



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-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 01006

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

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

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

Model Tested:	ZXL-11-A-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:	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

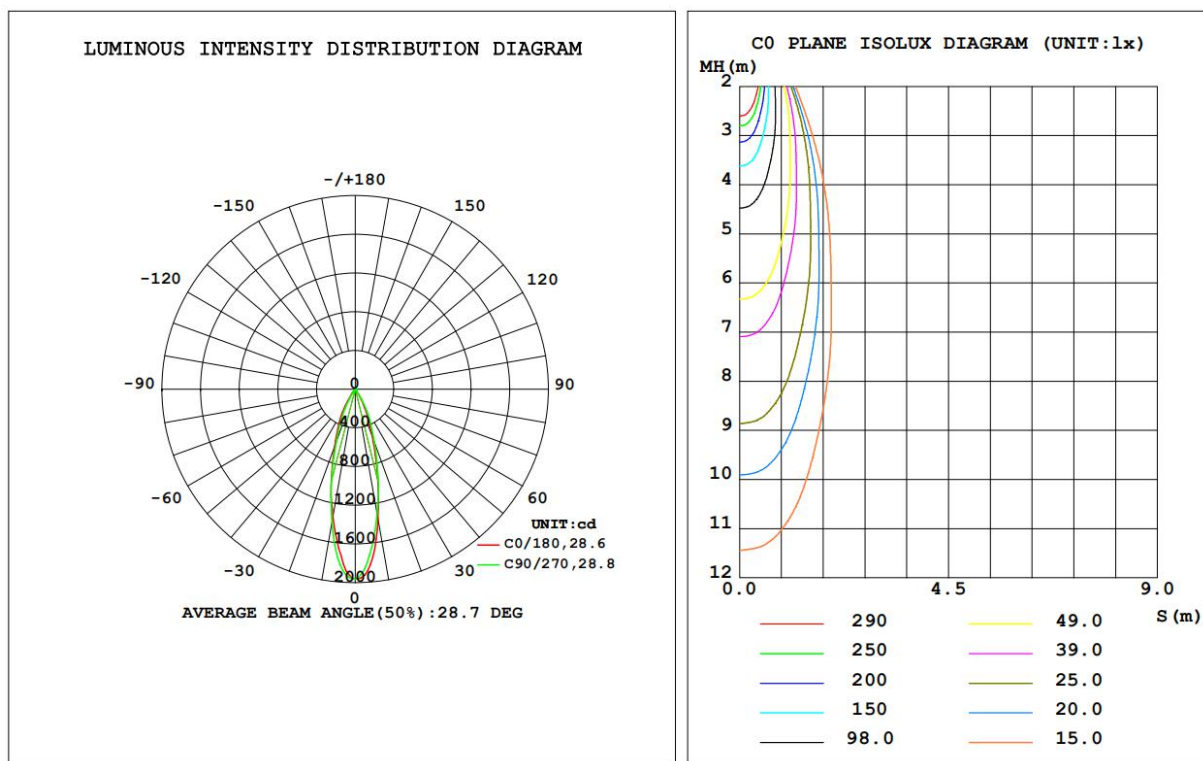
### Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
12.0	60.00	0.7167	0.9468	8.143

### Photometric Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I <sub>max</sub> (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
635.66	78.06	1964	0.48	0.49

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



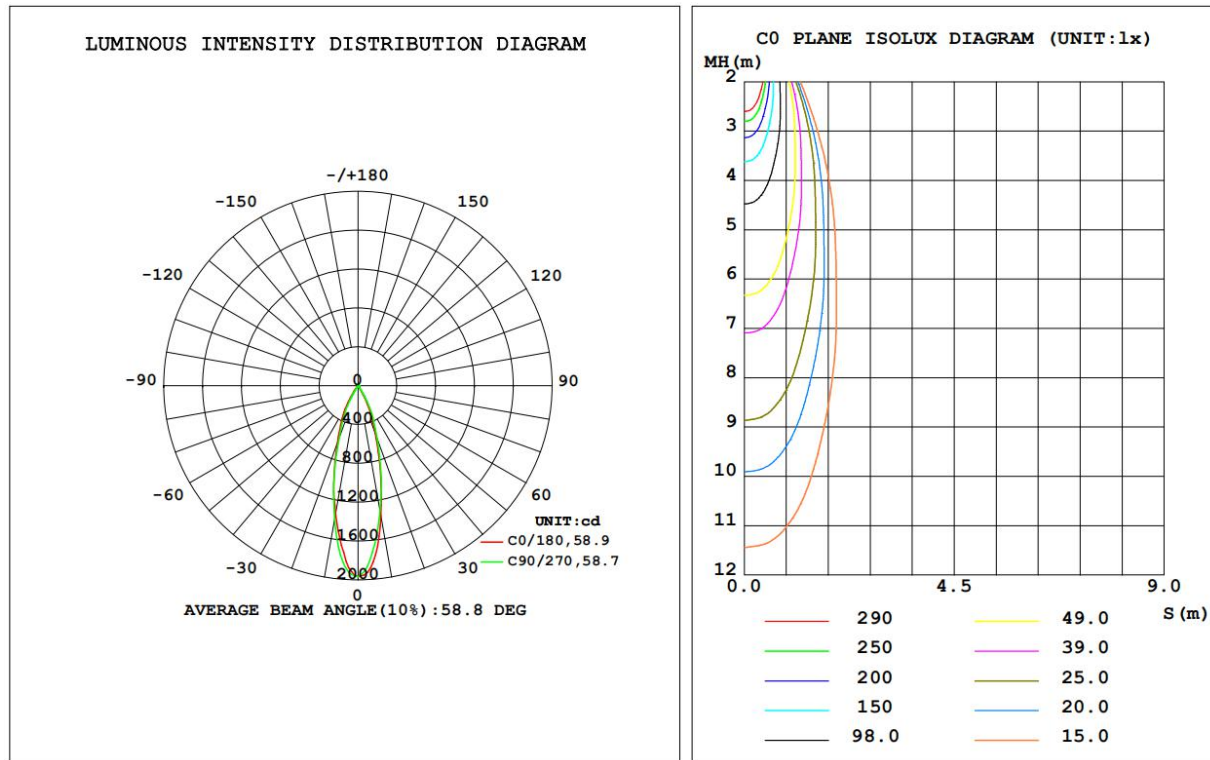
AVERAGE BEAM ANGLE(50%):28.7 DEG



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NVLAP LAB CODE:600177-0



AVERAGE BEAM ANGLE(10%):58.8 DEG





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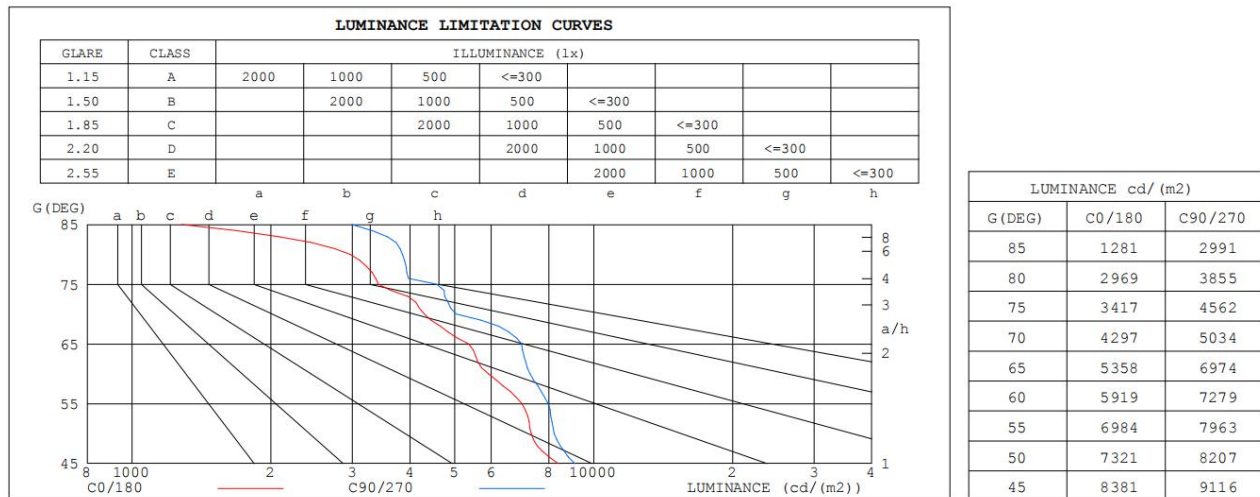


### 5.3 ZONAL FLUX DIAGRAM

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum, lamp
10	1358	1330	1309	1331	1336	1373	1397	1387	0- 10	155.4	155.4	24.4, 24.4
20	523.5	535.9	575.1	610.1	623.5	618.6	570.9	539.9	10- 20	254.6	410.1	64.5, 64.5
30	121.0	144.6	188.4	227.4	239.2	213.7	161.4	129.3	20- 30	161.6	571.7	89.9, 89.9
40	11.57	12.23	13.98	20.95	30.74	24.63	18.10	14.69	30- 40	42.39	614.0	96.6, 96.6
50	5.883	6.319	6.595	7.976	13.66	12.04	9.899	7.725	40- 50	9.058	623.1	98, 98
60	3.699	4.031	4.550	5.095	7.665	6.623	5.552	4.267	50- 60	6.099	629.2	99, 99
70	1.837	2.038	2.152	2.708	3.938	3.231	2.744	2.112	60- 70	3.836	633.0	99.6, 99.6
80	0.6445	0.7265	0.8367	0.8364	0.7696	0.6673	0.5702	0.5915	70- 80	1.540	634.6	99.8, 99.8
90	0.0000	0.0000	0.0035	0.0515	0.0701	0.0435	0.0000	0.0000	80- 90	0.3355	634.9	99.9, 99.9
100	0	0	0.0000	0.0000	0	0	0	0	90-100	0.0022	634.9	99.9, 99.9
110	0	0	0.0009	0.0002	0	0	0	0	100-110	0.0000	634.9	99.9, 99.9
120	0.0049	0.0017	0.0039	0.0021	0.0007	0.0016	0.0016	0.0041	110-120	0.0005	634.9	99.9, 99.9
130	0.0528	0.0422	0.0448	0.0350	0.0358	0.0476	0.0479	0.0510	120-130	0.0160	634.9	99.9, 99.9
140	0.1560	0.1619	0.2611	0.2216	0.2063	0.2531	0.1796	0.1685	130-140	0.0838	635.0	99.9, 99.9
150	0.2358	0.2680	0.6256	0.5769	0.4629	0.5534	0.3396	0.3016	140-150	0.1933	635.2	99.9, 99.9
160	0.3092	0.3717	0.8543	0.8201	0.7009	0.7146	0.4513	0.3729	150-160	0.2392	635.4	100, 100
170	0.3394	0.3996	0.7593	0.7387	0.6323	0.5912	0.4351	0.3528	160-170	0.1638	635.6	100, 100
180	0.7417	0.7417	0.4194	0.4194	0.4194	0.4194	0.7417	0.7417	170-180	0.0518	635.7	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



## 5.4 LUMINANCE LIMITATION CURVES



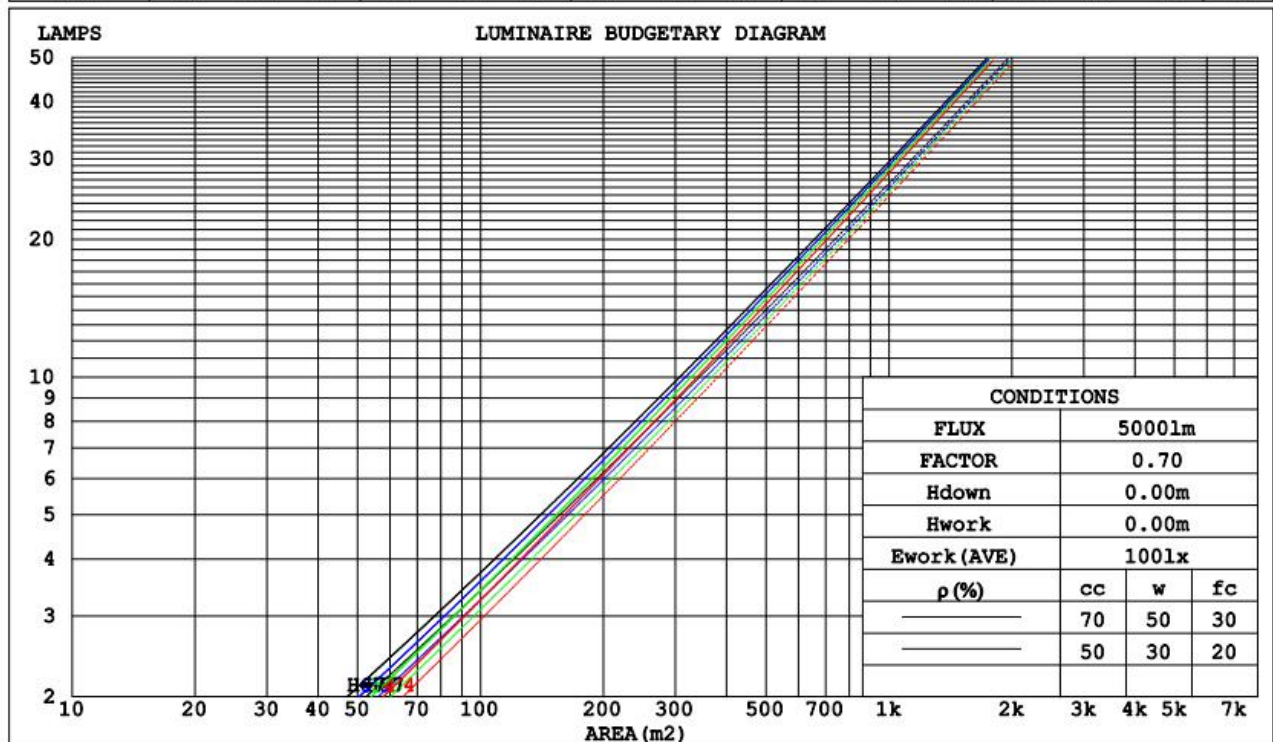


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## 5.5 CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

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	.99	.98	.97	.95
2.0	1.06	1.02	.00	1.04	1.01	.98	1.01	.98	.96	.98	.96	.94	.95	.94	.92	.91
3.0	1.00	.96	.93	.99	.95	.92	.96	.93	.91	.94	.92	.89	.92	.90	.88	.87
4.0	.96	.91	.88	.94	.90	.87	.92	.89	.86	.90	.87	.85	.89	.86	.84	.83
5.0	.91	.86	.83	.90	.86	.83	.89	.85	.82	.87	.84	.81	.86	.83	.80	.79
6.0	.87	.82	.79	.86	.82	.79	.85	.81	.78	.84	.80	.78	.83	.80	.77	.76
7.0	.84	.79	.75	.83	.78	.75	.82	.78	.75	.81	.77	.74	.80	.77	.74	.73
8.0	.80	.76	.72	.80	.75	.72	.79	.75	.72	.78	.74	.72	.77	.74	.71	.70
9.0	.77	.73	.69	.77	.72	.69	.76	.72	.69	.75	.71	.69	.74	.71	.69	.68
10.0	.75	.70	.67	.74	.70	.67	.73	.69	.67	.73	.69	.66	.72	.69	.66	.65







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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	.154	.087	.028	.147	.084	.027	.134	.077	.025	.123	.071	.023	.112	.065	.021		
2.0	.144	.079	.024	.138	.076	.023	.128	.071	.022	.118	.066	.021	.110	.062	.020		
3.0	.135	.072	.022	.131	.070	.021	.122	.066	.020	.114	.062	.019	.106	.059	.018		
4.0	.127	.066	.019	.124	.065	.019	.116	.062	.018	.109	.059	.018	.103	.056	.017		
5.0	.121	.061	.018	.117	.060	.018	.111	.058	.017	.105	.055	.016	.099	.053	.016		
6.0	.115	.057	.016	.112	.056	.016	.106	.054	.016	.101	.052	.015	.096	.050	.015		
7.0	.109	.054	.015	.106	.053	.015	.102	.051	.015	.097	.050	.014	.093	.048	.014		
8.0	.104	.051	.014	.102	.050	.014	.098	.049	.014	.093	.047	.014	.090	.046	.013		
9.0	.100	.048	.013	.098	.048	.013	.094	.046	.013	.090	.045	.013	.087	.044	.013		
10.0	.096	.046	.013	.094	.045	.013	.090	.044	.012	.087	.043	.012	.084	.042	.012		

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	.158	.148	.146	.136	.127	.100	.094	.088	.057	.054	.051	.018	.017	.017	
2.0	.153	.134	.117	.131	.115	.101	.090	.080	.070	.052	.046	.041	.017	.015	.013	
3.0	.139	.114	.094	.120	.099	.082	.082	.069	.057	.047	.040	.034	.015	.013	.011	
4.0	.128	.099	.077	.110	.086	.067	.075	.060	.047	.044	.035	.028	.014	.011	.009	
5.0	.118	.087	.064	.101	.075	.056	.070	.053	.040	.040	.031	.023	.013	.010	.008	
6.0	.110	.077	.054	.094	.067	.047	.065	.047	.033	.038	.028	.020	.012	.009	.007	
7.0	.102	.069	.046	.088	.060	.040	.061	.042	.029	.035	.025	.017	.011	.008	.006	
8.0	.096	.063	.040	.083	.055	.035	.057	.038	.025	.033	.023	.015	.011	.007	.005	
9.0	.091	.057	.035	.078	.050	.030	.054	.035	.022	.032	.021	.013	.010	.007	.004	
10.0	.086	.053	.031	.074	.046	.027	.051	.032	.019	.030	.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	11.6	12.4	11.8	12.6	12.7	13.9	14.7	14.2	14.9	15.0
3H	12.0	12.7	12.3	12.9	13.1	14.2	14.9	14.4	15.1	15.3
4H	12.1	12.8	12.4	13.0	13.2	14.3	14.9	14.5	15.2	15.4
6H	12.2	12.8	12.5	13.1	13.3	14.3	14.9	14.6	15.2	15.4
8H	12.2	12.8	12.5	13.1	13.3	14.3	14.9	14.6	15.2	15.4
12H	12.2	12.8	12.5	13.0	13.3	14.3	14.9	14.6	15.1	15.4
4H 2H	11.8	12.4	12.0	12.7	12.9	13.9	14.6	14.2	14.8	15.0
3H	12.3	12.9	12.6	13.1	13.4	14.3	14.8	14.6	15.1	15.4
4H	12.5	13.0	12.8	13.3	13.6	14.4	14.9	14.7	15.2	15.5
6H	12.6	13.1	13.0	13.4	13.8	14.5	14.9	14.8	15.3	15.6
8H	12.6	13.1	13.0	13.4	13.8	14.5	14.9	14.9	15.3	15.6
12H	12.6	13.0	13.0	13.4	13.8	14.5	14.9	14.9	15.2	15.6
8H 4H	12.5	12.9	12.9	13.3	13.7	14.3	14.8	14.7	15.1	15.5
6H	12.7	13.1	13.1	13.5	13.9	14.4	14.8	14.9	15.2	15.6
8H	12.7	13.1	13.2	13.5	13.9	14.5	14.8	14.9	15.2	15.7
12H	12.7	13.0	13.2	13.4	13.9	14.5	14.8	15.0	15.2	15.7
12H 4H	12.5	12.9	12.9	13.3	13.6	14.3	14.7	14.7	15.1	15.4
6H	12.7	13.0	13.1	13.4	13.9	14.4	14.7	14.9	15.2	15.6
8H	12.7	13.0	13.2	13.4	13.9	14.5	14.7	14.9	15.2	15.7
Variations with the observer position at spacings:										
S = 1.0H	+ 0.9 / - 0.8					+ 1.8 / - 0.9				
1.5H	+ 1.6 / - 0.5					+ 3.3 / - 0.8				
2.0H	+ 0.5 / - 0.7					+ 0.4 / - 0.4				

CIE Pub.117, 635.7 lm Total Lamp Luminous Flux Corrected ( $8\log(F/F_0) = -1.6$ )



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## 5.8 UTILIZATION FACTORS TABLE

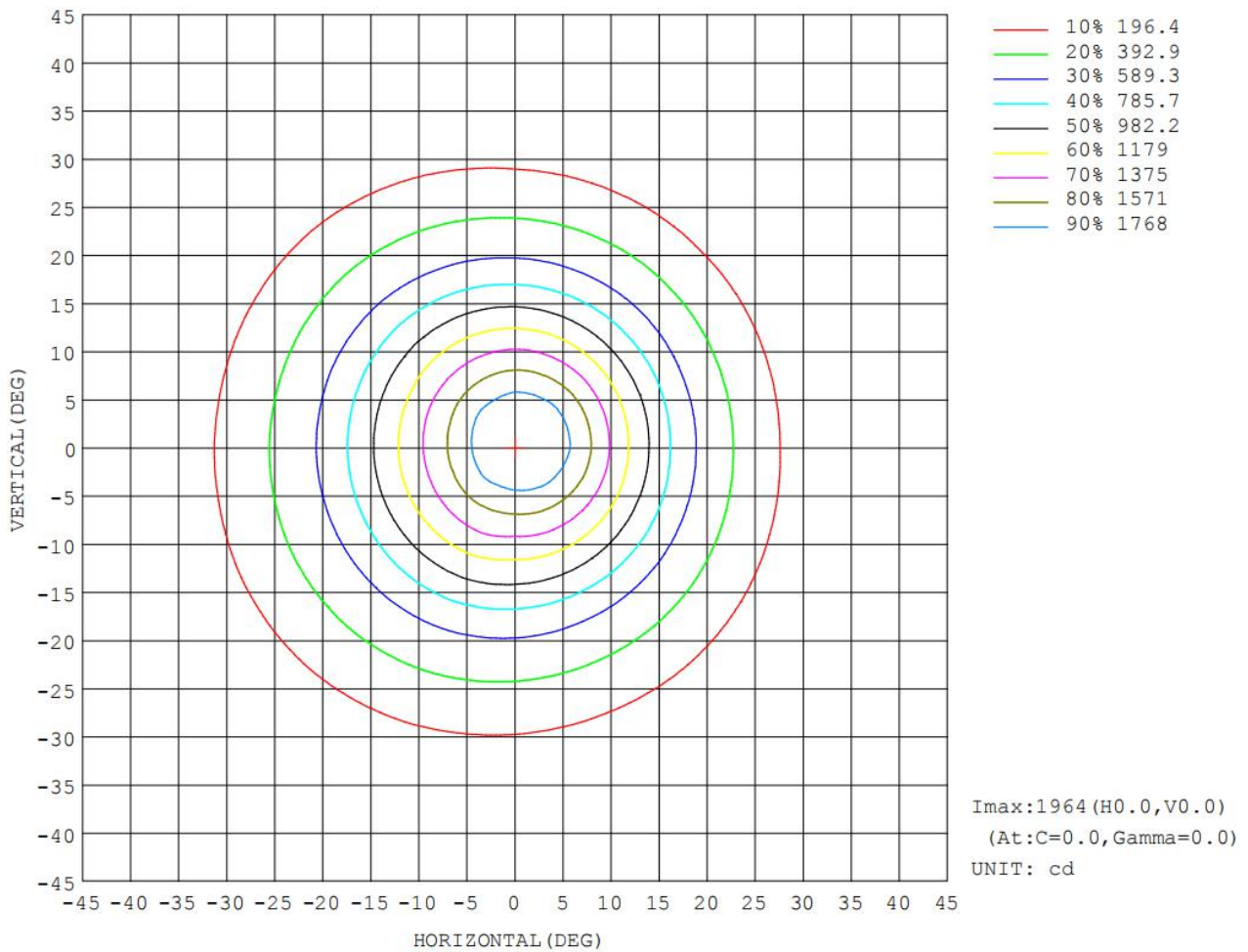
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	89	83	80	89	83	80	88	83	80	76
0.80	97	91	88	96	91	87	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	101	105	102	100	95
2.50	111	107	104	109	106	103	106	104	101	96
3.00	112	109	106	110	108	105	107	105	103	97
4.00	114	112	109	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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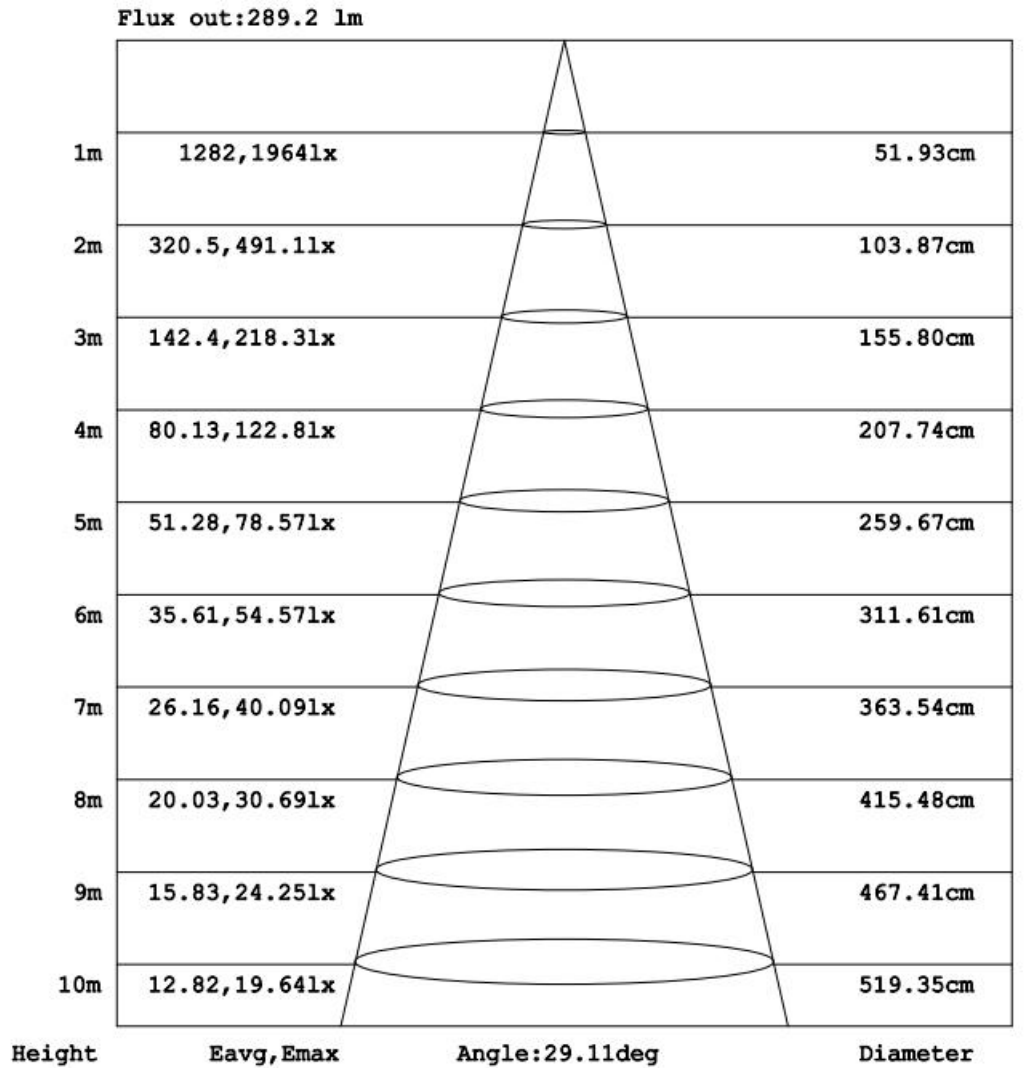
## 5.9 ISOCANDELA DIAGRAM







## 5.10 AAI Figure



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

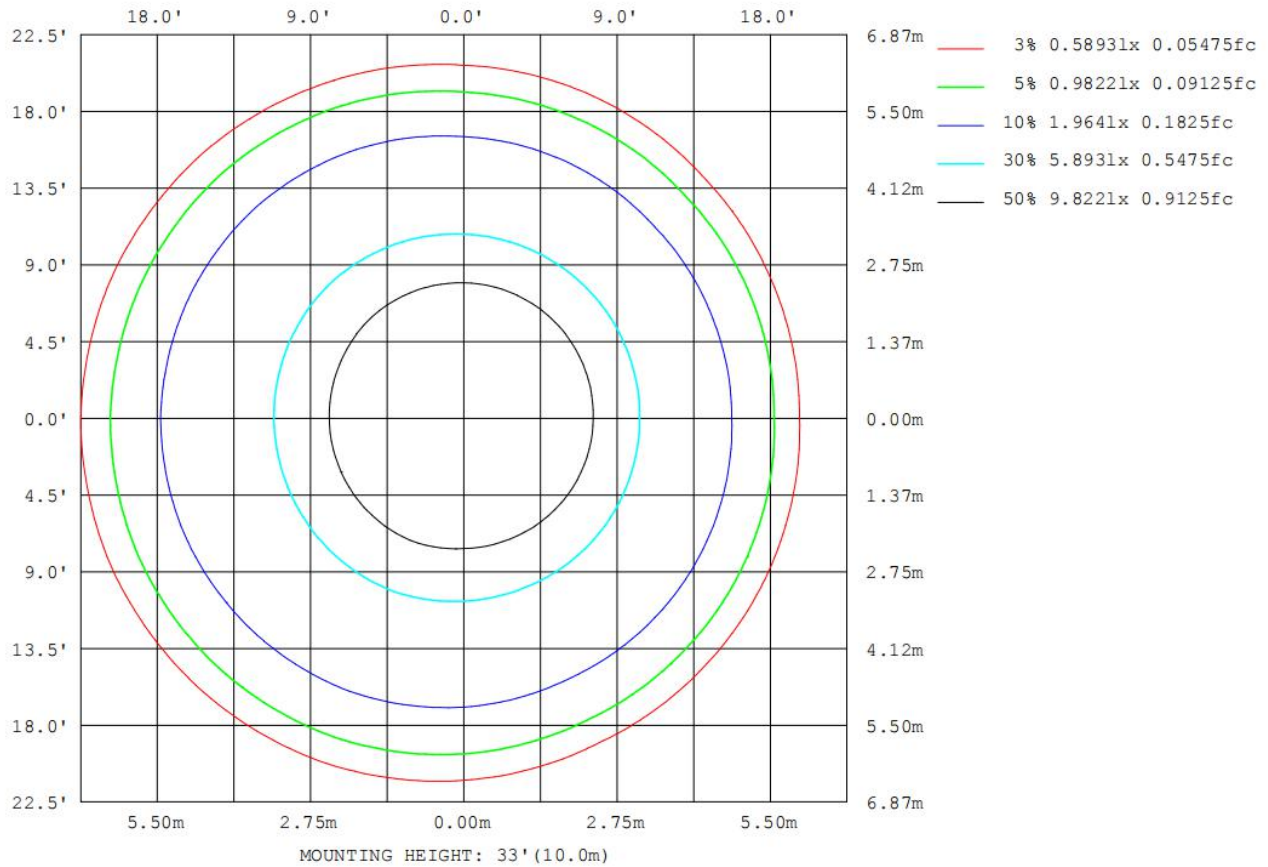




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## 5.11 ISOLUX DIAGRAM

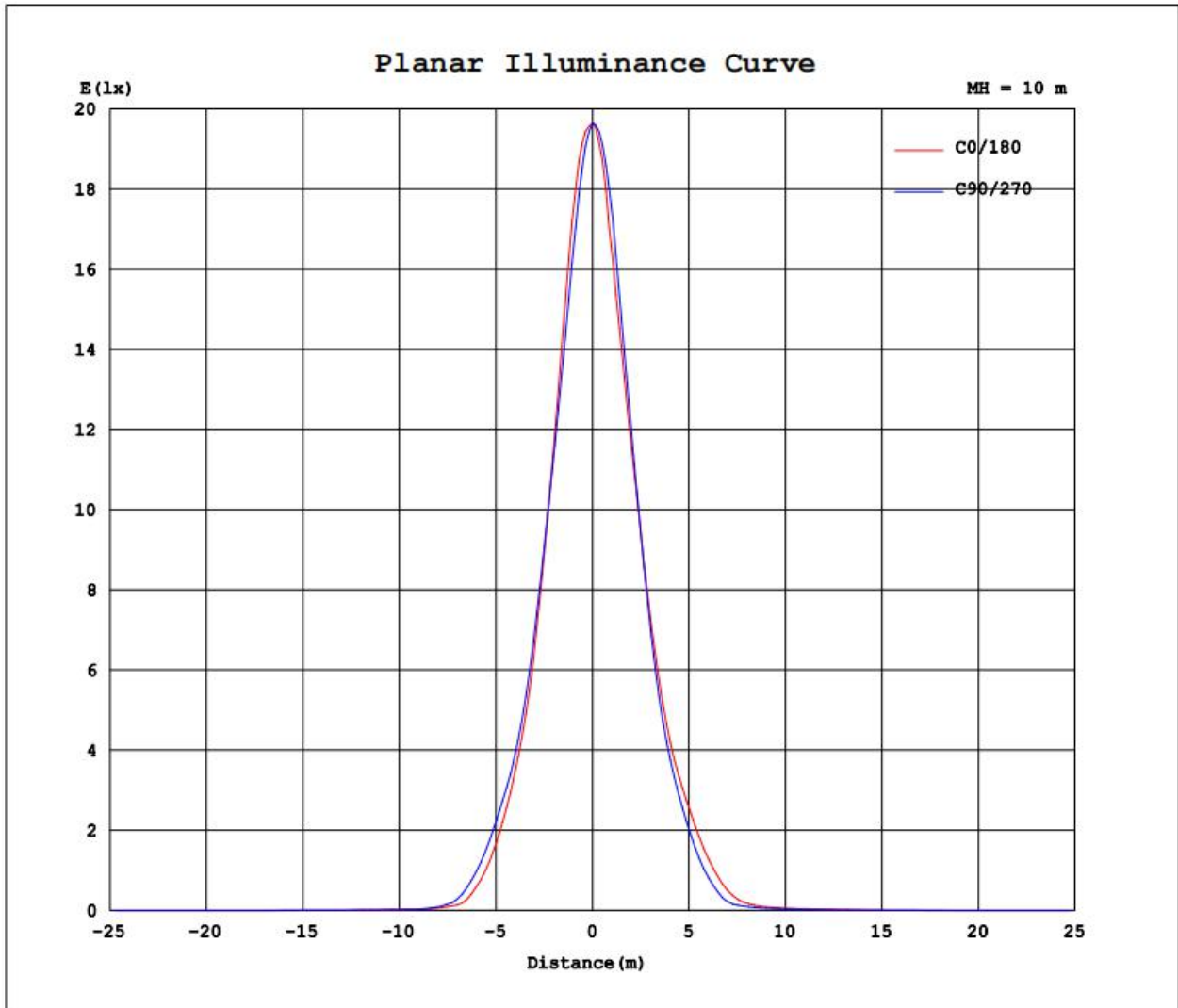




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## 5.12 Planar Illuminance Curve





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### 5.13 Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) Y (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	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964			
5	1820	1793	1772	1744	1723	1711	1736	1712	1722	1750	1787	1798	1820	1826	1837	1825			
10	1358	1346	1330	1319	1309	1334	1331	1330	1336	1356	1373	1388	1397	1393	1387	1370			
15	889	887	891	902	917	945	951	954	957	966	974	966	951	934	915	900			
20	524	528	536	549	575	599	610	617	624	626	619	596	571	554	540	527			
25	295	308	323	340	367	388	402	410	412	404	392	371	346	325	304	296			
30	121	131	145	161	188	213	227	237	239	228	214	190	161	145	129	124			
35	26.5	29.1	32.9	38.8	53.2	69.9	82.2	91.3	92.8	86.6	72.1	54.5	41.2	36.2	30.6	26.3			
40	11.6	11.5	12.2	12.7	14.0	16.7	21.0	26.6	30.7	30.1	24.6	18.7	18.1	17.0	14.7	12.0			
45	7.41	7.56	7.80	7.78	8.06	8.30	10.2	14.0	17.8	19.1	15.7	12.1	12.8	12.0	10.2	7.59			
50	5.88	6.03	6.32	6.36	6.59	6.68	7.98	10.7	13.7	14.4	12.0	9.27	9.90	9.11	7.73	5.92			
55	5.01	5.11	5.30	5.45	5.71	5.72	6.50	8.10	10.1	10.7	9.01	7.11	7.58	6.94	5.99	4.96			
60	3.70	3.81	4.03	4.26	4.55	4.60	5.10	6.20	7.67	7.97	6.62	5.13	5.55	4.94	4.27	3.66			
65	2.83	2.90	3.11	3.35	3.68	3.75	4.12	4.84	5.84	5.99	4.95	3.84	4.19	3.65	3.19	2.80			
70	1.84	1.95	2.04	2.09	2.15	2.21	2.71	3.28	3.94	4.01	3.23	2.46	2.74	2.44	2.11	1.77			
75	1.11	1.17	1.23	1.30	1.48	1.40	1.60	1.84	1.94	1.71	1.48	1.24	1.01	0.98	0.97	1.06			
80	0.64	0.68	0.73	0.77	0.84	0.85	0.84	0.80	0.77	0.74	0.67	0.61	0.57	0.57	0.59	0.63			
85	0.14	0.16	0.19	0.24	0.33	0.38	0.42	0.43	0.42	0.40	0.35	0.29	0.22	0.19	0.16	0.14			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.07	0.07	0.06	0.04	0.02	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	0.01			
125	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02			
130	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.05			
135	0.09	0.09	0.09	0.10	0.12	0.11	0.10	0.09	0.10	0.11	0.12	0.15	0.10	0.10	0.10	0.09			
140	0.16	0.16	0.16	0.18	0.26	0.24	0.22	0.21	0.21	0.22	0.25	0.29	0.18	0.18	0.17	0.14			
145	0.18	0.20	0.23	0.30	0.45	0.42	0.40	0.35	0.35	0.36	0.41	0.46	0.25	0.24	0.21	0.17			
150	0.24	0.26	0.27	0.40	0.63	0.60	0.58	0.51	0.46	0.49	0.55	0.61	0.34	0.33	0.30	0.25			
155	0.30	0.32	0.34	0.52	0.77	0.75	0.71	0.66	0.59	0.61	0.66	0.74	0.43	0.41	0.37	0.31			
160	0.31	0.34	0.37	0.62	0.85	0.84	0.82	0.78	0.70	0.68	0.71	0.77	0.45	0.42	0.37	0.32			
165	0.34	0.36	0.37	0.66	0.83	0.84	0.83	0.78	0.69	0.68	0.67	0.69	0.45	0.41	0.36	0.34			
170	0.34	0.34	0.40	0.70	0.76	0.76	0.74	0.70	0.63	0.61	0.59	0.61	0.44	0.39	0.35	0.34			
175	0.40	0.45	0.58	0.76	0.65	0.64	0.63	0.60	0.54	0.54	0.53	0.51	0.68	0.57	0.44	0.45			
180	0.74	0.74	0.74	0.74	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.74	0.74	0.74	0.74			





Guangdong Meide Testing Technology Co., Ltd.



## 6.Photo of sample



Figure 1



Figure 2

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