



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 KEMEILAI Optoelectronic Co., LTD

Address:

#116, Xiangshan Rd., Songgang, Bao' an, Shenzhen, Guangdong

For Product:

High Bay Luminaires for Commercial and Industrial Buildings

Model No.:

KML-UFOH200-40 / KML-UFOH200-57

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.

Complied by: Ike Li

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 use 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 U.S. Government.



1 General

1.1 Product Information

Manufacturer	ShenZhen KEMEILAI Optoelectronic Co., LTD
Manufacturer Address	#116, Xiangshan Rd., Songgang, Bao' an, Shenzhen, Guangdong
Brand Name	KML
Luminaire Type	High Bay Luminaires for Commercial and Industrial Buildings
Model Number	KML-UFOH200-40 / KML-UFOH200-57
Rated Inputs	AC 100-277V 50/60Hz
Rated Power	200 W
Nominal CCT	4000K / 5700K
Date of Receipt Samples	2017-11-01

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	2018-09-20
AC Power Source	ALL POWER	APW-110N	992257	2018-08-26
Total Luminous Flux Standard Lamp	SENSING	110V/100W	S13100234	2018-09-14
Digital Power Meter	YOKOGAWA	WT310	C2QM02030V	2018-08-28
Integral Sphere	SENSING	SPR-600M	N.A	2018-08-26
Digital Power Meter	YOKOGAWA	WT210	91L929742	2018-08-28
Optical Color and Electrical Measurement System	SENSING	SPR-3000	N.A	2018-08-26
Temperature/humidity/clock	VICTOR	VC230	57636	2018-09-12
Digital Anemometer	TECMAN	TD8901	026141	2018-09-12

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
KML-UFOH200-40	120.01	60	1.671	199.70	0.996
KML-UFOH200-57	120.03	60	1.689	201.90	0.996

3.1.2 Photometric data

Model Number	Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	CRI	R9
KML-UFOH200-40	29835.18	149.4	3982	72.1	-24
KML-UFOH200-57	31072.41	153.9	5564	77.6	-8

3.1.3 Chromaticity Coordinate

Model Number	Duv	x	y	u'	v'
KML-UFOH200-40	-0.00055	0.3809	0.3758	0.2257	0.5012
KML-UFOH200-57	0.0025	0.3310	0.3447	0.2045	0.4792

3.2 Goniophotometer System

3.2.1 Electrical data

Model Number	Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
KML-UFOH200-40	120.07	60	1.6675	199.4800	0.9963

3.2.2 Photometric data

Luminous Flux (lm)	Efficacy (lm/W)	Zonal Lumen in 20-50°(%lm)
29853.00	149.65	51.565



3.3 Additional Test

Model Number	Test Item	Test Voltage (V)	Frequency(Hz)	Test Result
KML-UFOH200-40	Power Factor	277	60	0.925
	THDi	277	60	13.9%



4 Test Data

KML-UFOH200-40

Test Condition

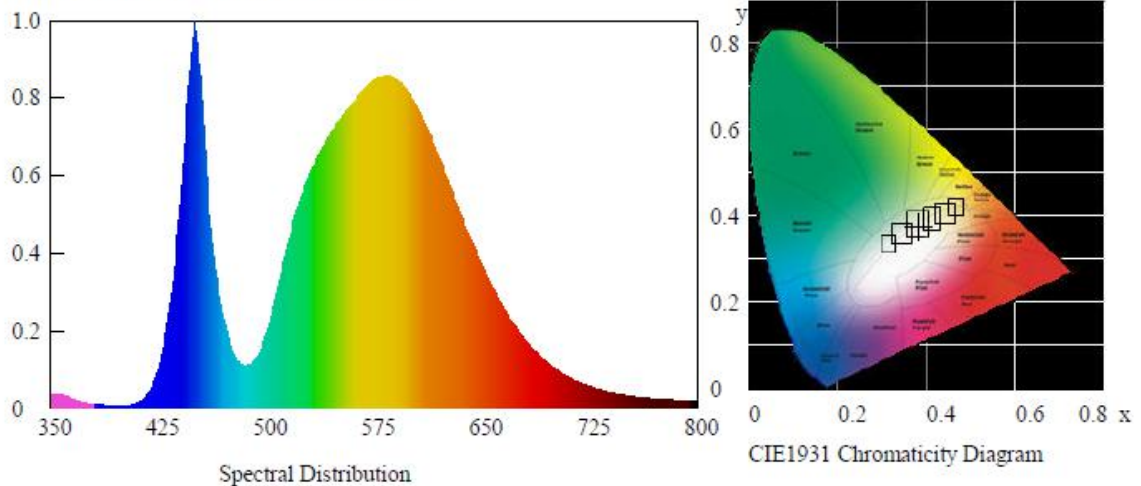
Temperature: 25°C

RH: 58%

Spectrum Range: 350-800 nm

Scan Step: 5 nm

Spectroradiometric Parameters

Chromaticity Coordinates: $x=0.3809$ $y=0.3758$ $u'=0.2257$ $v'=0.5012$

Correlated Color Temperature: 3982 K

Dominant Wavelength: 578.0 nm(E)

Colour Fidelity Index: $R_f=70$ Gamut Index: $R_g=94$

Luminous Flux: 29835.18 lm

Purity: 0.2713

Chromaticity Difference: -0.00055Duv

Peak Wavelength: 450.0 nm

Color Ratio: $K_r=37.4\%$ $K_g=56.1\%$ $K_b=6.5\%$

Bandwidth: 24.7nm

Radiant Flux: 95.807 W

Photosynthetically Active Radiation(PAR): 92.39W

Photosynthetic Photon Flux(PPF): 434.49 μ mol/sRendering Index: $R_a=72.1$ $R_1=70$ $R_2=79$ $R_3=85$ $R_4=70$ $R_5=68$ $R_6=69$ $R_7=82$ $R_8=54$ $R_9=-24$ $R_{10}=49$ $R_{11}=64$ $R_{12}=39$ $R_{13}=72$ $R_{14}=91$ $R_{15}=65$ $R_e=62$

Electric Parameters

Voltage: 120.01 V

Current: 1.671 A

Power Factor: 0.996

Power: 199.70 W

Luminous Efficacy: 149.4 lm/W

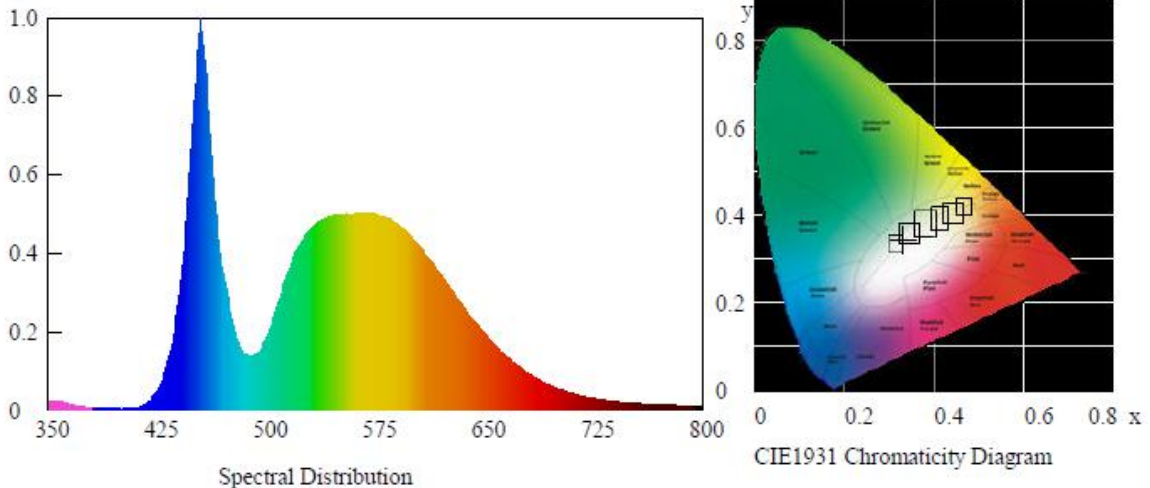
**KML-UFOH200-57****Test Condition**

Temperature: 25°C

RH: 58%

Spectrum Range: 350-800 nm

Scan Step: 5 nm

Spectroradiometric ParametersChromaticity Coordinates: $x=0.3310$ $y=0.3447$ $u'=0.2045$ $v'=0.4792$

Correlated Color Temperature: 5564 K

Dominant Wavelength: 543.0 nm(E)

Colour Fidelity Index: $R_f=74$ Gamut Index: $R_g=92$

Luminous Flux: 31072.41 lm

Purity: 0.0283

Chromaticity Difference: +0.0025Duv

Peak Wavelength: 455.0 nm

Color Ratio: $K_r=31.8\%$ $K_g=58.5\%$ $K_b=9.8\%$

Bandwidth: 23.7nm

Radiant Flux: 104.027 W

Photosynthetically Active Radiation(PAR): 100.89W

Photosynthetic Photon Flux(PPF): 462.04 μ mol/sRendering Index: $R_a=77.6$ $R_1=76$ $R_2=84$ $R_3=86$ $R_4=76$ $R_5=75$ $R_6=75$ $R_7=86$ $R_8=64$ $R_9=-8$ $R_{10}=58$ $R_{11}=71$ $R_{12}=44$ $R_{13}=79$ $R_{14}=92$ $R_{15}=72$ $R_e=69$ **Electric Parameters**

Voltage: 120.03 V

Current: 1.689 A

Power Factor: 0.996

Power: 201.90 W

Luminous Efficacy: 153.9 lm/W

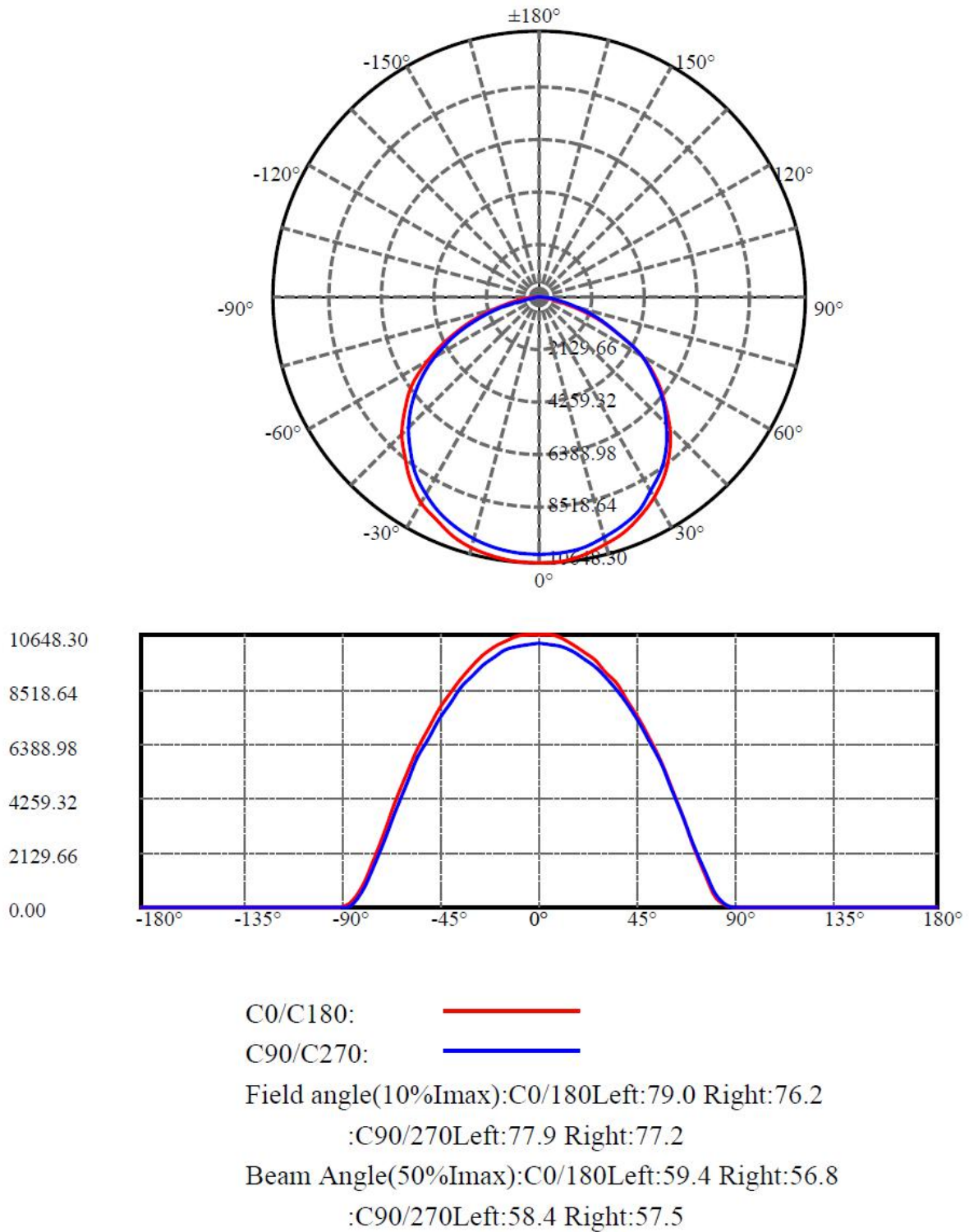
**Zonal Flux Diagram**

Zonal flux distribution table

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10346.320	.000	.000	.000%	.000%
5.0	10332.620	247.211	247.211	.828%	.828%
10.0	10243.480	736.072	983.283	2.466%	3.294%
15.0	10056.610	1204.188	2187.470	4.034%	7.327%
20.0	9804.347	1636.822	3824.292	5.483%	12.810%
25.0	9484.619	2023.056	5847.348	6.777%	19.587%
30.0	9062.576	2347.163	8194.511	7.862%	27.450%
35.0	8582.330	2598.336	10792.850	8.704%	36.153%
40.0	8006.689	2767.753	13560.600	9.271%	45.425%
45.0	7338.913	2841.362	16401.960	9.518%	54.942%
50.0	6596.880	2815.930	19217.890	9.433%	64.375%
55.0	5754.362	2685.571	21903.460	8.996%	73.371%
60.0	4801.701	2440.004	24343.460	8.173%	81.544%
65.0	3677.403	2061.286	26404.750	6.905%	88.449%
70.0	2546.633	1575.966	27980.720	5.279%	93.728%
75.0	1474.889	1051.161	29031.880	3.521%	97.249%
80.0	596.771	554.319	29586.200	1.857%	99.106%
85.0	98.620	188.954	29775.150	.633%	99.739%
90.0	4.829	28.325	29803.480	.095%	99.834%
95.0	4.019	2.423	29805.900	.008%	99.842%
100.0	4.320	2.266	29808.160	.008%	99.850%
105.0	4.907	2.469	29810.630	.008%	99.858%
110.0	5.807	2.800	29813.430	.009%	99.867%
115.0	6.695	3.166	29816.600	.011%	99.878%
120.0	7.765	3.515	29820.120	.012%	99.890%
125.0	8.718	3.810	29823.930	.013%	99.903%
130.0	9.527	3.967	29827.890	.013%	99.916%
135.0	10.179	3.982	29831.880	.013%	99.929%
140.0	10.793	3.883	29835.760	.013%	99.942%
145.0	11.354	3.695	29839.450	.012%	99.955%
150.0	11.810	3.411	29842.860	.011%	99.966%
155.0	12.176	3.035	29845.900	.010%	99.976%
160.0	12.163	2.553	29848.450	.009%	99.985%
165.0	11.993	1.991	29850.440	.007%	99.991%
170.0	11.811	1.412	29851.850	.005%	99.996%
175.0	12.006	.852	29852.710	.003%	99.999%
180.0	12.450	.292	29853.000	.001%	100.000%

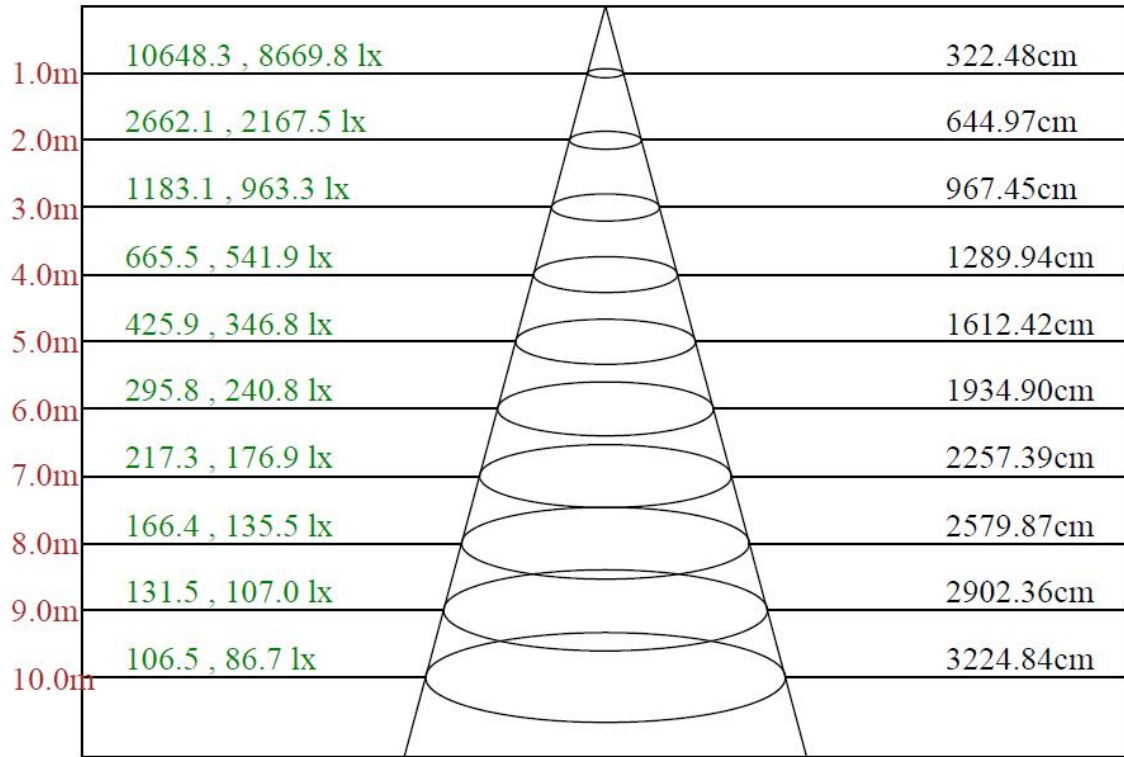
**Luminous Intensity Distribution Diagram**

Light Distribution Curve [Unit:cd]





Lux distance Curve



Max , Ave

Beam angle of C0plane116.30

**Luminous Intensity Distribution Data**

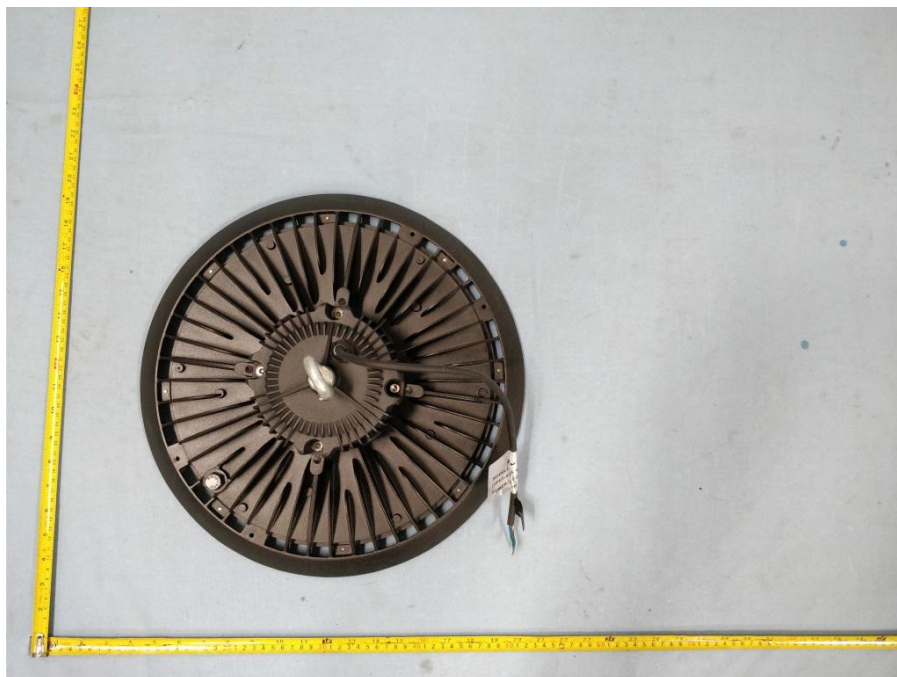
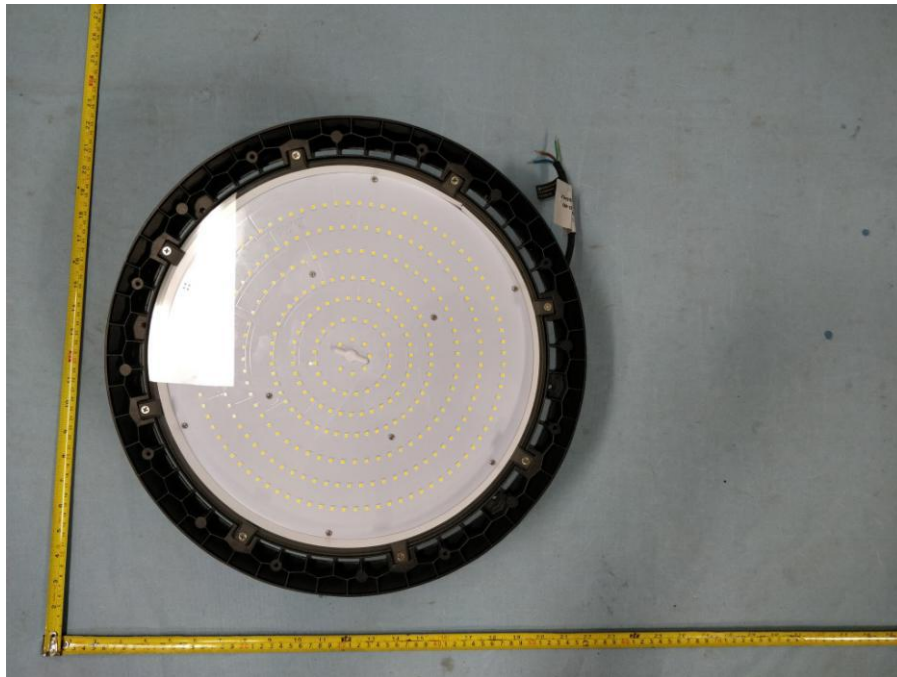
C/ γ (°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
0.0	10648.30	10629.51	10495.87	10268.28	10001.01	9660.66	9211.74	8708.53	8073.77
22.5	10525.11	10493.79	10368.51	10159.70	9904.96	9541.65	9101.07	8599.95	8002.77
45.0	10389.39	10401.91	10264.10	10063.65	9802.65	9460.21	9017.55	8537.31	7946.40
67.5	10330.92	10320.48	10218.17	10009.37	9750.45	9426.81	8977.88	8497.64	7915.08
90.0	10287.07	10278.72	10168.05	9982.22	9719.13	9397.57	8963.26	8480.93	7908.81
112.5	10245.31	10239.05	10109.59	9907.05	9652.31	9334.93	8925.68	8434.99	7860.79
135.0	10180.58	10170.14	10088.71	9882.00	9635.61	9318.23	8894.36	8420.38	7854.52
157.5	10163.88	10143.00	10072.01	9865.29	9612.64	9305.70	8877.66	8378.62	7831.56
180.0	10648.30	10629.51	10550.16	10408.18	10174.32	9827.71	9447.69	8944.47	8382.79
202.5	10525.11	10485.43	10431.15	10257.84	10023.98	9717.04	9309.88	8806.66	8265.86
225.0	10389.39	10404.00	10316.30	10149.26	9902.88	9587.58	9188.77	8723.14	8151.02
247.5	10330.92	10312.13	10255.75	10072.01	9842.32	9533.30	9113.60	8654.24	8080.03
270.0	10287.07	10264.10	10205.64	10036.51	9785.95	9472.74	9063.49	8587.42	8011.13
292.5	10245.31	10234.87	10163.88	9996.84	9727.48	9433.07	9005.02	8533.13	7952.66
315.0	10180.58	10161.79	10109.59	9927.93	9677.37	9387.13	8965.35	8516.43	7944.31
337.5	10163.88	10153.44	10078.27	9919.58	9656.49	9349.55	8938.21	8493.46	7925.52
360.0	10648.30	10629.51	10495.87	10268.28	10001.01	9660.66	9211.74	8708.53	8073.77
C/ γ (°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
0.0	7370.10	6587.09	5703.86	4672.37	3514.15	2347.98	1259.71	424.08	46.56
22.5	7288.67	6522.36	5645.39	4693.25	3464.87	2331.70	1265.76	464.59	57.42
45.0	7286.58	6505.66	5647.48	4659.85	3510.60	2394.76	1328.19	489.64	71.83
67.5	7236.47	6488.96	5618.25	4651.49	3538.58	2394.34	1341.77	515.74	78.09
90.0	7209.32	6453.46	5639.13	4661.93	3536.28	2426.08	1403.78	556.25	89.79
112.5	7207.24	6451.37	5607.81	4666.11	3564.89	2439.86	1389.79	547.90	95.42
135.0	7165.48	6417.96	5622.43	4672.37	3537.53	2411.88	1407.75	558.13	86.86
157.5	7165.48	6438.84	5586.93	4634.79	3553.61	2431.09	1373.50	529.11	83.31
180.0	7731.33	6985.91	6169.49	5200.64	4104.43	2962.28	1813.87	888.25	182.70
202.5	7610.22	6873.15	6035.85	5119.21	4014.65	2824.47	1742.87	750.23	151.17
225.0	7505.82	6783.37	5935.63	4996.02	3881.01	2768.10	1648.91	717.45	133.22
247.5	7424.39	6678.97	5866.72	4918.76	3793.32	2644.90	1590.45	654.60	110.25
270.0	7345.05	6637.21	5787.38	4831.06	3732.76	2626.11	1552.86	633.30	99.18
292.5	7322.08	6620.50	5743.53	4847.77	3691.00	2561.38	1475.61	601.98	91.04
315.0	7288.67	6566.21	5733.09	4797.66	3691.00	2609.41	1498.58	596.34	97.93
337.5	7265.70	6539.07	5726.83	4803.92	3709.79	2571.82	1504.84	620.77	103.15
360.0	7370.10	6587.09	5703.86	4672.37	3514.15	2347.98	1259.71	424.08	46.56
C/ γ (°)	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0
0.0	3.13	2.92	3.13	4.18	5.01	6.26	6.89	7.93	8.98
22.5	4.18	3.97	4.18	4.80	5.85	6.68	7.93	8.77	9.40
45.0	4.18	3.97	4.39	5.01	6.06	6.68	8.14	9.19	9.81
67.5	4.59	4.18	4.59	5.22	6.06	6.89	7.93	8.98	9.61
90.0	4.18	3.97	4.39	5.01	5.85	6.68	7.93	8.98	9.81
112.5	4.59	4.39	4.39	5.01	5.85	6.68	7.93	8.98	9.61
135.0	4.39	4.18	4.39	5.01	5.85	6.68	7.93	8.98	9.81
157.5	4.59	3.97	4.59	5.01	6.06	6.68	7.93	8.98	9.61
180.0	8.77	3.55	4.18	4.39	5.22	6.47	7.31	8.14	9.19
202.5	6.47	4.18	4.39	5.01	5.85	6.68	7.52	8.56	9.40
225.0	5.43	4.18	4.39	4.80	5.85	6.68	7.93	8.77	9.61
247.5	4.80	4.18	4.39	4.80	5.85	6.89	7.93	8.77	9.61
270.0	4.39	4.18	4.39	5.01	5.85	6.89	7.52	8.56	9.40
292.5	4.59	4.18	4.39	5.22	5.85	6.68	7.73	8.77	9.61
315.0	4.39	4.18	4.59	5.01	5.85	6.89	7.73	8.56	9.40
337.5	4.59	4.18	4.39	5.01	6.06	6.68	7.93	8.56	9.61
360.0	3.13	2.92	3.13	4.18	5.01	6.26	6.89	7.93	8.98



C/ γ (°)	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0
0.0	9.61	10.23	10.65	11.28	11.28	11.48	11.28	10.86	11.28
22.5	10.44	11.07	11.48	12.32	12.53	12.74	12.53	12.11	12.53
45.0	10.65	11.07	11.69	12.32	12.53	12.53	12.32	12.11	12.32
67.5	10.44	11.07	11.69	12.11	12.53	12.53	12.53	11.90	12.74
90.0	10.23	11.07	11.48	12.32	12.53	12.53	12.32	12.11	12.32
112.5	10.44	11.07	11.69	12.11	12.53	12.32	12.32	11.90	12.32
135.0	10.23	11.07	11.48	12.11	12.32	12.53	12.11	11.90	12.32
157.5	10.44	10.86	11.90	12.11	12.32	12.32	12.32	11.90	12.32
180.0	10.02	10.44	10.65	11.28	11.69	11.90	11.28	11.48	11.69
202.5	10.02	10.65	11.28	11.48	12.11	12.11	11.90	11.69	11.69
225.0	10.23	10.86	11.28	11.69	12.32	11.90	11.90	11.90	11.69
247.5	10.02	10.65	11.28	11.48	12.11	11.90	11.69	11.90	11.90
270.0	10.02	10.65	11.28	11.69	12.11	11.90	11.90	11.90	11.69
292.5	10.02	10.44	11.07	11.48	11.90	12.11	11.90	11.90	11.69
315.0	10.02	10.86	11.48	11.48	12.11	11.90	11.90	11.69	11.90
337.5	10.02	10.65	11.28	11.69	11.90	11.90	11.69	11.69	11.69
360.0	9.61	10.23	10.65	11.28	11.28	11.48	11.28	10.86	11.28
C/ γ (°)	180.0								
0.0	11.69								
22.5	12.32								
45.0	12.74								
67.5	12.95								
90.0	12.53								
112.5	12.53								
135.0	12.53								
157.5	12.32								
180.0	11.69								
202.5	12.32								
225.0	12.74								
247.5	12.95								
270.0	12.53								
292.5	12.53								
315.0	12.53								
337.5	12.32								
360.0	11.69								



Photo Document



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