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## Nata

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LumCAT: 3-2546-M	
Luminaire: 92.70.131.00	
Report No: 200921-B040	Voltage(V): 230.8000
Test No: 200921-C040	Current(A): 0.0900
LampCAT: SEOUL SAWx15 LES14.5	Power (W): 20.0100
Lamp flux(lm): 2329.0	PF: 0.9550
Number of Lamps: 1	Ballast type: AC
Length(feet)(ft.):0.000	Width(feet)(ft.):0.000
Phm Type: C	Height(feet)(ft.):0.000

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## Photometric Results

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Lumens(lm): 2236.47  
Efficiency(%): 96.03%  
Lumens(lm)/Power(W): 111.77  
Central intensity(cd): 10013.140  
Maximum intensity(cd): 10013.140  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=23.8  
                                  [C90/270]Total=23.8  
Field angle(10%Imax): [C0/180]Total=43.4  
                                  [C90/270]Total=43.4  
Maximum s/h(1/2): C0\_180=0.41 C90\_270=0.41  
Maximum s/h(1/4): C0\_180=0.38 C90\_270=0.38  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 96.13%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 99.773%

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Equipment: GMS 1800  
Temperature(°C): 25.0

Date: 2020/9/21  
Humidity(%): 60.0%

Operator: NT0100  
Distance(feet): 22.35

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10013.146	2.396	2.396	.103%	.107%
1.0	10011.405	19.160	21.556	.823%	.964%
2.0	9974.283	38.173	59.729	1.639%	2.671%
3.0	9906.418	56.855	116.584	2.441%	5.213%
4.0	9584.350	73.316	189.9	3.148%	8.491%
5.0	9415.703	89.991	279.891	3.864%	12.515%
6.0	9034.673	103.562	383.452	4.447%	17.145%
7.0	8488.158	113.438	496.891	4.871%	22.218%
8.0	7852.374	119.842	616.732	5.146%	27.576%
9.0	7100.988	121.816	738.548	5.230%	33.023%
10.0	6412.304	122.106	860.654	5.243%	38.483%
11.0	5698.157	119.230	979.884	5.119%	43.814%
12.0	4937.954	112.584	1092.468	4.834%	48.848%
13.0	4194.224	103.465	1195.932	4.443%	53.474%
14.0	3467.084	91.980	1287.912	3.949%	57.587%
15.0	2817.031	79.954	1367.866	3.433%	61.162%
16.0	2236.061	67.589	1435.454	2.902%	64.184%
17.0	2029.102	65.057	1500.511	2.793%	67.093%
18.0	1743.664	59.088	1559.599	2.537%	69.735%
19.0	1336.706	47.723	1607.322	2.049%	71.869%
20.0	1190.304	44.644	1651.966	1.917%	73.865%
21.0	1057.300	41.551	1693.516	1.784%	75.723%
22.0	979.946	40.256	1733.772	1.728%	77.523%
23.0	922.301	39.519	1773.291	1.697%	79.290%
24.0	871.942	38.891	1812.182	1.670%	81.029%
25.0	832.250	38.570	1850.753	1.656%	82.753%
26.0	799.298	38.424	1889.177	1.650%	84.472%
27.0	772.262	38.447	1927.624	1.651%	86.191%
28.0	751.578	38.693	1966.317	1.661%	87.921%
29.0	728.724	38.742	2005.059	1.664%	89.653%
30.0	687.355	37.688	2042.747	1.618%	91.338%
31.0	631.178	35.649	2078.396	1.531%	92.932%
32.0	561.939	32.655	2111.051	1.402%	94.392%
33.0	479.236	28.623	2139.674	1.229%	95.672%
34.0	401.546	24.623	2164.297	1.057%	96.773%
35.0	324.557	20.414	2184.711	.877%	97.686%
36.0	248.525	16.019	2200.73	.688%	98.402%
37.0	182.394	12.037	2212.768	.517%	98.940%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	136.861	9.240	2222.008	.397%	99.354%
39.0	52.221	3.604	2225.612	.155%	99.515%
40.0	21.839	1.539	2227.151	.066%	99.584%
41.0	11.195	0.805	2227.956	.035%	99.620%
42.0	8.828	0.648	2228.604	.028%	99.648%
43.0	7.123	0.533	2229.137	.023%	99.672%
44.0	5.864	0.447	2229.584	.019%	99.692%
45.0	5.099	0.395	2229.979	.017%	99.710%
46.0	4.403	0.347	2230.326	.015%	99.725%
47.0	3.933	0.315	2230.642	.014%	99.740%
48.0	3.445	0.281	2230.922	.012%	99.752%
49.0	3.092	0.256	2231.178	.011%	99.764%
50.0	2.952	0.248	2231.426	.011%	99.775%
51.0	2.894	0.247	2231.673	.011%	99.786%
52.0	2.854	0.247	2231.92	.011%	99.797%
53.0	2.813	0.246	2232.166	.011%	99.808%
54.0	2.749	0.244	2232.41	.010%	99.819%
55.0	2.697	0.242	2232.652	.010%	99.829%
56.0	2.552	0.232	2232.884	.010%	99.840%
57.0	2.378	0.219	2233.103	.009%	99.850%
58.0	2.193	0.204	2233.307	.009%	99.859%
59.0	2.088	0.196	2233.503	.008%	99.868%
60.0	2.013	0.191	2233.694	.008%	99.876%
61.0	1.978	0.190	2233.884	.008%	99.885%
62.0	1.926	0.186	2234.07	.008%	99.893%
63.0	1.879	0.184	2234.254	.008%	99.901%
64.0	1.862	0.184	2234.437	.008%	99.909%
65.0	1.781	0.177	2234.614	.008%	99.917%
66.0	1.659	0.166	2234.781	.007%	99.925%
67.0	1.502	0.152	2234.932	.007%	99.931%
68.0	1.340	0.136	2235.069	.006%	99.938%
69.0	1.189	0.122	2235.19	.005%	99.943%
70.0	1.015	0.105	2235.295	.004%	99.948%
71.0	0.928	0.096	2235.391	.004%	99.952%
72.0	0.835	0.087	2235.478	.004%	99.956%
73.0	0.760	0.080	2235.558	.003%	99.959%
74.0	0.690	0.073	2235.631	.003%	99.963%
75.0	0.632	0.067	2235.698	.003%	99.966%

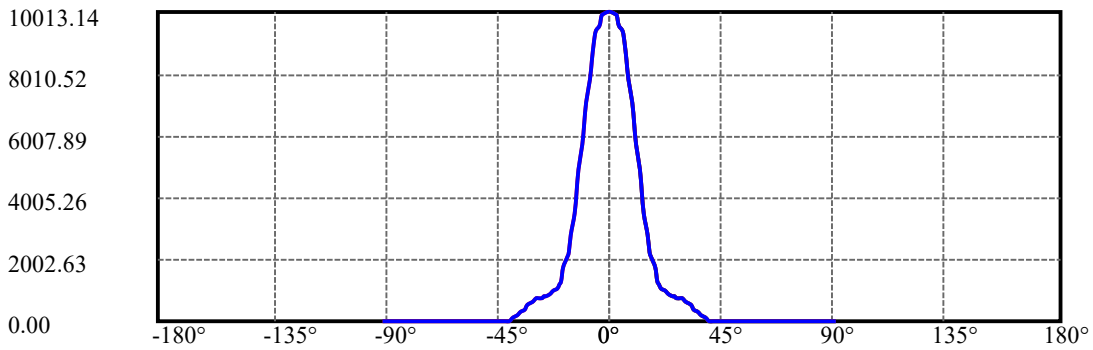
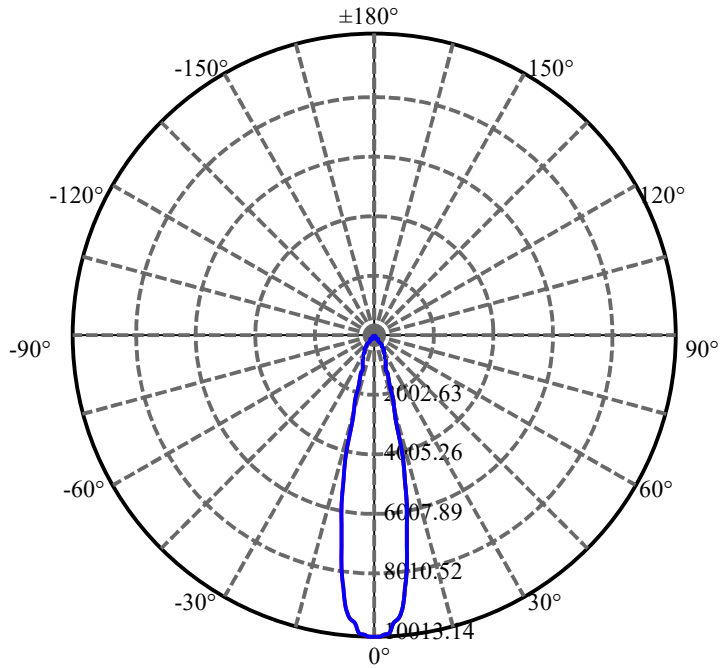
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	0.603	0.064	2235.762	.003%	99.969%
77.0	0.551	0.059	2235.821	.003%	99.971%
78.0	0.539	0.058	2235.879	.002%	99.974%
79.0	0.516	0.056	2235.934	.002%	99.976%
80.0	0.505	0.054	2235.989	.002%	99.979%
81.0	0.499	0.054	2236.043	.002%	99.981%
82.0	0.476	0.052	2236.094	.002%	99.983%
83.0	0.487	0.053	2236.147	.002%	99.986%
84.0	0.464	0.051	2236.198	.002%	99.988%
85.0	0.464	0.051	2236.249	.002%	99.990%
86.0	0.458	0.050	2236.299	.002%	99.993%
87.0	0.435	0.048	2236.346	.002%	99.995%
88.0	0.429	0.047	2236.393	.002%	99.997%
89.0	0.435	0.048	2236.441	.002%	99.999%
90.0	0.441	0.024	2236.465	.001%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2042.75	87.71%	91.34%
0-40	2227.15	95.63%	99.58%
0-60	2233.69	95.91%	99.88%
0-90	2236.44	96.03%	100.00%
0-120	2236.44	96.03%	100.00%
0-180	2236.47	96.03%	100.00%
60-90	2.94	0.13%	0.13%
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%
0-23.41	1789.17	76.82%	80.00%

ZONAL LUMEN SUMMARY

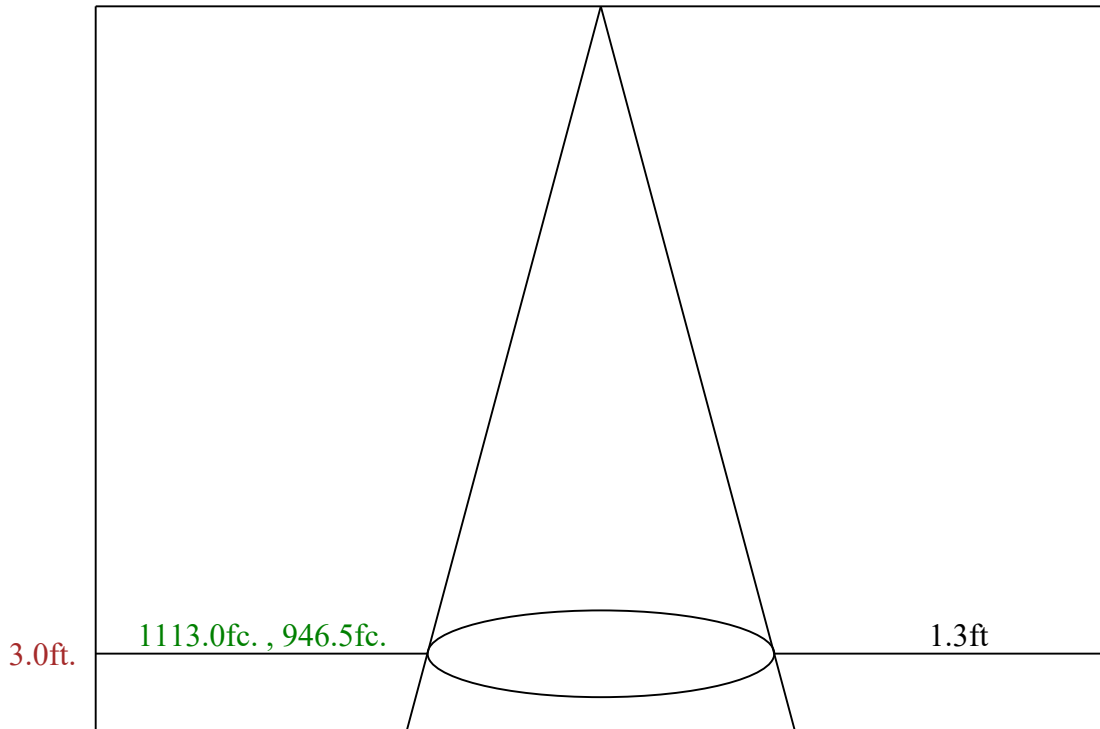
0-10	860.65
10-20	791.31
20-30	390.78
30-40	184.40
40-50	4.28
50-60	2.27
60-70	1.60
70-80	0.69
80-90	0.45
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00



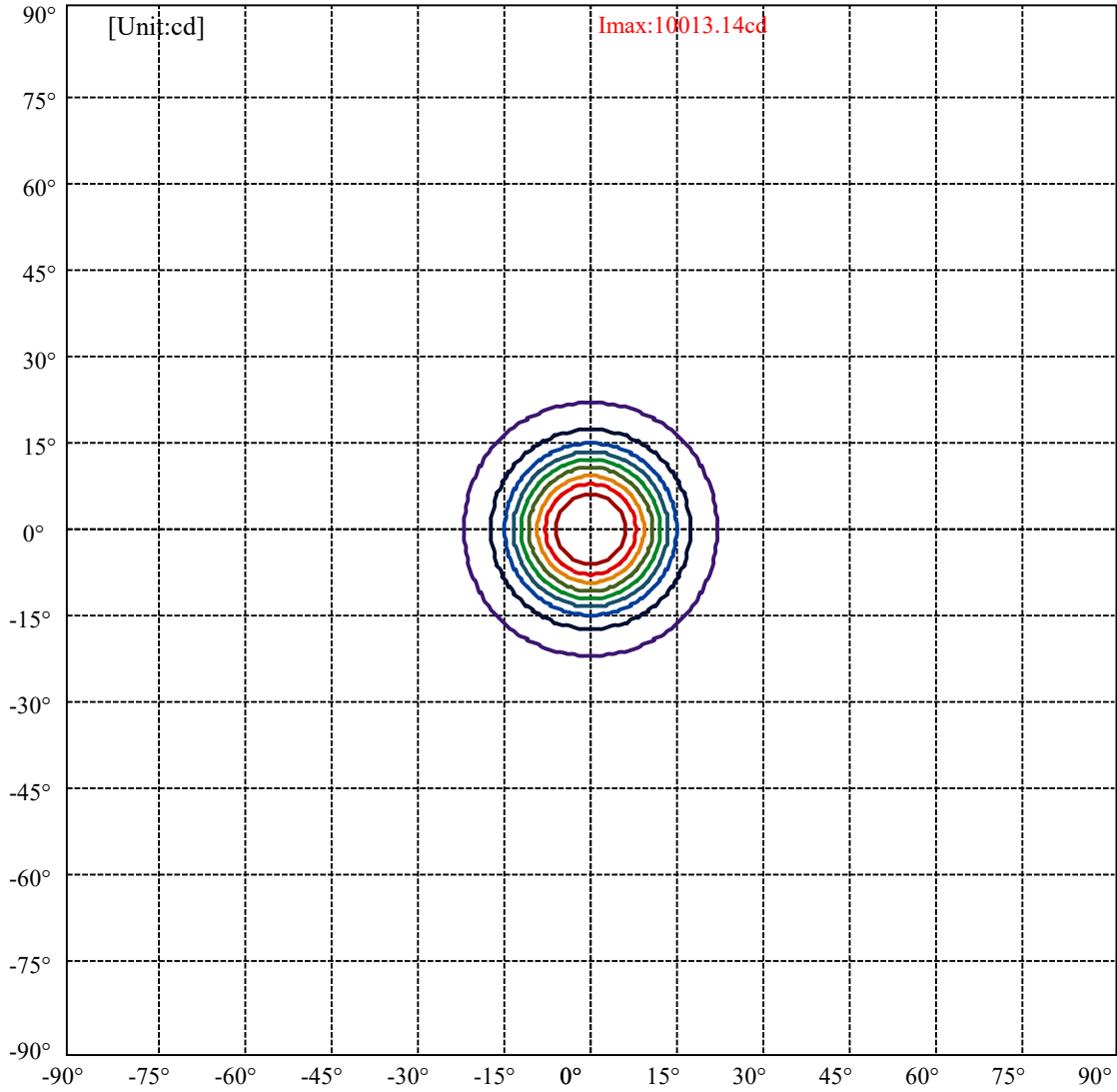
C0(Max): —————  
C0/C180: —————  
C90/C270: —————

Field angle(10%Imax):C0/180Left:21.7 Right:21.7  
:C90/270Left:21.7 Right:21.7

Beam Angle(50%Imax):C0/180Left:11.9 Right:11.9  
:C90/270Left:11.9 Right:11.9

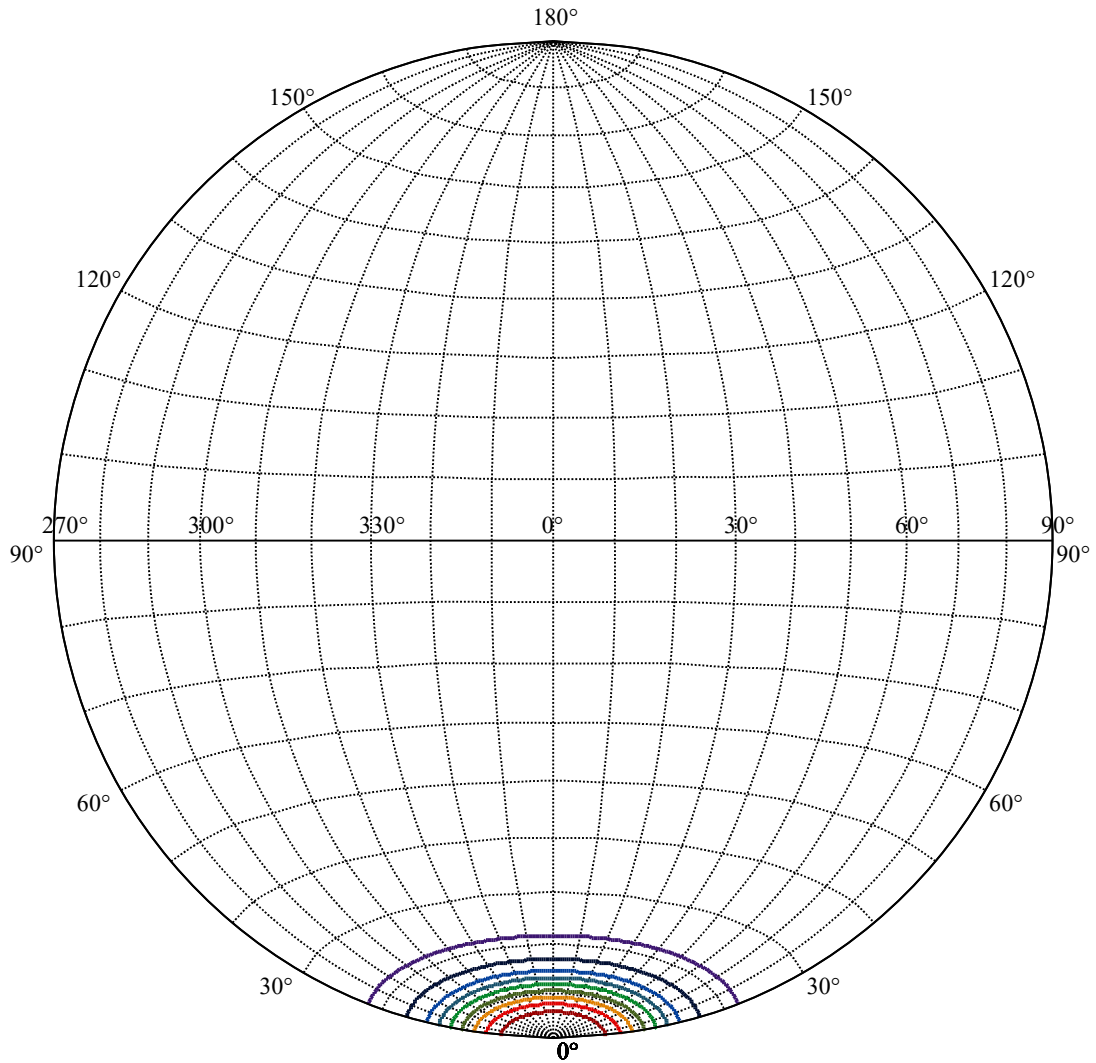


Max , Ave      Beam angle of C0 plane 23.82



(10%Imax) 1001.31	—
(20%Imax) 2002.63	—
(30%Imax) 3003.94	—
(40%Imax) 4005.26	—
(50%Imax) 5006.57	—
(60%Imax) 6007.89	—
(70%Imax) 7009.2	—
(80%Imax) 8010.52	—
(90%Imax) 9011.83	—





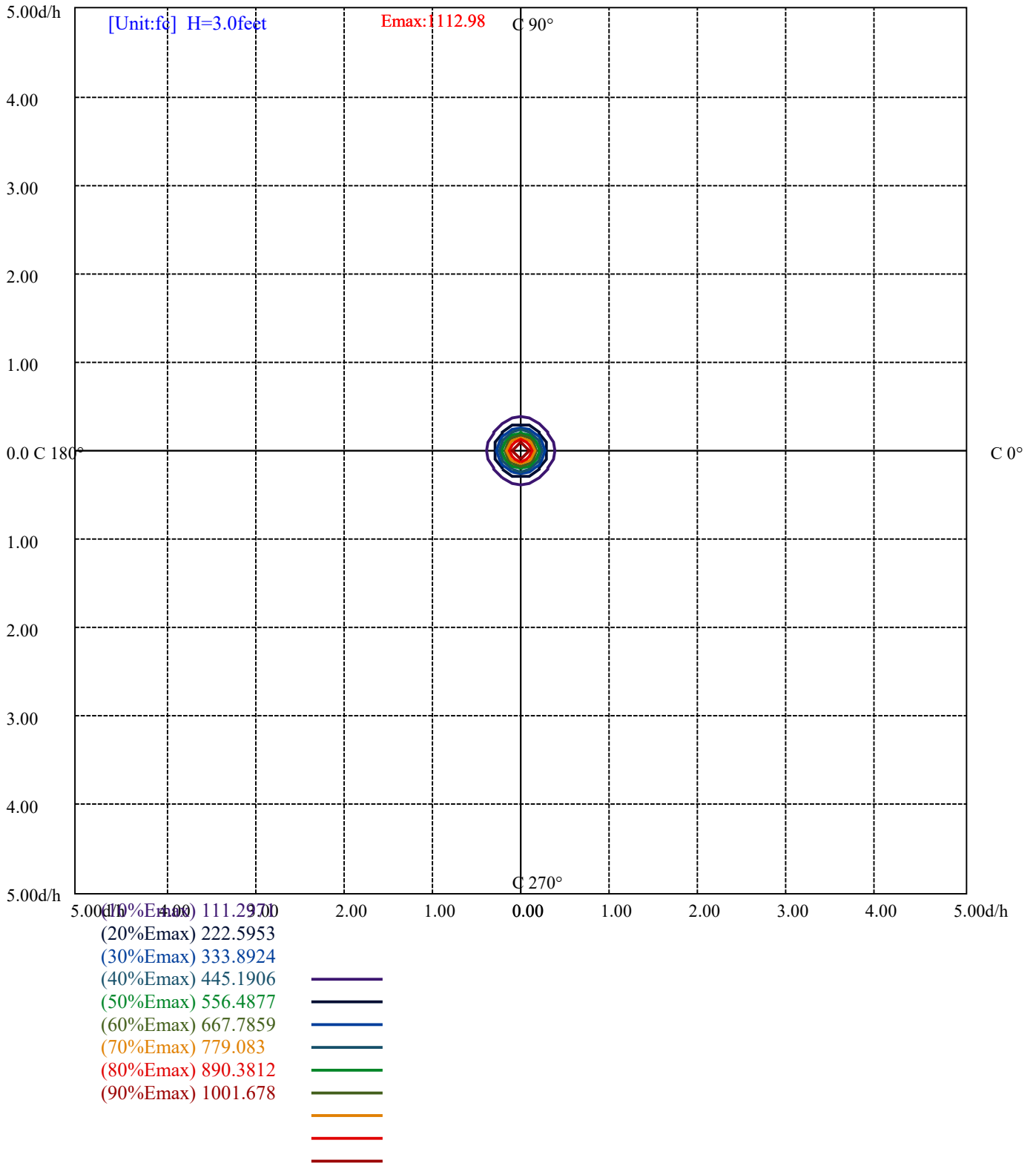
House

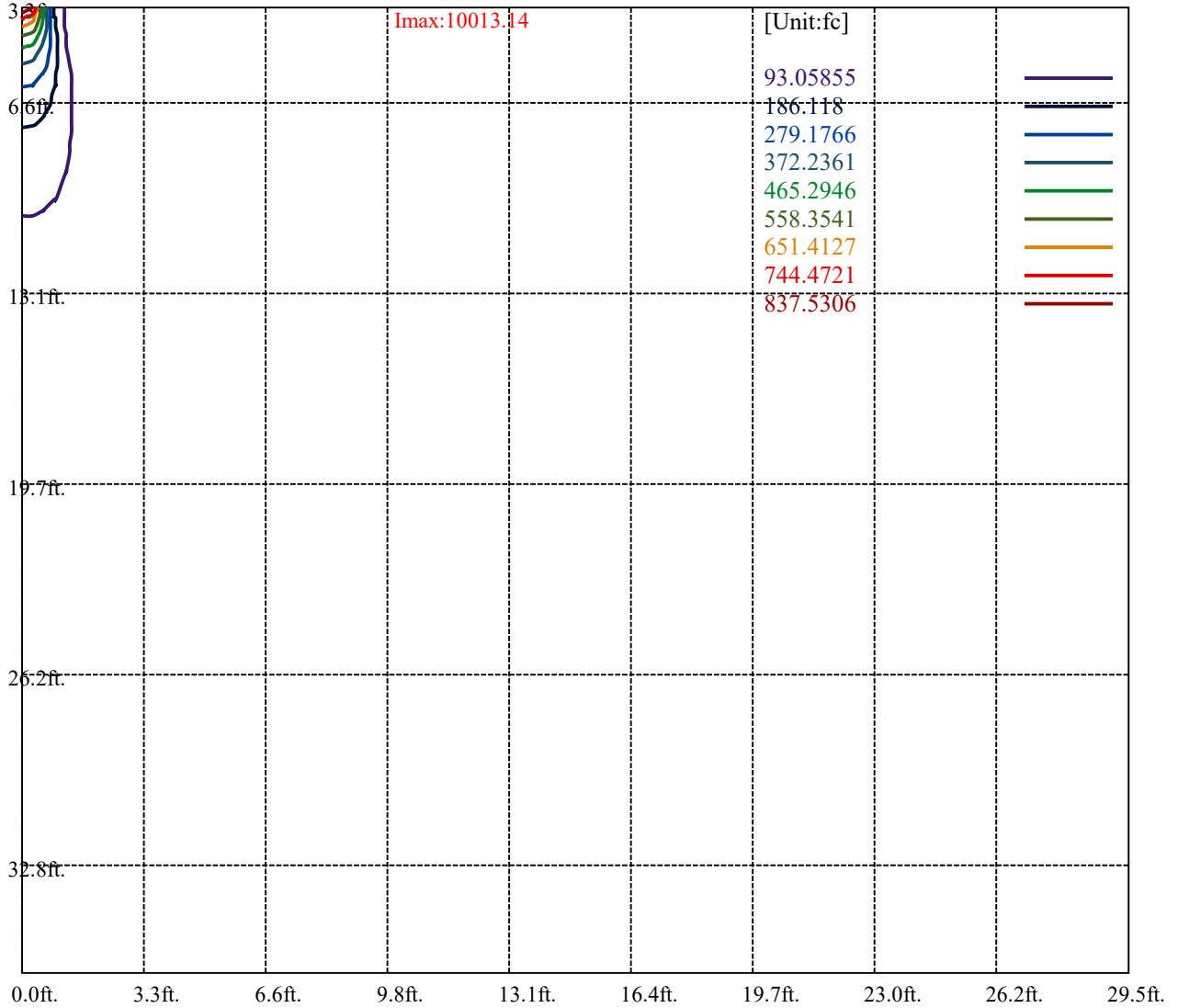
[Unit:cd]

Road

I<sub>max</sub>:10013.14

(10%I <sub>max</sub> )	1001.31	—
(20%I <sub>max</sub> )	2002.63	—
(30%I <sub>max</sub> )	3003.94	—
(40%I <sub>max</sub> )	4005.26	—
(50%I <sub>max</sub> )	5006.57	—
(60%I <sub>max</sub> )	6007.89	—
(70%I <sub>max</sub> )	7009.2	—
(80%I <sub>max</sub> )	8010.52	—
(90%I <sub>max</sub> )	9011.83	—





Luminance Table

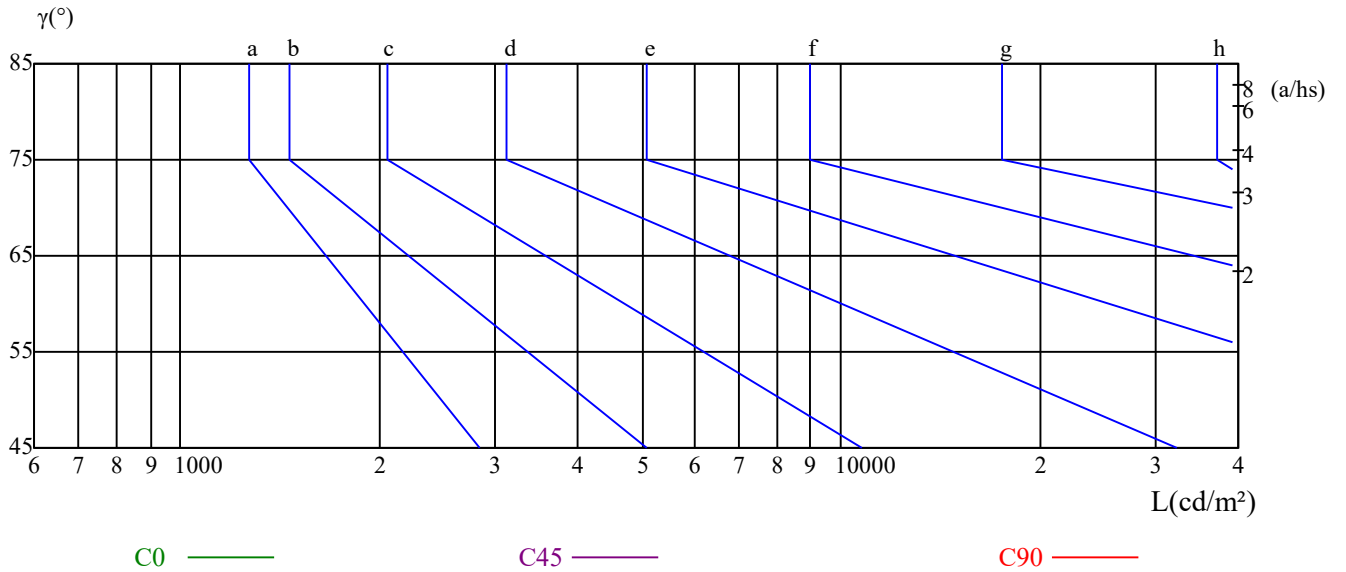
$\gamma$	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

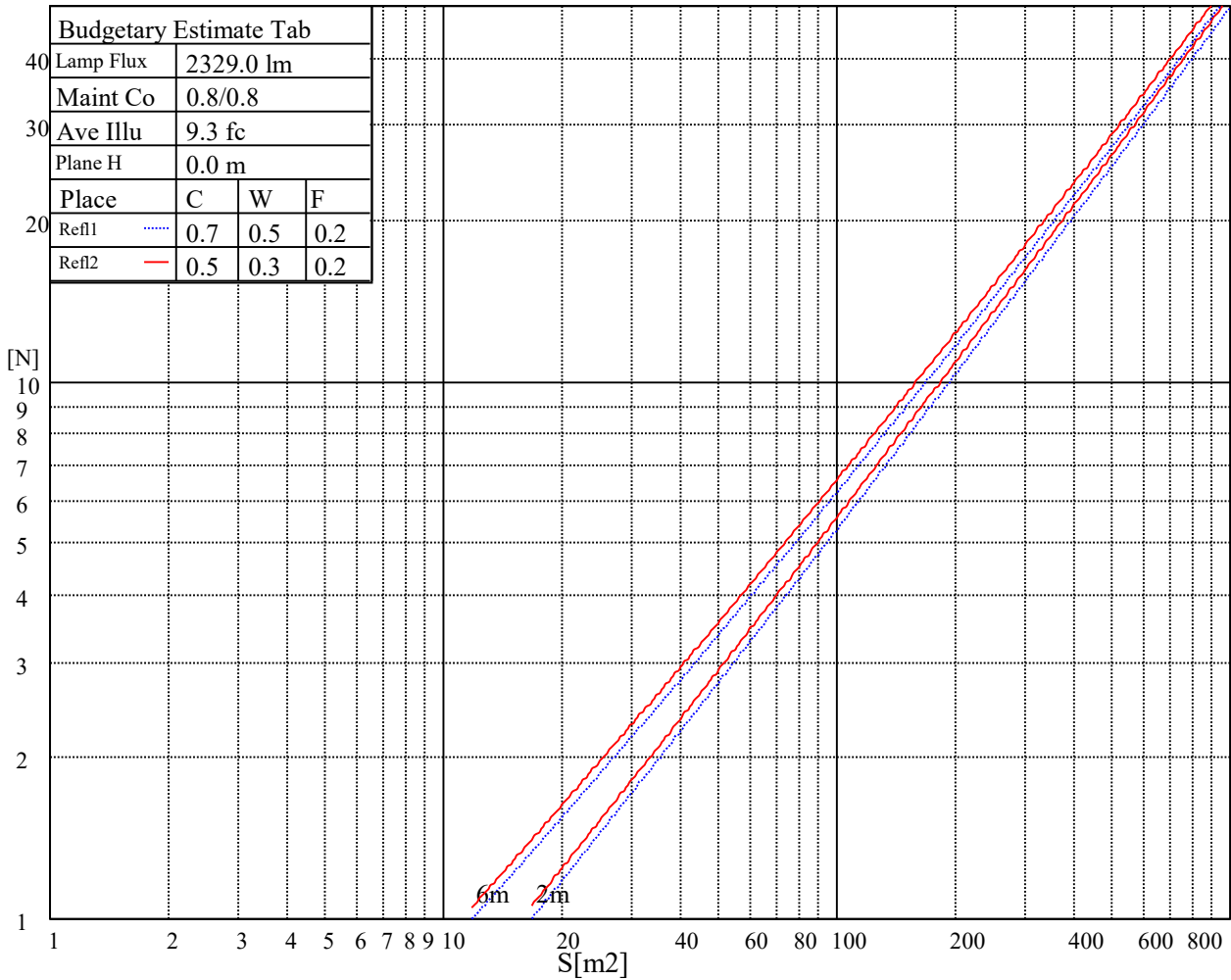
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

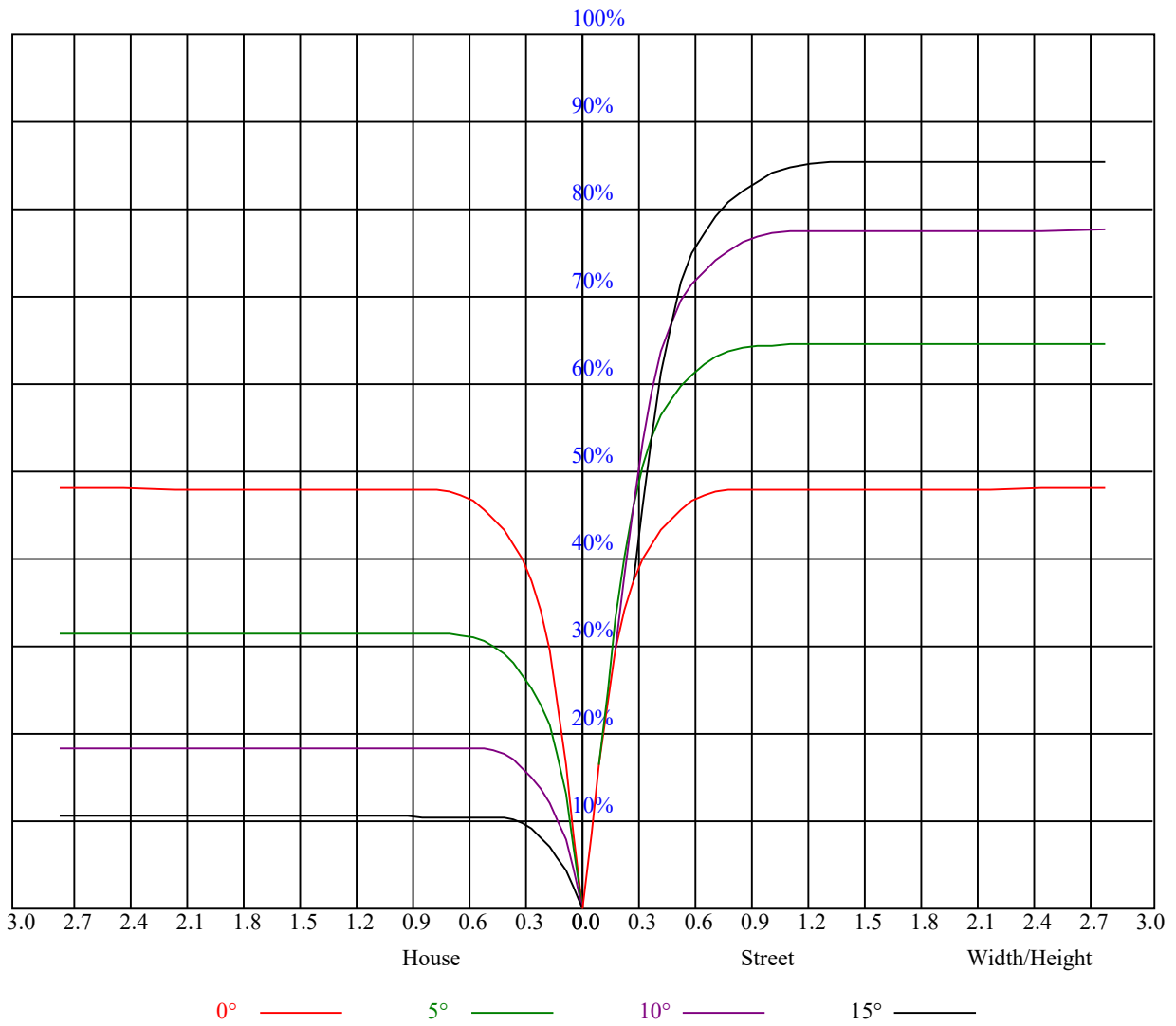
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.14	1.14	1.14	1.12	1.12	1.12	1.07	1.07	1.07	1.02	1.02	1.02	0.98	0.98	0.98	0.96
1	1.08	1.06	1.05	1.06	1.05	1.03	1.02	1.01	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93
2	1.03	1.00	0.98	1.02	0.99	0.97	0.99	0.96	0.95	0.96	0.94	0.93	0.93	0.92	0.91	0.89
3	0.99	0.95	0.92	0.97	0.94	0.92	0.95	0.92	0.90	0.93	0.91	0.89	0.91	0.89	0.87	0.86
4	0.95	0.91	0.88	0.94	0.90	0.87	0.92	0.89	0.86	0.90	0.87	0.85	0.88	0.86	0.84	0.83
5	0.91	0.87	0.84	0.90	0.87	0.84	0.89	0.86	0.83	0.87	0.85	0.82	0.86	0.84	0.82	0.81
6	0.88	0.84	0.81	0.87	0.83	0.81	0.86	0.83	0.80	0.85	0.82	0.80	0.84	0.81	0.79	0.78
7	0.85	0.81	0.78	0.84	0.81	0.78	0.83	0.80	0.77	0.82	0.79	0.77	0.81	0.79	0.77	0.76
8	0.82	0.78	0.75	0.82	0.78	0.75	0.81	0.78	0.75	0.80	0.77	0.75	0.79	0.77	0.75	0.74
9	0.80	0.76	0.73	0.79	0.76	0.73	0.79	0.75	0.73	0.78	0.75	0.73	0.77	0.74	0.72	0.72
10	0.78	0.74	0.71	0.77	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.71	0.75	0.73	0.71	0.70



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	10035.19	10053.75	9988.78	9877.42	9125.91	9125.91	8795.52	8093.44	7441.94
45.0	9998.06	10021.27	10030.55	10025.91	9970.22	9821.73	9529.39	9074.64	8443.55
90.0	10007.35	10007.35	9979.50	9905.26	9895.98	9131.48	9030.32	8448.42	7913.39
135.0	10011.99	10007.35	10002.70	9923.82	9854.21	9728.93	9450.51	9005.03	8415.71
180.0	10035.19	10007.35	9993.42	9947.02	9835.65	9682.52	9366.98	8889.02	8244.02
225.0	9998.06	9960.94	9863.49	9877.42	9105.96	9105.96	8506.43	7821.98	7118.97
270.0	10007.35	10016.63	9984.14	9877.42	9728.93	9571.15	9018.95	8684.85	8044.48
315.0	10011.99	10016.63	9951.66	9817.09	9157.93	9157.93	8579.28	7887.87	7196.93
360.0	10035.19	10053.75	9988.78	9877.42	9125.91	9125.91	8795.52	8093.44	7441.94
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	6711.08	6048.44	5329.66	4582.10	3792.31	3031.30	2345.46	1861.47	1562.17
45.0	7775.34	7065.37	6373.96	5650.07	5209.24	4123.40	3659.37	2921.55	2513.21
90.0	7061.89	6310.62	5705.06	4906.46	3978.39	3400.21	2710.65	2144.53	1741.75
135.0	7747.50	7014.33	6281.16	5510.86	4722.00	3974.91	3269.58	2578.17	2152.88
180.0	7557.25	6847.28	6151.23	5436.62	4680.24	3909.95	3172.13	2471.44	2471.44
225.0	6403.89	5667.94	4897.18	4144.51	3397.88	2681.88	2090.70	1713.44	1469.36
270.0	7060.73	6605.98	5868.17	5074.67	4313.65	3580.48	2893.71	2406.48	2406.48
315.0	6490.20	5738.47	4978.85	4198.34	3460.07	3034.55	2394.64	1791.40	1615.53
360.0	6711.08	6048.44	5329.66	4582.10	3792.31	3031.30	2345.46	1861.47	1562.17
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1396.51	1218.78	1107.42	1002.54	919.95	894.98	846.86	809.00	781.01
45.0	2513.21	1532.93	1340.36	1196.51	1085.14	995.58	925.98	870.29	830.39
90.0	1473.07	1293.96	1162.64	1060.55	896.47	896.47	867.32	830.02	810.81
135.0	2452.88	1503.70	1314.84	1175.63	1067.51	987.70	923.66	873.08	832.71
180.0	1907.87	1427.13	1258.69	1130.15	1031.31	951.04	891.64	845.24	808.58
225.0	1295.35	1162.64	1056.37	913.17	913.17	870.16	829.13	796.05	768.81
270.0	1518.09	1324.12	1178.41	1067.97	1014.15	914.84	862.41	838.74	791.87
315.0	1392.33	1230.38	1103.70	911.87	911.87	867.65	828.53	795.59	770.20
360.0	1396.51	1218.78	1107.42	1002.54	919.95	894.98	846.86	809.00	781.01
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	756.28	736.05	713.17	663.10	588.81	508.21	425.29	342.46	293.41
45.0	793.73	771.92	745.01	726.91	706.49	640.60	583.52	501.39	418.33
90.0	773.03	760.92	738.74	704.68	645.19	574.71	492.01	409.83	329.56
135.0	799.30	771.92	750.57	727.84	689.32	625.29	551.97	468.91	387.24
180.0	783.52	760.78	741.29	715.77	665.66	594.66	514.85	433.18	351.97
225.0	747.42	728.39	692.89	625.52	551.60	467.88	381.62	302.13	219.63
270.0	776.10	752.89	733.40	705.10	644.77	576.56	491.64	410.44	331.09
315.0	748.72	729.74	714.70	629.93	557.58	507.61	392.99	344.03	265.24
360.0	756.28	736.05	713.17	663.10	588.81	508.21	425.29	342.46	293.41
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	214.20	110.39	72.85	26.73	11.88	9.47	7.24	6.13	4.97
45.0	334.80	253.13	253.13	100.32	42.00	15.41	10.63	8.07	6.08
90.0	247.75	171.32	101.07	44.59	15.82	11.51	9.61	7.61	6.40
135.0	308.35	244.31	244.31	95.82	41.11	14.43	10.81	8.26	6.45
180.0	303.25	239.21	239.21	65.15	23.85	12.48	10.30	8.31	7.01
225.0	142.55	77.45	27.75	11.88	10.44	7.47	6.50	5.38	4.78
270.0	249.88	249.88	100.18	53.97	17.91	9.79	8.40	6.73	5.75
315.0	187.42	113.46	56.38	19.30	11.69	9.00	7.15	6.50	5.48
360.0	214.20	110.39	72.85	26.73	11.88	9.47	7.24	6.13	4.97



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	3.94	3.48	3.25	3.02	2.88	2.88	2.88	2.97	2.88
45.0	5.71	4.36	4.04	3.39	3.06	2.97	2.78	2.64	2.69
90.0	5.66	5.01	4.50	3.85	3.53	3.29	3.25	3.20	3.16
135.0	5.38	4.69	4.13	3.57	3.02	2.69	2.55	2.46	2.32
180.0	5.94	5.10	4.50	3.90	3.34	3.06	2.97	3.06	3.06
225.0	4.13	3.62	3.16	2.92	2.64	2.55	2.64	2.55	2.51
270.0	5.15	4.64	4.04	3.43	3.06	2.97	2.88	2.83	2.78
315.0	4.87	4.32	3.85	3.48	3.20	3.20	3.20	3.11	3.11
360.0	3.94	3.48	3.25	3.02	2.88	2.88	2.88	2.97	2.88
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	2.74	2.69	2.46	2.23	1.95	1.86	1.90	1.86	1.86
45.0	2.74	2.74	2.74	2.69	2.55	2.41	2.27	2.18	2.18
90.0	3.11	3.02	2.78	2.55	2.37	2.27	2.13	2.09	2.09
135.0	2.32	2.23	2.18	2.13	2.04	1.90	1.81	1.76	1.72
180.0	2.92	2.83	2.74	2.60	2.27	2.04	1.95	1.95	1.95
225.0	2.46	2.46	2.27	2.09	2.00	2.00	1.95	1.95	1.76
270.0	2.78	2.78	2.55	2.32	2.13	2.04	1.90	1.95	1.90
315.0	2.92	2.83	2.69	2.41	2.23	2.18	2.18	2.09	1.95
360.0	2.74	2.69	2.46	2.23	1.95	1.86	1.90	1.86	1.86
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	1.81	1.81	1.72	1.48	1.25	1.16	1.07	0.88	0.84
45.0	2.09	2.00	1.86	1.86	1.81	1.62	1.44	1.25	1.11
90.0	2.13	2.04	1.90	1.76	1.58	1.44	1.21	1.02	0.97
135.0	1.62	1.62	1.62	1.58	1.48	1.30	1.21	1.16	1.07
180.0	1.90	1.90	1.86	1.72	1.53	1.39	1.21	0.97	0.88
225.0	1.72	1.72	1.67	1.53	1.30	1.16	1.07	0.84	0.74
270.0	1.81	1.90	1.86	1.72	1.58	1.39	1.25	1.02	0.88
315.0	1.95	1.90	1.76	1.62	1.48	1.25	1.07	0.97	0.93
360.0	1.81	1.81	1.72	1.48	1.25	1.16	1.07	0.88	0.84
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	0.74	0.65	0.56	0.56	0.56	0.51	0.51	0.51	0.46
45.0	0.97	0.88	0.79	0.70	0.65	0.60	0.56	0.46	0.46
90.0	0.88	0.79	0.74	0.65	0.56	0.51	0.56	0.51	0.46
135.0	0.88	0.84	0.79	0.74	0.74	0.60	0.60	0.60	0.65
180.0	0.84	0.79	0.70	0.65	0.56	0.51	0.56	0.51	0.42
225.0	0.70	0.60	0.56	0.51	0.51	0.51	0.42	0.42	0.42
270.0	0.88	0.84	0.70	0.60	0.60	0.56	0.51	0.51	0.51
315.0	0.79	0.70	0.70	0.65	0.65	0.60	0.60	0.60	0.65
360.0	0.74	0.65	0.56	0.56	0.56	0.51	0.51	0.51	0.46
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	0.42	0.42	0.46	0.42	0.42	0.42	0.46	0.42	0.42
45.0	0.46	0.46	0.46	0.42	0.46	0.46	0.42	0.46	0.42
90.0	0.46	0.42	0.42	0.46	0.46	0.37	0.37	0.37	0.37
135.0	0.60	0.56	0.60	0.56	0.51	0.51	0.51	0.46	0.51
180.0	0.46	0.42	0.42	0.37	0.42	0.37	0.37	0.37	0.37
225.0	0.46	0.37	0.42	0.42	0.37	0.42	0.37	0.37	0.42
270.0	0.51	0.51	0.46	0.42	0.46	0.46	0.42	0.46	0.42
315.0	0.60	0.65	0.65	0.65	0.60	0.65	0.56	0.51	0.56
360.0	0.42	0.42	0.46	0.42	0.42	0.42	0.46	0.42	0.42

Intensity data(cd)

<b>C/<math>\gamma</math>(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>0.42</b>
<b>45.0</b>	<b>0.42</b>
<b>90.0</b>	<b>0.37</b>
<b>135.0</b>	<b>0.60</b>
<b>180.0</b>	<b>0.32</b>
<b>225.0</b>	<b>0.32</b>
<b>270.0</b>	<b>0.46</b>
<b>315.0</b>	<b>0.60</b>
<b>360.0</b>	<b>0.42</b>