



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-11-A-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**..... : C02A20100034L 01007

**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 used 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-11-A-W. The sample was received on 2020-10-12, is in undamaged condition.

Model Tested:	ZXL-11-A-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:	7W
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

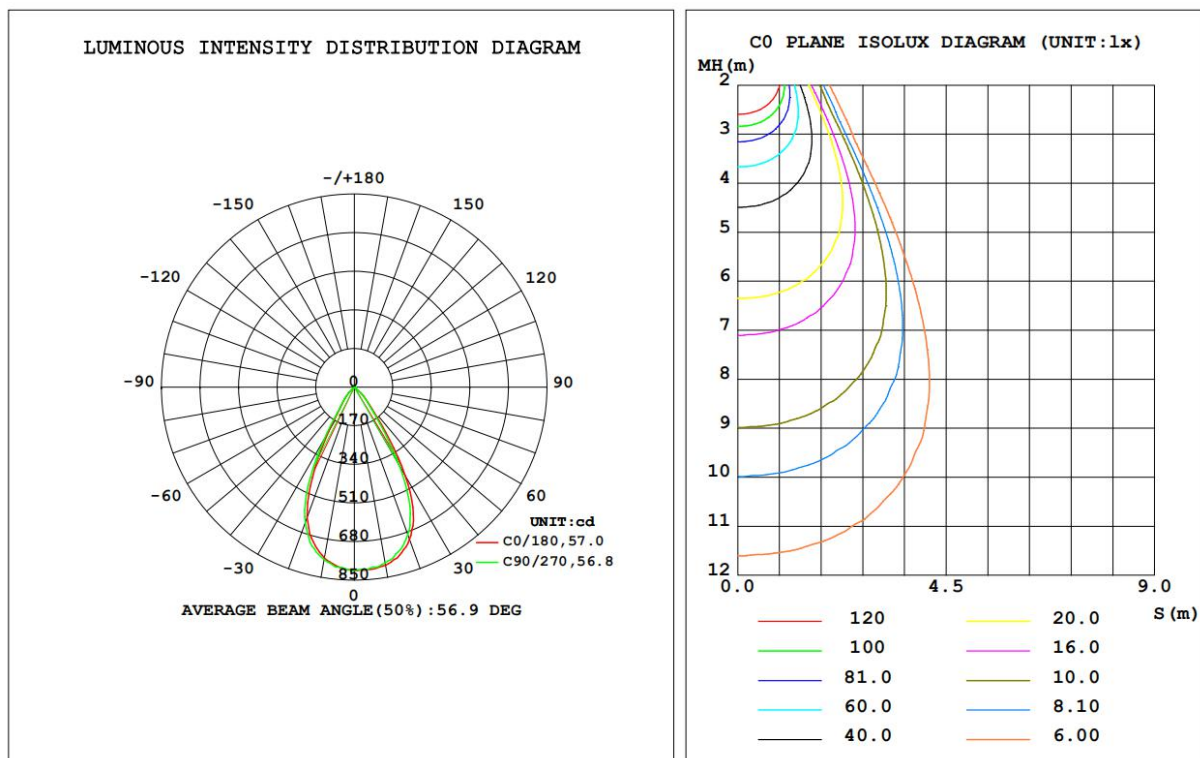
### Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
12.0	60.00	0.7139	0.9474	8.116

### Photometric Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I <sub>max</sub> (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
675.55	83.24	810.9	0.76	0.79

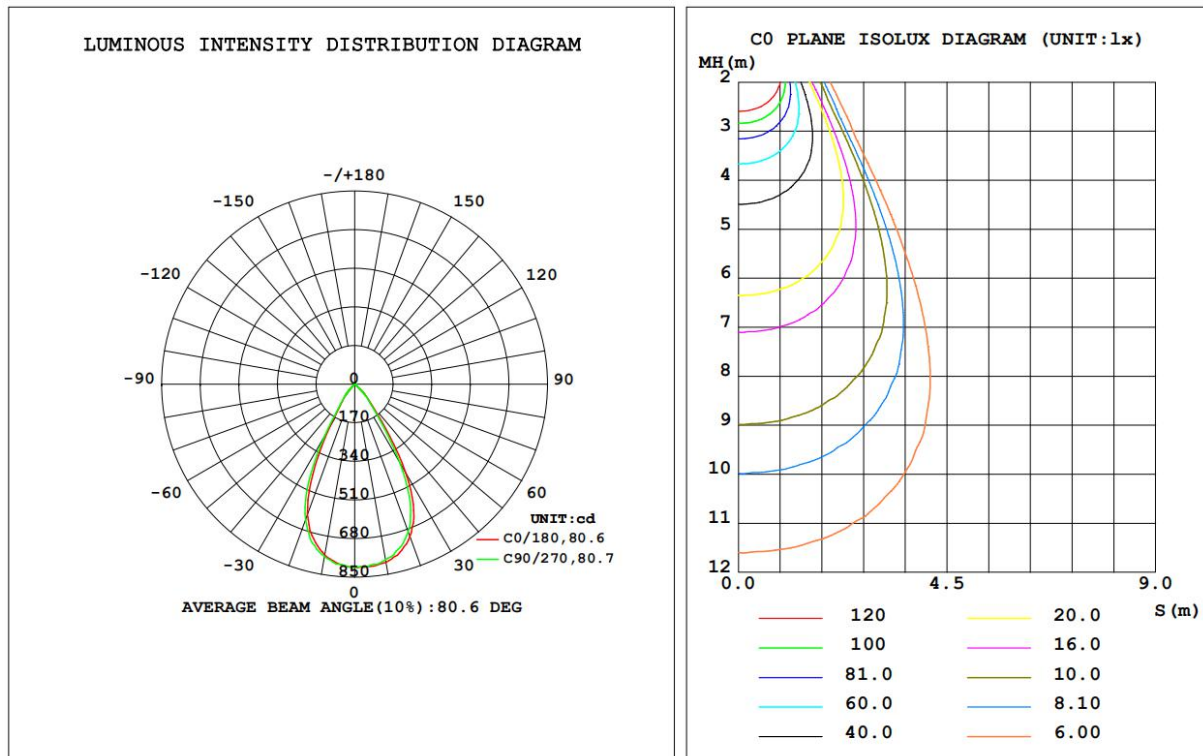
### 5.2 LUMINOUS INTENSITY DISTRIBUTION DIAGRAM AND C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



AVERAGE BEAM ANGLE(50%):56.9 DEG



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AVERAGE BEAM ANGLE(10%):80.6 DEG





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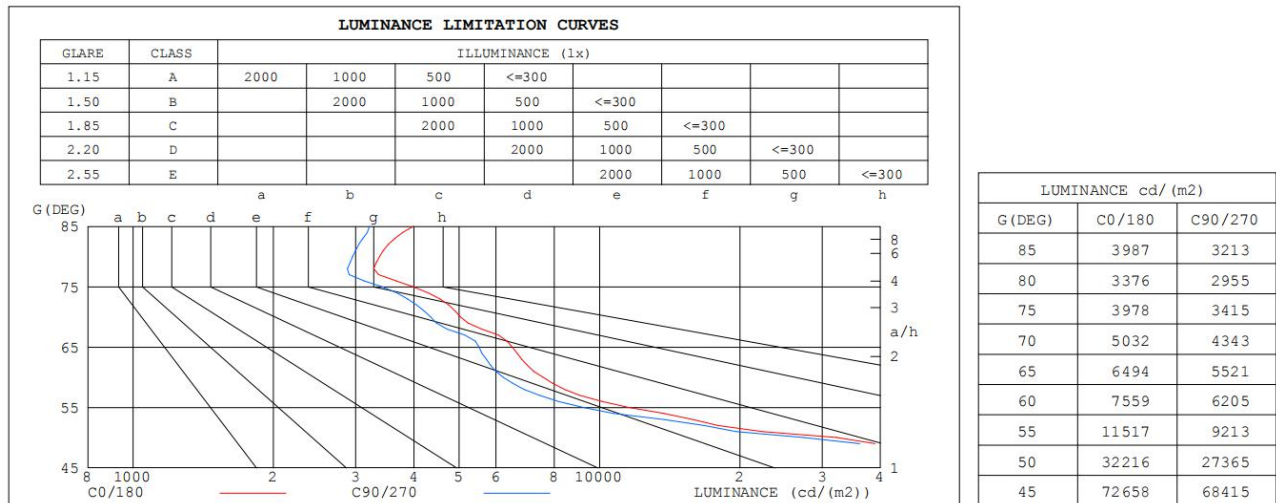


### 5.3 ZONAL FLUX DIAGRAM

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum, lamp
10	795.8	789.0	785.4	770.1	764.1	758.1	770.7	791.7	0- 10	75.69	75.69	11.2, 11.2
20	713.0	707.8	690.3	645.0	609.3	599.6	633.3	689.7	10- 20	205.7	281.4	41.6, 41.6
30	449.7	459.9	397.6	299.6	228.4	214.7	273.5	380.6	20- 30	236.2	517.6	76.6, 76.6
40	112.2	115.2	100.3	76.63	65.35	64.14	70.25	81.22	30- 40	110.8	628.4	93, 93
50	25.89	30.27	21.92	10.74	9.466	8.666	9.306	12.30	40- 50	35.61	664.0	98.3, 98.3
60	4.724	4.226	3.866	3.803	3.892	3.835	4.004	3.745	50- 60	6.484	670.5	99.2, 99.2
70	2.151	1.939	1.850	1.720	1.661	1.545	1.876	2.035	60- 70	2.865	673.3	99.7, 99.7
80	0.7328	0.6868	0.6393	0.6264	0.5442	0.5033	0.6081	0.7158	70- 80	1.202	674.5	99.8, 99.8
90	0.0990	0.1166	0.0553	0	0	0	0	0.0273	80- 90	0.3146	674.8	99.9, 99.9
100	0	0	0	0	0	0	0	0	90-100	0.0047	674.8	99.9, 99.9
110	0	0	0	0	0.0022	0.0030	0.0000	0	100-110	0.0003	674.8	99.9, 99.9
120	0.0038	0.0035	0.0047	0.0078	0.0222	0.0236	0.0191	0.0117	110-120	0.0039	674.9	99.9, 99.9
130	0.0511	0.0473	0.0510	0.0656	0.1191	0.1157	0.0973	0.0859	120-130	0.0343	674.9	99.9, 99.9
140	0.1452	0.1293	0.1310	0.1646	0.3370	0.3138	0.2565	0.2698	130-140	0.1102	675.0	99.9, 99.9
150	0.2320	0.2023	0.1907	0.2471	0.5295	0.5061	0.4244	0.4513	140-150	0.1789	675.2	99.9, 99.9
160	0.3503	0.3171	0.3085	0.3607	0.6343	0.6434	0.5596	0.5670	150-160	0.1904	675.4	100, 100
170	0.4051	0.3601	0.3817	0.4118	0.6056	0.5962	0.5616	0.5722	160-170	0.1358	675.5	100, 100
180	0.5100	0.4749	0.5146	0.5298	0.5032	0.4727	0.4809	0.5193	170-180	0.0466	675.5	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



## 5.4 LUMINANCE LIMITATION CURVES



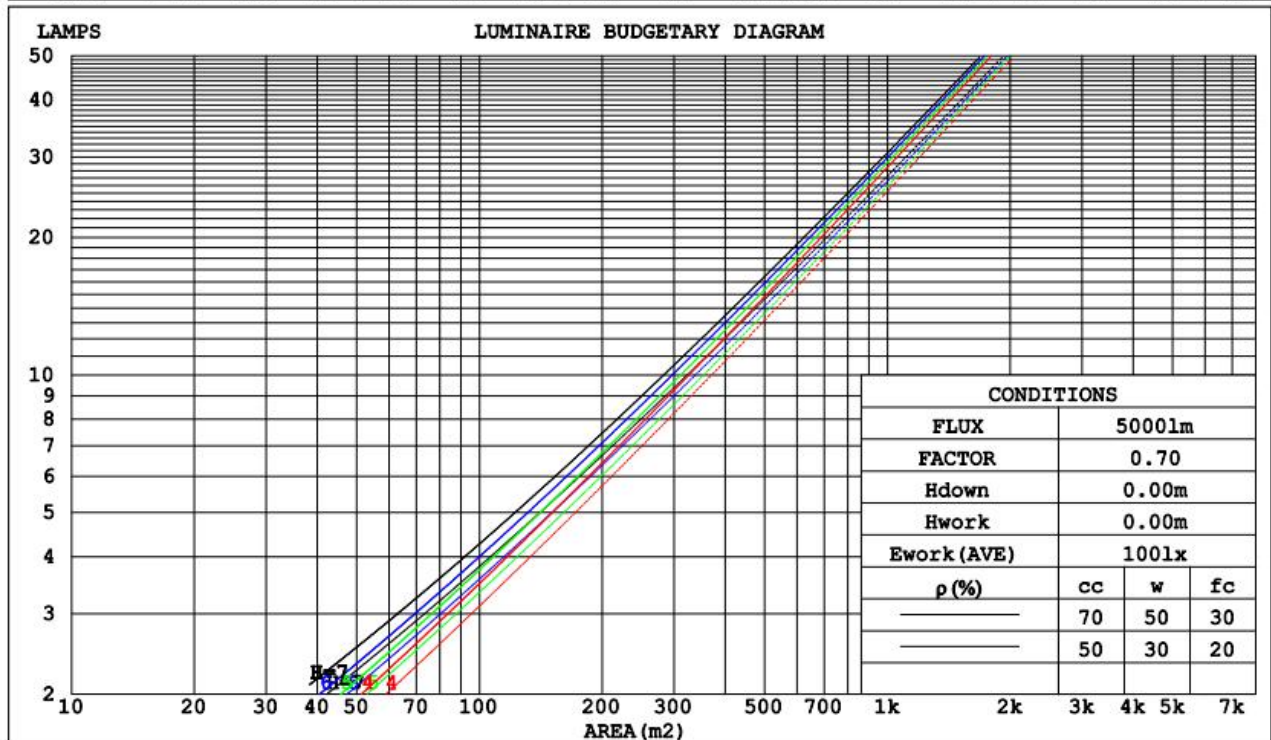


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## 5.5 CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
p <sub>w</sub>	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
p <sub>fc</sub>	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	1.11	1.08	1.06	1.09	1.07	1.05	1.05	1.03	1.01	1.01	.00	.98	.98	.96	.95	.94
2.0	1.03	.00	.96	1.02	.98	.95	.98	.96	.93	.95	.93	.91	.93	.91	.89	.87
3.0	.97	.92	.88	.95	.91	.87	.93	.89	.86	.90	.87	.85	.88	.85	.83	.82
4.0	.91	.85	.81	.89	.85	.81	.87	.83	.80	.85	.82	.79	.83	.80	.78	.76
5.0	.85	.79	.75	.84	.79	.75	.82	.78	.74	.81	.77	.74	.79	.76	.73	.71
6.0	.80	.74	.70	.79	.74	.70	.78	.73	.69	.76	.72	.69	.75	.71	.68	.67
7.0	.76	.70	.66	.75	.69	.65	.74	.69	.65	.72	.68	.65	.71	.67	.64	.63
8.0	.71	.66	.62	.71	.65	.61	.70	.65	.61	.69	.64	.61	.68	.64	.61	.59
9.0	.68	.62	.58	.67	.62	.58	.66	.61	.58	.65	.61	.57	.64	.60	.57	.56
10.0	.64	.58	.55	.64	.58	.55	.63	.58	.54	.62	.58	.54	.61	.57	.54	.53







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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	.175	.099	.031	.168	.096	.030	.155	.089	.028	.144	.083	.027	.133	.077	.025		
2.0	.167	.091	.028	.161	.089	.027	.151	.084	.026	.141	.079	.025	.132	.074	.023		
3.0	.159	.084	.025	.154	.082	.025	.145	.078	.024	.136	.075	.023	.129	.071	.022		
4.0	.151	.079	.023	.147	.077	.023	.139	.074	.022	.132	.071	.021	.125	.068	.021		
5.0	.144	.073	.021	.140	.072	.021	.134	.070	.020	.127	.067	.020	.121	.065	.019		
6.0	.137	.069	.020	.134	.068	.020	.128	.066	.019	.123	.064	.019	.118	.062	.018		
7.0	.131	.065	.018	.129	.064	.018	.123	.062	.018	.118	.061	.018	.114	.059	.017		
8.0	.126	.062	.017	.123	.061	.017	.119	.059	.017	.114	.058	.017	.110	.056	.016		
9.0	.121	.058	.016	.118	.058	.016	.114	.056	.016	.110	.055	.016	.106	.054	.016		
10.0	.116	.056	.015	.114	.055	.015	.110	.054	.015	.106	.053	.015	.103	.052	.015		

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	.112	.112	.112	.064	.064	.064	.020	.020	.020	
1.0	.172	.158	.146	.147	.136	.126	.101	.093	.087	.058	.054	.050	.019	.017	.016	
2.0	.156	.133	.114	.134	.115	.098	.092	.079	.069	.053	.046	.040	.017	.015	.013	
3.0	.144	.114	.091	.123	.099	.079	.085	.069	.055	.049	.040	.033	.016	.013	.011	
4.0	.133	.100	.074	.115	.086	.064	.079	.060	.045	.046	.035	.027	.015	.011	.009	
5.0	.125	.088	.061	.107	.076	.053	.074	.053	.037	.043	.031	.022	.014	.010	.007	
6.0	.117	.079	.051	.101	.068	.044	.070	.048	.031	.040	.028	.019	.013	.009	.006	
7.0	.111	.071	.043	.095	.062	.038	.066	.043	.027	.038	.025	.016	.012	.008	.005	
8.0	.105	.065	.037	.090	.056	.032	.063	.039	.023	.036	.023	.014	.012	.008	.005	
9.0	.100	.060	.032	.086	.052	.028	.060	.036	.020	.035	.021	.012	.011	.007	.004	
10.0	.096	.055	.028	.082	.048	.025	.057	.034	.018	.033	.020	.011	.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	23.6	24.5	23.8	24.7	24.9	23.0	23.9	23.2	24.1	24.3
3H	23.5	24.3	23.7	24.5	24.7	22.8	23.7	23.1	23.9	24.1
4H	23.4	24.2	23.7	24.4	24.6	22.8	23.6	23.0	23.8	24.0
6H	23.3	24.1	23.6	24.3	24.5	22.7	23.4	23.0	23.7	23.9
8H	23.3	24.0	23.6	24.2	24.5	22.6	23.4	22.9	23.6	23.9
12H	23.2	23.9	23.5	24.2	24.5	22.6	23.3	22.9	23.6	23.8
4H 2H	23.4	24.2	23.6	24.4	24.6	22.7	23.6	23.0	23.8	24.0
3H	23.2	23.9	23.5	24.2	24.5	22.6	23.3	22.9	23.6	23.8
4H	23.1	23.8	23.5	24.1	24.4	22.5	23.1	22.9	23.4	23.8
6H	23.0	23.6	23.4	23.9	24.3	22.4	23.0	22.8	23.3	23.7
8H	23.0	23.5	23.4	23.9	24.2	22.4	22.9	22.8	23.2	23.6
12H	23.0	23.4	23.4	23.8	24.2	22.3	22.8	22.7	23.2	23.6
8H 4H	23.0	23.5	23.4	23.9	24.2	22.4	22.9	22.8	23.2	23.6
6H	22.9	23.3	23.3	23.7	24.1	22.3	22.7	22.7	23.1	23.5
8H	22.9	23.2	23.3	23.7	24.1	22.2	22.6	22.7	23.0	23.5
12H	22.8	23.1	23.3	23.6	24.0	22.2	22.5	22.7	23.0	23.4
12H 4H	22.9	23.4	23.4	23.8	24.2	22.3	22.8	22.7	23.2	23.6
6H	22.9	23.2	23.3	23.6	24.1	22.2	22.6	22.7	23.0	23.5
8H	22.8	23.1	23.3	23.6	24.0	22.2	22.5	22.7	23.0	23.4
Variations with the observer position at spacings:										
S = 1.0H	+ 2.9 / - 9.7					+ 2.4 / - 9.8				
1.5H	+ 4.6 / - 8.9					+ 3.8 / - 9.1				
2.0H	+ 6.2 / - 6.7					+ 6.3 / - 7.2				

CIE Pub.117, 675.5 lm Total Lamp Luminous Flux Corrected (8log(F/F0) = -1.4)



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## 5.8 UTILIZATION FACTORS TABLE

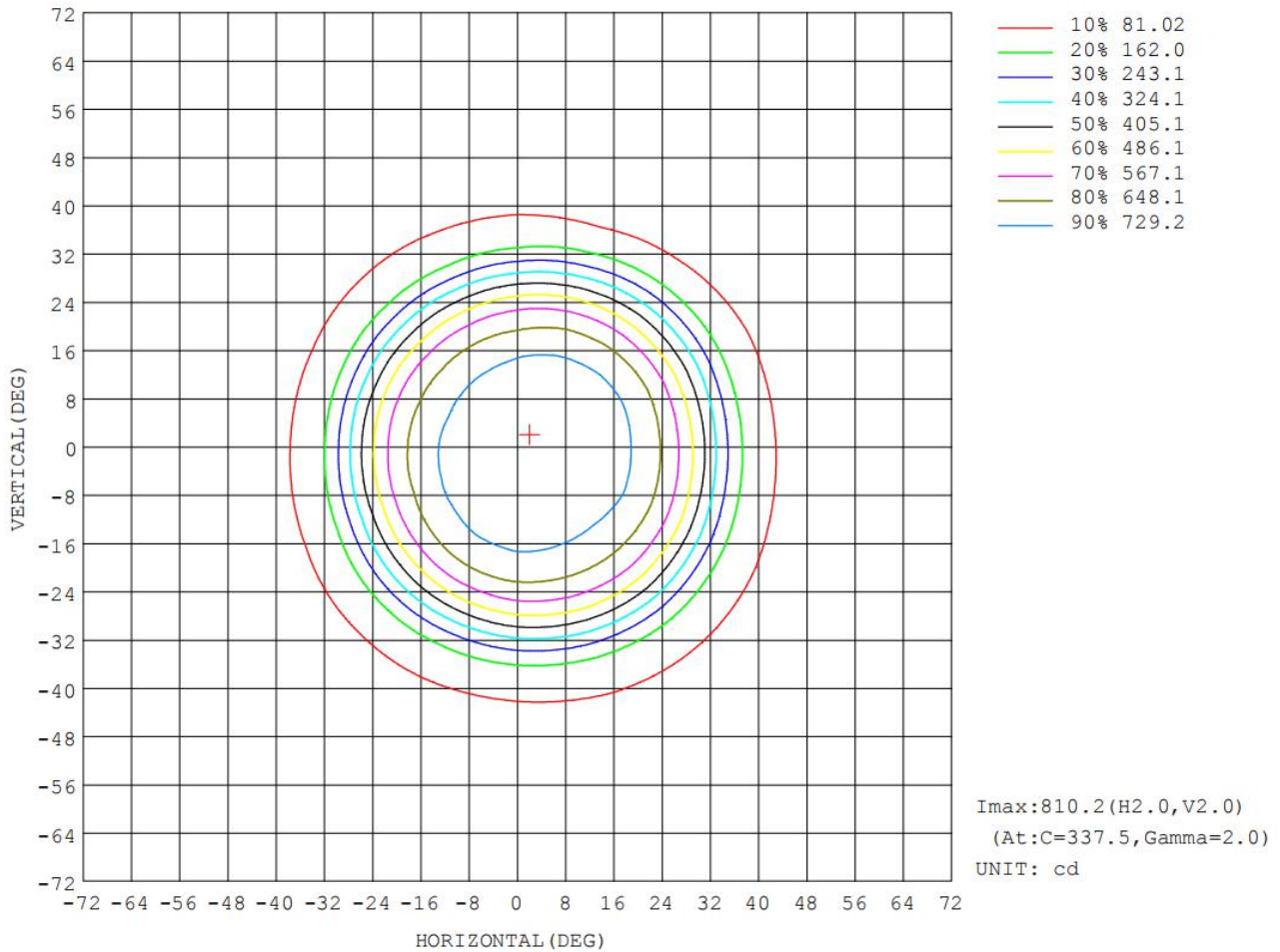
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	87	81	77	87	81	77	86	80	77	73
0.80	95	89	85	94	88	85	93	88	85	81
1.00	99	94	90	98	93	90	97	93	89	85
1.25	103	98	95	102	97	94	100	96	93	89
1.50	106	101	98	105	100	97	102	99	96	92
2.00	109	104	101	107	103	101	104	101	99	94
2.50	110	106	104	109	105	103	106	103	101	95
3.00	112	108	106	110	107	105	107	104	102	96
4.00	114	111	109	112	109	107	108	106	105	98
5.00	115	113	111	113	111	109	109	108	106	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



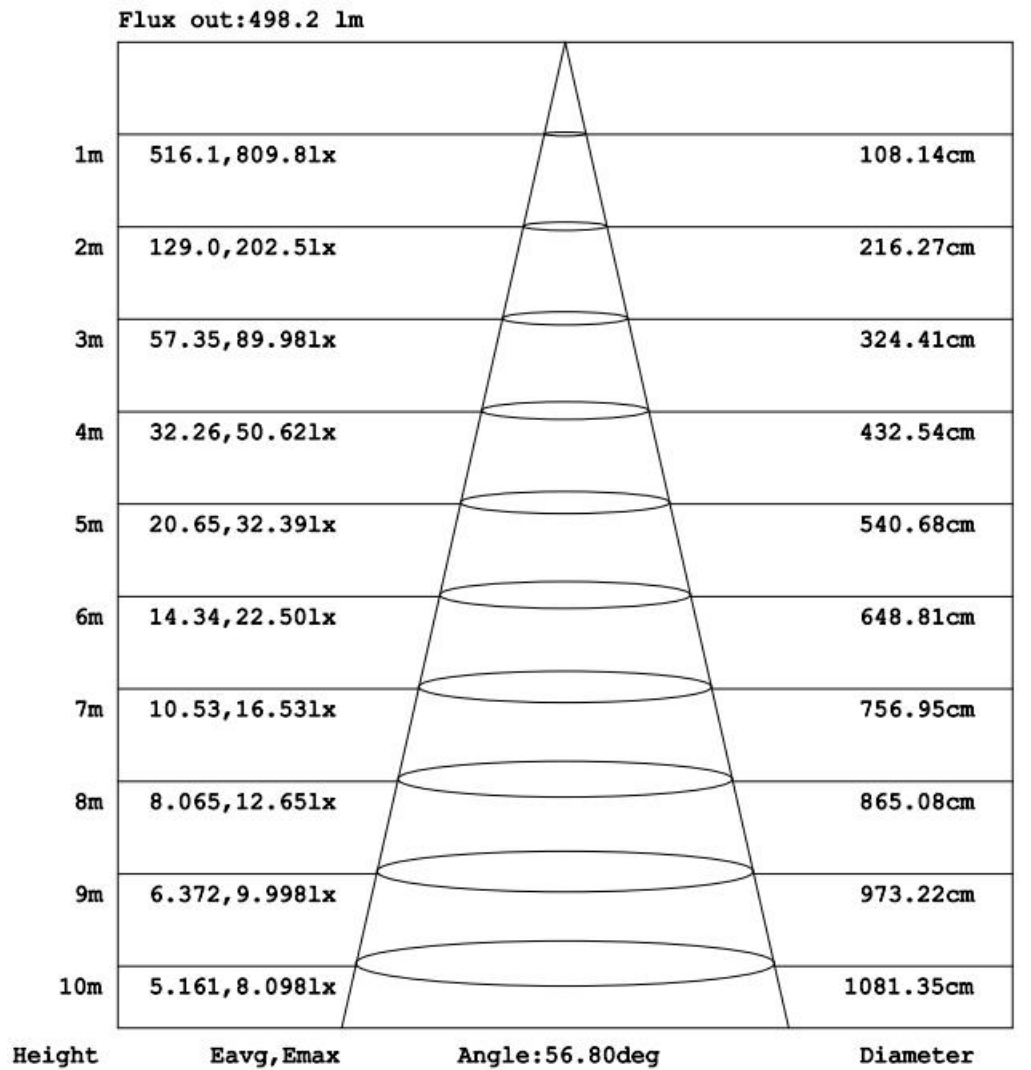




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## 5.10 AAI Figure



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

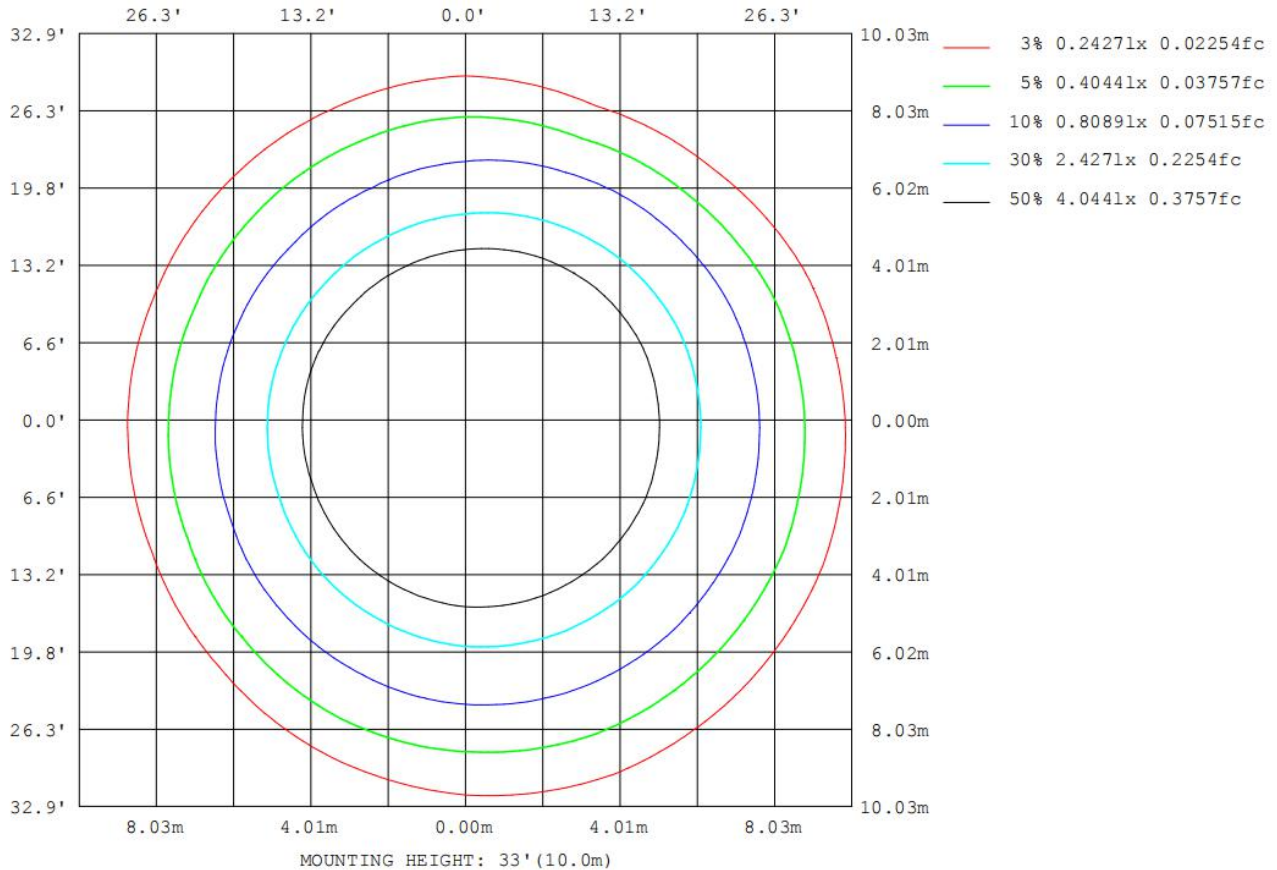




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## 5.11 ISOLUX DIAGRAM

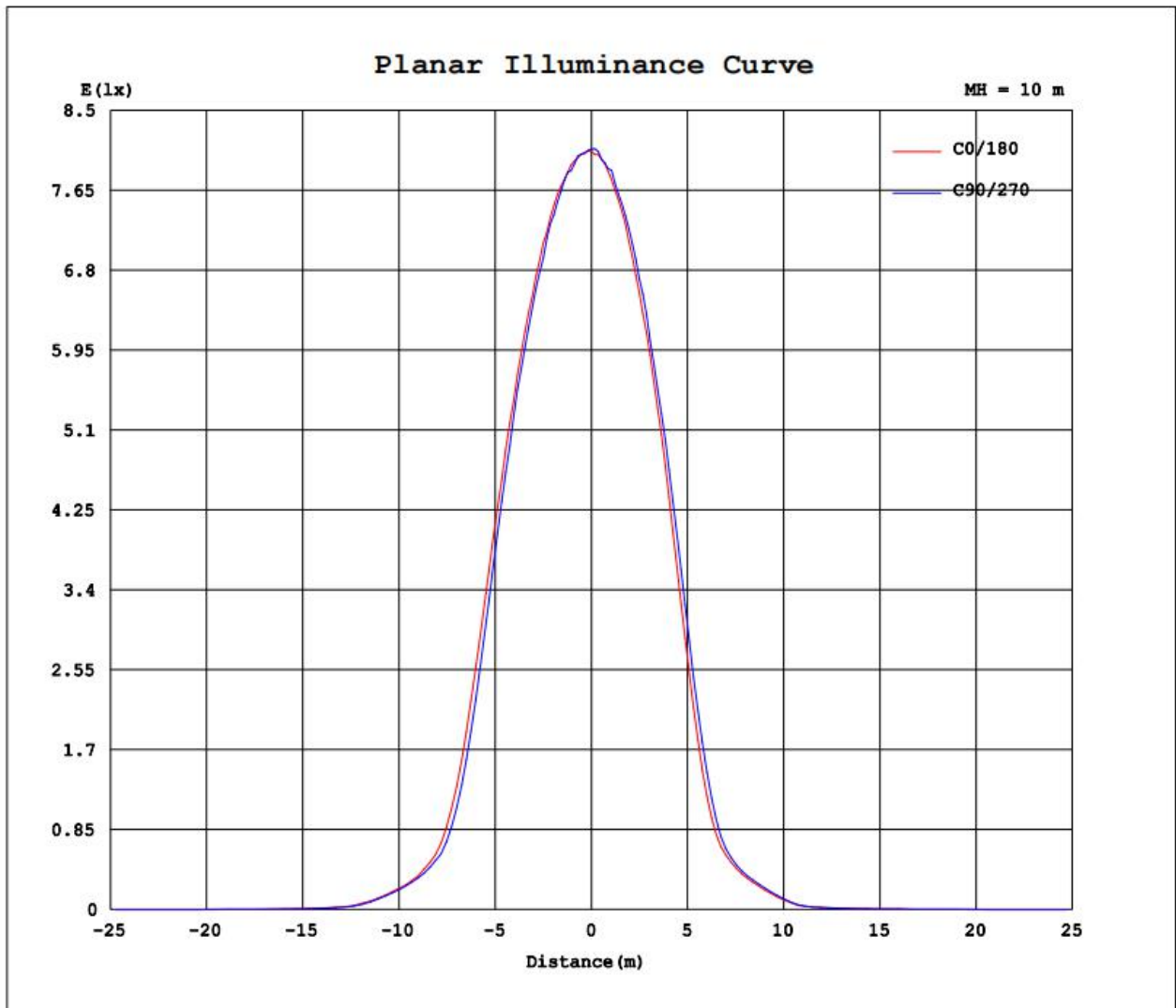




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## 5.12 Planar Illuminance Curve





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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	806	806	806	806	806	806	806	806	806	806	806	806	806	806	806	806			
5	806	802	799	804	800	795	796	793	795	792	792	796	794	807	803	809			
10	796	798	789	789	785	780	770	769	764	759	758	766	771	787	792	803			
15	767	772	759	756	751	742	723	716	704	700	697	711	724	743	757	775			
20	713	719	708	704	690	675	645	626	609	603	600	613	633	663	690	717			
25	614	632	619	608	581	541	499	461	438	427	427	447	485	534	573	610			
30	450	469	460	435	398	345	300	254	228	216	215	233	273	325	381	430			
35	239	255	249	227	197	160	132	117	106	100	100	105	117	137	176	221			
40	112	120	115	110	100	90.2	76.6	69.0	65.4	62.8	64.1	65.6	70.2	67.8	81.2	101			
45	64.2	69.5	69.2	67.8	60.3	49.7	38.5	31.2	29.6	26.3	25.7	29.1	32.9	32.3	44.1	57.6			
50	25.9	30.1	30.3	28.2	21.9	13.0	10.7	9.67	9.47	8.83	8.67	8.87	9.31	8.35	12.3	21.6			
55	8.26	8.91	8.02	7.38	6.58	5.80	5.30	5.24	5.17	5.05	4.95	5.15	5.22	4.82	5.55	7.40			
60	4.72	4.63	4.23	3.99	3.87	3.84	3.80	3.89	3.89	3.88	3.83	4.03	4.00	3.56	3.75	4.40			
65	3.43	3.30	3.01	2.92	2.91	2.93	2.73	2.66	2.60	2.56	2.50	2.68	2.79	2.64	3.00	3.31			
70	2.15	2.13	1.94	1.86	1.85	1.83	1.72	1.72	1.66	1.59	1.54	1.64	1.88	1.83	2.03	2.23			
75	1.29	1.31	1.24	1.17	1.10	1.02	0.97	0.98	0.95	0.93	0.92	0.96	1.02	1.08	1.17	1.27			
80	0.73	0.74	0.69	0.66	0.64	0.64	0.63	0.59	0.54	0.51	0.50	0.54	0.61	0.67	0.72	0.74			
85	0.43	0.45	0.43	0.39	0.35	0.30	0.22	0.14	0.10	0.07	0.07	0.10	0.16	0.24	0.34	0.41			
90	0.10	0.12	0.12	0.09	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07			
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	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00			
120	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01			
125	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.03			
130	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.07	0.12	0.12	0.12	0.11	0.10	0.09	0.09	0.08			
135	0.09	0.09	0.08	0.09	0.09	0.10	0.11	0.12	0.22	0.22	0.21	0.19	0.17	0.17	0.17	0.17			
140	0.15	0.14	0.13	0.12	0.13	0.15	0.16	0.18	0.34	0.34	0.31	0.28	0.26	0.26	0.27	0.27			
145	0.19	0.19	0.17	0.16	0.17	0.19	0.21	0.23	0.45	0.44	0.43	0.37	0.34	0.35	0.38	0.38			
150	0.23	0.22	0.20	0.18	0.19	0.23	0.25	0.27	0.53	0.54	0.51	0.47	0.42	0.43	0.45	0.48			
155	0.30	0.29	0.26	0.25	0.25	0.29	0.31	0.33	0.61	0.61	0.59	0.56	0.51	0.47	0.52	0.56			
160	0.35	0.34	0.32	0.30	0.31	0.33	0.36	0.38	0.63	0.64	0.64	0.60	0.56	0.54	0.57	0.59			
165	0.38	0.37	0.35	0.33	0.34	0.37	0.40	0.40	0.63	0.63	0.63	0.59	0.57	0.55	0.56	0.59			
170	0.41	0.38	0.36	0.36	0.38	0.40	0.41	0.42	0.61	0.61	0.60	0.57	0.56	0.56	0.57	0.59			
175	0.43	0.43	0.41	0.42	0.44	0.47	0.47	0.48	0.54	0.55	0.55	0.53	0.54	0.55	0.56	0.58			
180	0.51	0.48	0.47	0.48	0.51	0.53	0.53	0.53	0.50	0.51	0.47	0.47	0.48	0.50	0.52	0.53			





Guangdong Meide Testing Technology Co., Ltd.



## 6.Photo of sample



Figure 1



Figure 2

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