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## Nata

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LumCAT: LN01D04524DA-N

Luminaire: 97.70.234.00

Report No: 201228-B002

Test No: 201228-C002

LampCAT: CXM-9-TC40 LES9.8

Lamp flux(lm): 2078.7

Number of Lamps: 1

Length(mm): 92

Phm Type: C

Voltage(V): 35.0700

Current(A): 0.5000

Power (W): 17.5350

PF: 0.0000

Ballast type: DC

Width(mm): 92

Height(mm): 50

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## Photometric Results

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Lumens(lm): 1829.82

Efficiency(%): 88.03%

Lumens(lm)/Power(W): 104.35

Central intensity(cd): 5991.188

Maximum intensity(cd): 5991.188

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

Beam Angle(50%Imax): [C0/180]Total=29.6

[C90/270]Total=29.6

Field angle(10%Imax): [C0/180]Total=50.0

[C90/270]Total=50.0

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(%): 88.03%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 96.195%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5991.188	0.000	0	.000%	.000%
1.0	5974.945	5.726	5.726	.275%	.313%
2.0	5923.125	17.077	22.803	.822%	1.246%
3.0	5842.898	28.140	50.943	1.354%	2.784%
4.0	5735.531	38.757	89.7	1.864%	4.902%
5.0	5594.344	48.741	138.441	2.345%	7.566%
6.0	5419.969	57.883	196.324	2.785%	10.729%
7.0	5224.570	66.070	262.394	3.178%	14.340%
8.0	5008.359	73.235	335.629	3.523%	18.342%
9.0	4765.641	79.213	414.842	3.811%	22.671%
10.0	4499.086	83.842	498.685	4.033%	27.253%
11.0	4219.875	87.120	585.805	4.191%	32.014%
12.0	3928.641	89.075	674.88	4.285%	36.882%
13.0	3600.984	89.358	764.238	4.299%	41.766%
14.0	3245.133	87.630	851.867	4.216%	46.555%
15.0	2925.563	84.714	936.581	4.075%	51.184%
16.0	2596.359	80.912	1017.493	3.892%	55.606%
17.0	2248.453	75.447	1092.94	3.630%	59.729%
18.0	1953.000	69.273	1162.213	3.333%	63.515%
19.0	1690.495	63.389	1225.602	3.050%	66.979%
20.0	1393.256	56.441	1282.043	2.715%	70.064%
21.0	1198.870	49.774	1331.817	2.395%	72.784%
22.0	1013.126	44.451	1376.268	2.138%	75.213%
23.0	850.043	39.094	1415.362	1.881%	77.350%
24.0	708.827	34.082	1449.445	1.640%	79.213%
25.0	600.096	29.762	1479.207	1.432%	80.839%
26.0	506.074	26.111	1505.318	1.256%	82.266%
27.0	428.119	22.855	1528.174	1.100%	83.515%
28.0	365.105	20.083	1548.256	.966%	84.613%
29.0	315.577	17.809	1566.065	.857%	85.586%
30.0	272.721	15.884	1581.949	.764%	86.454%
31.0	244.076	14.382	1596.33	.692%	87.240%
32.0	209.805	13.003	1609.334	.626%	87.951%
33.0	185.456	11.645	1620.978	.560%	88.587%
34.0	166.493	10.651	1631.629	.512%	89.169%
35.0	148.992	9.798	1641.427	.471%	89.704%
36.0	134.438	9.024	1650.451	.434%	90.198%
37.0	122.941	8.394	1658.846	.404%	90.656%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	111.811	7.836	1666.681	.377%	91.085%
39.0	101.538	7.282	1673.964	.350%	91.483%
40.0	93.656	6.808	1680.771	.328%	91.855%
41.0	86.288	6.408	1687.179	.308%	92.205%
42.0	79.158	6.011	1693.19	.289%	92.533%
43.0	73.273	5.646	1698.836	.272%	92.842%
44.0	67.802	5.325	1704.161	.256%	93.133%
45.0	62.740	5.017	1709.178	.241%	93.407%
46.0	58.247	4.732	1713.909	.228%	93.666%
47.0	54.007	4.465	1718.374	.215%	93.910%
48.0	50.238	4.214	1722.588	.203%	94.140%
49.0	46.913	3.990	1726.578	.192%	94.358%
50.0	43.559	3.772	1730.35	.181%	94.564%
51.0	40.704	3.565	1733.915	.172%	94.759%
52.0	38.334	3.392	1737.306	.163%	94.944%
53.0	36.134	3.239	1740.546	.156%	95.121%
54.0	34.080	3.095	1743.64	.149%	95.290%
55.0	32.562	2.975	1746.615	.143%	95.453%
56.0	31.148	2.879	1749.494	.138%	95.610%
57.0	29.805	2.787	1752.281	.134%	95.763%
58.0	28.702	2.706	1754.987	.130%	95.911%
59.0	27.710	2.637	1757.624	.127%	96.055%
60.0	26.677	2.569	1760.193	.124%	96.195%
61.0	25.777	2.503	1762.697	.120%	96.332%
62.0	24.975	2.446	1765.142	.118%	96.466%
63.0	24.427	2.403	1767.545	.116%	96.597%
64.0	24.420	2.397	1769.942	.115%	96.728%
65.0	24.687	2.430	1772.372	.117%	96.861%
66.0	25.017	2.480	1774.852	.119%	96.996%
67.0	25.397	2.535	1777.387	.122%	97.135%
68.0	25.966	2.602	1779.989	.125%	97.277%
69.0	26.381	2.671	1782.659	.128%	97.423%
70.0	26.831	2.733	1785.392	.131%	97.572%
71.0	27.359	2.801	1788.193	.135%	97.725%
72.0	27.893	2.873	1791.066	.138%	97.882%
73.0	28.434	2.946	1794.011	.142%	98.043%
74.0	28.983	3.019	1797.03	.145%	98.208%
75.0	29.405	3.085	1800.115	.148%	98.377%

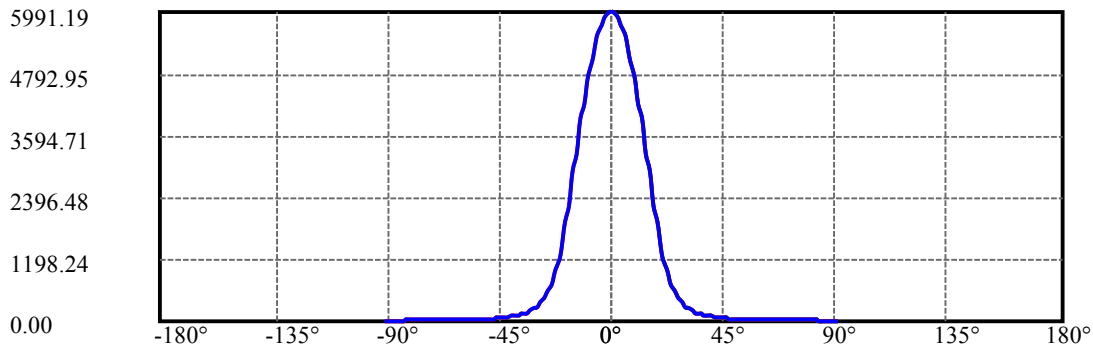
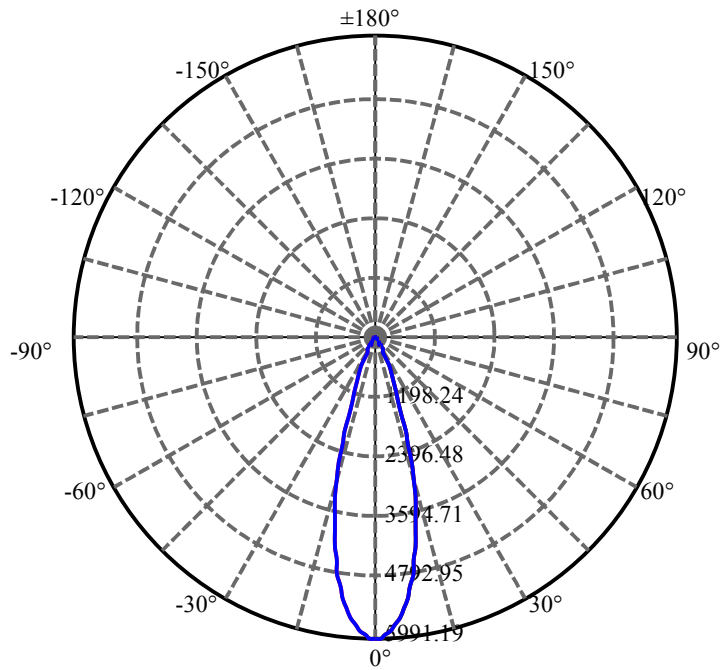
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	29.510	3.127	1803.242	.150%	98.548%
77.0	28.976	3.118	1806.36	.150%	98.718%
78.0	27.907	3.045	1809.405	.146%	98.885%
79.0	26.290	2.912	1812.317	.140%	99.044%
80.0	24.286	2.727	1815.044	.131%	99.193%
81.0	21.741	2.489	1817.533	.120%	99.329%
82.0	18.900	2.204	1819.737	.106%	99.449%
83.0	15.933	1.894	1821.631	.091%	99.553%
84.0	13.528	1.605	1823.235	.077%	99.640%
85.0	11.777	1.381	1824.617	.066%	99.716%
86.0	10.202	1.201	1825.818	.058%	99.781%
87.0	9.555	1.081	1826.899	.052%	99.841%
88.0	9.000	1.016	1827.916	.049%	99.896%
89.0	8.641	0.967	1828.883	.047%	99.949%
90.0	8.395	0.934	1829.817	.045%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1581.95	76.10%	86.45%
0-40	1680.77	80.86%	91.85%
0-60	1760.19	84.68%	96.20%
0-90	1828.88	87.98%	99.95%
0-120	1828.88	87.98%	99.95%
0-180	1829.82	88.03%	100.00%
60-90	71.26	3.43%	3.89%
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%
0-24.48	1463.85	70.42%	80.00%

ZONAL LUMEN SUMMARY

0-10	498.68
10-20	783.36
20-30	299.91
30-40	98.82
40-50	49.58
50-60	29.84
60-70	25.20
70-80	29.65
80-90	13.84
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: —————

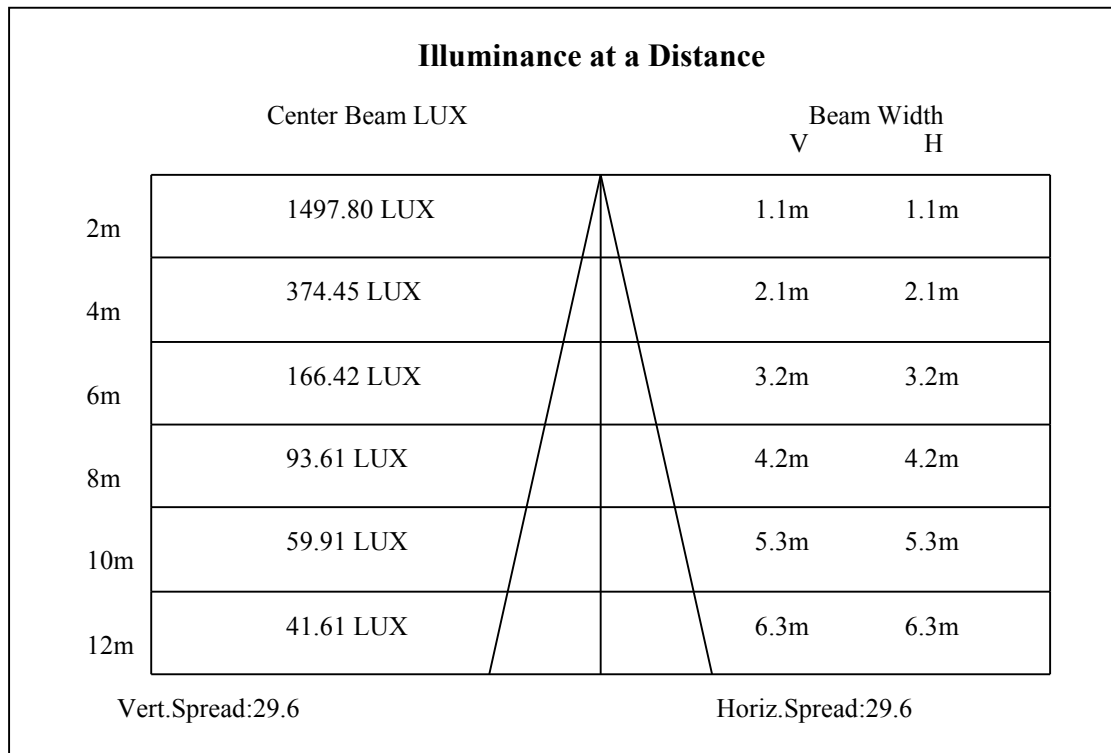
C90/C270: —————

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

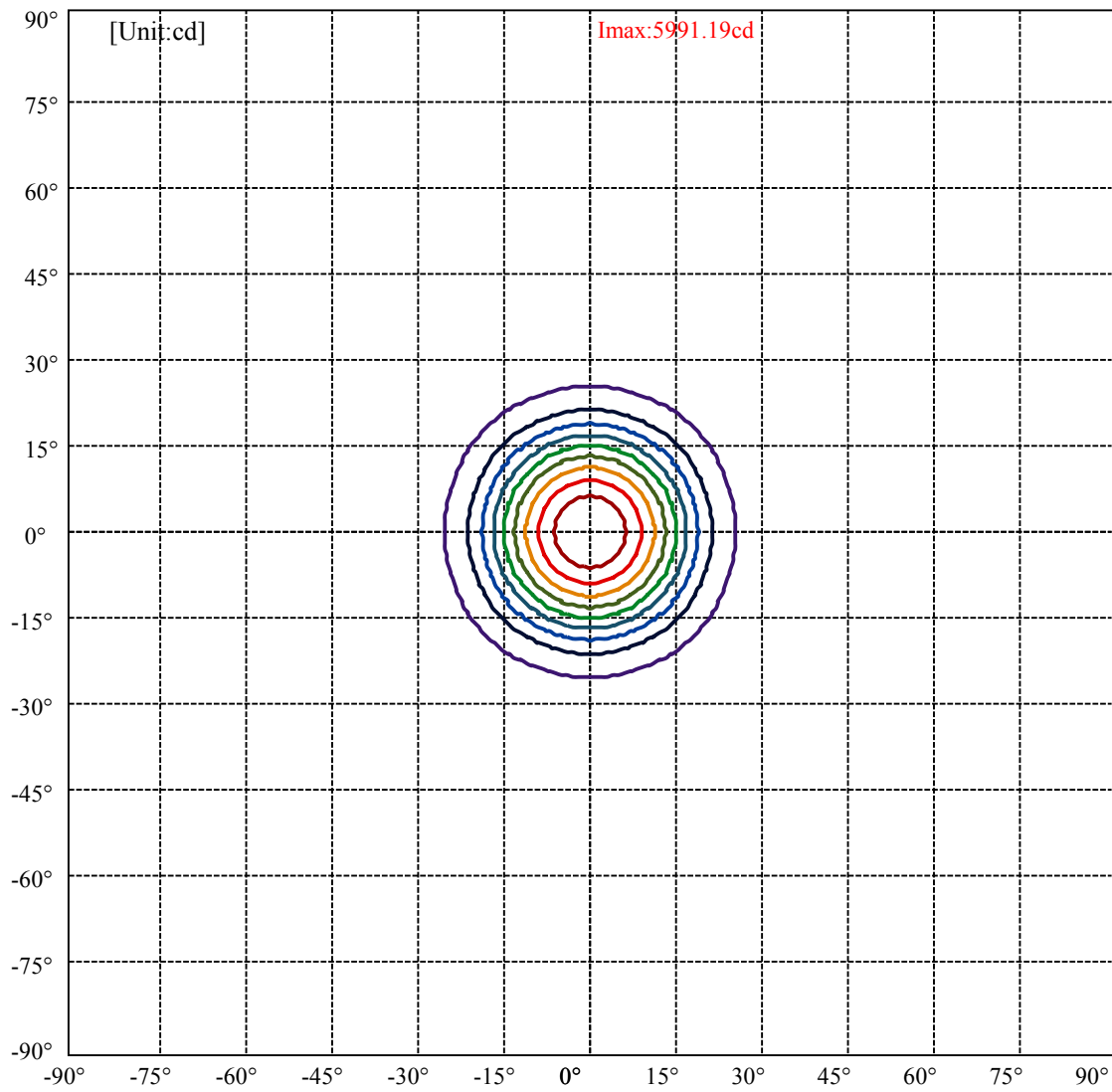
:C90/270Left:25.0 Right:25.0

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

:C90/270Left:14.8 Right:14.8

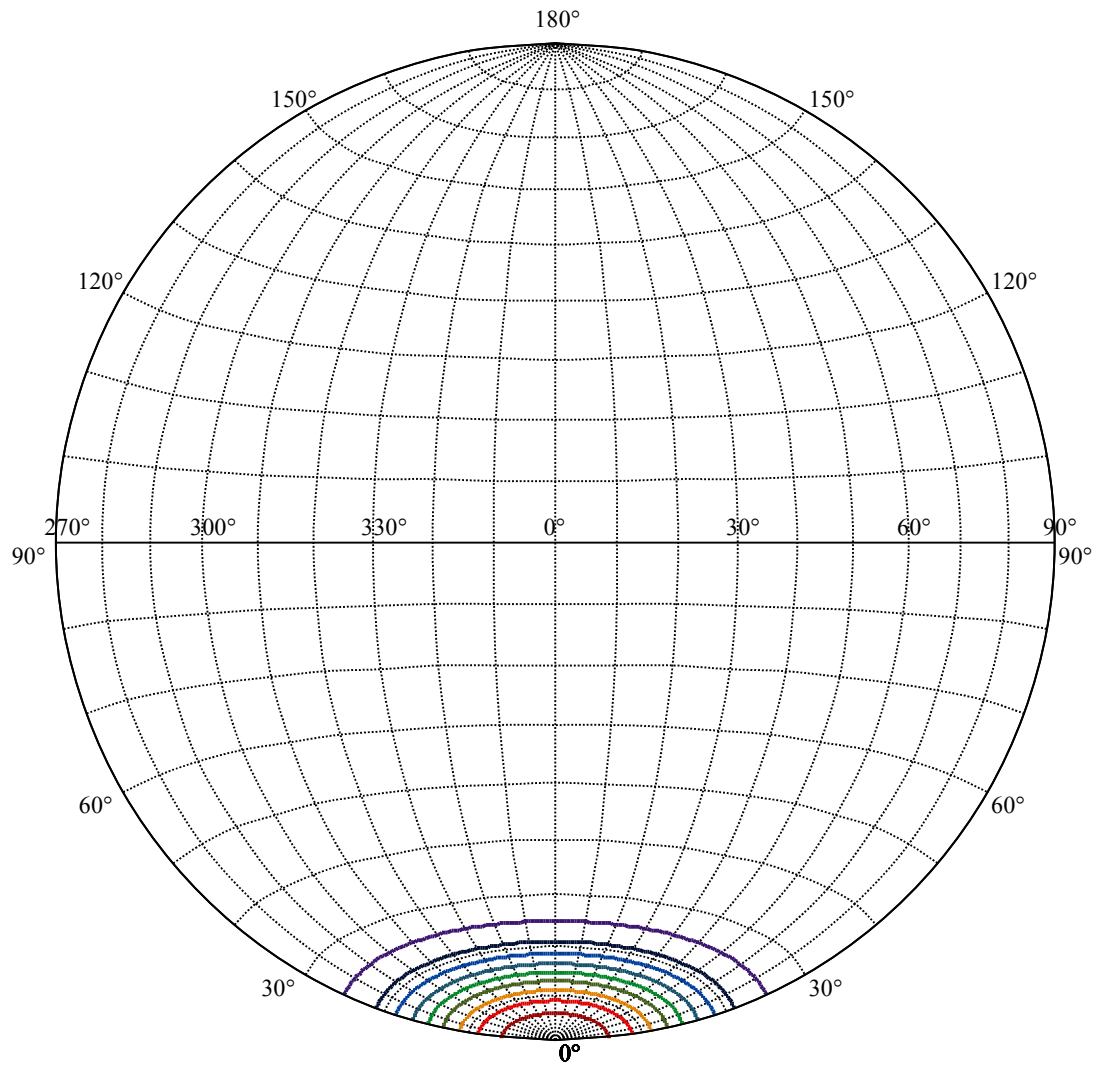


ISO-Intensity(V-H)



(10%Imax) 599.119	—
(20%Imax) 1198.24	—
(30%Imax) 1797.36	—
(40%Imax) 2396.48	—
(50%Imax) 2995.59	—
(60%Imax) 3594.71	—
(70%Imax) 4193.83	—
(80%Imax) 4792.95	—
(90%Imax) 5392.07	—





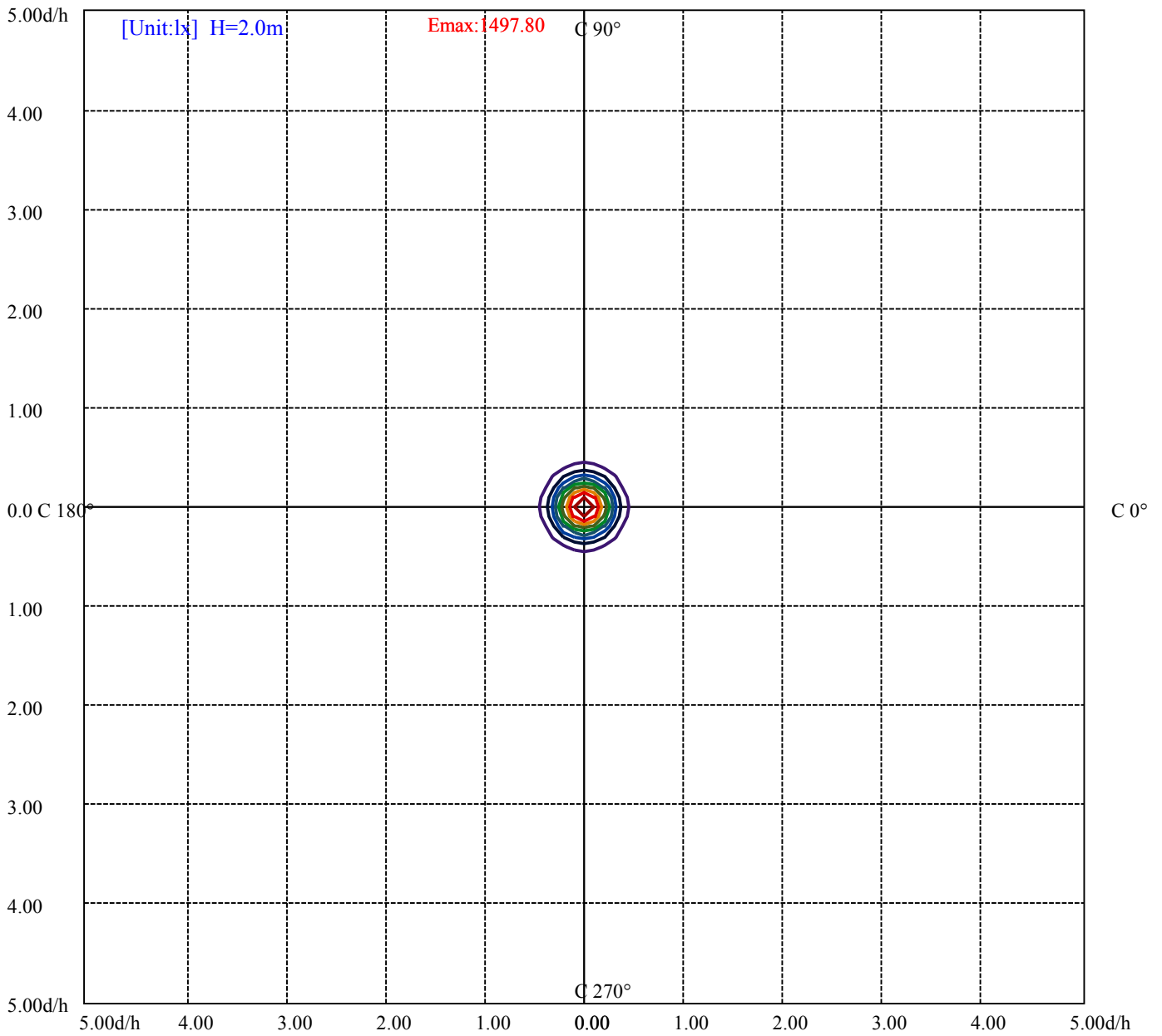
House

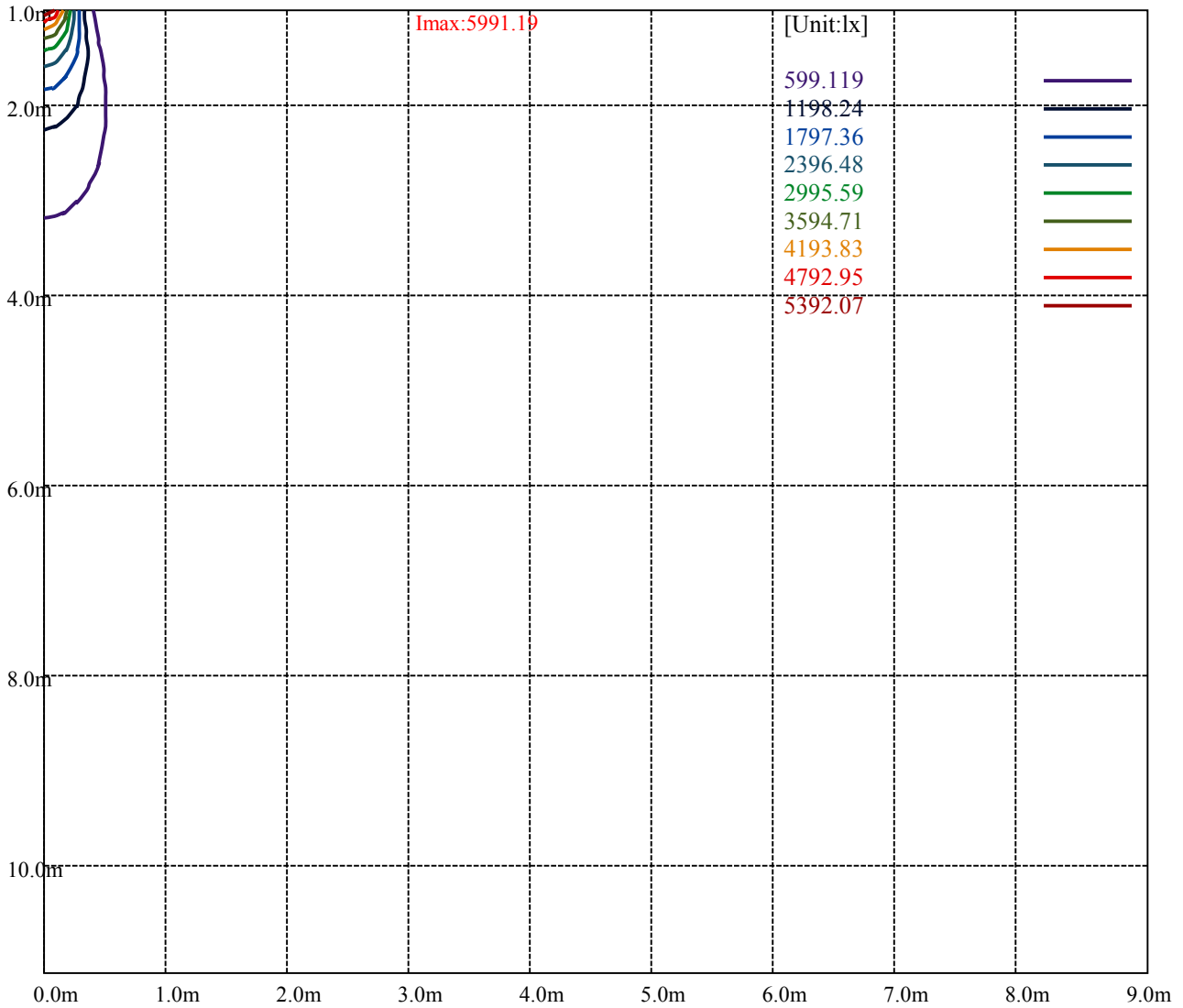
[Unit:cd]

Road

**Imax:5991.19**

(10%Imax) 599.119	—
(20%Imax) 1198.24	—
(30%Imax) 1797.36	—
(40%Imax) 2396.48	—
(50%Imax) 2995.59	—
(60%Imax) 3594.71	—
(70%Imax) 4193.83	—
(80%Imax) 4792.95	—
(90%Imax) 5392.07	—





Luminance Table

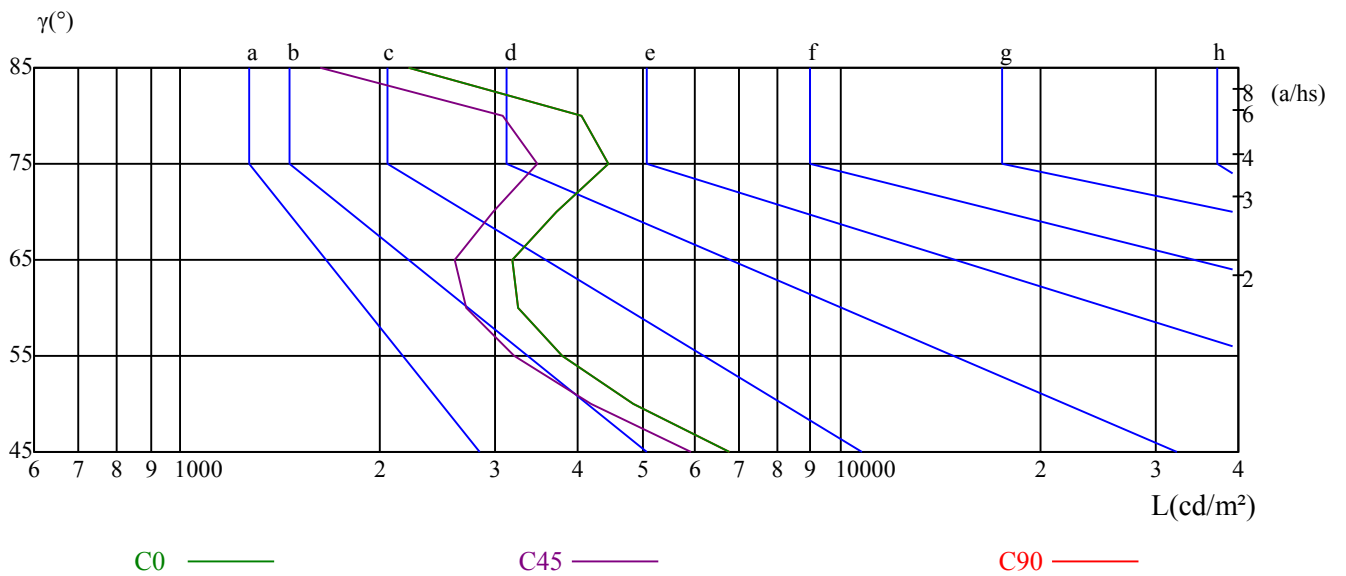
$\gamma$	45	50	55	60	65	70	75	80	85
C0	6792	4859	3776	3247	3187	3718	4432	4048	2214
C45	5927	4179	3197	2704	2606	2979	3470	3083	1632
C90	6792	4859	3776	3247	3187	3718	4432	4048	2214

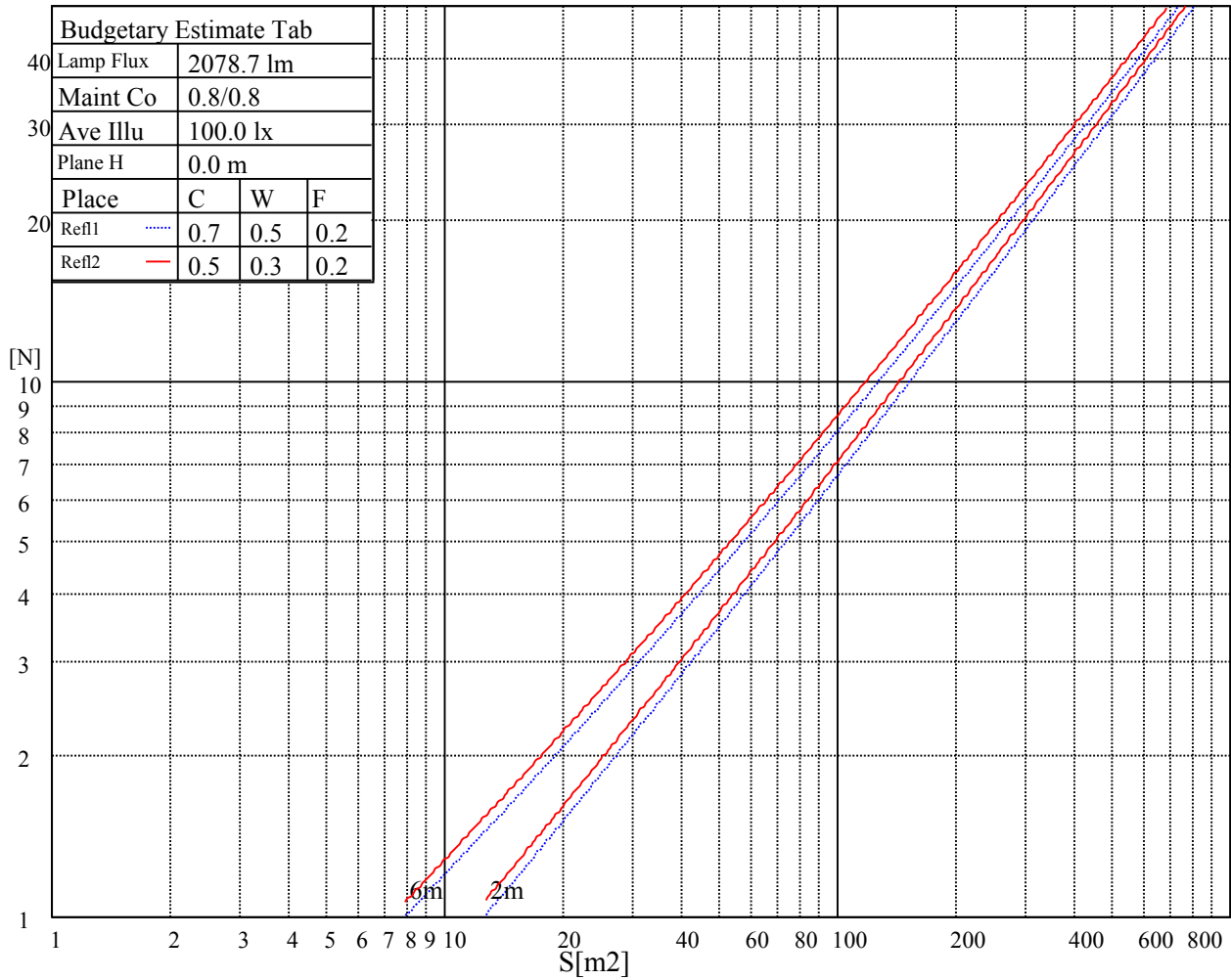
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
6901	6901	6901	13423	13423	13423	15965	15965	15965

Glare Table

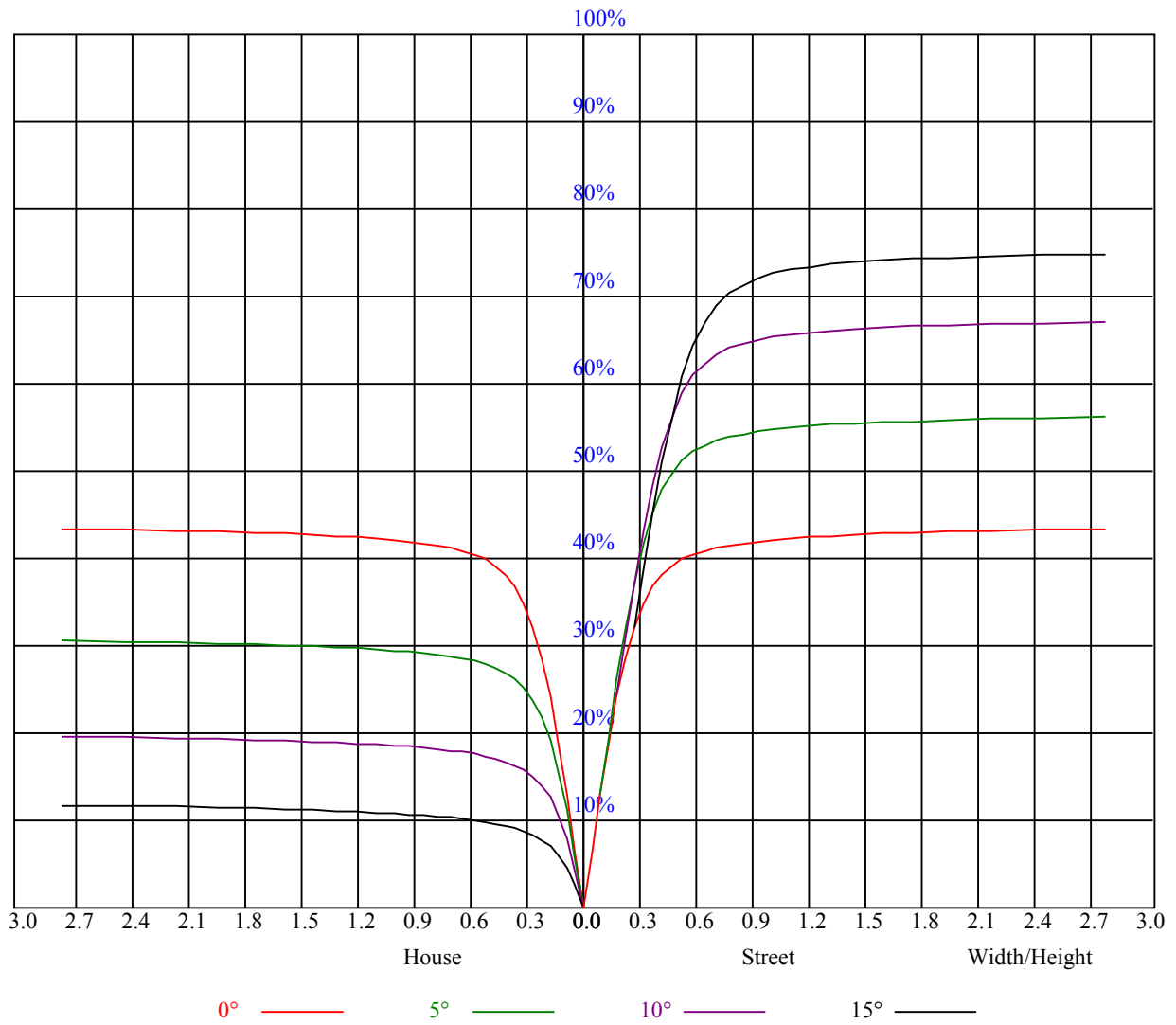
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.05	1.05	1.05	1.02	1.02	1.02	0.98	0.98	0.98	0.94	0.94	0.94	0.90	0.90	0.90	0.88
1	0.98	0.96	0.94	0.96	0.94	0.92	0.92	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.84	0.83
2	0.92	0.89	0.86	0.91	0.88	0.85	0.88	0.86	0.83	0.85	0.83	0.82	0.83	0.81	0.80	0.79
3	0.87	0.84	0.80	0.86	0.83	0.80	0.84	0.81	0.79	0.82	0.79	0.77	0.80	0.78	0.76	0.75
4	0.83	0.79	0.76	0.82	0.78	0.75	0.80	0.77	0.75	0.79	0.76	0.74	0.77	0.75	0.73	0.72
5	0.80	0.75	0.72	0.79	0.75	0.72	0.77	0.74	0.71	0.76	0.73	0.71	0.75	0.72	0.70	0.69
6	0.76	0.72	0.69	0.76	0.72	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.66
7	0.73	0.69	0.66	0.73	0.69	0.66	0.72	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.65	0.64
8	0.71	0.66	0.63	0.70	0.66	0.63	0.69	0.66	0.63	0.68	0.65	0.63	0.68	0.65	0.63	0.62
9	0.68	0.64	0.61	0.68	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.61	0.66	0.63	0.61	0.60
10	0.66	0.62	0.59	0.66	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.64	0.61	0.59	0.58



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	5975.44	6021.56	6039.56	6021.56	5973.75	5871.94	5758.88	5619.94	5430.94
45.0	6001.31	5999.63	5973.19	5905.69	5822.44	5713.31	5540.63	5374.69	5191.31
90.0	5981.06	5925.38	5821.31	5714.44	5581.69	5406.75	5203.69	5001.75	4754.25
135.0	6006.94	5940.56	5816.81	5691.38	5538.94	5343.75	5126.63	4914.00	4659.19
180.0	5975.44	5900.06	5778.56	5625.00	5459.06	5247.00	5033.81	4768.88	4484.25
225.0	6001.31	5960.81	5904.00	5799.94	5646.94	5512.50	5335.88	5063.63	4869.56
270.0	5981.06	6009.75	6004.69	5968.69	5904.00	5806.69	5648.06	5495.63	5319.00
315.0	6006.94	6041.81	6046.88	6016.50	5957.44	5852.81	5712.19	5558.06	5358.38
360.0	5975.44	6021.56	6039.56	6021.56	5973.75	5871.94	5758.88	5619.94	5430.94
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5213.81	5002.31	4740.19	4489.31	4182.19	3849.75	3533.06	3159.00	2784.38
45.0	4932.56	4700.25	4452.19	4148.44	3821.63	3513.94	3157.88	2796.75	2483.44
90.0	4516.88	4232.81	3928.50	3636.56	3289.50	2933.44	2621.81	2318.63	1960.88
135.0	4384.69	4121.44	3804.19	3498.75	3138.19	2777.06	2468.81	2175.19	1833.19
180.0	4215.38	3895.88	3551.63	3229.31	2898.56	2496.38	2190.94	1901.81	1571.63
225.0	4628.81	4268.81	4019.06	3712.50	3393.00	2985.75	2665.13	2311.88	2014.88
270.0	5070.94	4850.44	4609.13	4315.50	3996.56	3650.63	3327.75	2997.00	2634.19
315.0	5162.06	4920.75	4654.13	4398.75	4088.25	3754.13	3439.13	3110.63	2705.06
360.0	5213.81	5002.31	4740.19	4489.31	4182.19	3849.75	3533.06	3159.00	2784.38
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2463.19	2159.44	1805.06	1548.00	1316.81	1065.94	894.38	749.81	616.50
45.0	2140.31	1856.25	1585.69	1323.00	1134.56	936.56	780.19	664.31	568.13
90.0	1697.63	1460.81	1103.85	1018.13	864.00	718.99	597.83	507.43	422.72
135.0	1580.06	1351.69	1110.94	931.50	790.88	655.31	547.31	463.50	389.81
180.0	1335.38	1101.71	925.54	759.77	638.78	540.28	449.89	377.21	325.24
225.0	1716.75	1478.25	1102.73	1039.44	887.79	742.16	634.84	534.99	453.66
270.0	2290.50	2005.31	1709.44	1445.06	1237.50	1078.31	865.13	737.44	641.81
315.0	2400.19	2110.50	1802.81	1526.06	1234.69	1062.79	901.07	766.07	630.73
360.0	2463.19	2159.44	1805.06	1548.00	1316.81	1065.94	894.38	749.81	616.50
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	510.19	434.81	366.75	318.38	287.44	236.19	210.83	186.92	169.09
45.0	466.31	400.50	346.50	295.31	285.19	222.86	195.86	173.98	157.67
90.0	360.23	303.75	259.37	227.64	201.66	175.67	158.79	144.23	129.09
135.0	336.38	287.44	264.99	218.25	191.87	174.26	153.51	139.61	127.35
180.0	278.27	240.81	213.81	188.66	170.16	152.66	138.21	127.01	117.06
225.0	392.96	341.94	291.04	257.57	229.16	199.52	179.66	162.34	145.63
270.0	528.75	445.50	392.06	330.19	284.63	262.63	217.41	193.95	171.28
315.0	551.87	466.09	390.09	345.77	302.51	254.64	229.39	203.91	174.77
360.0	510.19	434.81	366.75	318.38	287.44	236.19	210.83	186.92	169.09
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	151.99	138.94	124.54	114.47	105.53	97.76	88.99	82.74	77.06
45.0	141.64	129.54	117.68	107.38	99.06	91.58	83.36	77.96	72.28
90.0	118.74	109.52	100.41	91.97	84.94	77.63	71.89	66.09	60.30
135.0	114.08	104.91	96.69	87.64	81.11	75.26	68.85	64.41	60.02
180.0	106.20	98.38	91.41	83.42	77.68	72.51	67.11	62.16	58.05
225.0	131.23	120.32	109.58	99.96	92.53	84.99	79.09	72.90	67.44
270.0	152.16	137.64	124.88	111.09	101.70	93.49	84.43	77.96	72.11
315.0	159.47	144.28	129.32	116.38	106.71	97.09	89.55	81.96	75.15
360.0	151.99	138.94	124.54	114.47	105.53	97.76	88.99	82.74	77.06



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	70.65	65.98	61.48	56.93	52.76	49.22	45.68	42.75	39.99
45.0	66.26	61.88	57.88	53.78	50.12	47.08	43.82	41.29	38.76
90.0	56.59	52.37	47.98	45.17	42.24	38.93	36.62	34.48	32.51
135.0	55.58	51.36	48.04	44.61	41.85	39.09	36.73	34.76	32.96
180.0	53.94	50.46	46.91	43.65	41.01	38.53	36.17	34.43	32.79
225.0	62.89	58.84	54.00	50.51	47.42	43.71	41.12	38.87	36.62
270.0	66.26	60.86	56.59	52.03	48.32	44.55	41.12	38.53	36.11
315.0	69.75	64.24	59.18	55.24	51.58	47.36	44.38	41.57	39.32
360.0	70.65	65.98	61.48	56.93	52.76	49.22	45.68	42.75	39.99
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	37.52	35.55	33.75	32.06	30.77	29.87	28.52	27.68	26.89
45.0	36.56	34.93	33.24	31.89	30.60	29.48	28.18	27.17	26.27
90.0	30.83	29.59	28.46	27.56	26.78	25.88	25.26	24.53	23.91
135.0	31.33	30.09	28.97	27.73	26.78	25.93	24.92	24.19	23.51
180.0	31.22	30.09	29.08	28.07	27.28	26.49	25.65	24.81	24.08
225.0	34.65	33.13	31.56	30.32	29.03	27.73	26.72	25.71	24.69
270.0	33.86	32.23	30.83	29.25	28.07	27.17	26.21	25.26	24.53
315.0	36.68	34.88	33.30	31.56	30.32	29.14	27.96	26.89	25.93
360.0	37.52	35.55	33.75	32.06	30.77	29.87	28.52	27.68	26.89
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	25.88	24.98	24.36	23.40	22.67	22.11	21.38	20.81	20.25
45.0	25.43	24.41	23.74	23.06	22.28	21.54	20.98	20.31	19.63
90.0	24.75	27.73	31.56	35.16	38.87	43.26	46.63	50.01	53.78
135.0	22.78	22.11	21.54	20.93	20.42	19.80	19.24	18.73	18.17
180.0	23.29	22.61	21.94	21.26	20.70	20.19	19.58	19.07	18.62
225.0	23.85	23.06	22.16	21.43	20.76	20.08	19.35	18.79	18.17
270.0	24.41	26.27	28.74	32.18	35.44	39.32	43.14	46.74	50.63
315.0	25.03	24.19	23.46	22.73	22.05	21.43	20.76	20.19	19.63
360.0	25.88	24.98	24.36	23.40	22.67	22.11	21.38	20.81	20.25
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	19.52	18.96	18.45	17.83	17.38	16.88	16.20	15.75	15.30
45.0	19.07	18.45	17.89	17.21	16.71	16.14	15.58	15.02	14.46
90.0	57.26	60.19	63.06	65.03	65.59	62.55	56.98	49.95	43.09
135.0	18.00	18.11	18.17	18.28	18.28	17.89	16.88	15.36	14.06
180.0	18.06	17.55	17.04	16.43	15.86	15.36	14.63	13.95	13.33
225.0	17.55	17.04	16.48	16.03	15.53	15.02	14.57	14.06	13.39
270.0	54.51	57.99	61.37	64.80	66.88	67.89	68.40	66.88	62.38
315.0	19.18	19.18	19.41	19.63	19.86	20.08	20.03	19.35	18.28
360.0	19.52	18.96	18.45	17.83	17.38	16.88	16.20	15.75	15.30
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	14.68	14.18	13.67	13.16	12.60	11.98	11.36	10.58	9.84
45.0	13.84	13.22	12.60	11.98	11.42	10.52	9.96	9.23	8.78
90.0	35.21	26.78	16.93	12.49	10.52	9.28	8.66	8.16	7.93
135.0	12.88	12.21	11.53	10.80	9.90	9.00	8.49	8.10	7.99
180.0	12.71	12.21	11.64	11.14	10.63	9.39	8.89	8.72	8.78
225.0	12.88	12.38	11.70	11.08	10.52	9.79	9.17	8.66	8.33
270.0	55.07	45.17	35.72	24.69	16.37	10.80	9.79	9.11	8.61
315.0	16.65	15.08	13.67	12.88	12.26	10.86	10.13	9.45	8.89
360.0	14.68	14.18	13.67	13.16	12.60	11.98	11.36	10.58	9.84

Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>9.23</b>
<b>45.0</b>	<b>8.38</b>
<b>90.0</b>	<b>7.99</b>
<b>135.0</b>	<b>8.04</b>
<b>180.0</b>	<b>8.61</b>
<b>225.0</b>	<b>8.33</b>
<b>270.0</b>	<b>8.16</b>
<b>315.0</b>	<b>8.44</b>
<b>360.0</b>	<b>9.23</b>