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## Nata

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LumCAT: LN01D05024DA-N

Luminaire: 97.70.234.00

Report No: 210107-B002

Test No: 210107-C002

LampCAT: SEOUL SAWX10 LES9.8

Lamp flux(lm): 1759.0

Number of Lamps: 1

Length(mm): 92

Phm Type: C

Voltage(V): 35.5600

Current(A): 0.3810

Power (W): 13.5480

PF: 0.0000

Ballast type: DC

Width(mm): 92

Height(mm): 50

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## Photometric Results

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Lumens(lm): 1568.32

Efficiency(%): 89.16%

Lumens(lm)/Power(W): 115.76

Central intensity(cd): 5231.390

Maximum intensity(cd): 5231.390

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=29.5

[C90/270]Total=29.5

Field angle(10%Imax): [C0/180]Total=49.5

[C90/270]Total=49.5

Maximum s/h(1/2): C0\_180=0.50 C90\_270=0.50

Maximum s/h(1/4): C0\_180=0.48 C90\_270=0.48

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 89.16%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 96.624%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5231.391	0.000	0	.000%	.000%
1.0	5218.594	5.000	5	.284%	.319%
2.0	5181.188	14.927	19.927	.849%	1.271%
3.0	5113.688	24.622	44.549	1.400%	2.841%
4.0	5025.727	33.940	78.489	1.929%	5.005%
5.0	4919.625	42.784	121.273	2.432%	7.733%
6.0	4762.477	50.882	172.155	2.893%	10.977%
7.0	4602.727	58.130	230.285	3.305%	14.684%
8.0	4429.547	64.642	294.927	3.675%	18.805%
9.0	4218.047	70.084	365.011	3.984%	23.274%
10.0	3966.609	74.068	439.079	4.211%	27.997%
11.0	3727.055	76.876	515.955	4.370%	32.899%
12.0	3457.969	78.543	594.497	4.465%	37.907%
13.0	3120.891	78.074	672.572	4.439%	42.885%
14.0	2837.953	76.273	748.844	4.336%	47.748%
15.0	2550.797	73.979	822.824	4.206%	52.465%
16.0	2242.969	70.242	893.066	3.993%	56.944%
17.0	1945.828	65.231	958.297	3.708%	61.103%
18.0	1696.922	60.061	1018.358	3.414%	64.933%
19.0	1434.270	54.476	1072.834	3.097%	68.407%
20.0	1227.417	48.716	1121.55	2.770%	71.513%
21.0	1030.303	43.353	1164.903	2.465%	74.277%
22.0	866.285	38.113	1203.016	2.167%	76.707%
23.0	731.742	33.531	1236.547	1.906%	78.845%
24.0	601.952	29.159	1265.706	1.658%	80.705%
25.0	493.495	24.908	1290.614	1.416%	82.293%
26.0	415.877	21.466	1312.08	1.220%	83.662%
27.0	349.643	18.729	1330.809	1.065%	84.856%
28.0	289.048	16.170	1346.979	.919%	85.887%
29.0	248.414	14.062	1361.04	.799%	86.783%
30.0	216.738	12.559	1373.599	.714%	87.584%
31.0	182.995	11.124	1384.723	.632%	88.293%
32.0	162.401	9.895	1394.619	.563%	88.924%
33.0	146.391	9.097	1403.716	.517%	89.504%
34.0	130.535	8.381	1412.096	.476%	90.039%
35.0	117.788	7.712	1419.808	.438%	90.531%
36.0	107.986	7.189	1426.997	.409%	90.989%
37.0	97.882	6.714	1433.711	.382%	91.417%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	90.352	6.283	1439.994	.357%	91.818%
39.0	82.652	5.905	1445.899	.336%	92.194%
40.0	75.558	5.518	1451.417	.314%	92.546%
41.0	69.940	5.181	1456.598	.295%	92.876%
42.0	64.582	4.887	1461.486	.278%	93.188%
43.0	58.971	4.577	1466.062	.260%	93.480%
44.0	54.844	4.296	1470.358	.244%	93.754%
45.0	50.998	4.068	1474.426	.231%	94.013%
46.0	46.575	3.816	1478.242	.217%	94.256%
47.0	43.376	3.578	1481.819	.203%	94.485%
48.0	40.423	3.388	1485.207	.193%	94.701%
49.0	37.434	3.197	1488.404	.182%	94.904%
50.0	34.770	3.010	1491.414	.171%	95.096%
51.0	32.674	2.853	1494.268	.162%	95.278%
52.0	30.670	2.718	1496.986	.155%	95.452%
53.0	28.920	2.592	1499.578	.147%	95.617%
54.0	27.457	2.485	1502.063	.141%	95.775%
55.0	26.170	2.394	1504.457	.136%	95.928%
56.0	25.080	2.316	1506.773	.132%	96.076%
57.0	24.026	2.245	1509.018	.128%	96.219%
58.0	23.063	2.178	1511.195	.124%	96.358%
59.0	22.247	2.118	1513.314	.120%	96.493%
60.0	21.495	2.066	1515.38	.117%	96.624%
61.0	20.707	2.014	1517.394	.114%	96.753%
62.0	20.025	1.963	1519.357	.112%	96.878%
63.0	19.484	1.922	1521.278	.109%	97.001%
64.0	18.851	1.881	1523.159	.107%	97.120%
65.0	18.316	1.839	1524.999	.105%	97.238%
66.0	17.880	1.806	1526.805	.103%	97.353%
67.0	17.487	1.778	1528.583	.101%	97.466%
68.0	17.311	1.763	1530.346	.100%	97.579%
69.0	17.438	1.773	1532.119	.101%	97.692%
70.0	17.831	1.811	1533.93	.103%	97.807%
71.0	18.499	1.878	1535.808	.107%	97.927%
72.0	19.209	1.961	1537.768	.111%	98.052%
73.0	20.032	2.052	1539.82	.117%	98.183%
74.0	20.721	2.142	1541.963	.122%	98.319%
75.0	21.466	2.229	1544.192	.127%	98.462%

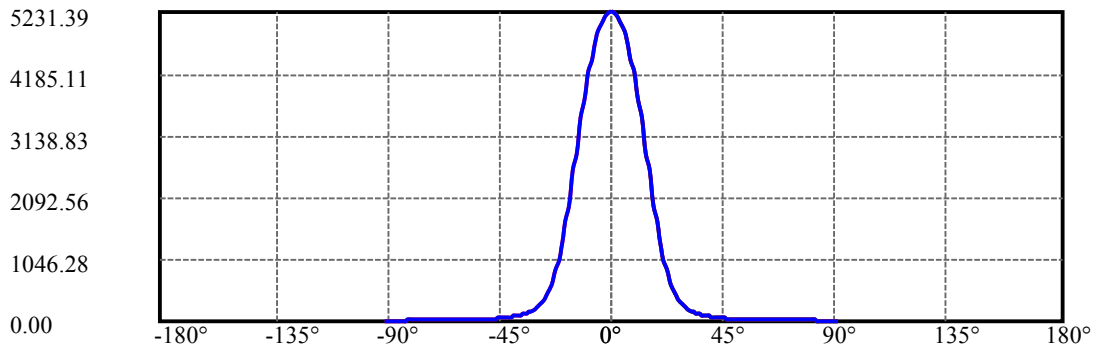
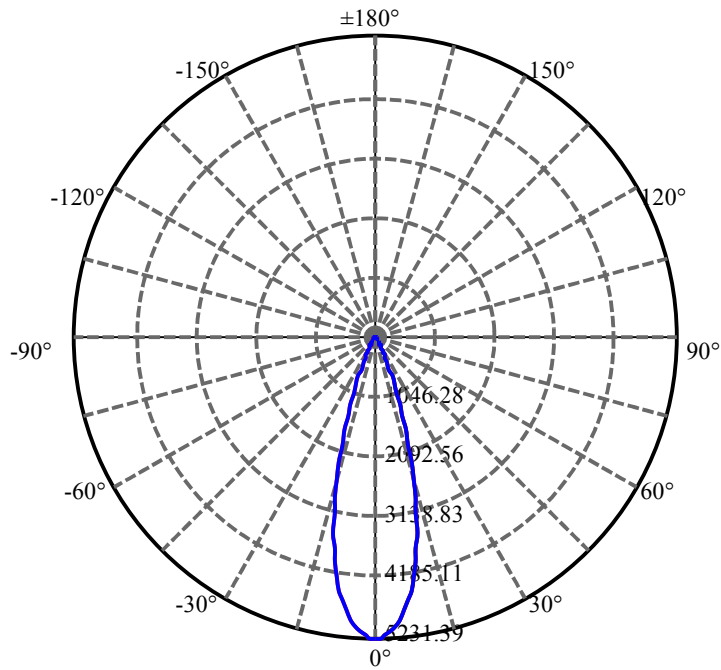
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	22.064	2.311	1546.503	.131%	98.609%
77.0	22.352	2.368	1548.871	.135%	98.760%
78.0	22.282	2.389	1551.26	.136%	98.912%
79.0	21.361	2.345	1553.605	.133%	99.062%
80.0	20.109	2.236	1555.841	.127%	99.204%
81.0	18.316	2.078	1557.919	.118%	99.337%
82.0	15.947	1.858	1559.777	.106%	99.455%
83.0	13.528	1.602	1561.379	.091%	99.557%
84.0	11.475	1.362	1562.741	.077%	99.644%
85.0	9.858	1.164	1563.906	.066%	99.719%
86.0	8.740	1.017	1564.922	.058%	99.783%
87.0	8.044	0.919	1565.841	.052%	99.842%
88.0	7.636	0.859	1566.7	.049%	99.897%
89.0	7.341	0.821	1567.52	.047%	99.949%
90.0	7.228	0.799	1568.319	.045%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1373.60	78.09%	87.58%
0-40	1451.42	82.51%	92.55%
0-60	1515.38	86.15%	96.62%
0-90	1567.52	89.11%	99.95%
0-120	1567.52	89.11%	99.95%
0-180	1568.32	89.16%	100.00%
60-90	54.21	3.08%	3.46%
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%
0-23.62	1254.66	71.33%	80.00%

ZONAL LUMEN SUMMARY

0-10	439.08
10-20	682.47
20-30	252.05
30-40	77.82
40-50	40.00
50-60	23.97
60-70	18.55
70-80	21.91
80-90	11.68
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: —————

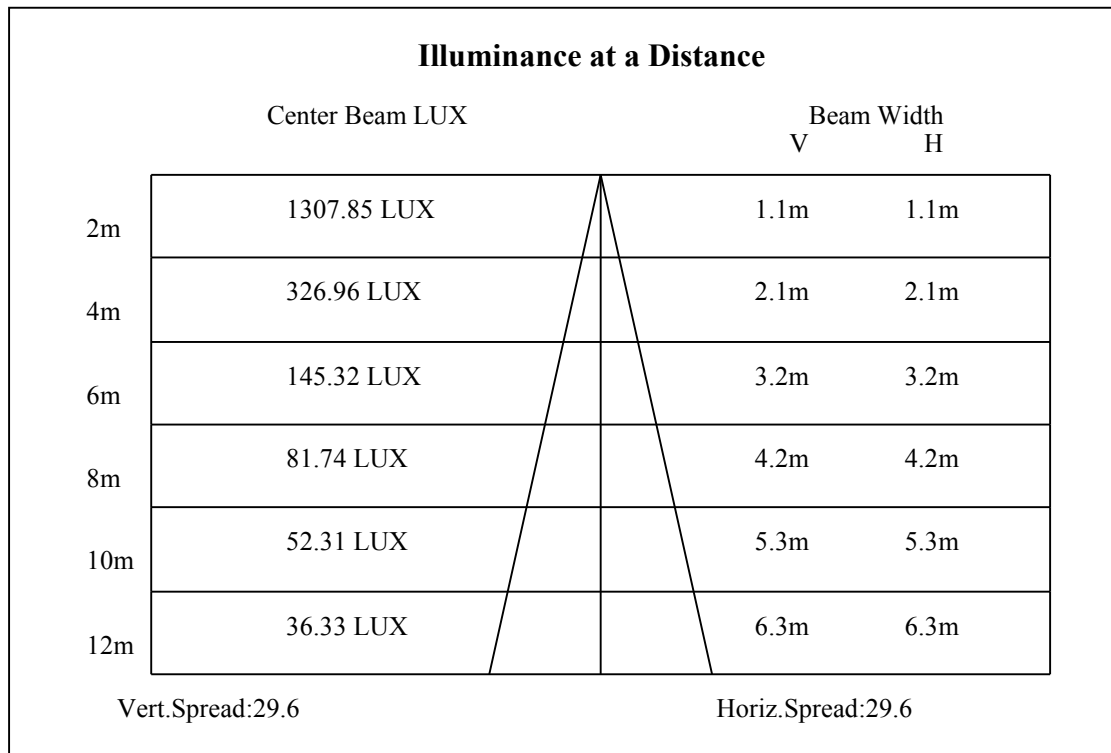
C90/C270: —————

Field angle(10%Imax):C0/180Left:24.7 Right:24.7

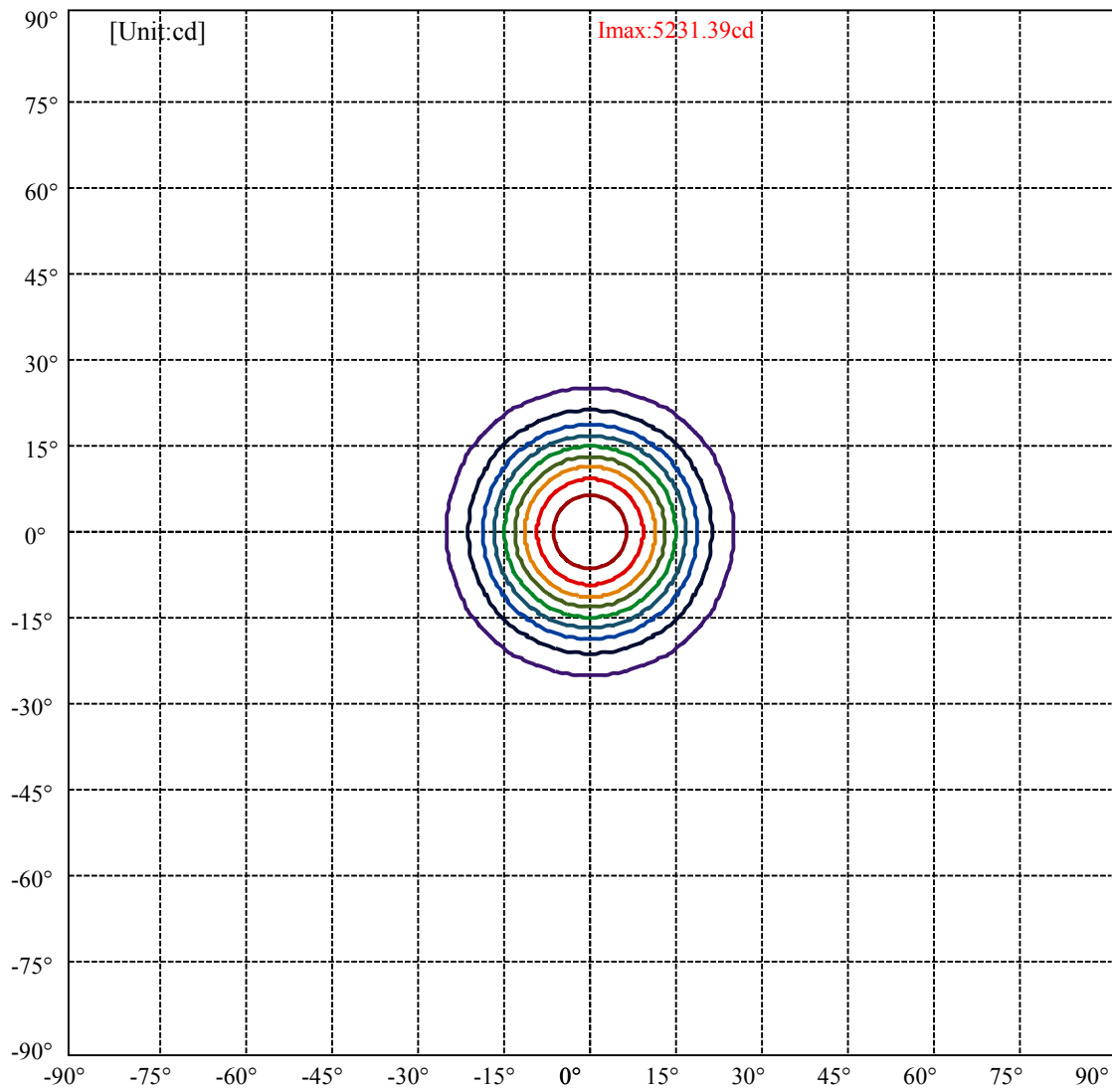
:C90/270Left:24.7 Right:24.7

Beam Angle(50%Imax):C0/180Left:14.8 Right:14.8

:C90/270Left:14.8 Right:14.8

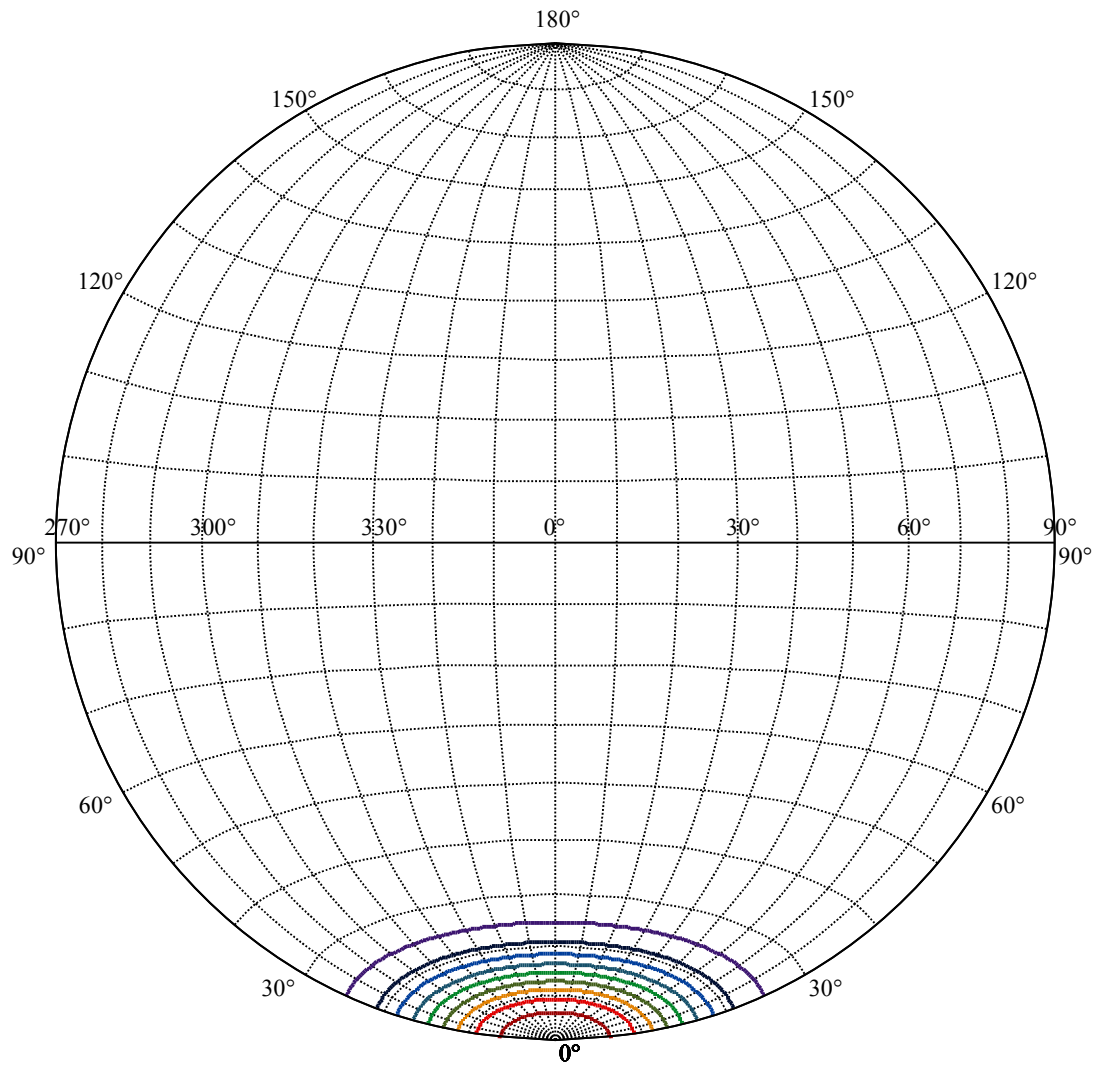


ISO-Intensity(V-H)



(10%Imax) 523.139	—
(20%Imax) 1046.28	—
(30%Imax) 1569.42	—
(40%Imax) 2092.56	—
(50%Imax) 2615.7	—
(60%Imax) 3138.83	—
(70%Imax) 3661.97	—
(80%Imax) 4185.11	—
(90%Imax) 4708.25	—





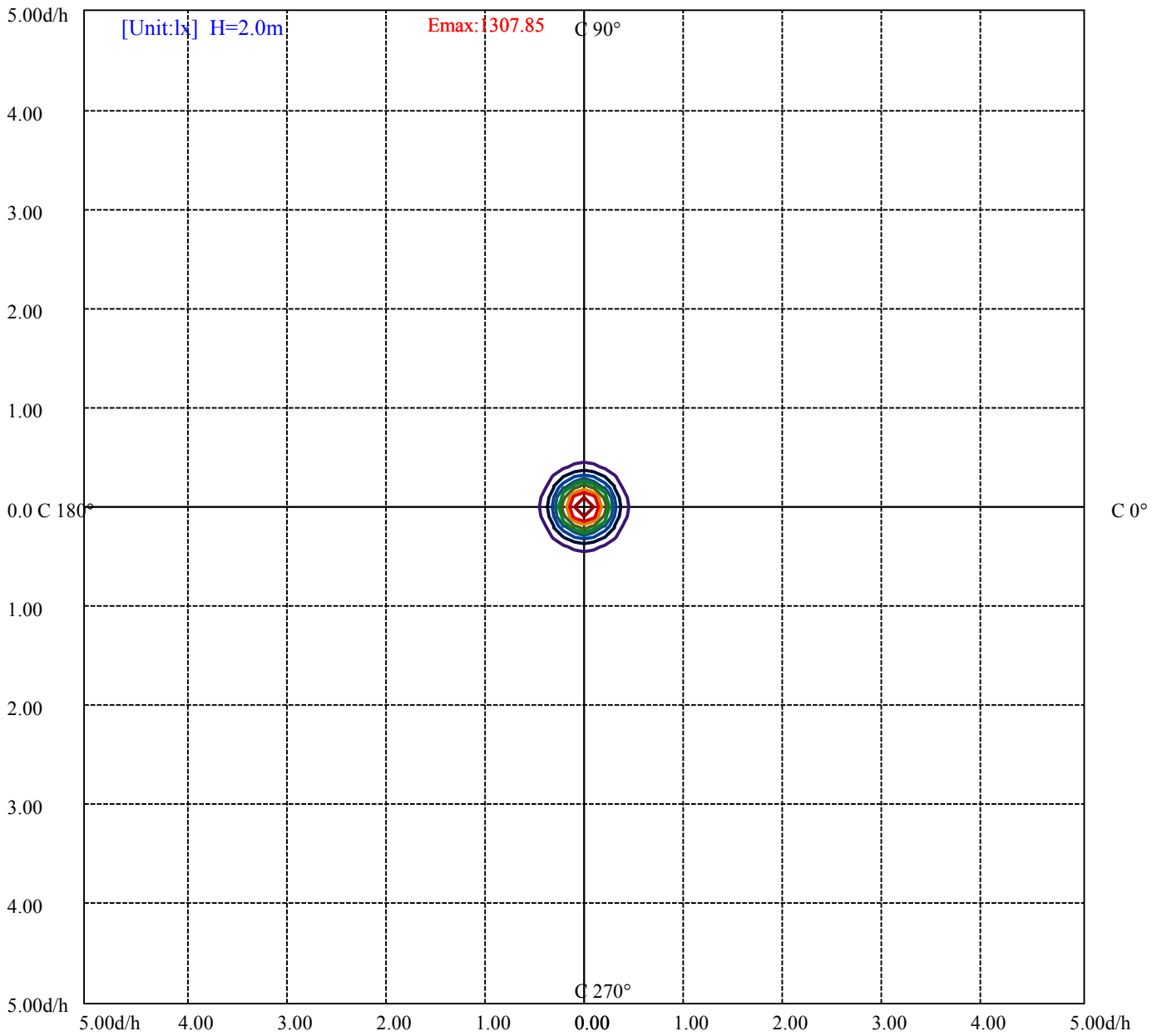
House

[Unit:cd]

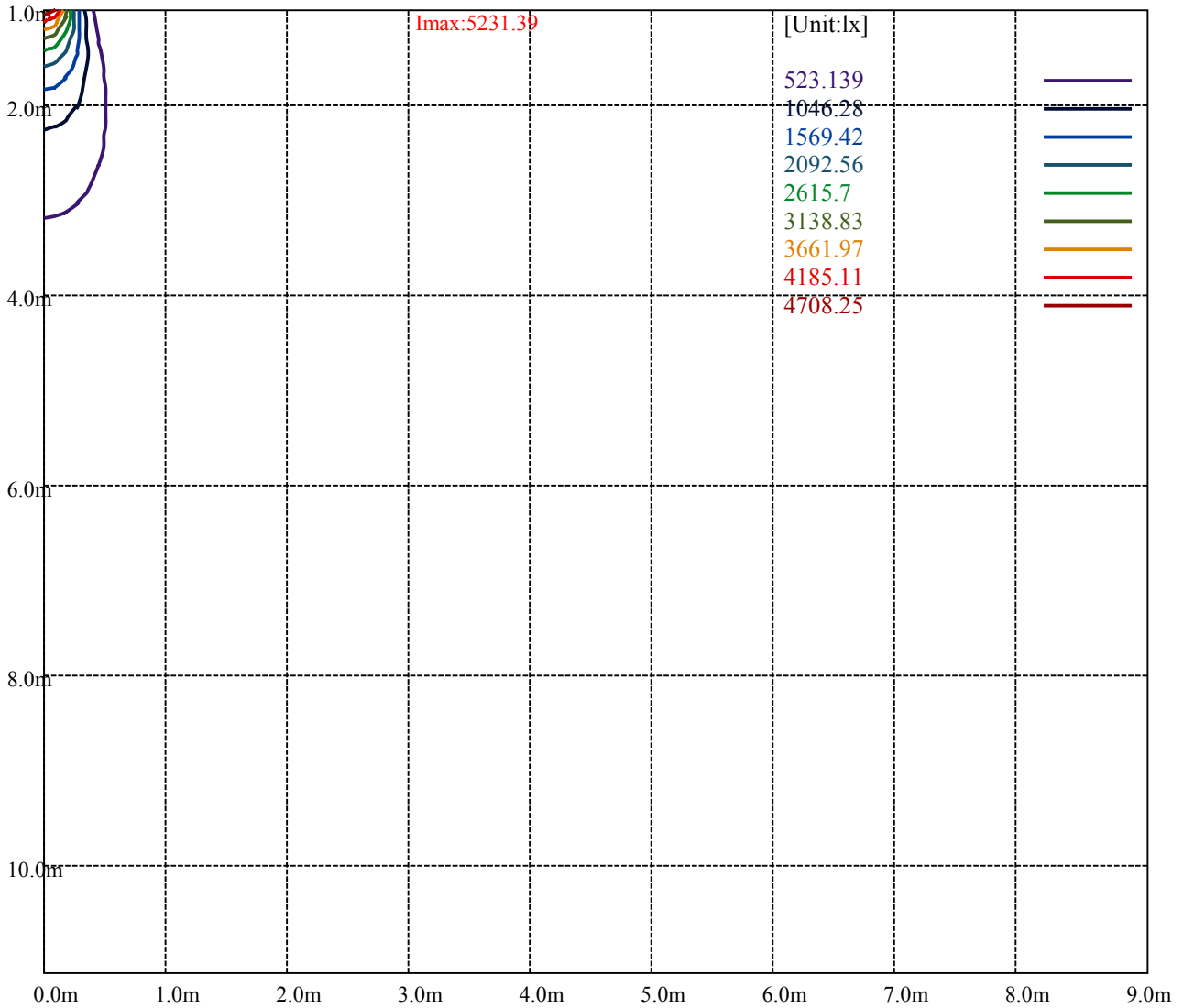
Road

**Imax:5231.39**

(10%Imax) 523.139	—
(20%Imax) 1046.28	—
(30%Imax) 1569.42	—
(40%Imax) 2092.56	—
(50%Imax) 2615.7	—
(60%Imax) 3138.83	—
(70%Imax) 3661.97	—
(80%Imax) 4185.11	—
(90%Imax) 4708.25	—



- (10%Emax) 130.7847
- (20%Emax) 261.57
- (30%Emax) 392.355
- (40%Emax) 523.14
- (50%Emax) 653.9225
- (60%Emax) 784.7075
- (70%Emax) 915.4925
- (80%Emax) 1046.277
- (90%Emax) 1177.063



Luminance Table

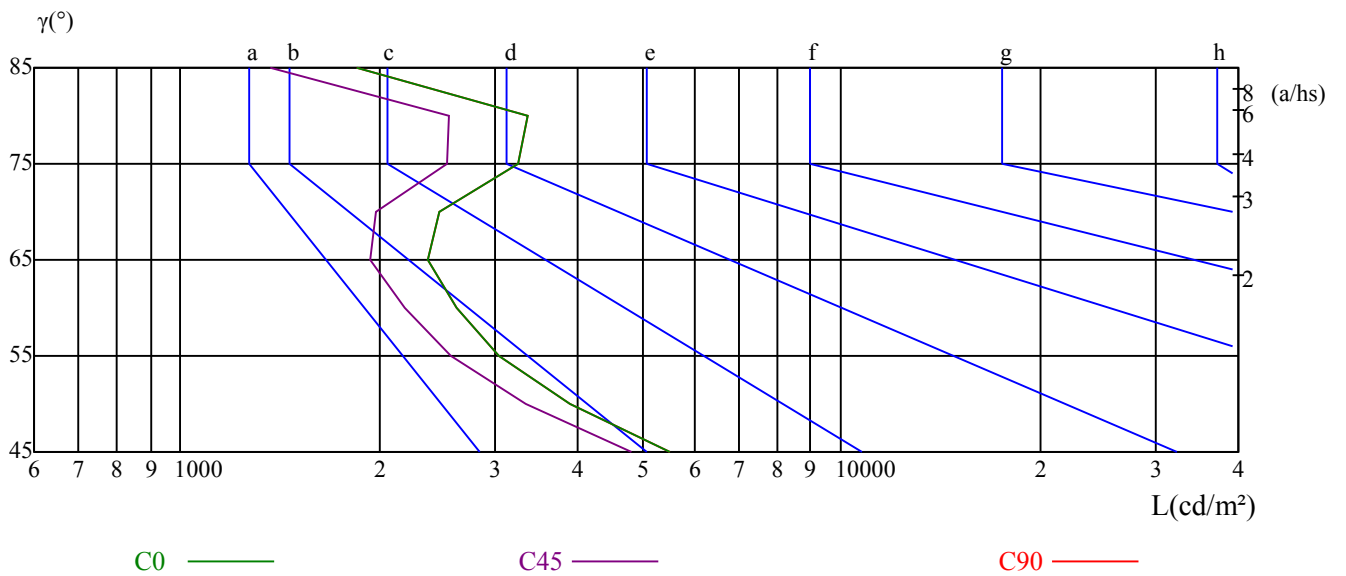
$\gamma$	45	50	55	60	65	70	75	80	85
C0	5521	3879	3035	2616	2365	2471	3236	3352	1853
C45	4818	3336	2570	2179	1934	1980	2533	2553	1366
C90	5521	3879	3035	2616	2365	2471	3236	3352	1853

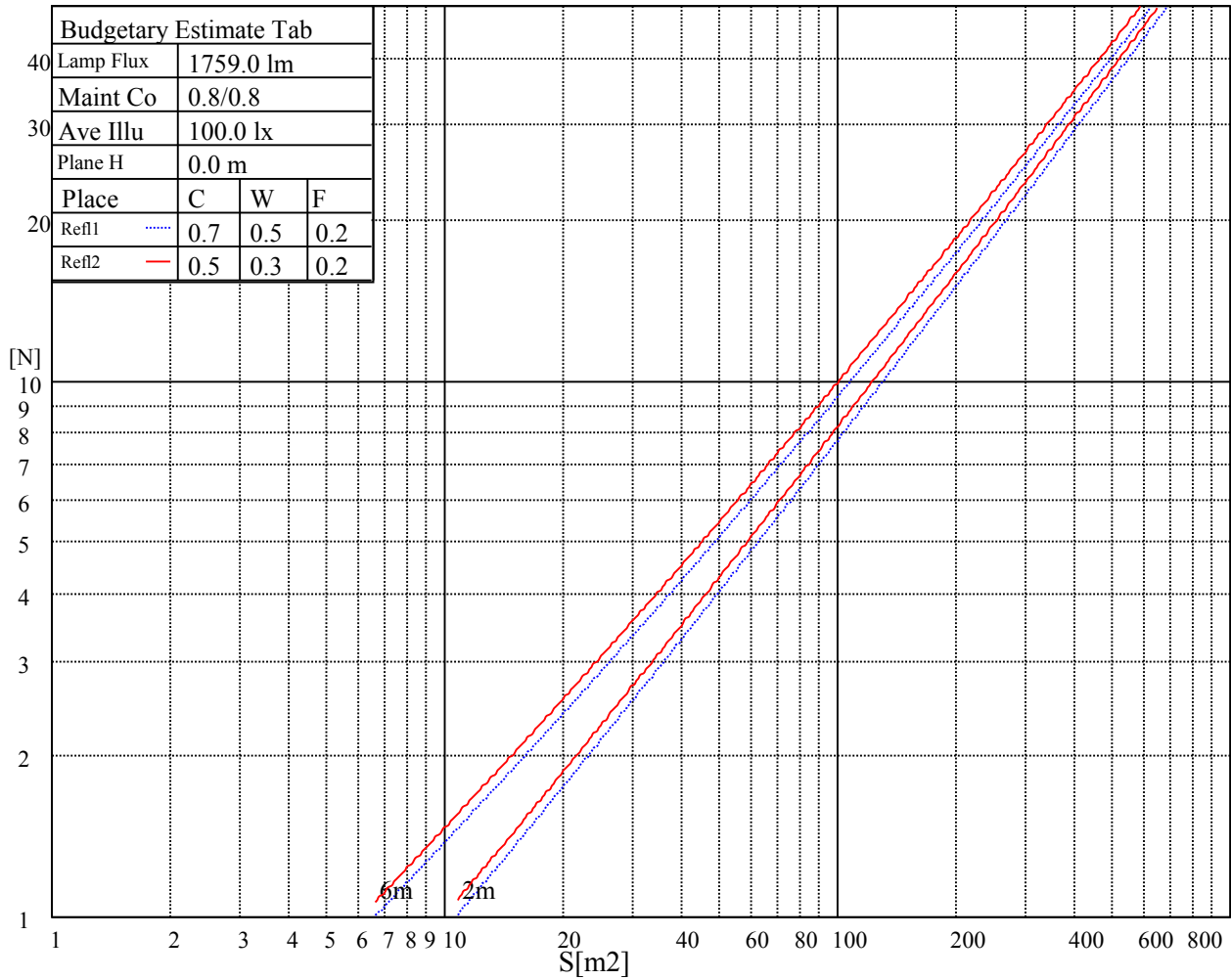
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
5121	5121	5121	9799	9799	9799	13363	13363	13363

Glare Table

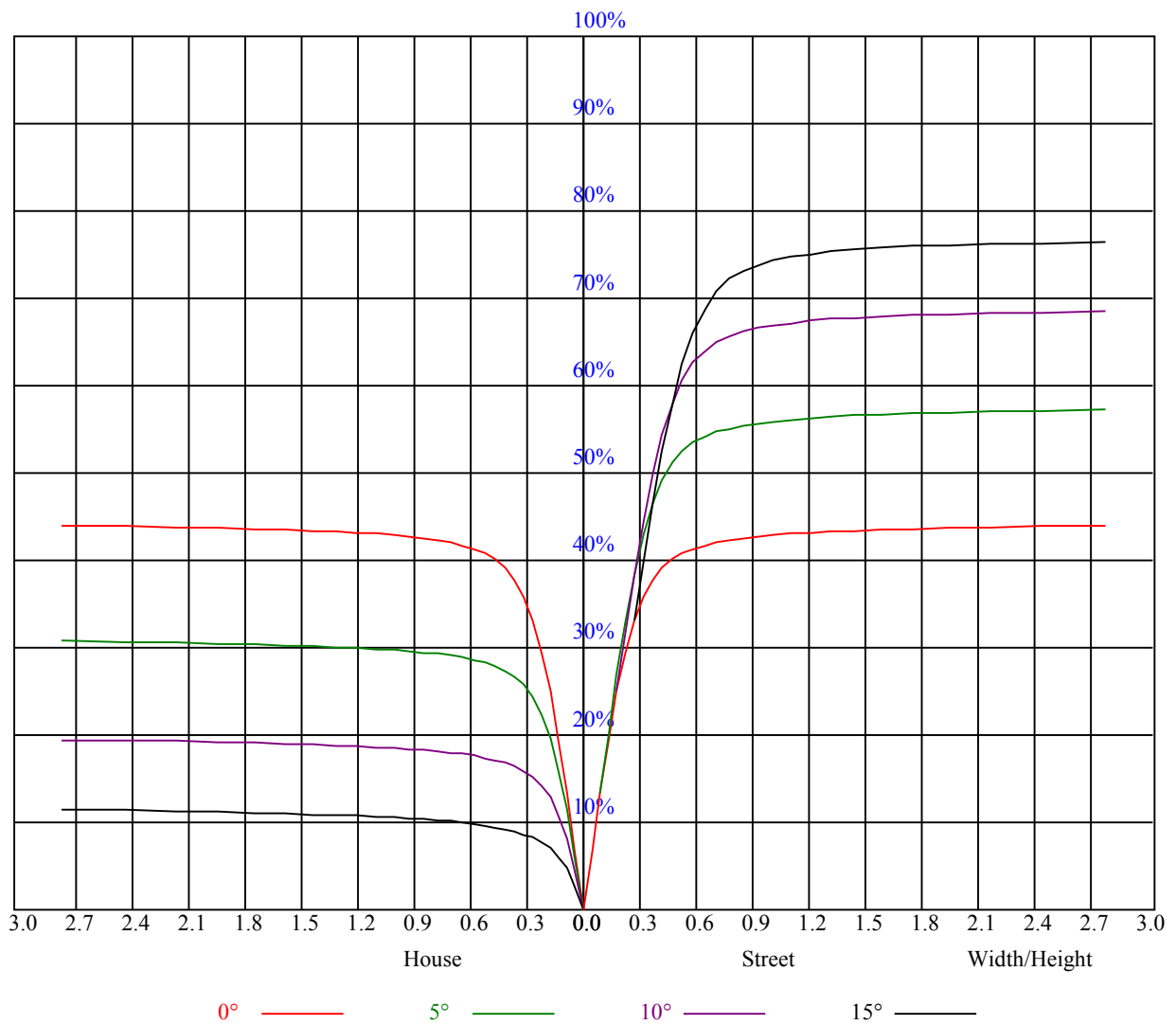
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.06	1.06	1.06	1.04	1.04	1.04	0.99	0.99	0.99	0.95	0.95	0.95	0.91	0.91	0.91	0.89
1	0.99	0.97	0.95	0.97	0.96	0.94	0.94	0.92	0.91	0.91	0.89	0.88	0.87	0.87	0.86	0.84
2	0.94	0.90	0.88	0.92	0.89	0.87	0.89	0.87	0.85	0.87	0.85	0.83	0.84	0.83	0.81	0.80
3	0.89	0.85	0.82	0.88	0.84	0.81	0.85	0.83	0.80	0.83	0.81	0.79	0.81	0.79	0.78	0.76
4	0.85	0.81	0.77	0.84	0.80	0.77	0.82	0.79	0.76	0.80	0.77	0.75	0.79	0.76	0.74	0.73
5	0.81	0.77	0.74	0.80	0.76	0.73	0.79	0.75	0.73	0.77	0.74	0.72	0.76	0.74	0.71	0.70
6	0.78	0.73	0.70	0.77	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.69	0.74	0.71	0.69	0.68
7	0.75	0.71	0.68	0.74	0.70	0.67	0.73	0.70	0.67	0.72	0.69	0.67	0.71	0.69	0.66	0.65
8	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
9	0.70	0.66	0.63	0.69	0.65	0.63	0.69	0.65	0.62	0.68	0.65	0.62	0.67	0.64	0.62	0.61
10	0.67	0.63	0.61	0.67	0.63	0.61	0.66	0.63	0.60	0.66	0.63	0.60	0.65	0.62	0.60	0.59



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	5227.31	5248.69	5244.19	5208.19	5151.38	5070.38	4939.88	4812.75	4664.25
45.0	5230.13	5230.13	5201.44	5160.38	5069.25	4969.69	4845.38	4658.63	4489.88
90.0	5231.25	5199.75	5151.94	5063.06	4968.56	4852.13	4674.94	4510.69	4323.94
135.0	5236.88	5206.50	5145.75	5061.94	4965.75	4847.63	4670.44	4506.75	4326.75
180.0	5227.31	5176.69	5106.38	5001.75	4867.88	4727.81	4543.88	4336.31	4132.13
225.0	5230.13	5209.31	5163.19	5065.88	4982.06	4862.25	4661.44	4517.44	4332.38
270.0	5231.25	5235.75	5215.50	5176.13	5103.00	5016.38	4878.56	4743.00	4586.63
315.0	5236.88	5241.94	5221.13	5172.19	5097.94	5010.75	4885.31	4736.25	4580.44
360.0	5227.31	5248.69	5244.19	5208.19	5151.38	5070.38	4939.88	4812.75	4664.25
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4454.44	4266.56	4060.69	3799.69	3509.44	3235.50	2913.19	2622.38	2300.63
45.0	4300.88	4033.69	3795.75	3534.75	3186.56	2899.69	2612.81	2295.00	1991.81
90.0	4114.13	3823.88	3569.06	3261.94	2941.88	2656.69	2377.69	2077.31	1792.69
135.0	4072.50	3841.31	3584.81	3308.06	2948.06	2660.06	2380.50	2076.19	1791.56
180.0	3906.00	3594.38	3327.75	3047.63	2688.75	2408.06	2134.69	1842.75	1573.31
225.0	4101.75	3844.69	3591.00	3282.19	2958.19	2668.50	2349.00	2072.81	1780.88
270.0	4389.75	4168.13	3947.63	3735.00	3371.63	3090.94	2838.94	2478.38	2168.44
315.0	4404.94	4160.25	3939.75	3694.50	3362.63	3084.19	2799.56	2478.94	2167.31
360.0	4454.44	4266.56	4060.69	3799.69	3509.44	3235.50	2913.19	2622.38	2300.63
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2000.25	1752.75	1496.25	1265.63	1084.50	923.06	748.69	628.88	527.63
45.0	1738.13	1463.06	1229.63	1051.88	879.75	735.75	605.25	499.50	418.50
90.0	1556.44	1319.06	1103.91	939.32	779.46	658.41	542.31	447.64	378.79
135.0	1526.06	1302.19	1090.69	928.69	771.75	645.75	531.56	435.94	367.88
180.0	1353.94	1112.34	965.48	800.33	646.14	555.08	455.12	365.85	315.73
225.0	1548.56	1240.31	1115.27	927.17	764.16	638.94	520.99	425.70	357.69
270.0	1941.19	1641.94	1396.69	1222.88	1004.06	851.06	716.06	573.75	481.50
315.0	1910.81	1642.50	1421.44	1106.55	1000.46	845.89	695.64	570.71	479.31
360.0	2000.25	1752.75	1496.25	1265.63	1084.50	923.06	748.69	628.88	527.63
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	430.88	353.81	300.94	284.06	215.61	190.13	171.96	150.64	134.83
45.0	352.69	287.44	260.83	213.02	182.53	163.18	147.26	132.36	119.93
90.0	323.21	267.36	231.58	202.84	176.79	156.21	140.96	126.51	114.19
135.0	313.31	284.06	221.01	193.33	166.56	149.18	134.83	121.28	109.91
180.0	269.44	219.77	195.08	172.24	151.65	135.11	122.85	111.09	100.97
225.0	302.01	247.39	214.71	188.89	165.60	146.98	133.26	120.09	108.79
270.0	402.75	326.25	284.06	238.67	201.83	178.59	159.58	141.92	126.84
315.0	402.86	326.31	279.11	240.86	203.40	179.83	160.43	140.40	126.84
360.0	430.88	353.81	300.94	284.06	215.61	190.13	171.96	150.64	134.83
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	124.20	111.09	102.04	93.88	85.11	78.86	73.41	66.94	62.33
45.0	110.31	100.74	93.32	85.61	79.26	72.84	66.99	61.71	57.43
90.0	104.68	95.06	87.58	79.88	72.96	67.28	62.10	56.42	52.26
135.0	101.08	92.31	85.33	78.19	71.49	65.87	60.13	55.18	51.13
180.0	93.04	85.11	78.86	72.45	66.71	61.93	57.66	52.99	49.39
225.0	100.01	91.41	84.54	77.46	71.10	66.09	61.43	56.14	52.26
270.0	115.31	104.12	95.34	86.63	78.92	73.01	66.83	61.31	56.87
315.0	115.26	103.22	95.79	87.13	78.92	73.63	68.12	61.09	57.09
360.0	124.20	111.09	102.04	93.88	85.11	78.86	73.41	66.94	62.33



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	58.22	53.44	49.95	46.69	43.26	40.05	37.63	35.10	32.85
45.0	53.55	48.99	45.68	42.64	39.49	36.73	34.43	32.46	30.32
90.0	48.38	44.16	41.12	38.19	35.49	33.02	31.11	29.25	27.90
135.0	47.31	43.09	39.77	36.84	33.92	31.61	29.87	27.84	26.33
180.0	46.24	42.58	39.83	37.29	34.93	32.68	30.94	29.36	27.73
225.0	48.66	44.55	41.46	38.76	35.89	33.41	31.44	29.59	28.13
270.0	52.76	48.09	44.66	41.51	38.31	35.44	33.08	30.88	29.08
315.0	52.88	47.70	44.55	41.46	38.19	35.21	32.91	30.88	29.03
360.0	58.22	53.44	49.95	46.69	43.26	40.05	37.63	35.10	32.85
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	31.16	29.48	28.13	26.72	25.48	24.47	23.46	22.50	21.60
45.0	28.80	27.39	26.27	25.14	24.13	23.29	22.44	21.54	20.87
90.0	26.55	25.37	24.41	23.51	22.67	21.88	21.21	20.42	19.74
135.0	25.09	23.96	23.12	22.16	21.26	20.64	19.97	19.35	18.84
180.0	26.44	25.37	24.24	23.23	22.44	21.60	20.93	20.19	19.52
225.0	26.72	25.48	24.47	23.46	22.56	21.71	21.04	20.31	19.63
270.0	27.56	26.21	25.14	24.13	23.12	22.33	21.54	20.76	20.08
315.0	27.34	26.10	24.86	23.85	22.84	22.05	21.38	20.59	19.91
360.0	31.16	29.48	28.13	26.72	25.48	24.47	23.46	22.50	21.60
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	20.93	20.14	19.41	18.84	18.34	17.72	17.27	16.71	16.26
45.0	20.25	19.52	18.96	18.45	17.89	17.33	16.82	16.37	15.81
90.0	19.24	18.56	18.06	17.66	17.10	16.71	16.31	16.09	16.26
135.0	18.45	18.00	17.55	17.33	17.38	18.68	20.81	24.19	28.01
180.0	19.01	18.39	17.89	17.44	17.04	16.48	16.03	15.64	15.08
225.0	19.13	18.56	17.94	17.49	16.99	16.54	16.09	15.64	15.19
270.0	19.52	18.90	18.39	17.89	17.49	17.10	16.71	16.26	15.98
315.0	19.35	18.73	18.34	17.94	17.66	17.94	19.46	21.77	25.43
360.0	20.93	20.14	19.41	18.84	18.34	17.72	17.27	16.71	16.26
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	15.81	15.30	14.79	14.29	13.89	13.39	12.99	12.49	12.09
45.0	15.41	14.91	14.40	13.89	13.44	12.99	12.54	12.15	11.70
90.0	16.48	17.44	18.34	19.41	20.48	20.53	19.91	17.83	16.03
135.0	31.50	35.16	38.08	41.18	43.09	44.04	43.59	40.28	35.94
180.0	14.63	14.12	13.67	13.05	12.66	12.15	11.76	11.25	10.80
225.0	14.68	14.18	13.78	13.33	12.88	12.49	12.09	11.53	11.14
270.0	15.92	16.09	16.43	17.10	17.89	18.62	19.13	18.79	18.00
315.0	29.25	33.08	36.28	39.49	42.19	44.61	46.24	46.58	45.17
360.0	15.81	15.30	14.79	14.29	13.89	13.39	12.99	12.49	12.09
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	11.64	11.19	10.69	10.24	9.90	9.45	8.55	8.16	7.71
45.0	11.25	10.80	10.35	9.96	9.56	8.89	8.27	7.82	7.48
90.0	14.01	11.53	10.58	10.01	8.78	8.27	7.71	7.31	7.14
135.0	30.26	22.95	16.09	11.19	8.66	8.16	7.59	7.26	7.03
180.0	10.41	10.01	9.56	9.11	8.33	7.88	7.54	7.20	7.09
225.0	10.74	10.35	9.96	9.62	9.23	8.49	8.04	7.65	7.43
270.0	16.59	14.29	12.21	10.58	9.96	8.94	8.27	7.76	7.43
315.0	41.63	36.45	28.80	21.09	14.46	9.84	8.38	7.93	7.43
360.0	11.64	11.19	10.69	10.24	9.90	9.45	8.55	8.16	7.71

Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>7.43</b>
<b>45.0</b>	<b>7.31</b>
<b>90.0</b>	<b>7.14</b>
<b>135.0</b>	<b>7.09</b>
<b>180.0</b>	<b>7.09</b>
<b>225.0</b>	<b>7.37</b>
<b>270.0</b>	<b>7.14</b>
<b>315.0</b>	<b>7.26</b>
<b>360.0</b>	<b>7.43</b>