



Shenzhen Belling Efficiency Testing Lab



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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric

Measurements of Solid-State Lighting Products

Applicant:

Shenzhen Qilishun Opto-electric Limited

Address:

Third Floor, Building B, 2nd Road No.2, Zhuangcun, Shajing, Baoan District,
Shenzhen, Guangdong, China

For Product:

Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires

Model No.:

KLWPGR040(3000K) / KLWPGR040(5700K)

Test laboratory: Shenzhen Belling Efficiency Testing Lab., 1/F., Building 1, 1F, No.1 building, Meibaohe industrial park, Dalang street, Shenzhen, Guangdong Prov.518101, China.

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Jason Zhou

Complied by: Sam Chen

Review by: Jason Zhou

Project Engineer

Technical Manager

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Shenzhen Belling Efficiency Testing Lab. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



1 General

1.1 Product Information

Manufacturer	Shenzhen Qilishun Opto-electric Limited
Manufacturer Address	Third Floor, Building B, 2nd Road No.2, Zhuangcun, Shajing, Baoan District, Shenzhen, Guangdong, China
Brand Name	KILI-LED
Luminaire Type	Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires
Model Number	KLWPGR040(3000K) / KLWPGR040(5700K)
Rated Inputs	AC 100-277V 50/60Hz
Rated Power	40W
Nominal CCT	3000K / 5700K
Date of Receipt Samples	2016-11-22

1.2 Standards or methods

- ANSI C78.377-2015: Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits-Related Power Quality Requirements for Lighting Equipment
- CIE Publication No.13.3-1995: Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products



1.3 Equipment list

Device	Manufacture	Model No.	Serial No.	Calibration due date
Goniophotometric System	SENSING	GMS-3000	N.A	2017-09-21
AC Power Source	ALL POWER	APW-110N	992257	2017-08-27
Total Luminous Flux Standard Lamp	SENSING	110V/100W	S13100234	2017-09-15
Digital Power Meter	YOKOGAWA	WT310	C2QM02030V	2017-08-29
Integral Sphere	SENSING	SPR-600M	N.A	2017-08-27
Integral Sphere (2M)	SENSING	SD-20	N.A	2017-08-27
Digital Power Meter	YOKOGAWA	WT210	91L929742	2017-08-29
Optical Color and Electrical Measurement System	SENSING	SPR-3000	N.A	2017-08-27
Temperature/humidity/clock	VICTOR	VC230	57636	2017-09-13
Digital Anemometer	TECMAN	TD8901	026141	2017-09-13

Statement of Traceability: Shenzhen Belling Efficiency Testing Lab attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).



2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within ± 0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards. 4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

2.5 Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The method according to IESNA LM-79-08 following chapter.



3 Test Result Summary

3.1 Integrating Sphere System

3.1.1 Electrical data

Model Number	Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
KLWPGR040(3000K)	120.08	60	0.329	39.23	0.994
KLWPGR040(5700K)	120.07	60	0.339	40.48	0.994

3.1.2 Additional Test

Test Item	Model	Test Voltage (V)	Frequency (Hz)	Test Result
Power factor	KLWPGR040(3000K)	120	60	0.994
		277	60	0.921
	KLWPGR040(5700K)	120	60	0.994
		277	60	0.938
Total harmonic distortion	KLWPGR040(3000K)	120	60	12.4%
		277	60	16.9%
	KLWPGR040(5700K)	120	60	13.6%
		277	60	17.8%
Off state power (W)	KLWPGR040(3000K)	120	60	0
	KLWPGR040(3000K)	277	60	0

3.1.3 Photometric data

Model Number	Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	CRI	R9
KLWPGR040(3000K)	4624.079	117.871	2992	72.5	-35
KLWPGR040(5700K)	4885.531	120.690	5358	72.2	26

3.1.4 Chromaticity Coordinate

Model Number	Duv	x	y	u'	v'
KLWPGR040(3000K)	-0.0013	0.4356	0.4003	0.2513	0.5197
KLWPGR040(5700K)	0.0025	0.3360	0.3490	0.2063	0.4820



3.2 Goniophotometer System

3.2.1 Electrical data

Model Number	Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
KLWPGR040(3000K)	120.08	60	0.328	39.13	0.9936

3.2.2 Photometric data

Luminous Flux (lm) (0-90°)	Efficacy (lm/W) (0-90°)	Zonal Lumen in 80-90°(%lm)
4128.237	105.501	8.87



4 Test Data

Report of Spectroradiometric & Electric Analysis for Light Source

Model No.:
Sample SN:
Manufacturer:
Tested By:
Description:

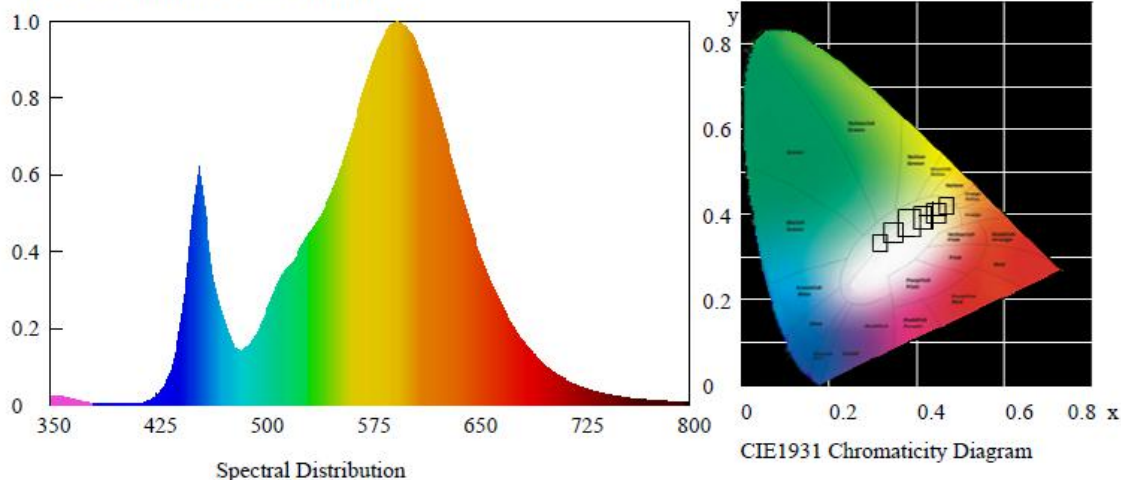
Application NO.:
Applicant:
Date:
Reviewed By:

Test Condition

Temperature: 25°C
Spectrum Range: 350-800 nm

RH: 58%
Scan Step: 5 nm

Spectroradiometric Parameters



Chromaticity Coordinates: $x=0.4356$ $y=0.4003$ $u'=0.2513$ $v'=0.5197$

Correlated Color Temperature: 2992 K

Dominant Wavelength: 582.0 nm(E)

Luminous Flux: 4624.079 lm

Purity: 0.5104

Chromaticity Difference: -0.0013Duv

Peak Wavelength: 555.5 nm

Color Ratio: $K_r=45.7\%$ $K_g=48.1\%$ $K_b=6.2\%$

Bandwidth: 167.9nm

Radiant Flux: 13.463 W

Rendering Index: $R_a=72.5$

$R_1=69$ $R_2=86$ $R_3=93$ $R_4=66$ $R_5=69$ $R_6=81$ $R_7=75$ $R_8=40$

$R_9=-35$ $R_{10}=68$ $R_{11}=62$ $R_{12}=56$ $R_{13}=74$ $R_{14}=97$ $R_{15}=61$

Electric Parameters

Voltage: 120.08 V

Current: 0.329 A

Power Factor: 0.994

Power: 39.23 W

Luminous Efficacy: 117.871 lm/W



Report of Spectroradiometric & Electric Analysis for Light Source

Model No.:
Sample SN:
Manufacturer:
Tested By:
Description:

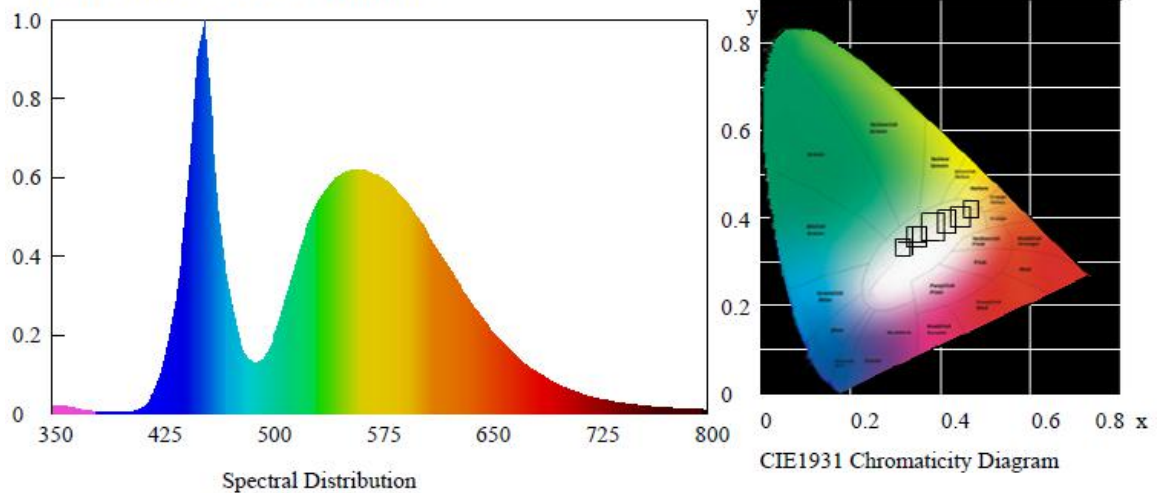
Application NO.:
Applicant:
Date:
Reviewed By:

Test Condition

Temperature: 25°C
Spectrum Range: 350-800 nm

RH: 58%
Scan Step: 5 nm

Spectroradiometric Parameters



Chromaticity Coordinates: $x=0.3360$ $y=0.3490$ $u'=0.2063$ $v'=0.4820$

Correlated Color Temperature: 5358 K

Dominant Wavelength: 560.0 nm(E)

Luminous Flux: 4885.531 lm

Purity: 0.0553

Chromaticity Difference: 0.0025Duv

Peak Wavelength: 445.8 nm

Color Ratio: $K_r=31.6\%$ $K_g=60.1\%$ $K_b=8.3\%$

Bandwidth: -444nm

Radiant Flux: 20.273 W

Rendering Index: $R_a=72.2$

$R_1=69$ $R_2=78$ $R_3=82$ $R_4=70$ $R_5=69$ $R_6=68$ $R_7=83$ $R_8=58$

$R_9=26$ $R_{10}=45$ $R_{11}=64$ $R_{12}=39$ $R_{13}=72$ $R_{14}=89$ $R_{15}=66$

Electric Parameters

Voltage: 120.07 V

Current: 0.339 A

Power Factor: 0.994

Power: 40.48 W

Luminous Efficacy: 120.69 lm/W

**Zonal Flux Diagram**

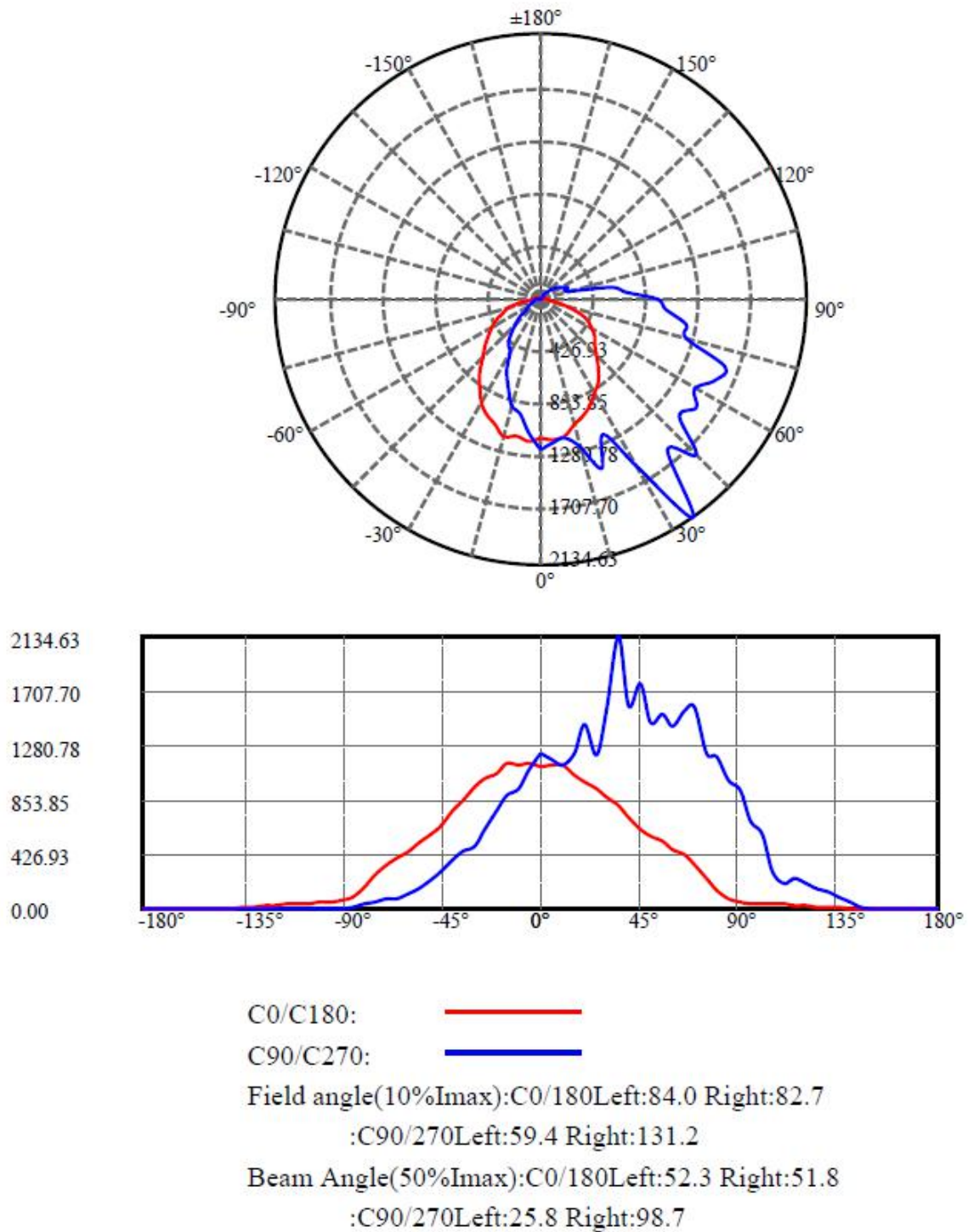
Zonal flux distribution table

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	1190.558	.000	.000	.000%	.000%
5.0	1148.977	27.968	27.968	.605%	.605%
10.0	1094.146	80.244	108.212	1.736%	2.341%
15.0	1043.934	126.830	235.042	2.743%	5.084%
20.0	1040.415	171.780	406.821	3.716%	8.800%
25.0	991.701	213.131	619.953	4.610%	13.410%
30.0	947.344	245.388	865.340	5.308%	18.718%
35.0	958.038	280.581	1145.921	6.069%	24.787%
40.0	853.764	302.285	1448.206	6.539%	31.326%
45.0	818.507	309.635	1757.841	6.698%	38.024%
50.0	772.899	321.567	2079.408	6.956%	44.979%
55.0	686.178	317.252	2396.660	6.862%	51.842%
60.0	623.691	302.773	2699.432	6.549%	58.391%
65.0	580.585	292.762	2992.194	6.333%	64.724%
70.0	524.640	279.850	3272.044	6.053%	70.777%
75.0	466.689	259.118	3531.162	5.605%	76.382%
80.0	395.597	230.724	3761.885	4.991%	81.373%
85.0	334.581	198.407	3960.292	4.292%	85.664%
90.0	278.787	167.945	4128.237	3.633%	89.297%
95.0	227.159	138.532	4266.769	2.997%	92.294%
100.0	176.190	109.600	4376.369	2.371%	94.665%
105.0	100.576	74.055	4450.424	1.602%	96.266%
110.0	77.044	46.427	4496.851	1.004%	97.271%
115.0	68.728	36.910	4533.761	.798%	98.069%
120.0	54.419	29.937	4563.698	.648%	98.717%
125.0	41.622	22.199	4585.897	.480%	99.197%
130.0	31.202	15.834	4601.732	.343%	99.539%
135.0	21.209	10.591	4612.322	.229%	99.768%
140.0	10.721	5.912	4618.234	.128%	99.896%
145.0	4.371	2.518	4620.752	.054%	99.951%
150.0	1.787	.907	4621.659	.020%	99.970%
155.0	1.663	.437	4622.096	.009%	99.980%
160.0	1.595	.342	4622.438	.007%	99.987%
165.0	1.595	.263	4622.700	.006%	99.993%
170.0	1.526	.185	4622.885	.004%	99.997%
175.0	1.553	.110	4622.996	.002%	99.999%
180.0	1.567	.037	4623.033	.001%	100.000%



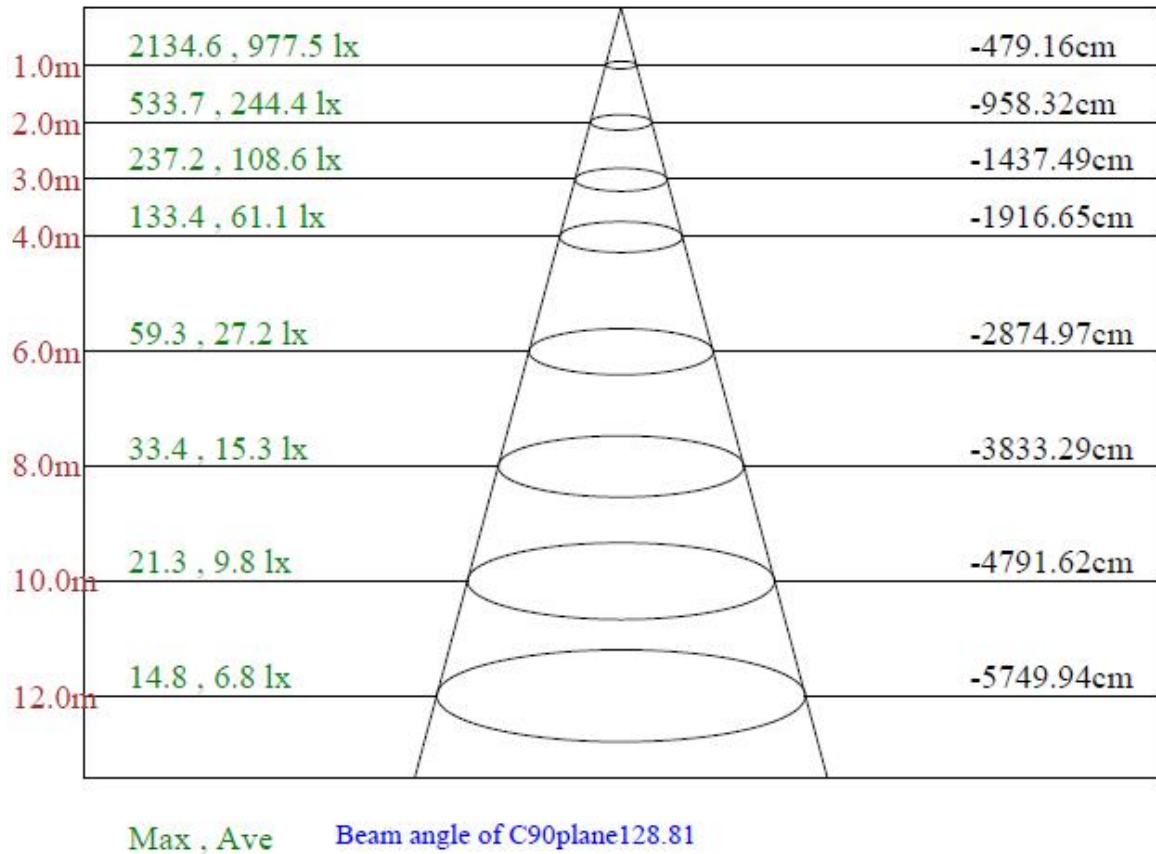
Luminous Intensity Distribution Diagram

Light Distribution Curve [Unit:cd]





Lux distance Curve



**Luminous Intensity Distribution Data**

C/γ(°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
0.0	1112.62	1129.56	1121.64	1046.42	991.88	939.54	869.16	810.88	710.37
22.5	1161.45	1201.25	1204.11	1126.92	1118.34	1075.45	986.38	972.97	1043.12
45.0	1189.16	1197.29	1228.08	1114.16	1107.34	1378.29	1206.31	1210.05	1517.29
67.5	1203.23	1182.34	1171.56	1164.08	1375.66	1331.89	1639.79	2069.75	1454.39
90.0	1213.35	1164.96	1133.51	1225.22	1445.59	1200.81	1561.28	2134.63	1588.33
112.5	1243.92	1214.23	1250.96	1151.55	1536.86	1504.09	1281.09	1510.69	1404.69
135.0	1233.14	1216.21	1202.35	1164.96	1063.80	1291.42	1296.04	1052.14	1131.75
157.5	1167.60	1232.92	1212.47	1115.26	997.60	1004.86	1037.19	967.03	867.18
180.0	1112.62	1144.07	1122.74	1140.99	1065.12	1025.97	960.87	853.32	769.97
202.5	1161.45	1133.29	1042.24	971.87	901.93	823.85	744.68	647.69	545.64
225.0	1189.16	1118.78	996.28	896.65	877.96	725.11	588.97	507.16	421.38
247.5	1203.23	1097.01	968.13	925.24	789.11	632.74	516.61	470.87	391.91
270.0	1213.35	1081.39	940.64	882.58	768.43	628.34	490.66	450.85	388.61
292.5	1243.92	1087.11	938.44	860.36	795.70	658.03	553.56	447.56	394.11
315.0	1233.14	1086.67	951.41	926.78	872.68	777.23	622.84	521.45	434.80
337.5	1167.60	1096.57	1021.79	989.90	938.66	869.60	802.08	701.57	596.67
360.0	1112.62	1129.56	1121.64	1046.42	991.88	939.54	869.16	810.88	710.37

C/γ(°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
0.0	629.44	572.04	528.71	463.17	418.97	342.87	244.56	142.73	83.57
22.5	872.68	822.75	896.65	769.09	747.98	618.66	547.40	437.22	381.80
45.0	1141.43	1227.42	1332.11	1080.95	1061.60	936.02	846.29	855.08	661.77
67.5	1793.52	1626.15	1422.06	1425.14	1478.58	1327.27	1214.23	1108.22	987.26
90.0	1761.19	1464.07	1527.85	1434.60	1547.86	1574.91	1214.89	1192.45	1007.49
112.5	1571.17	2101.86	1355.42	1385.11	1215.99	1212.25	1406.67	1004.64	971.87
135.0	1290.98	1053.24	1089.09	1141.21	841.45	804.06	706.85	656.27	625.26
157.5	761.61	813.52	693.22	602.61	678.70	541.03	481.64	376.74	291.85
180.0	652.53	589.19	516.39	453.49	395.87	338.25	265.89	168.03	96.77
202.5	471.53	387.30	310.54	232.91	171.11	131.30	99.85	80.05	64.44
225.0	350.57	281.73	221.03	174.40	126.68	91.05	70.82	55.86	30.35
247.5	309.22	238.40	180.34	120.74	86.87	75.00	58.28	36.73	16.72
270.0	292.29	221.69	157.25	116.78	82.91	75.22	53.44	35.85	13.20
292.5	316.26	253.36	186.72	133.28	96.99	74.34	60.26	39.81	15.84
315.0	367.50	286.35	224.11	172.64	132.18	104.25	80.05	56.74	39.15
337.5	514.19	427.32	337.37	272.93	205.63	147.79	115.90	83.13	65.98
360.0	629.44	572.04	528.71	463.17	418.97	342.87	244.56	142.73	83.57

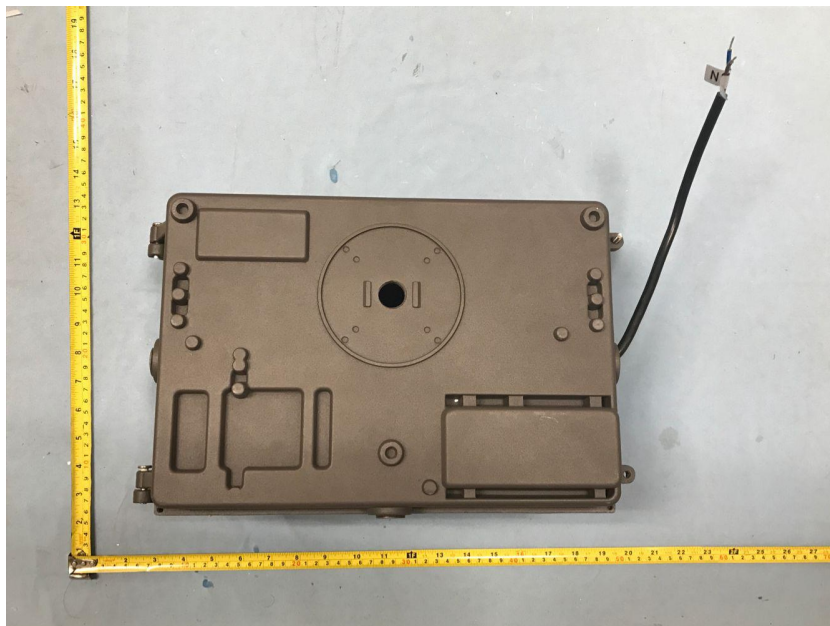
C/γ(°)	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0
0.0	56.30	44.21	42.67	40.25	35.85	28.37	21.33	15.40	10.56
22.5	313.62	216.85	155.05	111.06	75.00	52.12	35.63	22.21	13.64
45.0	608.54	518.37	414.35	270.07	186.72	132.62	92.59	69.94	51.02
67.5	890.05	741.60	546.52	235.54	225.65	229.83	191.34	148.45	114.14
90.0	933.38	691.46	577.31	287.23	197.50	233.78	199.26	162.53	128.66
112.5	801.64	706.19	515.07	242.58	214.65	202.56	166.27	125.36	96.55
135.0	462.95	423.36	334.95	231.81	141.63	97.65	69.72	50.36	31.89
157.5	190.24	130.86	91.27	66.86	51.02	38.05	27.71	20.01	14.52
180.0	65.76	51.02	47.29	45.53	41.35	35.41	28.59	20.89	13.20
202.5	46.85	35.85	28.81	22.65	16.72	11.66	8.14	5.94	4.40
225.0	10.34	7.26	5.06	3.74	2.86	2.20	1.98	1.76	1.76
247.5	1.54	1.54	1.76	1.98	2.20	2.20	2.42	2.42	2.42
270.0	1.76	1.76	2.20	2.42	2.64	2.64	2.64	2.64	2.64
292.5	2.64	1.98	2.20	2.42	2.42	2.64	2.64	2.64	2.64
315.0	21.77	16.06	12.54	9.46	7.26	5.50	4.62	3.96	3.08
337.5	53.22	46.19	42.01	35.63	29.25	22.43	15.84	11.44	8.14
360.0	56.30	44.21	42.67	40.25	35.85	28.37	21.33	15.40	10.56



C/γ(°)	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0
0.0	6.82	4.18	2.42	1.10	1.32	1.32	1.32	1.32	1.32
22.5	8.58	5.06	1.54	1.10	1.10	1.10	1.32	1.32	1.32
45.0	26.61	8.80	1.76	1.10	1.10	1.10	1.32	1.32	1.32
67.5	81.81	38.49	12.98	1.10	1.10	1.32	1.32	1.32	1.54
90.0	97.43	51.46	17.15	1.32	1.32	1.32	1.32	1.32	1.54
112.5	64.88	30.79	8.80	1.54	1.54	1.54	1.54	1.54	1.54
135.0	13.64	2.64	3.08	1.98	1.54	1.54	1.54	1.54	1.76
157.5	9.46	5.72	1.98	1.76	1.76	1.76	1.76	1.76	1.76
180.0	8.80	5.72	3.96	2.42	1.32	1.32	1.32	1.32	1.32
202.5	3.08	2.42	1.76	1.54	1.54	1.54	1.54	1.32	1.32
225.0	1.76	1.76	1.76	1.76	1.76	1.76	1.54	1.54	1.54
247.5	2.42	2.20	2.20	2.20	2.20	1.98	1.76	1.76	1.54
270.0	2.64	2.64	2.42	2.42	2.64	1.98	1.98	1.76	1.76
292.5	2.64	2.64	2.64	2.64	2.20	1.98	1.98	1.76	1.76
315.0	2.64	2.42	2.20	2.20	2.20	1.98	1.98	1.76	1.76
337.5	6.16	4.62	3.30	2.42	1.98	1.98	1.98	1.76	1.76
360.0	6.82	4.18	2.42	1.10	1.32	1.32	1.32	1.32	1.32
C/γ(°)	180.0								
0.0	1.32								
22.5	1.32								
45.0	1.54								
67.5	1.54								
90.0	1.54								
112.5	1.76								
135.0	1.76								
157.5	1.76								
180.0	1.32								
202.5	1.32								
225.0	1.54								
247.5	1.54								
270.0	1.54								
292.5	1.76								
315.0	1.76								
337.5	1.76								
360.0	1.32								



Photo Document



****End of test report****