



NATA LIGHTING CO.,LTD.
www.nata.cn
Email:info@nata.com
Tel:+86-750-3770000 Fax:+86-750-3771111
Address:380JinOu Road,GaoXin Zone,Jiang Men City,Guangdong,China

Nata

LumCAT: 2-2211-L	
Luminaire: 92.70.131.00	
Report No: 200416-B011	Voltage(V): 24.6700
Test No: 200416-C011	Current(A): 0.6010
LampCAT: SEOUL SAWx15	Power (W): 14.8000
Lamp flux(lm): 2526.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 0	Width(mm): 0
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 2423.28
Efficiency(%): 95.93%
Lumens(lm)/Power(W): 163.74
Central intensity(cd): 13469.060
Maximum intensity(cd): 13469.060
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=18.7
[C90/270]Total=18.7
Field angle(10%Imax): [C0/180]Total=39.4
[C90/270]Total=39.4
Maximum s/h(1/2): C0_180=0.32 C90_270=0.32
Maximum s/h(1/4): C0_180=0.32 C90_270=0.32
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 95.93%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.240%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	13469.063	0.000	0	.000%	.000%
1.0	13460.625	12.885	12.885	.510%	.532%
2.0	13338.984	38.465	51.351	1.523%	2.119%
3.0	12995.859	62.984	114.335	2.493%	4.718%
4.0	12473.930	85.256	199.591	3.375%	8.236%
5.0	11761.453	104.259	303.85	4.127%	12.539%
6.0	10782.422	118.474	422.324	4.690%	17.428%
7.0	9640.477	126.765	549.089	5.018%	22.659%
8.0	8490.867	129.763	678.851	5.137%	28.014%
9.0	7207.031	127.223	806.074	5.037%	33.264%
10.0	5933.180	118.914	924.988	4.708%	38.171%
11.0	4930.242	108.548	1033.536	4.297%	42.650%
12.0	4068.141	98.365	1131.901	3.894%	46.709%
13.0	3300.961	87.453	1219.354	3.462%	50.318%
14.0	2794.500	78.021	1297.375	3.089%	53.538%
15.0	2479.359	72.402	1369.777	2.866%	56.526%
16.0	2066.133	66.604	1436.381	2.637%	59.274%
17.0	1816.313	60.460	1496.841	2.394%	61.769%
18.0	1617.539	56.617	1553.458	2.241%	64.105%
19.0	1444.500	53.273	1606.731	2.109%	66.304%
20.0	1309.781	50.411	1657.142	1.996%	68.384%
21.0	1200.811	48.208	1705.351	1.908%	70.374%
22.0	1109.820	46.433	1751.784	1.838%	72.290%
23.0	1048.943	45.297	1797.081	1.793%	74.159%
24.0	989.775	44.574	1841.654	1.765%	75.998%
25.0	937.399	43.820	1885.474	1.735%	77.807%
26.0	901.695	43.412	1928.886	1.719%	79.598%
27.0	867.804	43.291	1972.177	1.714%	81.384%
28.0	833.309	43.069	2015.246	1.705%	83.162%
29.0	796.092	42.630	2057.876	1.688%	84.921%
30.0	750.164	41.749	2099.624	1.653%	86.644%
31.0	683.093	39.885	2139.51	1.579%	88.290%
32.0	610.031	37.046	2176.556	1.467%	89.818%
33.0	540.570	33.897	2210.453	1.342%	91.217%
34.0	452.482	30.053	2240.506	1.190%	92.457%
35.0	378.035	25.793	2266.299	1.021%	93.522%
36.0	305.691	21.770	2288.069	.862%	94.420%
37.0	234.696	17.624	2305.693	.698%	95.147%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	168.124	13.446	2319.139	.532%	95.702%
39.0	106.066	9.359	2328.498	.371%	96.088%
40.0	66.220	6.009	2334.506	.238%	96.336%
41.0	46.048	3.998	2338.504	.158%	96.501%
42.0	37.287	3.028	2341.532	.120%	96.626%
43.0	33.975	2.640	2344.172	.105%	96.735%
44.0	32.112	2.494	2346.666	.099%	96.838%
45.0	30.241	2.396	2349.062	.095%	96.937%
46.0	28.969	2.316	2351.378	.092%	97.033%
47.0	27.928	2.263	2353.641	.090%	97.126%
48.0	27.120	2.225	2355.866	.088%	97.218%
49.0	26.395	2.198	2358.064	.087%	97.309%
50.0	25.615	2.168	2360.232	.086%	97.398%
51.0	24.898	2.137	2362.369	.085%	97.486%
52.0	24.335	2.113	2364.482	.084%	97.573%
53.0	23.660	2.088	2366.57	.083%	97.660%
54.0	23.126	2.062	2368.632	.082%	97.745%
55.0	22.542	2.039	2370.67	.081%	97.829%
56.0	22.050	2.015	2372.685	.080%	97.912%
57.0	21.797	2.005	2374.69	.079%	97.995%
58.0	21.445	2.000	2376.69	.079%	98.077%
59.0	20.946	1.982	2378.671	.078%	98.159%
60.0	20.433	1.955	2380.626	.077%	98.240%
61.0	19.898	1.925	2382.551	.076%	98.319%
62.0	19.245	1.886	2384.437	.075%	98.397%
63.0	18.555	1.838	2386.276	.073%	98.473%
64.0	17.880	1.788	2388.064	.071%	98.547%
65.0	17.100	1.731	2389.795	.069%	98.618%
66.0	16.439	1.673	2391.468	.066%	98.687%
67.0	15.680	1.615	2393.083	.064%	98.754%
68.0	15.082	1.558	2394.641	.062%	98.818%
69.0	14.618	1.515	2396.157	.060%	98.881%
70.0	14.161	1.478	2397.635	.059%	98.942%
71.0	13.655	1.438	2399.072	.057%	99.001%
72.0	13.219	1.397	2400.47	.055%	99.059%
73.0	12.909	1.366	2401.836	.054%	99.115%
74.0	12.586	1.340	2403.176	.053%	99.170%
75.0	12.305	1.315	2404.491	.052%	99.224%

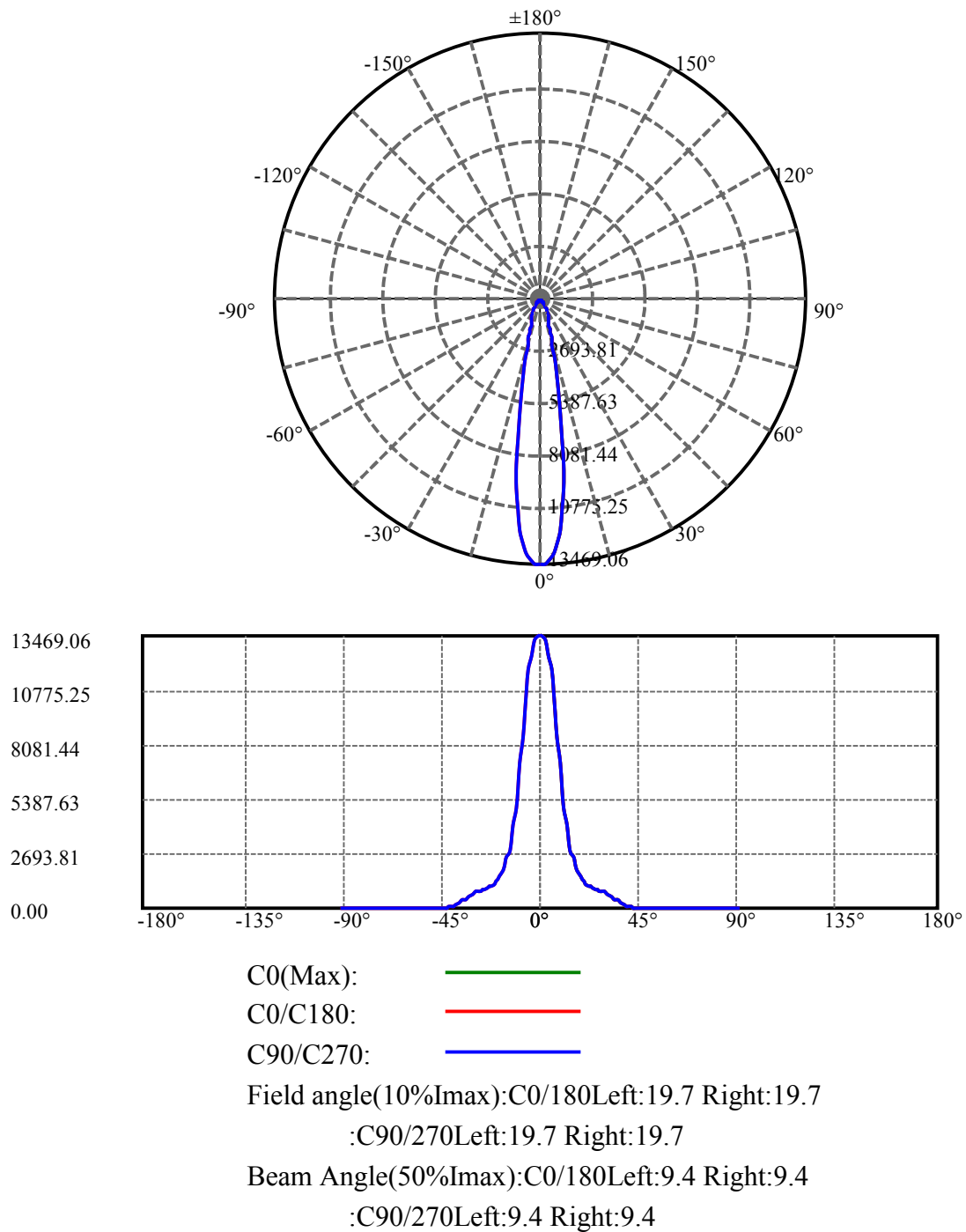
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	12.150	1.298	2405.789	.051%	99.278%
77.0	12.080	1.292	2407.081	.051%	99.331%
78.0	12.023	1.290	2408.372	.051%	99.385%
79.0	12.009	1.291	2409.663	.051%	99.438%
80.0	11.995	1.294	2410.957	.051%	99.491%
81.0	11.974	1.296	2412.253	.051%	99.545%
82.0	11.848	1.292	2413.545	.051%	99.598%
83.0	11.468	1.267	2414.813	.050%	99.650%
84.0	11.419	1.247	2416.059	.049%	99.702%
85.0	11.355	1.243	2417.302	.049%	99.753%
86.0	11.292	1.238	2418.54	.049%	99.804%
87.0	10.976	1.219	2419.759	.048%	99.855%
88.0	10.821	1.194	2420.953	.047%	99.904%
89.0	10.631	1.176	2422.129	.047%	99.952%
90.0	10.448	1.156	2423.285	.046%	100.000%

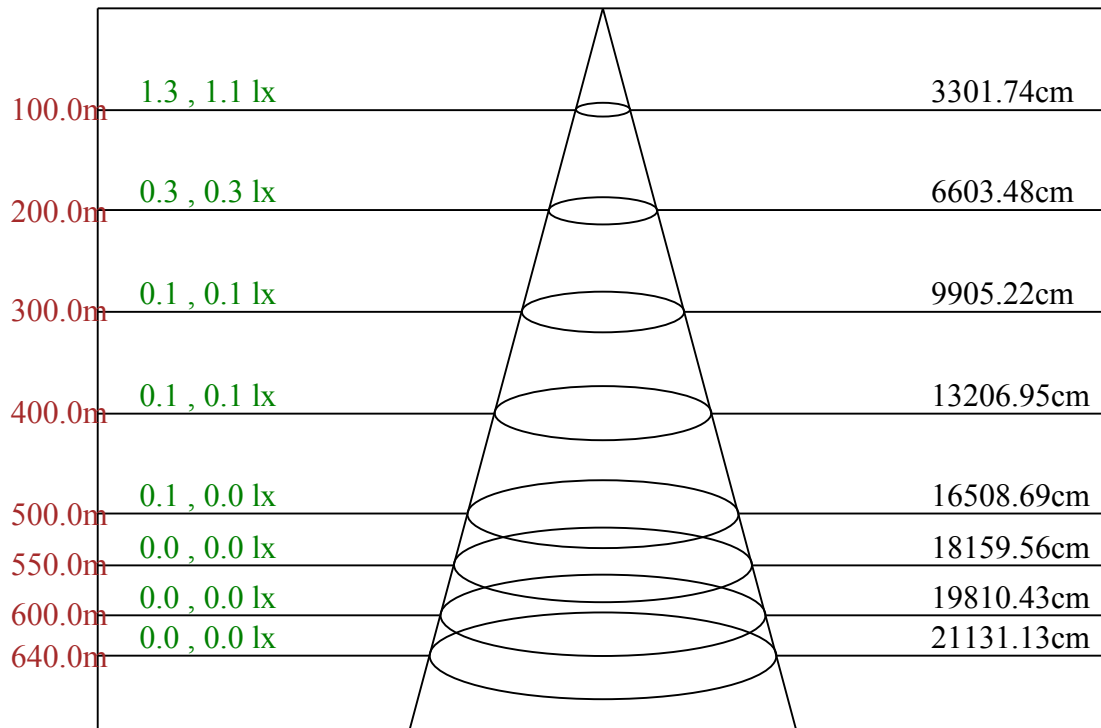
ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2099.62	83.12%	86.64%
0-40	2334.51	92.42%	96.34%
0-60	2380.63	94.24%	98.24%
0-90	2422.13	95.89%	99.95%
0-120	2422.13	95.89%	99.95%
0-180	2423.28	95.93%	100.00%
60-90	43.46	1.72%	1.79%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-26.23	1938.63	76.75%	80.00%

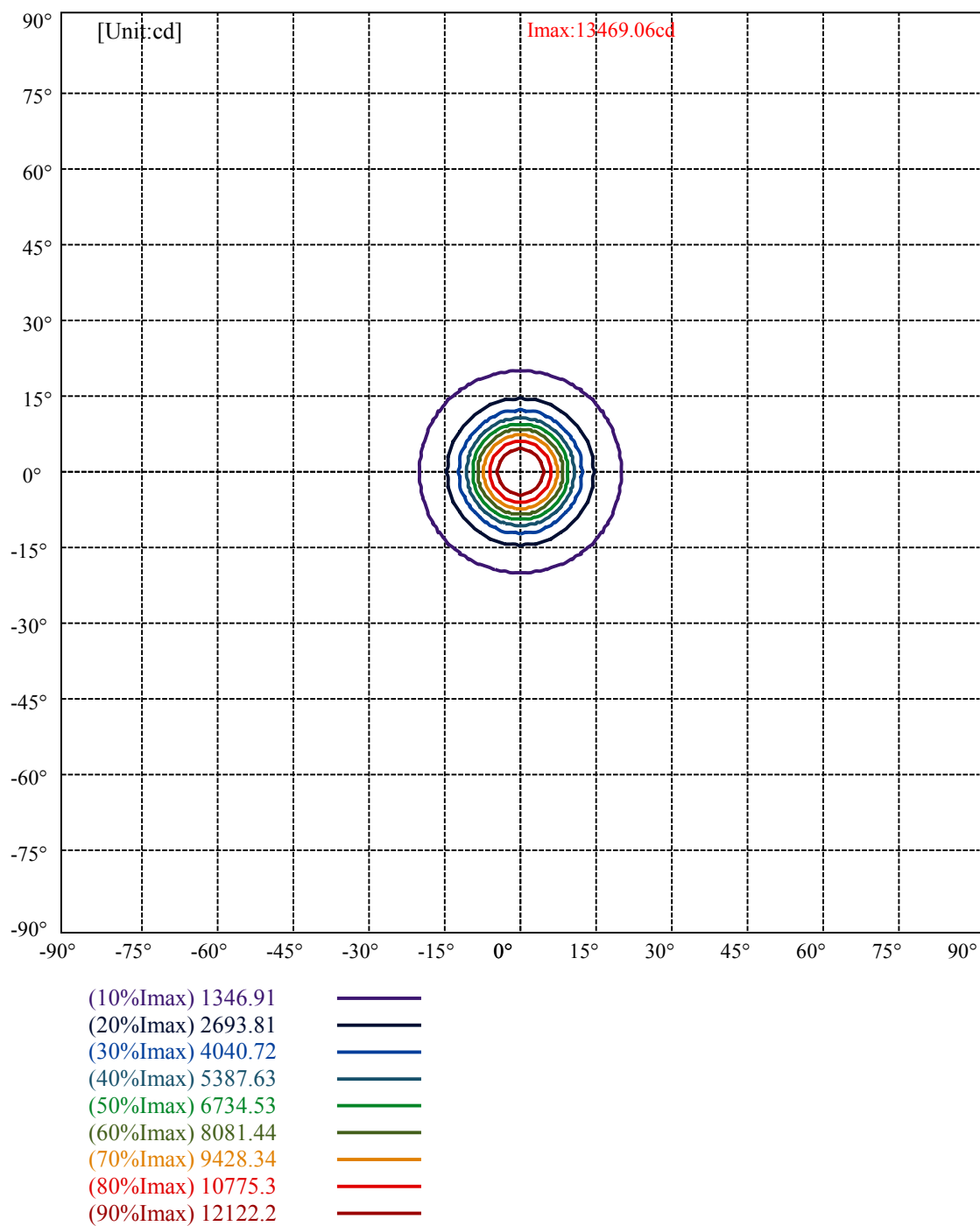
ZONAL LUMEN SUMMARY

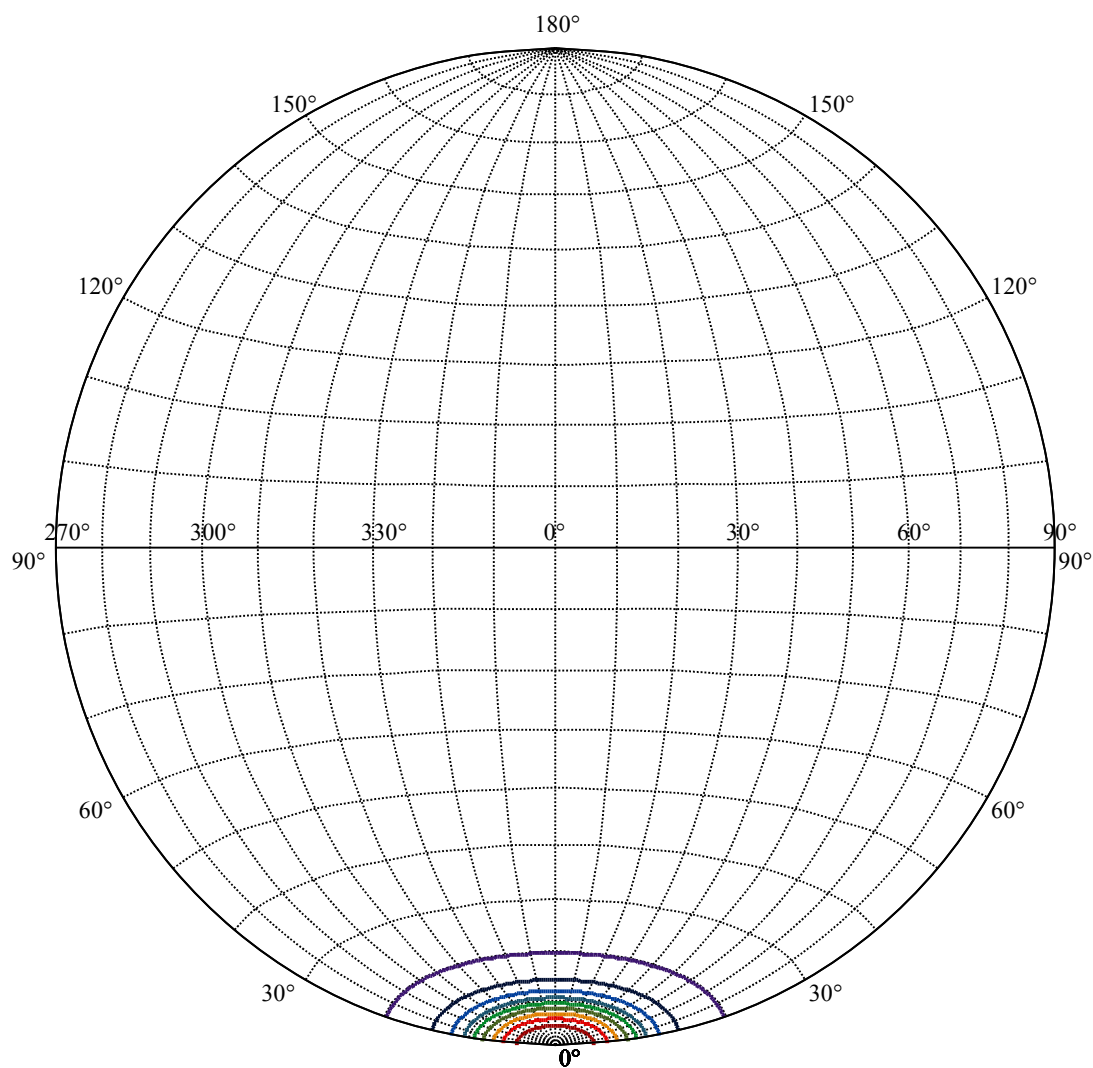
0-10	924.99
10-20	732.15
20-30	442.48
30-40	234.88
40-50	25.73
50-60	20.39
60-70	17.01
70-80	13.32
80-90	11.17
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00





Max , Ave Beam angle of C0 plane 18.75





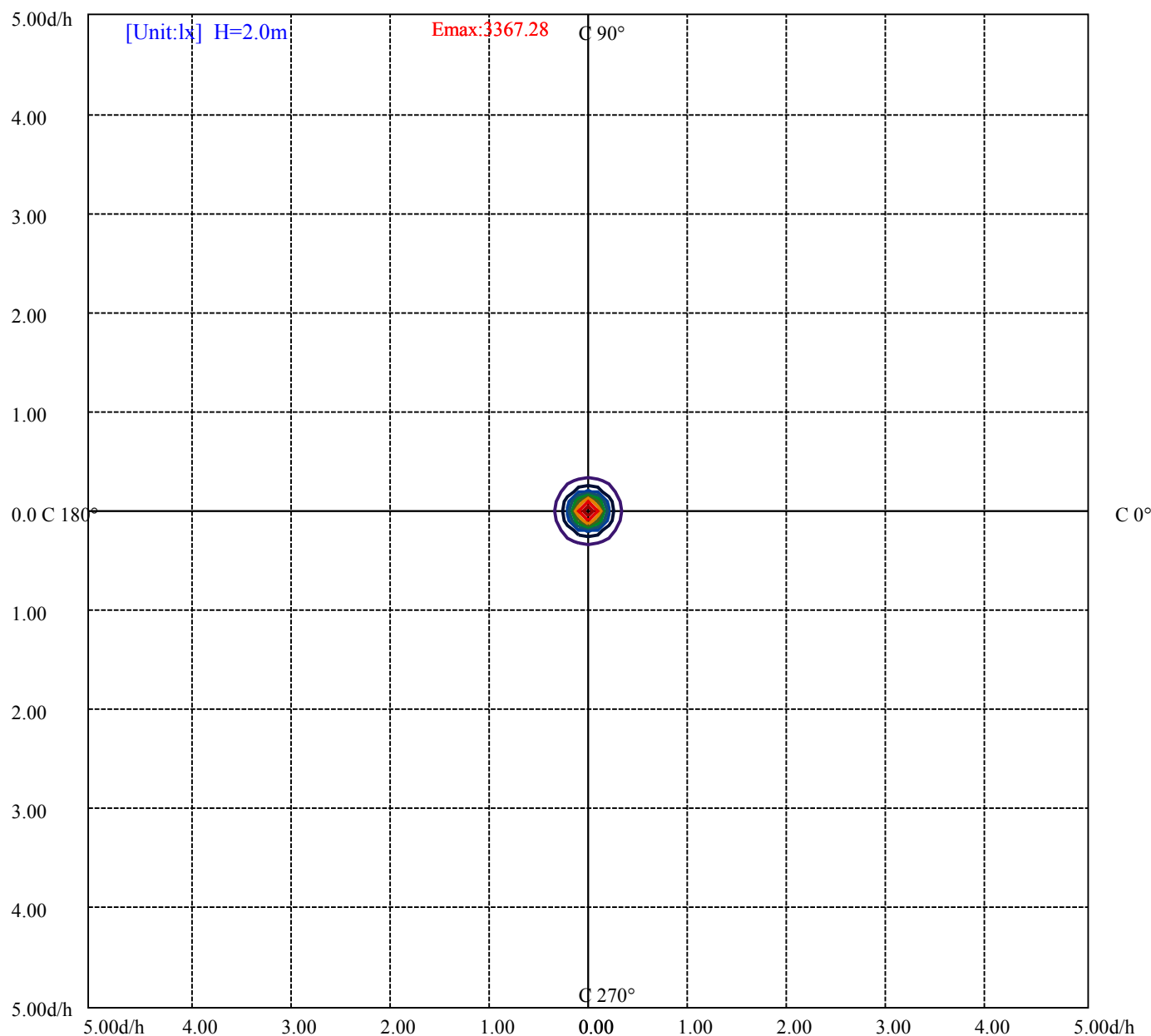
House

[Unit:cd]

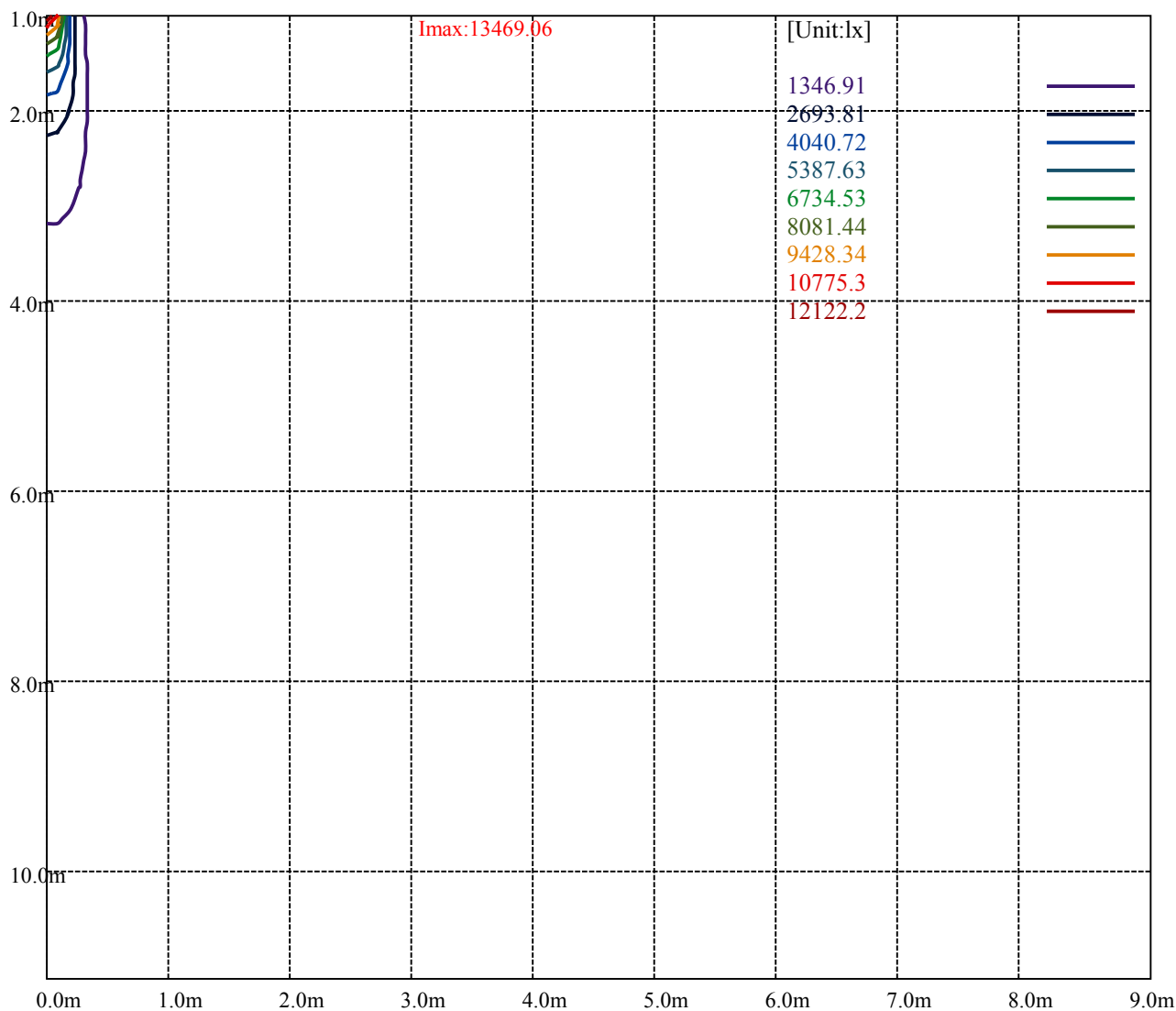
Road

Imax:13469.06

(10%Imax)	1346.91	—
(20%Imax)	2693.81	—
(30%Imax)	4040.72	—
(40%Imax)	5387.63	—
(50%Imax)	6734.53	—
(60%Imax)	8081.44	—
(70%Imax)	9428.34	—
(80%Imax)	10775.3	—
(90%Imax)	12122.2	—



(10%Emax) 336.7275	—
(20%Emax) 673.4525	—
(30%Emax) 1010.18	—
(40%Emax) 1346.907	—
(50%Emax) 1683.632	—
(60%Emax) 2020.36	—
(70%Emax) 2357.085	—
(80%Emax) 2693.825	—
(90%Emax) 3030.55	—



Luminance Table

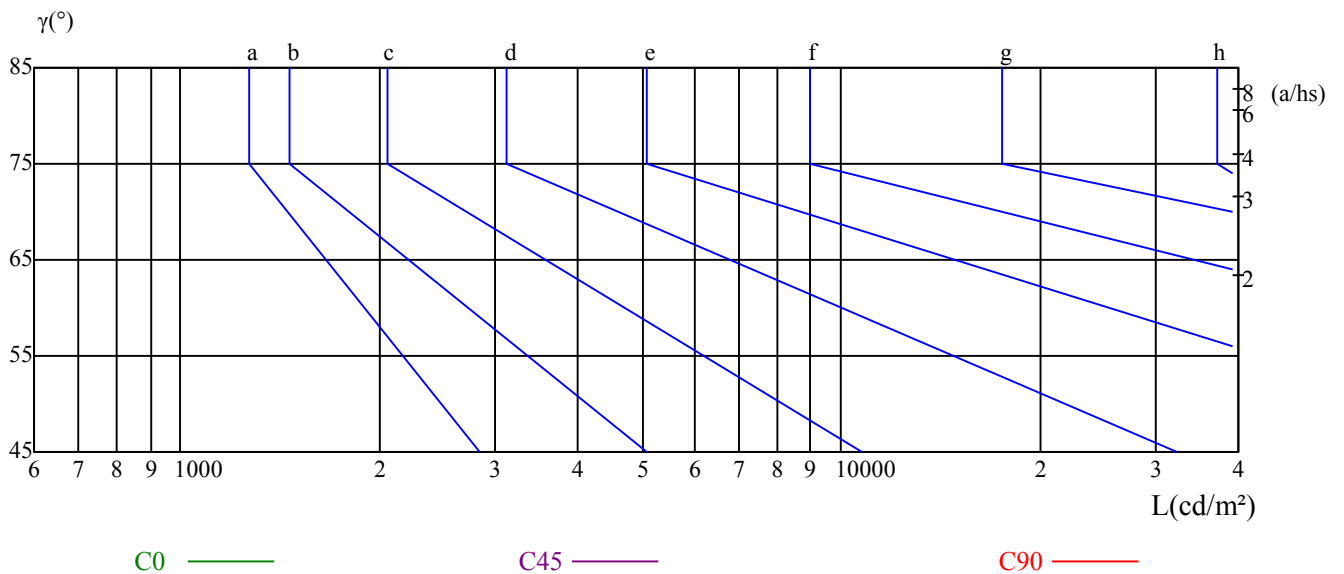
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

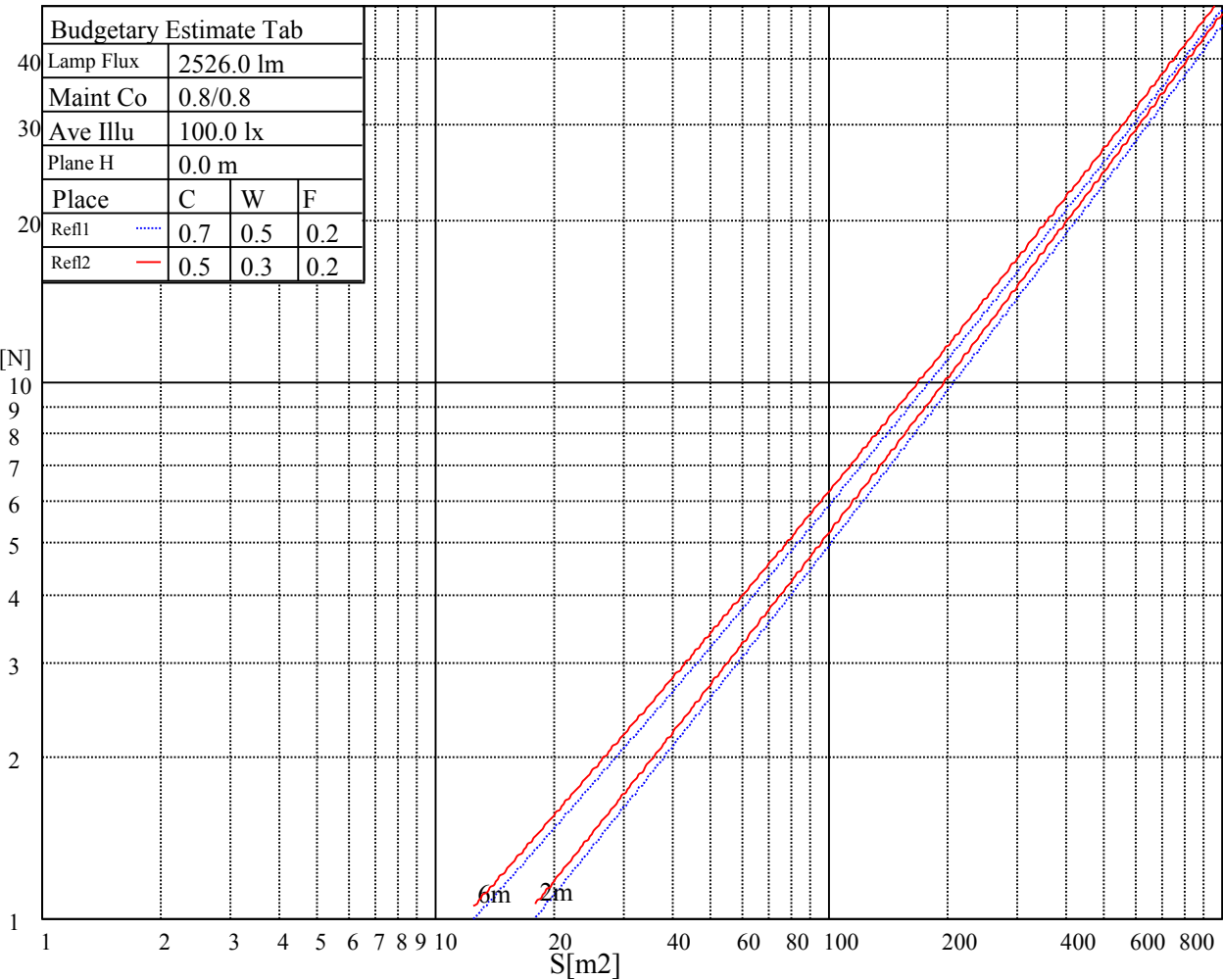
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

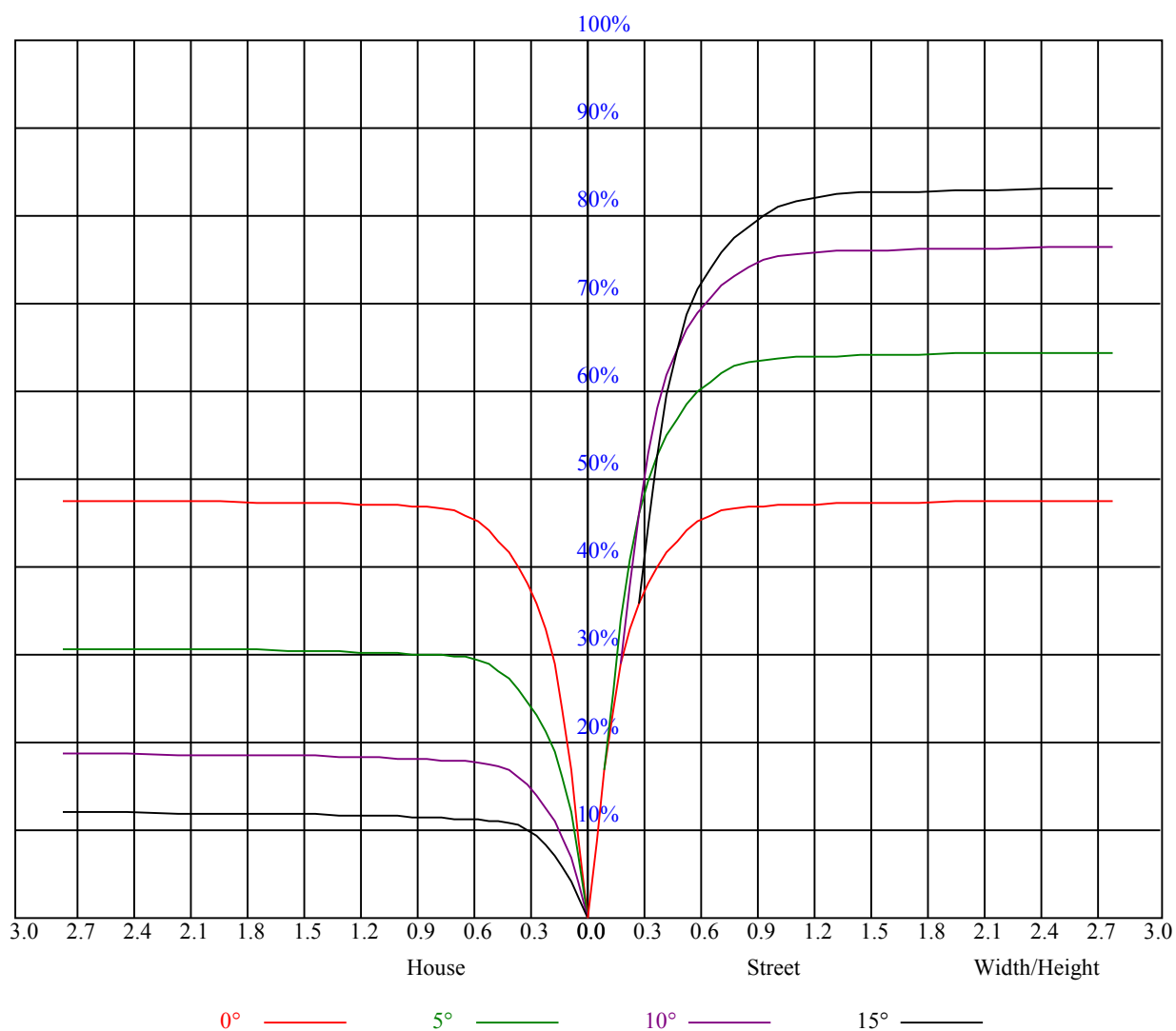
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

Luminance Limiting Curve





RHOC	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 RHOFC=20 CU															
0	1.14	1.14	1.14	1.12	1.12	1.12	1.07	1.07	1.07	1.02	1.02	1.02	0.98	0.98	0.98	0.96
1	1.08	1.06	1.04	1.05	1.04	1.02	1.02	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92
2	1.02	0.99	0.96	1.00	0.97	0.95	0.97	0.95	0.93	0.95	0.93	0.91	0.92	0.90	0.89	0.88
3	0.97	0.93	0.90	0.96	0.92	0.90	0.93	0.91	0.88	0.91	0.89	0.87	0.89	0.87	0.86	0.84
4	0.93	0.89	0.86	0.92	0.88	0.85	0.90	0.87	0.84	0.88	0.85	0.83	0.86	0.84	0.82	0.81
5	0.89	0.85	0.82	0.88	0.84	0.81	0.87	0.83	0.81	0.85	0.82	0.80	0.84	0.81	0.79	0.78
6	0.86	0.81	0.78	0.85	0.81	0.78	0.84	0.80	0.78	0.83	0.79	0.77	0.81	0.79	0.77	0.75
7	0.83	0.78	0.75	0.82	0.78	0.75	0.81	0.77	0.75	0.80	0.77	0.74	0.79	0.76	0.74	0.73
8	0.80	0.76	0.73	0.80	0.75	0.73	0.79	0.75	0.72	0.78	0.74	0.72	0.77	0.74	0.72	0.71
9	0.77	0.73	0.70	0.77	0.73	0.70	0.76	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.70	0.69
10	0.75	0.71	0.68	0.75	0.71	0.68	0.74	0.71	0.68	0.74	0.70	0.68	0.73	0.70	0.68	0.67



Intensity data(cd)

C/ γ (°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
0.0	13438.13	13516.88	13511.25	13460.63	13320.00	12836.25	12093.75	11126.25	10113.75
45.0	13488.75	13460.63	13370.63	13185.00	12903.75	12296.25	11418.75	10428.75	9337.50
90.0	13443.75	13336.88	13128.75	12751.88	12150.00	11139.19	10372.50	8974.13	7790.06
135.0	13500.00	13370.63	13207.50	12757.50	12105.00	11182.50	10046.25	8904.38	7717.50
180.0	13449.38	13320.00	13050.00	12279.38	11175.19	10590.19	9499.50	7975.69	6730.31
225.0	13488.75	13494.38	13314.38	12858.75	12110.63	11122.88	10237.50	8843.63	7646.63
270.0	13443.75	13573.13	13539.38	13286.25	12988.13	12363.75	11396.25	10338.75	9202.50
315.0	13500.00	13612.50	13590.00	13387.50	13038.75	12560.63	11194.88	10532.25	9388.69
360.0	13438.13	13516.88	13511.25	13460.63	13320.00	12836.25	12093.75	11126.25	10113.75
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	8876.25	7560.00	6406.88	5478.75	4235.63	3532.50	3048.75	2655.00	2178.00
45.0	7869.38	6671.25	5535.00	4455.00	3622.50	3054.38	2880.00	2211.19	1957.50
90.0	6615.00	5225.06	4283.44	3568.50	2954.81	2493.00	2168.44	1859.63	1678.50
135.0	6277.50	5180.63	4235.63	3510.00	2863.13	2648.25	2173.50	1861.88	1663.88
180.0	5590.69	4401.00	3671.44	3104.44	2622.94	2244.94	1986.75	1751.63	1582.31
225.0	6488.44	5163.19	4255.88	3518.44	2898.00	2447.44	2145.94	1861.31	1656.00
270.0	7740.00	6564.38	5478.75	4303.13	3526.88	2947.50	2880.00	2138.63	1882.13
315.0	8199.00	6699.94	5574.94	4606.88	3683.81	2988.00	2551.50	2189.81	1932.19
360.0	8876.25	7560.00	6406.88	5478.75	4235.63	3532.50	3048.75	2655.00	2178.00
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1920.38	1688.06	1506.94	1376.44	1260.00	1175.06	1095.75	1029.94	978.75
45.0	1753.88	1543.50	1389.38	1269.56	1177.31	1104.75	1032.19	984.38	943.88
90.0	1475.44	1337.63	1222.31	1114.54	1045.97	991.80	939.21	885.71	850.05
135.0	1514.25	1355.06	1239.19	1156.50	1091.25	1037.81	984.94	942.75	909.00
180.0	1431.56	1307.25	1211.63	1121.79	1050.81	996.75	952.54	907.14	874.74
225.0	1469.25	1323.00	1213.88	1119.09	1036.74	994.11	951.53	904.78	882.62
270.0	1677.94	1486.69	1321.88	1205.44	1096.88	1024.31	953.44	901.69	863.44
315.0	1697.63	1514.81	1373.06	1243.13	1119.60	1066.95	1008.62	942.81	911.08
360.0	1920.38	1688.06	1506.94	1376.44	1260.00	1175.06	1095.75	1029.94	978.75
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	931.50	892.13	862.31	837.00	783.00	721.13	655.88	569.81	498.38
45.0	902.25	870.75	843.19	807.75	743.63	675.56	601.88	520.88	438.19
90.0	816.92	784.46	748.86	702.06	643.28	563.51	482.57	415.13	329.51
135.0	878.06	843.19	805.50	749.81	660.38	590.06	521.44	416.81	343.69
180.0	847.24	800.61	740.31	673.59	584.16	513.11	436.78	348.47	286.99
225.0	859.73	829.01	780.30	715.89	652.22	566.33	496.18	407.08	335.31
270.0	828.00	799.88	772.31	736.31	678.94	607.50	555.19	450.00	380.81
315.0	878.74	846.45	815.96	778.89	719.16	643.05	574.65	491.68	411.41
360.0	931.50	892.13	862.31	837.00	783.00	721.13	655.88	569.81	498.38
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	418.50	337.50	290.81	191.98	122.85	75.88	45.51	36.11	33.53
45.0	357.75	289.13	242.94	159.69	88.65	51.53	34.65	30.09	28.46
90.0	260.21	191.25	130.50	83.98	61.93	45.00	43.43	42.64	40.28
135.0	290.81	198.34	127.29	82.74	52.99	42.02	39.94	38.19	36.56
180.0	218.31	141.19	98.66	54.28	36.34	34.59	32.01	29.19	28.35
225.0	255.60	190.18	120.94	67.73	41.46	35.49	32.85	30.60	28.91
270.0	316.13	284.06	155.70	97.31	63.73	43.99	38.08	36.06	34.43
315.0	328.22	245.93	178.14	110.81	61.82	39.88	31.84	28.91	26.38
360.0	418.50	337.50	290.81	191.98	122.85	75.88	45.51	36.11	33.53

Intensity data(cd)

C/ γ (°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	31.11	29.70	28.58	27.51	26.33	25.37	24.64	24.02	23.23
45.0	26.78	25.26	24.24	23.40	22.50	21.88	21.54	21.04	20.64
90.0	37.80	35.49	34.76	34.43	33.86	32.91	31.50	30.88	30.21
135.0	31.11	29.08	28.07	27.28	26.61	25.59	24.81	24.19	23.40
180.0	27.51	26.78	25.76	25.20	24.64	24.30	23.79	23.18	22.67
225.0	28.18	27.45	26.33	25.26	24.58	23.63	22.84	22.22	21.66
270.0	34.54	33.92	33.02	31.78	31.05	30.32	29.81	29.19	27.79
315.0	24.92	24.08	22.67	22.11	21.60	20.93	20.25	19.97	19.69
360.0	31.11	29.70	28.58	27.51	26.33	25.37	24.64	24.02	23.23
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	22.67	21.94	21.26	20.70	20.08	19.63	19.13	18.68	18.28
45.0	20.31	19.74	19.29	18.96	18.68	18.39	18.11	17.72	17.49
90.0	29.70	28.58	28.52	28.80	28.58	27.17	26.38	24.98	23.46
135.0	22.56	21.77	20.87	20.19	19.86	19.07	18.56	18.06	17.44
180.0	22.11	21.54	21.15	20.76	20.36	20.08	19.52	18.90	18.34
225.0	20.93	20.53	20.03	19.63	19.18	18.39	17.94	17.49	17.10
270.0	27.39	27.06	26.44	26.66	26.38	26.72	26.04	25.88	24.64
315.0	19.35	19.18	18.84	18.68	18.45	18.11	17.78	17.49	17.21
360.0	22.67	21.94	21.26	20.70	20.08	19.63	19.13	18.68	18.28
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	17.94	17.44	17.10	16.71	16.26	15.86	15.47	15.13	14.57
45.0	17.21	16.65	16.31	15.98	15.41	14.68	14.40	14.12	13.67
90.0	22.11	21.04	19.58	18.06	16.82	15.98	15.19	14.57	14.18
135.0	16.88	16.31	15.92	15.58	15.02	14.63	14.29	13.89	13.33
180.0	17.89	17.44	16.76	16.26	15.86	15.41	14.85	14.34	13.89
225.0	16.59	16.20	15.64	15.30	15.02	14.74	14.23	13.78	13.39
270.0	23.06	22.16	21.09	19.86	17.72	16.65	15.98	15.08	14.12
315.0	16.76	15.81	14.40	13.78	13.33	12.71	12.54	12.38	12.09
360.0	17.94	17.44	17.10	16.71	16.26	15.86	15.47	15.13	14.57
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	14.06	13.67	13.16	12.71	12.38	12.15	12.09	11.98	11.87
45.0	13.39	13.11	12.77	12.49	12.26	12.15	11.98	11.87	11.81
90.0	13.61	13.39	12.99	12.54	12.38	12.21	12.09	11.98	11.81
135.0	12.94	12.54	12.26	12.04	11.87	11.76	11.70	11.59	11.53
180.0	13.22	12.83	12.32	12.15	12.15	12.43	12.54	12.99	13.56
225.0	12.94	12.60	12.32	12.09	11.98	11.87	11.81	11.87	11.87
270.0	13.61	13.28	13.05	12.71	12.54	12.49	12.43	12.26	12.09
315.0	11.98	11.87	11.81	11.70	11.64	11.59	11.53	11.53	11.42
360.0	14.06	13.67	13.16	12.71	12.38	12.15	12.09	11.98	11.87
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	11.70	11.64	11.53	11.53	11.42	11.31	11.19	11.03	10.91
45.0	11.70	11.59	11.48	11.42	11.31	11.25	11.08	10.97	10.69
90.0	11.64	11.48	11.31	11.14	11.03	10.86	10.69	10.52	10.35
135.0	11.42	11.36	11.36	11.31	11.25	11.31	10.91	10.80	10.52
180.0	14.06	13.67	11.70	11.70	11.81	11.76	10.86	10.80	10.52
225.0	12.04	12.04	11.59	11.53	11.53	11.48	11.08	10.91	10.74
270.0	11.93	11.81	11.64	11.59	11.42	11.36	11.08	10.80	10.69
315.0	11.31	11.19	11.14	11.14	11.08	11.03	10.91	10.74	10.63
360.0	11.70	11.64	11.53	11.53	11.42	11.31	11.19	11.03	10.91

Intensity data(cd)

Appendix Page: 18 Total:18

C/ γ (°)	90.0
0.0	10.69
45.0	10.46
90.0	10.24
135.0	10.41
180.0	10.35
225.0	10.58
270.0	10.46
315.0	10.41
360.0	10.69