

GONIOPHOTOMETERS SYSTEM TEST REPORT

LED Spotlight KENZO Series K1X70-18W-930-15D



Light Output Ratio:	100.0%	
Luminaire Power:	20.27 W	
SHR Nominal:	0.00	Calculated using the TM5
SHR Maximum:	1.00	fine grid method.

C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: Meng Yongjian
Test Date: 2017-05-19

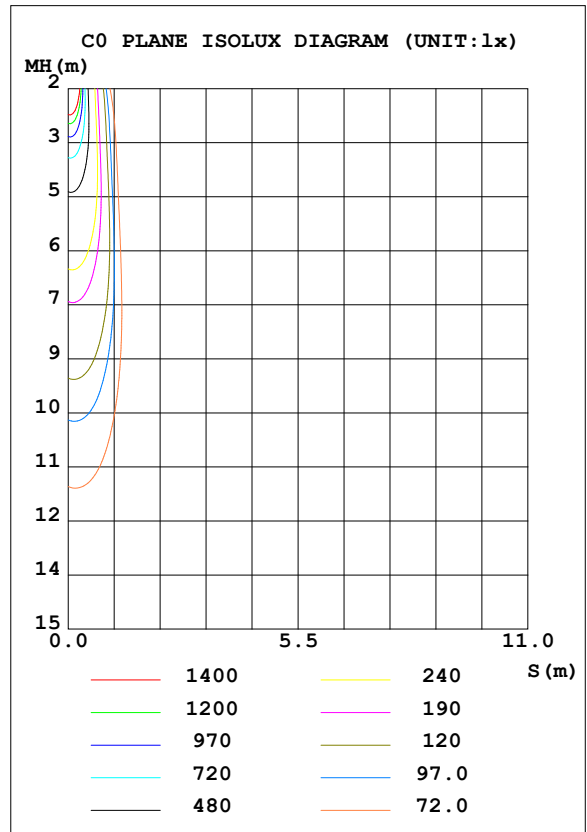
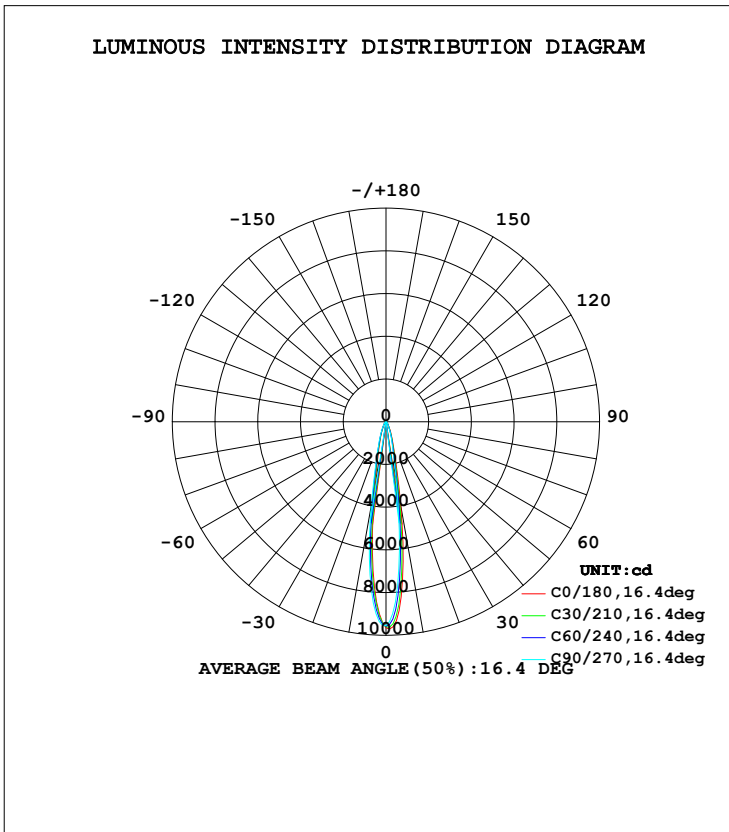
γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.288
Humidity: 52%
Test Distance: 5.850m [K=1.0000]
Remarks:

GONIOPHOTOMETERS SYSTEM TEST REPORT

LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:220.7V I:0.0979A P:20.27W PF:0.9380 Lamp Flux:1456.95x1 lm		
NAME: K1X70-18W-930-15D	TYPE:Spotlight	SERIAL No.:
SPEC.:3000K	DIM.: φ110mm*H138mm	
MFR.: NEKO LIGHTING AG		

DATA OF LAMP		PHOTOMETRIC DATA Eff: 71.87 lm/W			
MODEL	CITIZEN-3000K	I _{max} (cd)	9709	S/MH (C0/180)	0.26
NOMINAL POWER (W)	21	LOR (%)	100.0	S/MH (C90/270)	0.31
RATED VOLTAGE (V)	220	TOTAL FLUX (lm)	1456.9	η UP, DN (C0-180)	0.0, 46.7
NOMINAL FLUX (lm)	1456.95	CIE CLASS	DIRECT	η UP, DN (C180-360)	0.0, 53.3
LAMPS INSIDE	1	η up (%)	0.0	CIBSE SHR NOM	0.00
TEST VOLTAGE (V)	220	η down (%)	100.0	CIBSE SHR MAX	1.00



C Range: 0 - 360DEG
C Interval: 15.0DEG
Test Speed: HIGH
Temperature: 25.3DEG
Operators: Meng Yongjian
Test Date: 2017-05-19

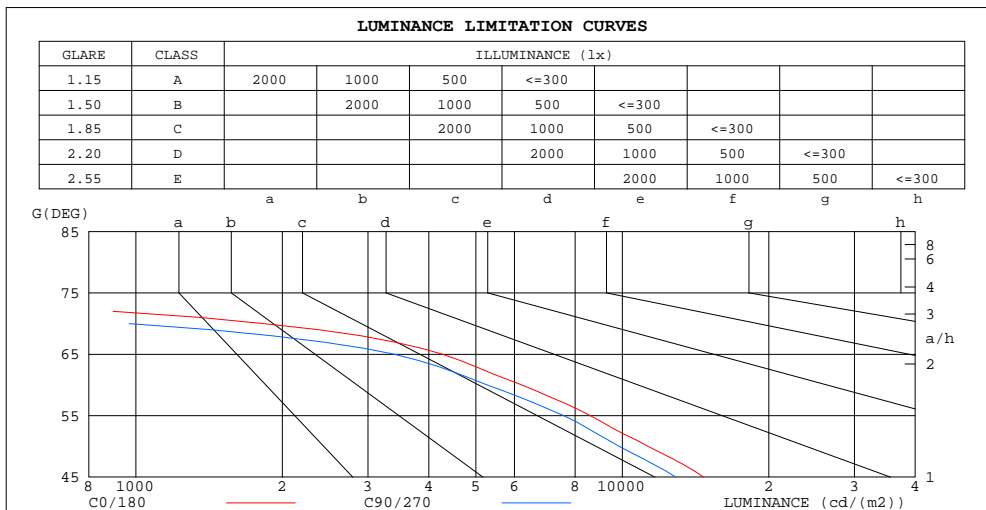
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Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.288
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**ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES**

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	Φ lum, lamp
10	3994	3392	2725	2649	2937	3299	3950	4204	0- 10	575.0	575.0	39.5,39.5
20	837.1	744.2	663.1	657.1	729.0	800.3	883.2	899.7	10- 20	428.4	1003	68.9,68.9
30	286.2	254.5	232.0	233.7	255.5	278.4	304.3	307.2	20- 30	211.4	1215	83.4,83.4
40	133.6	123.4	115.9	115.3	123.3	130.8	138.6	139.2	30- 40	114.5	1329	91.2,91.2
50	68.97	64.80	60.17	58.51	61.69	64.27	68.55	70.36	40- 50	72.40	1402	96.2,96.2
60	29.51	27.88	25.05	23.54	24.65	25.65	28.37	29.72	50- 60	39.31	1441	98.9,98.9
70	5.958	4.937	3.149	2.421	2.801	3.660	5.218	6.213	60- 70	14.78	1456	99.9,99.9
80	0.2495	0.2075	0.1970	0.1594	0.1682	0.1948	0.2053	0.2363	70- 80	1.001	1457	100,100
90	0.0809	0.0678	0.0678	0.0700	0.0765	0.0612	0.0722	0.0722	80- 90	0.1281	1457	100,100
100									90-100			
110									100-110			
120									110-120			
130									120-130			
140									130-140			
150									140-150			
160									150-160			
170									160-170			
180									170-180			
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	177	130
80	151	119
75	217	136
70	1834	969
65	4267	3398
60	6213	5274
55	8594	7580
50	11296	9855
45	14691	12879

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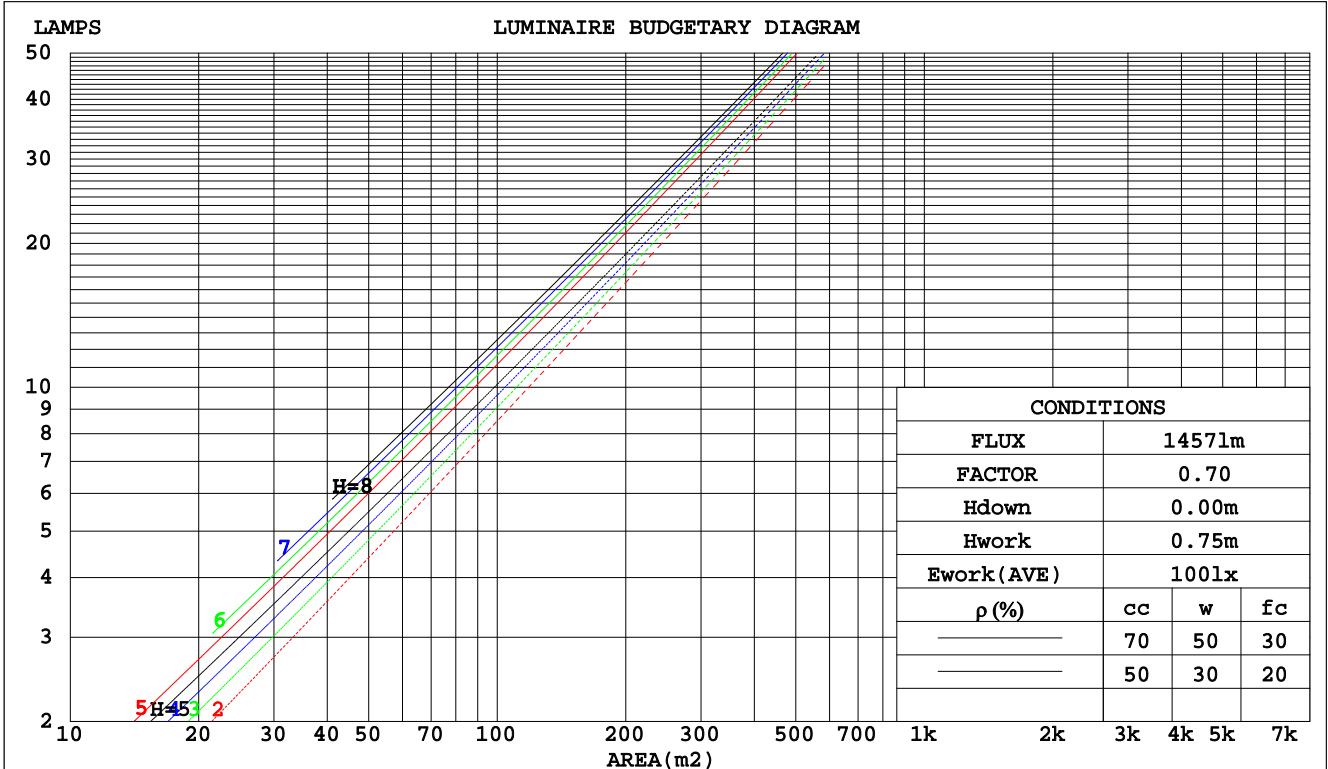
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CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

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NAME: K1X70-18W-930-15D	TYPE:Spotlight	SERIAL No.:
SPEC.:3000K	DIM.: φ110mm*H138mm	
MFR.: NEKO LIGHTING AG		

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	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	1.00
1.0	1.12	1.10	1.08	1.10	1.08	1.07	1.06	1.05	1.03	1.02	1.01	1.00	.99	.98	.97	.96
2.0	1.06	1.03	1.00	1.05	1.02	.99	1.01	.99	.97	.98	.97	.95	.96	.94	.93	.91
3.0	1.01	.97	.94	.90	.96	.93	.97	.94	.91	.95	.92	.90	.93	.91	.89	.87
4.0	.96	.92	.89	.95	.91	.88	.93	.90	.87	.91	.88	.86	.90	.87	.85	.84
5.0	.92	.88	.84	.91	.87	.84	.90	.86	.83	.88	.85	.82	.87	.84	.82	.81
6.0	.89	.84	.81	.88	.84	.80	.87	.83	.80	.85	.82	.79	.84	.81	.79	.78
7.0	.85	.81	.78	.85	.80	.77	.84	.80	.77	.83	.79	.77	.82	.79	.76	.75
8.0	.83	.78	.75	.82	.78	.75	.81	.77	.74	.80	.77	.74	.79	.76	.74	.73
9.0	.80	.76	.73	.80	.75	.72	.79	.75	.72	.78	.74	.72	.77	.74	.72	.71
10.0	.78	.73	.70	.77	.73	.70	.77	.73	.70	.76	.72	.70	.75	.72	.70	.69



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WEC AND CCEC

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ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.149	.085	.027	.143	.081	.026	.130	.075	.024	.119	.068	.022	.108	.063	.020	
2.0	.141	.077	.024	.135	.074	.023	.125	.069	.022	.115	.065	.020	.106	.060	.019	
3.0	.132	.070	.021	.127	.068	.021	.119	.064	.020	.111	.061	.019	.103	.057	.018	
4.0	.124	.064	.019	.120	.063	.019	.113	.060	.018	.106	.057	.017	.099	.054	.016	
5.0	.117	.059	.017	.113	.058	.017	.107	.056	.016	.101	.053	.016	.096	.051	.015	
6.0	.110	.055	.016	.107	.054	.016	.102	.052	.015	.097	.050	.015	.092	.048	.014	
7.0	.104	.051	.015	.102	.051	.014	.097	.049	.014	.092	.047	.014	.088	.046	.013	
8.0	.099	.048	.014	.097	.048	.013	.092	.046	.013	.088	.045	.013	.085	.044	.013	
9.0	.094	.045	.013	.092	.045	.013	.088	.044	.012	.085	.043	.012	.082	.041	.012	
10.0	.090	.043	.012	.088	.042	.012	.085	.041	.012	.081	.040	.011	.078	.039	.011	

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.190	.190	.190	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.169	.158	.147	.145	.135	.127	.099	.093	.088	.057	.054	.051	.018	.017	.016	
2.0	.152	.133	.116	.130	.114	.101	.089	.079	.070	.051	.046	.041	.017	.015	.013	
3.0	.138	.113	.094	.118	.098	.081	.081	.068	.057	.047	.040	.034	.015	.013	.011	
4.0	.126	.098	.077	.108	.085	.067	.074	.059	.047	.043	.035	.028	.014	.011	.009	
5.0	.116	.086	.064	.099	.074	.056	.069	.052	.039	.040	.031	.023	.013	.010	.008	
6.0	.107	.076	.054	.092	.066	.047	.064	.046	.033	.037	.027	.020	.012	.009	.007	
7.0	.100	.068	.046	.086	.059	.040	.059	.041	.028	.034	.024	.017	.011	.008	.006	
8.0	.093	.061	.040	.080	.053	.035	.055	.037	.025	.032	.022	.015	.010	.007	.005	
9.0	.087	.056	.035	.075	.049	.030	.052	.034	.021	.030	.020	.013	.010	.007	.004	
10.0	.082	.051	.030	.071	.044	.027	.049	.031	.019	.029	.018	.011	.009	.006	.004	

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γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-2000B_V1 SYSTEM V2.0.288
 Humidity:52%
 Test Distance:5.850m [K=1.0000]
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UGR(Unified Glare Rating) Table

Test:U:220.7V I:0.0979A P:20.27W PF:0.9380 Lamp Flux:1456.95x1 lm		
NAME: K1X70-18W-930-15D	TYPE:Spotlight	SERIAL No.:
SPEC.:3000K	DIM.: φ110mm*H138mm	
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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	15.4	16.1	15.6	16.3	16.5	14.8	15.5	15.0	15.7	15.8
3H	15.5	16.2	15.7	16.4	16.6	14.8	15.5	15.0	15.7	15.9
4H	15.4	16.1	15.7	16.3	16.5	14.7	15.4	15.0	15.6	15.8
6H	15.3	15.9	15.6	16.2	16.4	14.6	15.2	14.9	15.5	15.7
8H	15.3	15.9	15.6	16.1	16.4	14.6	15.2	14.9	15.4	15.7
12H	15.2	15.8	15.5	16.1	16.3	14.5	15.1	14.8	15.4	15.6
4H 2H	15.5	16.1	15.7	16.3	16.5	14.9	15.5	15.1	15.7	15.9
3H	15.5	16.1	15.8	16.4	16.6	14.9	15.4	15.2	15.7	16.0
4H	15.4	16.0	15.8	16.2	16.5	14.8	15.3	15.1	15.6	15.9
6H	15.3	15.8	15.7	16.1	16.5	14.7	15.1	15.0	15.5	15.8
8H	15.3	15.7	15.7	16.1	16.4	14.6	15.1	15.0	15.4	15.8
12H	15.2	15.6	15.6	16.0	16.4	14.6	15.0	15.0	15.3	15.7
8H 4H	15.3	15.7	15.7	16.1	16.4	14.6	15.1	15.0	15.4	15.8
6H	15.2	15.5	15.6	15.9	16.3	14.5	14.9	14.9	15.3	15.7
8H	15.1	15.4	15.6	15.8	16.3	14.5	14.8	14.9	15.2	15.6
12H	15.1	15.3	15.5	15.8	16.2	14.4	14.7	14.9	15.1	15.6
12H 4H	15.2	15.6	15.6	16.0	16.4	14.6	15.0	15.0	15.3	15.7
6H	15.1	15.4	15.6	15.8	16.3	14.5	14.8	14.9	15.2	15.6
8H	15.1	15.3	15.5	15.8	16.2	14.4	14.7	14.9	15.1	15.6
Variations with the observer position at spacings:										
S = 1.0H	+ 1.3 / - 2.1					+ 1.4 / - 2.3				
1.5H	+ 1.4 / - 1.2					+ 1.1 / - 1.0				
2.0H	+ 2.6 / - 3.0					+ 2.5 / - 2.9				

CIE Pub.117 Corrected 1457 lm Total Lamp Luminous Flux.(8log(F/F0) = 1.3)

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γ Range: 0 - 90DEG
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 Humidity:52%
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UTILIZATION FACTORS TABLE

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SPEC.:3000K	DIM.: φ110mm*H138mm	
MFR.: NEKO LIGHTING AG		

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	86	79	75	85	79	75	85	79	75	71
0.80	94	88	84	93	87	84	92	87	83	79
1.00	98	93	89	97	92	89	96	92	88	84
1.25	103	97	94	101	97	93	99	95	92	88
1.50	105	100	97	104	100	97	102	98	95	91
2.00	108	104	101	107	103	100	104	101	98	93
2.50	110	106	103	108	105	102	105	102	100	94
3.00	112	108	105	110	107	104	106	104	102	96
4.00	114	111	109	112	109	107	108	106	104	97
5.00	115	113	111	113	111	109	109	107	106	98
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			

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ISOCANDELA DIAGRAM

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SPEC.:3000K	DIM.: φ110mm*H138mm	
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Conical surface Flux(90deg):

1370 lm

%lum = 94.0%

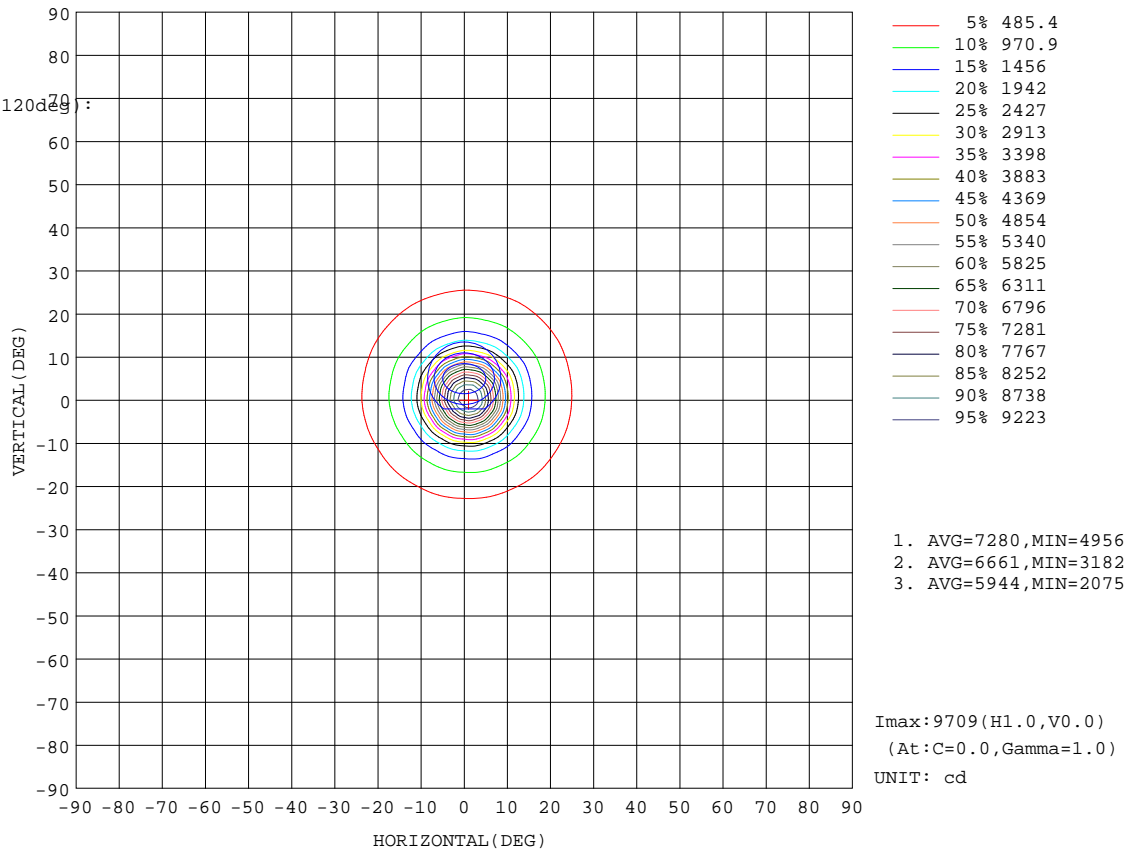
%lamp = 94.0%

Conical surface Flux(120deg):

1441 lm

%lum = 98.9%

%lamp = 98.9%



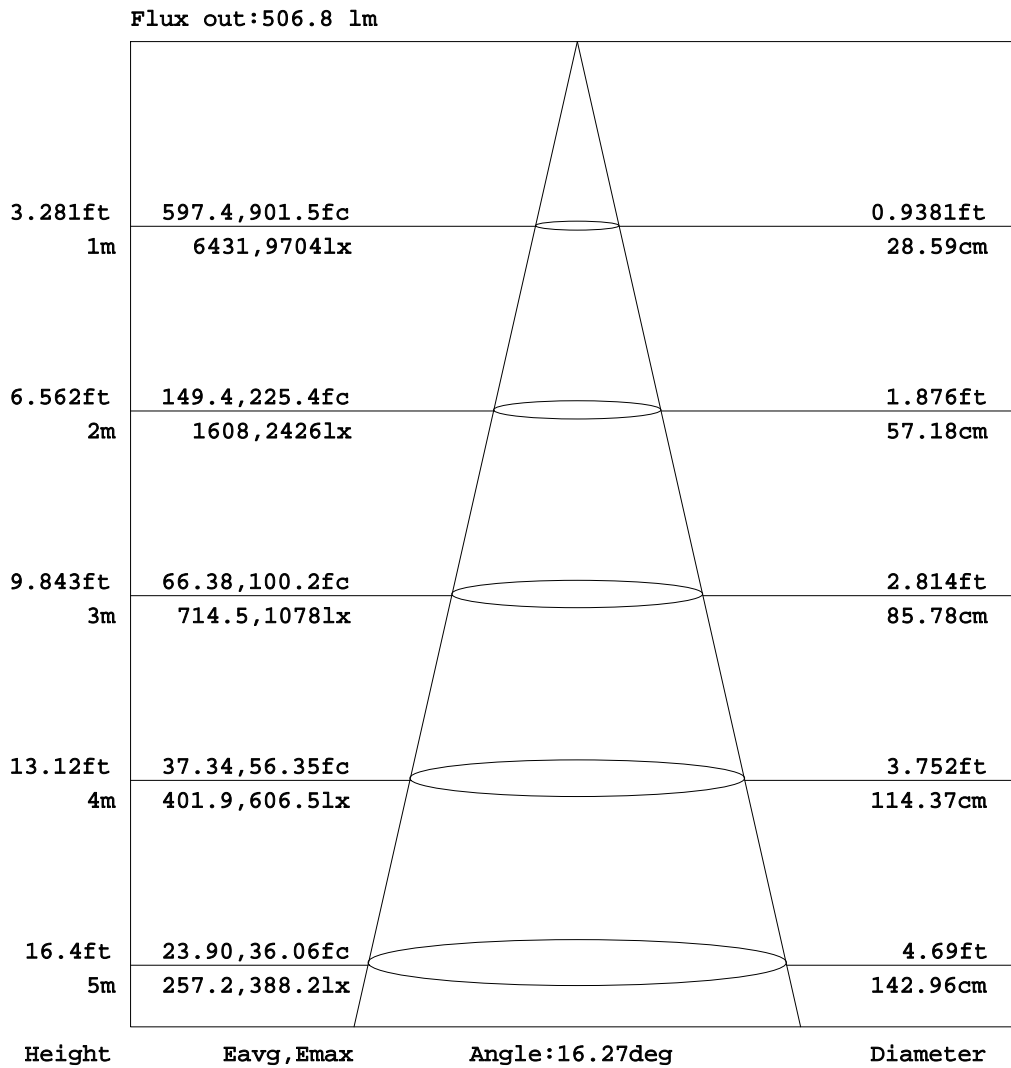
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AAI Figure

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

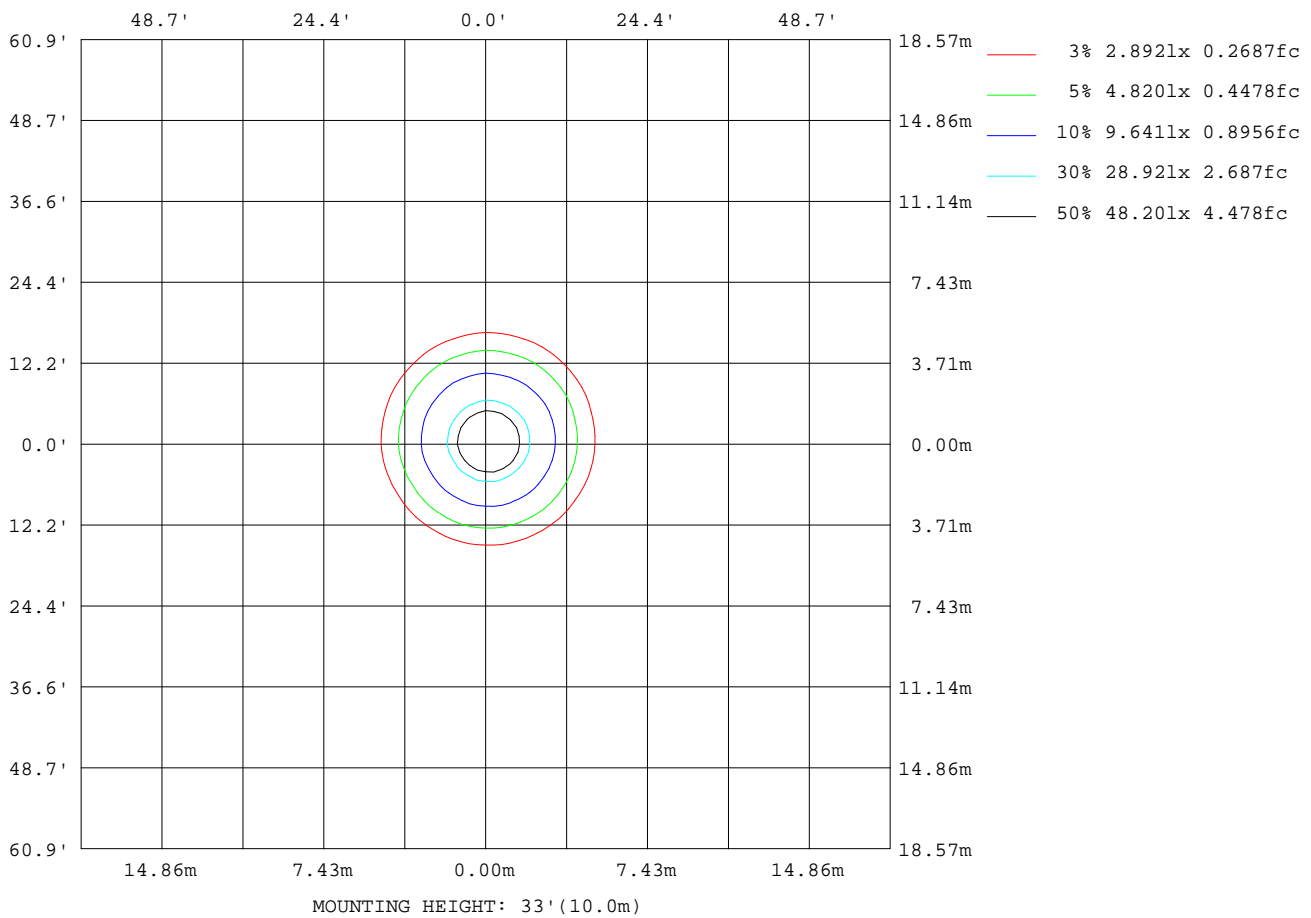
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ISOLUX DIAGRAM

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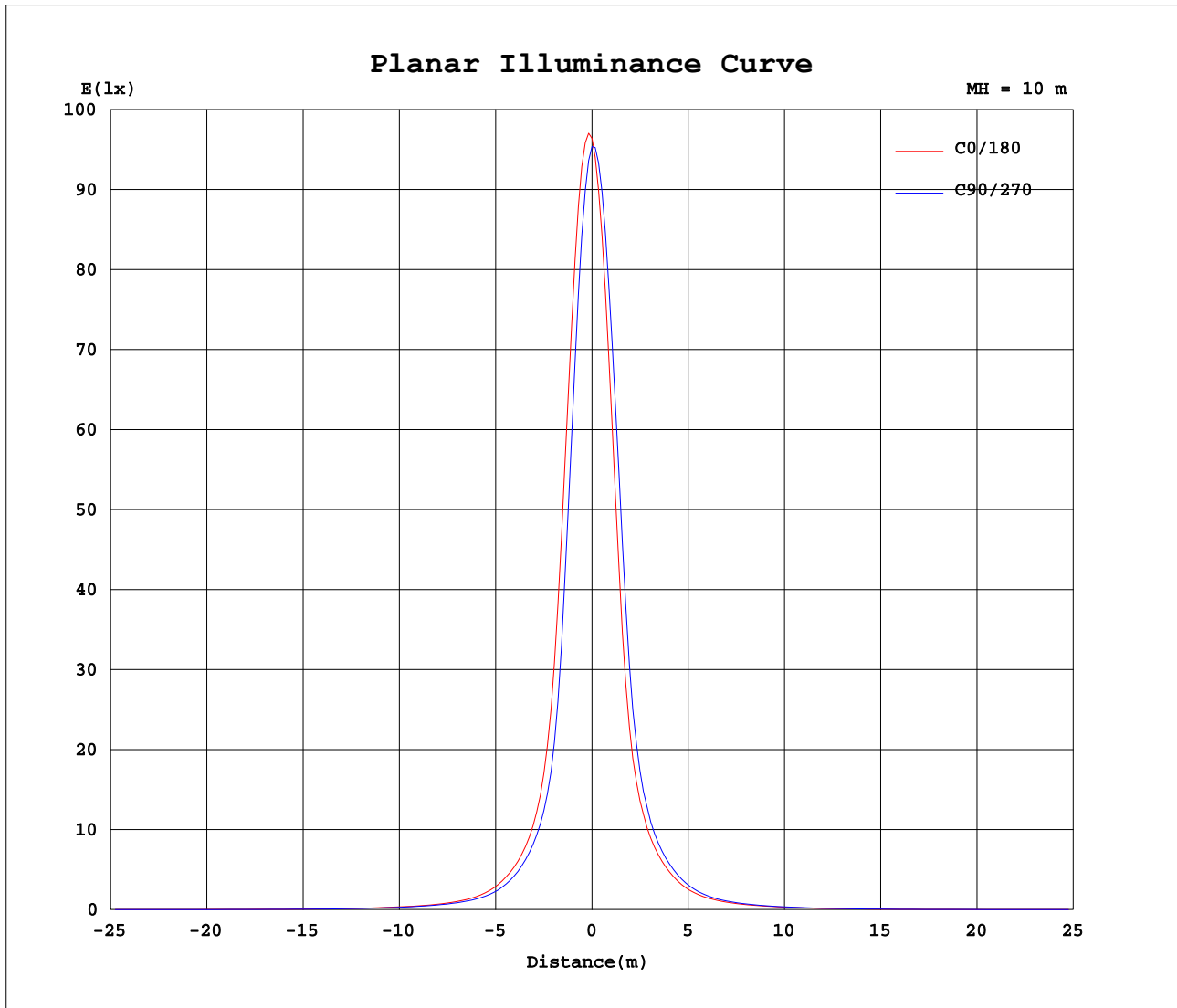


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Planar Illuminance Curve



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Photometric Data Table [cd]

G/C	0.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0	120.0	135.0
0.0	9641	9602	9602	9575	9566	9554	9539	9542	9522	9537
3.0	9325	9291	9127	9022	8790	8687	8458	8412	8237	8255
6.0	7439	7381	7050	6873	6493	6346	6026	5969	5763	5822
9.0	4824	4733	4363	4210	3837	3715	3410	3383	3210	3295
12.0	2680	2580	2345	2233	2044	1973	1846	1829	1776	1824
15.0	1590	1536	1425	1398	1285	1250	1190	1186	1158	1181
18.0	1060	1028	969.2	940.9	887.1	867.4	832.8	830.9	811.6	823.6
21.0	746.9	724.2	684.6	663.5	626.8	613.3	589.8	591.7	583.2	588.3
24.0	539.9	518.6	489.1	472.2	446.7	437.0	422.0	421.9	414.9	422.2
27.0	386.8	373.5	352.4	340.3	322.8	316.4	306.3	306.1	302.3	308.4
30.0	286.2	277.1	262.9	254.5	243.1	238.7	232.0	232.0	229.7	233.7
33.0	219.5	213.4	203.8	198.2	190.6	187.4	182.9	182.9	181.1	183.9
36.0	174.6	170.8	163.8	160.1	154.4	152.4	148.7	148.7	147.0	148.9
39.0	142.7	140.1	134.6	131.9	127.4	125.4	123.0	122.3	121.5	122.4
42.0	118.2	116.2	112.3	109.7	106.8	105.2	103.2	102.6	101.8	102.4
45.0	98.67	97.54	94.19	92.12	89.50	88.28	86.50	85.97	84.79	85.13
48.0	80.53	79.97	77.05	75.32	72.79	71.68	70.03	69.44	68.00	68.07
51.0	63.93	63.65	61.56	60.14	58.06	57.36	55.95	55.58	54.27	54.33
54.0	50.59	50.83	49.09	48.26	46.57	46.08	44.90	44.56	43.21	43.09
57.0	39.46	39.78	38.28	37.51	35.91	35.36	34.21	33.87	32.63	32.37
60.0	29.51	29.79	28.51	27.88	26.47	26.07	25.05	24.82	23.78	23.54
63.0	21.51	21.67	20.72	20.22	19.16	18.88	18.06	17.89	17.04	16.81
66.0	14.89	14.93	14.02	13.55	12.50	12.19	11.33	11.10	10.25	10.09
69.0	8.094	8.111	7.306	6.903	6.021	5.615	4.859	4.590	4.016	3.942
72.0	2.635	2.589	2.089	1.902	1.441	1.180	0.8357	0.7436	0.6435	0.6239
75.0	0.5334	0.5238	0.4699	0.4322	0.3842	0.3538	0.3333	0.3058	0.3133	0.2906
78.0	0.3065	0.2861	0.2868	0.2622	0.2605	0.2403	0.2430	0.2184	0.2277	0.2053
81.0	0.2255	0.1988	0.2080	0.1835	0.1861	0.1660	0.1751	0.1463	0.1642	0.1354
84.0	0.1620	0.1354	0.1467	0.1201	0.1335	0.1049	0.1227	0.0939	0.1160	0.0939
87.0	0.1160	0.0917	0.1029	0.0786	0.0920	0.0656	0.0854	0.0678	0.0789	0.0656
90.0	0.0809	0.0787	0.0700	0.0678	0.0700	0.0678	0.0678	0.0678	0.0700	0.0700
G/C	150.0	165.0	180.0	195.0	210.0	225.0	240.0	255.0	270.0	285.0
0.0	9516	9546	9602	9602	9575	9566	9554	9539	9542	9537
3.0	8162	8286	8451	8432	8579	8622	8787	8846	9005	9064
6.0	5734	5936	6142	6163	6432	6530	6824	6924	7192	7267
9.0	3234	3430	3594	3622	3899	4014	4341	4456	4757	4813
12.0	1822	1921	2025	2065	2211	2276	2454	2516	2676	2709
15.0	1183	1241	1323	1328	1429	1448	1541	1568	1639	1637
18.0	825.7	866.2	911.1	927.2	976.1	1002	1057	1074	1111	1107
21.0	588.7	621.4	654.1	665.9	698.8	717.5	754.2	765.1	791.2	791.7
24.0	425.6	446.4	470.2	479.0	503.3	516.8	543.7	554.9	572.4	576.7
27.0	310.7	324.2	340.3	346.8	364.0	373.5	391.5	398.3	412.7	414.3
30.0	235.6	244.5	255.5	260.1	271.9	278.4	290.8	294.8	304.3	304.8
33.0	185.1	191.1	199.1	202.6	210.4	214.8	223.1	226.1	232.2	232.2
36.0	149.6	154.3	160.3	162.9	168.3	171.1	177.1	179.1	183.2	182.8
39.0	123.3	127.2	131.8	134.0	137.6	139.5	143.9	145.3	148.2	147.7
42.0	103.1	105.7	109.4	112.2	114.1	115.7	118.5	120.0	121.7	121.8
45.0	85.17	87.47	90.64	93.04	94.63	95.61	98.06	99.25	100.9	101.2
48.0	67.86	69.54	72.03	73.87	74.93	75.56	77.66	78.83	80.71	81.32
51.0	53.90	55.31	57.15	58.14	58.91	58.96	60.62	61.78	63.18	63.89
54.0	42.49	43.69	45.18	45.83	46.49	46.46	47.72	48.40	49.84	50.17
57.0	31.78	32.76	33.92	34.45	35.05	35.06	36.14	36.85	38.25	38.69
60.0	23.04	23.80	24.65	25.04	25.55	25.65	26.58	27.16	28.37	28.76
63.0	16.34	17.08	17.75	18.05	18.51	18.65	19.38	19.87	20.64	20.89
66.0	9.642	10.28	10.94	11.08	11.69	11.89	12.71	13.21	13.96	14.17
69.0	3.744	4.019	4.422	4.537	5.119	5.340	6.150	6.443	7.217	7.442
72.0	0.6019	0.6239	0.6713	0.7148	0.9659	1.109	1.560	1.768	2.172	2.313
75.0	0.3044	0.2884	0.3014	0.3110	0.3101	0.3355	0.3732	0.4278	0.4733	0.4978
78.0	0.2189	0.2032	0.2162	0.2276	0.2184	0.2386	0.2380	0.2626	0.2599	0.2823
81.0	0.1576	0.1398	0.1507	0.1685	0.1463	0.1729	0.1638	0.1904	0.1812	0.2035
84.0	0.1073	0.0960	0.1048	0.1204	0.1004	0.1204	0.1092	0.1357	0.1223	0.1466
87.0	0.0788	0.0656	0.0765	0.0897	0.0678	0.0897	0.0743	0.0985	0.0808	0.1073
90.0	0.0656	0.0656	0.0765	0.0678	0.0634	0.0612	0.0590	0.0743	0.0722	0.0765
G/C	300.0	315.0	330.0	345.0						
0.0	9522	9537	9516	9546						
3.0	9200	9240	9328	9290						
6.0	7490	7497	7638	7496						
9.0	5051	5030	5170	4967						
12.0	2865	2863	2951	2801						
15.0	1711	1704	1742	1656						
18.0	1142	1138	1148	1098						
21.0	812.5	804.4	804.4	770.1						

C Range: 0 - 360DEG

C Interval: 15.0DEG

Test Speed: HIGH

Temperature: 25.3DEG

Operators: Meng Yongjian

Test Date: 2017-05-19

γ Range: 0 - 90DEG

γ Interval: 1.0DEG

Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.288

Humidity: 52%

Test Distance: 5.850m [K=1.0000]

Remarks:

GONIOPHOTOMETERS SYSTEM TEST REPORT

Photometric Data Table [cd]

24.0	588.9	583.3	577.2	555.7
27.0	424.3	418.3	416.0	398.7
30.0	311.5	307.2	305.9	294.0
33.0	236.4	233.5	232.8	224.7
36.0	185.8	184.2	183.8	178.0
39.0	150.1	149.2	149.1	144.9
42.0	122.8	122.5	122.0	119.6
45.0	102.2	101.9	101.5	99.63
48.0	82.64	82.54	82.56	81.11
51.0	64.87	64.81	65.02	64.19
54.0	51.22	51.07	51.36	50.60
57.0	39.79	39.71	40.08	39.51
60.0	29.70	29.72	30.05	29.58
63.0	21.56	21.68	21.90	21.61
66.0	14.95	15.08	15.39	15.05
69.0	8.217	8.429	8.800	8.350
72.0	2.764	2.862	3.159	2.825
75.0	0.5341	0.5244	0.5407	0.5266
78.0	0.2730	0.2889	0.2730	0.2867
81.0	0.1922	0.2123	0.1921	0.2079
84.0	0.1310	0.1532	0.1310	0.1510
87.0	0.0852	0.1116	0.0873	0.1094
90.0	0.0722	0.0722	0.0700	0.0722

C Range: 0 - 360DEG
 C Interval: 15.0DEG
 Test Speed: HIGH
 Temperature: 25.3DEG
 Operators: Meng Yongjian
 Test Date: 2017-05-19

γ Range: 0 - 90DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-2000B_V1 SYSTEM V2.0.288
 Humidity: 52%
 Test Distance: 5.850m [K=1.0000]
 Remarks: