



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: 3-1545-A3
Luminaire: 99.02.73.172+92.76.365.00
Report No: NATA0100
Test No: GC2018082716
LampCAT: CITIZEN CLU038
Lamp flux(lm): 2534.0
Number of Lamps: 1
Length(mm): 84
Phm Type: C

Voltage(V): 35.4000
Current(A): 0.5000
Power (W): 17.7000
PF: 0.0000
Ballast type: DC
Width(mm): 84
Height(mm): 0

Photometric Results

Lumens(lm): 2313.50
Efficiency(%): 91.30%
Lumens(lm)/Power(W): 130.71
Central intensity(cd): 21345.370
Maximum intensity(cd): 21345.370
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=13.1
 [C90/270]Total=13.1
Field angle(10%Imax): [C0/180]Total=26.5
 [C90/270]Total=26.5
Maximum s/h(1/2): C0_180=0.23 C90_270=0.23
Maximum s/h(1/4): C0_180=0.23 C90_270=0.23
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 91.50%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.418%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	21345.365	5.107	5.107	.202%	.221%
1.0	21096.924	40.376	45.483	1.593%	1.966%
2.0	20364.674	77.938	123.421	3.076%	5.335%
3.0	18964.178	108.839	232.26	4.295%	10.039%
4.0	17097.766	130.790	363.051	5.161%	15.693%
5.0	14582.376	139.372	502.423	5.500%	21.717%
6.0	11949.235	136.970	639.393	5.405%	27.638%
7.0	9668.867	129.218	768.611	5.099%	33.223%
8.0	7583.606	115.740	884.35	4.567%	38.226%
9.0	5770.117	98.985	983.335	3.906%	42.504%
10.0	4278.226	81.468	1064.803	3.215%	46.026%
11.0	3382.803	70.783	1135.586	2.793%	49.085%
12.0	2797.278	63.777	1199.363	2.517%	51.842%
13.0	2230.885	55.032	1254.395	2.172%	54.221%
14.0	1860.631	49.361	1303.757	1.948%	56.354%
15.0	1631.528	46.307	1350.063	1.827%	58.356%
16.0	1436.284	43.414	1393.477	1.713%	60.233%
17.0	1309.104	41.972	1435.449	1.656%	62.047%
18.0	1209.059	40.971	1476.421	1.617%	63.818%
19.0	1139.165	40.671	1517.091	1.605%	65.576%
20.0	1089.078	40.847	1557.939	1.612%	67.341%
21.0	1051.144	41.309	1599.247	1.630%	69.127%
22.0	1016.341	41.751	1640.998	1.648%	70.932%
23.0	990.816	42.454	1683.453	1.675%	72.767%
24.0	965.166	43.049	1726.502	1.699%	74.627%
25.0	935.986	43.378	1769.88	1.712%	76.502%
26.0	913.227	43.901	1813.781	1.732%	78.400%
27.0	890.696	44.343	1858.124	1.750%	80.317%
28.0	867.751	44.674	1902.798	1.763%	82.248%
29.0	848.213	45.095	1947.893	1.780%	84.197%
30.0	830.416	45.532	1993.425	1.797%	86.165%
31.0	803.507	45.382	2038.807	1.791%	88.127%
32.0	758.416	44.073	2082.88	1.739%	90.032%
33.0	688.769	41.137	2124.017	1.623%	91.810%
34.0	588.023	36.059	2160.075	1.423%	93.368%
35.0	492.025	30.948	2191.023	1.221%	94.706%
36.0	386.978	24.943	2215.967	.984%	95.784%
37.0	285.412	18.836	2234.803	.743%	96.599%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	184.680	12.468	2247.271	.492%	97.137%
39.0	103.520	7.144	2254.415	.282%	97.446%
40.0	54.361	3.832	2258.247	.151%	97.612%
41.0	35.374	2.545	2260.792	.100%	97.722%
42.0	27.239	1.999	2262.791	.079%	97.808%
43.0	21.272	1.591	2264.382	.063%	97.877%
44.0	18.182	1.385	2265.767	.055%	97.937%
45.0	15.017	1.164	2266.931	.046%	97.987%
46.0	12.801	1.010	2267.941	.040%	98.031%
47.0	12.312	0.987	2268.928	.039%	98.074%
48.0	12.112	0.987	2269.915	.039%	98.116%
49.0	11.892	0.984	2270.9	.039%	98.159%
50.0	11.713	0.984	2271.884	.039%	98.201%
51.0	11.576	0.987	2272.87	.039%	98.244%
52.0	11.410	0.986	2273.856	.039%	98.287%
53.0	11.293	0.989	2274.845	.039%	98.329%
54.0	11.156	0.990	2275.835	.039%	98.372%
55.0	11.046	0.992	2276.827	.039%	98.415%
56.0	10.936	0.994	2277.821	.039%	98.458%
57.0	10.839	0.997	2278.818	.039%	98.501%
58.0	10.757	1.000	2279.819	.039%	98.544%
59.0	10.681	1.004	2280.823	.040%	98.588%
60.0	10.626	1.009	2281.832	.040%	98.631%
61.0	10.550	1.012	2282.844	.040%	98.675%
62.0	10.502	1.017	2283.86	.040%	98.719%
63.0	10.461	1.022	2284.882	.040%	98.763%
64.0	10.419	1.027	2285.909	.041%	98.808%
65.0	10.392	1.033	2286.942	.041%	98.852%
66.0	10.357	1.038	2287.98	.041%	98.897%
67.0	10.323	1.042	2289.022	.041%	98.942%
68.0	10.296	1.047	2290.069	.041%	98.987%
69.0	10.275	1.052	2291.121	.042%	99.033%
70.0	10.247	1.056	2292.177	.042%	99.078%
71.0	10.247	1.063	2293.239	.042%	99.124%
72.0	10.234	1.067	2294.306	.042%	99.171%
73.0	10.220	1.072	2295.378	.042%	99.217%
74.0	10.206	1.076	2296.454	.042%	99.263%
75.0	10.185	1.079	2297.533	.043%	99.310%

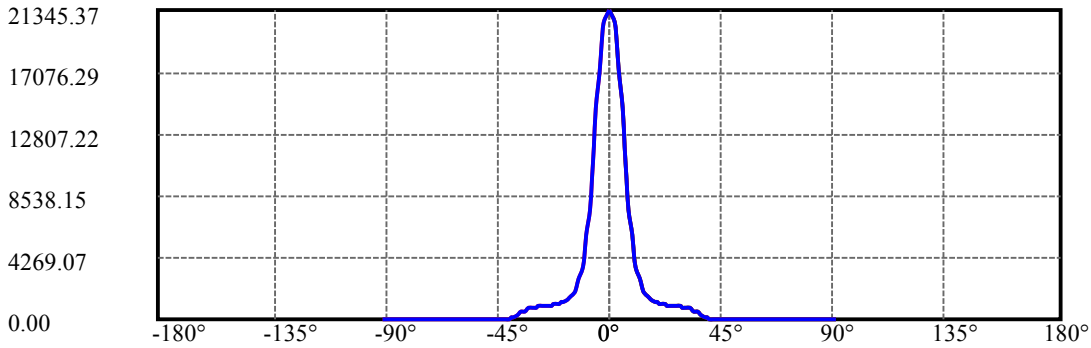
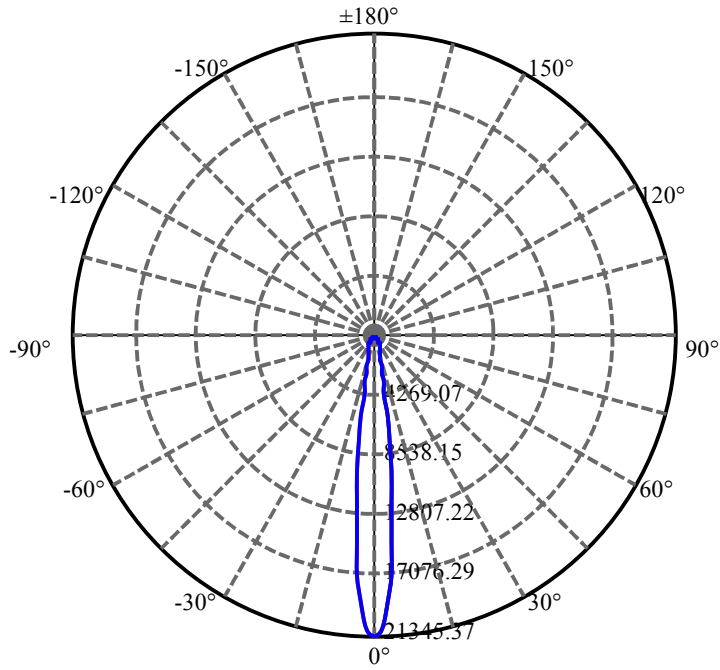
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.179	1.083	2298.616	.043%	99.357%
77.0	10.165	1.086	2299.702	.043%	99.404%
78.0	10.144	1.088	2300.79	.043%	99.451%
79.0	10.137	1.091	2301.881	.043%	99.498%
80.0	10.123	1.093	2302.975	.043%	99.545%
81.0	10.144	1.099	2304.073	.043%	99.593%
82.0	10.179	1.105	2305.179	.044%	99.640%
83.0	10.158	1.106	2306.284	.044%	99.688%
84.0	10.234	1.116	2307.4	.044%	99.737%
85.0	10.323	1.128	2308.528	.045%	99.785%
86.0	10.364	1.134	2309.662	.045%	99.834%
87.0	10.082	1.104	2310.766	.044%	99.882%
88.0	9.965	1.092	2311.858	.043%	99.929%
89.0	9.958	1.092	2312.95	.043%	99.976%
90.0	9.958	0.546	2313.496	.022%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1993.43	78.67%	86.17%
0-40	2258.25	89.12%	97.61%
0-60	2281.83	90.05%	98.63%
0-90	2312.95	91.28%	99.98%
0-120	2312.95	91.28%	99.98%
0-180	2313.50	91.30%	100.00%
60-90	32.13	1.27%	1.39%
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%
0-26.83	1850.80	73.04%	80.00%

ZONAL LUMEN SUMMARY

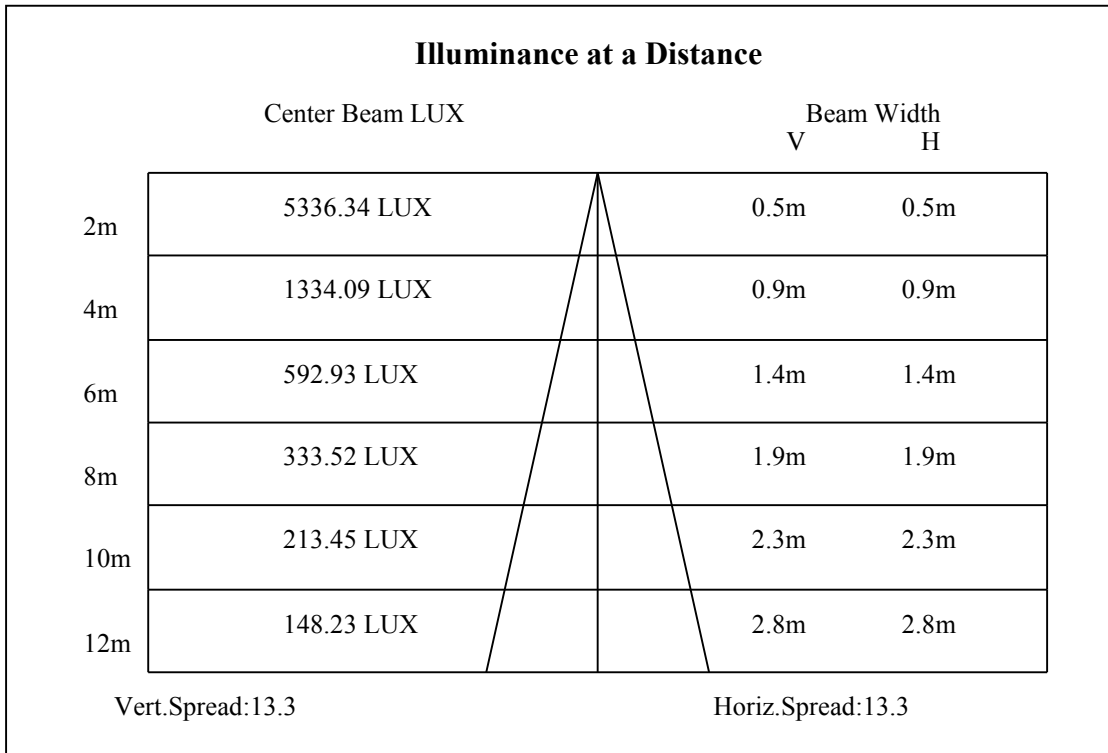
0-10	1064.80
10-20	493.14
20-30	435.49
30-40	264.82
40-50	13.64
50-60	9.95
60-70	10.34
70-80	10.80
80-90	9.98
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

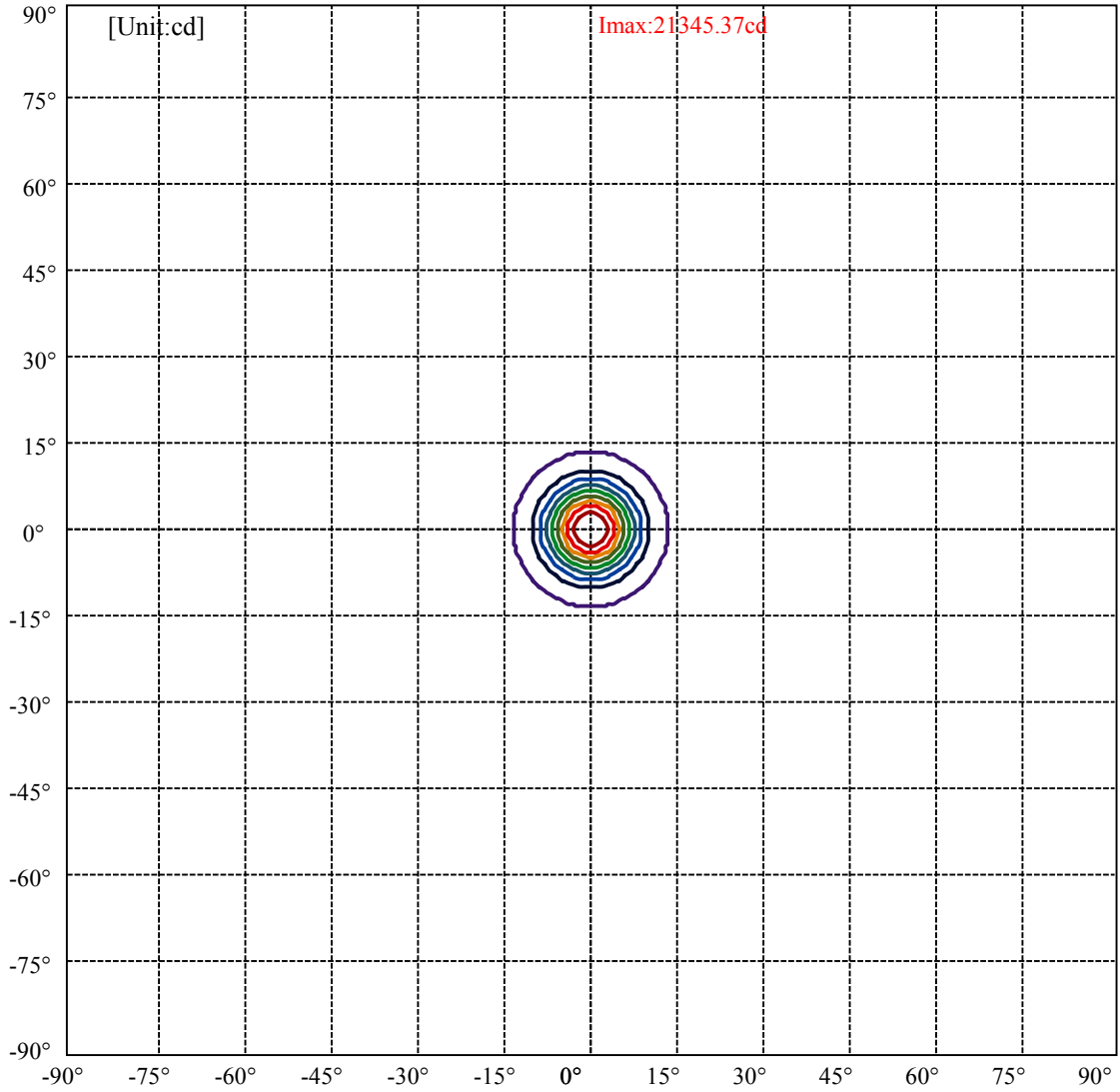


C0(Max): —————
C0/C180: —————
C90/C270: —————

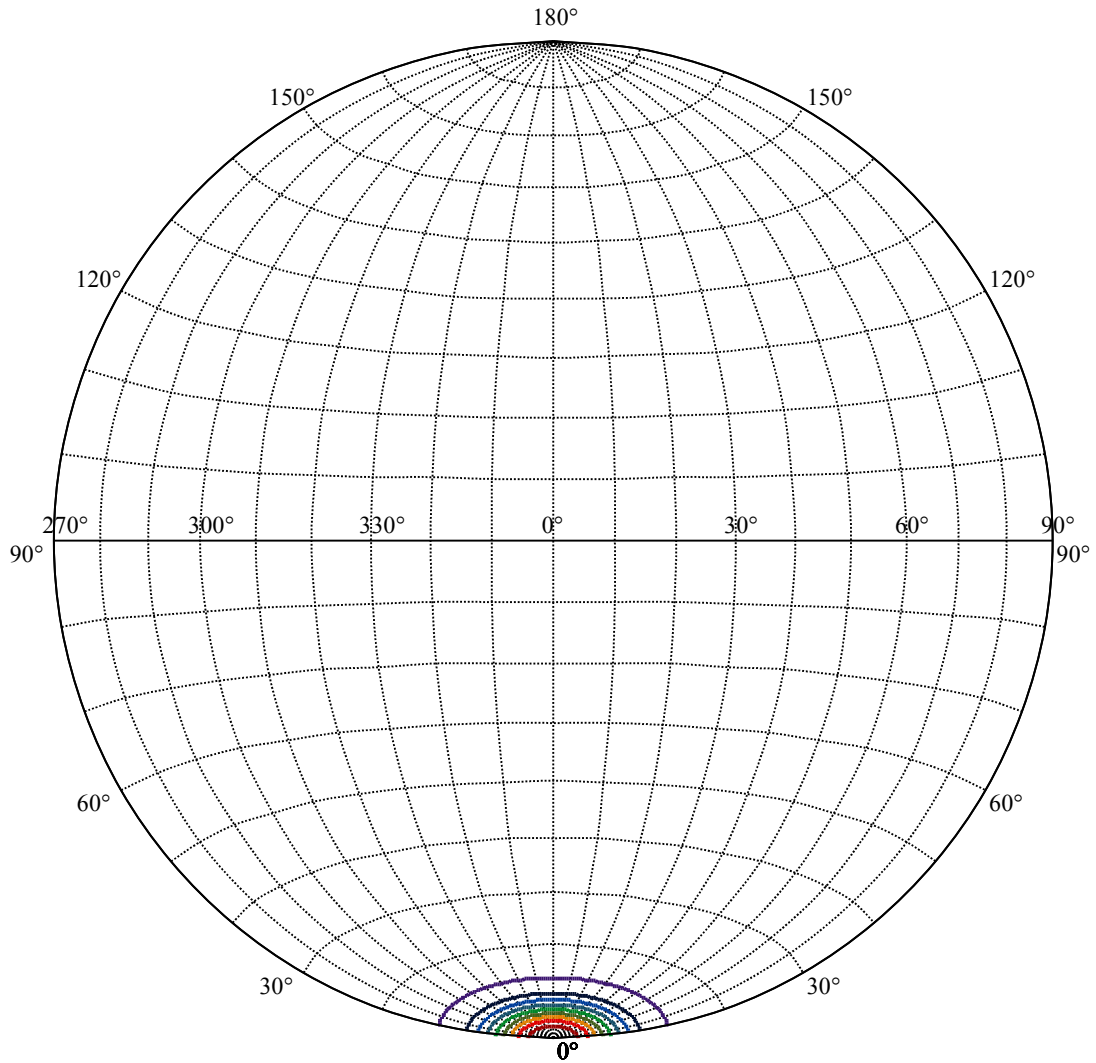
Field angle(10%Imax):C0/180Left:13.3 Right:13.3
:C90/270Left:13.3 Right:13.3

Beam Angle(50%Imax):C0/180Left:6.6 Right:6.6
:C90/270Left:6.6 Right:6.6





(10%Imax) 2134.54	—
(20%Imax) 4269.07	—
(30%Imax) 6403.61	—
(40%Imax) 8538.15	—
(50%Imax) 10672.7	—
(60%Imax) 12807.2	—
(70%Imax) 14941.8	—
(80%Imax) 17076.3	—
(90%Imax) 19210.8	—



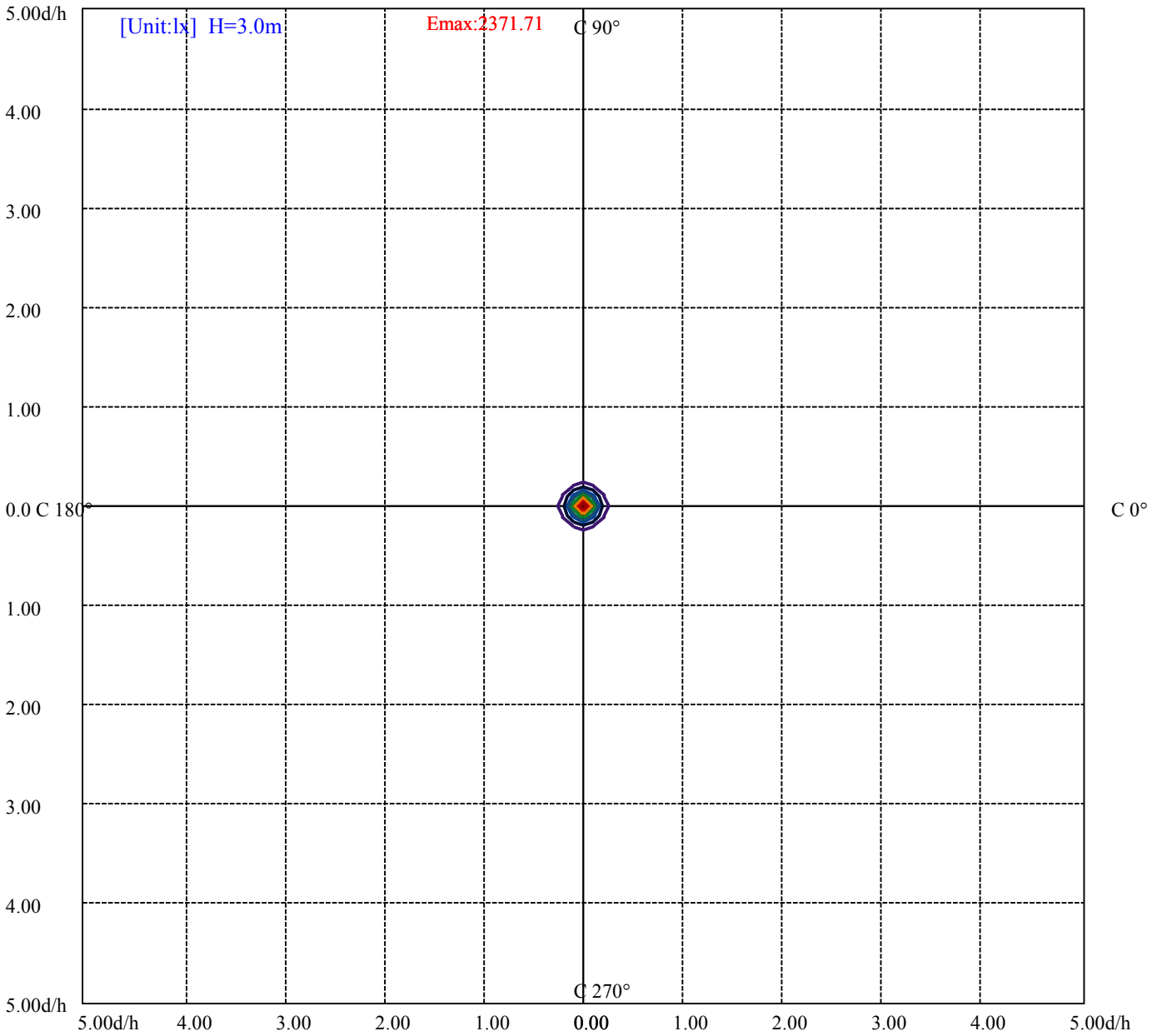
House

[Unit:cd]

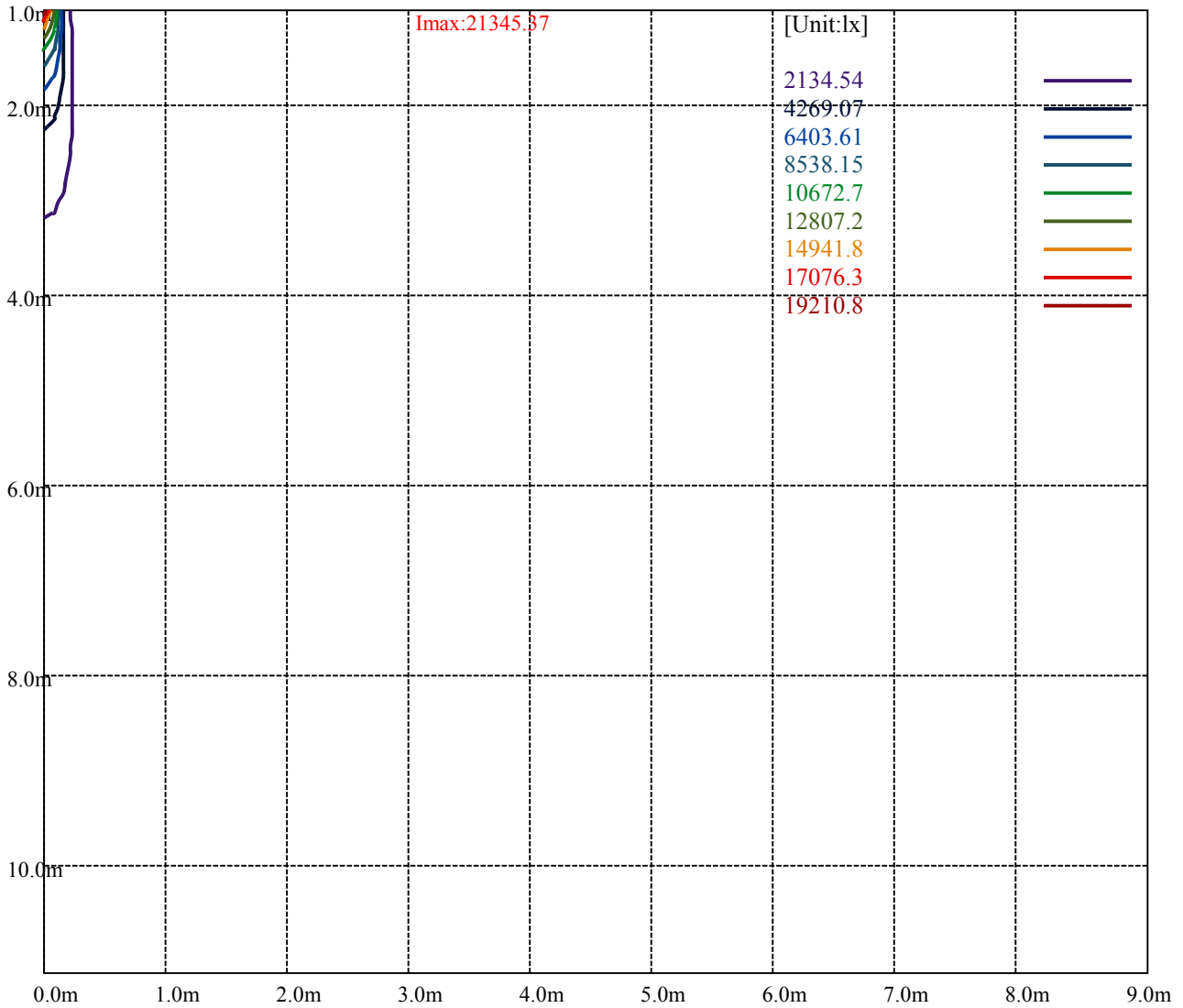
Road

Imax:21345.37

(10%Imax) 2134.54	—
(20%Imax) 4269.07	—
(30%Imax) 6403.61	—
(40%Imax) 8538.15	—
(50%Imax) 10672.7	—
(60%Imax) 12807.2	—
(70%Imax) 14941.8	—
(80%Imax) 17076.3	—
(90%Imax) 19210.8	—



- (10%Emax) 237.17
- (20%Emax) 474.3411
- (30%Emax) 711.5111
- (40%Emax) 948.6811
- (50%Emax) 1185.856
- (60%Emax) 1423.022
- (70%Emax) 1660.189
- (80%Emax) 1897.367
- (90%Emax) 2134.533



Luminance Table

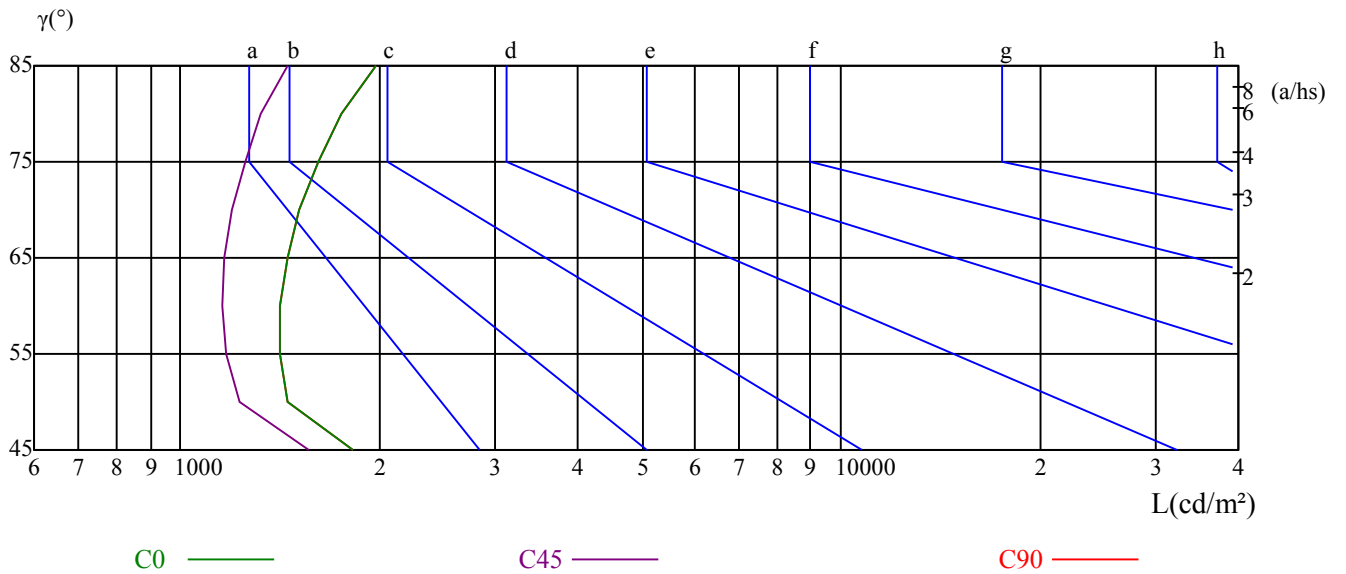
γ	45	50	55	60	65	70	75	80	85
C0	1819	1451	1410	1411	1450	1517	1620	1753	1979
C45	1563	1228	1175	1157	1167	1198	1252	1322	1449
C90	1819	1451	1410	1411	1450	1517	1620	1753	1979

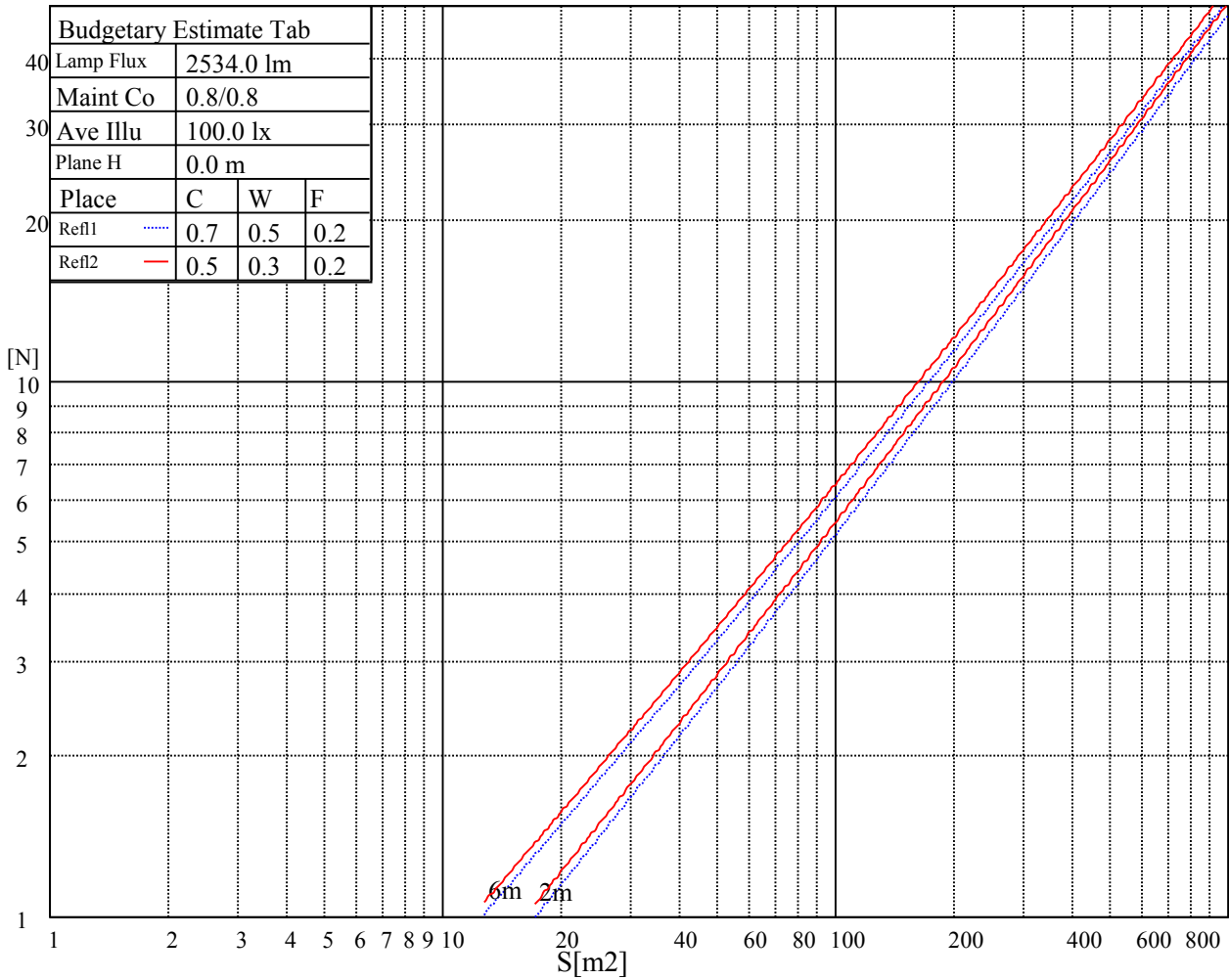
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3485	3485	3485	5577	5577	5577	16786	16786	16786

Glare Table

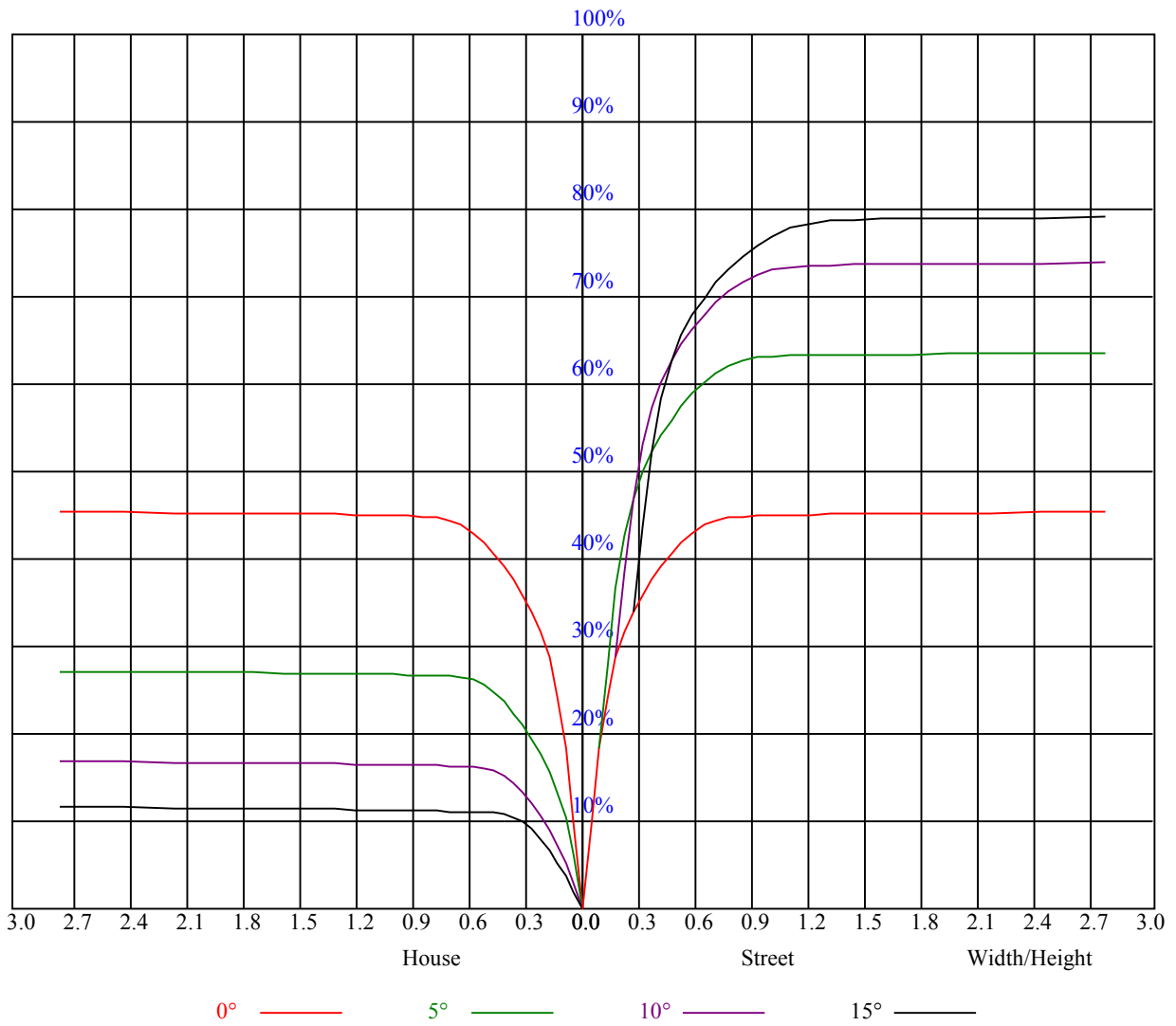
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.02	1.02	1.02	0.97	0.97	0.97	0.93	0.93	0.93	0.91
1	1.03	1.01	0.99	1.01	0.99	0.97	0.97	0.96	0.94	0.94	0.93	0.92	0.90	0.90	0.89	0.87
2	0.97	0.94	0.92	0.96	0.93	0.91	0.93	0.91	0.89	0.90	0.89	0.87	0.88	0.87	0.85	0.84
3	0.93	0.90	0.87	0.92	0.89	0.86	0.90	0.87	0.85	0.87	0.85	0.83	0.86	0.84	0.82	0.81
4	0.89	0.85	0.82	0.88	0.85	0.82	0.86	0.83	0.81	0.85	0.82	0.80	0.83	0.81	0.79	0.78
5	0.86	0.82	0.79	0.85	0.81	0.79	0.84	0.80	0.78	0.82	0.79	0.77	0.81	0.79	0.77	0.76
6	0.83	0.79	0.76	0.82	0.78	0.76	0.81	0.78	0.75	0.80	0.77	0.75	0.79	0.76	0.74	0.73
7	0.80	0.76	0.73	0.80	0.76	0.73	0.79	0.75	0.73	0.78	0.75	0.72	0.77	0.74	0.72	0.71
8	0.78	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.71	0.76	0.73	0.70	0.75	0.72	0.70	0.69
9	0.75	0.72	0.69	0.75	0.71	0.69	0.74	0.71	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.67
10	0.73	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.67	0.72	0.69	0.67	0.71	0.69	0.67	0.66



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	21367.39	21207.73	20442.44	19225.69	17271.19	14771.63	12382.18	9744.98	7614.30
45.0	21378.40	20932.44	19908.39	18218.16	16258.15	13725.56	11049.82	8770.48	6810.48
90.0	21229.75	20475.48	19280.75	17315.24	14914.78	10774.54	10185.43	7504.19	5802.39
135.0	21405.93	21053.57	20161.65	18999.96	16786.70	14298.15	12228.03	9321.05	7300.48
180.0	21367.39	21119.64	20381.88	18774.23	16946.36	14766.13	10844.46	9403.63	7308.74
225.0	21378.40	21323.34	20855.36	19726.71	17948.39	15905.79	13565.90	10561.47	8321.77
270.0	21229.75	21438.96	21240.76	20425.92	19143.11	17061.98	14479.83	12079.37	9728.47
315.0	21405.93	21224.24	20646.15	19027.49	17513.44	15355.23	10858.22	9965.76	7782.22
360.0	21367.39	21207.73	20442.44	19225.69	17271.19	14771.63	12382.18	9744.98	7614.30
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5687.33	4294.40	3396.98	2807.88	2184.64	1876.32	1644.53	1439.72	1314.75
45.0	4966.09	3881.48	3099.68	2796.87	2049.75	1770.61	1565.80	1381.92	1266.30
90.0	4525.09	3390.92	2753.37	2295.85	1921.47	1650.04	1476.06	1329.61	1230.51
135.0	5676.31	4184.29	3336.42	2785.85	2182.99	1867.51	1639.03	1436.42	1316.95
180.0	5628.97	4144.65	3313.84	2704.37	2214.37	1865.31	1640.68	1457.34	1320.25
225.0	6395.35	4617.58	3619.96	2903.67	2336.59	1941.84	1695.74	1498.08	1351.63
270.0	7333.51	5417.55	4178.78	3385.97	2791.36	2099.85	1795.39	1529.47	1378.06
315.0	5948.29	4294.95	3363.40	2697.76	2165.92	1813.56	1594.98	1417.70	1294.38
360.0	5687.33	4294.40	3396.98	2807.88	2184.64	1876.32	1644.53	1439.72	1314.75
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1221.70	1155.08	1106.08	1071.40	1040.02	1016.34	985.51	955.78	928.80
45.0	1192.52	1123.15	1081.86	1051.58	1015.24	990.46	966.79	934.86	910.63
90.0	1097.99	1087.75	1048.82	1012.32	981.55	957.71	936.01	909.04	887.67
135.0	1211.79	1130.86	1075.25	1040.02	1009.73	982.76	956.88	929.90	908.98
180.0	1223.90	1140.22	1095.68	1051.14	1013.64	987.71	962.66	937.17	914.71
225.0	1255.84	1166.65	1098.49	1056.20	1014.36	990.68	966.79	931.61	911.29
270.0	1267.95	1175.45	1109.94	1069.20	1031.21	1002.58	975.05	950.82	928.80
315.0	1200.78	1134.16	1096.50	1057.30	1024.98	998.28	971.64	938.71	914.93
360.0	1221.70	1155.08	1106.08	1071.40	1040.02	1016.34	985.51	955.78	928.80
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	902.92	881.45	861.08	843.46	817.59	770.79	701.42	591.86	497.71
45.0	888.06	863.83	842.91	826.95	793.36	732.25	650.22	547.81	442.65
90.0	868.24	844.90	826.07	808.34	762.09	698.01	613.44	491.87	404.77
135.0	889.16	866.59	847.32	830.80	806.58	761.98	687.10	577.54	481.19
180.0	893.01	869.40	847.32	828.60	807.29	756.47	684.08	584.48	490.77
225.0	889.33	865.27	847.98	828.65	809.38	778.17	715.57	634.64	530.19
270.0	902.37	880.90	864.94	845.67	821.99	803.82	761.98	676.64	588.55
315.0	892.46	869.67	848.09	830.86	809.77	765.83	696.35	599.34	500.35
360.0	902.92	881.45	861.08	843.46	817.59	770.79	701.42	591.86	497.71
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	397.51	287.94	179.76	103.73	58.08	35.24	27.47	22.02	18.00
45.0	345.20	284.64	140.28	75.15	37.88	29.79	21.42	17.12	14.87
90.0	291.58	177.56	113.20	54.89	31.22	25.27	18.83	15.14	13.21
135.0	378.79	281.89	168.42	97.01	46.80	32.59	24.56	19.16	16.46
180.0	382.20	278.59	190.55	108.19	52.52	35.73	28.52	21.42	18.94
225.0	424.15	327.86	221.60	128.28	69.21	38.98	32.48	24.94	21.47
270.0	491.10	371.08	280.24	161.92	87.87	49.17	34.69	27.31	22.30
315.0	385.28	273.74	183.39	98.99	51.31	36.23	29.95	23.07	20.21
360.0	397.51	287.94	179.76	103.73	58.08	35.24	27.47	22.02	18.00

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	13.98	12.88	12.55	12.28	12.06	11.84	11.67	11.51	11.34
45.0	12.61	12.28	12.11	11.89	11.73	11.56	11.45	11.29	11.18
90.0	12.39	12.17	11.95	11.78	11.62	11.51	11.34	11.23	11.12
135.0	12.83	12.50	12.28	12.11	11.89	11.73	11.62	11.45	11.34
180.0	14.42	12.61	12.39	12.22	12.00	11.84	11.67	11.51	11.40
225.0	18.44	12.72	12.39	12.17	11.95	11.67	11.56	11.40	11.29
270.0	19.38	14.70	12.55	12.33	12.06	11.84	11.73	11.51	11.40
315.0	16.08	12.55	12.28	12.11	11.84	11.73	11.56	11.40	11.29
360.0	13.98	12.88	12.55	12.28	12.06	11.84	11.67	11.51	11.34
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	11.23	11.12	11.01	10.90	10.85	10.74	10.68	10.63	10.52
45.0	11.07	10.96	10.85	10.79	10.68	10.63	10.57	10.46	10.46
90.0	11.01	10.90	10.79	10.74	10.63	10.57	10.57	10.46	10.46
135.0	11.23	11.12	10.96	10.85	10.79	10.74	10.68	10.63	10.57
180.0	11.23	11.12	11.01	10.90	10.85	10.74	10.68	10.63	10.57
225.0	11.12	11.01	10.90	10.79	10.74	10.63	10.57	10.52	10.46
270.0	11.23	11.12	11.01	10.90	10.79	10.74	10.63	10.57	10.52
315.0	11.12	11.01	10.96	10.85	10.74	10.68	10.63	10.52	10.46
360.0	11.23	11.12	11.01	10.90	10.85	10.74	10.68	10.63	10.52
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.52	10.46	10.41	10.35	10.35	10.30	10.30	10.24	10.24
45.0	10.41	10.35	10.35	10.30	10.24	10.24	10.19	10.19	10.19
90.0	10.41	10.35	10.35	10.30	10.24	10.24	10.24	10.19	10.19
135.0	10.52	10.52	10.46	10.46	10.41	10.41	10.35	10.35	10.35
180.0	10.52	10.52	10.46	10.46	10.41	10.41	10.35	10.35	10.35
225.0	10.41	10.35	10.35	10.30	10.30	10.24	10.24	10.24	10.24
270.0	10.46	10.41	10.41	10.35	10.35	10.30	10.30	10.24	10.24
315.0	10.46	10.41	10.35	10.35	10.30	10.24	10.24	10.19	10.19
360.0	10.52	10.46	10.41	10.35	10.35	10.30	10.30	10.24	10.24
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.24	10.24	10.19	10.19	10.19	10.13	10.13	10.13	10.13
45.0	10.13	10.13	10.13	10.13	10.08	10.08	10.08	10.08	10.02
90.0	10.19	10.19	10.19	10.13	10.13	10.13	10.13	10.13	10.13
135.0	10.35	10.30	10.30	10.30	10.30	10.24	10.24	10.24	10.19
180.0	10.35	10.30	10.30	10.24	10.24	10.24	10.19	10.19	10.19
225.0	10.19	10.19	10.19	10.19	10.19	10.19	10.13	10.13	10.13
270.0	10.24	10.24	10.19	10.19	10.19	10.19	10.19	10.13	10.13
315.0	10.19	10.19	10.19	10.13	10.13	10.13	10.08	10.08	10.08
360.0	10.24	10.24	10.19	10.19	10.19	10.13	10.13	10.13	10.13
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.13	10.13	10.08	10.08	10.08	10.08	10.02	10.02	10.02
45.0	10.08	10.02	10.08	10.13	10.13	10.13	9.97	9.97	9.91
90.0	10.13	10.13	10.24	10.46	10.79	10.74	9.91	9.97	9.97
135.0	10.30	10.74	10.35	10.63	10.90	11.07	10.02	9.97	9.97
180.0	10.19	10.19	10.24	10.24	10.19	10.13	10.02	9.97	9.97
225.0	10.13	10.08	10.08	10.13	10.13	10.19	10.08	9.91	9.91
270.0	10.13	10.08	10.13	10.13	10.19	10.35	10.63	9.97	9.97
315.0	10.08	10.08	10.08	10.08	10.19	10.24	10.02	9.97	9.97
360.0	10.13	10.13	10.08	10.08	10.08	10.08	10.02	10.02	10.02

Intensity data(cd)

C/ γ (°)	90.0
0.0	10.02
45.0	9.97
90.0	9.91
135.0	9.97
180.0	9.97
225.0	9.91
270.0	9.97
315.0	9.97
360.0	10.02