
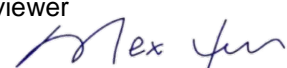


Prüfbericht <i>Test report</i>			Auftragsnr. / order no.: 244268555 Berichtsnr. / report no.: 60397074 001		
Auftraggeber <i>client:</i>			Auftragsdatum / <i>date of order:</i> 23.09.2020		
NISKO GROUP LTD. 41 HAMAAYAN MODI'IN, Israel.			AG-Referenz-Nr. / <i>client reference no.:</i> -		
Inhalt des Auftrags <i>content of order:</i>			Electrical and Photometric Measurement to LM-79-08		
Prüfgrundlagen <i>test specifications:</i>			IES LM-79-08		
Prüfgegenstand <i>test item:</i>			LED Street Light		
Bezeichnung <i>identification:</i>			EL-SL18LA-160W CLASS I T2S TFB 4000K		
Eingang Prüfgegenstand <i>receipt of test item:</i>			23.09.2020		
Prüfgegenstands-Nr. <i>test item no.:</i>			A002073542-020		
Prüfzeitraum und -ort <i>period of test and location:</i>			23.09.2020-28.08.2020, Shanghai Xingshang Photoelectric technology Co., Ltd		
Prüflaboratorium <i>testing laboratory:</i>			TÜV Rheinland (Shanghai) Co., Ltd.		
Prüfergebnis <i>test result *):</i>			N/A		
Sonstiges / other aspects:			<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>		
geprüft / tested by:			kontrolliert / reviewed by:		
06.11.2020 Fernando Dai /PE			06.11.2020 Alex Yan /Reviewer		
					
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
<p>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. 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>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. 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

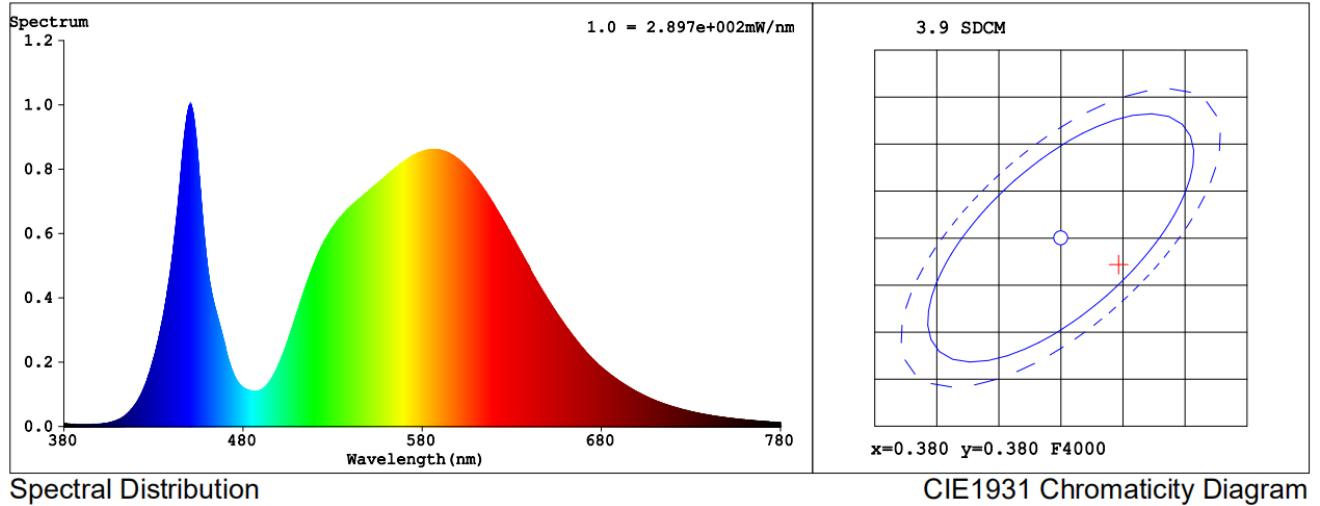
Product Information

Model name	Sample number	Rated voltage, frequency (V, Hz)	Nominal CCT (K)	Rated Wattage (W)	Type of LED Chip
EL-SL18LA-160W CLASS I T2S TFB 4000K	A002073542-020	200-240Vac, 50/60Hz	4000K	160W	LUMILEDS LUXEON 5050- L15030705006000 00 18S2P 2MODULE

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

Measured Results	
	EL-SL18LA-160W CLASS I T2S TFB 4000K
Total luminous flux (lm)	23599
Input wattage (W)	158.523
Input current (A)	0.7287
Frequency (Hz)	50
Power factor	0.9901
Efficacy (Lm/W)	148.87
CCT (K)	3913
Chromaticity x	0.3837
Chromaticity y	0.3762
Chromaticity u'	0.2268
Chromaticity v'	0.5012
CRI	73.8
R9	0
Du'v' (Max.)	-0.00138
THDI(%)	4.538
LCS BUG Rating	B2-U0-G3, Semi cut-off

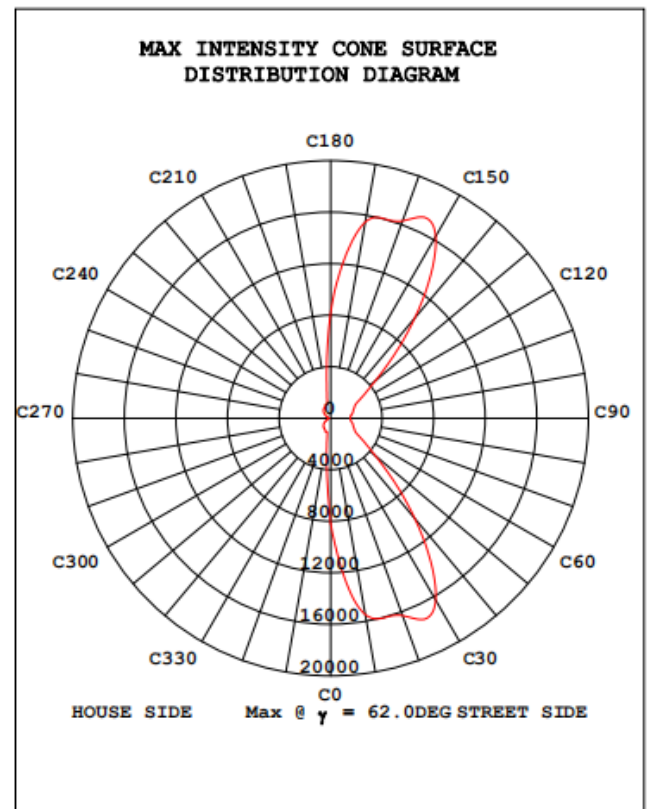
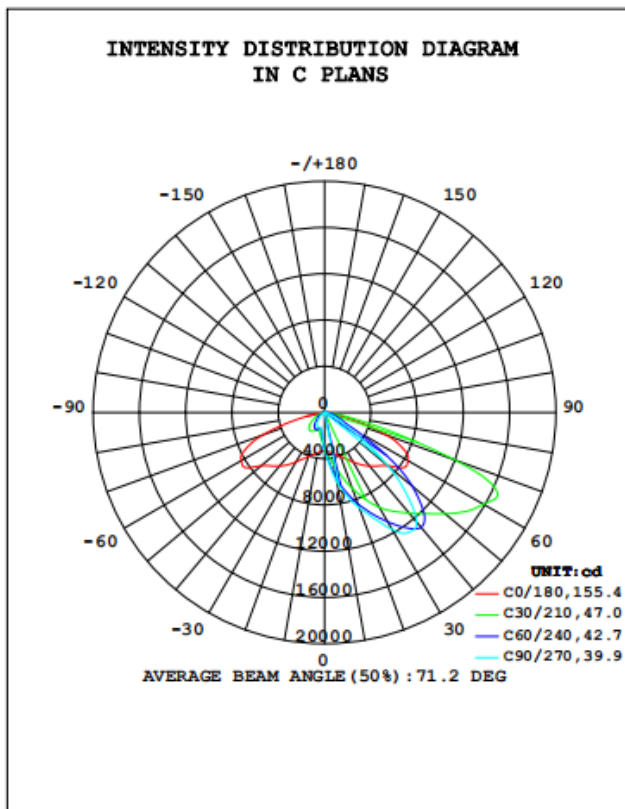
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Spectral power distribution: (Clause 10 of LM-79)
EL-SL18LA-160W CLASS I T2S TFB 4000K

Dominant WL: 580.3nm
Peak WL: 450nm
Luminous Intensity Distribution, Ambient temperature: 25°C (Clause 10 of LM-79)

Description	Data
Model	EL-SL18LA-160W CLASS I T2S TFB 4000K
Test voltage (V)	220VAC
Test current (A)	0.7287
Test wattage (W)	158.523
Frequency (Hz)	50
Power factor	0.9901
Central luminous intensity (cd)	3156
Max. luminous intensity(cd)	17216.66 (C=65, Gamma=62)

For the distribution curve see next page.
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DATA OF LAMP		PHOTOMETRIC DATA				Eff: 148.87 lm/W
MODEL	EL-SL181A	I _{max} (cd)	17216.66	η street_up (%)	0.0	
NOMINAL POWER (W)	160	LOR (%)	100.0	η street_down (%)	86.5	
RATED VOLTAGE (V)	220-240	TOTAL FLUX (lm)	23599	η house_up (%)	0.0	
NOMINAL FLUX (lm)	23599.4	MAXIMUM @ (C, γ)	65, 62.0	η house_down (%)	13.5	
LAMPS INSIDE	1	η up (%)	0.0	76 FLASHAREA (m2)	0.05000	
TEST VOLTAGE (V)	220	η down (%)	100.0	SLI	23.562	



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

Zone	Lumens	%Lamp	%Fixt
0-20	1458.31	6.20	6.20
0-30	3862.51	16.40	16.40
0-40	7820.67	33.10	33.10
0-60	17744.16	75.20	75.20
0-80	23403.8	99.20	99.20
0-90	23599.39	100.00	100.00
10-90	23286.73	98.70	98.70
20-40	6362.36	27.00	27.00
20-50	11327.98	48.00	48.00
40-70	13920.64	59.00	59.00
60-80	5659.61	24.00	24.00
70-80	1662.47	7.00	7.00
80-90	195.62	0.80	0.80
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	23599.39	100.00	100.00

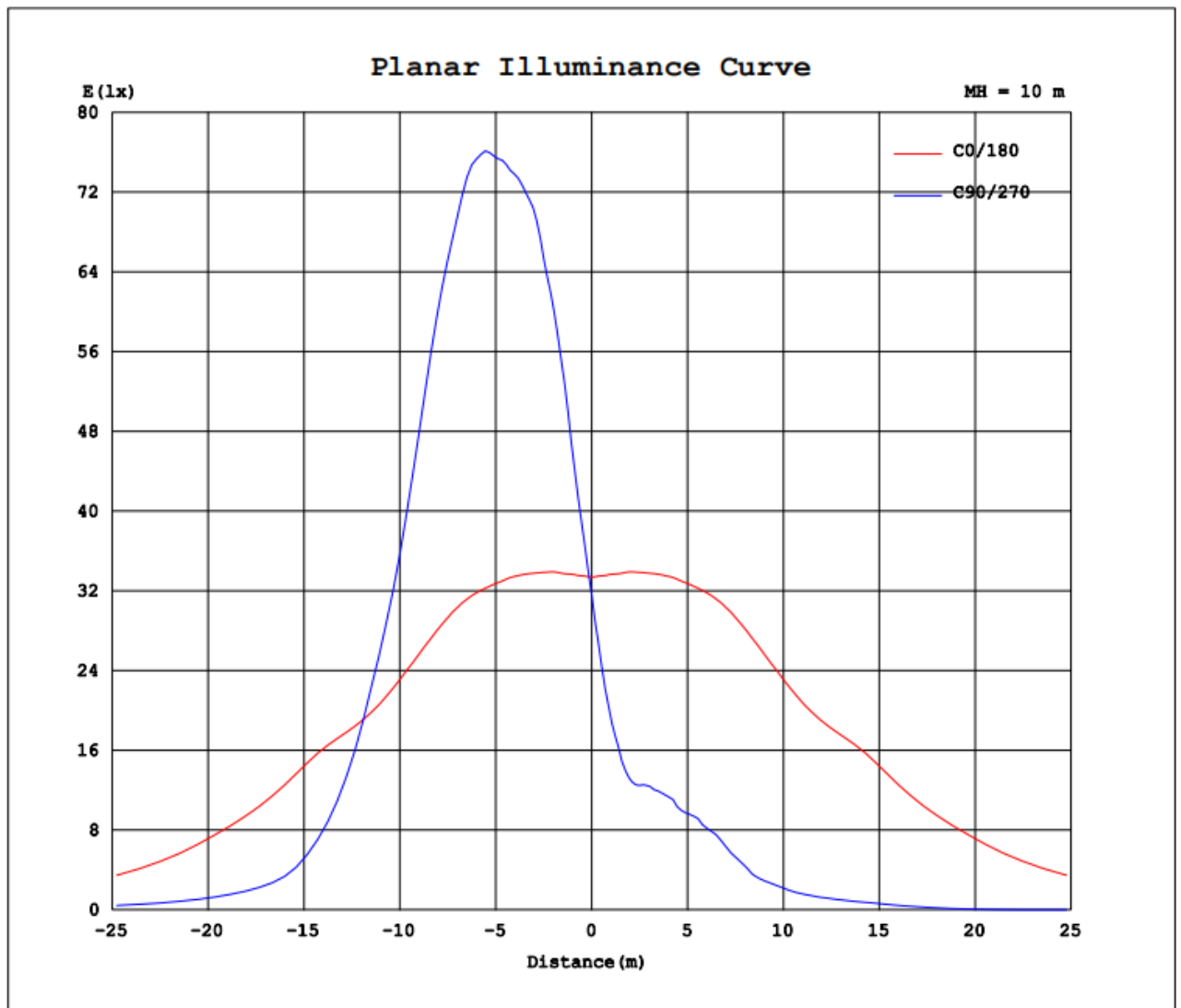
Total Luminaire Efficiency = 100.00%

Prüfbericht Nr. / Test report no. 60397074 001

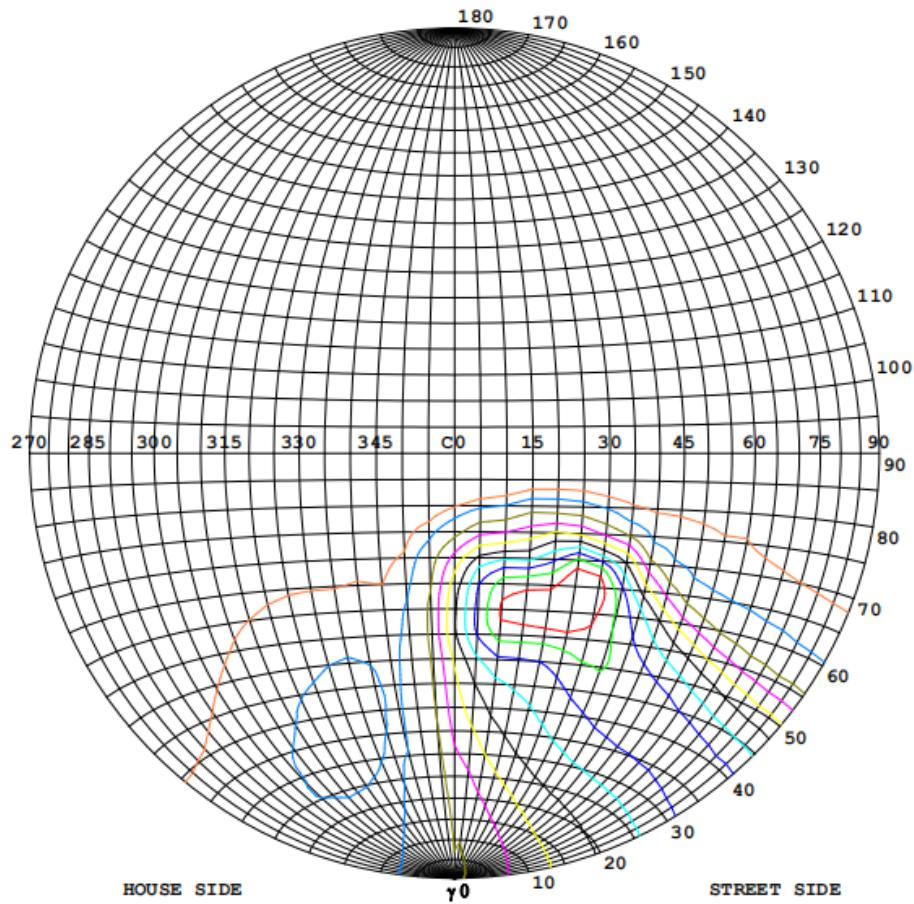
Luminous Intensity Distribution Data

Keywords		Candela										20										30										
Vertical Angles	Horizontal Angles	Multipler=1	Max Cd																													
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105											
38	12726.90	12724.34	12686.90	12784.92	12865.44	12841.40	12782.61	12667.10	12528.21	12269.47	11956.80	11467.33	10977.64	10416.49	9912.82	9308.50	8538.43	7277.33	5849.44	3419.01	2178.86	1529.34										
39	12617.31	12631.37	12600.07	12737.41	12863.72	12921.66	12905.23	12844.87	12712.52	12491.24	12180.00	11669.74	11158.55	10574.78	10054.60	9489.93	8729.69	7466.04	5957.60	3446.06	2167.87	1523.09										
40	12394.94	12438.19	12431.15	12606.68	12780.59	12915.30	12935.43	12930.06	12796.54	12702.15	12398.65	11877.01	11346.72	10732.28	10189.40	9661.59	8925.65	7648.94	6050.90	3485.16	2157.75	1515.94										
41	12056.64	12152.65	12155.39	12390.07	12592.69	12626.63	12664.87	13089.67	13082.28	12897.96	12617.07	12095.12	11542.27	10891.62	10330.39	9836.30	9130.25	7832.94	6152.43	3487.90	2135.14	1511.49										
42	11638.03	11770.68	11767.63	12027.12	12312.65	12645.23	12686.13	13013.13	13072.80	12827.80	12599.81	12139.66	11747.71	11095.18	10461.36	9936.47	9333.81	8017.61	6246.82	3506.07	2117.23	1608.82										
43	11172.21	11289.73	11283.10	11656.90	11976.29	12376.55	12690.69	13067.06	13246.40	13214.50	13005.07	12599.81	11961.56	11226.19	10596.27	10178.08	9542.96	8211.28	6342.02	3524.28	2099.82	1603.64										
44	10642.51	10787.43	10861.60	11107.71	11523.61	12033.94	12494.80	12945.20	13223.38	13304.73	13223.38	12756.93	12166.95	11403.29	10773.72	10346.04	9764.94	8433.91	6442.51	3539.76	2079.98	1591.40										
45	10082.29	10247.85	10332.42	10667.27	11027.06	11616.63	12126.28	12751.89	13126.20	13343.99	13379.27	13024.26	12384.94	11587.12	10863.77	10522.57	9994.88	8616.23	6531.54	3565.34	2060.96	1574.80										
46	9539.61	9730.13	9779.79	10131.73	10495.50	11159.29	12116.48	12485.51	12960.49	13327.80	13497.41	13245.20	12607.91	11786.71	11046.94	10720.56	10253.87	8856.67	6633.14	3556.37	2038.20	1562.96										
47	9031.95	9181.03	9237.66	9586.19	9968.24	10643.80	11089.59	12130.34	12731.88	13253.10	13564.10	13442.41	12856.79	12004.14	11230.71	10948.32	10550.20	9107.79	6742.65	3577.24	2019.78	1554.39										
48	8462.20	8624.74	8710.62	9057.96	9467.57	10142.44	10820.02	11722.65	12436.14	13113.57	13575.44	13614.94	13026.28	12243.53	11420.81	11212.25	10889.30	9361.35	6862.23	3593.20	2001.73	1547.78										
49	7877.47	8026.62	8135.21	8506.95	8955.38	9654.22	10357.37	11289.30	12080.84	12913.88	13536.21	13751.67	13364.72	12504.38	11718.94	11522.76	11291.03	9684.50	7008.83	3608.26	1982.16	1539.90										
50	7140.48	7345.44	7447.05	7800.19	8370.27	9136.77	9847.86	10826.56	11678.75	12650.03	13440.84	13958.34	13624.72	12809.22	12050.02	11891.71	11758.25	10600.25	7181.15	3635.25	1987.42	1527.88										
51	6402.83	6612.7																														

Tool_View EL-S18L1A 160W CLASS I T2S TFB 4000K.IES		Keywords										Candela										2D										3D									
Vertical Angles		Horizontal Angles					Multiplier=1					Max Cd																													
255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	↕																			
48	1547.78	1907.16	3593.20	6862.23	9361.35	10889.30	1122.25	11451.82	13106.28	13614.94	13575.44	13113.57	12436.14	11722.65	10833.02	10142.44	9467.57	9057.82	8710.62	8624.74	8462.20																				
49	1539.90	1907.16	3609.26	6808.73	9684.50	11291.03	11522.76	11718.94	12504.38	13364.72	13751.67	13536.21	12931.88	12080.84	11289.30	10542.22	9895.98	9506.95	9135.21	8626.72	7870.77																				
50	1527.88	1982.42	3635.25	7181.51	10060.25	11758.25	11891.71	12050.02	12809.22	13624.72	13868.34	13440.84	12650.03	11678.75	10826.56	9872.46	9136.77	8707.29	7900.19	7447.05	7345.44	7147.48																			
51	1511.59	1975.91	3668.67	7388.59	10468.94	12275.45	12328.03	12451.47	13148.69	13888.65	13949.46	13293.70	12338.40	11261.12	10357.71	9346.40	8574.73	8300.10	7215.10	6678.30	6612.78	6402.83																			
52	1491.59	1963.44	3707.17	7631.99	10911.62	12824.17	12834.21	12921.12	13533.71	14155.37	14001.71	13102.53	11983.91	10835.01	9885.13	8811.82	7914.95	7606.18	6468.63	5993.19	5845.38	5706.40																			
53	1464.45	1907.34	3742.61	7893.96	11370.30	13403.23	13404.41	13456.82	13675.40	14411.80	14015.80	12879.59	11617.13	10400.93	9360.45	8716.07	7196.55	6277.72	5724.53	5263.26	5140.54	5069.75																			
54	1365.98	1987.37	3768.93	8134.35	10778.17	13876.08	14030.59	14432.38	14670.34	13993.93	13255.30	12146.78	9844.53	8782.57	7472.05	6461.13	5540.45	5041.64	4610.63	4453.91	4355.57																				
55	1389.17	1921.49	3859.59	8336.12	1278.90	14455.19	14517.10	14622.00	14926.44	14921.43	13943.24	12427.06	10883.50	9441.35	8150.63	7044.54	5712.02	4823.19	4422.40	3977.20	3924.63	3743.97																			
56	1341.14	1903.32	3792.46	8461.24	12375.32	14911.46	15013.18	15073.18	15436.45	15152.96	13862.07	12199.60	10517.22	8906.09	7430.34	5939.35	4971.55	4125.19	3849.94	3411.44	3256.35	3195.74																			
57	1296.38	1891.14	3787.73	8461.54	12542.73	15271.27	15404.73	15682.32	15921.03	15843.44	13604.72	11972.15	10142.57	8290.07	6565.85	5208.12	4309.85	3673.19	3278.64	2905.93	2768.35	2657.59																			
58	1266.30	1879.19	3771.71	8461.24	12616.71	15517.02	15807.40	16095.24	16354.73	15526.06	13725.60	11738.56	9719.83	7597.12	5895.09	4461.58	3724.17	3056.89	2756.04	2449.37	2300.23	2260.39																			
59	1232.90	1853.48	3759.97	8376.02	12616.18	15654.78	16053.13	16389.40	16734.64	15688.34	13657.61	11487.63	9200.97	6820.72	5106.86	3801.76	3140.57	2578.94	2354.70	2152.06	2077.99	1997.92																			
60	1197.99	1813.57	3716.87	8318.90	12570.32	15686.37	16181.27	16522.16	17029.77	15873.95	13615.10	11147.26	8958.09	6012.39	4408.50	3213.60	2630.08	2230.54	2125.02	1946.68	1882.41	1807.43																			
61	1152.09	17																																							



STREETLIGHT ISOCANDELA DIAGRAM

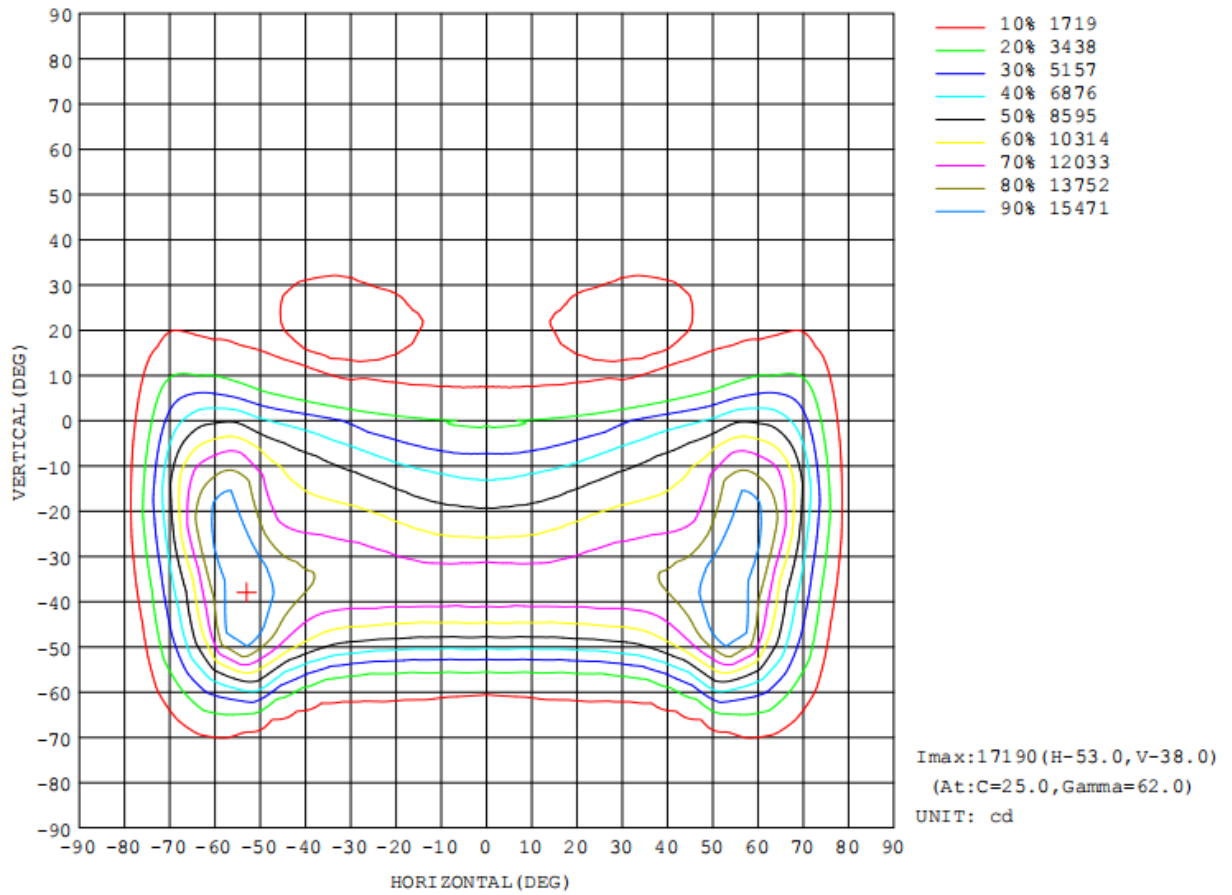


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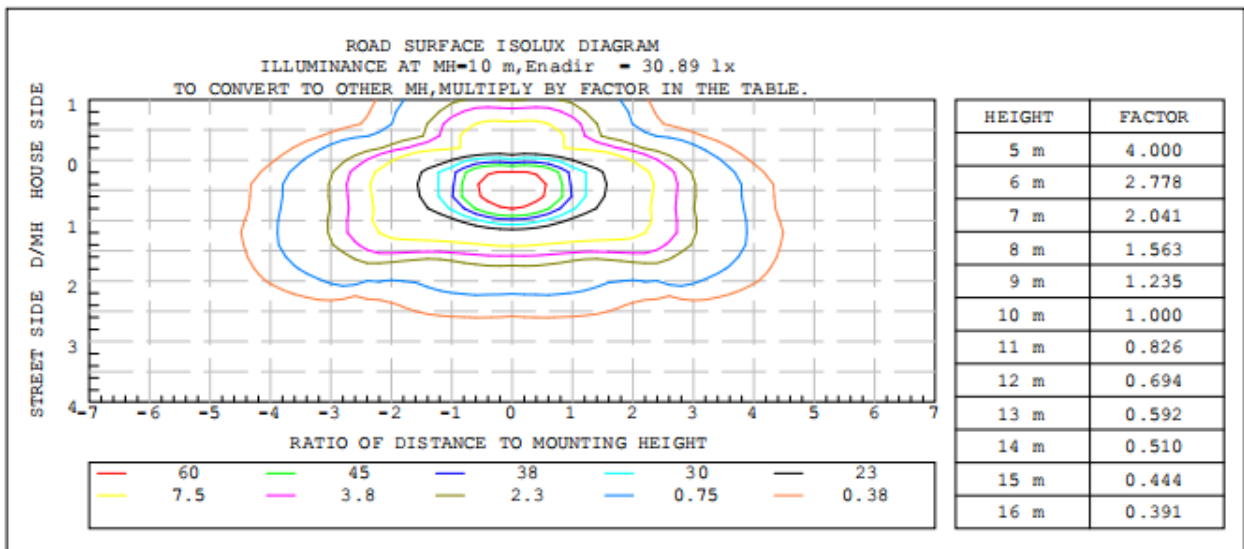
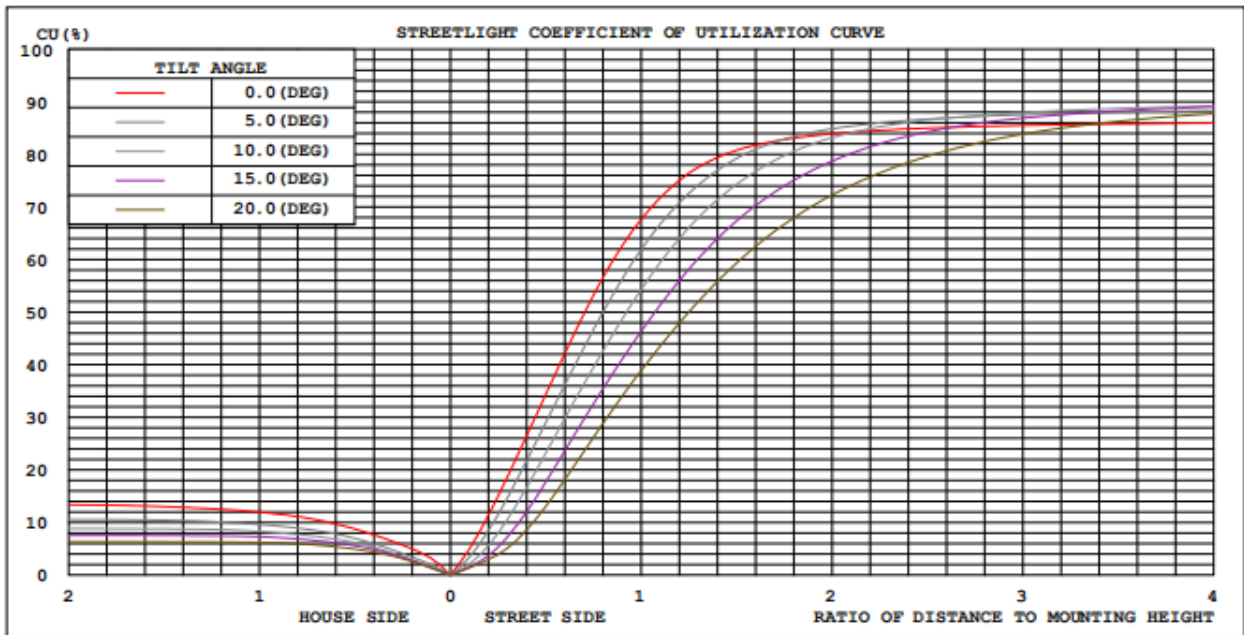
IES:Type II - Short
CIE:Average - Intermediate
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:113.2cd/klm
Max.At90:0cd/klm
Max.80-90:113.2cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
I _{max} =100%	17217
90%	15495
80%	13773
70%	12052
60%	10330
50%	8608
40%	6887
30%	5165
20%	3443
10%	1722
5%	861

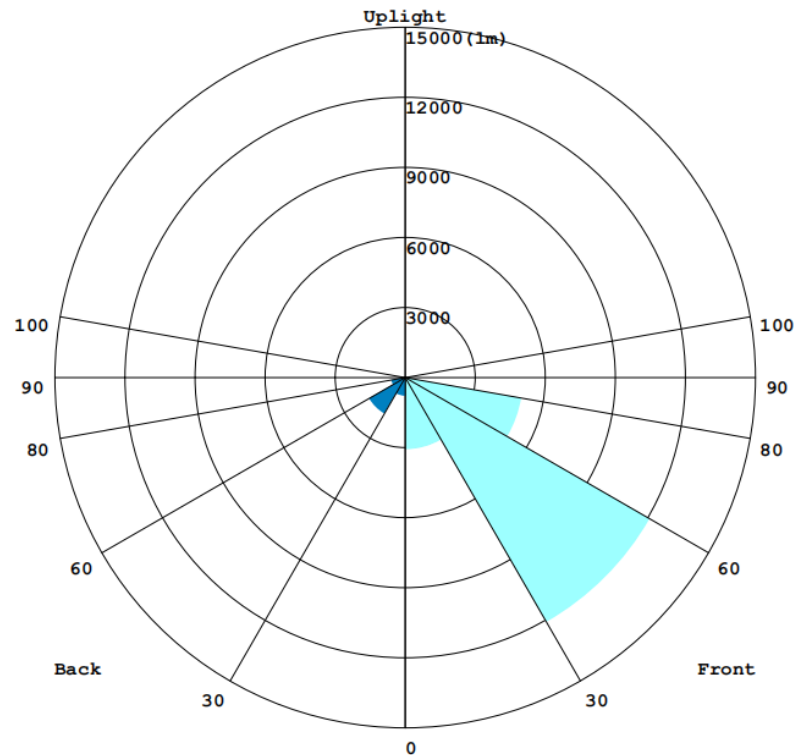
ISOCANDELA DIAGRAM



COEFFICIENT OF UTILIZATION CURVE AND ISOLUX DIAGRAM



LCS REPORT



IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	3075.2	13.0
FM - Front-Medium(30-60)	12095	51.2
FH - Front-High(60-80)	5055.3	21.4
FVH - Front-Very High(80-90)	186.61	0.8
Total Forward Light	20412	86.5

BL - Back-Low(0-30)	787.27	3.3
BM - Back-Medium(30-60)	1787.1	7.6
BH - Back-High(60-80)	604.31	2.6
BVH - Back-Very High(80-90)	9.0067	0.0
Total Back Light	3187.7	13.5

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	B2-U0-G3
---------------------------	----------

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	3187.7	0	3187.7
Street Side	20412	0	20412

Photo



overview



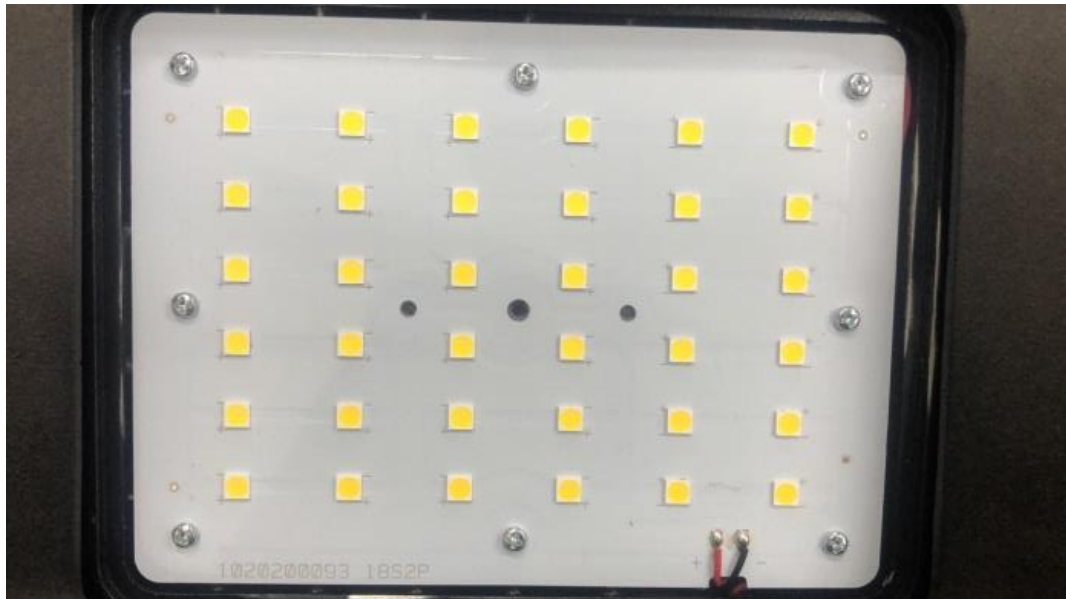
Back-side



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

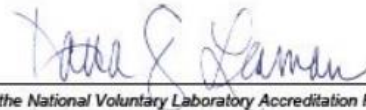
*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

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