



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-M

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 01005

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

Model Tested:	ZXL-11-A-M
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° 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

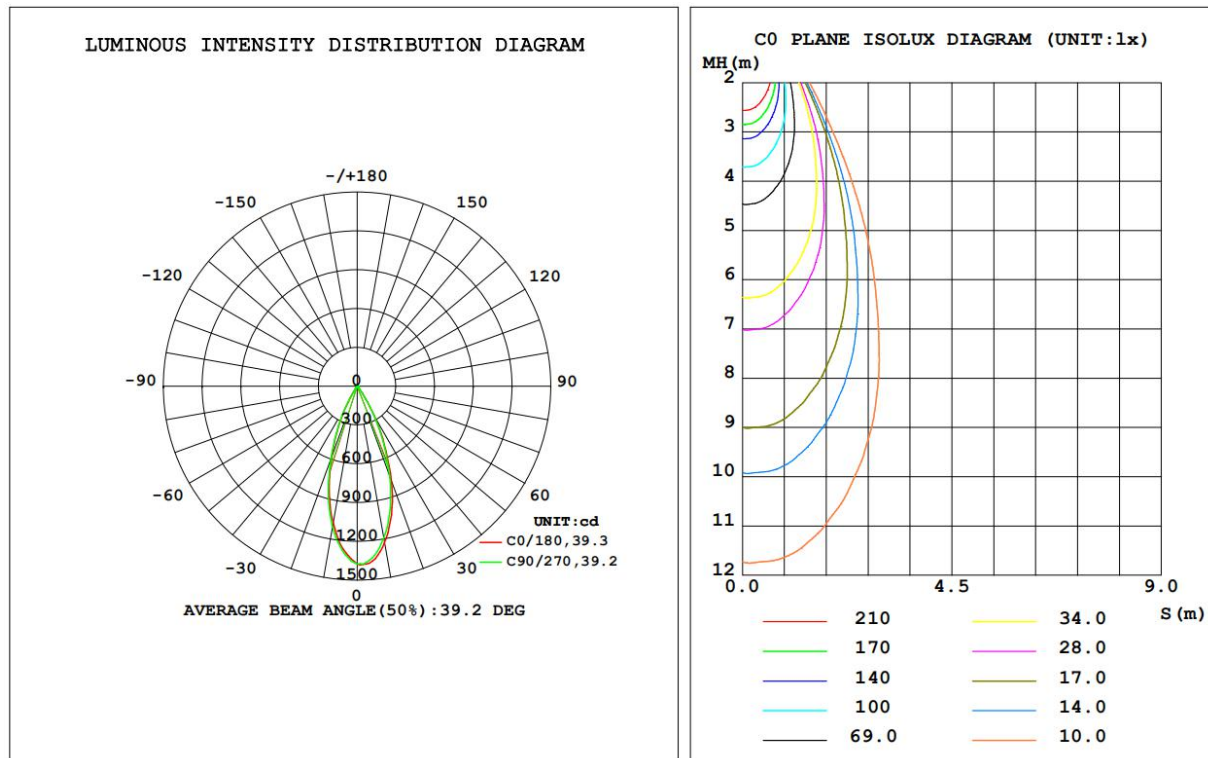
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
12.0	60.00	0.7135	0.9473	8.111

Photometric Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I _{max} (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
632.597	77.99	1383	0.58	0.60

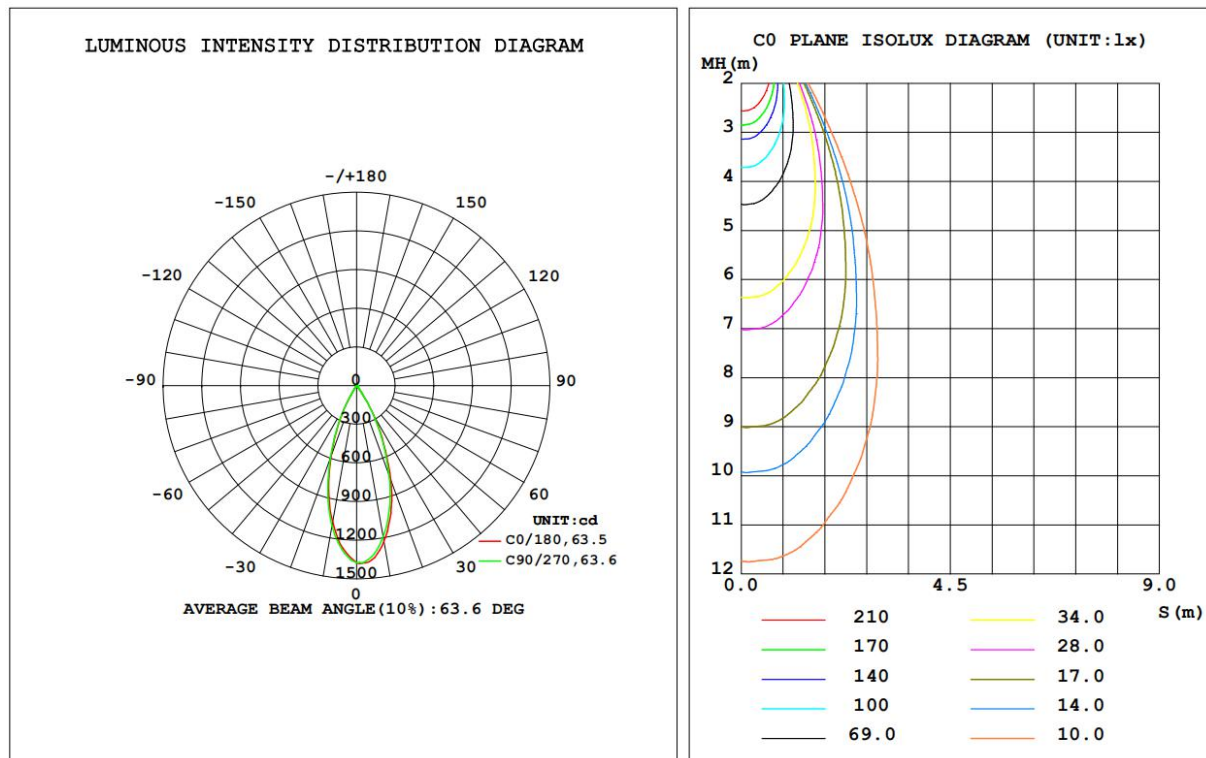
5.2 LUMINOUS INTENSITY DISTRIBUTION DIAGRAM AND C0 PLANE ISOLUX DIAGRAM (UNIT:lx)



AVERAGE BEAM ANGLE(50%):39.2 DEG



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AVERAGE BEAM ANGLE(10%):63.6 DEG



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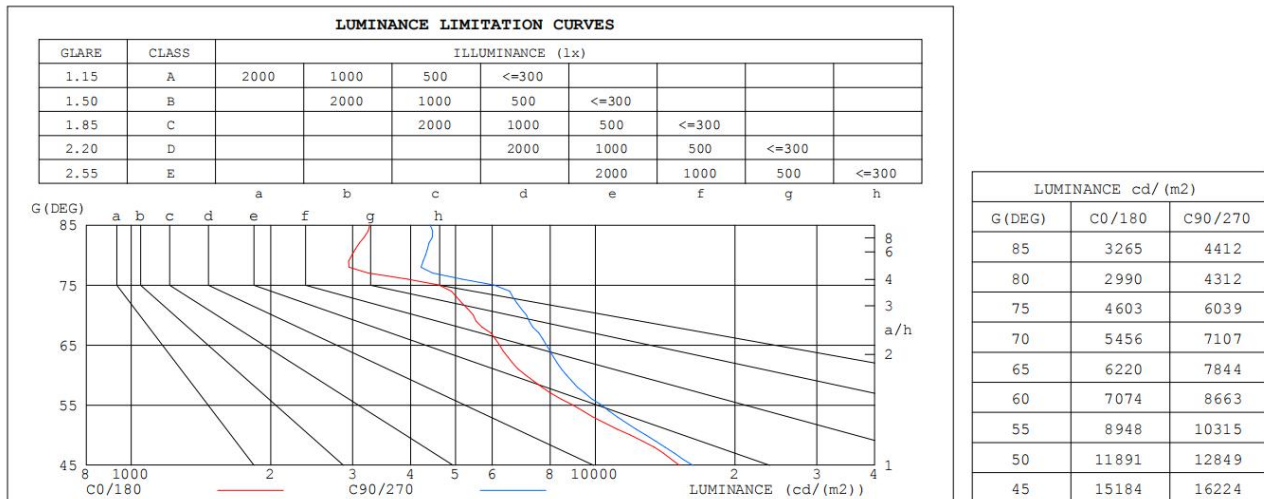


5.3 ZONAL FLUX DIAGRAM

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	1224	1244	1193	1116	1073	1066	1105	1168	0- 10	119.7	119.7	18.9,18.9
20	776.1	796.9	737.9	636.8	574.3	555.0	595.9	687.6	10- 20	254.4	374.1	59.1,59.1
30	267.0	288.8	257.8	193.9	143.8	128.6	149.0	205.8	20- 30	190.1	564.2	89.2,89.2
40	24.56	27.98	25.60	18.61	13.38	11.79	13.66	18.92	30- 40	48.37	612.6	96.8,96.8
50	9.555	9.039	10.32	8.880	6.476	5.590	6.271	7.586	40- 50	9.198	621.8	98.3,98.3
60	4.421	4.498	5.414	4.802	3.774	3.147	3.289	3.728	50- 60	5.156	626.9	99.1,99.1
70	2.333	2.524	3.038	2.819	2.207	1.831	1.746	2.008	60- 70	3.157	630.1	99.6,99.6
80	0.6490	0.8196	0.9360	0.8185	0.6642	0.5313	0.5244	0.5909	70- 80	1.445	631.5	99.8,99.8
90	0.0529	0.0871	0.0511	0.0020	0.0000	0	0	0.0113	80- 90	0.3367	631.9	99.9,99.9
100	0	0	0	0	0	0	0	0	90-100	0.0026	631.9	99.9,99.9
110	0	0	0	0	0	0	0	0	100-110	0	631.9	99.9,99.9
120	0.0000	0	0	0.0001	0.0044	0.0060	0.0053	0.0046	110-120	0.0005	631.9	99.9,99.9
130	0.0406	0.0331	0.0328	0.0393	0.0723	0.0782	0.0742	0.0703	120-130	0.0187	631.9	99.9,99.9
140	0.1516	0.1297	0.1260	0.1480	0.3196	0.3120	0.2670	0.2879	130-140	0.0967	632.0	99.9,99.9
150	0.2665	0.2143	0.1864	0.2522	0.6258	0.5951	0.4751	0.5342	140-150	0.1925	632.2	99.9,99.9
160	0.3968	0.3312	0.2999	0.3633	0.7823	0.7767	0.6455	0.6701	150-160	0.2192	632.4	100,100
170	0.4000	0.3347	0.3524	0.3807	0.6872	0.6658	0.5812	0.6127	160-170	0.1497	632.6	100,100
180	0.4764	0.4764	0.4747	0.4747	0.4747	0.4747	0.4764	0.4764	170-180	0.0459	632.6	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



5.4 LUMINANCE LIMITATION CURVES



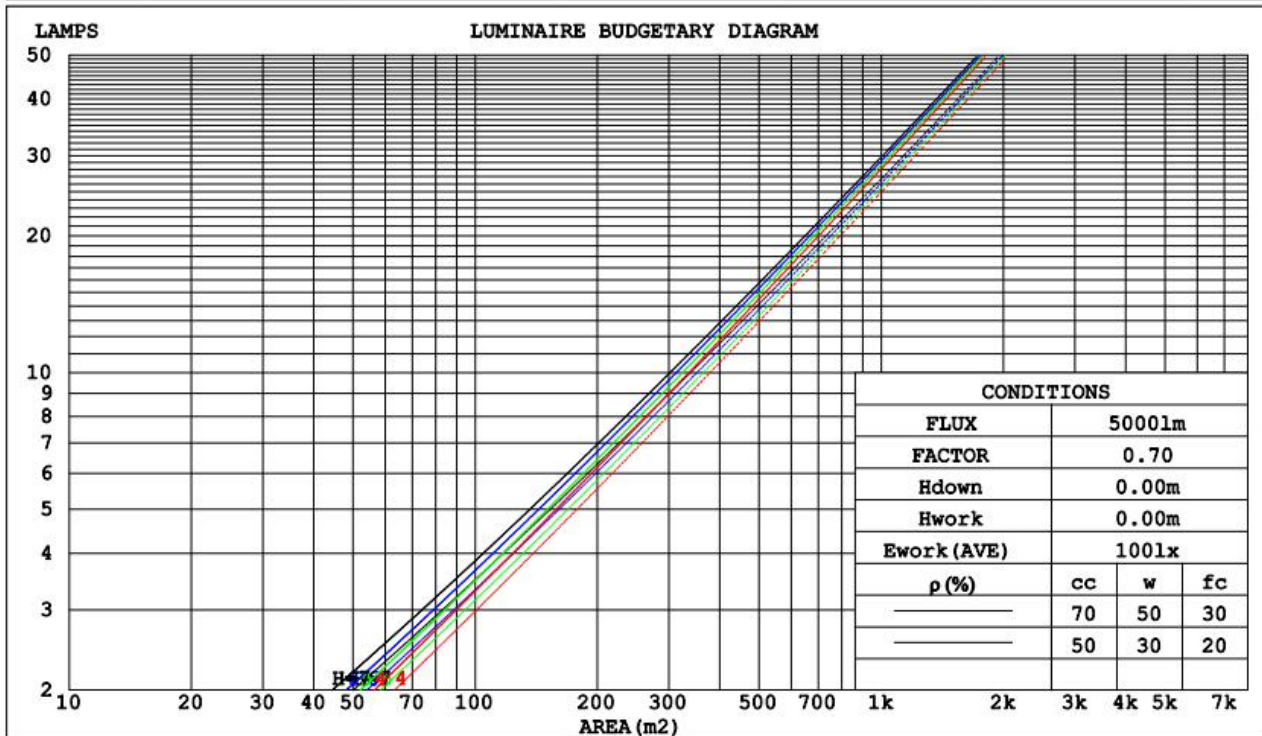


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5.5 CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

pcc	80%			70%			50%			30%			10%			0
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	1.12	1.10	1.08	1.10	1.08	1.06	1.06	1.04	1.03	1.02	1.01	.00	.98	.98	.97	.95
2.0	1.05	1.02	.99	1.04	1.00	.98	1.00	.98	.96	.97	.95	.94	.95	.93	.92	.90
3.0	.00	.95	.92	.98	.94	.91	.96	.92	.90	.93	.91	.88	.91	.89	.87	.86
4.0	.94	.90	.86	.93	.89	.86	.91	.88	.85	.89	.86	.84	.88	.85	.83	.81
5.0	.90	.85	.81	.89	.84	.81	.87	.83	.80	.86	.82	.79	.84	.81	.79	.77
6.0	.86	.81	.77	.85	.80	.77	.83	.79	.76	.82	.78	.76	.81	.78	.75	.74
7.0	.82	.77	.73	.81	.76	.73	.80	.76	.73	.79	.75	.72	.78	.74	.72	.71
8.0	.78	.73	.70	.78	.73	.70	.77	.72	.69	.76	.72	.69	.75	.71	.69	.68
9.0	.75	.70	.67	.74	.70	.66	.74	.69	.66	.73	.69	.66	.72	.68	.66	.65
10.0	.72	.67	.64	.72	.67	.64	.71	.66	.64	.70	.66	.63	.69	.66	.63	.62





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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	.158	.090	.029	.152	.086	.027	.139	.080	.025	.127	.074	.024	.117	.068	.022	
2.0	.149	.082	.025	.143	.079	.024	.133	.074	.023	.123	.069	.022	.114	.065	.020	
3.0	.140	.075	.022	.136	.073	.022	.127	.069	.021	.119	.065	.020	.111	.061	.019	
4.0	.133	.069	.020	.129	.067	.020	.121	.064	.019	.114	.061	.018	.108	.058	.018	
5.0	.126	.064	.019	.122	.063	.018	.116	.060	.018	.110	.058	.017	.104	.056	.017	
6.0	.120	.060	.017	.117	.059	.017	.111	.057	.017	.106	.055	.016	.101	.053	.016	
7.0	.114	.057	.016	.112	.056	.016	.107	.054	.016	.102	.052	.015	.098	.051	.015	
8.0	.109	.053	.015	.107	.053	.015	.103	.051	.015	.098	.050	.014	.095	.049	.014	
9.0	.105	.051	.014	.103	.050	.014	.099	.049	.014	.095	.048	.014	.092	.047	.013	
10.0	.101	.048	.013	.099	.048	.013	.095	.047	.013	.092	.046	.013	.089	.045	.013	

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	.171	.158	.147	.146	.136	.127	.100	.094	.088	.058	.054	.051	.018	.017	.016	
2.0	.154	.133	.116	.132	.115	.100	.090	.079	.070	.052	.046	.041	.017	.015	.013	
3.0	.140	.114	.094	.120	.099	.081	.083	.069	.057	.048	.040	.034	.015	.013	.011	
4.0	.129	.099	.077	.111	.086	.067	.076	.060	.047	.044	.035	.028	.014	.011	.009	
5.0	.119	.087	.064	.103	.076	.055	.071	.053	.039	.041	.031	.023	.013	.010	.008	
6.0	.111	.078	.054	.096	.067	.047	.066	.047	.033	.038	.028	.020	.012	.009	.006	
7.0	.104	.070	.046	.090	.061	.040	.062	.042	.028	.036	.025	.017	.012	.008	.006	
8.0	.098	.063	.039	.085	.055	.034	.059	.039	.024	.034	.023	.015	.011	.007	.005	
9.0	.093	.058	.034	.080	.050	.030	.056	.035	.021	.032	.021	.013	.010	.007	.004	
10.0	.088	.053	.030	.076	.046	.026	.053	.033	.019	.031	.019	.011	.010	.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	2H	17.8	18.6	18.0	18.8	18.9	17.8	18.6	18.0	18.7	18.9	
	3H	17.8	18.5	18.0	18.7	18.9	17.8	18.6	18.1	18.8	18.9	
	4H	17.8	18.5	18.0	18.7	18.9	17.8	18.5	18.1	18.8	19.0	
	6H	17.7	18.4	18.0	18.6	18.9	17.8	18.5	18.1	18.7	18.9	
	8H	17.7	18.3	18.0	18.6	18.8	17.8	18.4	18.1	18.7	18.9	
	12H	17.7	18.3	18.0	18.5	18.8	17.8	18.4	18.1	18.6	18.9	
	4H	2H	17.7	18.4	17.9	18.6	18.8	17.6	18.3	17.9	18.5	18.8
		3H	17.7	18.3	18.0	18.6	18.8	17.7	18.3	18.0	18.6	18.9
		4H	17.7	18.2	18.0	18.5	18.8	17.8	18.3	18.1	18.6	18.9
		6H	17.6	18.1	18.0	18.5	18.8	17.8	18.3	18.1	18.6	18.9
		8H	17.6	18.1	18.0	18.4	18.8	17.8	18.2	18.2	18.6	18.9
		12H	17.6	18.0	18.0	18.4	18.8	17.7	18.2	18.2	18.5	18.9
	8H	4H	17.6	18.0	18.0	18.4	18.8	17.7	18.1	18.1	18.5	18.9
		6H	17.6	17.9	18.0	18.3	18.7	17.7	18.1	18.1	18.5	18.9
		8H	17.5	17.9	18.0	18.3	18.7	17.7	18.0	18.2	18.5	18.9
		12H	17.5	17.8	18.0	18.3	18.7	17.7	18.0	18.2	18.4	18.9
	12H	4H	17.5	18.0	18.0	18.3	18.7	17.6	18.1	18.0	18.4	18.8
		6H	17.5	17.8	18.0	18.3	18.7	17.7	18.0	18.1	18.4	18.8
		8H	17.5	17.8	18.0	18.2	18.7	17.7	18.0	18.1	18.4	18.9
Variations with the observer position at spacings:												
S = 1.0H	+ 2.4 / - 2.3					+ 2.2 / - 1.8						
1.5H	+ 4.1 / - 1.9					+ 3.9 / - 1.6						
2.0H	+ 1.7 / - 1.1					+ 1.5 / - 1.0						

CIE Pub.117, 632.6 lm Total Lamp Luminous Flux Corrected ($8\log(F/F_0) = -1.6$)



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5.8 UTILIZATION FACTORS TABLE

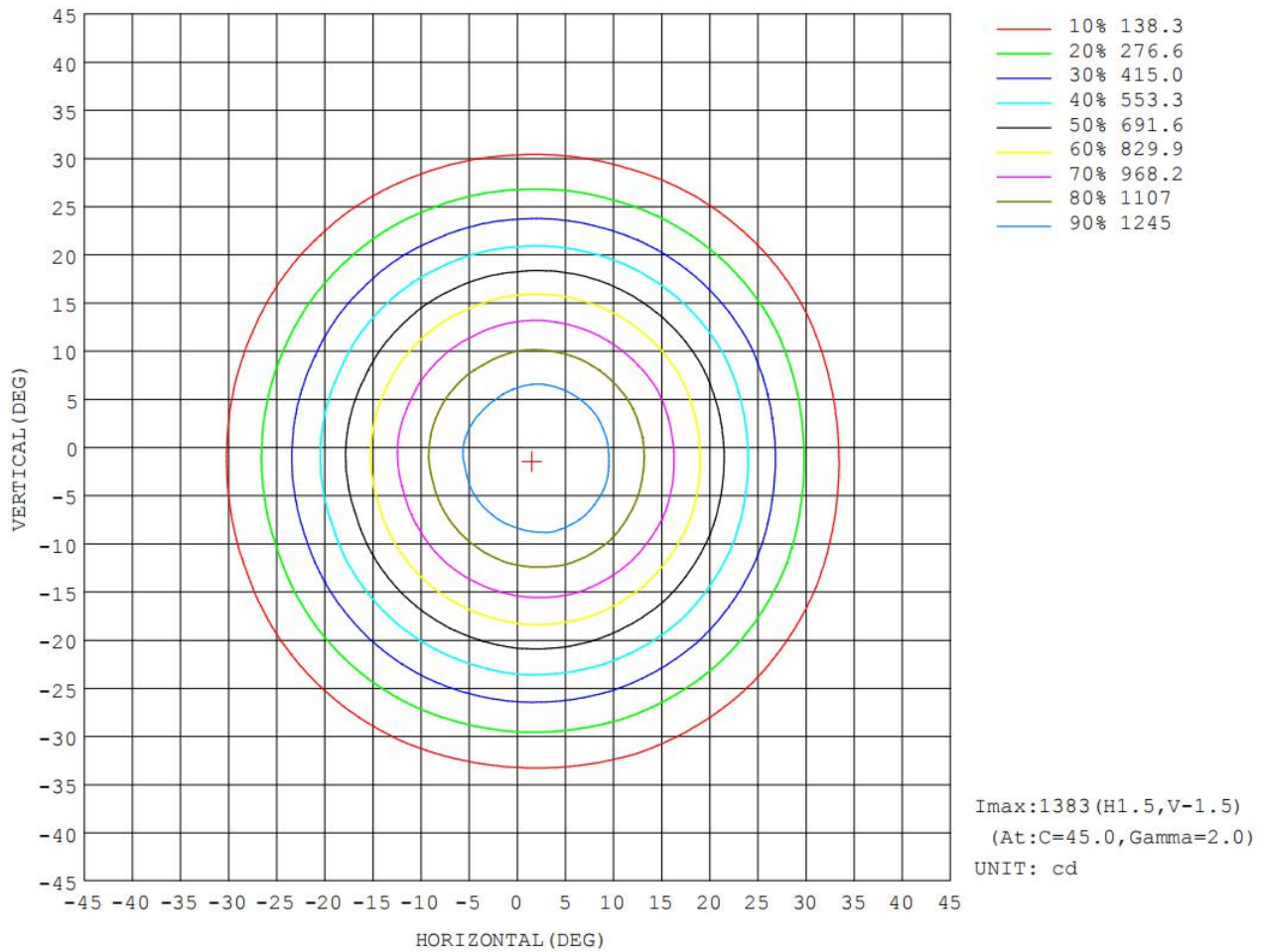
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	90	84	80	89	84	80	88	83	80	77
0.80	97	91	88	96	91	88	95	90	87	84
1.00	101	95	92	100	95	92	98	95	91	87
1.25	104	99	96	103	99	96	101	98	95	91
1.50	107	102	99	106	102	99	103	100	98	93
2.00	109	105	102	108	104	102	105	102	100	95
2.50	111	107	104	109	106	103	106	104	102	96
3.00	112	109	106	110	108	105	107	105	103	97
4.00	114	112	110	112	110	108	109	107	105	98
5.00	115	113	112	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

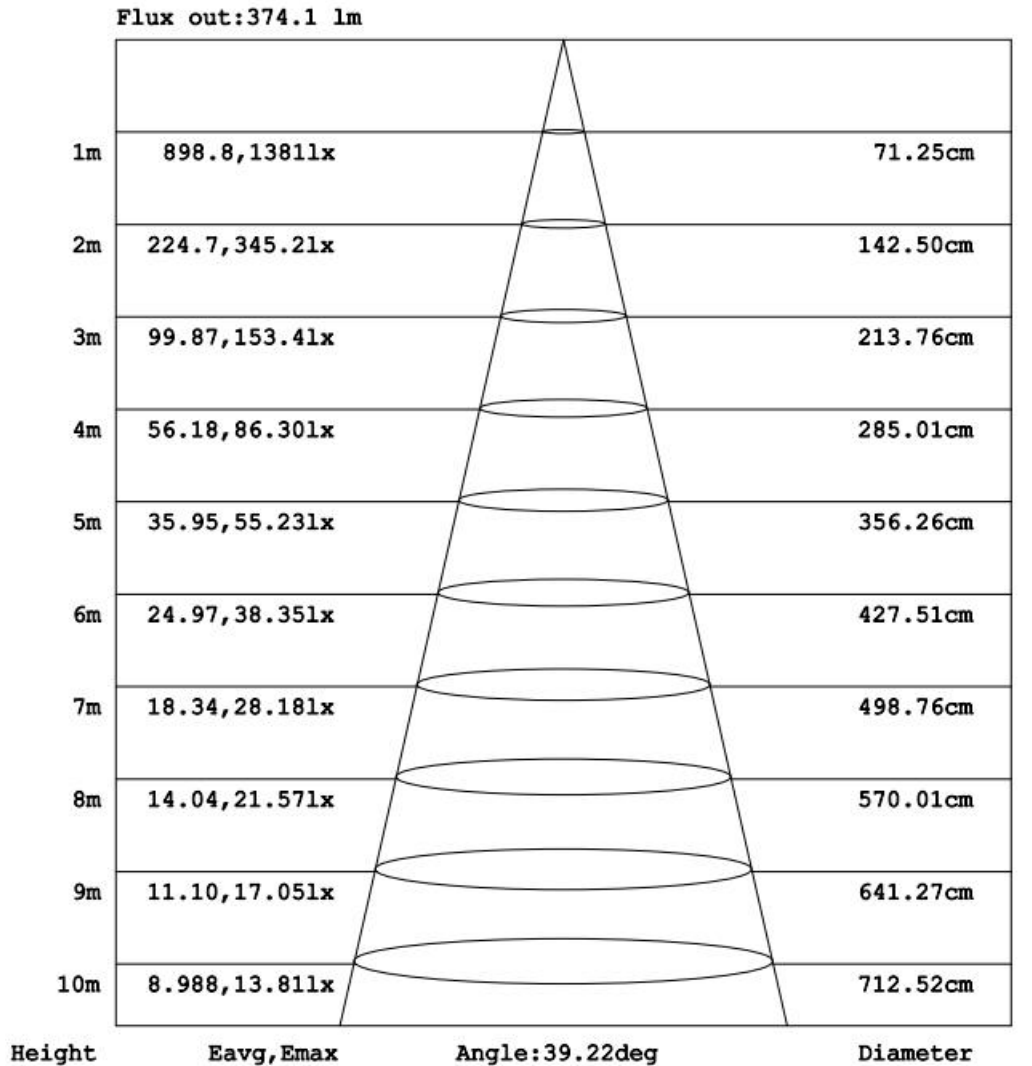




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5.10 AAI Figure



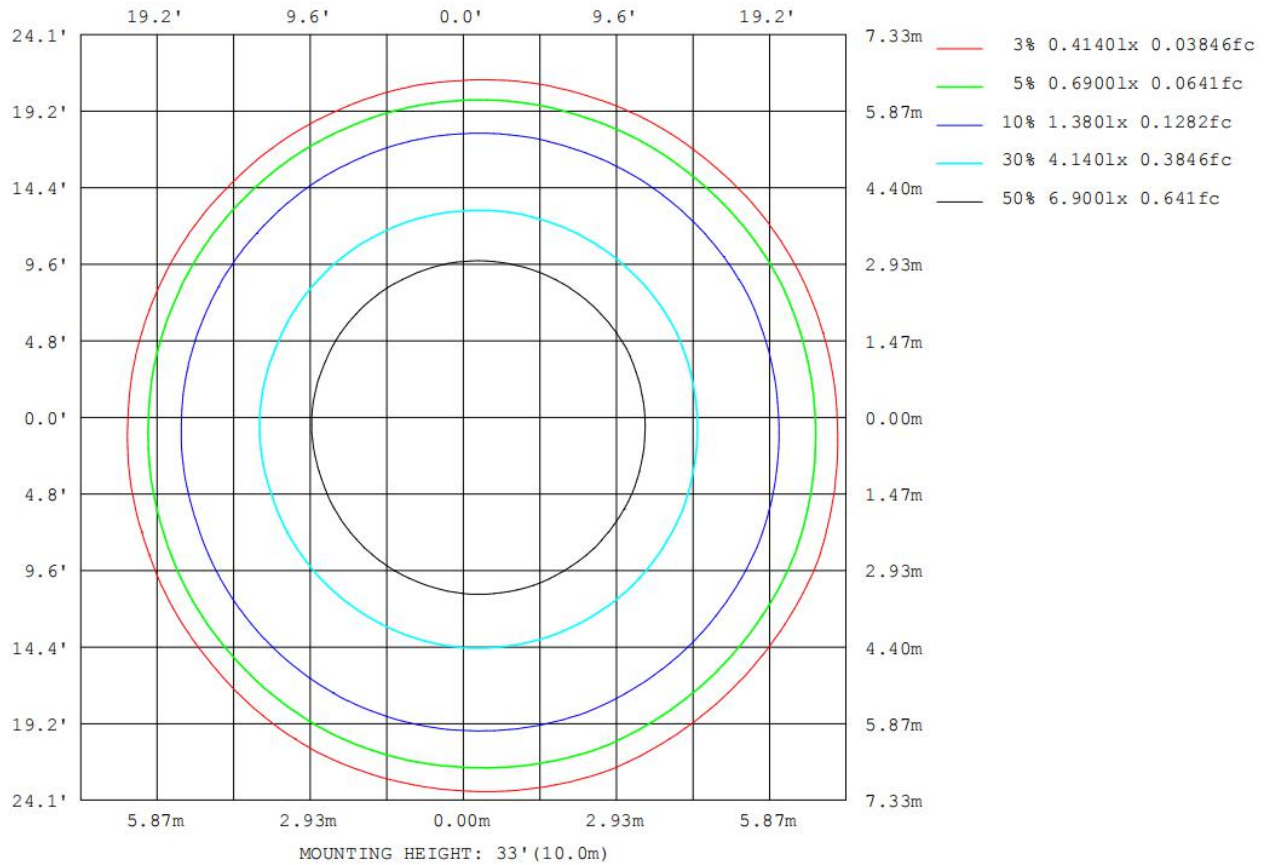
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.



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5.11 ISOLUX DIAGRAM

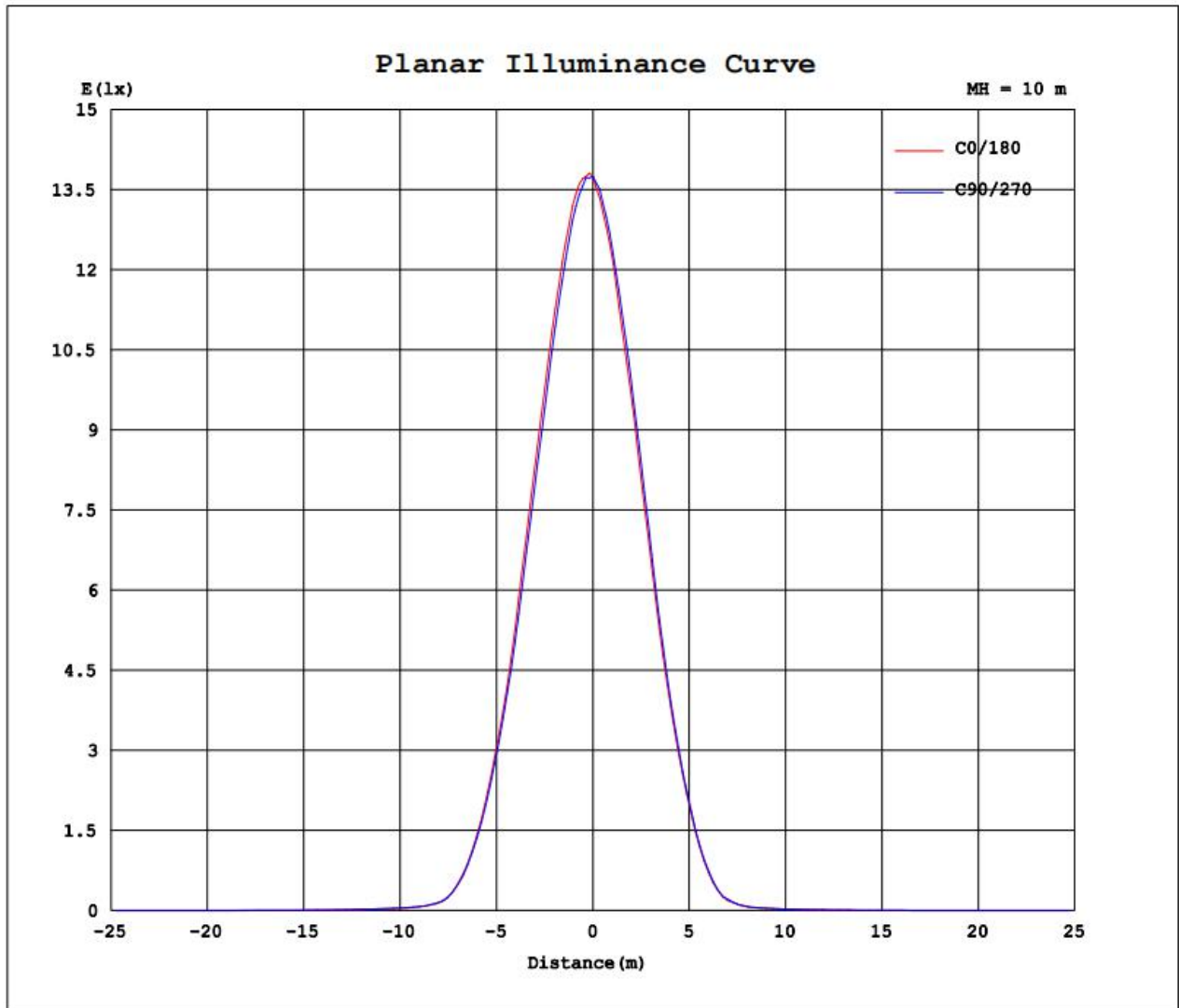




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5.12 Planar Illuminance Curve





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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	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375			
5	1358	1362	1362	1356	1335	1304	1293	1273	1265	1256	1252	1259	1284	1304	1325	1343			
10	1224	1245	1244	1229	1193	1151	1116	1085	1073	1063	1066	1076	1105	1135	1168	1208			
15	1028	1047	1046	1030	987	943	898	859	841	826	828	838	869	909	951	998			
20	776	799	797	777	738	688	637	593	574	554	555	566	596	637	688	743			
25	501	526	527	511	483	443	400	362	343	324	319	329	350	385	428	476			
30	267	290	289	281	258	229	194	161	144	131	129	135	149	171	206	246			
35	93.6	109	109	108	90.4	75.2	53.3	39.8	34.8	33.6	32.6	34.4	39.0	45.8	57.1	75.8			
40	24.6	26.7	28.0	26.3	25.6	22.1	18.6	15.5	13.4	12.0	11.8	13.0	13.7	16.2	18.9	21.9			
45	13.4	13.2	13.2	13.3	14.3	13.6	12.5	10.8	9.13	8.21	7.91	8.89	9.12	10.3	11.4	12.1			
50	9.55	9.14	9.04	9.34	10.3	9.93	8.88	7.81	6.48	5.89	5.59	6.13	6.27	7.07	7.59	8.64			
55	6.42	6.15	6.22	6.60	7.40	7.04	6.32	5.78	4.84	4.38	4.12	4.45	4.47	4.92	5.17	6.00			
60	4.42	4.37	4.50	4.83	5.41	5.29	4.80	4.50	3.77	3.38	3.15	3.28	3.29	3.56	3.73	4.23			
65	3.29	3.21	3.36	3.68	4.14	4.10	3.76	3.50	2.98	2.68	2.45	2.52	2.44	2.62	2.80	3.17			
70	2.33	2.33	2.52	2.80	3.04	3.06	2.82	2.58	2.21	1.97	1.83	1.85	1.75	1.88	2.01	2.25			
75	1.49	1.49	1.60	1.83	1.95	1.70	1.39	1.18	1.11	1.03	0.94	0.88	0.84	0.88	1.02	1.30			
80	0.65	0.73	0.82	0.92	0.94	0.89	0.82	0.72	0.66	0.59	0.53	0.51	0.52	0.56	0.59	0.62			
85	0.36	0.42	0.48	0.52	0.48	0.40	0.29	0.20	0.15	0.12	0.10	0.12	0.15	0.20	0.27	0.32			
90	0.05	0.07	0.09	0.08	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04			
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	0.01	0.01	0.01	0.01	0.01	0.00	0.00			
125	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02			
130	0.04	0.04	0.03	0.03	0.03	0.03	0.04	0.05	0.07	0.08	0.08	0.08	0.07	0.07	0.07	0.07			
135	0.08	0.08	0.07	0.07	0.07	0.08	0.09	0.10	0.17	0.18	0.18	0.17	0.16	0.16	0.16	0.16			
140	0.15	0.14	0.13	0.12	0.13	0.13	0.15	0.17	0.32	0.33	0.31	0.28	0.27	0.27	0.29	0.29			
145	0.21	0.20	0.18	0.15	0.17	0.19	0.22	0.25	0.48	0.49	0.47	0.41	0.37	0.38	0.42	0.42			
150	0.27	0.25	0.21	0.18	0.19	0.22	0.25	0.30	0.63	0.62	0.60	0.54	0.48	0.49	0.53	0.56			
155	0.36	0.33	0.30	0.26	0.24	0.28	0.31	0.36	0.74	0.74	0.71	0.67	0.60	0.57	0.63	0.68			
160	0.40	0.37	0.33	0.30	0.30	0.33	0.36	0.42	0.78	0.78	0.78	0.72	0.65	0.63	0.67	0.71			
165	0.42	0.39	0.35	0.32	0.32	0.35	0.38	0.42	0.75	0.76	0.74	0.69	0.63	0.62	0.64	0.70			
170	0.40	0.36	0.33	0.34	0.35	0.37	0.38	0.42	0.69	0.69	0.67	0.63	0.58	0.59	0.61	0.66			
175	0.42	0.39	0.38	0.38	0.39	0.38	0.38	0.44	0.58	0.58	0.57	0.55	0.51	0.52	0.52	0.56			
180	0.48	0.48	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.48	0.48	0.48	0.48			



Guangdong Meide Testing Technology Co., Ltd.



6.Photo of sample



Figure 1



Figure 2

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