



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-N

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..... : C02A20100034L 01004

Test Date..... : Oct.12,2020 - Oct.13,2020

Report Date..... : Oct.15,2020

Tested by:

Tim Qian/ Test Engineer

Checked by:

Luke Lei/ Project Engineer

Approved by:

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-N. The sample was received on 2020-10-12, is in undamaged condition.

Model Tested:	ZXL-08-N
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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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

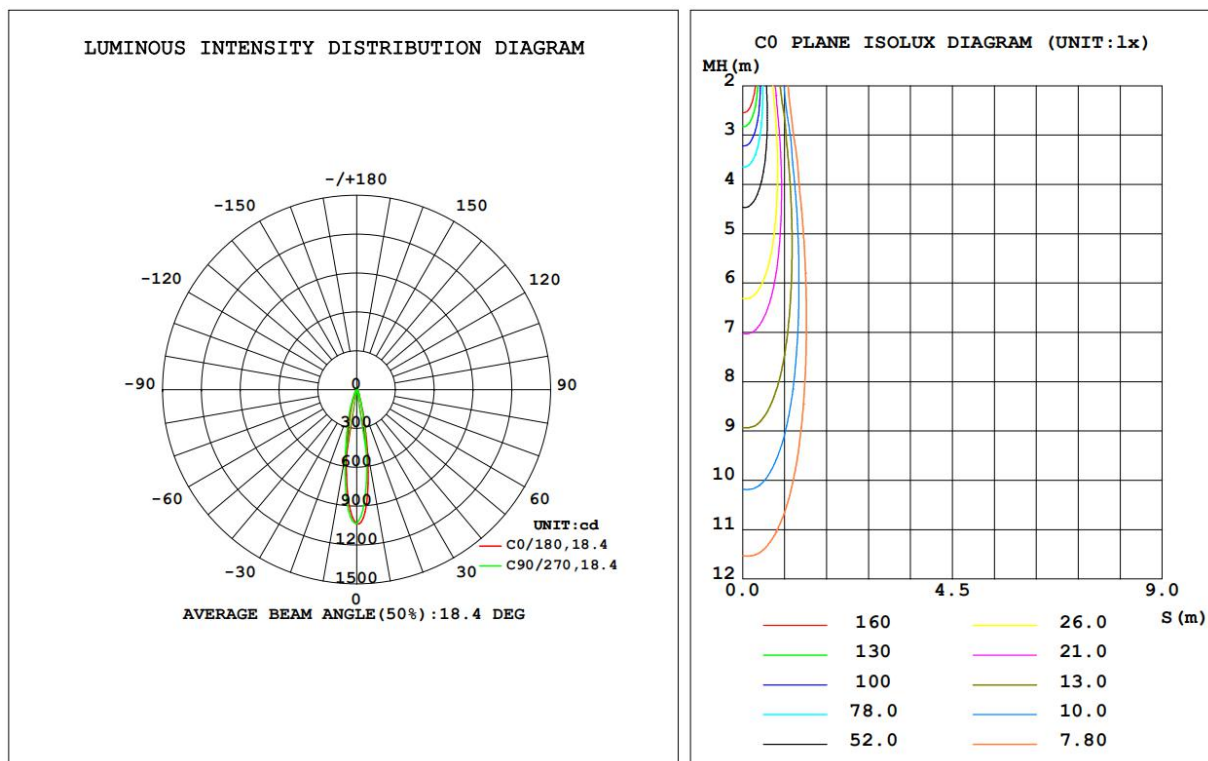
### Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
12.0	60.00	0.3756	0.6589	2.970

### Photometric Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I <sub>max</sub> (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
171.833	57.86	1037	0.31	0.34

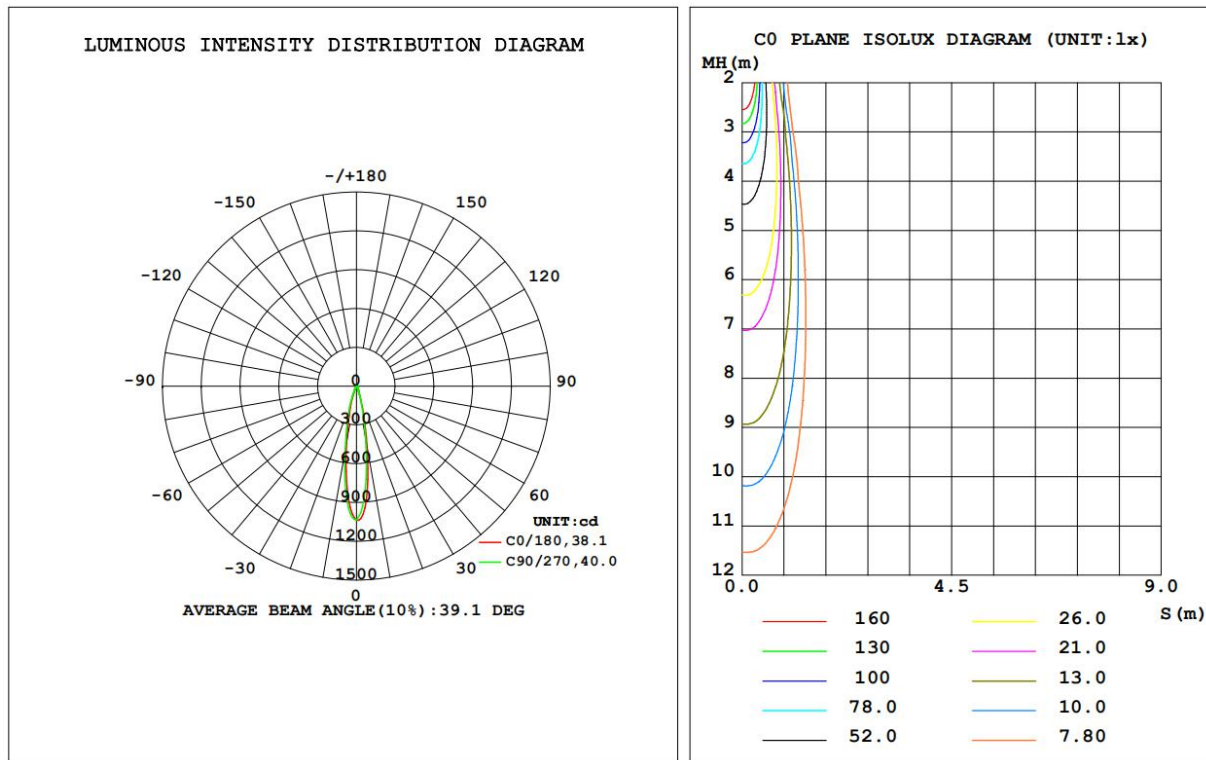
### 5.2 LUMINOUS INTENSITY DISTRIBUTION DIAGRAM AND C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



AVERAGE BEAM ANGLE(50%):18.4 DEG



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AVERAGE BEAM ANGLE(10%):39.1 DEG





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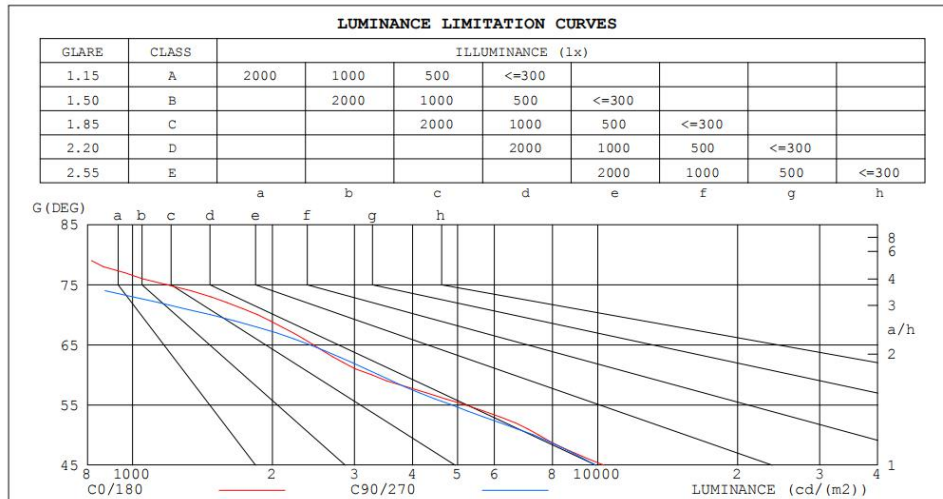


### 5.3 ZONAL FLUX DIAGRAM

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	$\Phi$ lum, lamp
10	480.3	445.5	411.1	419.1	443.4	475.3	510.3	505.4	0- 10	67.41	67.41	39.2,39.2
20	84.37	84.29	78.51	75.91	90.34	129.5	134.6	104.7	10- 20	61.25	128.7	74.9,74.9
30	33.32	30.37	29.14	26.96	25.07	32.87	31.52	30.33	20- 30	24.50	153.2	89.1,89.1
40	9.129	8.032	7.463	7.362	8.121	10.67	10.88	9.617	30- 40	10.57	163.7	95.3,95.3
50	3.358	3.319	3.274	3.147	3.690	5.041	5.291	4.096	40- 50	4.576	168.3	97.9,97.9
60	1.143	1.171	1.184	1.119	1.190	1.615	1.760	1.382	50- 60	2.199	170.5	99.2,99.2
70	0.4442	0.3825	0.3522	0.3397	0.4369	0.6221	0.6052	0.5267	60- 70	0.8203	171.3	99.7,99.7
80	0.0949	0.0712	0.0598	0.0664	0.0868	0.1684	0.1446	0.1259	70- 80	0.2611	171.6	99.9,99.9
90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0065	0.0141	0.0069	80- 90	0.0461	171.6	99.9,99.9
100	0	0	0	0	0	0	0	0	90-100	0.0002	171.6	99.9,99.9
110	0	0	0	0	0	0	0	0	100-110	0	171.6	99.9,99.9
120	0	0	0.0000	0.0000	0	0	0	0	110-120	0.0000	171.6	99.9,99.9
130	0.0026	0.0038	0.0111	0.0058	0.0039	0.0050	0.0002	0.0005	120-130	0.0008	171.6	99.9,99.9
140	0.0316	0.0388	0.0762	0.0618	0.0496	0.0514	0.0310	0.0323	130-140	0.0147	171.6	99.9,99.9
150	0.0599	0.0795	0.2064	0.1873	0.1481	0.1733	0.0998	0.0865	140-150	0.0542	171.7	99.9,99.9
160	0.0721	0.0875	0.2680	0.2654	0.2232	0.2343	0.1248	0.1099	150-160	0.0746	171.8	100,100
170	0.0738	0.0740	0.2024	0.1946	0.1754	0.1653	0.1045	0.0890	160-170	0.0466	171.8	100,100
180	0.2730	0.2730	0.0894	0.0894	0.0894	0.0894	0.2730	0.2730	170-180	0.0124	171.8	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



## 5.4 LUMINANCE LIMITATION CURVES



LUMINANCE cd/(m2)		
G (DEG)	C0/180	C90/270
85	630	336
80	781	492
75	1181	761
70	1855	1471
65	2446	2403
60	3266	3382
55	5195	4850
50	7464	7276
45	10312	9905

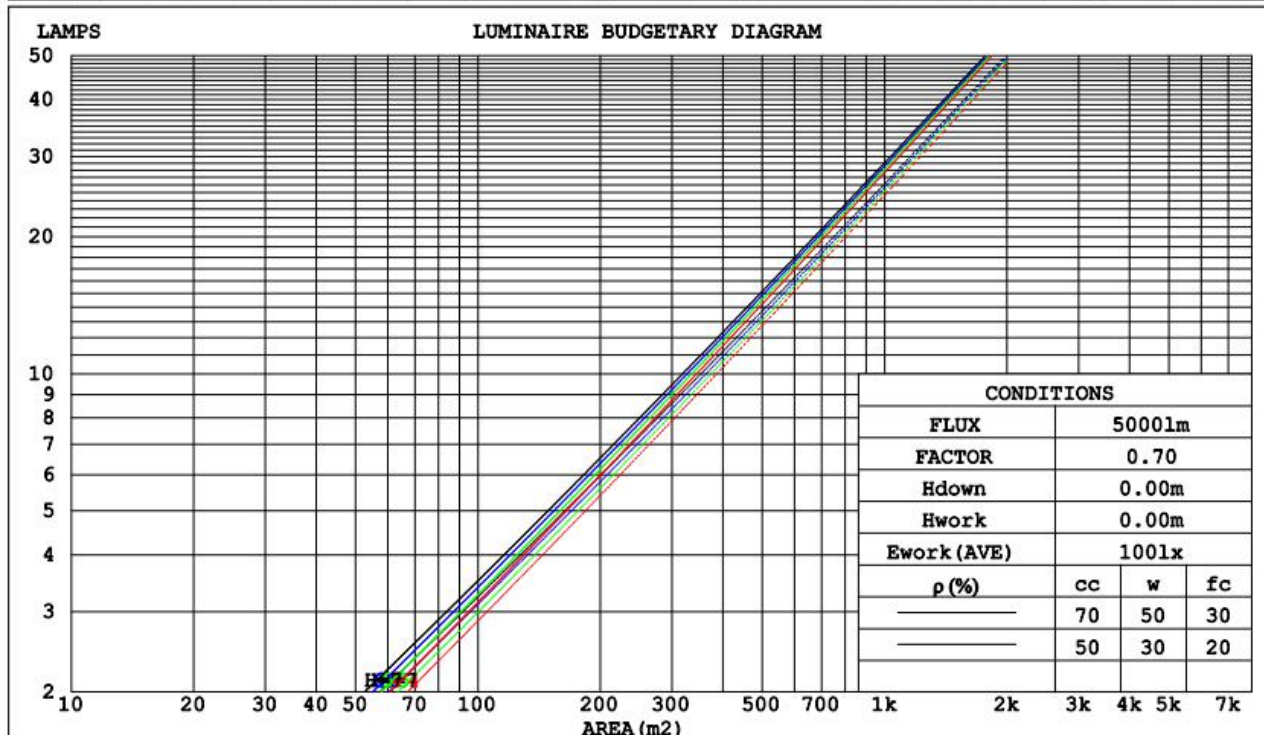


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## 5.5 CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

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						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	1.13	1.11	1.09	1.10	1.09	1.07	1.06	1.05	1.04	1.03	1.02	1.01	.99	.99	.98	.96	
2.0	1.07	1.04	1.01	1.05	1.03	1.00	1.02	.00	.98	.99	.97	.96	.97	.95	.94	.92	
3.0	1.02	.98	.95	1.01	.97	.95	.98	.95	.93	.96	.94	.92	.94	.92	.90	.89	
4.0	.98	.94	.91	.97	.93	.90	.95	.92	.89	.93	.90	.88	.91	.89	.87	.86	
5.0	.94	.90	.87	.93	.89	.86	.92	.88	.86	.90	.87	.85	.89	.86	.84	.83	
6.0	.91	.86	.83	.90	.86	.83	.89	.85	.83	.87	.84	.82	.86	.84	.82	.80	
7.0	.88	.83	.80	.87	.83	.80	.86	.82	.80	.85	.82	.79	.84	.81	.79	.78	
8.0	.85	.81	.78	.85	.81	.78	.84	.80	.77	.83	.79	.77	.82	.79	.77	.76	
9.0	.83	.78	.76	.82	.78	.75	.81	.78	.75	.81	.77	.75	.80	.77	.75	.74	
10.0	.80	.76	.73	.80	.76	.73	.79	.76	.73	.79	.75	.73	.78	.75	.73	.72	







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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	.142	.081	.026	.135	.077	.025	.123	.070	.023	.111	.064	.021	.101	.058	.019	
2.0	.132	.073	.022	.127	.070	.022	.117	.065	.020	.107	.060	.019	.098	.056	.018	
3.0	.124	.066	.020	.119	.064	.019	.110	.060	.018	.102	.056	.017	.095	.053	.016	
4.0	.116	.060	.018	.112	.059	.017	.105	.056	.017	.098	.053	.016	.092	.050	.015	
5.0	.109	.056	.016	.106	.054	.016	.099	.052	.015	.094	.049	.015	.088	.047	.014	
6.0	.103	.052	.015	.100	.051	.015	.095	.049	.014	.090	.047	.014	.085	.045	.013	
7.0	.098	.048	.014	.095	.047	.014	.090	.046	.013	.086	.044	.013	.082	.043	.013	
8.0	.093	.045	.013	.091	.045	.013	.086	.043	.012	.083	.042	.012	.079	.041	.012	
9.0	.088	.043	.012	.086	.042	.012	.083	.041	.012	.079	.040	.011	.076	.039	.011	
10.0	.084	.040	.011	.083	.040	.011	.079	.039	.011	.076	.038	.011	.074	.037	.011	

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	.164	.164	.164	.112	.112	.112	.064	.064	.064	.021	.021	.021	
1.0	.170	.159	.149	.145	.136	.128	.099	.094	.088	.057	.054	.051	.018	.017	.017	
2.0	.152	.134	.118	.130	.115	.102	.089	.080	.071	.051	.046	.042	.016	.015	.014	
3.0	.137	.114	.096	.118	.099	.083	.081	.068	.058	.047	.040	.034	.015	.013	.011	
4.0	.125	.099	.079	.107	.085	.069	.074	.060	.048	.043	.035	.029	.014	.011	.009	
5.0	.115	.087	.066	.098	.075	.058	.068	.052	.041	.039	.031	.024	.013	.010	.008	
6.0	.106	.077	.056	.091	.066	.049	.063	.047	.035	.036	.027	.021	.012	.009	.007	
7.0	.098	.069	.048	.084	.059	.042	.058	.042	.030	.034	.025	.018	.011	.008	.006	
8.0	.092	.062	.041	.079	.054	.036	.055	.038	.026	.032	.022	.015	.010	.007	.005	
9.0	.086	.056	.036	.074	.049	.032	.051	.034	.022	.030	.020	.013	.010	.007	.004	
10.0	.081	.051	.032	.070	.045	.028	.048	.031	.020	.028	.019	.012	.009	.006	.004	



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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	13.2	13.9	13.4	14.0	14.2	12.2	12.9	12.4	13.0	13.2
3H	13.2	13.8	13.4	14.0	14.2	12.2	12.8	12.4	13.0	13.2
4H	13.2	13.8	13.4	14.0	14.2	12.1	12.7	12.4	12.9	13.2
6H	13.1	13.7	13.4	13.9	14.1	12.0	12.6	12.3	12.9	13.1
8H	13.1	13.6	13.3	13.9	14.1	12.0	12.6	12.3	12.8	13.1
12H	13.0	13.5	13.3	13.8	14.1	12.0	12.5	12.3	12.8	13.0
4H 2H	13.1	13.7	13.4	13.9	14.1	12.1	12.7	12.4	12.9	13.1
3H	13.1	13.6	13.4	13.9	14.2	12.1	12.7	12.4	12.9	13.2
4H	13.1	13.5	13.4	13.8	14.1	12.1	12.6	12.4	12.8	13.2
6H	13.0	13.4	13.4	13.7	14.1	12.0	12.4	12.4	12.7	13.1
8H	12.9	13.3	13.3	13.7	14.1	11.9	12.3	12.3	12.7	13.1
12H	12.9	13.3	13.3	13.6	14.0	11.9	12.3	12.3	12.6	13.0
8H 4H	12.9	13.3	13.3	13.7	14.0	11.9	12.3	12.3	12.7	13.1
6H	12.8	13.2	13.3	13.6	14.0	11.8	12.2	12.3	12.6	13.0
8H	12.8	13.1	13.2	13.5	13.9	11.8	12.1	12.2	12.5	13.0
12H	12.7	13.0	13.2	13.4	13.9	11.7	12.0	12.2	12.4	12.9
12H 4H	12.9	13.2	13.3	13.6	14.0	11.9	12.3	12.3	12.6	13.0
6H	12.8	13.1	13.2	13.5	13.9	11.8	12.1	12.2	12.5	12.9
8H	12.7	13.0	13.2	13.4	13.9	11.7	12.0	12.2	12.4	12.9
Variations with the observer position at spacings:										
S = 1.0H	+ 2.6 / - 3.9					+ 2.1 / - 3.4				
1.5H	+ 3.9 / - 2.9					+ 2.9 / - 2.5				
2.0H	+ 3.1 / - 3.1					+ 3.2 / - 3.1				

CIE Pub.117, 171.8 lm Total Lamp Luminous Flux Corrected ( $8\log(F/F_0) = -6.1$ )



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## 5.8 UTILIZATION FACTORS TABLE

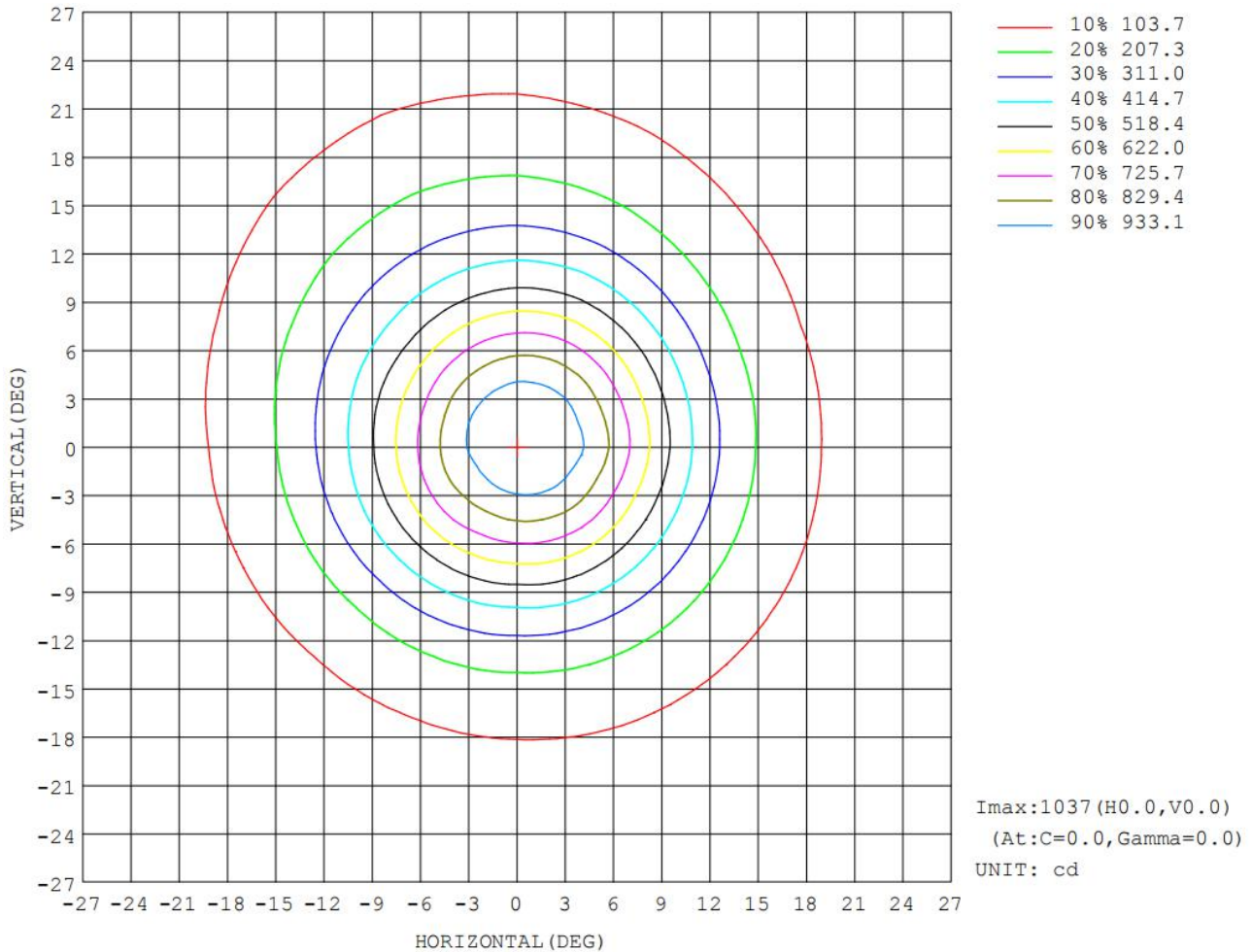
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	89	82	79	88	82	79	87	82	79	75
0.80	96	90	87	95	90	87	94	89	86	83
1.00	100	95	91	99	94	91	98	94	90	87
1.25	104	99	96	103	98	95	101	97	94	90
1.50	106	102	99	105	101	98	103	100	97	93
2.00	109	105	102	108	104	101	105	102	100	94
2.50	111	107	104	109	106	103	106	103	101	95
3.00	112	109	106	110	107	105	107	105	103	97
4.00	114	111	109	112	110	108	108	107	105	98
5.00	115	113	111	113	111	110	109	108	107	99
ROOM INDEX	UF (total)									Direct
According to DIN EN 13032-2 2004			Suspended					SHRNOM = 1.25		



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## 5.9 ISOCANDELA DIAGRAM



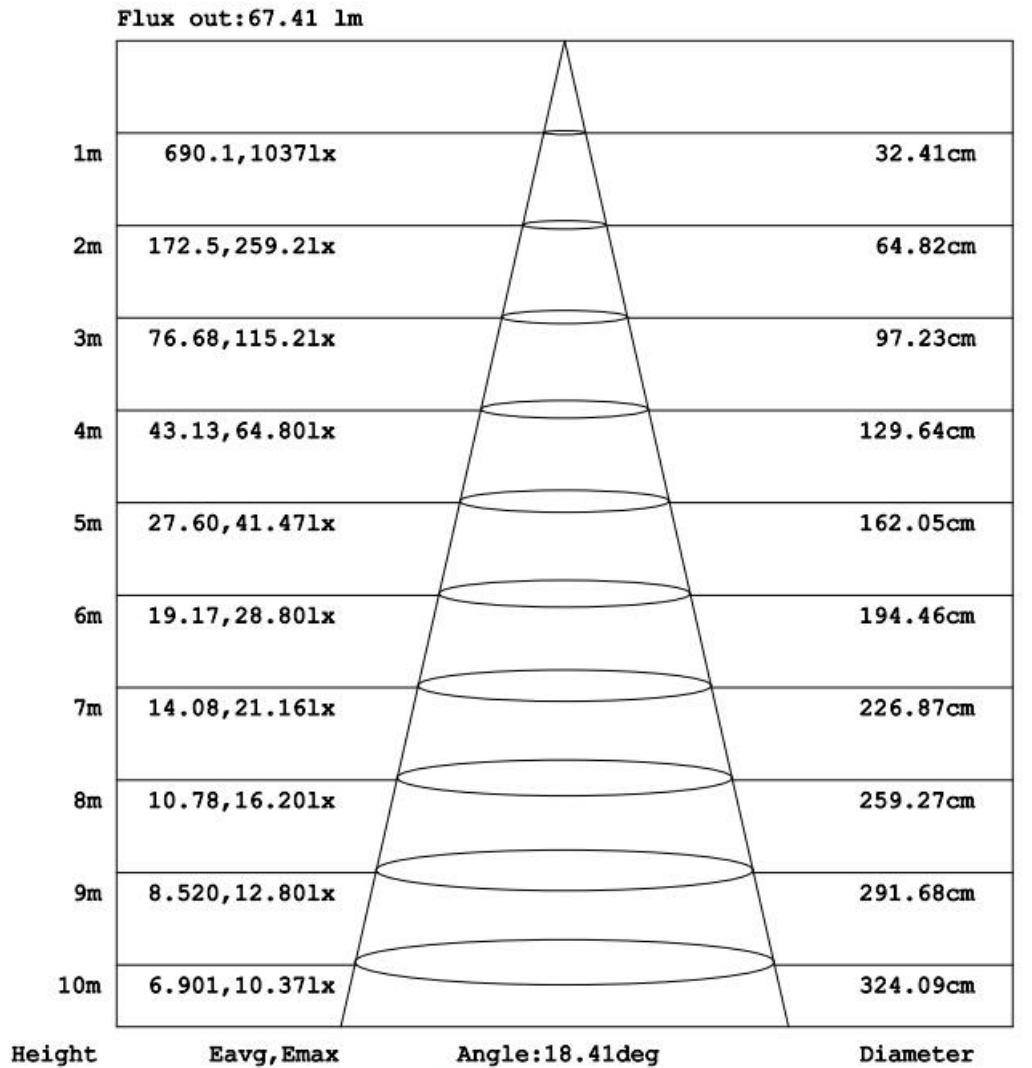




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## 5.10 AAI Figure



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

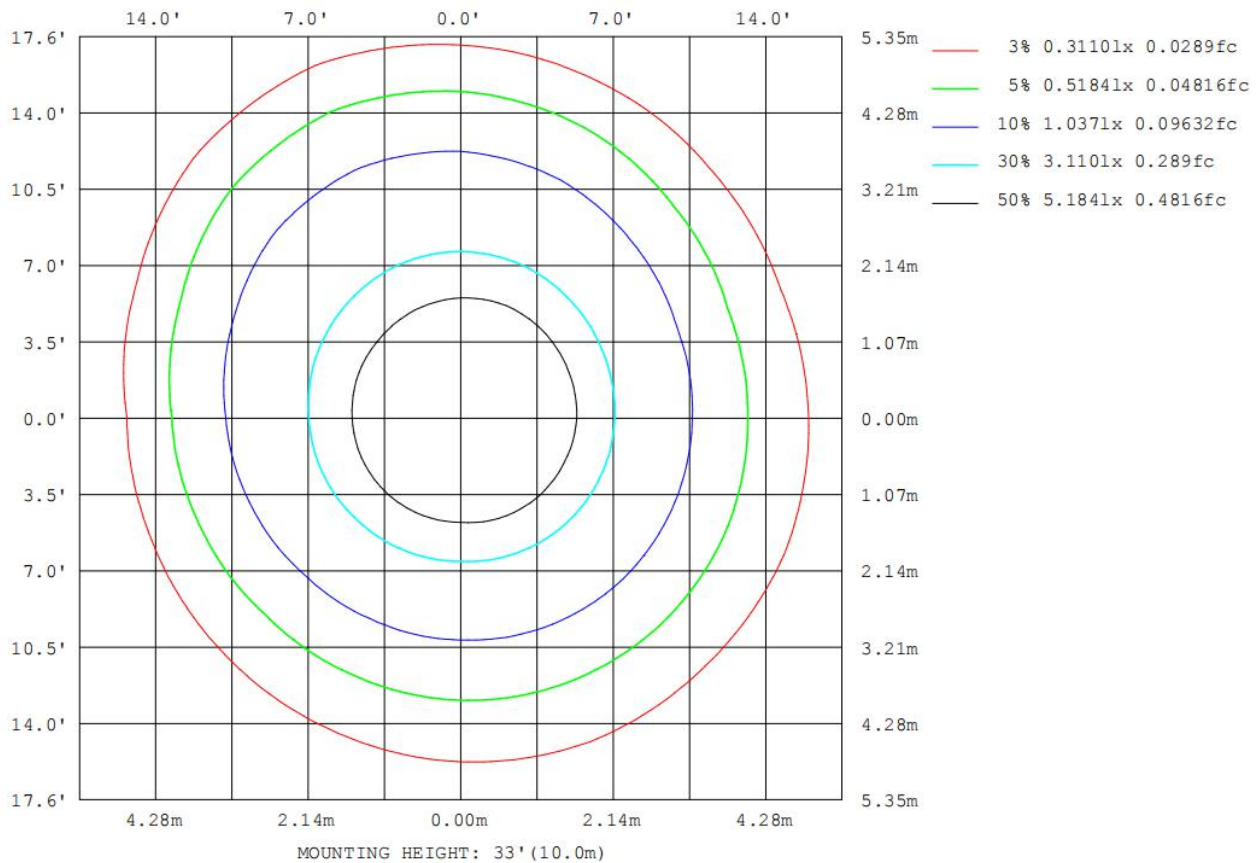




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## 5.11 ISOLUX DIAGRAM

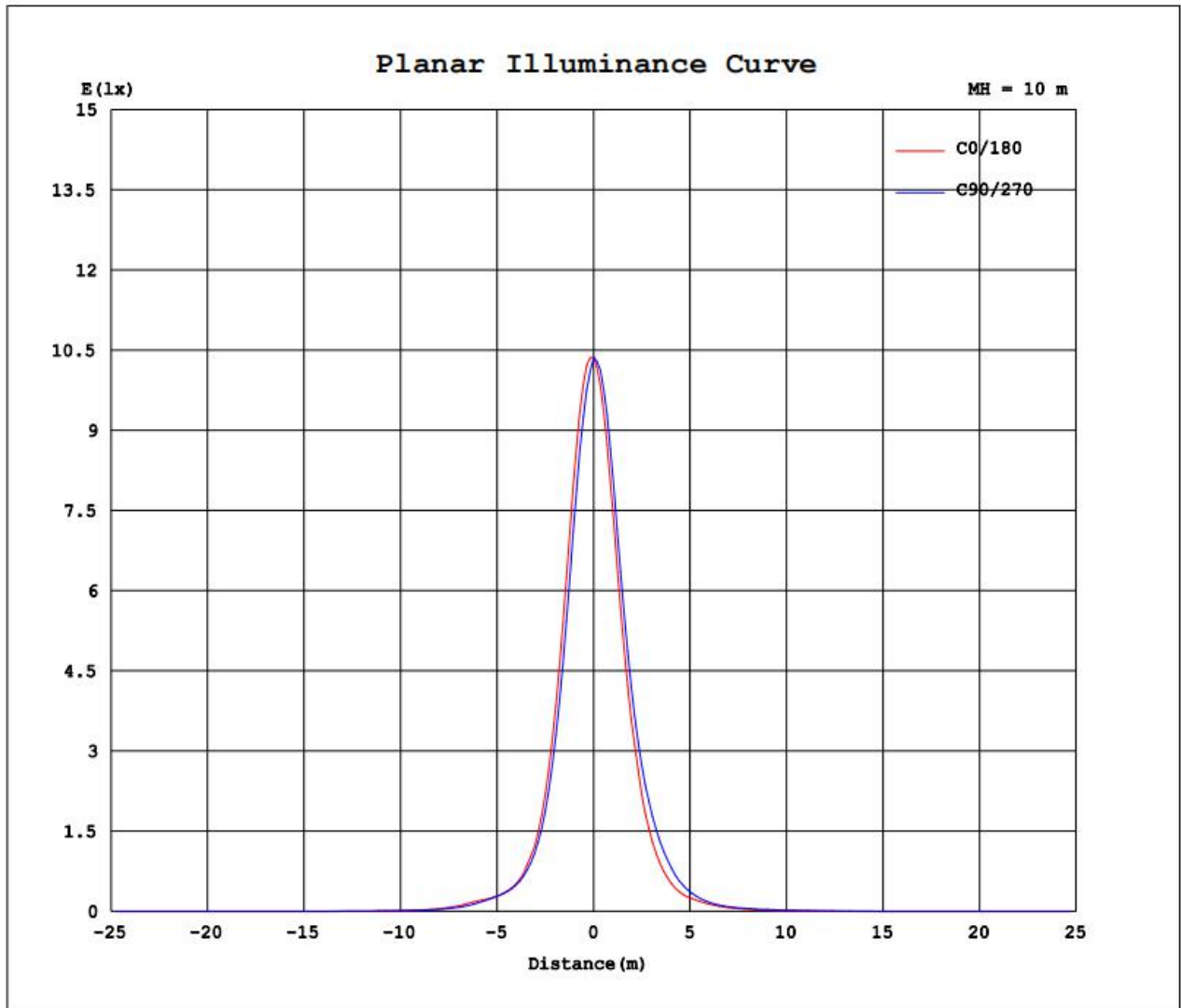




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## 5.12 Planar Illuminance Curve





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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	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037			
5	882	854	840	816	800	789	799	810	814	821	844	859	876	886	891	880			
10	480	461	445	429	411	413	419	431	443	463	475	495	510	516	505	490			
15	201	195	189	182	174	172	175	188	205	231	252	263	264	252	230	210			
20	84.4	85.7	84.3	81.6	78.5	76.2	75.9	81.7	90.3	107	129	140	135	123	105	88.4			
25	46.8	47.6	47.0	46.8	45.2	43.3	42.2	41.6	42.2	50.4	63.6	69.7	64.9	57.6	49.8	46.1			
30	33.3	33.4	30.4	29.5	29.1	27.7	27.0	26.4	25.1	27.0	32.9	34.9	31.5	30.3	30.3	30.3			
35	19.7	18.9	16.1	14.8	14.4	13.9	13.6	13.6	13.3	14.6	17.1	18.0	16.9	16.3	16.8	18.5			
40	9.13	8.99	8.03	7.73	7.46	7.32	7.36	7.60	8.12	9.14	10.7	11.3	10.9	10.2	9.62	9.55			
45	5.10	5.13	4.98	4.91	4.90	4.71	4.66	4.97	5.38	6.25	7.24	7.76	7.55	6.71	5.94	5.63			
50	3.36	3.46	3.32	3.29	3.27	3.18	3.15	3.45	3.69	4.32	5.04	5.38	5.29	4.70	4.10	3.81			
55	2.09	2.07	1.95	1.93	1.95	1.90	1.86	2.05	2.19	2.63	3.07	3.33	3.36	2.98	2.60	2.45			
60	1.14	1.21	1.17	1.18	1.18	1.15	1.12	1.18	1.19	1.43	1.62	1.73	1.76	1.56	1.38	1.35			
65	0.72	0.77	0.73	0.72	0.71	0.69	0.68	0.72	0.74	0.88	0.96	0.96	0.97	0.90	0.84	0.83			
70	0.44	0.42	0.38	0.37	0.35	0.34	0.34	0.38	0.44	0.55	0.62	0.61	0.61	0.56	0.53	0.50			
75	0.21	0.18	0.15	0.14	0.14	0.14	0.14	0.16	0.21	0.30	0.35	0.35	0.34	0.32	0.29	0.26			
80	0.09	0.08	0.07	0.06	0.06	0.06	0.07	0.07	0.09	0.13	0.17	0.15	0.14	0.14	0.13	0.11			
85	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.06	0.05	0.05			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	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	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00			
135	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01			
140	0.03	0.03	0.04	0.05	0.08	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.03	0.03	0.03	0.03			
145	0.04	0.05	0.06	0.08	0.14	0.13	0.12	0.11	0.11	0.10	0.11	0.12	0.07	0.07	0.06	0.04			
150	0.06	0.07	0.08	0.12	0.21	0.20	0.19	0.16	0.15	0.15	0.17	0.18	0.10	0.10	0.09	0.07			
155	0.08	0.08	0.10	0.16	0.26	0.26	0.24	0.22	0.19	0.19	0.22	0.23	0.12	0.12	0.11	0.09			
160	0.07	0.08	0.09	0.17	0.27	0.27	0.27	0.25	0.22	0.22	0.23	0.25	0.12	0.12	0.11	0.09			
165	0.07	0.08	0.08	0.18	0.24	0.25	0.24	0.23	0.21	0.21	0.21	0.22	0.11	0.11	0.10	0.09			
170	0.07	0.07	0.07	0.19	0.20	0.20	0.19	0.19	0.18	0.17	0.17	0.17	0.10	0.10	0.09	0.08			
175	0.07	0.08	0.14	0.21	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.13	0.10	0.10	0.09	0.09			
180	0.27	0.27	0.27	0.27	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.27	0.27	0.27	0.27			





Guangdong Meide Testing Technology Co., Ltd.



## 6.Photo of sample

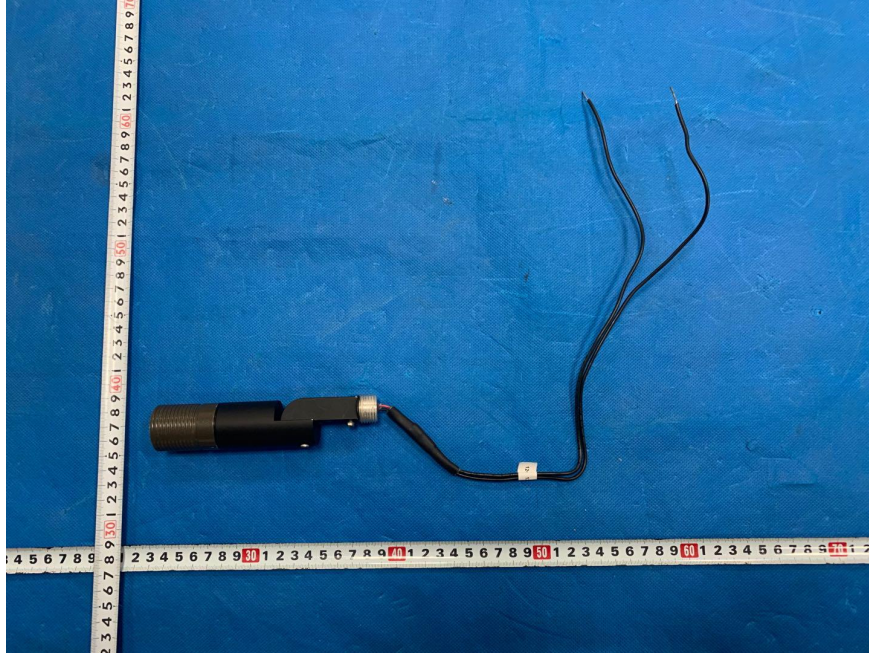


Figure 1



Figure 2

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