



NATA LIGHTING CO.,LTD

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Nata

LumCAT: 2-1121-A4

Luminaire: TE2133401-1+92.76.365.00

Report No: NT2017071204

Voltage(V): 35.2500

Test No: NT2017071204

Current(A): 0.5000

LampCAT: CXA1830

Power (W): 17.6250

Lamp flux(lm): 1976.0

PF: 0.0000

Number of Lamps: 1

Ballast type: DC

Length(mm): 70

Width(mm): 70

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1805.43

Efficiency(%): 91.37%

Lumens(lm)/Power(W): 102.44

Central intensity(cd): 5522.865

Maximum intensity(cd): 5522.865

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=27.6

[C90/270]Total=27.6

Field angle(10%Imax): [C0/180]Total=67.7

[C90/270]Total=67.7

Maximum s/h(1/2): C0_180=0.47 C90_270=0.47

Maximum s/h(1/4): C0_180=0.43 C90_270=0.43

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 91.37%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 98.708%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5522.865	0.000	0	.000%	.000%
1.0	5508.882	5.278	5.278	.267%	.292%
2.0	5474.448	15.764	21.043	.798%	1.166%
3.0	5422.901	26.063	47.106	1.319%	2.609%
4.0	5372.745	36.136	83.242	1.829%	4.611%
5.0	5308.189	45.949	129.191	2.325%	7.156%
6.0	5202.381	55.236	184.427	2.795%	10.215%
7.0	5066.661	63.740	248.167	3.226%	13.746%
8.0	4880.645	71.191	319.358	3.603%	17.689%
9.0	4637.378	77.138	396.496	3.904%	21.961%
10.0	4324.964	81.106	477.602	4.105%	26.454%
11.0	3984.376	83.027	560.629	4.202%	31.052%
12.0	3597.598	82.882	643.511	4.194%	35.643%
13.0	3121.846	79.743	723.254	4.036%	40.060%
14.0	2684.494	74.321	797.575	3.761%	44.177%
15.0	2271.072	68.032	865.607	3.443%	47.945%
16.0	1881.233	60.843	926.45	3.079%	51.315%
17.0	1546.280	53.376	979.825	2.701%	54.271%
18.0	1284.870	46.680	1026.505	2.362%	56.857%
19.0	1124.114	41.911	1068.416	2.121%	59.178%
20.0	1011.252	39.083	1107.499	1.978%	61.343%
21.0	926.898	37.216	1144.716	1.883%	63.404%
22.0	876.130	36.233	1180.948	1.834%	65.411%
23.0	842.656	36.065	1217.013	1.825%	67.409%
24.0	816.889	36.284	1253.297	1.836%	69.418%
25.0	796.806	36.692	1289.989	1.857%	71.451%
26.0	779.234	37.203	1327.191	1.883%	73.511%
27.0	760.625	37.673	1364.864	1.907%	75.598%
28.0	736.417	37.902	1402.766	1.918%	77.697%
29.0	713.836	37.943	1440.709	1.920%	79.799%
30.0	692.125	37.961	1478.67	1.921%	81.901%
31.0	667.270	37.830	1516.5	1.914%	83.997%
32.0	641.218	37.487	1553.986	1.897%	86.073%
33.0	600.620	36.585	1590.571	1.851%	88.100%
34.0	543.897	34.636	1625.208	1.753%	90.018%
35.0	473.957	31.611	1656.818	1.600%	91.769%
36.0	405.352	27.997	1684.816	1.417%	93.320%
37.0	331.419	24.029	1708.845	1.216%	94.651%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	268.157	20.013	1728.858	1.013%	95.759%
39.0	190.509	15.656	1744.514	.792%	96.626%
40.0	127.067	11.076	1755.59	.561%	97.240%
41.0	75.171	7.202	1762.791	.364%	97.639%
42.0	36.494	4.057	1766.848	.205%	97.863%
43.0	17.878	2.014	1768.862	.102%	97.975%
44.0	13.600	1.188	1770.05	.060%	98.041%
45.0	11.464	0.963	1771.014	.049%	98.094%
46.0	10.122	0.844	1771.858	.043%	98.141%
47.0	9.530	0.782	1772.639	.040%	98.184%
48.0	9.176	0.756	1773.396	.038%	98.226%
49.0	8.821	0.739	1774.135	.037%	98.267%
50.0	8.598	0.726	1774.861	.037%	98.307%
51.0	8.459	0.722	1775.583	.037%	98.347%
52.0	8.341	0.721	1776.303	.036%	98.387%
53.0	8.223	0.721	1777.024	.036%	98.427%
54.0	8.139	0.721	1777.745	.036%	98.467%
55.0	8.021	0.721	1778.466	.037%	98.507%
56.0	7.958	0.722	1779.188	.037%	98.547%
57.0	7.889	0.725	1779.913	.037%	98.587%
58.0	7.819	0.726	1780.639	.037%	98.627%
59.0	7.791	0.730	1781.369	.037%	98.668%
60.0	7.715	0.733	1782.102	.037%	98.708%
61.0	7.680	0.735	1782.836	.037%	98.749%
62.0	7.631	0.738	1783.574	.037%	98.790%
63.0	7.610	0.741	1784.315	.038%	98.831%
64.0	7.576	0.745	1785.061	.038%	98.872%
65.0	7.548	0.748	1785.809	.038%	98.913%
66.0	7.513	0.751	1786.56	.038%	98.955%
67.0	7.485	0.754	1787.315	.038%	98.997%
68.0	7.457	0.757	1788.072	.038%	99.039%
69.0	7.423	0.759	1788.831	.038%	99.081%
70.0	7.436	0.763	1789.594	.039%	99.123%
71.0	7.617	0.778	1790.372	.039%	99.166%
72.0	7.569	0.790	1791.161	.040%	99.210%
73.0	7.534	0.790	1791.951	.040%	99.254%
74.0	7.527	0.792	1792.743	.040%	99.298%
75.0	7.548	0.796	1793.54	.040%	99.342%

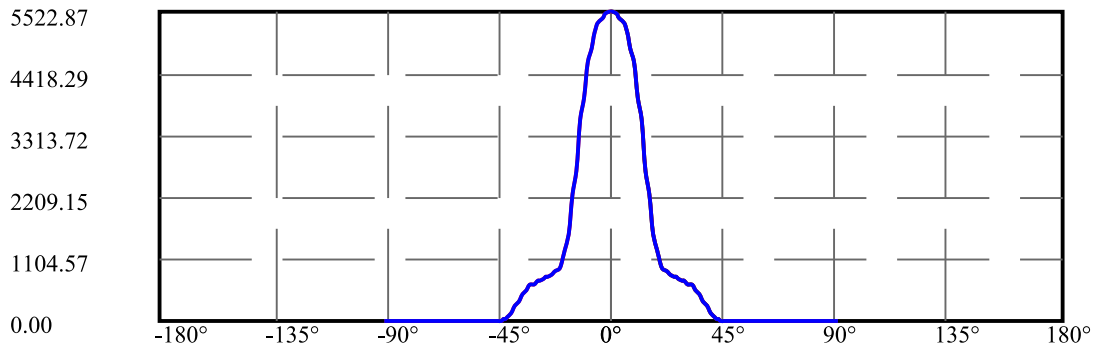
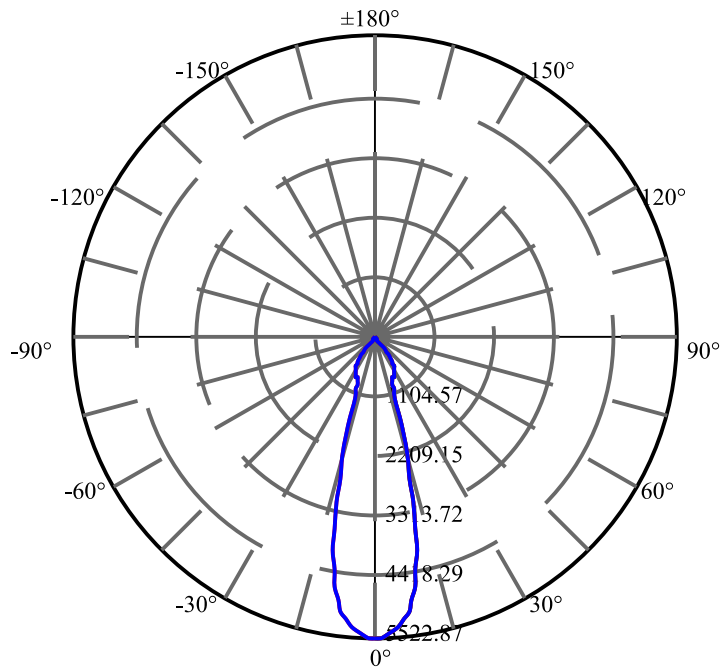
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	7.589	0.804	1794.343	.041%	99.386%
77.0	7.485	0.804	1795.147	.041%	99.431%
78.0	7.263	0.789	1795.936	.040%	99.474%
79.0	7.283	0.782	1796.718	.040%	99.518%
80.0	7.283	0.785	1797.503	.040%	99.561%
81.0	7.283	0.788	1798.291	.040%	99.605%
82.0	7.249	0.788	1799.079	.040%	99.648%
83.0	7.256	0.788	1799.867	.040%	99.692%
84.0	7.283	0.792	1800.659	.040%	99.736%
85.0	7.332	0.798	1801.457	.040%	99.780%
86.0	7.283	0.799	1802.256	.040%	99.824%
87.0	7.263	0.796	1803.052	.040%	99.869%
88.0	7.228	0.794	1803.846	.040%	99.912%
89.0	7.200	0.791	1804.637	.040%	99.956%
90.0	7.193	0.789	1805.426	.040%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1478.67	74.83%	81.90%
0-40	1755.59	88.85%	97.24%
0-60	1782.10	90.19%	98.71%
0-90	1804.64	91.33%	99.96%
0-120	1804.64	91.33%	99.96%
0-180	1805.43	91.37%	100.00%
60-90	23.27	1.18%	1.29%
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%
0-29.10	1444.34	73.09%	80.00%

ZONAL LUMEN SUMMARY

0-10	477.60
10-20	629.90
20-30	371.17
30-40	276.92
40-50	19.27
50-60	7.24
60-70	7.49
70-80	7.91
80-90	7.13
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



C0(Max):

C0/C180:

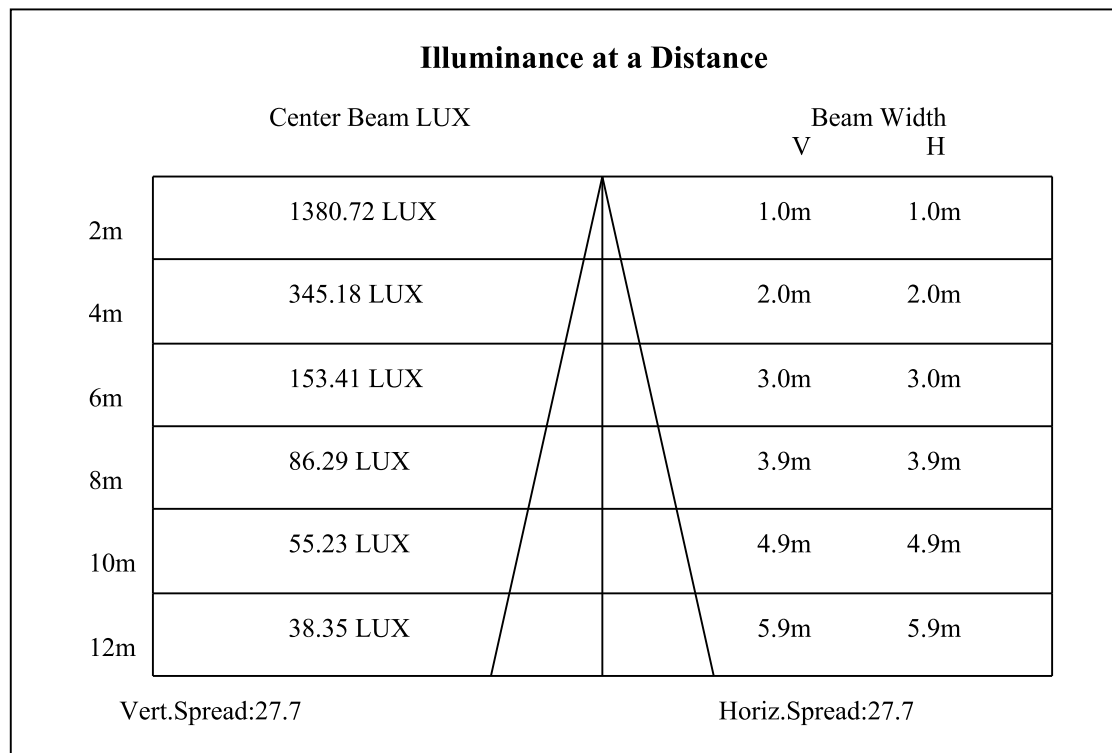
C90/C270:

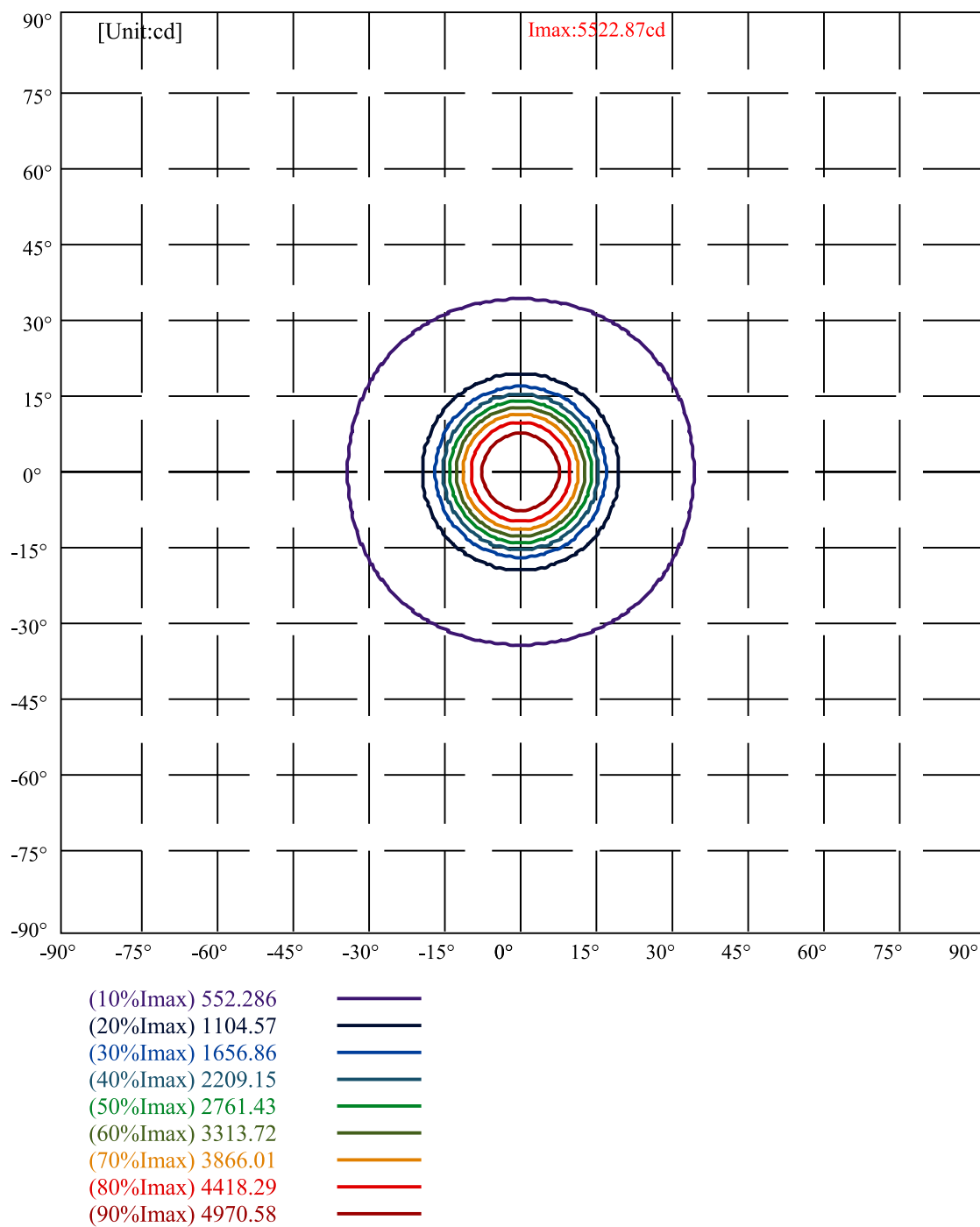
Field angle(10%Imax):C0/180Left:33.9 Right:33.9

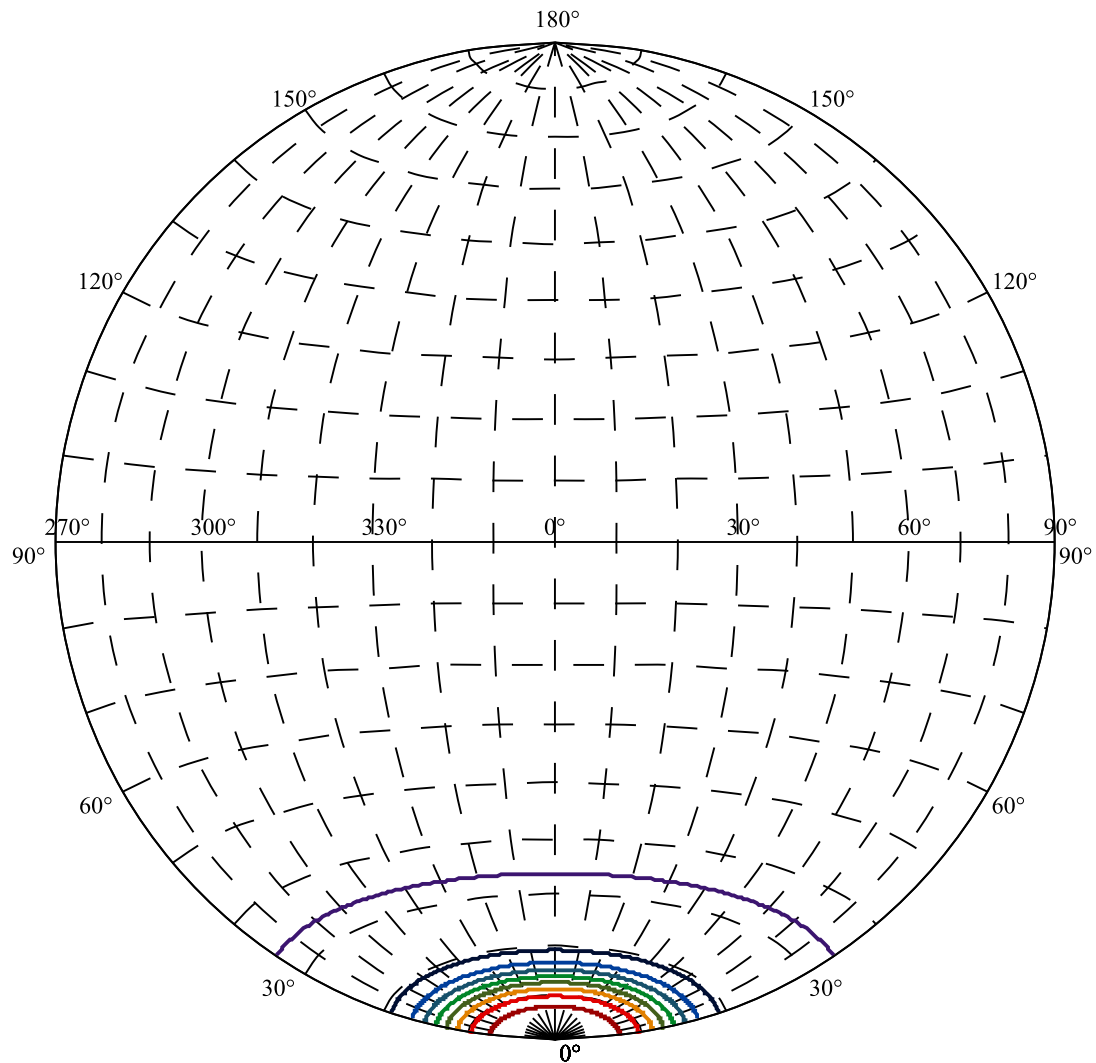
:C90/270Left:33.9 Right:33.9

Beam Angle(50%Imax):C0/180Left:13.8 Right:13.8

:C90/270Left:13.8 Right:13.8







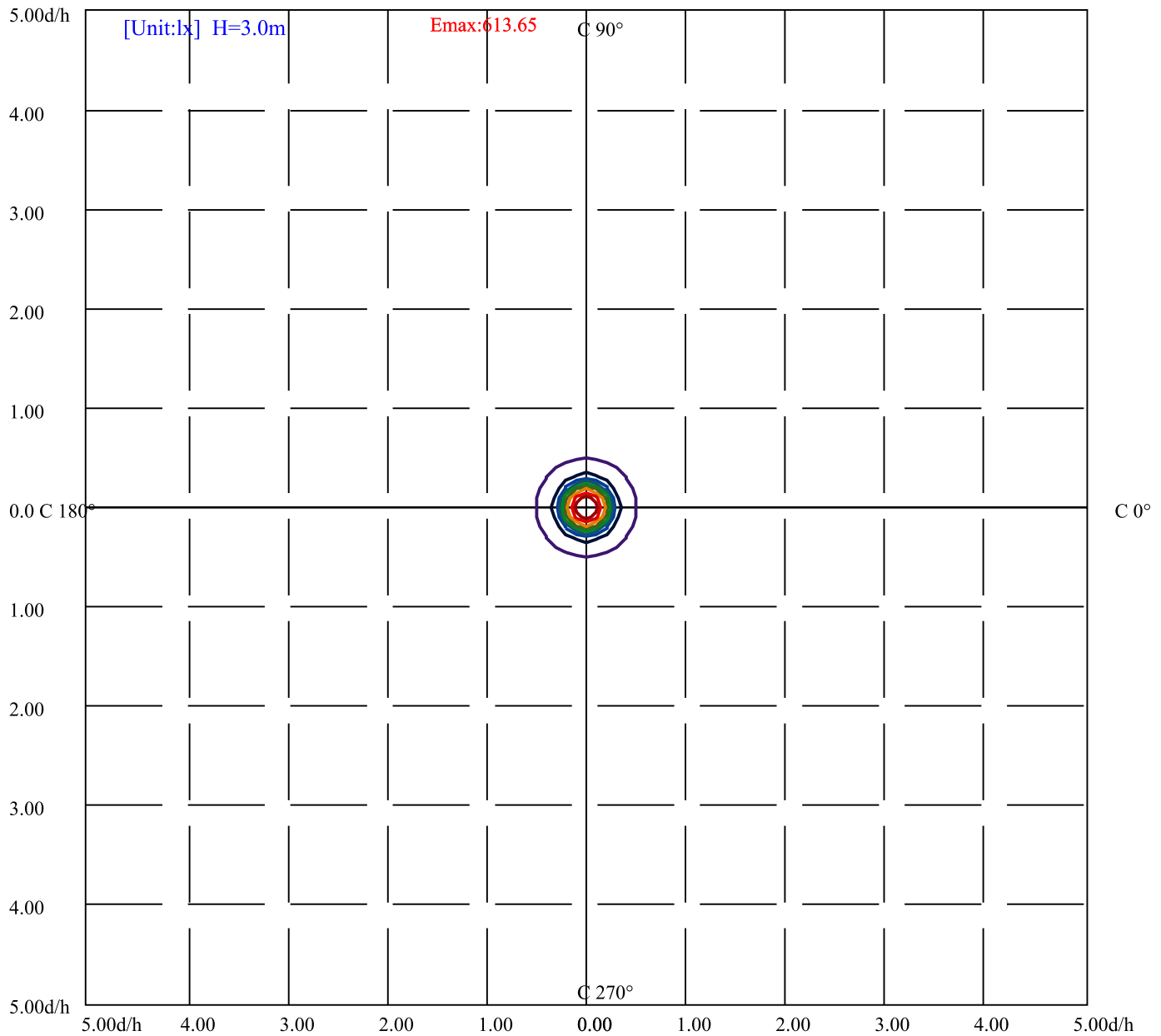
House

[Unit:cd]

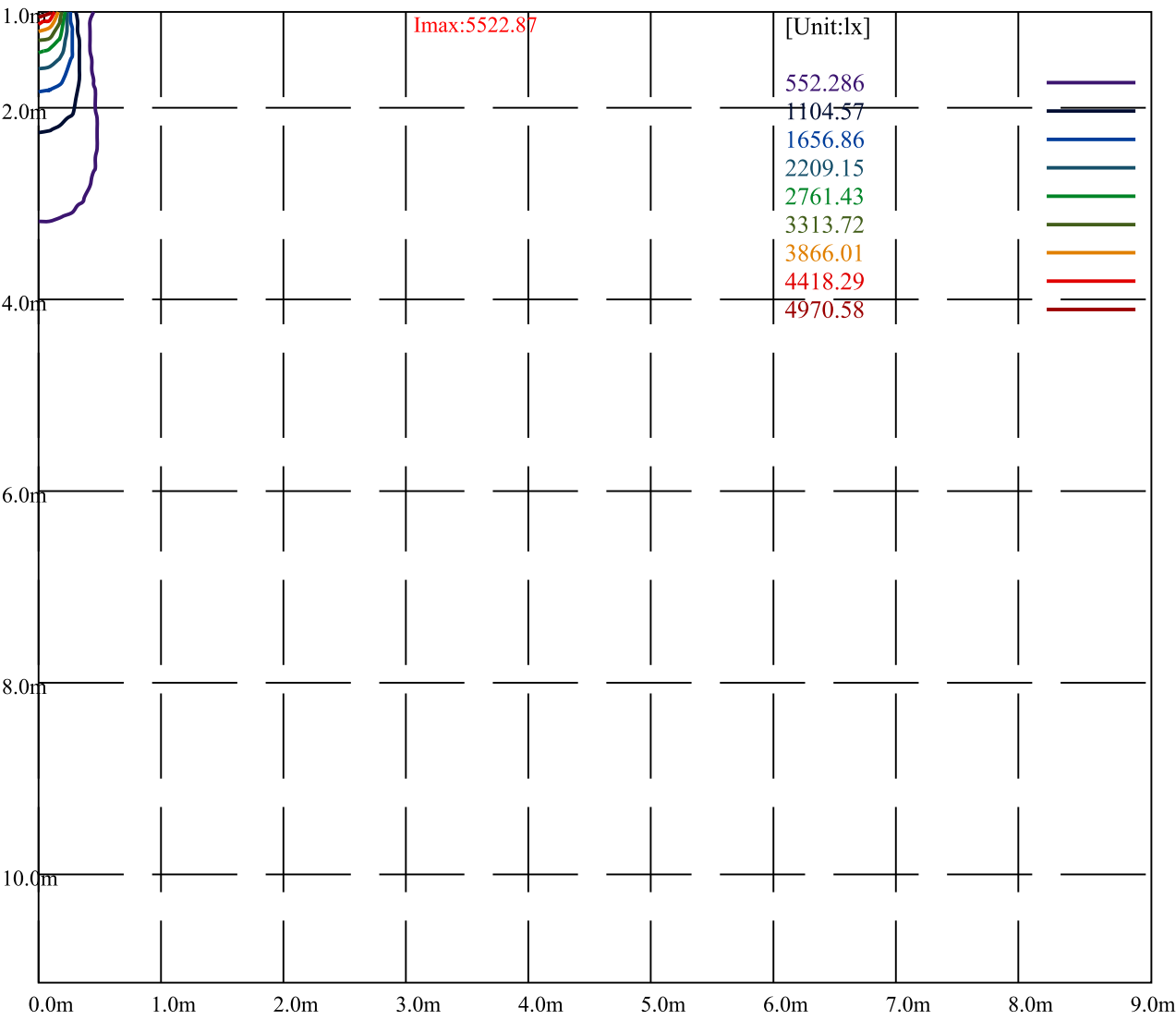
Road

Imax:5522.87

(10%Imax)	552.286	—
(20%Imax)	1104.57	—
(30%Imax)	1656.86	—
(40%Imax)	2209.15	—
(50%Imax)	2761.43	—
(60%Imax)	3313.72	—
(70%Imax)	3866.01	—
(80%Imax)	4418.29	—
(90%Imax)	4970.58	—



(10%Emax) 61.36511	—
(20%Emax) 122.73	—
(30%Emax) 184.0956	—
(40%Emax) 245.4611	—
(50%Emax) 306.8256	—
(60%Emax) 368.1911	—
(70%Emax) 429.5555	—
(80%Emax) 490.9211	—
(90%Emax) 552.2867	—



Luminance Table

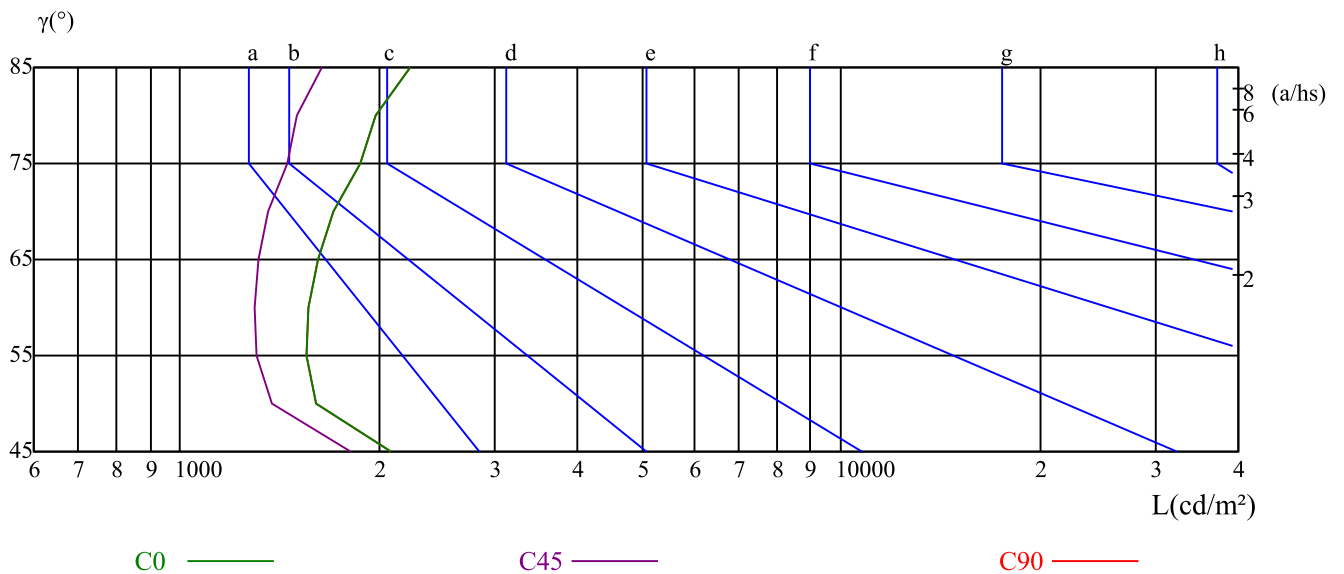
γ	45	50	55	60	65	70	75	80	85
C0	2087	1608	1554	1563	1616	1701	1868	1981	2231
C45	1810	1374	1307	1293	1313	1355	1455	1502	1640
C90	2087	1608	1554	1563	1616	1701	1868	1981	2231

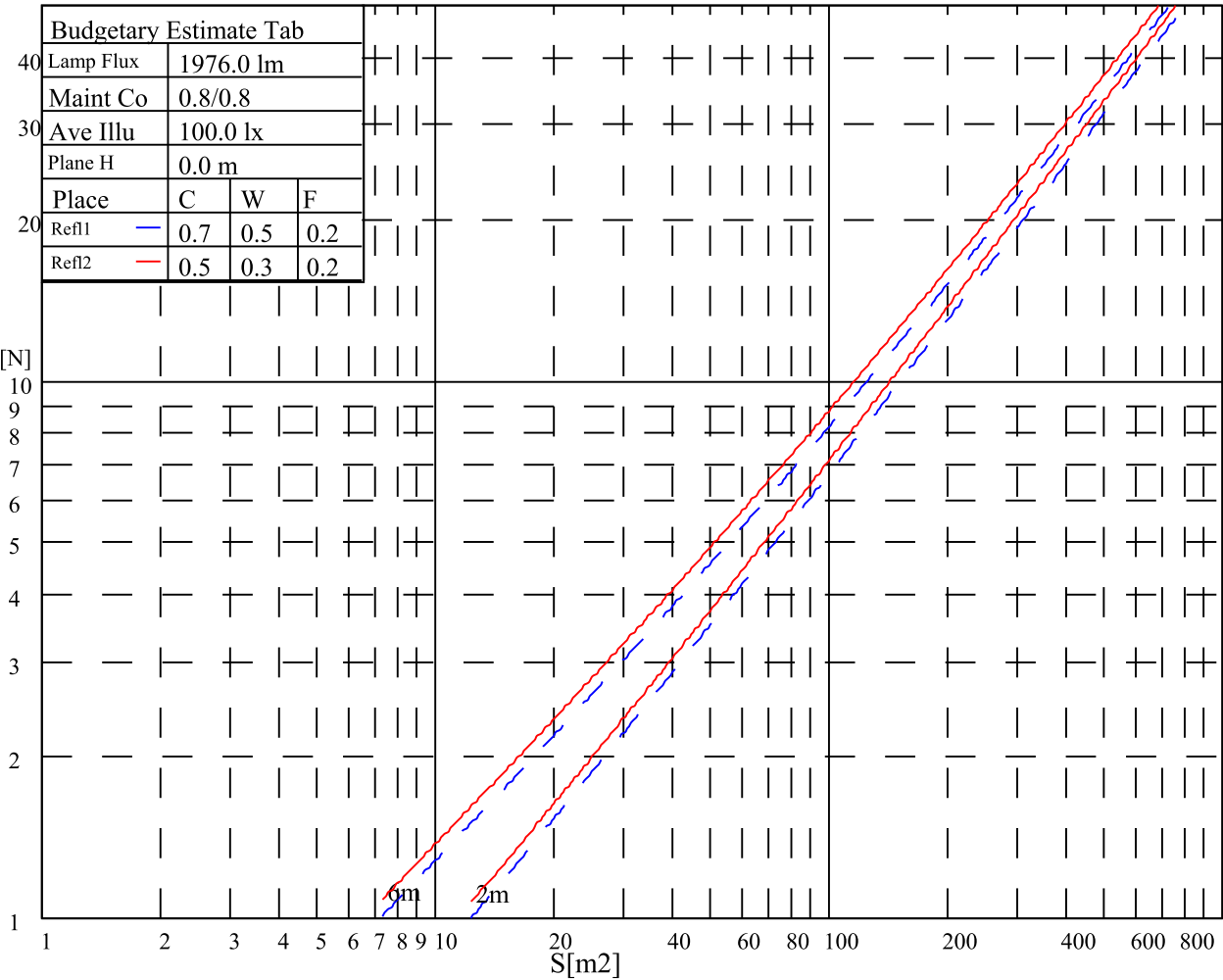
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3645	3645	3645	5951	5951	5951	17169	17169	17169

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 RHOC=20 CU															
0	1.09	1.09	1.09	1.06	1.06	1.06	1.02	1.02	1.02	0.97	0.97	0.97	0.93	0.93	0.93	0.91
1	1.02	1.00	0.98	1.00	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87
2	0.96	0.93	0.90	0.95	0.92	0.89	0.92	0.89	0.87	0.89	0.87	0.86	0.87	0.85	0.84	0.82
3	0.91	0.87	0.84	0.90	0.86	0.83	0.88	0.85	0.82	0.85	0.83	0.81	0.83	0.81	0.80	0.78
4	0.87	0.82	0.79	0.86	0.82	0.79	0.84	0.80	0.78	0.82	0.79	0.77	0.80	0.78	0.76	0.75
5	0.82	0.78	0.75	0.82	0.77	0.74	0.80	0.76	0.74	0.79	0.76	0.73	0.77	0.75	0.73	0.71
6	0.79	0.74	0.71	0.78	0.74	0.71	0.77	0.73	0.70	0.76	0.72	0.70	0.74	0.72	0.69	0.68
7	0.75	0.71	0.68	0.75	0.71	0.67	0.74	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.66	0.65
8	0.72	0.68	0.65	0.72	0.68	0.65	0.71	0.67	0.64	0.70	0.67	0.64	0.69	0.66	0.64	0.63
9	0.70	0.65	0.62	0.69	0.65	0.62	0.68	0.64	0.62	0.68	0.64	0.62	0.67	0.64	0.61	0.60
10	0.67	0.63	0.60	0.67	0.62	0.60	0.66	0.62	0.59	0.65	0.62	0.59	0.65	0.61	0.59	0.58

Intensity data(cd)									Appendix Page: 15 Total:17
C/ γ (°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
0.0	5521.20	5523.98	5499.49	5470.00	5436.60	5386.52	5300.26	5198.97	5014.21
45.0	5512.29	5515.07	5488.36	5449.96	5417.13	5366.48	5257.41	5124.40	4946.31
90.0	5528.99	5508.95	5477.23	5429.37	5379.28	5325.86	5241.27	5082.10	4894.00
135.0	5528.99	5521.20	5500.60	5438.83	5380.95	5323.08	5229.58	5123.29	4969.13
180.0	5521.20	5496.71	5448.29	5381.51	5320.29	5238.49	5113.27	4966.35	4729.27
225.0	5512.29	5491.14	5447.74	5384.29	5319.74	5242.94	5107.70	4968.02	4788.82
270.0	5528.99	5509.51	5462.76	5411.56	5357.02	5288.02	5182.83	5048.71	4874.52
315.0	5528.99	5504.50	5471.11	5417.68	5370.94	5294.14	5186.73	5021.44	4828.89
360.0	5521.20	5523.98	5499.49	5470.00	5436.60	5386.52	5300.26	5198.97	5014.21
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4781.59	4548.96	4139.37	3752.59	3330.75	2788.15	2355.18	1960.05	1558.24
45.0	4683.64	4345.28	3976.31	3562.82	3016.32	2575.56	2165.96	1759.15	1439.71
90.0	4658.60	4286.29	3945.14	3561.70	3098.68	2628.98	2224.95	1820.92	1527.08
135.0	4722.04	4471.61	4175.54	3782.64	3356.35	2958.44	2514.34	2135.91	1765.83
180.0	4483.85	4159.96	3839.40	3431.48	2996.84	2563.31	2194.34	1855.42	1510.38
225.0	4574.56	4220.62	3902.85	3547.23	3058.06	2664.04	2277.26	1880.47	1550.45
270.0	4599.60	4345.28	4030.29	3674.68	3181.05	2775.35	2316.22	1903.84	1595.53
315.0	4595.15	4221.73	3866.12	3467.65	2936.73	2522.13	2120.33	1734.10	1423.01
360.0	4781.59	4548.96	4139.37	3752.59	3330.75	2788.15	2355.18	1960.05	1558.24
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1320.61	1143.08	1012.86	929.94	884.86	852.03	828.10	811.40	793.04
45.0	1223.22	1060.16	956.65	900.44	862.60	835.33	815.85	798.60	779.12
90.0	1209.87	1091.49	985.92	910.74	862.82	837.50	816.85	793.42	777.51
135.0	1463.08	1261.07	1098.01	983.36	914.36	865.94	826.43	803.05	784.13
180.0	1297.24	1104.96	1018.59	922.15	870.50	835.61	804.72	783.24	767.16
225.0	1325.62	1107.97	1025.38	936.95	878.68	847.07	818.52	799.60	782.46
270.0	1330.63	1160.89	1025.66	934.95	882.63	843.68	818.08	798.60	780.79
315.0	1108.69	1063.28	966.95	896.66	852.58	824.09	806.56	786.52	769.66
360.0	1320.61	1143.08	1012.86	929.94	884.86	852.03	828.10	811.40	793.04
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	775.23	754.08	726.81	707.33	681.73	656.13	621.07	572.10	498.08
45.0	764.65	734.04	713.45	693.42	663.92	639.44	603.26	545.39	470.26
90.0	759.48	734.16	710.17	688.24	662.42	635.26	591.63	532.14	468.31
135.0	761.31	740.17	717.91	691.75	668.93	648.34	610.50	559.30	495.30
180.0	748.18	720.97	700.49	675.89	654.18	624.24	571.71	515.72	444.77
225.0	764.10	742.11	719.13	698.15	672.10	649.01	611.44	553.57	484.67
270.0	759.64	740.72	717.91	696.76	671.16	649.45	614.39	551.51	489.73
315.0	752.41	725.08	704.83	685.46	663.70	627.86	580.95	521.46	440.54
360.0	775.23	754.08	726.81	707.33	681.73	656.13	621.07	572.10	498.08
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	430.74	363.96	287.72	209.64	149.31	90.04	44.13	21.20	14.19
45.0	416.27	329.46	283.82	192.00	124.49	72.57	34.17	17.03	13.08
90.0	393.29	317.10	252.16	188.77	114.48	64.89	31.50	15.92	12.74
135.0	417.94	350.61	283.82	199.73	139.96	86.98	41.46	19.48	14.75
180.0	372.03	305.86	243.20	166.90	112.14	64.83	29.05	15.81	12.91
225.0	418.00	334.52	277.92	205.58	139.07	87.32	46.52	19.70	14.69
270.0	423.51	346.71	286.61	201.46	133.06	81.64	39.35	18.75	14.25
315.0	371.03	303.13	230.01	160.00	104.01	53.09	25.77	15.14	12.19
360.0	430.74	363.96	287.72	209.64	149.31	90.04	44.13	21.20	14.19

Intensity data(cd)

Appendix Page: 16 Total:17

C/γ(°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	11.74	10.24	9.57	9.24	8.85	8.63	8.46	8.35	8.18
45.0	11.13	9.85	9.46	9.07	8.74	8.57	8.46	8.35	8.18
90.0	11.02	9.91	9.29	8.90	8.63	8.46	8.35	8.24	8.18
135.0	11.97	10.35	9.63	9.29	8.96	8.68	8.51	8.35	8.29
180.0	10.85	9.68	9.18	8.90	8.68	8.51	8.40	8.29	8.18
225.0	12.30	10.52	9.79	9.41	8.85	8.63	8.51	8.40	8.29
270.0	11.97	10.52	9.91	9.52	9.07	8.79	8.57	8.46	8.24
315.0	10.74	9.91	9.41	9.07	8.79	8.51	8.40	8.29	8.24
360.0	11.74	10.24	9.57	9.24	8.85	8.63	8.46	8.35	8.18

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	8.13	8.01	7.96	7.90	7.85	7.79	7.68	7.62	7.57
45.0	8.13	8.01	7.96	7.85	7.79	7.74	7.74	7.74	7.68
90.0	8.07	7.96	7.85	7.85	7.79	7.79	7.74	7.68	7.62
135.0	8.18	8.13	8.07	7.96	7.85	7.79	7.74	7.74	7.68
180.0	8.07	7.96	7.90	7.85	7.79	7.79	7.68	7.62	7.57
225.0	8.24	8.01	8.01	7.90	7.85	7.79	7.74	7.74	7.68
270.0	8.18	8.07	8.01	7.96	7.90	7.85	7.74	7.68	7.68
315.0	8.13	8.01	7.90	7.85	7.74	7.79	7.68	7.62	7.57
360.0	8.13	8.01	7.96	7.90	7.85	7.79	7.68	7.62	7.57

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	7.51	7.57	7.51	7.51	7.46	7.40	7.35	7.35	7.85
45.0	7.62	7.57	7.57	7.57	7.51	7.51	7.46	7.46	7.46
90.0	7.62	7.57	7.51	7.46	7.46	7.46	7.46	7.46	7.40
135.0	7.62	7.57	7.57	7.57	7.51	7.46	7.40	7.46	7.46
180.0	7.62	7.57	7.57	7.46	7.46	7.40	7.40	7.35	7.35
225.0	7.68	7.62	7.57	7.51	7.51	7.51	7.46	7.51	7.85
270.0	7.62	7.62	7.57	7.51	7.51	7.51	7.46	7.51	7.85
315.0	7.57	7.51	7.51	7.51	7.46	7.40	7.40	7.40	7.74
360.0	7.51	7.57	7.51	7.51	7.46	7.40	7.35	7.35	7.85

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	7.68	7.74	7.68	7.74	7.85	7.62	7.23	7.23	7.23
45.0	7.46	7.40	7.40	7.35	7.35	7.35	7.35	7.35	7.35
90.0	7.35	7.35	7.29	7.29	7.35	7.35	7.29	7.29	7.23
135.0	7.35	7.35	7.35	7.35	7.29	7.29	7.23	7.29	7.29
180.0	7.35	7.35	7.35	7.23	7.23	7.23	7.18	7.23	7.23
225.0	7.85	7.68	7.74	7.74	7.96	7.68	7.29	7.35	7.35
270.0	7.79	7.79	7.74	7.90	7.90	7.74	7.29	7.29	7.29
315.0	7.74	7.62	7.68	7.79	7.79	7.62	7.23	7.23	7.29
360.0	7.68	7.74	7.68	7.74	7.85	7.62	7.23	7.23	7.23

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	7.23	7.23	7.23	7.23	7.40	7.23	7.23	7.23	7.18
45.0	7.35	7.29	7.35	7.35	7.46	7.35	7.35	7.29	7.23
90.0	7.23	7.23	7.23	7.29	7.29	7.29	7.23	7.23	7.18
135.0	7.29	7.23	7.23	7.23	7.18	7.23	7.18	7.18	7.18
180.0	7.29	7.18	7.18	7.18	7.23	7.18	7.18	7.18	7.18
225.0	7.35	7.29	7.29	7.29	7.35	7.29	7.29	7.23	7.29
270.0	7.29	7.29	7.29	7.35	7.40	7.40	7.35	7.23	7.18
315.0	7.23	7.23	7.23	7.35	7.35	7.29	7.29	7.23	7.18
360.0	7.23	7.23	7.23	7.23	7.40	7.23	7.23	7.23	7.18

Intensity data(cd)

Appendix Page: 17 Total:17

C/ $\gamma(^{\circ})$	90.0
0.0	7.18
45.0	7.23
90.0	7.18
135.0	7.23
180.0	7.18
225.0	7.18
270.0	7.18
315.0	7.18
360.0	7.18