

20W

LumCAT: 20W	Luminaire: LED TUBE LIGHT
Report No:	Voltage(V): 220.100
Test No:	Current(A): 0.084
LampCAT: LED	Power (W): 18.100
Lamp flux(lm)	PF: 0.980
Number of Lamps: 1	Ballast type:
Length(mm): 1200	Width(mm): 30
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1131.23
Lumens(lm)/Power(W): 62.50
Central intensity(cd): 294.229
Maximum intensity(cd): 296.764
Angle of maximum intensity: C=30.0 γ =5.0
Beam Angle(50%Imax): [H]Left=75.0 Right=71.6
 [V]Left=57.1 Right=55.8
Field angle(10%Imax): [H]Left=90.0 Right=90.0
 [V]Left=81.1 Right=79.4
Beam angle of C30plane: 119.56

Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

20W

Zonal flux distribution table

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	294.116	.000	.000	.000%	.000%
5.0	293.088	7.020	7.020	.621%	.621%
10.0	289.652	20.846	27.866	1.843%	2.463%
15.0	284.188	34.040	61.906	3.009%	5.472%
20.0	276.611	46.218	108.124	4.086%	9.558%
25.0	267.090	57.024	165.148	5.041%	14.599%
30.0	255.880	66.182	231.330	5.850%	20.450%
35.0	242.670	73.415	304.745	6.490%	26.939%
40.0	228.164	78.555	383.300	6.944%	33.884%
45.0	212.503	81.593	464.894	7.213%	41.096%
50.0	195.702	82.484	547.377	7.292%	48.388%
55.0	178.042	81.264	628.642	7.184%	55.572%
60.0	160.029	78.144	706.786	6.908%	62.480%
65.0	141.805	73.376	780.162	6.486%	68.966%
70.0	122.962	67.041	847.203	5.926%	74.892%
75.0	104.583	59.476	906.679	5.258%	80.150%
80.0	87.176	51.309	957.989	4.536%	84.686%
85.0	71.374	43.082	1001.070	3.808%	88.494%
90.0	57.488	35.284	1036.354	3.119%	91.613%
95.0	41.419	27.082	1063.436	2.394%	94.007%
100.0	17.886	16.115	1079.550	1.425%	95.432%
105.0	16.449	9.187	1088.737	.812%	96.244%
110.0	21.491	9.917	1098.654	.877%	97.121%
115.0	13.774	8.929	1107.583	.789%	97.910%
120.0	8.858	5.502	1113.085	.486%	98.396%
125.0	7.380	3.753	1116.839	.332%	98.728%
130.0	6.295	2.973	1119.812	.263%	98.991%
135.0	5.718	2.427	1122.240	.215%	99.206%
140.0	5.887	2.149	1124.388	.190%	99.396%
145.0	5.605	1.917	1126.306	.169%	99.565%
150.0	5.070	1.572	1127.878	.139%	99.704%
155.0	4.464	1.207	1129.084	.107%	99.811%
160.0	3.929	.880	1129.964	.078%	99.889%
165.0	3.366	.601	1130.566	.053%	99.942%
170.0	3.070	.382	1130.948	.034%	99.975%
175.0	2.845	.212	1131.159	.019%	99.994%
180.0	2.732	.067	1131.226	.006%	100.000%

Equipment: GMS1800B
Temperature($^{\circ}$ C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

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Zonal flux distribution table

ZONAL LUMEN SUMMARY

Zone	Lumens	%Fixt
0-30	231.33	20.45%
0-40	383.30	33.88%
0-60	706.79	62.48%
0-90	1036.35	91.61%
90-120	76.73	6.78%
90-130	83.46	7.38%
90-150	91.52	8.09%
90-180	94.81	8.38%
0-180	1131.23	100.00%

ZONAL LUMEN SUMMARY

0-10	27.87
10-20	80.26
20-30	123.21
30-40	151.97
40-50	164.08
50-60	159.41
60-70	140.42
70-80	110.79
80-90	78.37
90-100	43.20
100-110	19.10
110-120	14.43
120-130	6.73
130-140	4.58
140-150	3.49
150-160	2.09
160-170	0.98
170-180	0.21

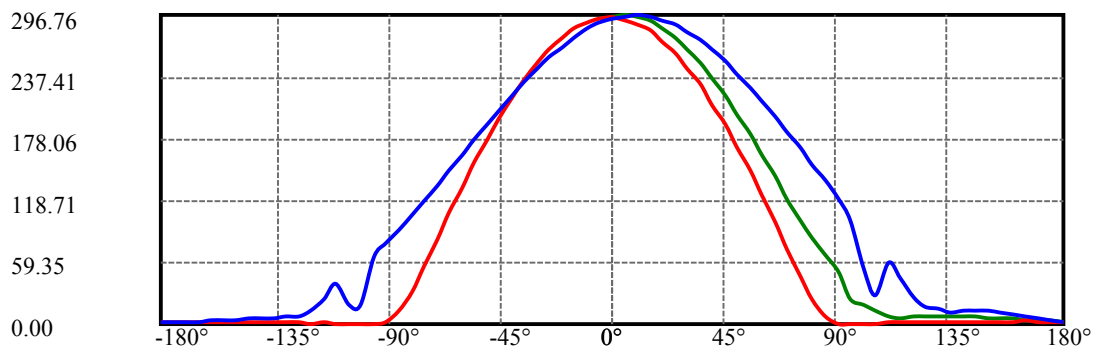
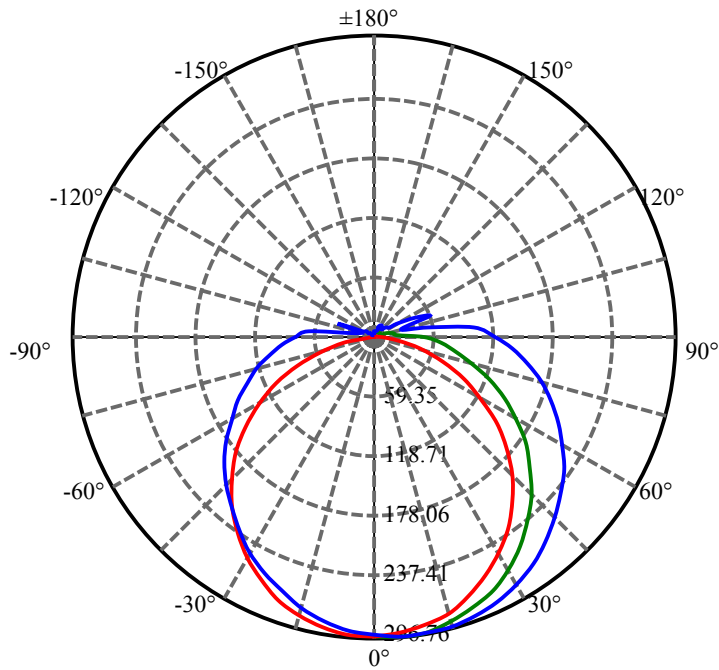
Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

20W

Light Distribution Curve [Unit: cd]



C30(Max): ———
C0/C180: ———
C90/C270: ———

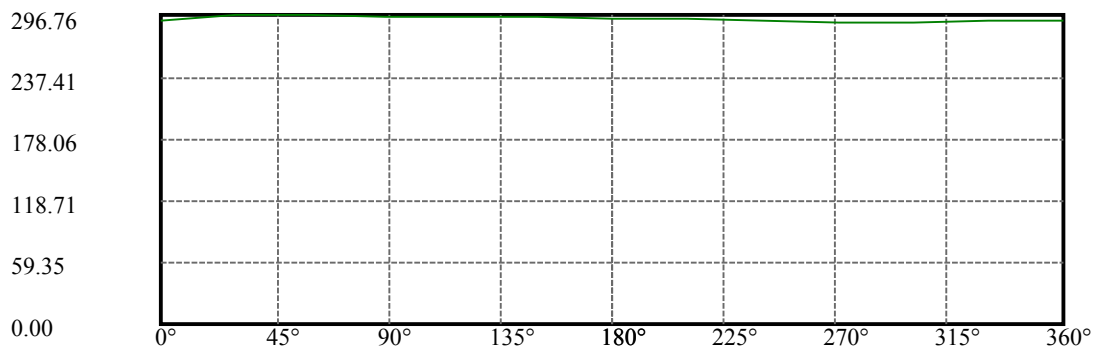
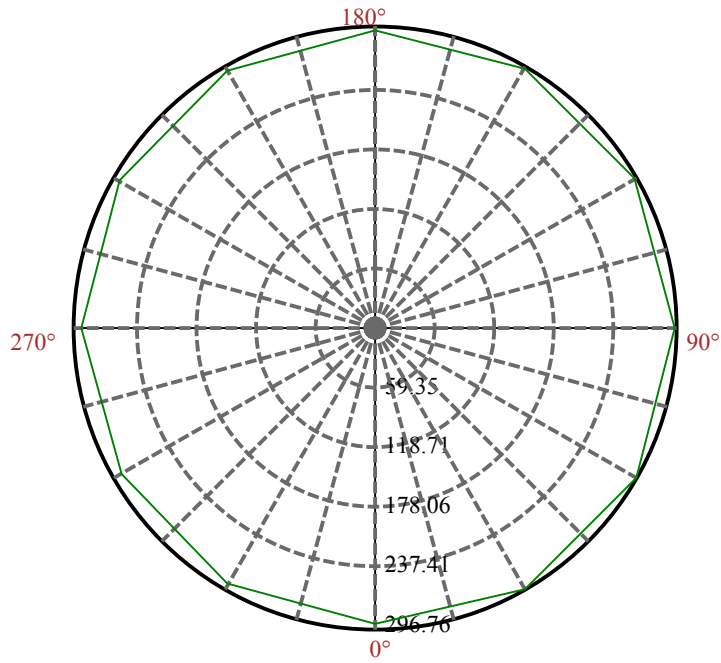
Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

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Light Distribution Curve [Unit: cd]



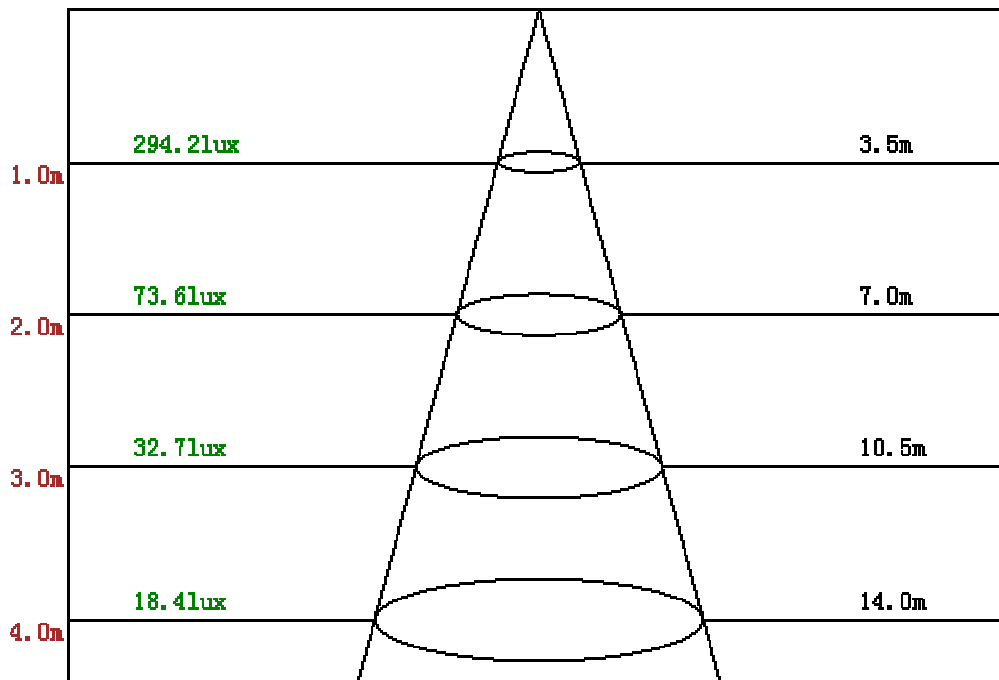
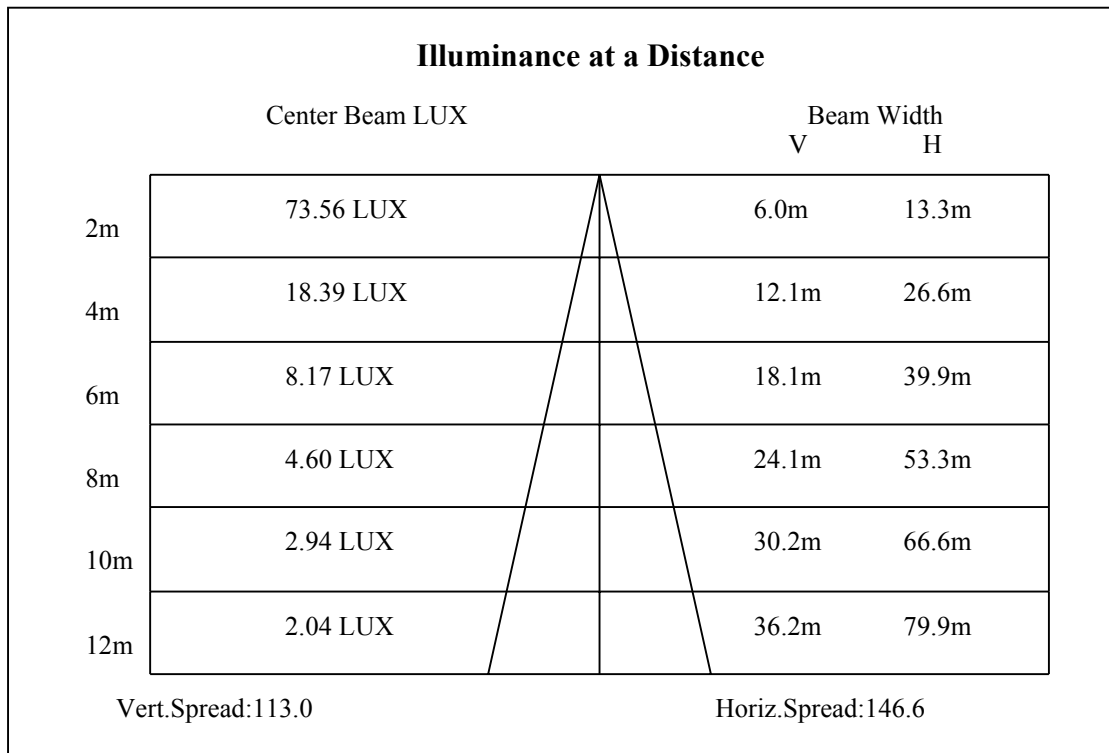
MaxG=5

Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

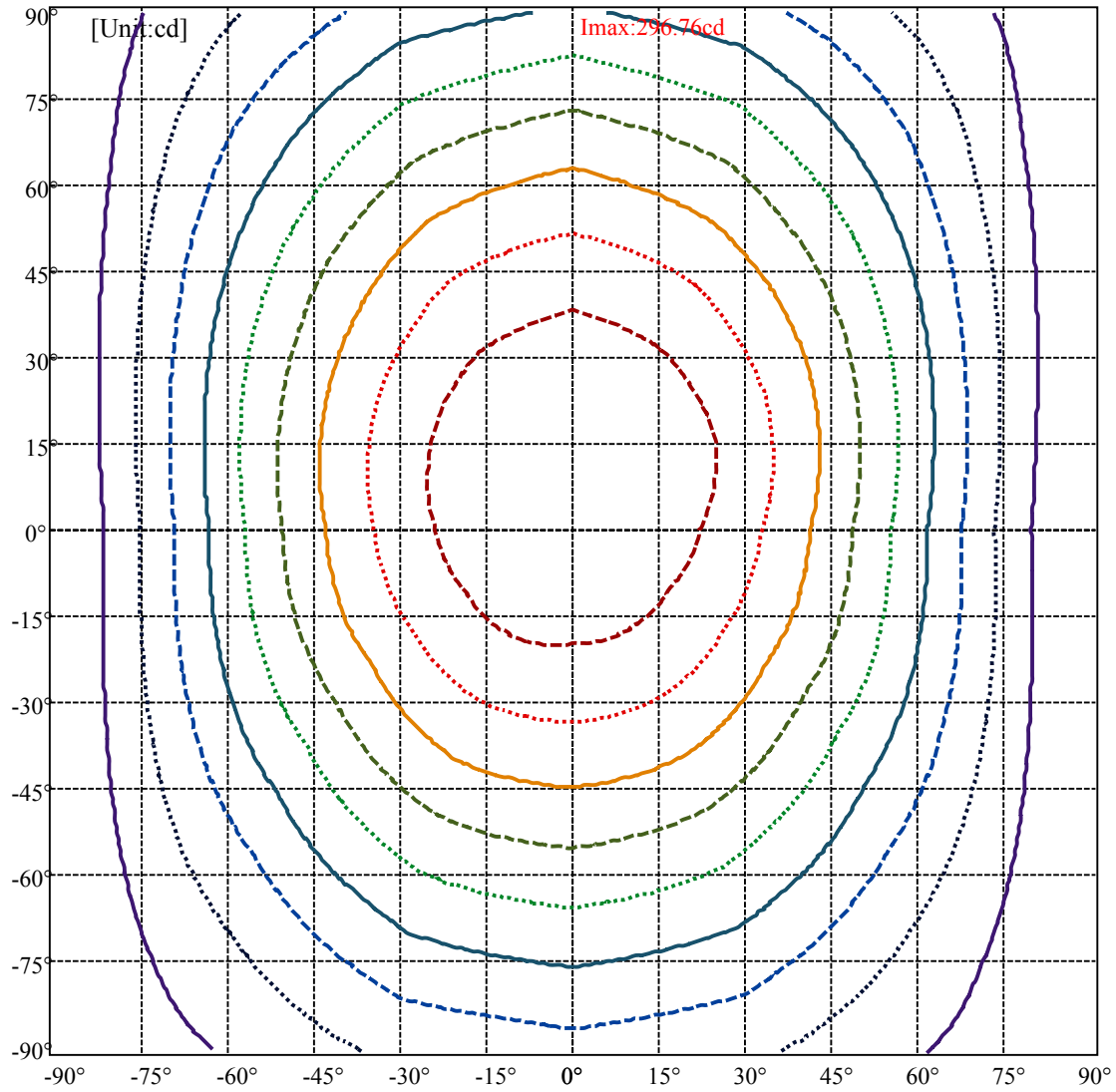
Operator:
Distance(m): 13.00

Lux distance Curve



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ISO-Intensity(V-H)



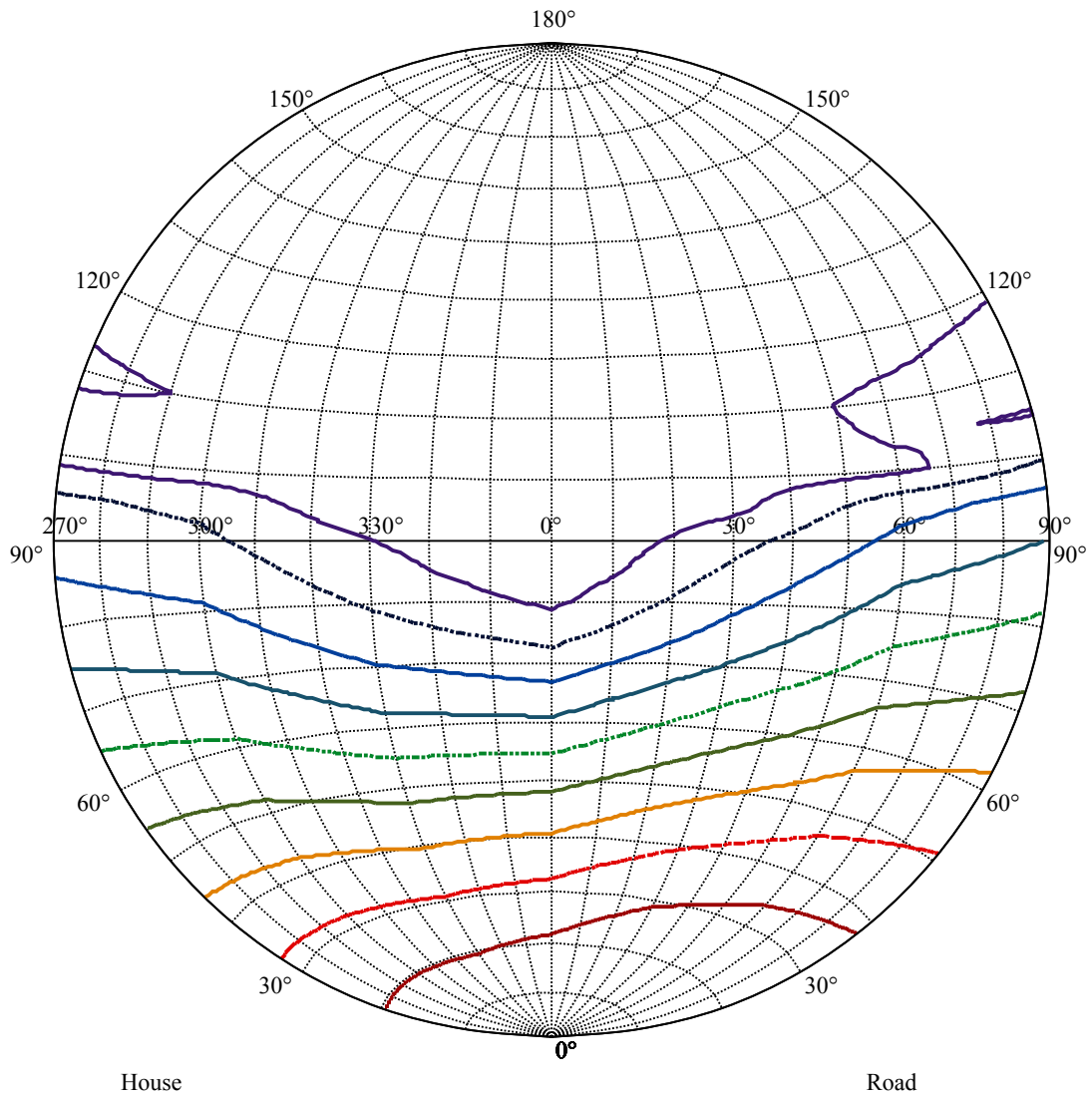
- | | |
|-------------------|-----------|
| (10%Imax) 29.6687 | ——— |
| (20%Imax) 59.3374 | |
| (30%Imax) 89.0061 | - - - - - |
| (40%Imax) 118.675 | ————— |
| (50%Imax) 148.343 | |
| (60%Imax) 178.012 | - - - - - |
| (70%Imax) 207.681 | ————— |
| (80%Imax) 237.349 | |
| (90%Imax) 267.018 | - - - - - |

Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

ISO candela diagram on circular web



House

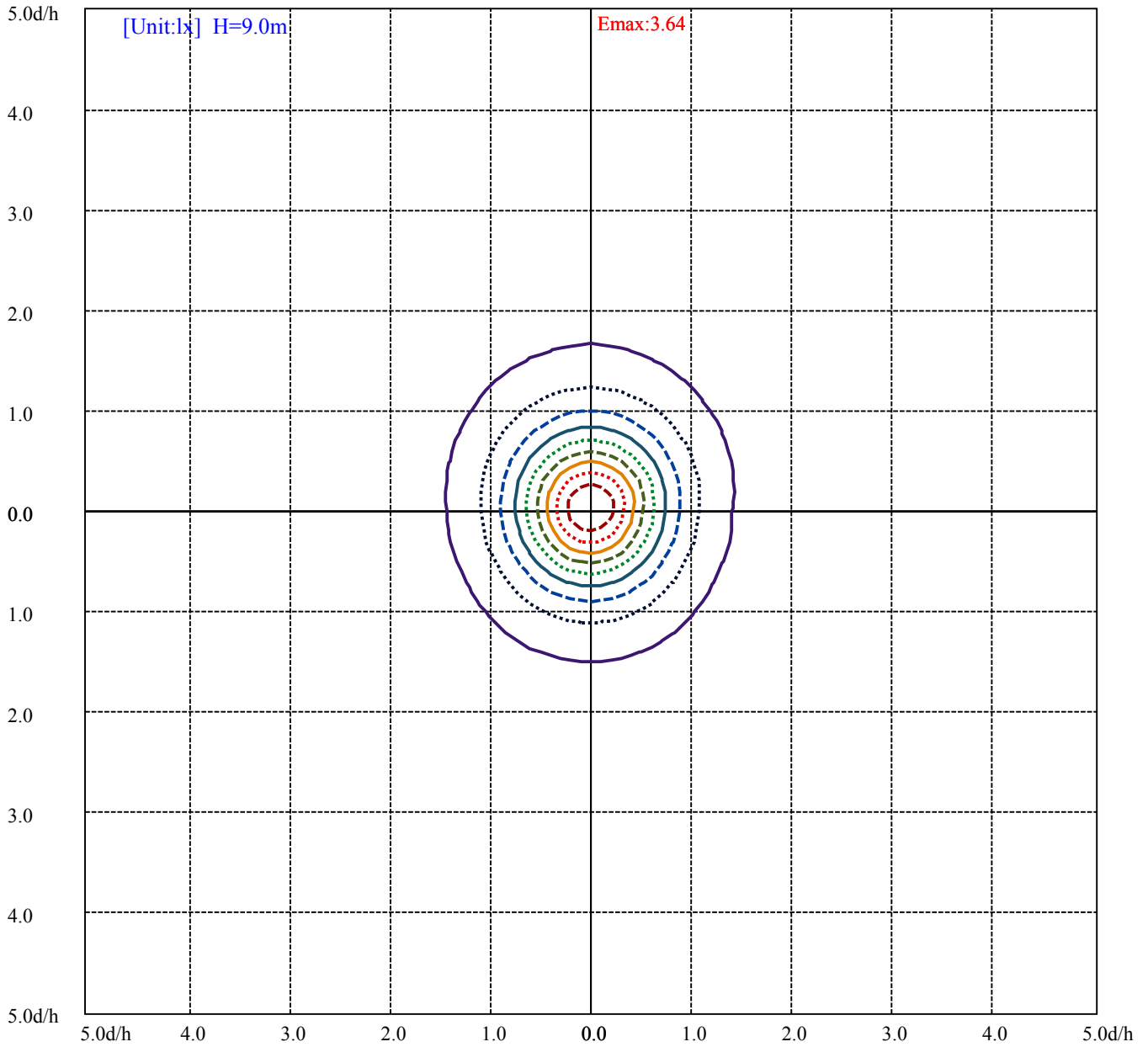
Road

Imax:296.76cd

(10%Imax) 29.6764	—
(20%Imax) 59.3528	·····
(30%Imax) 89.0292	- - - - -
(40%Imax) 118.706	—
(50%Imax) 148.382	·····
(60%Imax) 178.058	- - - - -
(70%Imax) 207.735	—
(80%Imax) 237.411	·····
(90%Imax) 267.088	- - - - -

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ISO illuminance diagram



- (10%Emax) 0.3642889 ————
- (20%Emax) 0.7285778 ······
- (30%Emax) 1.092867 - - - - -
- (40%Emax) 1.45716 ————
- (50%Emax) 1.821445 ······
- (60%Emax) 2.185729 - - - - -
- (70%Emax) 2.550025 ————
- (80%Emax) 2.914309 ······
- (90%Emax) 3.278605 - - - - -

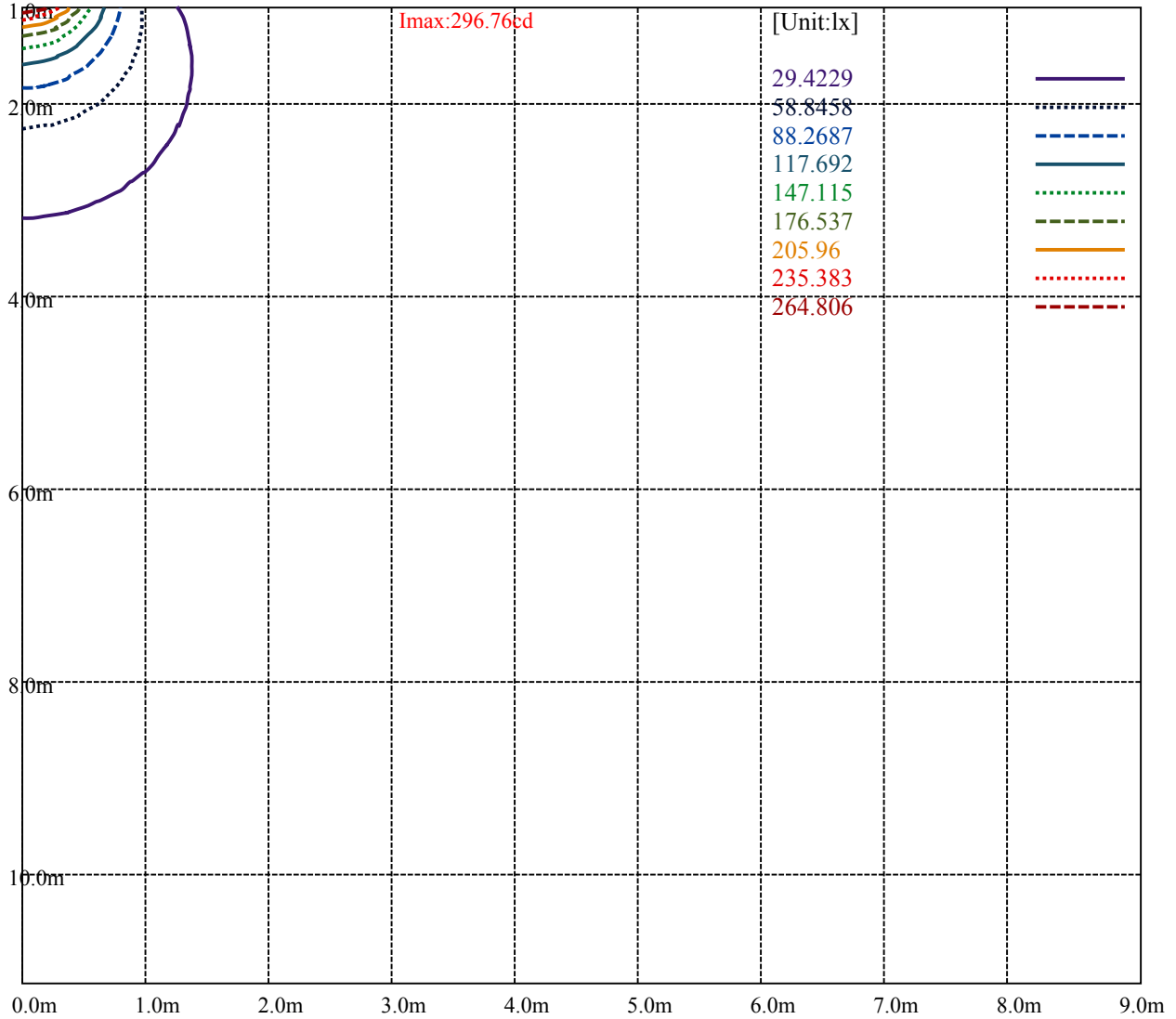
Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

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Space ISO Lux diagram



Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

20W

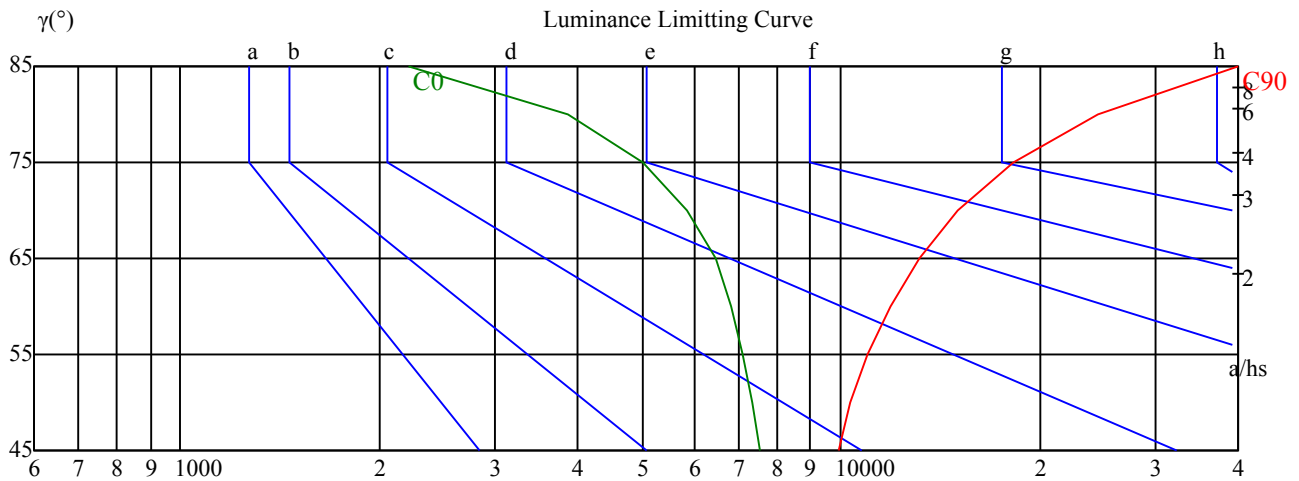
Luminance Limiting Curve(no luminous side)

Luminance Table

γ	45	50	55	60	65	70	75	80	85
C0	7522	7325	7112	6845	6465	5861	5006	3866	2208
C45	0	0	0	0	0	0	0	0	0
C90	9912	10363	11008	11896	13119	15002	18210	24547	43790

Glare Table

Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h



Equipment: GMS1800B
 Temperature(°C): 25.0

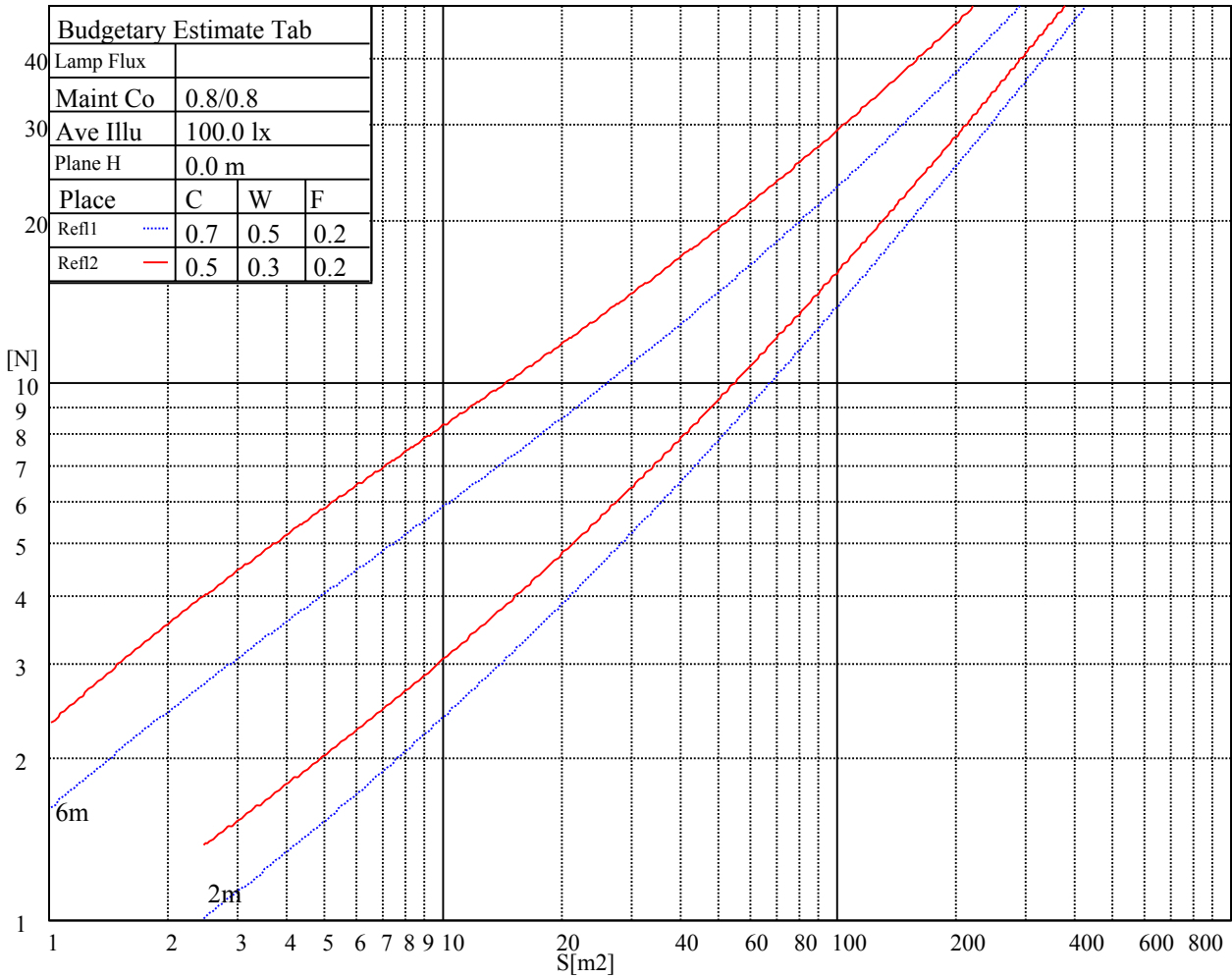
Date:
 Humidity(%): 60.0%

Operator:
 Distance(m): 13.00

UGR Glare

Illuminatin assessment according UGR											
Rf of Ceiling	70	70	50	50	30	70	70	50	50	30	
Rf of Wall	50	30	50	30	30	50	30	50	30	30	
Rf of Floor	20	20	20	20	20	20	20	20	20	20	
Room dimensions		Viewed crosswise					Viewed endwise				
X	Y										
2H	2H	18.7	20.1	19.1	20.5	20.9	20.6	22.0	21.1	22.4	22.8
	3H	20.3	21.5	20.7	21.9	22.4	23.4	24.6	23.8	25.0	25.5
	4H	20.7	21.7	21.2	22.2	22.7	24.7	25.7	25.2	26.2	26.7
	6H	21.2	22.2	21.7	22.7	23.2	26.3	27.4	26.8	27.9	28.4
	8H	21.3	22.4	21.8	22.9	23.4	27.3	28.3	27.8	28.8	29.3
	12H	21.2	22.0	21.7	22.5	23.1	28.1	28.9	28.7	29.5	30.1
4H	2H	19.7	20.8	20.2	21.2	21.8	21.1	22.2	21.6	22.7	23.2
	3H	21.6	22.4	22.1	22.9	23.5	24.1	24.9	24.6	25.4	26.0
	4H	22.5	23.3	23.0	23.8	24.4	25.8	26.6	26.4	27.2	27.8
	6H	23.2	24.0	23.7	24.5	25.1	27.7	28.5	28.3	29.1	29.7
	8H	23.2	23.7	23.8	24.3	25.0	28.6	29.1	29.2	29.7	30.4
	12H	23.4	23.9	24.0	24.5	25.2	29.7	30.2	30.4	30.9	31.5
8H	4H	23.5	24.0	24.1	24.6	25.3	26.1	26.6	26.8	27.3	27.9
	6H	24.6	25.1	25.2	25.7	26.4	28.3	28.8	28.9	29.4	30.1
	8H	25.0	25.5	25.7	26.1	26.8	29.6	30.1	30.2	30.7	31.4
	12H	25.4	25.9	26.0	26.5	27.2	31.0	31.5	31.6	32.1	32.8
12H	4H	23.8	24.3	24.5	24.9	25.6	26.2	26.7	26.9	27.3	28.0
	6H	25.1	25.6	25.8	26.3	26.9	28.5	29.0	29.1	29.6	30.3
	8H	25.8	26.3	26.4	26.9	27.6	29.9	30.4	30.5	31.0	31.7
Variation with the observer position at spacings:											
S = 1.0H		0.2/-0.6					0.2/-1.2				
S = 1.5H		0.4/-0.6					0.3/-1.1				
S = 2.0H		0.3/-0.7					0.1/-0.9				
Standard tables:		BKBF					BKBF				
Uncorrected UGR		8.6					12.5				
According 1000lm											

Budgetary Estimate Table



Utilization factor table for indoor luminaire

RHOCC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFICIENTS OF UTILIZATION RHOF=20 CU															
0	1.17	1.17	1.17	1.13	1.13	1.13	1.06	1.06	1.06	1.00	1.00	1.00	0.94	0.94	0.94	0.92
1	0.98	0.93	0.88	0.95	0.90	0.86	0.89	0.85	0.82	0.84	0.81	0.78	0.79	0.76	0.74	0.71
2	0.84	0.76	0.70	0.81	0.74	0.68	0.76	0.70	0.65	0.72	0.67	0.63	0.68	0.63	0.60	0.57
3	0.73	0.64	0.57	0.71	0.62	0.56	0.67	0.59	0.54	0.63	0.57	0.52	0.59	0.54	0.50	0.47
4	0.64	0.55	0.47	0.62	0.54	0.47	0.59	0.51	0.45	0.55	0.49	0.44	0.52	0.47	0.42	0.39
5	0.57	0.48	0.40	0.55	0.47	0.40	0.52	0.45	0.39	0.49	0.43	0.37	0.47	0.41	0.36	0.34
6	0.51	0.42	0.35	0.50	0.41	0.35	0.47	0.39	0.34	0.45	0.38	0.33	0.42	0.36	0.32	0.29
7	0.46	0.37	0.31	0.45	0.36	0.30	0.43	0.35	0.29	0.40	0.34	0.29	0.38	0.32	0.28	0.26
8	0.42	0.33	0.27	0.41	0.33	0.27	0.39	0.32	0.26	0.37	0.30	0.26	0.35	0.29	0.25	0.23
9	0.39	0.30	0.24	0.38	0.30	0.24	0.36	0.29	0.23	0.34	0.28	0.23	0.33	0.27	0.22	0.20
10	0.35	0.27	0.22	0.35	0.27	0.22	0.33	0.26	0.21	0.32	0.25	0.21	0.30	0.24	0.20	0.18
RCR	COEFFICIENTS OF UTILIZATION RHOF=20 WLC															
1	0.38	0.22	0.07	0.37	0.21	0.07	0.35	0.20	0.06	0.34	0.19	0.06	0.32	0.19	0.06	
2	0.33	0.18	0.06	0.32	0.18	0.05	0.31	0.17	0.05	0.29	0.16	0.05	0.28	0.16	0.05	
3	0.30	0.16	0.05	0.29	0.15	0.05	0.27	0.15	0.05	0.26	0.14	0.04	0.25	0.14	0.04	
4	0.27	0.14	0.04	0.26	0.14	0.04	0.25	0.13	0.04	0.24	0.13	0.04	0.22	0.12	0.04	
5	0.24	0.12	0.04	0.24	0.12	0.04	0.23	0.12	0.03	0.21	0.11	0.03	0.20	0.11	0.03	
6	0.22	0.11	0.03	0.22	0.11	0.03	0.21	0.11	0.03	0.20	0.10	0.03	0.19	0.10	0.03	
7	0.21	0.10	0.03	0.20	0.10	0.03	0.19	0.10	0.03	0.18	0.09	0.03	0.17	0.09	0.03	
8	0.19	0.09	0.03	0.19	0.09	0.03	0.18	0.09	0.03	0.17	0.09	0.02	0.16	0.08	0.02	
9	0.18	0.09	0.02	0.17	0.09	0.02	0.17	0.08	0.02	0.16	0.08	0.02	0.15	0.08	0.02	
10	0.17	0.08	0.02	0.16	0.08	0.02	0.16	0.08	0.02	0.15	0.07	0.02	0.14	0.07	0.02	
RCR	COEFFICIENTS OF UTILIZATION RHOF=20 CCLU															
0	0.25	0.25	0.25	0.22	0.22	0.22	0.15	0.15	0.15	0.09	0.09	0.09	0.03	0.03	0.03	
1	0.21	0.20	0.19	0.19	0.17	0.16	0.13	0.12	0.11	0.08	0.07	0.07	0.03	0.02	0.02	
2	0.18	0.16	0.15	0.16	0.15	0.13	0.12	0.11	0.09	0.08	0.07	0.06	0.03	0.02	0.02	
3	0.16	0.14	0.12	0.15	0.13	0.11	0.12	0.10	0.08	0.08	0.06	0.05	0.03	0.02	0.02	
4	0.15	0.13	0.11	0.14	0.11	0.10	0.11	0.09	0.07	0.07	0.06	0.04	0.03	0.02	0.01	
5	0.14	0.12	0.10	0.13	0.11	0.09	0.11	0.08	0.06	0.07	0.05	0.04	0.03	0.02	0.01	
6	0.13	0.11	0.09	0.12	0.10	0.08	0.10	0.08	0.06	0.07	0.05	0.04	0.03	0.02	0.01	
7	0.12	0.10	0.09	0.12	0.09	0.08	0.10	0.07	0.06	0.07	0.05	0.04	0.02	0.02	0.01	
8	0.12	0.10	0.08	0.11	0.09	0.07	0.09	0.07	0.05	0.06	0.05	0.03	0.02	0.02	0.01	
9	0.11	0.09	0.08	0.11	0.09	0.07	0.09	0.07	0.05	0.06	0.05	0.03	0.02	0.02	0.01	
10	0.11	0.09	0.08	0.11	0.08	0.07	0.09	0.07	0.05	0.06	0.04	0.03	0.02	0.02	0.01	

Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

Intensity data(cd)

C/γ(°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
0.0	294.23	292.03	287.64	281.22	271.58	259.42	245.05	229.50	210.74
30.0	295.58	296.76	294.91	290.34	283.41	275.30	264.15	250.80	235.42
60.0	294.57	296.43	295.58	293.55	289.33	282.57	274.63	264.82	253.33
90.0	293.38	295.75	296.43	295.24	291.86	287.13	280.54	272.26	262.96
120.0	293.55	295.41	295.24	292.88	289.16	282.57	275.30	264.99	253.84
150.0	293.38	294.40	292.88	288.82	282.57	274.12	263.47	250.63	236.09
180.0	294.23	293.38	289.67	283.58	274.79	263.81	250.80	234.23	217.00
210.0	295.58	292.88	287.30	279.53	269.72	257.73	243.87	227.98	210.41
240.0	294.57	291.02	285.61	278.17	268.88	258.06	245.22	232.04	217.84
270.0	293.38	289.50	283.58	275.30	266.18	255.87	244.88	232.04	219.02
300.0	293.55	289.16	282.91	275.81	266.18	255.36	242.85	229.50	215.14
330.0	293.38	290.34	284.09	275.81	265.67	253.16	239.81	223.25	206.18
360.0	294.23	292.03	287.64	281.22	271.58	259.42	245.05	229.50	210.74
C/γ(°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
0.0	191.48	169.51	146.86	123.20	98.36	72.16	46.64	24.17	6.93
30.0	219.02	200.77	181.68	161.73	142.30	120.16	100.39	82.13	65.74
60.0	240.32	226.97	211.93	196.89	181.34	165.11	148.21	131.31	114.58
90.0	252.32	239.81	227.31	214.12	199.59	184.72	169.68	153.45	137.40
120.0	241.84	228.66	213.95	198.58	183.20	167.14	150.07	133.51	116.95
150.0	219.87	201.96	183.37	164.10	143.99	123.37	103.94	85.51	68.61
180.0	197.73	177.45	154.30	130.64	106.13	80.95	55.43	31.60	12.00
210.0	191.82	173.06	152.61	132.50	112.39	92.95	74.19	57.80	43.26
240.0	202.97	187.08	171.37	155.65	139.93	123.88	109.17	93.96	79.43
270.0	205.34	191.31	176.77	162.58	148.21	133.17	118.81	104.61	90.92
300.0	199.93	184.21	167.99	152.61	137.23	121.68	106.98	92.11	78.75
330.0	187.42	167.65	148.38	127.76	109.01	90.25	71.49	55.94	41.91
360.0	191.48	169.51	146.86	123.20	98.36	72.16	46.64	24.17	6.93
C/γ(°)	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0
0.0	0.34	0.68	0.85	0.51	1.18	1.18	1.52	1.69	1.86
30.0	49.18	23.32	18.42	12.17	7.10	6.25	6.59	7.94	8.28
60.0	97.18	78.92	23.66	32.62	41.57	23.32	15.38	12.68	11.15
90.0	119.48	99.37	53.40	27.55	58.64	44.45	25.18	17.41	14.20
120.0	100.56	79.60	26.53	31.94	41.24	22.82	16.06	12.84	10.14
150.0	52.39	27.21	17.58	15.55	9.63	7.61	6.08	6.93	6.59
180.0	1.01	0.17	0.17	0.51	0.68	1.01	0.85	1.01	1.18
210.0	30.76	8.79	12.51	6.08	4.39	2.87	2.03	2.87	2.70
240.0	65.74	52.73	14.87	22.31	25.69	14.03	8.62	6.93	4.73
270.0	77.57	64.05	18.42	18.42	38.19	24.51	12.68	8.28	6.59
300.0	65.23	52.90	15.21	22.82	25.52	14.37	8.45	6.42	5.07
330.0	30.42	9.30	13.01	6.93	4.06	2.87	2.87	3.55	3.04
360.0	0.34	0.68	0.85	0.51	1.18	1.18	1.52	1.69	1.86
C/γ(°)	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0
0.0	1.86	1.69	2.20	2.20	2.54	2.54	2.87	2.70	2.54
30.0	8.28	7.77	6.76	5.92	5.07	4.73	4.06	3.55	3.38
60.0	11.83	12.68	11.83	10.82	8.79	7.44	5.92	4.56	3.89
90.0	11.83	12.51	13.69	12.34	10.82	8.62	6.59	5.24	3.21
120.0	8.96	10.48	9.80	8.62	6.76	5.58	4.56	3.72	3.38
150.0	6.59	5.41	4.56	4.23	4.06	3.55	3.21	3.21	3.21
180.0	1.18	1.52	1.18	1.86	1.69	2.20	2.20	2.70	2.54
210.0	2.37	1.86	1.69	1.69	1.69	1.86	2.03	2.20	2.70
240.0	3.38	3.55	3.21	2.54	2.54	2.03	1.69	1.86	2.54
270.0	5.07	5.24	5.24	4.06	3.72	2.87	2.37	2.20	2.03
300.0	4.39	5.07	4.23	4.06	3.38	3.21	2.37	2.20	2.37
330.0	2.87	2.87	2.87	2.54	2.54	2.54	2.54	2.70	2.37
360.0	1.86	1.69	2.20	2.20	2.54	2.54	2.87	2.70	2.54

Equipment: GMS1800B
Temperature(°C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00

20W

Intensity data(cd)

C/ γ ($^{\circ}$)	180.0
0.0	2.54
30.0	2.70
60.0	3.04
90.0	2.37
120.0	2.87
150.0	2.87
180.0	2.54
210.0	2.70
240.0	3.04
270.0	2.37
300.0	2.87
330.0	2.87
360.0	2.54

Equipment: GMS1800B
Temperature($^{\circ}$ C): 25.0

Date:
Humidity(%): 60.0%

Operator:
Distance(m): 13.00