



Guangdong Meide Testing Technology Co., Ltd.



TEST REPORT OF ANSI/IES LM-79-19

APPROVED METHOD FOR OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS

Client..... : HK Lighting Group

Address..... : 3529 Old Conejo, Suite 118, Newbury Park, CA. USA

Test Model..... : ZXL-08-W

Product Description : LED Luminaire

Brand Name..... : HK Lighting Group

Testing Laboratory..... : Guangdong Meide Testing Technology Co., Ltd.

Address..... : 1st floor, B Area, Jinbaisheng Industrial Park, Headquarters 2 Road,
Songshan Lake Hi-tech Industrial Development Zone, Dongguan City,
Guangdong Pr., China.

Testing location..... : As above

Report No..... : C02A20110022L01001

Test Date..... : Nov.03,2020

Report Date..... : Nov.04,2020

Tested by:

Tim

Tim Qian/ Test Engineer

Checked by:

Luke lei

Luke Lei/ Project Engineer

Approved by:

Jessie

Jessie Li/ Technical Manager

Note 1: The test data was only valid for the test sample(s). 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 Guangdong Meide Testing Technology Co., Ltd. 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.

Note 2: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



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1. Product Description for Equipment under Test(EUT)

The client submitted 1 sample of model ZXL-08-W. The sample was received on 2020-11-03, is in undamaged condition.

Model Tested:	ZXL-08-W
Manufacturer:	HK Lighting Group
Address:	3529 Old Conejo, Suite 118, Newbury Park, CA. USA
Product Type:	LED Luminaire
Rated Voltage/Frequency:	AC 12V 60Hz
Rated Power:	3W
Nominal CCT:	3000K
LED Manufacturer:	N/A
LED Model No:	N/A

2. Standards Used

- ANSI/IES LM-79-19: APPROVED METHOD: OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS

3. Test equipment list

Test Equipment	Serial No	Model No	Calibration due date
Full-field Speed Goniophotometer	MD-E028	GO-R5000	2021/09/29
Digital Power Meter	MD-E001	PF2010	2021/09/29
AC Testing Power Source	MD-E002	DPS1060	2021/09/29
Total Spectral Radiant Flux Standard Lamp	MD-E007	D908S	2021/09/29

Statement of Traceability: Guangdong Meide Testing Technology Co., Ltd. attested that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit(SI).



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4. Test Method

Requirements of Ambient Condition

Product was tested with no seasoning. All stabilization and measurements were made in compliance with ANSI/IES LM-79-19. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ during measurement. And relative humidity between 10% and 65%.

Goniophotometer System

The sample was tested according to the ANSI/IES LM-79-19.

Photometric parameters were measured using a type C goniophotometer and software. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, Luminous efficacy, zonal flux were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the Largest dimension of the test SSL product.



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5. Goniophotometer Test results

5.1 Test Data

Test Ambient Temperature	25.1℃	Test orientation	Downward
Operate time(Min.)	90	stabilization time(Min.)	60

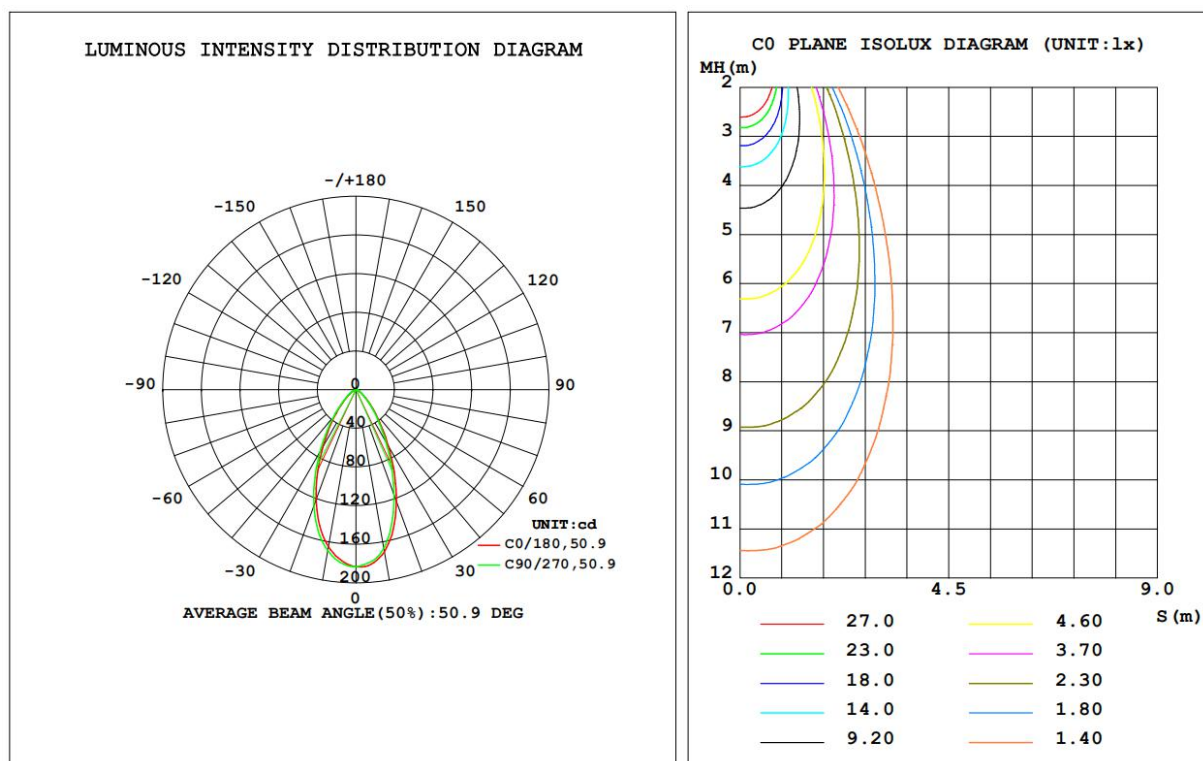
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
12.0	60.00	0.3800	0.6491	2.960

Photometric Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I _{max} (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
157.42	53.18	183.4	0.78	0.82

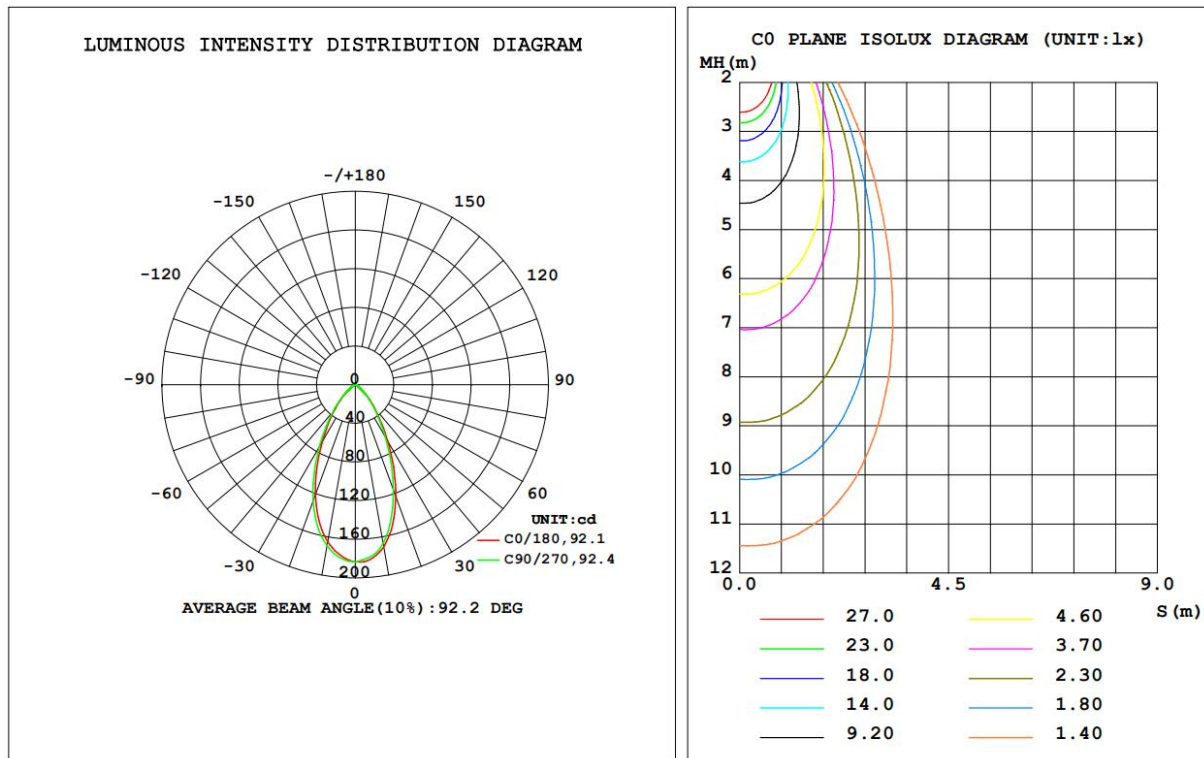
5.2 LUMINOUS INTENSITY DISTRIBUTION DIAGRAM AND C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



AVERAGE BEAM ANGLE(50%):50.9 DEG



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AVERAGE BEAM ANGLE(10%):92.2 DEG



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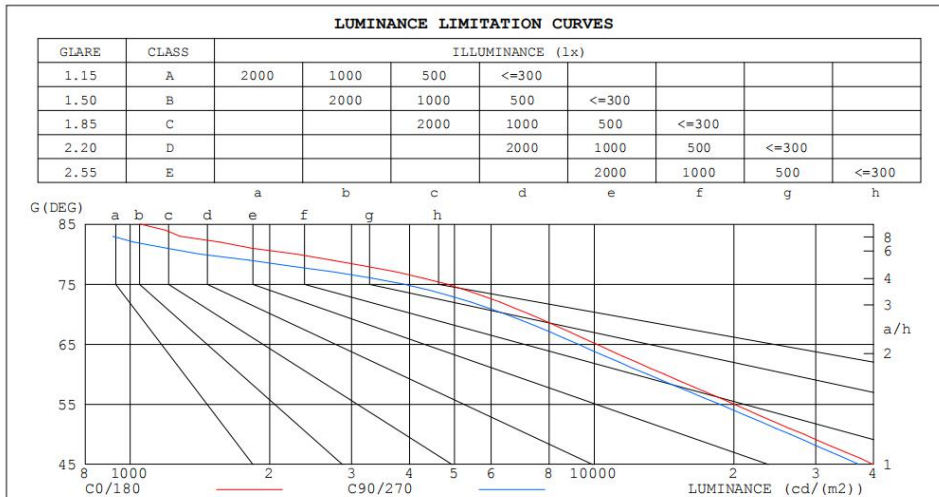


5.3 ZONAL FLUX DIAGRAM

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	$\%lum, lamp$
10	170.1	166.8	166.5	166.4	164.8	165.1	168.9	169.8	0- 10	16.74	16.74	10.6,10.6
20	122.5	115.2	115.5	117.7	120.7	122.9	127.6	126.4	10- 20	40.70	57.43	36.5,36.5
30	67.32	61.18	62.30	65.22	68.87	72.73	75.16	72.58	20- 30	42.71	100.1	63.6,63.6
40	30.65	27.95	28.40	29.62	32.27	34.23	35.44	33.49	30- 40	29.69	129.8	82.5,82.5
50	12.74	11.85	11.89	12.20	12.84	13.91	14.25	13.80	40- 50	16.06	145.9	92.7,92.7
60	4.956	4.619	4.559	4.463	4.805	5.227	5.387	5.293	50- 60	7.417	153.3	97.4,97.4
70	1.738	1.608	1.542	1.448	1.616	1.748	1.800	1.802	60- 70	3.016	156.3	99.3,99.3
80	0.2772	0.2223	0.1717	0.1634	0.2066	0.2655	0.2735	0.2916	70- 80	0.8930	157.2	99.9,99.9
90	0.0000	0.0000	0	0	0	0.0000	0.0000	0.0001	80- 90	0.0757	157.3	99.9,99.9
100	0	0	0	0	0	0	0	0	90-100	0.0000	157.3	99.9,99.9
110	0	0	0	0	0	0	0	0	100-110	0	157.3	99.9,99.9
120	0	0	0	0	0	0	0	0	110-120	0	157.3	99.9,99.9
130	0.0038	0.0044	0.0138	0.0103	0.0065	0.0069	0.0015	0.0016	120-130	0.0011	157.3	99.9,99.9
140	0.0206	0.0253	0.0553	0.0466	0.0375	0.0424	0.0218	0.0212	130-140	0.0143	157.3	99.9,99.9
150	0.0348	0.0423	0.0987	0.0898	0.0735	0.0830	0.0413	0.0365	140-150	0.0303	157.4	100,100
160	0.0529	0.0624	0.1224	0.1214	0.1062	0.1073	0.0610	0.0573	150-160	0.0353	157.4	100,100
170	0.0632	0.0676	0.1125	0.1096	0.1027	0.1025	0.0688	0.0637	160-170	0.0249	157.4	100,100
180	0.1058	0.1058	0.0834	0.0834	0.0834	0.0834	0.1058	0.1058	170-180	0.0083	157.4	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT: lm		



5.4 LUMINANCE LIMITATION CURVES



LUMINANCE cd/(m2)		
G (DEG)	C0/180	C90/270
85	1051	632
80	2280	1413
75	4811	3881
70	7259	6442
65	10118	9236
60	14159	13026
55	19995	18634
50	28308	26435
45	39932	37214

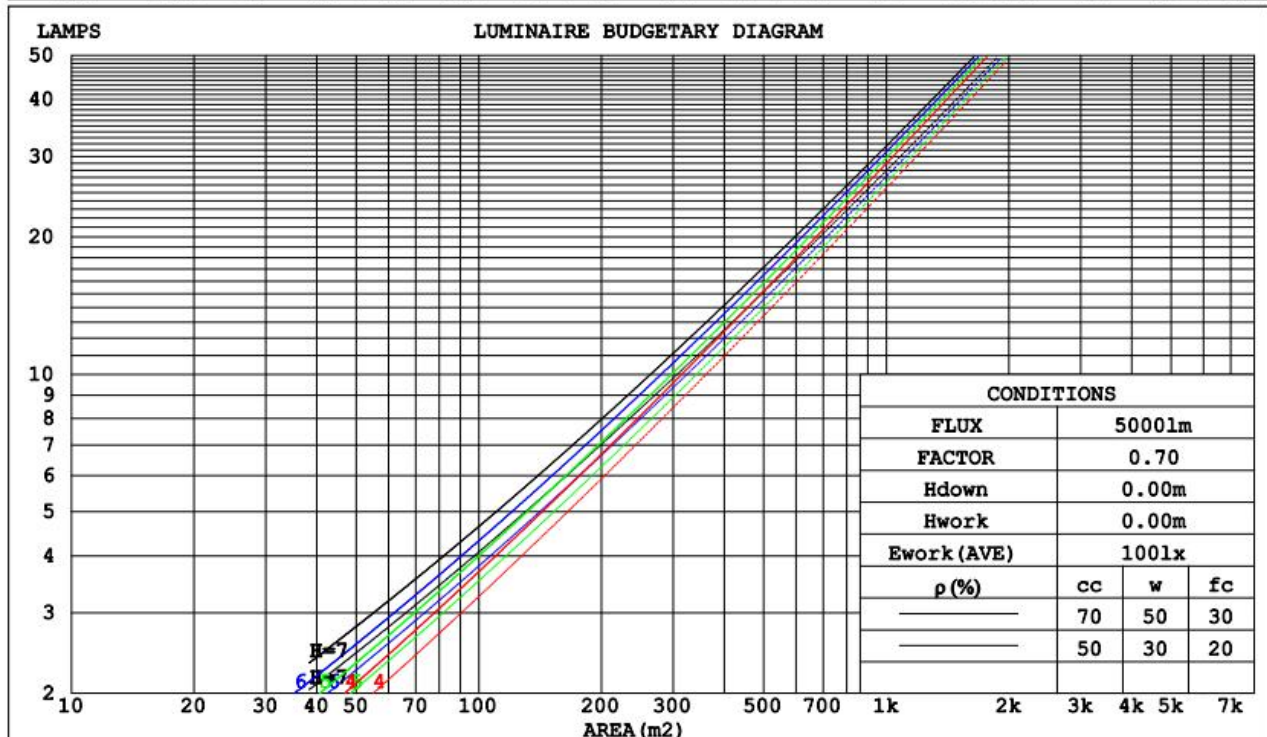


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5.5 CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
p _w	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
p _{fc}	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio Coefficients of Utilization(CU)															
0.0	1.19	1.19	1.19	1.16	1.16	1.16	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	.00
1.0	1.10	1.07	1.05	1.08	1.05	1.03	1.04	1.02	.00	.00	.98	.97	.96	.95	.94	.92
2.0	1.01	.97	.93	.90	.96	.92	.96	.93	.90	.93	.91	.88	.91	.88	.86	.85
3.0	.94	.88	.84	.92	.87	.83	.90	.85	.82	.87	.84	.81	.85	.82	.79	.78
4.0	.87	.81	.76	.86	.80	.76	.84	.79	.75	.82	.77	.74	.80	.76	.73	.72
5.0	.81	.75	.70	.80	.74	.70	.78	.73	.69	.76	.72	.68	.75	.71	.68	.66
6.0	.76	.69	.65	.75	.69	.64	.73	.68	.64	.72	.67	.63	.70	.66	.63	.61
7.0	.71	.64	.60	.70	.64	.60	.69	.63	.59	.68	.63	.59	.66	.62	.59	.57
8.0	.66	.60	.56	.66	.60	.56	.65	.59	.55	.64	.59	.55	.63	.58	.55	.53
9.0	.63	.56	.52	.62	.56	.52	.61	.56	.52	.60	.55	.52	.59	.55	.52	.50
10.0	.59	.53	.49	.59	.53	.49	.58	.52	.49	.57	.52	.49	.56	.52	.48	.47





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5.6 WEC AND CCEC

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.193	.110	.035	.186	.106	.034	.174	.100	.032	.162	.093	.030	.151	.088	.028	
2.0	.186	.102	.031	.181	.099	.031	.170	.094	.029	.160	.090	.028	.151	.085	.027	
3.0	.177	.094	.028	.173	.092	.028	.163	.088	.027	.155	.085	.026	.147	.081	.025	
4.0	.169	.088	.026	.164	.086	.025	.156	.083	.025	.149	.080	.024	.142	.077	.023	
5.0	.160	.082	.024	.156	.080	.023	.149	.078	.023	.143	.075	.022	.137	.073	.022	
6.0	.152	.076	.022	.149	.075	.022	.142	.073	.021	.137	.071	.021	.131	.069	.021	
7.0	.145	.071	.020	.142	.071	.020	.136	.069	.020	.131	.067	.020	.126	.066	.019	
8.0	.138	.067	.019	.135	.067	.019	.130	.065	.019	.126	.064	.018	.121	.062	.018	
9.0	.131	.064	.018	.129	.063	.018	.125	.062	.017	.120	.060	.017	.116	.059	.017	
10.0	.125	.060	.017	.123	.060	.017	.119	.058	.016	.116	.057	.016	.112	.056	.016	

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.191	.191	.191	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.173	.158	.144	.148	.135	.124	.101	.093	.086	.058	.054	.050	.019	.017	.016	
2.0	.159	.133	.111	.136	.114	.096	.093	.079	.067	.054	.046	.039	.017	.015	.013	
3.0	.147	.114	.088	.126	.099	.076	.087	.068	.053	.050	.040	.032	.016	.013	.010	
4.0	.138	.100	.071	.118	.086	.062	.081	.060	.043	.047	.035	.026	.015	.011	.008	
5.0	.129	.088	.058	.111	.076	.051	.076	.053	.036	.044	.031	.021	.014	.010	.007	
6.0	.122	.079	.049	.105	.069	.042	.072	.048	.030	.042	.028	.018	.014	.009	.006	
7.0	.116	.072	.041	.099	.062	.036	.069	.044	.025	.040	.026	.015	.013	.008	.005	
8.0	.110	.066	.035	.094	.057	.031	.065	.040	.022	.038	.024	.013	.012	.008	.004	
9.0	.105	.061	.031	.090	.053	.027	.062	.037	.019	.036	.022	.011	.012	.007	.004	
10.0	.100	.056	.027	.086	.049	.024	.060	.034	.017	.035	.020	.010	.011	.007	.003	



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5.7 UGR(Unified Glare Rating) Table

ceiling/cavity	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
walls	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions	Viewed crosswise					Viewed endwise				
x = 2H y = 2H	20.9	22.0	21.2	22.1	22.3	20.6	21.6	20.8	21.8	22.0
3H	21.0	22.0	21.3	22.2	22.4	20.6	21.6	20.9	21.8	22.0
4H	21.0	21.9	21.3	22.1	22.3	20.6	21.5	20.9	21.7	22.0
6H	20.9	21.7	21.2	22.0	22.2	20.5	21.4	20.8	21.6	21.9
8H	20.9	21.7	21.2	21.9	22.2	20.5	21.3	20.8	21.6	21.8
12H	20.8	21.6	21.1	21.9	22.1	20.4	21.2	20.8	21.5	21.8
4H 2H	20.9	21.8	21.2	22.0	22.2	20.6	21.5	20.8	21.7	21.9
3H	21.0	21.8	21.3	22.0	22.3	20.7	21.4	21.0	21.7	22.0
4H	21.0	21.7	21.3	22.0	22.3	20.7	21.4	21.0	21.7	22.0
6H	20.9	21.6	21.3	21.9	22.2	20.6	21.2	21.0	21.5	21.9
8H	20.9	21.5	21.3	21.8	22.2	20.5	21.1	20.9	21.5	21.8
12H	20.8	21.4	21.3	21.7	22.1	20.5	21.0	20.9	21.4	21.8
8H 4H	20.9	21.5	21.3	21.8	22.2	20.6	21.1	20.9	21.5	21.9
6H	20.8	21.3	21.3	21.7	22.1	20.5	20.9	20.9	21.3	21.8
8H	20.8	21.2	21.2	21.6	22.1	20.4	20.8	20.9	21.3	21.7
12H	20.7	21.1	21.2	21.5	22.0	20.4	20.7	20.9	21.2	21.7
12H 4H	20.8	21.4	21.3	21.7	22.1	20.5	21.0	20.9	21.4	21.8
6H	20.8	21.2	21.2	21.6	22.1	20.4	20.8	20.9	21.3	21.7
8H	20.7	21.1	21.2	21.5	22.0	20.4	20.7	20.9	21.2	21.7
Variations with the observer position at spacings:										
S = 1.0H	+ 1.7 / - 2.7					+ 1.6 / - 2.8				
1.5H	+ 2.5 / - 2.1					+ 2.3 / - 2.0				
2.0H	+ 3.3 / - 3.1					+ 3.1 / - 3.0				

CIE Pub.117, 157.4 lm Total Lamp Luminous Flux Corrected ($8\log(F/F_0) = -6.4$)



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5.8 UTILIZATION FACTORS TABLE

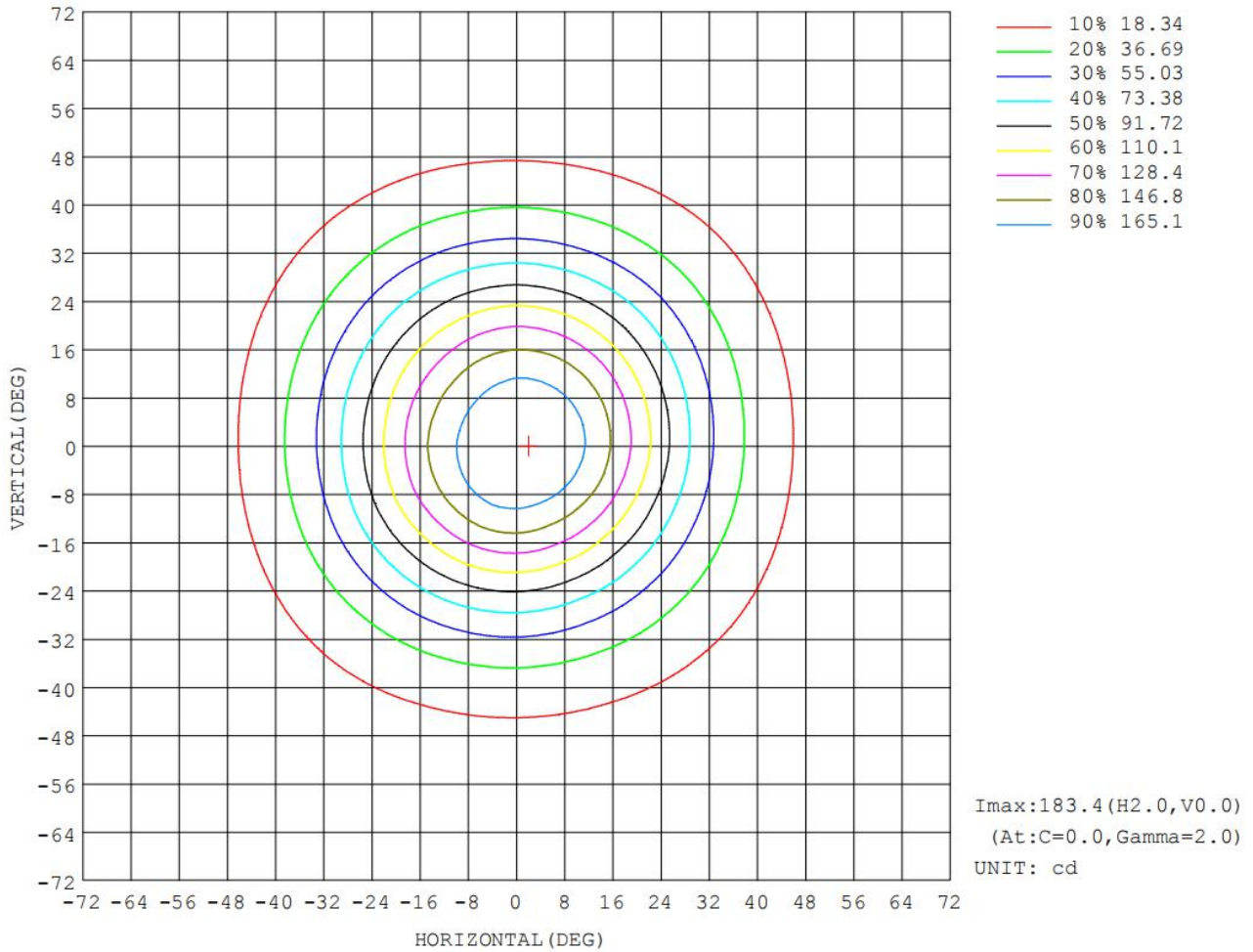
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	80	73	68	80	73	68	79	72	68	64
0.80	89	82	77	88	81	77	87	81	77	72
1.00	95	88	84	94	87	83	92	88	83	78
1.25	99	93	89	98	93	89	96	91	88	83
1.50	103	97	93	101	96	93	99	95	91	86
2.00	106	101	98	105	100	97	102	98	95	90
2.50	108	104	100	107	103	99	103	100	98	91
3.00	110	106	103	108	105	102	105	102	100	93
4.00	113	109	107	110	108	105	107	104	103	95
5.00	114	111	109	112	109	107	108	106	104	96
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		



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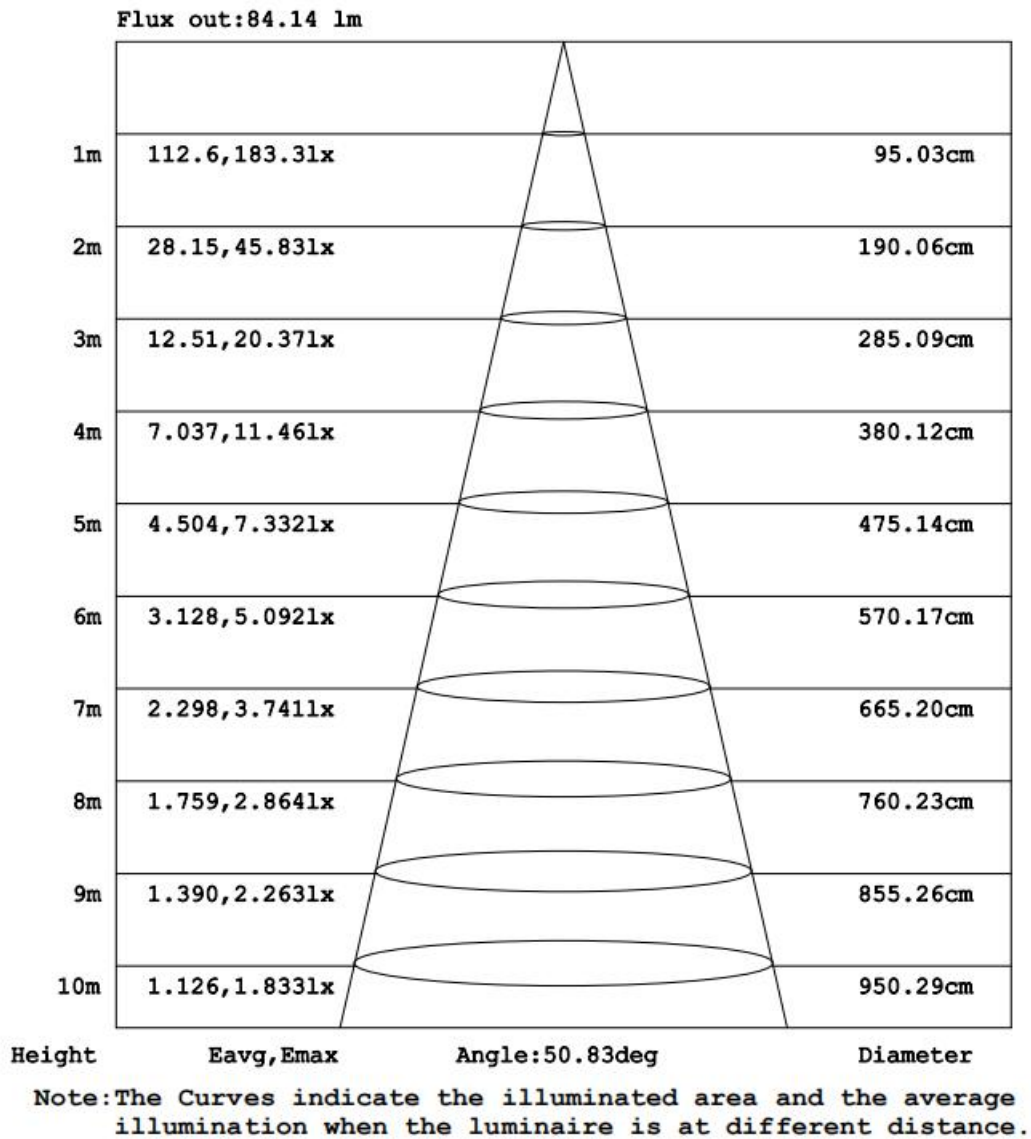


5.9 ISOCANDELA DIAGRAM





5.10 AAI Figure

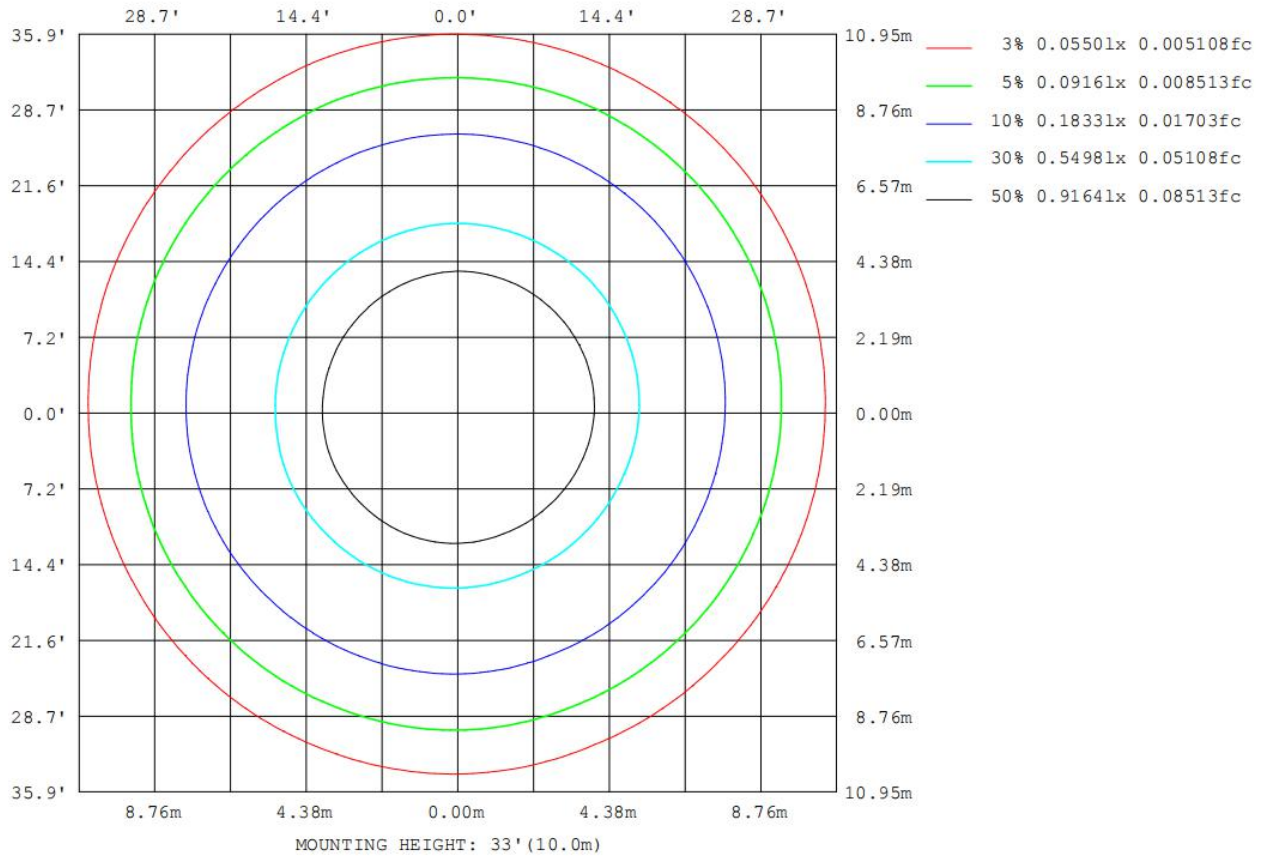




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5.11 ISOLUX DIAGRAM

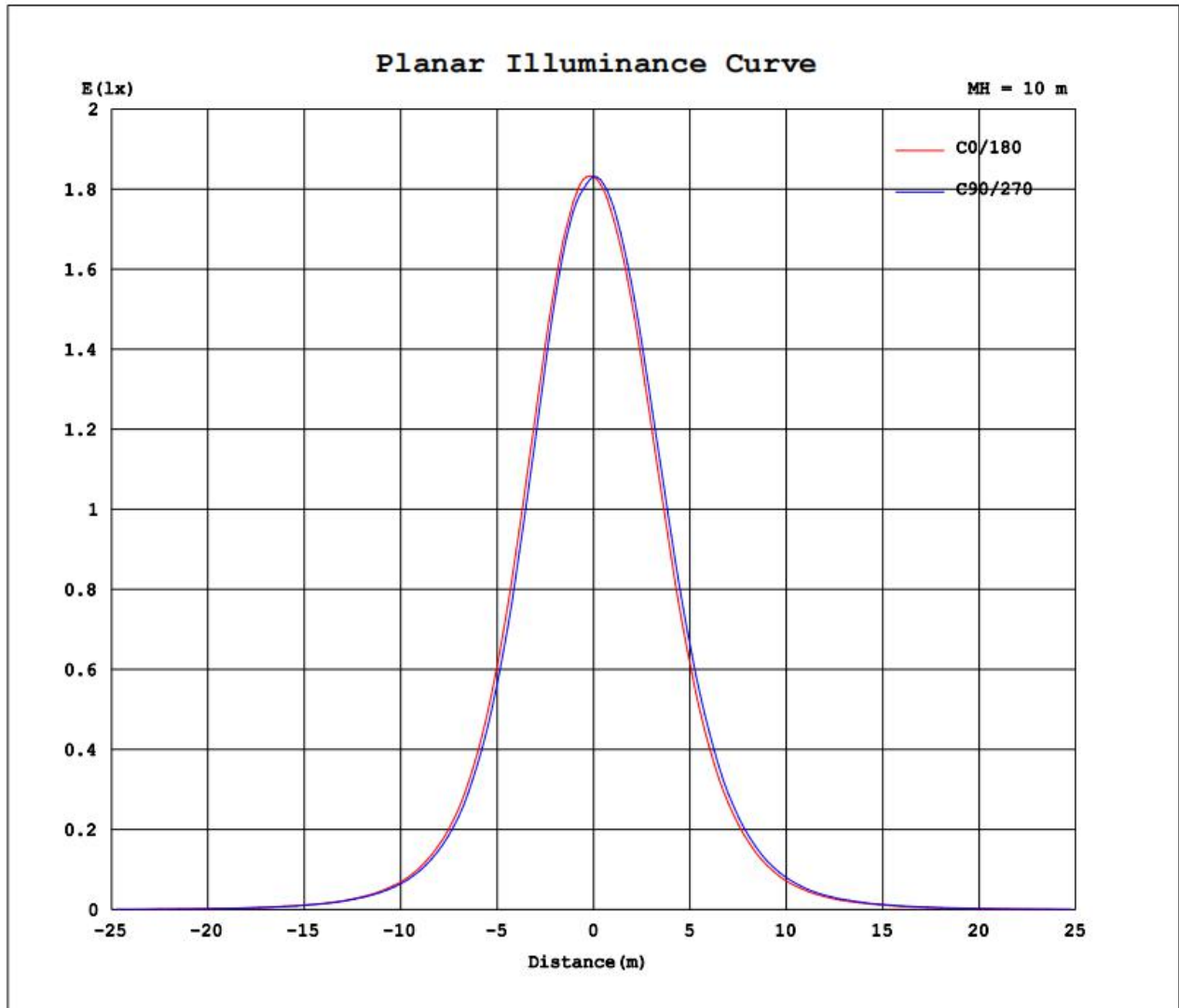




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5.12 Planar Illuminance Curve





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5.13 Luminous Distribution Intensity Data

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	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183			
5	181	181	180	179	179	180	179	178	177	177	177	180	180	180	181	181			
10	170	168	167	166	167	167	166	165	165	164	165	167	169	169	170	171			
15	150	147	144	142	144	145	145	145	145	145	146	149	151	152	152	151			
20	122	118	115	114	115	117	118	120	121	122	123	125	128	127	126	125			
25	94.0	89.2	86.4	85.6	87.1	88.5	90.6	93.0	94.1	95.7	97.5	99.8	101	100	98.7	96.7			
30	67.3	63.4	61.2	60.7	62.3	63.3	65.2	67.5	68.9	70.8	72.7	74.2	75.2	73.9	72.6	70.1			
35	45.9	43.3	41.7	41.3	42.3	43.2	44.5	46.4	48.3	49.8	51.1	52.4	52.7	51.7	50.4	48.3			
40	30.7	28.9	28.0	27.6	28.4	28.7	29.6	31.0	32.3	33.3	34.2	35.1	35.4	34.6	33.5	32.2			
45	19.8	19.0	18.3	18.0	18.4	18.6	19.3	19.9	20.4	21.5	22.2	22.8	22.8	22.4	21.8	20.8			
50	12.7	12.3	11.9	11.6	11.9	12.0	12.2	12.5	12.8	13.4	13.9	14.2	14.2	14.0	13.8	13.3			
55	8.03	7.79	7.50	7.36	7.48	7.42	7.48	7.66	7.91	8.28	8.56	8.80	8.82	8.78	8.65	8.32			
60	4.96	4.78	4.62	4.53	4.56	4.46	4.46	4.62	4.81	5.06	5.23	5.39	5.39	5.40	5.29	5.15			
65	2.99	2.87	2.80	2.75	2.73	2.64	2.61	2.73	2.88	3.02	3.12	3.23	3.21	3.23	3.17	3.11			
70	1.74	1.66	1.61	1.58	1.54	1.48	1.45	1.53	1.62	1.69	1.75	1.82	1.80	1.83	1.80	1.80			
75	0.87	0.82	0.77	0.74	0.70	0.67	0.66	0.70	0.75	0.81	0.85	0.90	0.88	0.90	0.90	0.90			
80	0.28	0.25	0.22	0.20	0.17	0.16	0.16	0.18	0.21	0.24	0.27	0.29	0.27	0.28	0.29	0.29			
85	0.06	0.06	0.05	0.04	0.04	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.06	0.07	0.07	0.07			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
130	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00			
135	0.01	0.01	0.01	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01			
140	0.02	0.02	0.03	0.03	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.05	0.02	0.02	0.02	0.02			
145	0.03	0.03	0.03	0.04	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.03	0.03	0.03	0.03			
150	0.03	0.04	0.04	0.05	0.10	0.10	0.09	0.08	0.07	0.08	0.08	0.09	0.04	0.04	0.04	0.03			
155	0.05	0.05	0.06	0.07	0.12	0.11	0.11	0.10	0.09	0.09	0.10	0.11	0.05	0.05	0.05	0.05			
160	0.05	0.06	0.06	0.08	0.12	0.12	0.12	0.11	0.11	0.10	0.11	0.11	0.06	0.06	0.06	0.05			
165	0.06	0.07	0.07	0.08	0.12	0.12	0.12	0.11	0.10	0.10	0.10	0.11	0.06	0.06	0.06	0.06			
170	0.06	0.07	0.07	0.09	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.11	0.07	0.07	0.06	0.06			
175	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.07	0.07	0.07	0.07			
180	0.11	0.11	0.11	0.11	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.11	0.11	0.11	0.11			



Guangdong Meide Testing Technology Co., Ltd.



6.Photo of sample

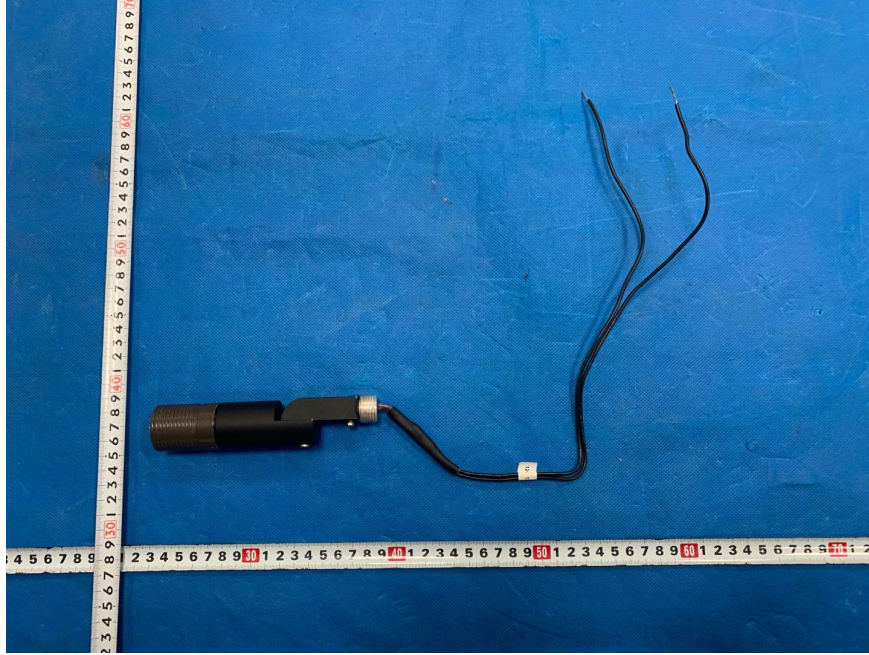


Figure 1



Figure 2

***** END OF THE TEST REPORT*****