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Nata

LumCAT: 2-2078-M
Luminaire: 92.70.131.00
Report No: NATA0100
Test No: GC2019091106
LampCAT: CITIZEN CLU038
Lamp flux(lm): 1918.0
Number of Lamps: 1
Length(mm): 65
Phm Type: C

Voltage(V): 33.9700
Current(A): 0.3970
Power (W): 13.4800
PF: 0.0000
Ballast type: DC
Width(mm): 65
Height(mm): 0

Photometric Results

Lumens(lm): 1481.50
Efficiency(%): 77.24%
Lumens(lm)/Power(W): 109.90
Central intensity(cd): 4819.641
Maximum intensity(cd): 4819.641
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=33.6
 [C90/270]Total=33.6
Field angle(10%Imax): [C0/180]Total=50.0
 [C90/270]Total=50.0
Maximum s/h(1/2): C0_180=0.56 C90_270=0.56
Maximum s/h(1/4): C0_180=0.53 C90_270=0.53
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 77.24%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.508%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	4819.641	0.000	0	.000%	.000%
1.0	4810.359	4.608	4.608	.240%	.311%
2.0	4780.688	13.766	18.374	.718%	1.240%
3.0	4730.484	22.748	41.121	1.186%	2.776%
4.0	4662.563	31.442	72.563	1.639%	4.898%
5.0	4576.289	39.745	112.308	2.072%	7.581%
6.0	4474.125	47.562	159.87	2.480%	10.791%
7.0	4340.039	54.709	214.58	2.852%	14.484%
8.0	4205.602	61.160	275.739	3.189%	18.612%
9.0	4046.484	66.879	342.618	3.487%	23.126%
10.0	3865.430	71.600	414.218	3.733%	27.959%
11.0	3692.531	75.520	489.737	3.937%	33.057%
12.0	3499.313	78.617	568.354	4.099%	38.363%
13.0	3287.813	80.546	648.901	4.199%	43.800%
14.0	3070.688	81.388	730.289	4.243%	49.294%
15.0	2849.625	81.277	811.565	4.238%	54.780%
16.0	2602.758	79.893	891.458	4.165%	60.173%
17.0	2359.055	77.269	968.727	4.029%	65.388%
18.0	2117.461	73.808	1042.535	3.848%	70.370%
19.0	1865.883	69.302	1111.837	3.613%	75.048%
20.0	1611.844	63.652	1175.489	3.319%	79.344%
21.0	1358.888	57.044	1232.533	2.974%	83.195%
22.0	1123.320	49.881	1282.414	2.601%	86.562%
23.0	891.541	42.277	1324.691	2.204%	89.415%
24.0	675.907	34.270	1358.961	1.787%	91.729%
25.0	484.552	26.386	1385.348	1.376%	93.510%
26.0	331.460	19.262	1404.61	1.004%	94.810%
27.0	207.541	13.187	1417.796	.688%	95.700%
28.0	118.955	8.266	1426.063	.431%	96.258%
29.0	67.662	4.882	1430.945	.255%	96.587%
30.0	39.888	2.904	1433.849	.151%	96.783%
31.0	27.647	1.879	1435.728	.098%	96.910%
32.0	22.823	1.446	1437.174	.075%	97.008%
33.0	19.955	1.260	1438.434	.066%	97.093%
34.0	17.754	1.141	1439.576	.059%	97.170%
35.0	16.130	1.052	1440.628	.055%	97.241%
36.0	14.801	0.985	1441.613	.051%	97.308%
37.0	13.746	0.931	1442.544	.049%	97.370%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	12.860	0.888	1443.432	.046%	97.430%
39.0	12.073	0.851	1444.283	.044%	97.488%
40.0	11.447	0.820	1445.103	.043%	97.543%
41.0	10.941	0.797	1445.9	.042%	97.597%
42.0	10.463	0.778	1446.678	.041%	97.649%
43.0	10.013	0.758	1447.436	.040%	97.701%
44.0	9.682	0.743	1448.18	.039%	97.751%
45.0	9.373	0.732	1448.912	.038%	97.800%
46.0	9.070	0.721	1449.633	.038%	97.849%
47.0	8.838	0.712	1450.346	.037%	97.897%
48.0	8.634	0.706	1451.052	.037%	97.945%
49.0	8.445	0.701	1451.753	.037%	97.992%
50.0	8.283	0.697	1452.451	.036%	98.039%
51.0	8.135	0.695	1453.145	.036%	98.086%
52.0	8.016	0.693	1453.838	.036%	98.133%
53.0	7.903	0.692	1454.531	.036%	98.180%
54.0	7.798	0.692	1455.223	.036%	98.226%
55.0	7.720	0.693	1455.916	.036%	98.273%
56.0	7.643	0.694	1456.61	.036%	98.320%
57.0	7.566	0.695	1457.305	.036%	98.367%
58.0	7.509	0.697	1458.002	.036%	98.414%
59.0	7.453	0.700	1458.702	.036%	98.461%
60.0	7.390	0.701	1459.403	.037%	98.508%
61.0	7.355	0.704	1460.107	.037%	98.556%
62.0	7.313	0.707	1460.813	.037%	98.604%
63.0	7.277	0.710	1461.523	.037%	98.651%
64.0	7.228	0.712	1462.235	.037%	98.700%
65.0	7.200	0.714	1462.949	.037%	98.748%
66.0	7.144	0.716	1463.665	.037%	98.796%
67.0	7.137	0.718	1464.383	.037%	98.844%
68.0	7.123	0.722	1465.105	.038%	98.893%
69.0	7.080	0.725	1465.829	.038%	98.942%
70.0	7.059	0.726	1466.556	.038%	98.991%
71.0	7.045	0.729	1467.285	.038%	99.040%
72.0	7.031	0.732	1468.017	.038%	99.090%
73.0	7.024	0.735	1468.752	.038%	99.139%
74.0	7.003	0.737	1469.489	.038%	99.189%
75.0	6.989	0.739	1470.228	.039%	99.239%

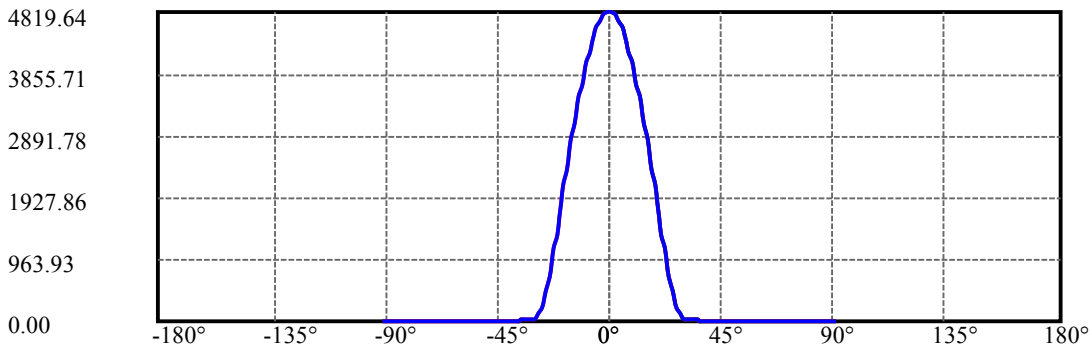
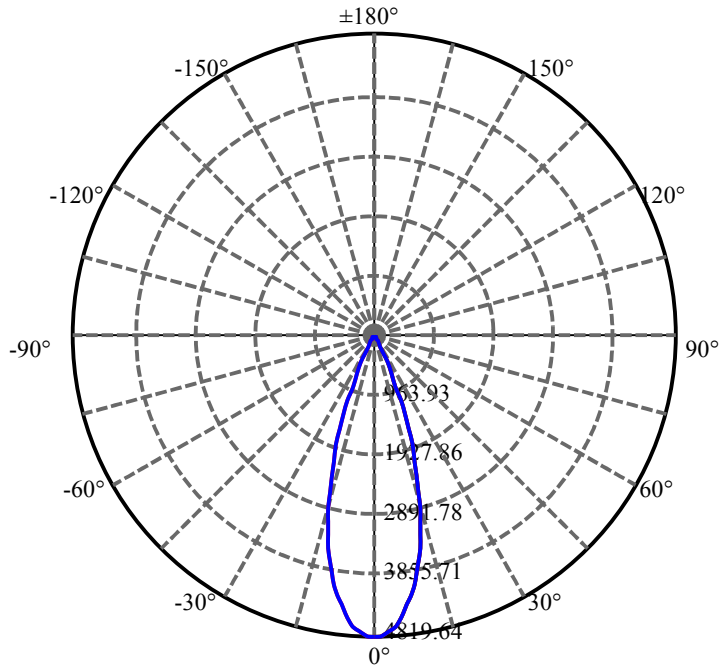
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	6.989	0.742	1470.97	.039%	99.289%
77.0	6.968	0.744	1471.715	.039%	99.339%
78.0	6.947	0.745	1472.459	.039%	99.390%
79.0	6.940	0.746	1473.206	.039%	99.440%
80.0	6.940	0.748	1473.954	.039%	99.491%
81.0	6.933	0.750	1474.704	.039%	99.541%
82.0	6.926	0.752	1475.456	.039%	99.592%
83.0	6.919	0.753	1476.208	.039%	99.643%
84.0	6.891	0.752	1476.96	.039%	99.693%
85.0	6.870	0.751	1477.711	.039%	99.744%
86.0	6.855	0.750	1478.462	.039%	99.795%
87.0	6.898	0.753	1479.214	.039%	99.846%
88.0	6.947	0.758	1479.973	.040%	99.897%
89.0	7.052	0.767	1480.74	.040%	99.949%
90.0	6.834	0.761	1481.501	.040%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1433.85	74.76%	96.78%
0-40	1445.10	75.34%	97.54%
0-60	1459.40	76.09%	98.51%
0-90	1480.74	77.20%	99.95%
0-120	1480.74	77.20%	99.95%
0-180	1481.50	77.24%	100.00%
60-90	22.04	1.15%	1.49%
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%
0-20.17	1185.20	61.79%	80.00%

ZONAL LUMEN SUMMARY

0-10	414.22
10-20	761.27
20-30	258.36
30-40	11.25
40-50	7.35
50-60	6.95
60-70	7.15
70-80	7.40
80-90	6.79
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: —————

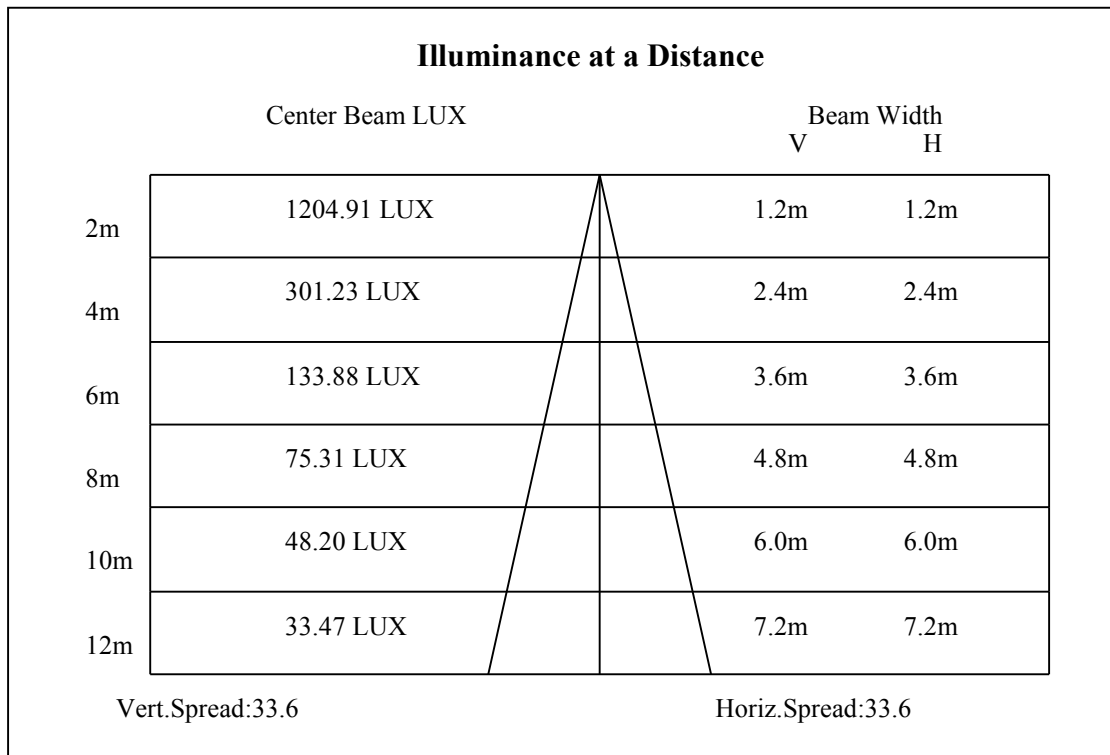
C90/C270: —————

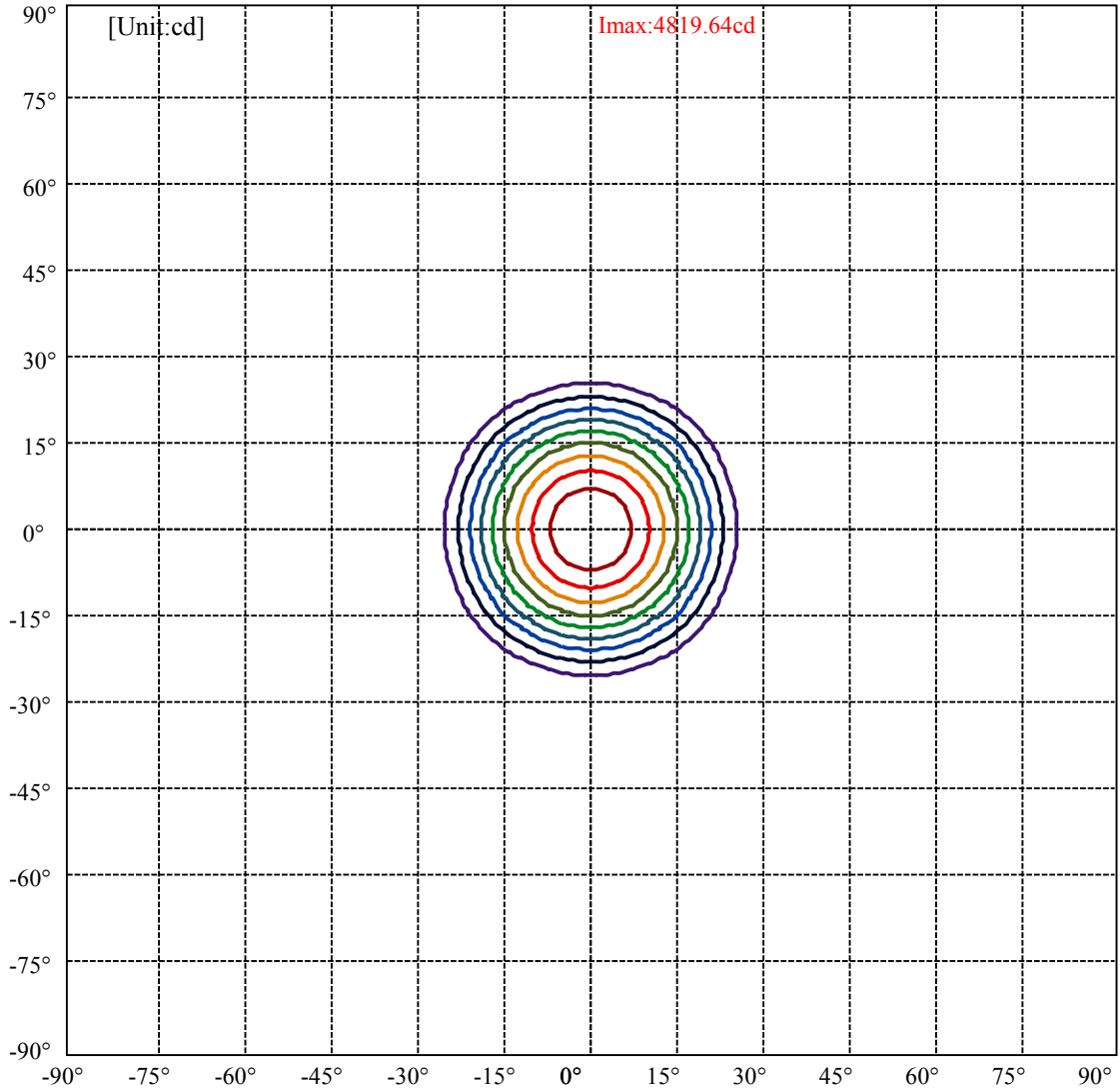
Field angle(10%Imax):C0/180Left:25.0 Right:25.0

:C90/270Left:25.0 Right:25.0

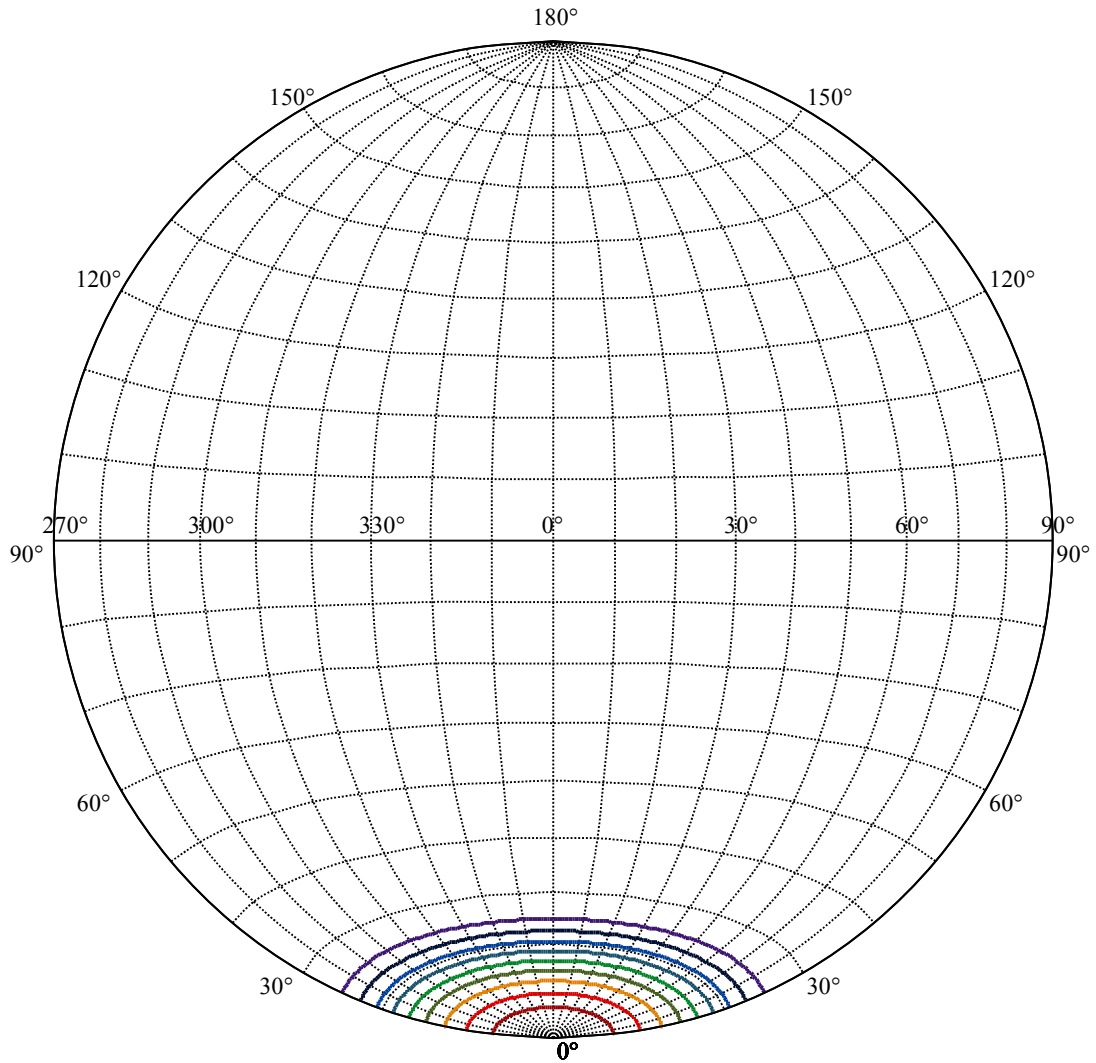
Beam Angle(50%Imax):C0/180Left:16.8 Right:16.8

:C90/270Left:16.8 Right:16.8





(10%Imax)	481.964	—
(20%Imax)	963.928	—
(30%Imax)	1445.89	—
(40%Imax)	1927.86	—
(50%Imax)	2409.82	—
(60%Imax)	2891.78	—
(70%Imax)	3373.75	—
(80%Imax)	3855.71	—
(90%Imax)	4337.68	—



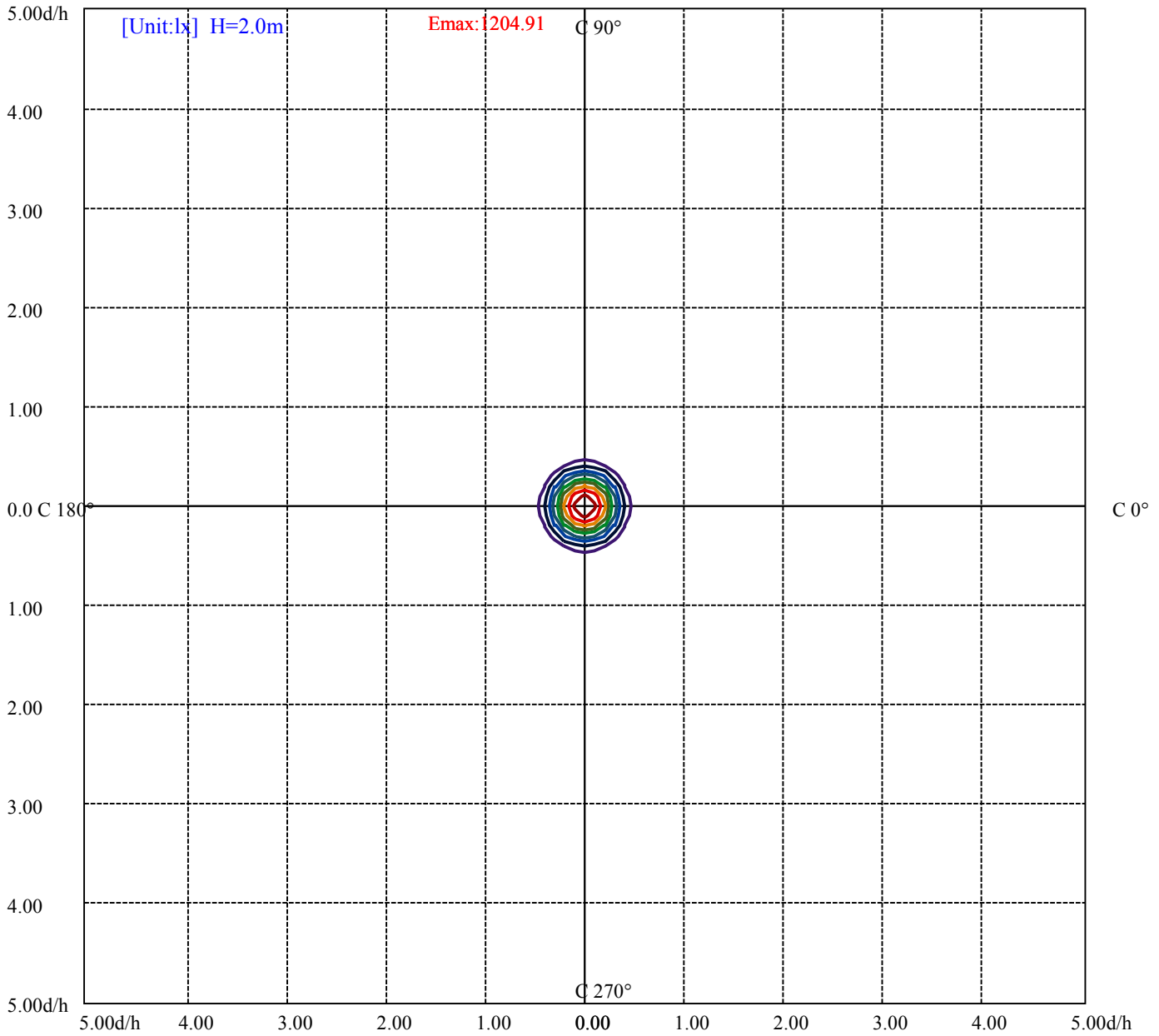
House

[Unit:cd]

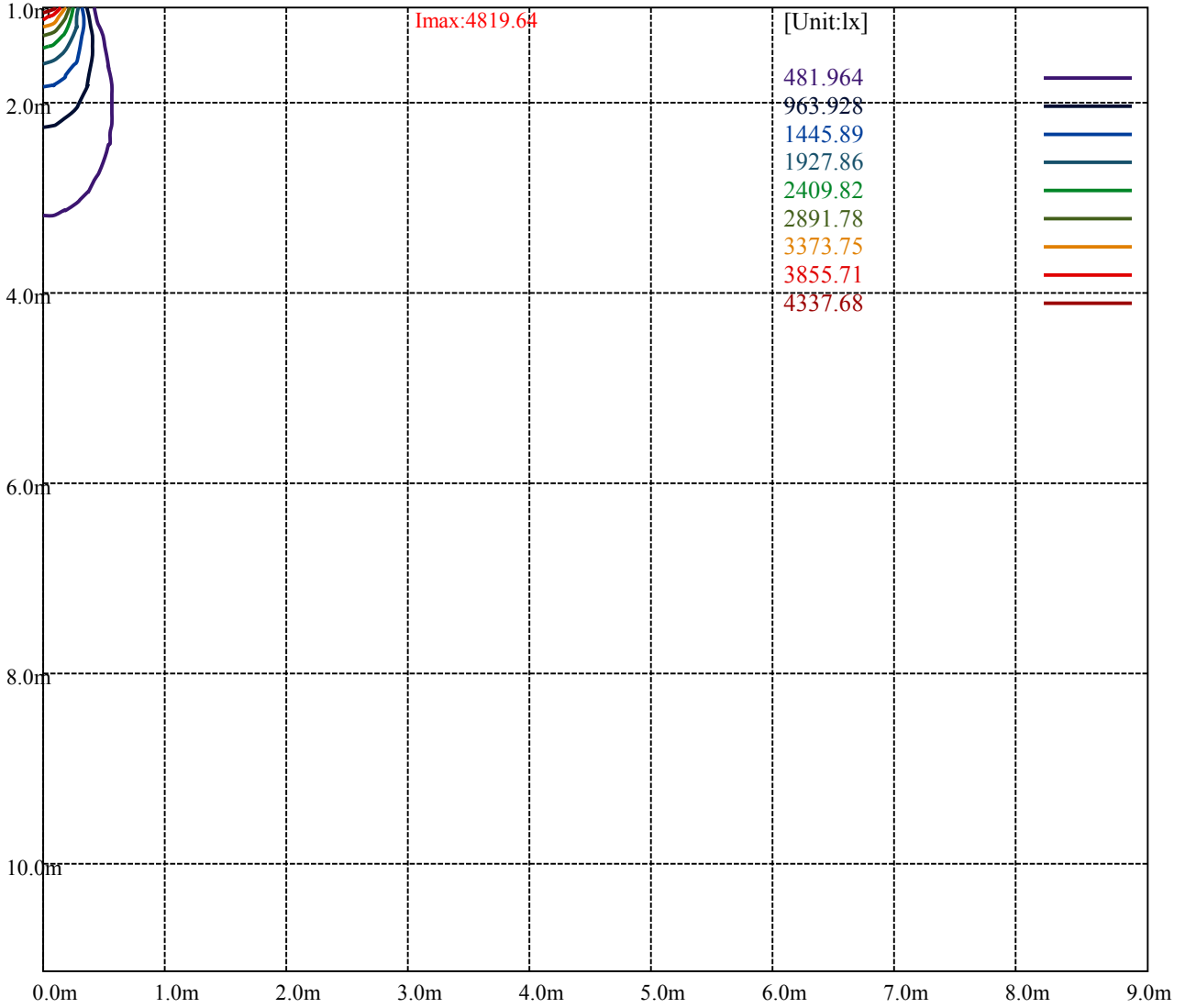
Road

Imax:4819.64

(10%Imax) 481.964	—
(20%Imax) 963.928	—
(30%Imax) 1445.89	—
(40%Imax) 1927.86	—
(50%Imax) 2409.82	—
(60%Imax) 2891.78	—
(70%Imax) 3373.75	—
(80%Imax) 3855.71	—
(90%Imax) 4337.68	—



(10%Emax) 120.491	—
(20%Emax) 240.982	—
(30%Emax) 361.4725	—
(40%Emax) 481.965	—
(50%Emax) 602.455	—
(60%Emax) 722.945	—
(70%Emax) 843.4375	—
(80%Emax) 963.9275	—
(90%Emax) 1084.42	—



Luminance Table

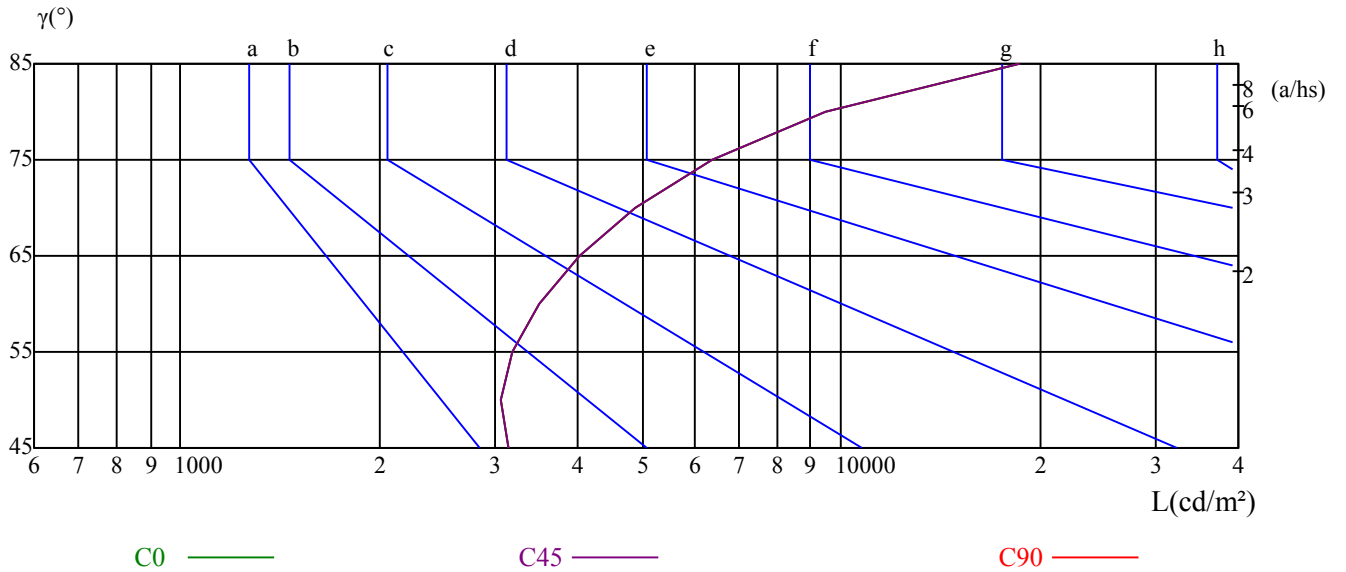
γ	45	50	55	60	65	70	75	80	85
C0	3137	3050	3186	3498	4032	4885	6391	9459	18655
C45	3137	3050	3186	3498	4032	4885	6391	9459	18655
C90	3137	3050	3186	3498	4032	4885	6391	9459	18655

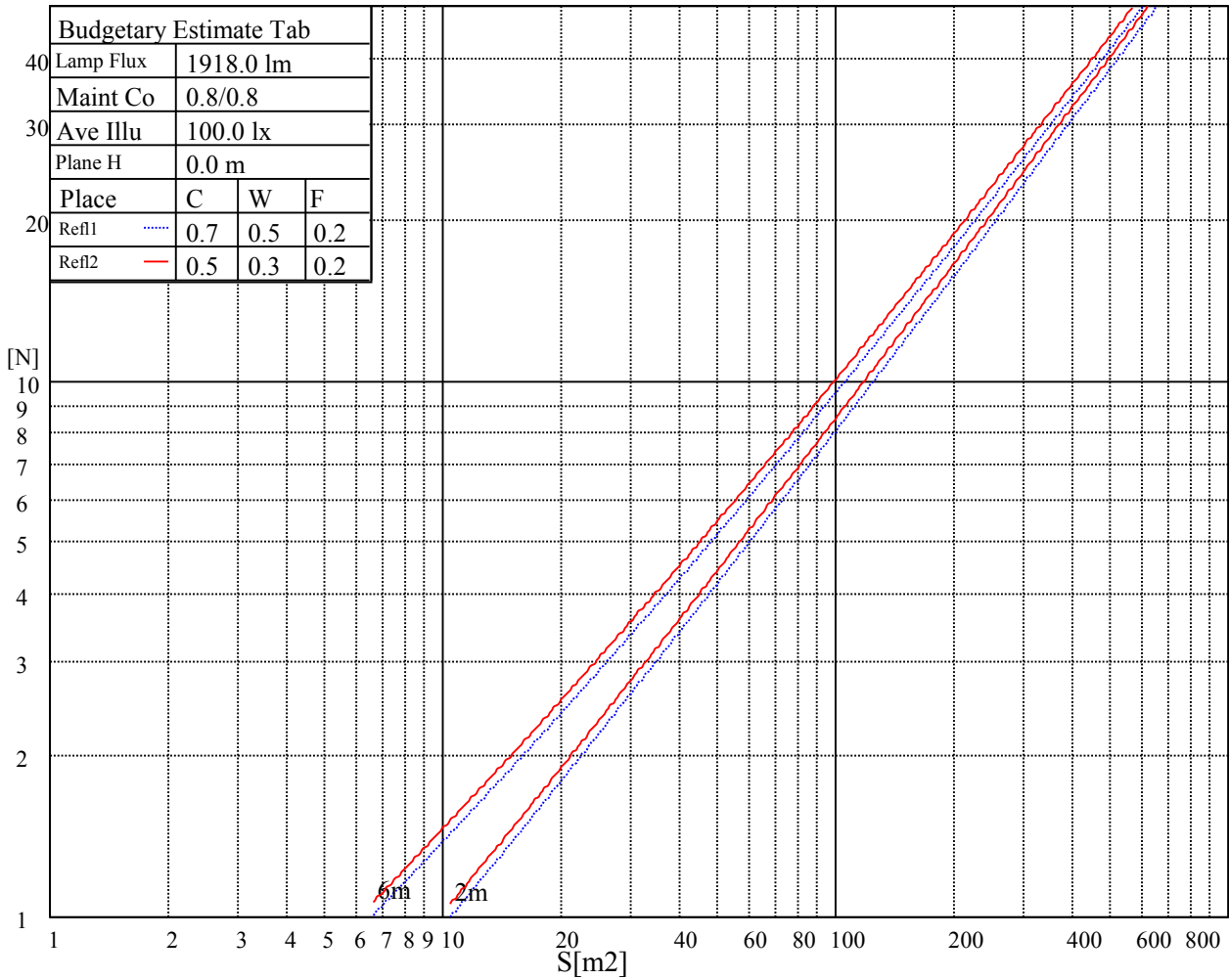
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4032	4032	4032	6391	6391	6391	18655	18655	18655

Glare Table

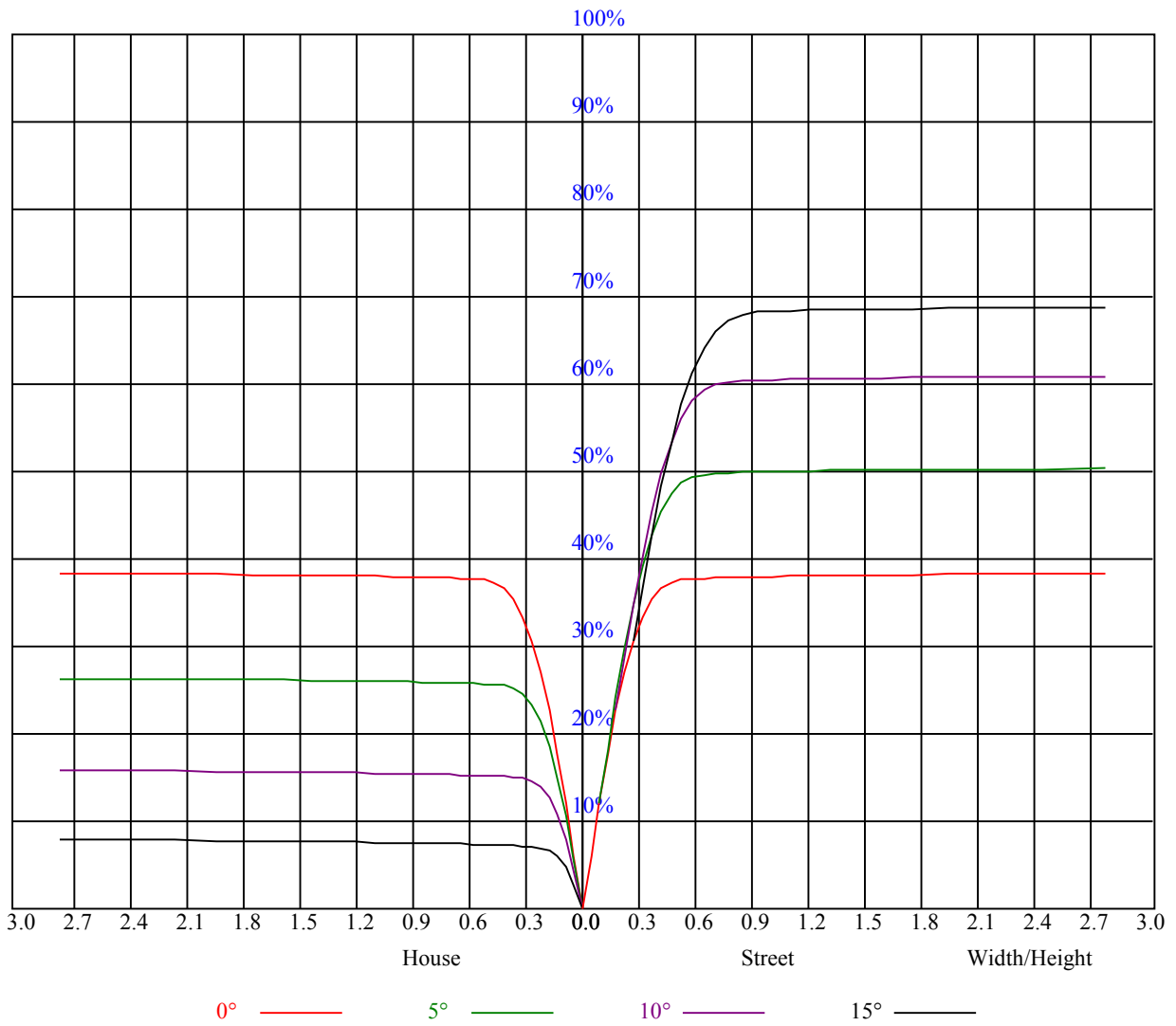
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.92	0.92	0.92	0.90	0.90	0.90	0.86	0.86	0.86	0.82	0.82	0.82	0.79	0.79	0.79	0.77
1	0.87	0.85	0.84	0.85	0.84	0.82	0.82	0.81	0.80	0.79	0.78	0.77	0.77	0.76	0.75	0.74
2	0.82	0.80	0.78	0.81	0.79	0.77	0.79	0.77	0.75	0.76	0.75	0.74	0.74	0.73	0.72	0.71
3	0.79	0.76	0.73	0.78	0.75	0.73	0.76	0.74	0.72	0.74	0.72	0.71	0.72	0.71	0.70	0.69
4	0.75	0.72	0.70	0.75	0.72	0.69	0.73	0.71	0.69	0.72	0.70	0.68	0.70	0.69	0.67	0.66
5	0.73	0.69	0.67	0.72	0.69	0.67	0.71	0.68	0.66	0.69	0.67	0.65	0.68	0.66	0.65	0.64
6	0.70	0.67	0.64	0.69	0.66	0.64	0.68	0.66	0.64	0.67	0.65	0.63	0.66	0.64	0.63	0.62
7	0.68	0.64	0.62	0.67	0.64	0.62	0.66	0.63	0.61	0.65	0.63	0.61	0.65	0.62	0.61	0.60
8	0.65	0.62	0.60	0.65	0.62	0.60	0.64	0.61	0.59	0.64	0.61	0.59	0.63	0.61	0.59	0.58
9	0.63	0.60	0.58	0.63	0.60	0.58	0.62	0.59	0.58	0.62	0.59	0.57	0.61	0.59	0.57	0.56
10	0.61	0.58	0.56	0.61	0.58	0.56	0.61	0.58	0.56	0.60	0.57	0.56	0.60	0.57	0.56	0.55



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	4814.44	4844.81	4847.63	4835.81	4807.13	4753.69	4684.50	4599.56	4490.44
45.0	4812.75	4824.56	4806.56	4776.75	4731.19	4654.69	4565.81	4460.63	4329.56
90.0	4817.81	4790.25	4744.69	4673.25	4593.38	4498.88	4371.19	4225.50	4070.25
135.0	4833.56	4795.31	4741.31	4684.50	4575.94	4459.50	4353.19	4179.38	4029.75
180.0	4814.44	4772.25	4710.38	4616.44	4509.56	4390.88	4263.75	4083.75	3921.75
225.0	4812.75	4787.44	4744.13	4665.38	4582.69	4481.44	4358.25	4209.19	4064.63
270.0	4817.81	4826.81	4809.38	4778.44	4723.88	4653.56	4555.69	4438.69	4324.50
315.0	4833.56	4841.44	4841.44	4813.31	4776.75	4717.69	4640.63	4523.63	4413.94
360.0	4814.44	4844.81	4847.63	4835.81	4807.13	4753.69	4684.50	4599.56	4490.44
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4342.50	4209.19	4057.31	3871.69	3675.38	3486.38	3270.38	3036.38	2816.44
45.0	4178.81	4032.56	3849.75	3649.50	3467.25	3254.63	3060.56	2821.50	2565.00
90.0	3893.06	3704.06	3524.63	3316.50	3120.19	2887.88	2639.25	2408.06	2145.94
135.0	3864.94	3650.06	3466.69	3273.19	3024.00	2806.31	2580.75	2292.19	2062.69
180.0	3746.81	3522.94	3333.38	3139.31	2904.75	2658.38	2430.00	2172.94	1946.81
225.0	3890.25	3703.50	3526.88	3313.13	3109.50	2875.50	2624.63	2387.81	2150.44
270.0	4170.94	4001.63	3844.69	3669.75	3444.19	3250.69	3045.94	2799.56	2534.06
315.0	4284.56	4099.50	3936.94	3761.44	3557.25	3345.75	3145.50	2903.63	2651.06
360.0	4342.50	4209.19	4057.31	3871.69	3675.38	3486.38	3270.38	3036.38	2816.44
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2588.63	2327.63	2071.69	1841.63	1581.75	1348.31	1054.69	830.25	622.13
45.0	2329.88	2091.38	1806.19	1567.13	1365.75	1074.38	833.06	658.13	436.50
90.0	1893.38	1656.56	1419.75	1104.92	918.39	713.59	507.43	330.58	212.12
135.0	1841.06	1581.19	1312.88	1079.44	830.25	621.00	425.25	284.06	167.40
180.0	1692.56	1422.00	1121.06	924.53	688.78	502.88	345.04	196.48	115.76
225.0	1874.25	1642.50	1407.38	1118.53	898.26	691.99	478.69	303.58	187.99
270.0	2302.31	2046.94	1821.94	1562.06	1299.38	1071.56	826.88	599.63	420.75
315.0	2417.63	2158.88	1933.88	1672.88	1404.00	1108.63	936.23	673.71	489.04
360.0	2588.63	2327.63	2071.69	1841.63	1581.75	1348.31	1054.69	830.25	622.13
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	398.81	289.13	156.54	86.06	43.43	32.57	27.00	22.73	20.14
45.0	291.94	168.92	87.47	44.61	32.34	25.71	22.11	19.52	17.10
90.0	111.71	56.25	35.89	26.27	22.67	19.35	16.88	15.53	14.40
135.0	83.98	41.68	30.49	24.92	20.76	18.45	16.71	15.19	13.95
180.0	56.70	32.18	25.93	22.28	19.24	17.49	16.20	14.91	14.06
225.0	99.34	43.59	31.22	25.14	22.05	19.41	17.49	16.09	14.91
270.0	287.44	137.64	71.10	38.36	27.56	23.57	20.81	18.51	16.82
315.0	330.41	182.25	102.66	51.47	33.13	26.04	22.44	19.58	17.66
360.0	398.81	289.13	156.54	86.06	43.43	32.57	27.00	22.73	20.14
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	18.23	16.48	15.02	13.95	12.99	12.32	11.64	11.03	10.63
45.0	15.58	14.46	13.22	12.49	11.87	11.19	10.63	10.29	9.84
90.0	13.16	12.49	11.87	11.08	10.69	10.29	9.96	9.51	9.23
135.0	13.11	12.32	11.64	11.14	10.63	10.24	9.84	9.51	9.28
180.0	13.11	12.38	11.81	11.25	10.69	10.29	9.96	9.51	9.34
225.0	13.73	12.88	12.21	11.48	10.91	10.52	10.07	9.62	9.28
270.0	15.53	14.29	13.39	12.49	11.81	11.25	10.69	10.29	9.84
315.0	15.98	14.68	13.73	12.71	11.98	11.42	10.91	10.35	10.01
360.0	18.23	16.48	15.02	13.95	12.99	12.32	11.64	11.03	10.63

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	10.24	9.79	9.51	9.28	9.00	8.78	8.55	8.44	8.27
45.0	9.51	9.17	8.94	8.72	8.49	8.33	8.16	8.04	7.93
90.0	9.00	8.78	8.55	8.33	8.21	8.10	7.93	7.82	7.71
135.0	9.00	8.78	8.55	8.44	8.27	8.16	8.04	7.93	7.82
180.0	9.11	8.83	8.66	8.49	8.33	8.21	8.10	7.99	7.93
225.0	9.00	8.78	8.55	8.33	8.21	8.04	7.93	7.82	7.71
270.0	9.45	9.17	8.89	8.66	8.44	8.27	8.10	7.99	7.88
315.0	9.68	9.28	9.06	8.83	8.61	8.38	8.27	8.10	7.99
360.0	10.24	9.79	9.51	9.28	9.00	8.78	8.55	8.44	8.27
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	8.16	8.04	7.93	7.82	7.76	7.76	7.65	7.59	7.54
45.0	7.82	7.71	7.65	7.59	7.48	7.43	7.37	7.31	7.26
90.0	7.65	7.59	7.54	7.43	7.37	7.31	7.26	7.26	7.20
135.0	7.71	7.65	7.59	7.48	7.48	7.43	7.37	7.37	7.31
180.0	7.88	7.76	7.71	7.65	7.59	7.54	7.48	7.43	7.43
225.0	7.59	7.54	7.48	7.43	7.37	7.31	7.26	7.20	7.20
270.0	7.76	7.71	7.59	7.54	7.48	7.37	7.37	7.31	7.26
315.0	7.82	7.76	7.65	7.59	7.54	7.48	7.37	7.37	7.31
360.0	8.16	8.04	7.93	7.82	7.76	7.76	7.65	7.59	7.54
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	7.48	7.43	7.43	7.37	7.31	7.26	7.26	7.26	7.20
45.0	7.26	7.20	7.14	7.09	7.09	7.09	7.03	7.03	6.98
90.0	7.14	7.09	7.09	7.03	7.03	7.03	6.98	6.98	6.98
135.0	7.26	7.20	7.20	7.14	7.14	7.09	7.09	7.03	7.03
180.0	7.37	7.31	7.31	7.26	7.26	7.26	7.20	7.14	7.20
225.0	7.14	7.14	7.09	7.03	7.03	7.03	6.98	6.98	6.98
270.0	7.26	7.20	7.14	7.09	7.09	7.09	7.03	7.03	6.98
315.0	7.31	7.26	7.20	7.14	7.14	7.14	7.09	7.03	7.03
360.0	7.48	7.43	7.43	7.37	7.31	7.26	7.26	7.26	7.20
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	7.20	7.20	7.14	7.14	7.14	7.14	7.09	7.09	7.09
45.0	6.98	6.92	6.98	6.92	6.92	6.86	6.86	6.86	6.86
90.0	6.98	6.98	6.98	6.92	6.92	6.86	6.86	6.86	6.92
135.0	7.03	7.03	7.03	6.98	6.98	6.98	6.98	6.92	6.92
180.0	7.14	7.14	7.09	7.09	7.09	7.09	7.03	7.09	7.03
225.0	6.92	6.92	6.86	6.92	6.92	6.86	6.86	6.86	6.86
270.0	6.98	6.98	6.98	6.98	6.98	6.98	6.98	6.92	6.92
315.0	7.03	7.03	6.98	6.98	6.98	6.98	6.92	6.92	6.92
360.0	7.20	7.20	7.14	7.14	7.14	7.14	7.09	7.09	7.09
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	7.09	7.09	7.09	7.03	7.03	7.03	7.03	7.03	7.03
45.0	6.86	6.86	6.86	6.81	6.81	6.81	6.81	6.75	6.75
90.0	6.86	6.86	6.86	6.86	6.81	6.75	7.14	7.59	8.44
135.0	6.92	6.86	6.86	6.86	6.86	6.86	6.86	6.86	6.86
180.0	7.03	7.03	6.98	6.98	6.98	6.98	6.98	6.98	6.98
225.0	6.86	6.86	6.86	6.81	6.75	6.75	6.75	6.75	6.75
270.0	6.92	6.92	6.92	6.92	6.86	6.81	6.75	6.75	6.75
315.0	6.92	6.92	6.92	6.86	6.86	6.86	6.86	6.86	6.86
360.0	7.09	7.09	7.09	7.03	7.03	7.03	7.03	7.03	7.03

Intensity data(cd)

C/ γ (°)	90.0
0.0	7.03
45.0	6.75
90.0	6.75
135.0	6.86
180.0	6.98
225.0	6.75
270.0	6.75
315.0	6.81
360.0	7.03