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Nata

LumCAT: 2-1120-A3
Luminaire: 99.02.73.172+92.76.365.00
Report No: NATA0100
Test No: GC2018082710
LampCAT:CITIZEN CLU038
Lamp flux(lm): 2534.0
Number of Lamps: 1
Length(mm): 71
Phm Type: C

Voltage(V): 35.3000
Current(A): 0.4900
Power (W): 17.2970
PF: 0.0000
Ballast type: DC
Width(mm): 71
Height(mm): 0

Photometric Results

Lumens(lm): 2307.63
Efficiency(%): 91.07%
Lumens(lm)/Power(W): 133.61
Central intensity(cd): 14456.430
Maximum intensity(cd): 14456.430
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=15.8
 [C90/270]Total=15.8
Field angle(10%Imax): [C0/180]Total=34.1
 [C90/270]Total=34.1
Maximum s/h(1/2): C0_180=0.27 C90_270=0.27
Maximum s/h(1/4): C0_180=0.27 C90_270=0.27
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 91.20%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.481%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	14456.434	3.459	3.459	.136%	.150%
1.0	14327.740	27.421	30.88	1.082%	1.338%
2.0	13960.927	53.430	84.31	2.109%	3.654%
3.0	13293.368	76.293	160.603	3.011%	6.960%
4.0	12339.584	94.392	254.995	3.725%	11.050%
5.0	11067.988	105.783	360.779	4.175%	15.634%
6.0	9903.476	113.520	474.299	4.480%	20.554%
7.0	8377.382	111.958	586.257	4.418%	25.405%
8.0	7068.278	107.875	694.132	4.257%	30.080%
9.0	5751.260	98.661	792.793	3.894%	34.355%
10.0	4523.984	86.148	878.941	3.400%	38.089%
11.0	3686.783	77.143	956.084	3.044%	41.431%
12.0	3059.553	69.757	1025.841	2.753%	44.454%
13.0	2517.798	62.110	1087.951	2.451%	47.146%
14.0	2132.059	56.562	1144.513	2.232%	49.597%
15.0	1817.549	51.586	1196.099	2.036%	51.832%
16.0	1596.773	48.265	1244.365	1.905%	53.924%
17.0	1453.214	46.593	1290.957	1.839%	55.943%
18.0	1336.976	45.306	1336.263	1.788%	57.906%
19.0	1254.529	44.789	1381.053	1.768%	59.847%
20.0	1190.966	44.669	1425.721	1.763%	61.783%
21.0	1146.901	45.072	1470.793	1.779%	63.736%
22.0	1105.106	45.397	1516.191	1.792%	65.703%
23.0	1076.876	46.142	1562.333	1.821%	67.703%
24.0	1046.842	46.692	1609.025	1.843%	69.726%
25.0	1016.093	47.091	1656.116	1.858%	71.767%
26.0	987.987	47.495	1703.61	1.874%	73.825%
27.0	959.076	47.748	1751.358	1.884%	75.894%
28.0	928.870	47.821	1799.178	1.887%	77.967%
29.0	899.092	47.800	1846.978	1.886%	80.038%
30.0	871.281	47.773	1894.751	1.885%	82.108%
31.0	841.654	47.536	1942.287	1.876%	84.168%
32.0	808.042	46.956	1989.244	1.853%	86.203%
33.0	764.837	45.680	2034.924	1.803%	88.183%
34.0	694.275	42.574	2077.498	1.680%	90.027%
35.0	619.336	38.956	2116.454	1.537%	91.716%
36.0	536.070	34.554	2151.007	1.364%	93.213%
37.0	447.781	29.552	2180.559	1.166%	94.494%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	355.183	23.980	2204.539	.946%	95.533%
39.0	283.100	19.537	2224.076	.771%	96.379%
40.0	196.056	13.820	2237.896	.545%	96.978%
41.0	122.528	8.815	2246.711	.348%	97.360%
42.0	71.855	5.273	2251.983	.208%	97.589%
43.0	41.223	3.083	2255.066	.122%	97.722%
44.0	29.139	2.220	2257.286	.088%	97.818%
45.0	22.587	1.751	2259.037	.069%	97.894%
46.0	17.935	1.415	2260.452	.056%	97.956%
47.0	15.774	1.265	2261.717	.050%	98.011%
48.0	14.776	1.204	2262.921	.048%	98.063%
49.0	13.854	1.147	2264.068	.045%	98.112%
50.0	13.200	1.109	2265.177	.044%	98.160%
51.0	12.897	1.099	2266.276	.043%	98.208%
52.0	12.629	1.091	2267.367	.043%	98.255%
53.0	12.346	1.081	2268.448	.043%	98.302%
54.0	12.126	1.076	2269.524	.042%	98.349%
55.0	11.899	1.069	2270.593	.042%	98.395%
56.0	11.713	1.065	2271.658	.042%	98.441%
57.0	11.541	1.061	2272.719	.042%	98.487%
58.0	11.376	1.058	2273.777	.042%	98.533%
59.0	11.225	1.055	2274.832	.042%	98.579%
60.0	11.094	1.054	2275.886	.042%	98.625%
61.0	10.977	1.053	2276.939	.042%	98.670%
62.0	10.887	1.054	2277.993	.042%	98.716%
63.0	10.791	1.054	2279.047	.042%	98.762%
64.0	10.702	1.055	2280.102	.042%	98.807%
65.0	10.626	1.056	2281.158	.042%	98.853%
66.0	10.571	1.059	2282.217	.042%	98.899%
67.0	10.495	1.059	2283.277	.042%	98.945%
68.0	10.447	1.062	2284.339	.042%	98.991%
69.0	10.385	1.063	2285.402	.042%	99.037%
70.0	10.337	1.065	2286.467	.042%	99.083%
71.0	10.296	1.068	2287.535	.042%	99.129%
72.0	10.247	1.069	2288.603	.042%	99.176%
73.0	10.227	1.072	2289.676	.042%	99.222%
74.0	10.199	1.075	2290.751	.042%	99.269%
75.0	10.165	1.077	2291.828	.042%	99.315%

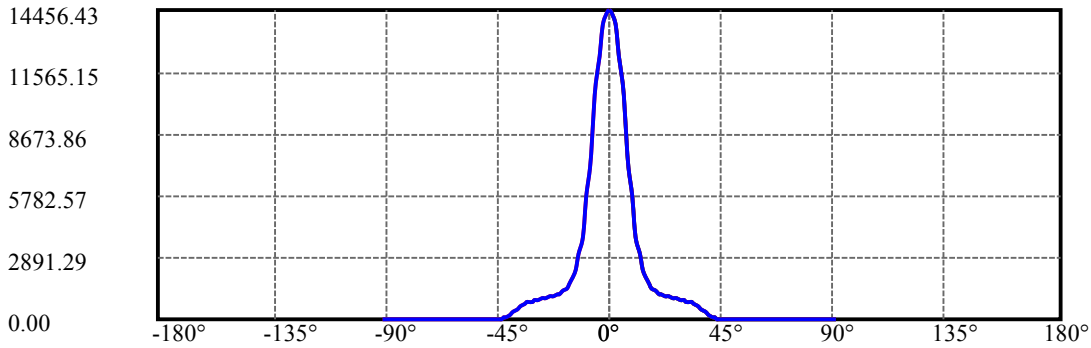
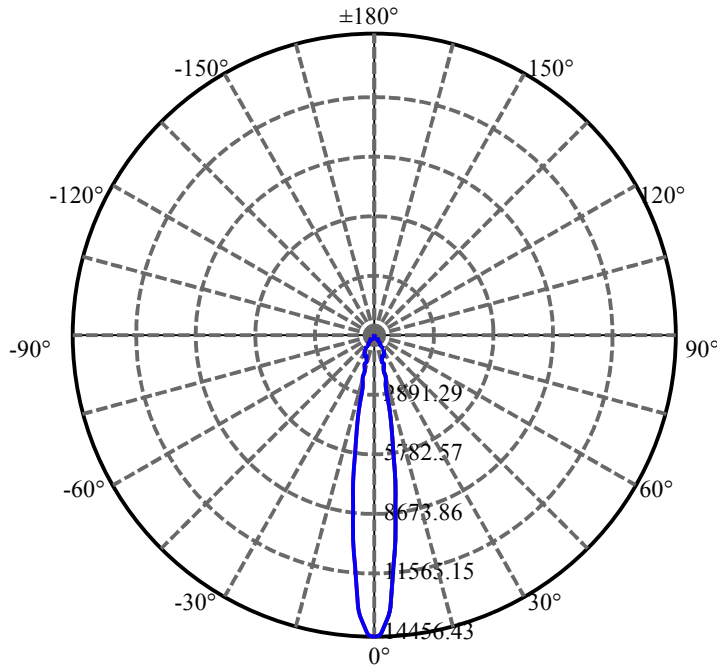
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.151	1.080	2292.908	.043%	99.362%
77.0	10.110	1.080	2293.988	.043%	99.409%
78.0	10.089	1.082	2295.07	.043%	99.456%
79.0	10.062	1.083	2296.153	.043%	99.503%
80.0	10.041	1.084	2297.238	.043%	99.550%
81.0	10.034	1.087	2298.325	.043%	99.597%
82.0	10.013	1.087	2299.412	.043%	99.644%
83.0	10.041	1.093	2300.505	.043%	99.691%
84.0	10.089	1.100	2301.605	.043%	99.739%
85.0	10.158	1.110	2302.715	.044%	99.787%
86.0	10.213	1.117	2303.832	.044%	99.836%
87.0	9.938	1.088	2304.92	.043%	99.883%
88.0	9.876	1.082	2306.003	.043%	99.930%
89.0	9.876	1.083	2307.085	.043%	99.977%
90.0	9.876	0.541	2307.627	.021%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1894.75	74.77%	82.11%
0-40	2237.90	88.31%	96.98%
0-60	2275.89	89.81%	98.62%
0-90	2307.09	91.05%	99.98%
0-120	2307.09	91.05%	99.98%
0-180	2307.63	91.07%	100.00%
60-90	32.25	1.27%	1.40%
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%
0-28.98	1846.10	72.85%	80.00%

ZONAL LUMEN SUMMARY

0-10	878.94
10-20	546.78
20-30	469.03
30-40	343.14
40-50	27.28
50-60	10.71
60-70	10.58
70-80	10.77
80-90	9.85
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



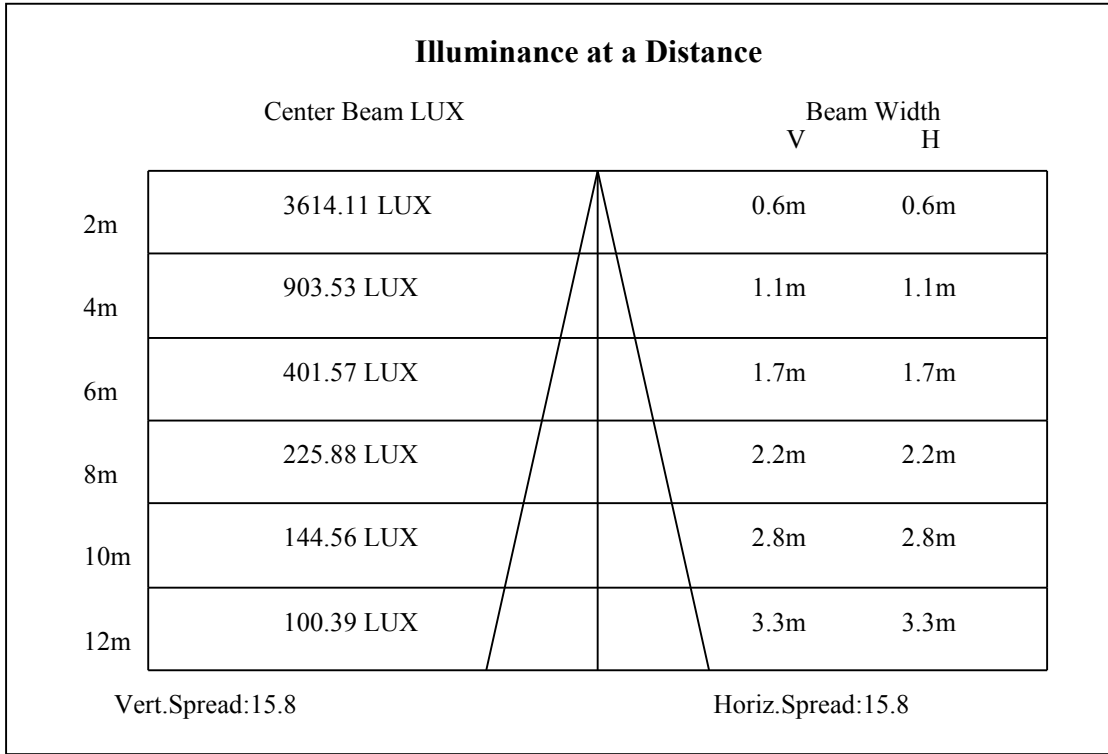
C0(Max): —————

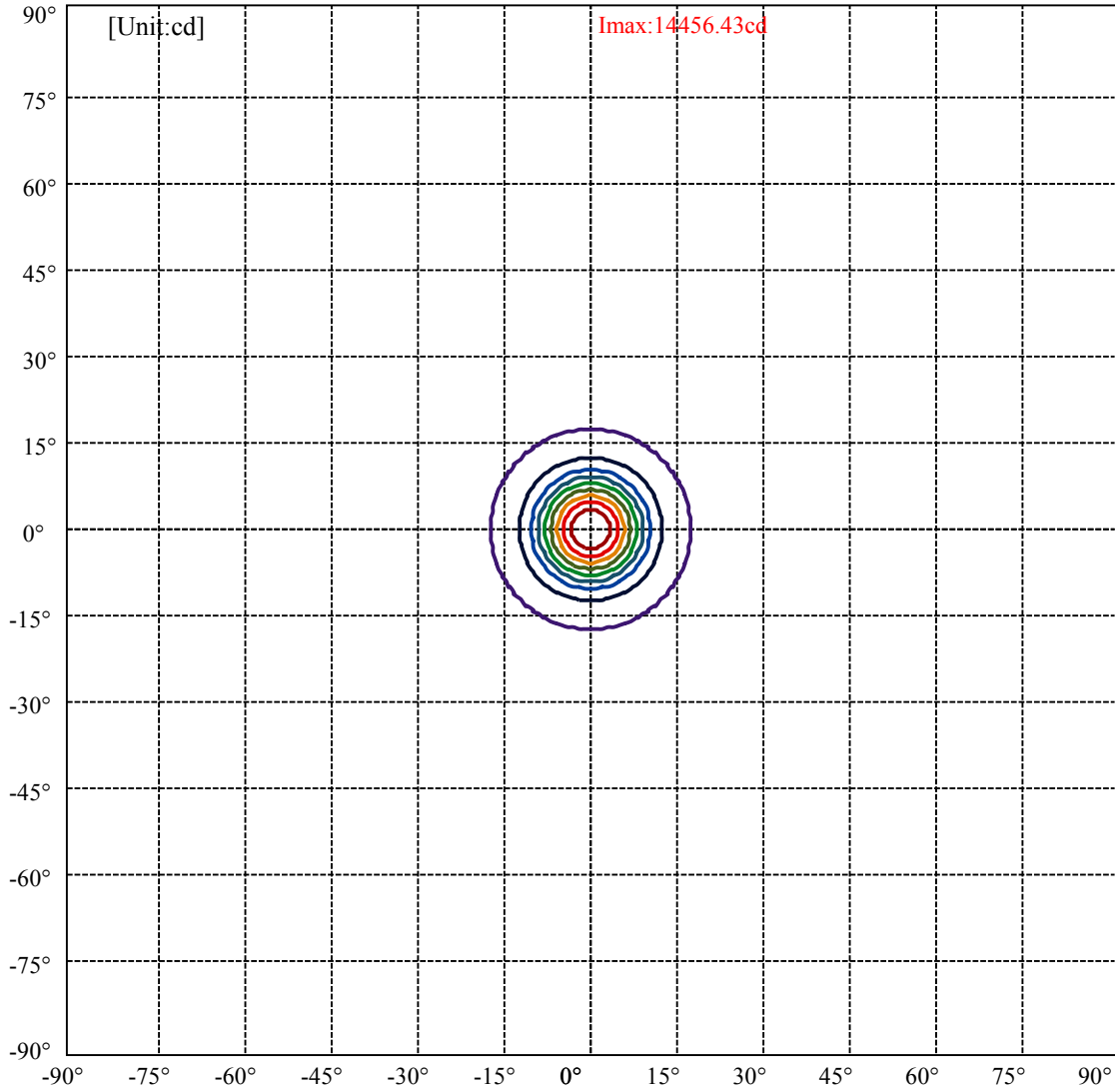
C0/C180: —————

C90/C270: —————

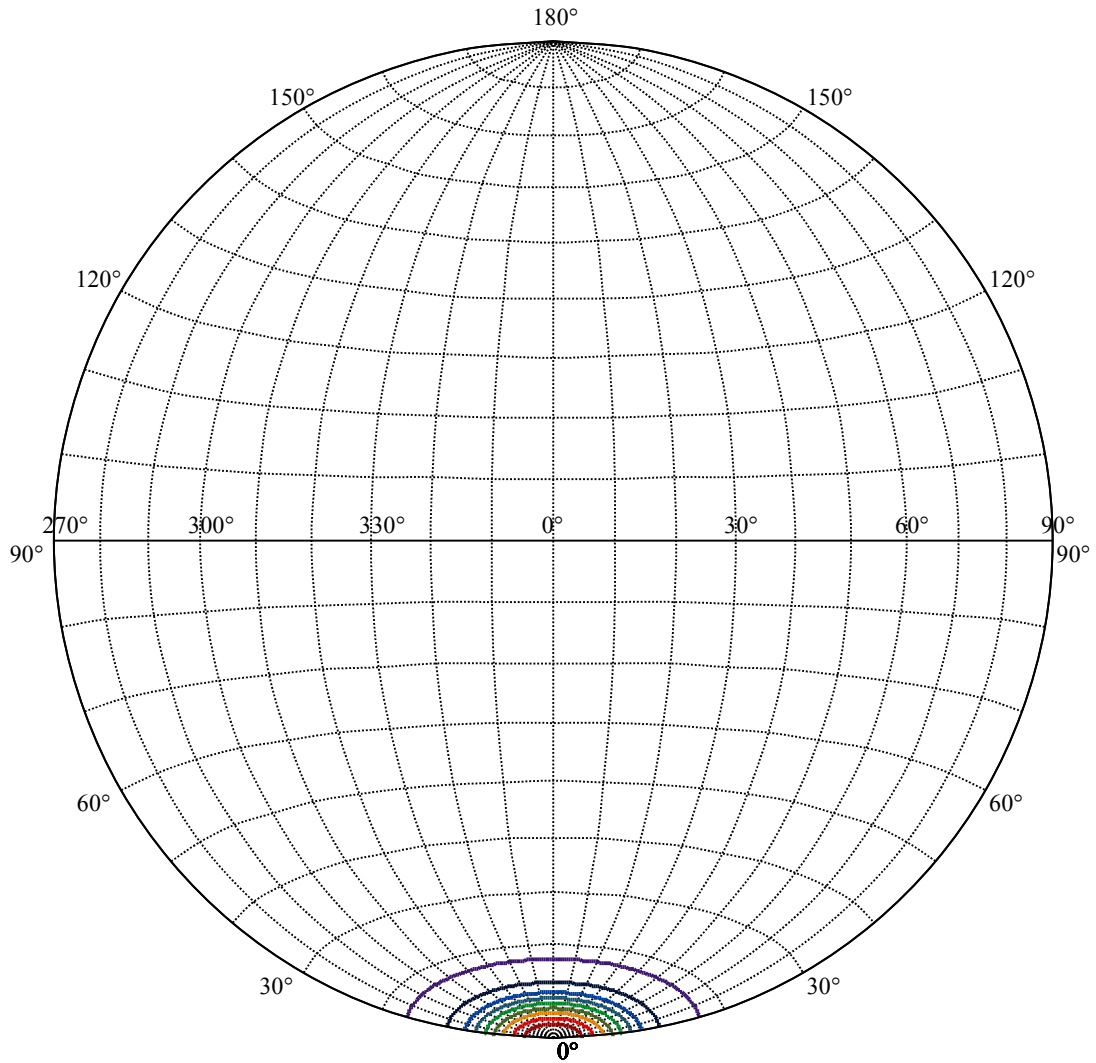
Field angle(10%Imax):C0/180Left:17.1 Right:17.1
:C90/270Left:17.1 Right:17.1

Beam Angle(50%Imax):C0/180Left:7.9 Right:7.9
:C90/270Left:7.9 Right:7.9





(10%Imax) 1445.64	—
(20%Imax) 2891.29	—
(30%Imax) 4336.93	—
(40%Imax) 5782.57	—
(50%Imax) 7228.22	—
(60%Imax) 8673.86	—
(70%Imax) 10119.5	—
(80%Imax) 11565.1	—
(90%Imax) 13010.8	—



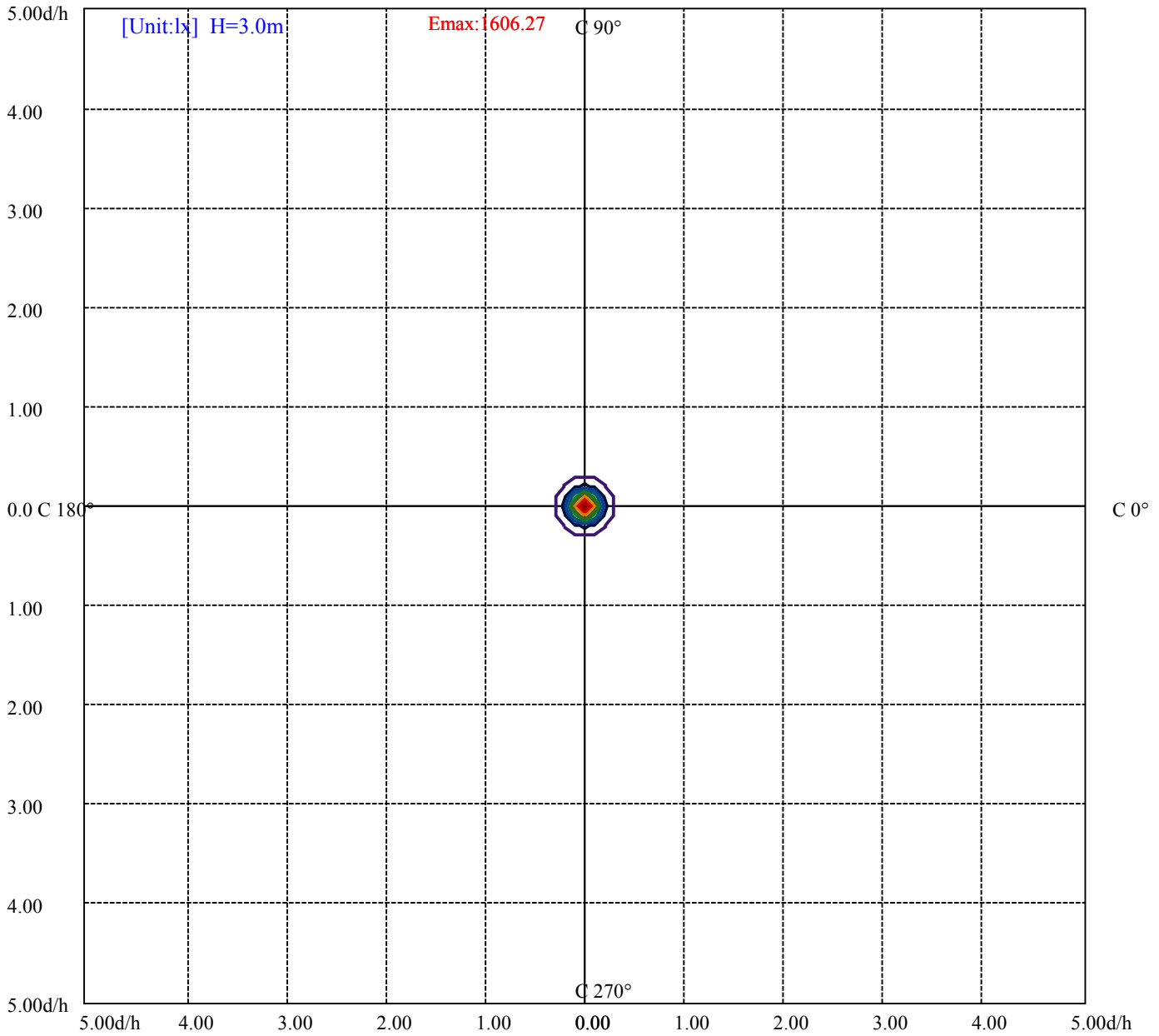
House

[Unit:cd]

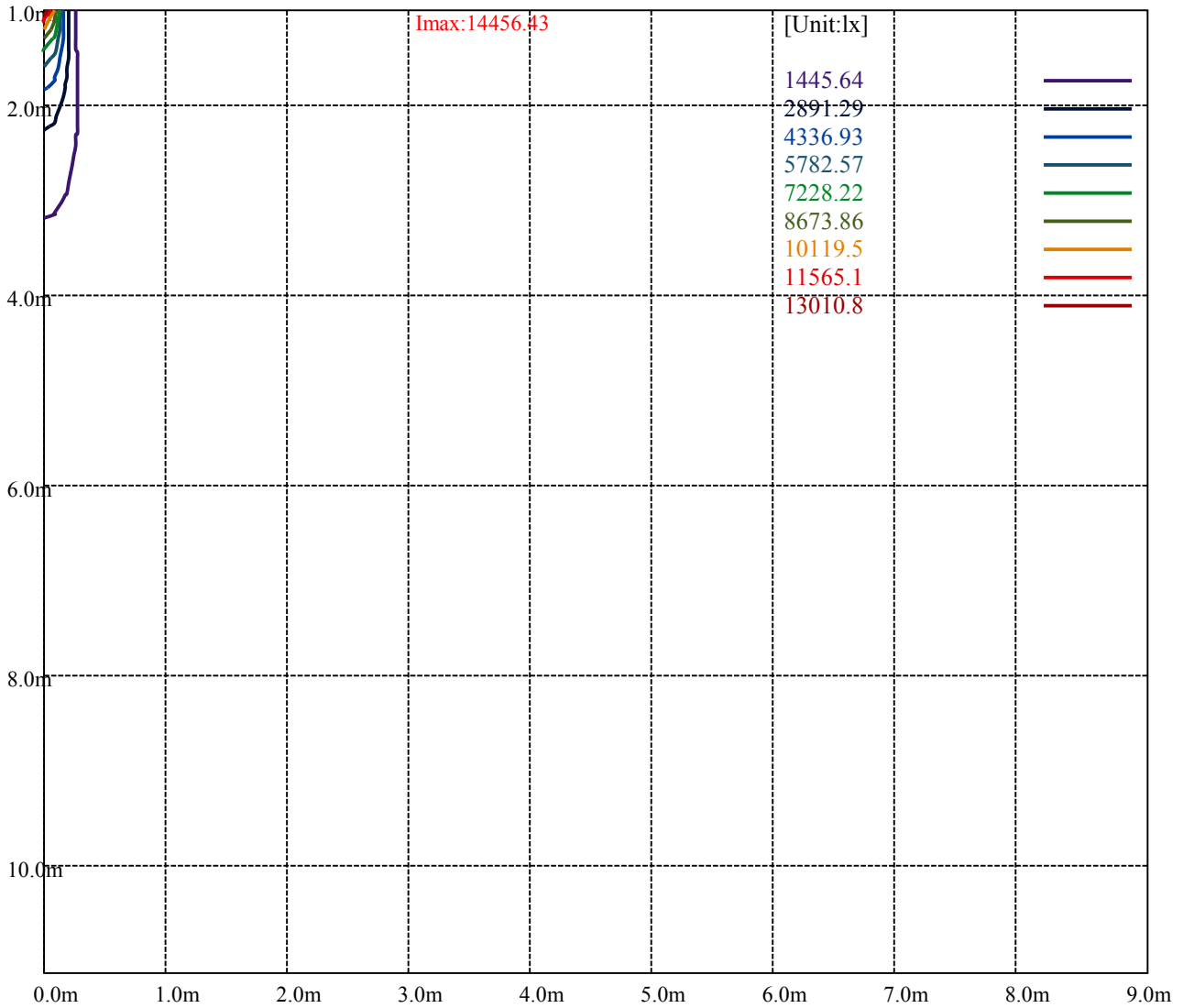
Road

Imax:14456.43

(10%Imax) 1445.64	—
(20%Imax) 2891.29	—
(30%Imax) 4336.93	—
(40%Imax) 5782.57	—
(50%Imax) 7228.22	—
(60%Imax) 8673.86	—
(70%Imax) 10119.5	—
(80%Imax) 11565.1	—
(90%Imax) 13010.8	—



(10%Emax) 160.6267	—
(20%Emax) 321.2533	—
(30%Emax) 481.88	—
(40%Emax) 642.5078	—
(50%Emax) 803.1345	—
(60%Emax) 963.761	—
(70%Emax) 1124.389	—
(80%Emax) 1285.011	—
(90%Emax) 1445.644	—



Luminance Table

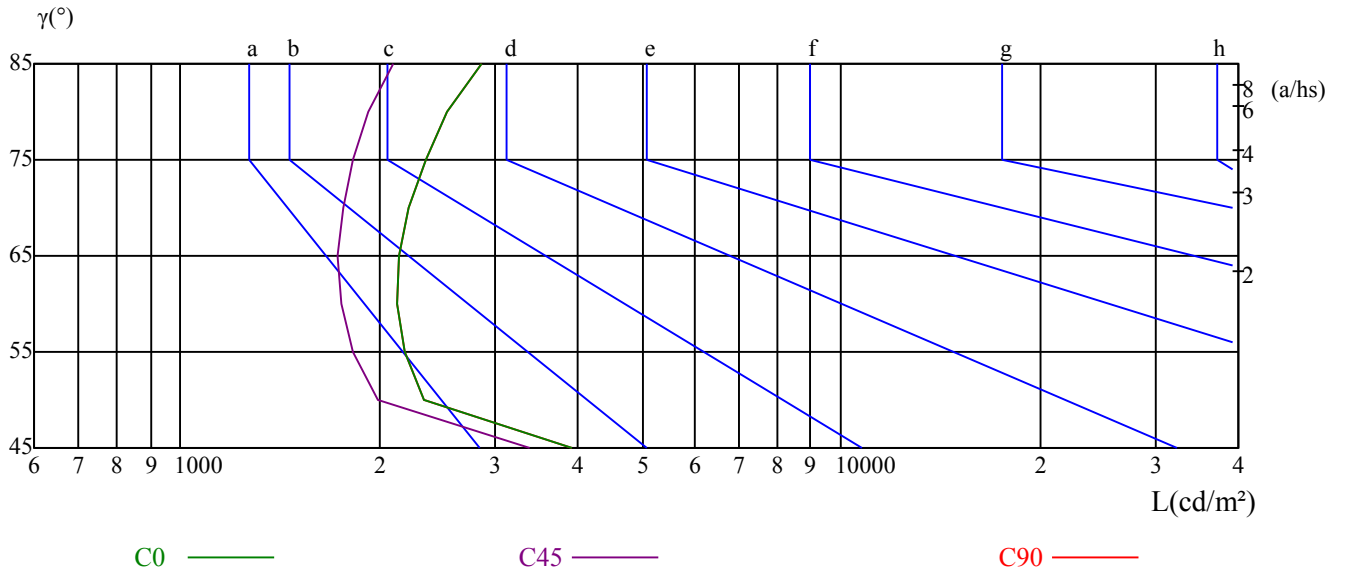
γ	45	50	55	60	65	70	75	80	85
C0	3912	2343	2183	2123	2142	2218	2352	2541	2860
C45	3377	1993	1828	1748	1732	1759	1824	1921	2099
C90	3912	2343	2183	2123	2142	2218	2352	2541	2860

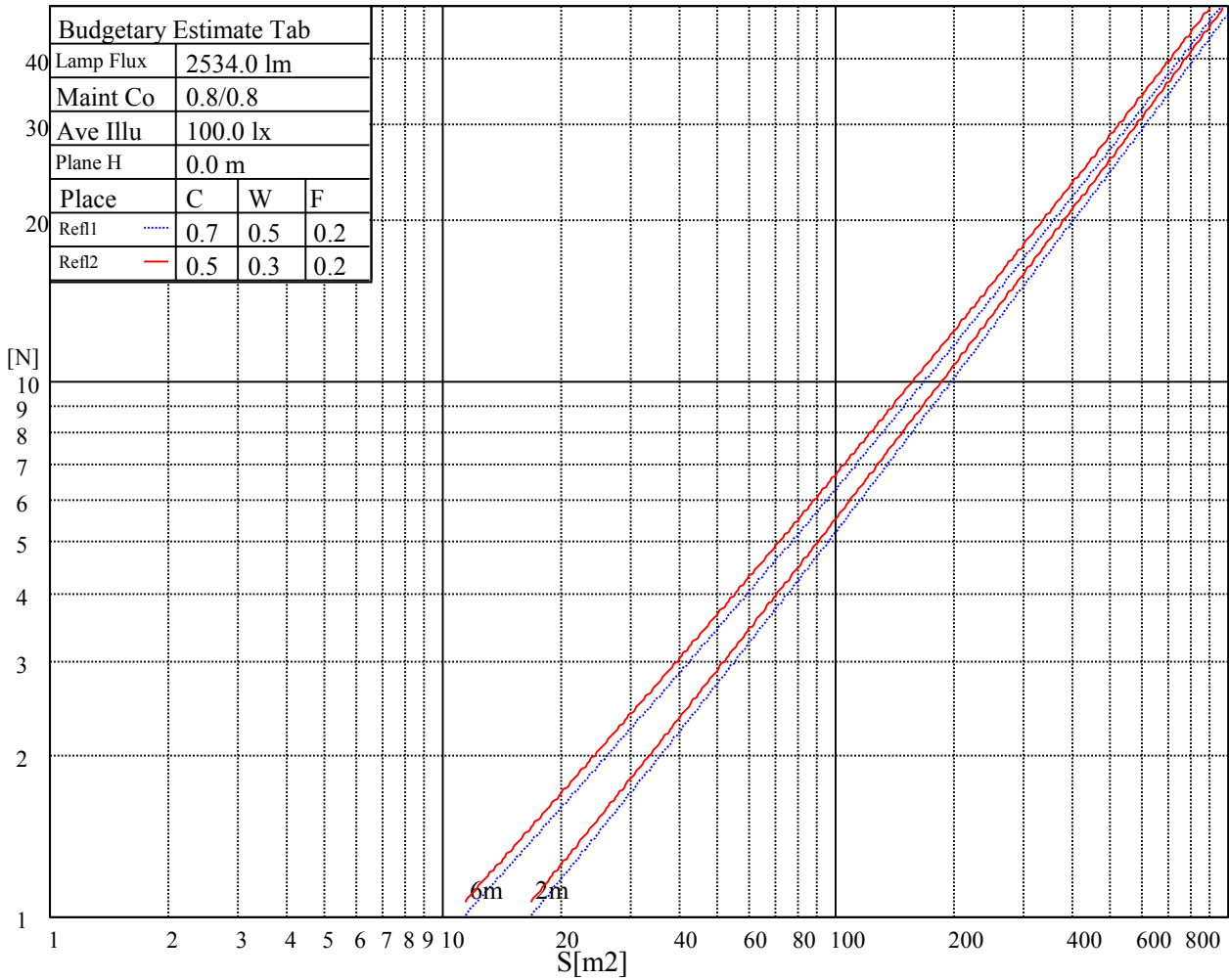
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4988	4988	4988	7791	7791	7791	23120	23120	23120

Glare Table

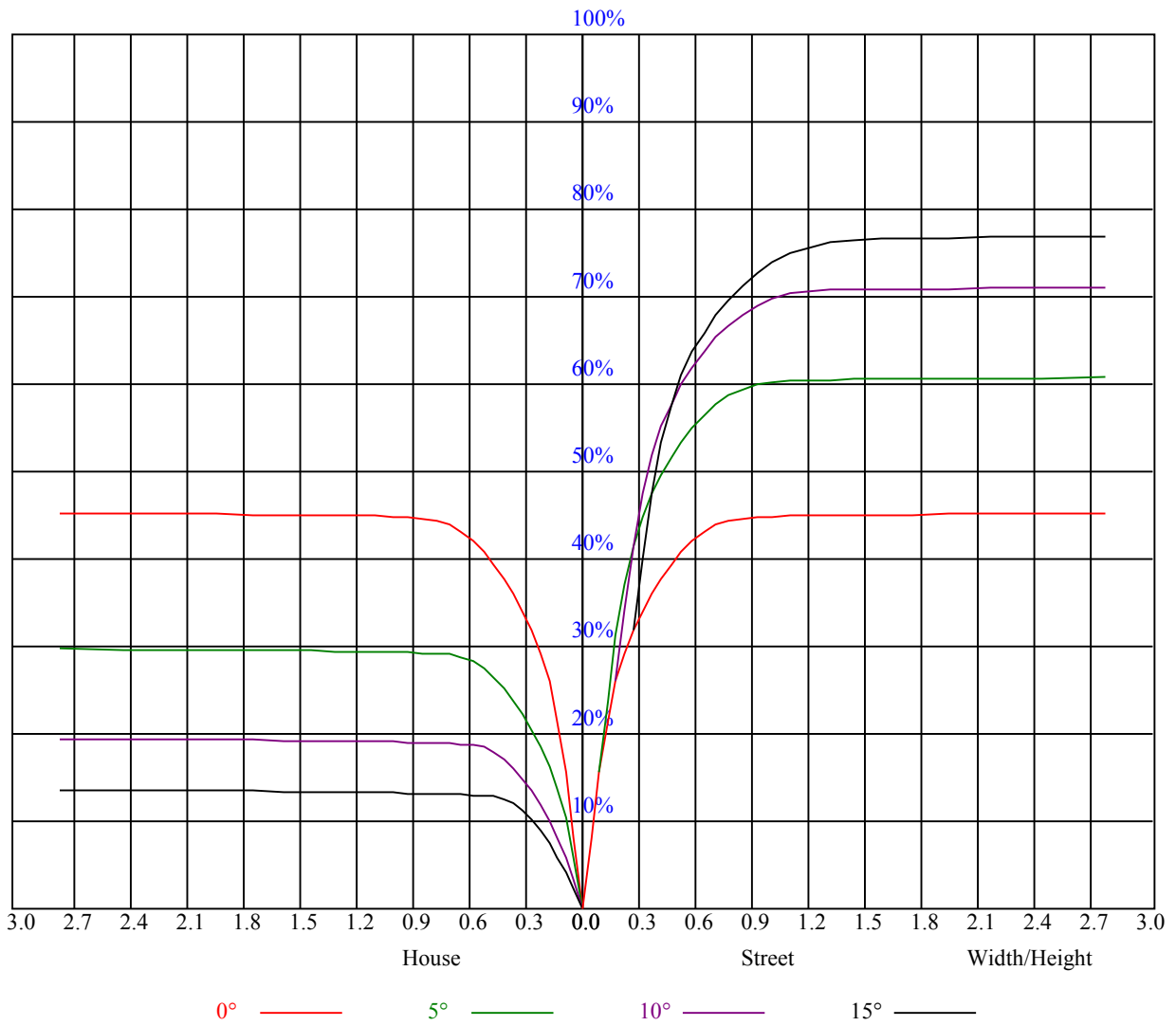
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

Luminance Limiting Curve





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 RHOFC=20 CU															
0	1.09	1.09	1.09	1.06	1.06	1.06	1.01	1.01	1.01	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	0.91	0.95	0.92	0.90	0.92	0.90	0.88	0.89	0.88	0.86	0.87	0.85	0.84	0.83
3	0.92	0.88	0.85	0.90	0.87	0.84	0.88	0.85	0.83	0.86	0.84	0.82	0.84	0.82	0.80	0.79
4	0.87	0.83	0.80	0.86	0.83	0.80	0.85	0.81	0.79	0.83	0.80	0.78	0.81	0.79	0.77	0.76
5	0.84	0.79	0.76	0.83	0.79	0.76	0.81	0.78	0.75	0.80	0.77	0.75	0.79	0.76	0.74	0.73
6	0.80	0.76	0.73	0.80	0.76	0.73	0.78	0.75	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.70
7	0.77	0.73	0.70	0.77	0.73	0.70	0.76	0.72	0.69	0.75	0.71	0.69	0.74	0.71	0.69	0.68
8	0.74	0.70	0.67	0.74	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.67	0.71	0.69	0.66	0.65
9	0.72	0.68	0.65	0.72	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.64	0.69	0.66	0.64	0.63
10	0.70	0.66	0.63	0.69	0.65	0.63	0.69	0.65	0.63	0.68	0.65	0.62	0.67	0.64	0.62	0.61



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	14474.33	14237.59	13725.56	12971.29	11848.14	10510.27	9205.43	7696.88	6419.58
45.0	14534.89	14182.53	13532.86	12817.13	11528.81	10146.89	8974.19	7267.44	6012.16
90.0	14386.24	14011.85	13400.73	12327.13	10934.75	9975.12	8605.87	6913.98	5670.81
135.0	14430.28	14358.71	13989.83	13444.77	12536.34	11341.62	10097.34	8577.79	7239.92
180.0	14474.33	14446.80	14237.59	13648.48	12888.70	10850.52	10522.38	8996.22	7624.76
225.0	14534.89	14584.44	14463.32	13940.28	13329.15	12398.70	10935.85	9612.30	8259.56
270.0	14386.24	14512.87	14419.27	14077.92	13444.77	12431.74	11303.08	9855.10	8522.73
315.0	14430.28	14287.14	13918.26	13119.94	12206.00	10889.05	9583.67	8099.35	6796.71
360.0	14474.33	14237.59	13725.56	12971.29	11848.14	10510.27	9205.43	7696.88	6419.58

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5131.26	4068.67	3336.42	2835.40	2258.41	1949.00	1722.16	1532.22	1395.68
45.0	4911.03	3787.88	3110.69	2840.91	2137.29	1863.11	1658.30	1472.76	1359.89
90.0	4594.46	3551.14	2932.85	2469.28	2073.97	1783.28	1593.88	1435.87	1330.16
135.0	5835.98	4613.73	3749.34	3072.15	2862.93	2103.15	1836.13	1591.68	1451.84
180.0	6143.19	4856.53	3946.44	3175.10	2658.12	2219.32	1899.45	1688.03	1527.26
225.0	6919.49	5368.55	4327.43	3519.21	2840.91	2341.00	2011.21	1737.03	1561.40
270.0	7030.70	5643.28	4586.20	3732.82	2934.51	2796.87	2088.29	1759.05	1572.96
315.0	5443.98	4302.11	3504.89	2831.55	2376.23	2000.75	1730.97	1557.55	1426.51
360.0	5131.26	4068.67	3336.42	2835.40	2258.41	1949.00	1722.16	1532.22	1395.68

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1306.49	1239.32	1180.96	1142.42	1112.14	1079.66	1048.82	1022.95	990.46
45.0	1274.56	1206.84	1156.18	1119.30	1082.96	1052.68	1024.05	993.77	968.99
90.0	1240.42	1176.00	1098.60	1090.17	1058.13	1032.36	1005.38	973.95	947.36
135.0	1341.72	1252.53	1190.32	1144.62	1109.94	1075.80	1043.32	1016.34	989.91
180.0	1373.11	1285.02	1222.25	1162.24	1098.38	1090.17	1063.52	1030.99	1002.52
225.0	1416.60	1312.54	1242.62	1183.16	1138.57	1096.50	1070.13	1036.77	1007.92
270.0	1434.22	1323.56	1244.27	1191.42	1143.52	1111.59	1073.60	1042.22	1013.04
315.0	1308.69	1240.42	1192.52	1141.87	1097.22	1076.24	1045.91	1011.77	983.69
360.0	1306.49	1239.32	1180.96	1142.42	1112.14	1079.66	1048.82	1022.95	990.46

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	960.18	932.66	899.07	873.19	844.57	807.68	751.52	685.45	590.20
45.0	939.81	907.88	883.10	856.68	826.40	785.10	729.50	635.35	553.32
90.0	924.84	893.07	866.64	841.15	812.91	761.98	705.93	626.60	546.88
135.0	960.18	934.86	901.27	874.85	846.22	818.69	779.05	706.92	631.50
180.0	971.47	945.92	911.73	881.45	850.79	821.61	784.61	718.93	649.11
225.0	977.25	944.93	914.05	883.27	854.42	827.50	799.25	742.38	676.04
270.0	982.21	950.27	924.40	893.57	861.08	836.86	810.98	754.82	698.12
315.0	956.66	921.37	892.46	866.09	836.86	804.92	757.85	683.75	609.53
360.0	960.18	932.66	899.07	873.19	844.57	807.68	751.52	685.45	590.20

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	513.13	440.45	323.73	282.44	168.36	100.09	52.30	32.81	26.32
45.0	470.18	380.99	290.15	280.24	134.89	78.68	41.79	29.18	23.34
90.0	453.55	356.77	274.68	189.17	116.66	67.88	39.75	27.47	21.53
135.0	551.11	465.78	361.17	280.24	232.12	125.31	67.61	39.75	29.12
180.0	560.69	472.16	389.80	301.16	217.20	148.93	91.34	45.64	31.99
225.0	593.62	504.10	423.33	332.76	245.28	172.99	110.28	55.61	35.35
270.0	627.09	536.25	437.15	349.61	285.19	178.93	110.39	65.85	38.04
315.0	519.18	425.75	341.46	249.19	168.75	107.42	61.39	33.47	27.42
360.0	513.13	440.45	323.73	282.44	168.36	100.09	52.30	32.81	26.32

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	19.71	16.19	15.20	14.42	13.65	13.21	12.94	12.66	12.28
45.0	17.40	15.42	14.65	13.76	13.27	12.88	12.66	12.44	12.17
90.0	16.90	15.36	14.42	13.60	13.16	12.88	12.61	12.39	12.17
135.0	21.97	17.34	15.75	14.76	13.76	13.27	12.99	12.72	12.44
180.0	25.27	18.66	16.08	15.14	13.98	13.43	13.10	12.77	12.50
225.0	28.90	20.76	16.96	15.86	14.48	13.43	13.05	12.72	12.50
270.0	29.07	23.01	17.73	16.30	15.03	13.54	13.16	12.88	12.50
315.0	21.47	16.74	15.42	14.37	13.49	12.94	12.66	12.44	12.22
360.0	19.71	16.19	15.20	14.42	13.65	13.21	12.94	12.66	12.28
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	12.06	11.89	11.67	11.51	11.34	11.23	11.07	11.01	10.90
45.0	12.00	11.78	11.62	11.45	11.34	11.18	11.12	10.96	10.90
90.0	11.95	11.73	11.56	11.40	11.29	11.18	11.07	10.96	10.85
135.0	12.22	12.00	11.78	11.62	11.45	11.29	11.18	11.07	10.96
180.0	12.28	12.00	11.84	11.67	11.45	11.29	11.12	11.01	10.90
225.0	12.22	11.95	11.78	11.62	11.40	11.23	11.12	10.96	10.90
270.0	12.28	12.11	11.89	11.67	11.51	11.29	11.12	11.01	10.90
315.0	12.00	11.73	11.56	11.40	11.23	11.12	10.96	10.85	10.79
360.0	12.06	11.89	11.67	11.51	11.34	11.23	11.07	11.01	10.90
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.79	10.74	10.68	10.63	10.52	10.46	10.41	10.35	10.30
45.0	10.85	10.79	10.68	10.63	10.57	10.52	10.46	10.41	10.35
90.0	10.74	10.68	10.63	10.57	10.52	10.46	10.41	10.35	10.35
135.0	10.85	10.79	10.68	10.63	10.57	10.52	10.41	10.41	10.35
180.0	10.85	10.68	10.63	10.57	10.46	10.46	10.41	10.35	10.30
225.0	10.79	10.63	10.57	10.52	10.46	10.35	10.30	10.24	10.24
270.0	10.79	10.68	10.57	10.52	10.46	10.41	10.35	10.30	10.24
315.0	10.68	10.63	10.57	10.52	10.41	10.41	10.35	10.30	10.24
360.0	10.79	10.74	10.68	10.63	10.52	10.46	10.41	10.35	10.30
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.30	10.30	10.24	10.19	10.19	10.13	10.13	10.13	10.08
45.0	10.30	10.30	10.24	10.24	10.24	10.13	10.13	10.13	10.08
90.0	10.30	10.24	10.19	10.19	10.19	10.19	10.13	10.08	10.08
135.0	10.30	10.30	10.30	10.24	10.19	10.19	10.13	10.08	10.08
180.0	10.24	10.19	10.19	10.13	10.13	10.08	10.08	10.02	10.02
225.0	10.19	10.13	10.13	10.08	10.08	10.02	10.02	10.02	9.97
270.0	10.19	10.19	10.19	10.13	10.13	10.08	10.02	10.02	10.02
315.0	10.19	10.19	10.13	10.13	10.08	10.08	10.08	10.02	10.02
360.0	10.30	10.30	10.24	10.19	10.19	10.13	10.13	10.13	10.08
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.08	10.02	10.02	10.02	10.08	10.13	9.91	9.91	9.86
45.0	10.08	10.02	10.13	10.30	10.30	10.19	9.91	9.86	9.86
90.0	10.08	10.08	10.13	10.30	10.57	10.74	9.91	9.91	9.91
135.0	10.08	10.08	10.08	10.19	10.41	10.68	9.91	9.86	9.86
180.0	9.97	9.97	9.97	9.97	9.97	9.91	9.91	9.86	9.86
225.0	9.97	9.97	9.97	9.97	9.91	9.91	9.91	9.86	9.86
270.0	10.02	9.97	10.02	9.97	9.97	10.02	10.13	9.91	9.91
315.0	10.02	10.02	10.02	10.02	10.08	10.13	9.91	9.86	9.91
360.0	10.08	10.02	10.02	10.02	10.08	10.13	9.91	9.91	9.86

Intensity data(cd)

C/ γ (°)	90.0
0.0	9.91
45.0	9.86
90.0	9.86
135.0	9.86
180.0	9.86
225.0	9.86
270.0	9.91
315.0	9.91
360.0	9.91