TEST REPORT

Reference No	:	WTS17F0991028N
Applicant	:	Kinglumi Co., Ltd.
Address	:	Bldg 3, Nangang Third Industrial Zone, Tangtou, Shiyan Town, Baoan District, Shenzhen City, China
Manufacturer	:	Kinglumi Co., Ltd.
Address	:	Bldg 3, Nangang Third Industrial Zone, Tangtou, Shiyan Town, Baoan District, Shenzhen City, China
Product Name	:	LED Panel Light
Model No	:	28W Apollo LED Panel Light
Ratings	:	100-240VAC, 50/60Hz, 28W
Standards	:	IES LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products
Date of Receipt sample	:	2017-09-22
Date of Test	:	2017-09-25 to 2017-09-26
Date of Issue	:	2017-09-25
Test Report Form No	:	WPL-LM7908A-01A
Test Result	:	See the attached sheets

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:
Waltek Services (Foshan) Co., Ltd.
Address: No. 13-19, 2/F, 2nd Building, Sunlink International Machinery City, Chencun Town, Shunde District, Foshan, Guangdong, China

Tel :+86-757-23811398
Fax:+86-757-23811381

Compiled by: Approved by:

Finn Yu / Project Engineer Akin Xu / Manager

Trade Mark: N
Measurement Point: N
Characteristic data (not shown on the marking plate) N
Purpose of the product (Description of intended use) LED Lamp for generally lighting purpose. Other information refers to photos in end page.
Possible test case verdicts: - test case does not apply to the test object: ……: N(.A.) / not included in the order - test object does meet the requirement……: P(ass) - test object does not meet the requirement: ……: F(ail) **Possible suffixes to the verdicts:** - suffix for detailed information for the client……: - C(omment) - suffix for important information for factory inspection....: - M(anufacturing)
General remarks: "(See Attachment #)" refers to additional information appended to the report. “(See remark #)” refers to a remark appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a comma (point) is used as the decimal separator. Remark: 1. Measurement was conducted at voltage 240VAC 50Hz and at a stable ambient temperature 25°C±1°C. 2. Detail information for models covered in this report as below:

Item	Model	Ratings	CCT	Driver
1	28W Apollo LED Panel Light	100-240VAC, 50/60Hz, 28W	4000K	Model: 28W DRIVER NON DIMMABLE

Test summary:

Testing is performed in accordance with the procedures outlined in IES LM-79-08. The sample is evaluated for photometric and electrical characteristics using an integrating sphere and a goniophotometer, located in an accredited, temperature and humidity-controlled, draft free photometric laboratory.

☒ Test No. 1 : Integrating Sphere Test

The sample was tested according to the IES LM-79-08.

Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load. The AC power supply, while operating the product, shall have a sinusoidal voltage waveshape at the prescribed frequency 50Hz or 60Hz such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item. It was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

☒ Test No. 2: Goniophotometer Test

The sample was tested according to the IES LM-79-08.

Photometric paramters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.

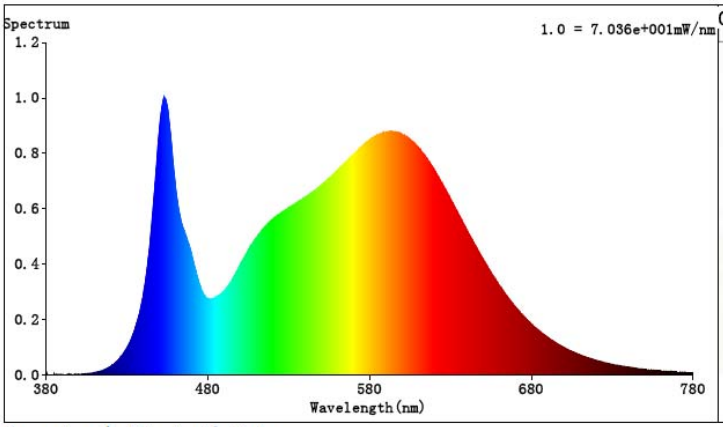
The sample was operated at Rated Volts(see Table 1). It was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 22.5° horizontal intervals.

IES LM-79-08			
Clause	Requirement – Test	Measuring result – Remark	Verdict
2.0	Ambient Conditions		P
2.1	Genaral		P
2.2	Air Temperature		P
2.3	Thermal Condition for Mounting SSL Products		P
2.4	Air Movement		P
3.0	Power Supply Characteristics		P
3.1	Waveshape of AC power supply		P
3.2	Voltage regulation		P
4.0	Seasoning of SSL Product		N
	No seasoning of SSL product		N
5.0	Stabilisation of SSL Product		P
	SSL product has sufficiently stabilized before measurement	Stabilized 30 minute	P
6.0	Operation Orientation		P
	SSL product shall be stabilized and measured in intended operating orientation	As normal working	P
7.0	Electrical Settings		P
	SSL product shall be operated at rated voltage		P
	SSL product with dimming capability are tested at maximum input power condition		N
	SSL product with different modes are measured in all relvant modes		N
8.0	Electrical Instrumentations		P
8.1	Circuits		P
8.2	Uncertainties		P
9.0	Test Methodes for Luminous Flux measurement		P
9.1	Integrating sphere with a spectroradiometer (Sphere-spectroradiometer system)		P
9.2	Integrating sphere with a photometer head (Sphere-photometer system)		N
9.3	Goniophotometer		P
10.0	Luminous Intensity Distribution		P
	Reporting acc. to IES LM-63		P
11.0	Luminous Efficay		P
	Calculation	See table 1	P
12.0	Test Methodes for Color Characteristics of SSL Products		P
	Measurements	See table 1	P
13.0	Uncertainty statement		N

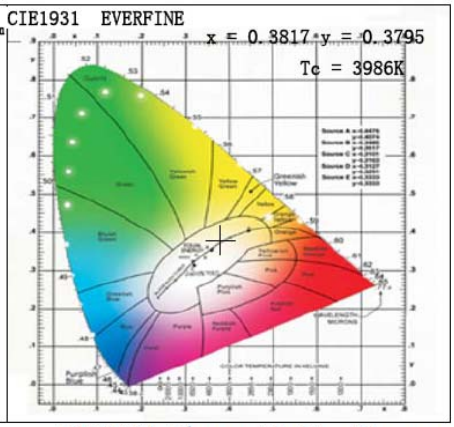
Table 1	**Test data**		
Model:	28W Apollo LED Panel Light		
Rated Voltage:	100-240VAC	Rated Power (W):	28
Rated luminous flux (lm):	N	Ambient temperature 25 ±1 (°C):	25.0
Test item		**Measured Value**	
		Integrating Sphere	**Goniophotometer**
Key Photometric Results			
Luminous Efficacy (Lumens/Watt)		---	129.87
Total Luminous Flux (Lumens)		---	3596.8
Peak Intensity (cd)		---	2545
Total Radiant Flux (Watts)		10.756	---
Correlated Color Temperature (CCT)		3986	---
Color Rendering Index (CRI)		82.1	---
Chromaticity (Chroma x / Chroma y)		0.3817 / 0.3795	---
Chromaticity (Chroma u' / Chroma v')		0.2248 / 0.5030	---
Duv Value		9.26e-04	---
Stabilization Time (Light and Power) (Minutes)		30	30
Total Run Time (Minutes)		60	90
Electrical Input Results			
Input Power (Watts)		---	27.70
Input Voltage (Volts AC)		---	240.3
Input Current (Amps)		---	0.1217
Input Frequency (Hertz)		---	50.0
Power Factor		---	0.9470
Additional Information			
Test Geometry Configuration		4π	Type C
Ambient Temperature (°C):		25.0	25.0
ISTMT (In-Situ Temperature Measurement) (°C):		N	
Supplementary Information: - Absorbtion Correction used: Yes - Stabilisation was considered reached by: the variation (maximum-minimum) of at least 3 readings of the light output and electrical power over a period of 30 minutes is less than 0.5%.			

Table 2	Spectrum Test
Model:	28W Apollo LED Panel Light

Spectrum



Spectral Distribution



CIE1931 Chromaticity Diagram

Colorimetric Quantities

Chromaticity Coordinate: x = 0.3817 y = 0.3795 / u' = 0.2248 v' = 0.5030 (duv=9.26e-04)

Tc= 3986K Prcp WL: λ d=578.6nm Purity=28.5%

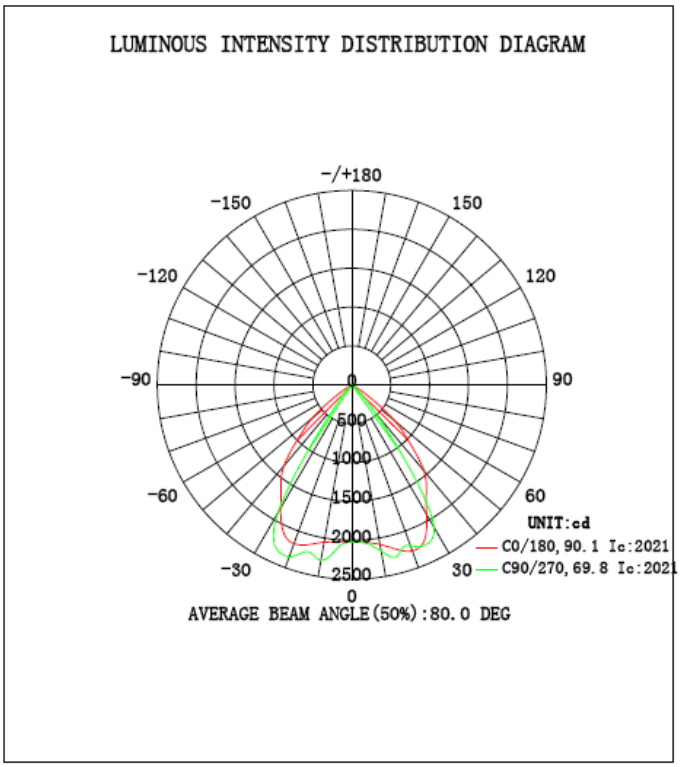
Peak WL: λp=453nm Half Width: Δλp=21.8nm Ratio:R=19.7% G=76.9% B=3.4%

Render Index: Ra = 82.1

R1 =80	R2 =90	R3 =96	R4 =79	R5 =80	R6 =86	R7 =84
R8 =61	R9 =2	R10=76	R11=78	R12=60	R13=83	R14=98 R15=74

Table 3	Luminous intensity distribution diagram and C0 Plane Isolux Diagram
Model:	28W Apollo LED Panel Light

DATA OF LAMP		PHOTOMETRIC DATA		Eff: 129.87 lm/W	
MODEL	Apollo LED Panel Light	Imax(cd)	2545	S/MH(C0/180)	1.30
NOMINAL POWER(W)	28	LOR(%)	100.0	S/MH(C90/270)	1.04
RATED VOLTAGE(V)	240	TOTAL FLUX(lm)	3596.8	η UP,DN(C0-180)	0.1,48.6
NOMINAL FLUX(lm)	3596.83	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.1,51.3
LAMPS INSIDE	1	η up(%)	0.1	CIBSE SHR NOM	0.50
TEST VOLTAGE(V)	240	η down(%)	99.9	CIBSE SHR MAX	0.70



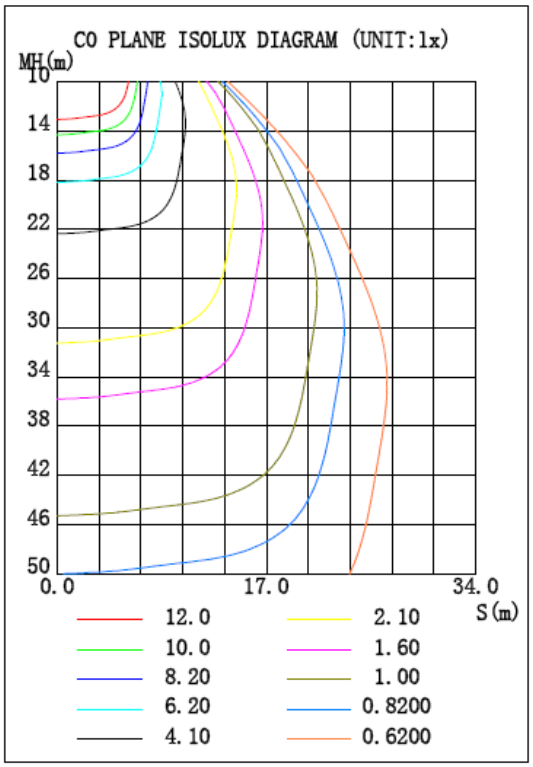


Table 4	Isocandela Diagram
Model:	28W Apollo LED Panel Light

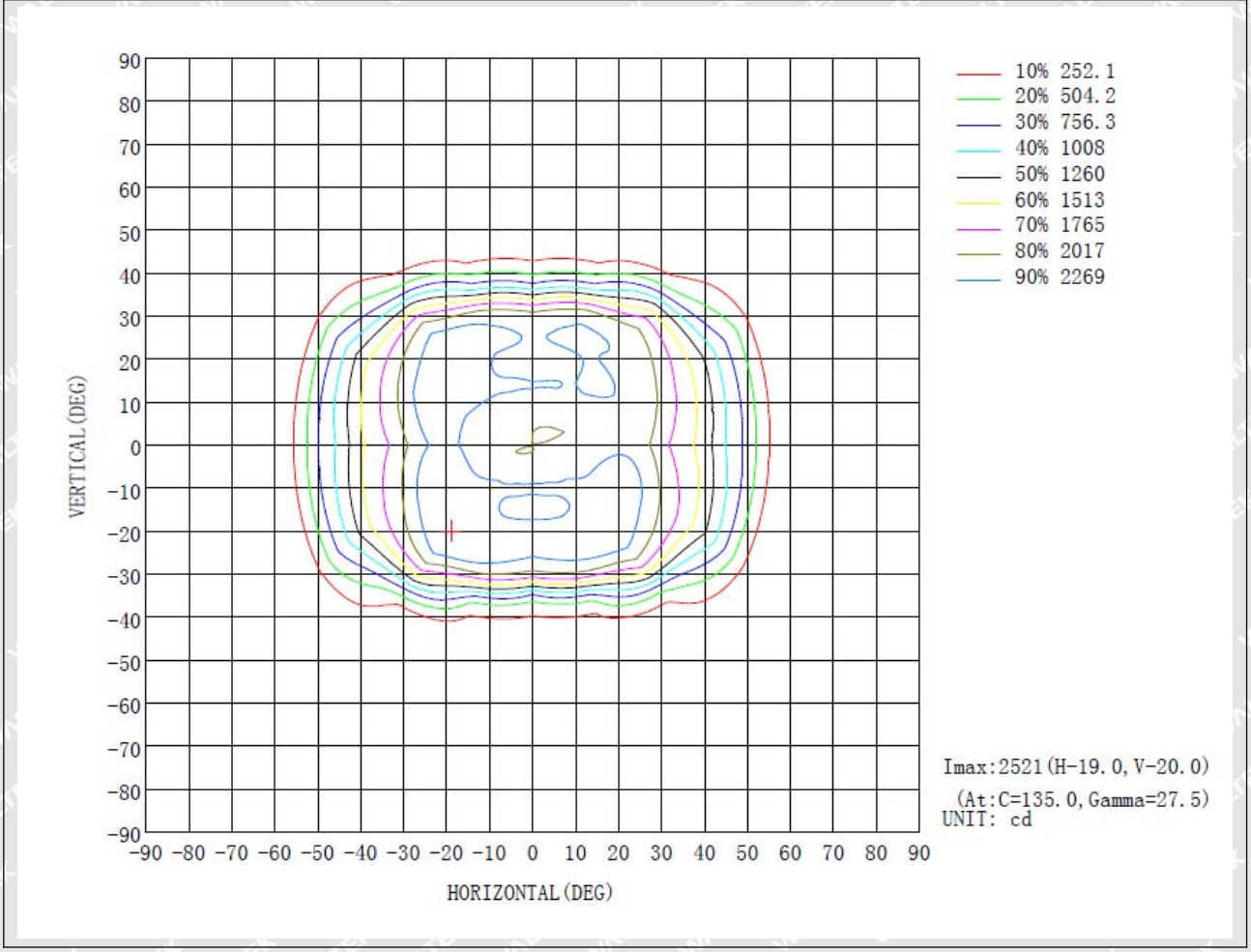
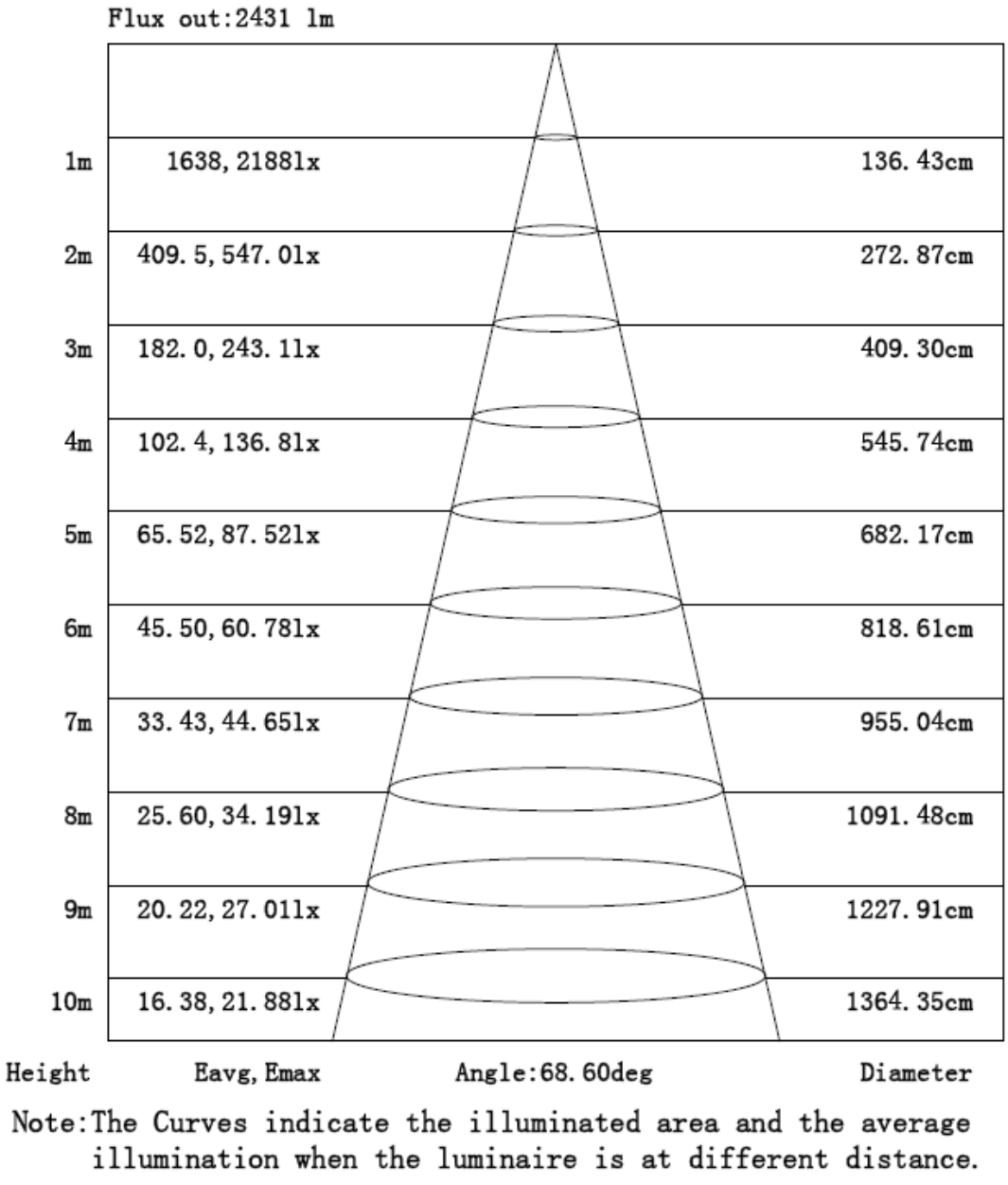


Table 5	AAI Figure
Model:	28W Apollo LED Panel Light



Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Table 6	Isolux Diagram
Model:	28W Apollo LED Panel Light

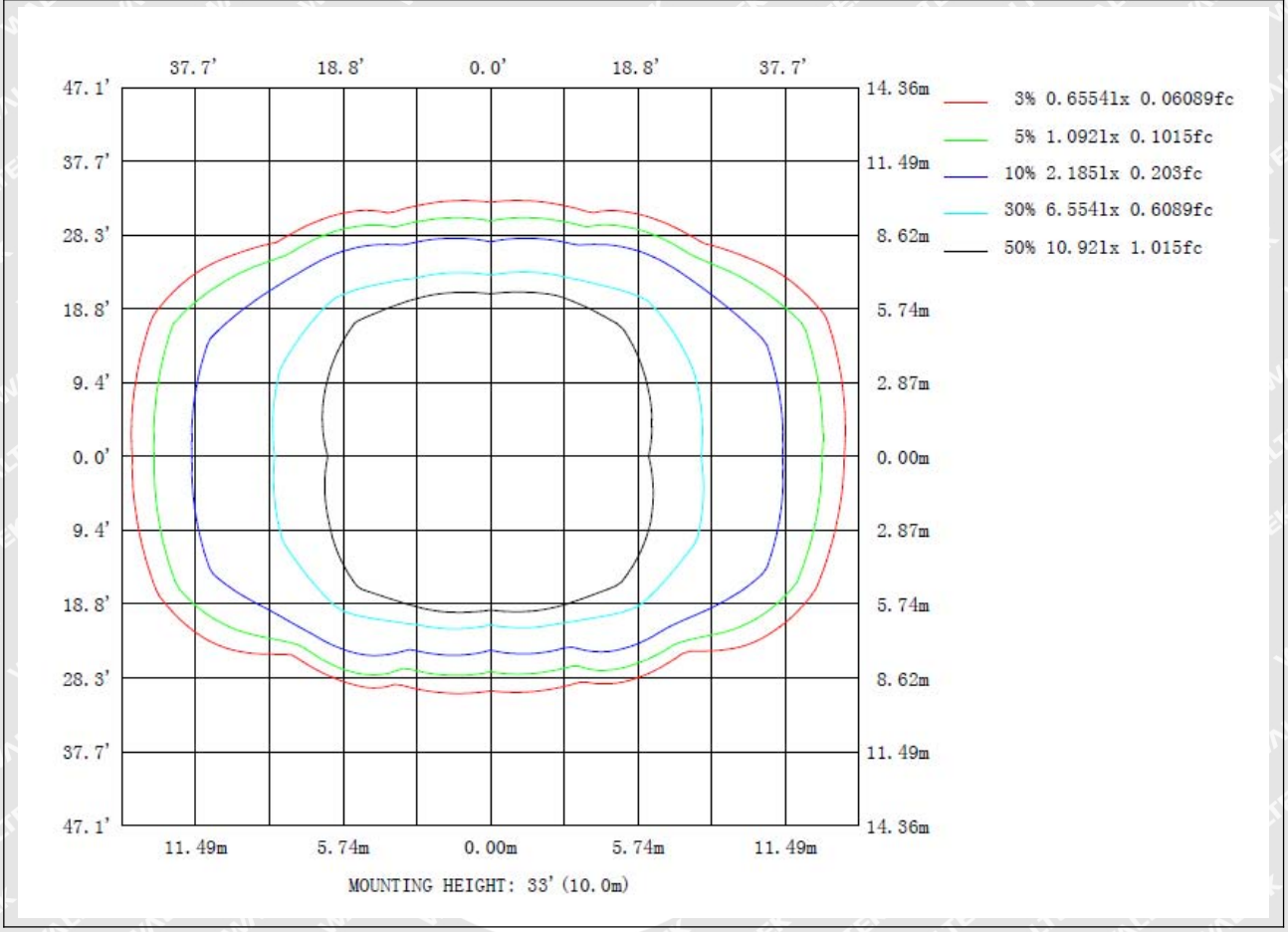


Table 7	Zonal Flux Diagram
Model:	28W Apollo LED Panel Light

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
5	2024	2055	2103	2062	2034	2034	2042	2028	0- 5	48.60	48.60	1.35, 1.35
10	2054	2226	2292	2230	2084	2109	2168	2090	5- 10	150.6	199.2	5.54, 5.54
15	2125	2318	2220	2369	2185	2266	2271	2226	10- 15	261.5	460.7	12.8, 12.8
20	2174	2309	2352	2384	2271	2424	2200	2363	15- 20	375.8	836.5	23.3, 23.3
25	2086	2412	2310	2513	2204	2384	2264	2280	20- 25	490.2	1327	36.9, 36.9
30	1828	2363	1907	2500	1922	2416	2115	2277	25- 30	577.2	1904	52.9, 52.9
35	1592	2034	716.0	2183	1669	2227	1236	2104	30- 35	581.3	2485	69.1, 69.1
40	1358	1295	240.8	1475	1446	1661	468.7	1624	35- 40	468.9	2954	82.1, 82.1
45	978.3	387.4	92.52	508.4	1047	755.4	170.8	773.2	40- 45	325.1	3279	91.2, 91.2
50	661.9	79.39	12.88	100.8	724.3	218.1	50.57	212.8	45- 50	189.2	3469	96.4, 96.4
55	254.9	9.034	2.220	13.46	284.1	33.67	4.709	34.91	50- 55	92.95	3561	99.99
60	63.90	1.212	1.098	1.331	68.09	2.232	0.9254	2.182	55- 60	25.70	3587	99.7, 99.7
65	2.650	0.8652	0.8833	0.8694	3.509	0.8496	0.7852	0.8252	60- 65	3.472	3591	99.8, 99.8
70	0.6668	0.5663	0.7278	0.5679	0.7367	0.5832	0.6966	0.5636	65- 70	0.4299	3591	99.8, 99.8
75	0.4258	0.4107	0.5796	0.4057	0.4871	0.4543	0.3896	0.4383	70- 75	0.3049	3591	99.8, 99.8
80	0.2396	0.2670	0.4029	0.2515	0.2732	0.2376	0.1935	0.2370	75- 80	0.2000	3592	99.9, 99.9
85	0.1092	0.0948	0.0426	0.1148	0.1294	0.1246	0.1078	0.1212	80- 85	0.1095	3592	99.9, 99.9
90	0.0244	0.0227	0.0165	0.0211	0.0273	0.0267	0.0257	0.0247	85- 90	0.0282	3592	99.9, 99.9
95	0.1079	0.0733	0.0422	0.0568	0.1316	0.0584	0.0501	0.0734	90- 95	0.0251	3592	99.9, 99.9
100	0.1162	0.1193	0.0634	0.0969	0.1571	0.1100	0.0836	0.1360	95-100	0.0521	3592	99.9, 99.9
105	0.1820	0.1460	0.0736	0.1174	0.1794	0.1343	0.1059	0.1734	100-105	0.0681	3592	99.9, 99.9
110	0.4657	0.2361	0.0867	0.1549	0.2508	0.1590	0.1026	0.2833	105-110	0.0835	3592	99.9, 99.9
115	1.100	0.3306	0.1235	0.2202	0.2404	0.2382	0.1209	0.4184	110-115	0.1414	3592	99.9, 99.9
120	1.332	0.4197	0.2146	0.3131	0.4720	0.3959	0.2142	0.5760	115-120	0.1891	3592	99.9, 99.9
125	0.5433	0.5100	0.3581	0.4162	0.5175	0.6180	0.4434	0.7736	120-125	0.2293	3592	99.9, 99.9
130	1.043	0.6162	0.5296	0.5303	0.7802	0.8360	0.7673	0.9621	125-130	0.2877	3593	99.9, 99.9
135	1.102	0.7061	0.8126	0.7071	1.047	1.045	1.162	1.172	130-135	0.3488	3593	99.9, 99.9
140	1.270	0.9981	1.146	0.9913	1.360	1.412	1.661	1.561	135-140	0.4193	3594	99.9, 99.9
145	1.459	1.402	1.373	1.287	1.866	1.942	2.246	2.077	140-145	0.4995	3594	99.9, 99.9
150	1.611	1.694	1.669	1.526	2.334	2.448	2.797	2.581	145-150	0.5514	3595	99.9, 99.9
155	1.981	2.018	1.903	1.757	2.798	2.884	3.269	3.034	150-155	0.5749	3595	100, 100
160	2.269	2.212	2.164	1.963	3.297	3.303	3.596	3.298	155-160	0.5553	3596	100, 100
165	2.408	2.372	2.183	2.042	3.380	3.577	3.835	3.534	160-165	0.4701	3596	100, 100
170	2.547	2.577	2.339	2.219	3.485	3.490	3.580	3.549	165-170	0.3501	3597	100, 100
175	2.856	2.904	2.492	2.504	3.314	3.340	3.316	3.317	170-175	0.2134	3597	100, 100
180	3.213	3.117	2.889	2.951	3.229	3.126	2.944	2.954	175-180	0.0725	3597	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Table 8	Luminous Distribution Intensity Data
Model:	28W Apollo LED Panel Light

Table--1 UNIT: cd

C(DEG) / γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019			
5	2024	2034	2055	2084	2103	2088	2062	2041	2034	2035	2034	2040	2042	2035	2028	2025			
10	2054	2090	2226	2284	2292	2292	2230	2109	2084	2080	2109	2152	2168	2145	2090	2052			
15	2125	2241	2318	2227	2220	2248	2369	2279	2185	2191	2266	2303	2271	2295	2226	2128			
20	2174	2401	2309	2336	2352	2356	2384	2493	2271	2343	2424	2210	2200	2202	2363	2233			
25	2086	2371	2412	2374	2310	2416	2513	2503	2204	2407	2384	2304	2264	2307	2280	2263			
30	1828	2124	2363	2183	1907	2245	2500	2241	1922	2261	2416	2268	2115	2287	2277	2117			
35	1592	1847	2034	1233	716	1338	2183	1905	1669	1944	2227	1715	1236	1769	2104	1838			
40	1358	1574	1295	335	241	371	1475	1635	1446	1649	1661	717	469	720	1624	1552			
45	978	1188	387	120	92.5	131	508	1233	1047	1274	755	225	171	228	773	1172			
50	662	704	79.4	22.4	12.9	25.9	101	789	724	797	218	62.6	50.6	62.7	213	732			
55	255	225	9.03	1.61	2.22	1.72	13.5	292	284	334	33.7	4.46	4.71	6.41	34.9	324			
60	63.9	24.5	1.21	1.10	1.10	1.12	1.33	36.1	68.1	46.1	2.23	1.02	0.93	0.98	2.18	54.1			
65	2.65	1.40	0.87	0.91	0.88	0.92	0.87	1.99	3.51	2.44	0.85	0.80	0.79	0.77	0.83	3.32			
70	0.67	0.71	0.57	0.75	0.73	0.72	0.57	0.77	0.74	0.76	0.58	0.72	0.70	0.69	0.56	0.71			
75	0.43	0.45	0.41	0.57	0.58	0.55	0.41	0.50	0.49	0.50	0.45	0.47	0.39	0.46	0.44	0.47			
80	0.24	0.29	0.27	0.44	0.40	0.42	0.25	0.31	0.27	0.30	0.24	0.20	0.19	0.20	0.24	0.28			
85	0.11	0.13	0.09	0.05	0.04	0.05	0.11	0.16	0.13	0.14	0.12	0.12	0.11	0.11	0.12	0.13			
90	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03			
95	0.11	0.12	0.07	0.05	0.04	0.05	0.06	0.09	0.13	0.09	0.06	0.05	0.05	0.06	0.07	0.12			
100	0.12	0.15	0.12	0.08	0.06	0.07	0.10	0.12	0.16	0.14	0.11	0.09	0.08	0.11	0.14	0.16			
105	0.18	0.18	0.15	0.10	0.07	0.09	0.12	0.15	0.18	0.18	0.13	0.11	0.11	0.13	0.17	0.19			
110	0.47	0.27	0.24	0.12	0.09	0.11	0.15	0.18	0.25	0.23	0.16	0.11	0.10	0.14	0.28	0.45			
115	1.10	0.33	0.33	0.16	0.12	0.15	0.22	0.25	0.24	0.32	0.24	0.14	0.12	0.17	0.42	0.88			
120	1.33	0.28	0.42	0.26	0.21	0.25	0.31	0.27	0.47	0.45	0.40	0.25	0.21	0.31	0.58	1.05			
125	0.54	0.82	0.51	0.40	0.36	0.38	0.42	0.44	0.52	0.58	0.62	0.48	0.44	0.55	0.77	1.12			
130	1.04	0.82	0.62	0.55	0.53	0.52	0.53	0.57	0.78	0.83	0.84	0.79	0.77	0.85	0.96	1.17			
135	1.10	0.96	0.71	0.83	0.81	0.78	0.71	0.73	1.05	0.99	1.05	1.13	1.16	1.19	1.17	1.27			
140	1.27	1.14	1.00	1.16	1.15	1.10	0.99	1.01	1.36	1.38	1.41	1.59	1.66	1.66	1.56	1.52			
145	1.46	1.39	1.40	1.37	1.37	1.30	1.29	1.23	1.87	1.86	1.94	2.16	2.25	2.20	2.08	1.83			
150	1.61	1.62	1.69	1.72	1.67	1.55	1.53	1.41	2.33	2.31	2.45	2.74	2.80	2.79	2.58	2.34			
155	1.98	2.06	2.02	2.05	1.90	1.88	1.76	1.75	2.80	2.80	2.88	3.20	3.27	3.21	3.03	2.92			
160	2.27	2.31	2.21	2.34	2.16	2.16	1.96	2.03	3.30	3.23	3.30	3.58	3.60	3.64	3.30	3.31			
165	2.41	2.48	2.37	2.26	2.18	2.15	2.04	2.10	3.38	3.41	3.58	3.74	3.84	3.68	3.53	3.52			
170	2.55	2.65	2.58	2.43	2.34	2.21	2.22	2.25	3.49	3.46	3.49	3.58	3.58	3.60	3.55	3.54			
175	2.86	2.93	2.90	2.79	2.49	2.55	2.50	2.61	3.31	3.35	3.34	3.32	3.32	3.32	3.32	3.31			
180	3.21	3.24	3.12	2.97	2.89	2.97	2.95	3.02	3.23	3.22	3.13	2.96	2.94	2.97	2.95	3.01			

Attachment 1: Equipment List

Equipment	Model	calibration date	Calibration due date
Goniophotometer	EVERFINE GO R5000-2M2D	2017-03-09	2018-03-08
Temperature & Humidity Datalogger	Testo 608-H1	2017-03-09	2018-03-08
Digital power meter	EVERFINE PF2010A-V1-CAN	2017-03-09	2018-03-08
AC power source	EVERFINE DPS1060	2017-03-09	2018-03-08
DC power source	EVERFINE WY12010	2017-03-09	2018-03-08
Luminance meter	EVERFINE CX-2B	2017-03-09	2018-03-08
Standard lamp	EVERFINE 28V/10A/500cd	2017-03-09	2018-03-08
Standard lamp	EVERFINE D908	2017-03-09	2018-03-08
Integrating Sphere and High accuracy array spectroradio meter system	EVERFINE HAAS-2000	2017-03-09	2018-03-08
Standard lamp	EVERFINE D204	2017-03-09	2018-03-08

Attachment 2: Photo document

Model: 28W Apollo LED Panel Light

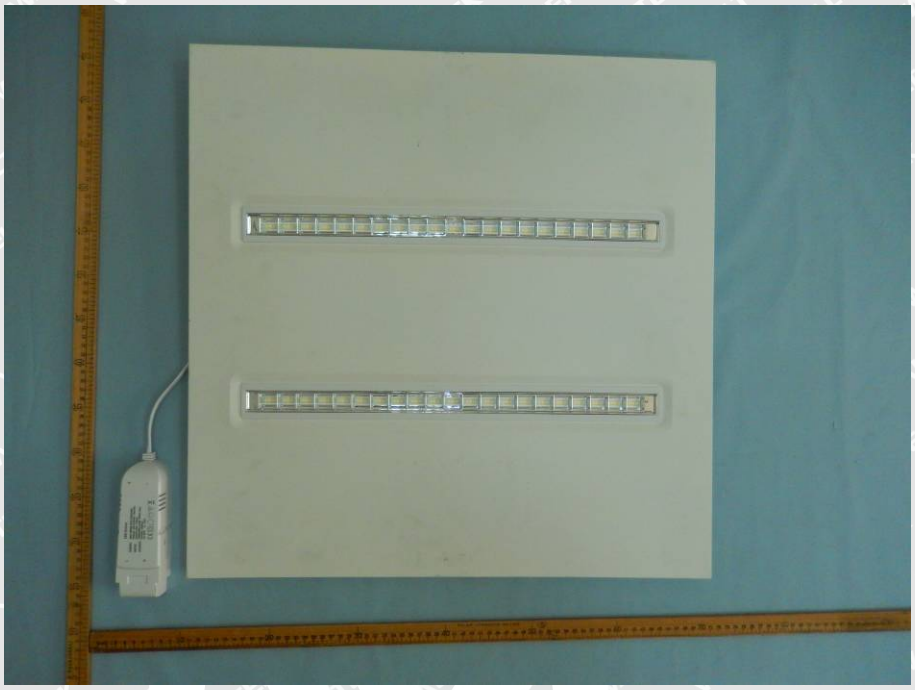


Photo 1

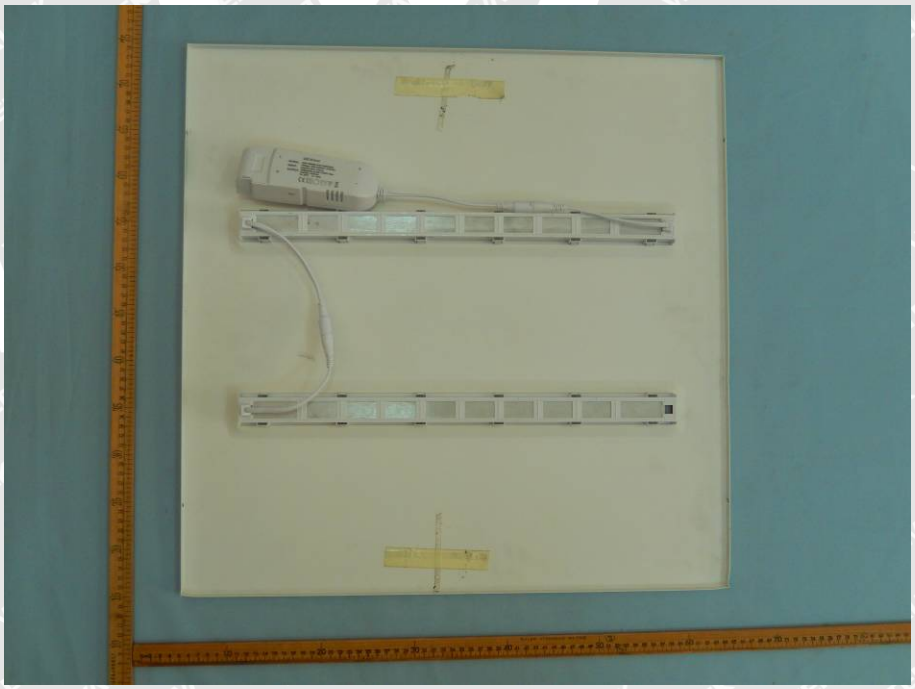


Photo 2

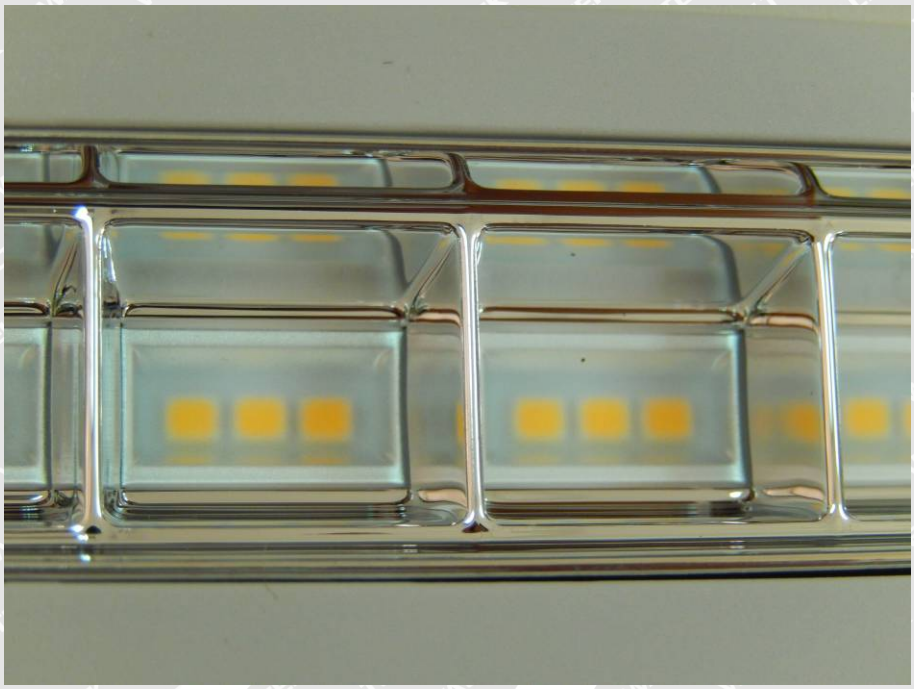


Photo 3

Photo 4

====== End of Report ======