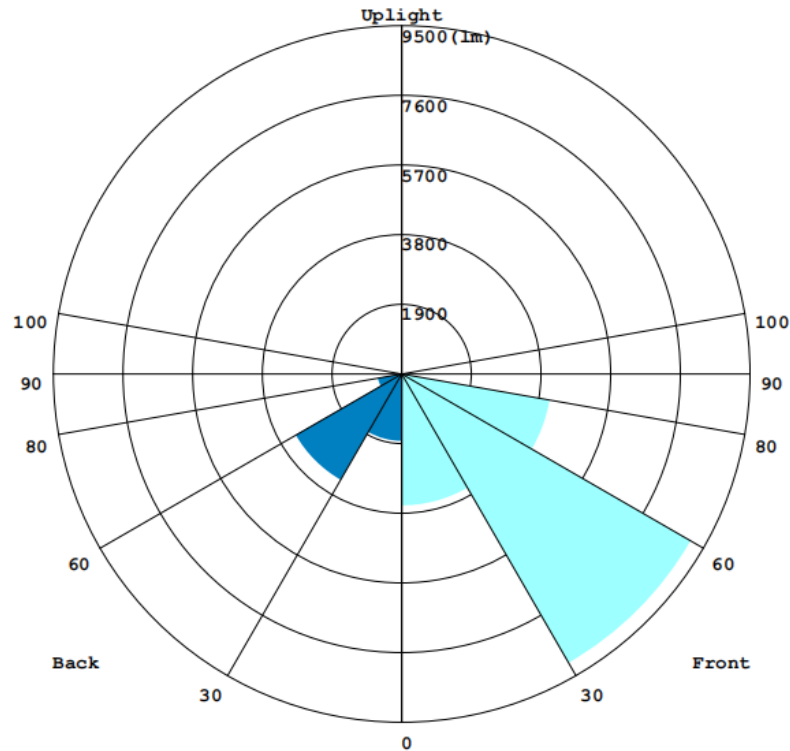
## ISOCANDELA DIAGRAM



## COEFFICIENT OF UTILIZATION CURVE AND ISOLUX DIAGRAM



### LCS REPORT



IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	3589.4	15.8
FM - Front-Medium(30-60)	9103	40.1
FH - Front-High(60-80)	4102.5	18.1
FVH - Front-Very High(80-90)	78.87	0.3
Total Forward Light	16874	74.3

BL - Back-Low(0-30)	1827.1	8.0
BM - Back-Medium(30-60)	3334.1	14.7
BH - Back-High(60-80)	660.19	2.9
BVH - Back-Very High(80-90)	3.6713	0.0
Total Back Light	5825.2	25.7

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	5825.2	0	5825.2
Street Side	16874	0	16874

**Photo**



**overview**



**Back-side**



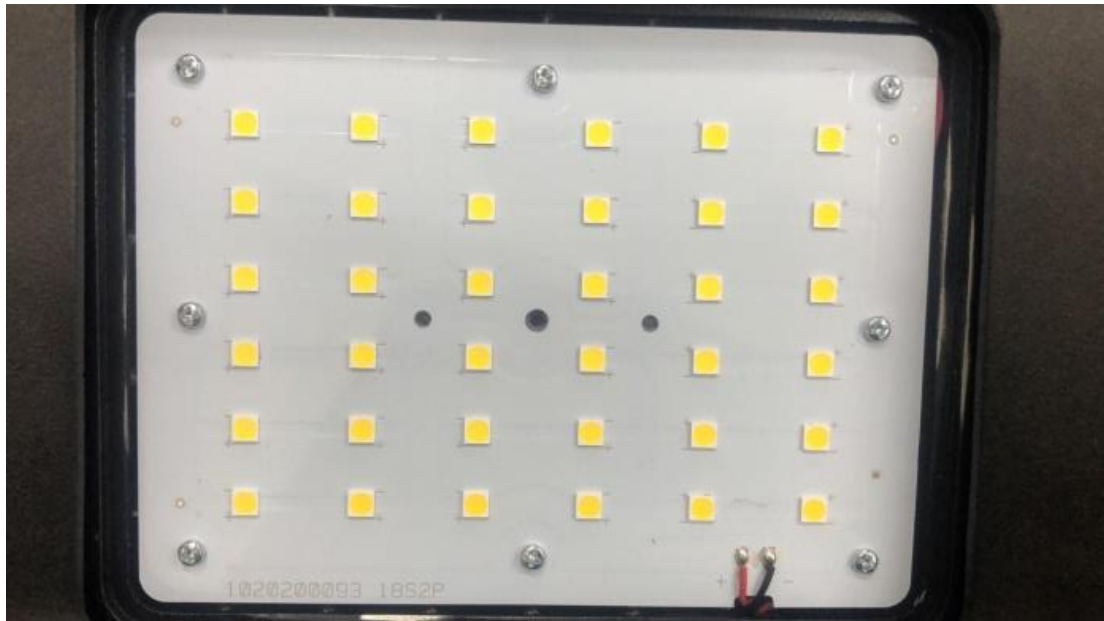


LED Driver + SPD



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

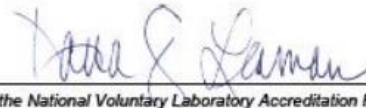
*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

### 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