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NATA

LumCAT: 3-2042-M
Luminaire: 92.70.135.00
Report No: NATA0100
Test No: GC2018102514
LampCAT: LUMILEDS LUXEON 1205
Lamp flux(lm): 2979.0
Number of Lamps: 1
Length(mm): 84
Phm Type: C
Voltage(V): 35.7000
Current(A): 0.6000
Power (W): 21.4200
PF: 1.0000
Ballast type: DC
Width(mm): 84
Height(mm): 0

Photometric Results

Lumens(lm): 2651.62
Efficiency(%): 89.01%
Lumens(lm)/Power(W): 124.07
Central intensity(cd): 25378.590
Maximum intensity(cd): 25378.590
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=13.2
[C90/270]Total=13.2
Field angle(10%Imax): [C0/180]Total=26.0
[C90/270]Total=26.0
Maximum s/h(1/2): C0_180=0.23 C90_270=0.23
Maximum s/h(1/4): C0_180=0.22 C90_270=0.22
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 89.21%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.497%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	25378.594	6.072	6.072	.204%	.229%
1.0	25157.109	48.147	54.219	1.616%	2.045%
2.0	24446.250	93.558	147.777	3.141%	5.573%
3.0	22906.406	131.465	279.242	4.413%	10.531%
4.0	20640.938	157.894	437.136	5.300%	16.486%
5.0	17912.813	171.203	608.339	5.747%	22.942%
6.0	14602.008	167.378	775.717	5.619%	29.254%
7.0	11313.773	151.201	926.918	5.076%	34.957%
8.0	8943.328	136.492	1063.409	4.582%	40.104%
9.0	6622.805	113.612	1177.022	3.814%	44.389%
10.0	4873.711	92.807	1269.829	3.115%	47.889%
11.0	3789.000	79.282	1349.111	2.661%	50.879%
12.0	3035.531	69.209	1418.32	2.323%	53.489%
13.0	2540.039	62.659	1480.979	2.103%	55.852%
14.0	2019.164	53.567	1534.546	1.798%	57.872%
15.0	1756.758	49.861	1584.407	1.674%	59.752%
16.0	1543.781	46.663	1631.07	1.566%	61.512%
17.0	1412.086	45.274	1676.344	1.520%	63.220%
18.0	1307.320	44.301	1720.646	1.487%	64.890%
19.0	1237.641	44.186	1764.832	1.483%	66.557%
20.0	1178.944	44.218	1809.05	1.484%	68.224%
21.0	1134.745	44.594	1853.644	1.497%	69.906%
22.0	1100.665	45.215	1898.859	1.518%	71.611%
23.0	1069.080	45.808	1944.667	1.538%	73.339%
24.0	1042.917	46.517	1991.184	1.562%	75.093%
25.0	1018.547	47.204	2038.388	1.585%	76.873%
26.0	997.460	47.950	2086.338	1.610%	78.682%
27.0	976.057	48.593	2134.931	1.631%	80.514%
28.0	958.071	49.324	2184.255	1.656%	82.374%
29.0	942.687	50.118	2234.373	1.682%	84.264%
30.0	927.563	50.859	2285.232	1.707%	86.182%
31.0	911.538	51.483	2336.715	1.728%	88.124%
32.0	876.867	50.956	2387.671	1.711%	90.046%
33.0	805.767	48.125	2435.796	1.615%	91.861%
34.0	691.699	42.416	2478.212	1.424%	93.460%
35.0	579.930	36.477	2514.689	1.224%	94.836%
36.0	451.104	29.077	2543.766	.976%	95.932%
37.0	327.628	21.622	2565.388	.726%	96.748%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	226.301	15.278	2580.666	.513%	97.324%
39.0	113.112	7.806	2588.472	.262%	97.618%
40.0	49.113	3.462	2591.934	.116%	97.749%
41.0	31.409	2.260	2594.194	.076%	97.834%
42.0	26.283	1.929	2596.122	.065%	97.907%
43.0	21.066	1.575	2597.698	.053%	97.966%
44.0	17.817	1.357	2599.055	.046%	98.018%
45.0	15.940	1.236	2600.291	.041%	98.064%
46.0	15.166	1.196	2601.488	.040%	98.109%
47.0	14.773	1.185	2602.672	.040%	98.154%
48.0	14.456	1.178	2603.85	.040%	98.198%
49.0	14.133	1.170	2605.02	.039%	98.242%
50.0	13.859	1.164	2606.184	.039%	98.286%
51.0	13.613	1.160	2607.344	.039%	98.330%
52.0	13.373	1.156	2608.5	.039%	98.374%
53.0	13.141	1.151	2609.651	.039%	98.417%
54.0	12.930	1.147	2610.798	.039%	98.460%
55.0	12.727	1.143	2611.941	.038%	98.503%
56.0	12.565	1.142	2613.084	.038%	98.547%
57.0	12.417	1.142	2614.226	.038%	98.590%
58.0	12.277	1.142	2615.367	.038%	98.633%
59.0	12.129	1.140	2616.507	.038%	98.676%
60.0	12.002	1.140	2617.647	.038%	98.719%
61.0	11.876	1.139	2618.786	.038%	98.762%
62.0	11.742	1.137	2619.923	.038%	98.804%
63.0	11.658	1.139	2621.062	.038%	98.847%
64.0	11.538	1.137	2622.2	.038%	98.890%
65.0	11.440	1.137	2623.336	.038%	98.933%
66.0	11.370	1.139	2624.475	.038%	98.976%
67.0	11.299	1.141	2625.616	.038%	99.019%
68.0	11.222	1.141	2626.757	.038%	99.062%
69.0	11.166	1.143	2627.9	.038%	99.105%
70.0	11.109	1.145	2629.045	.038%	99.149%
71.0	11.053	1.146	2630.191	.038%	99.192%
72.0	10.997	1.147	2631.338	.038%	99.235%
73.0	10.969	1.150	2632.488	.039%	99.278%
74.0	10.927	1.152	2633.64	.039%	99.322%
75.0	10.884	1.153	2634.793	.039%	99.365%

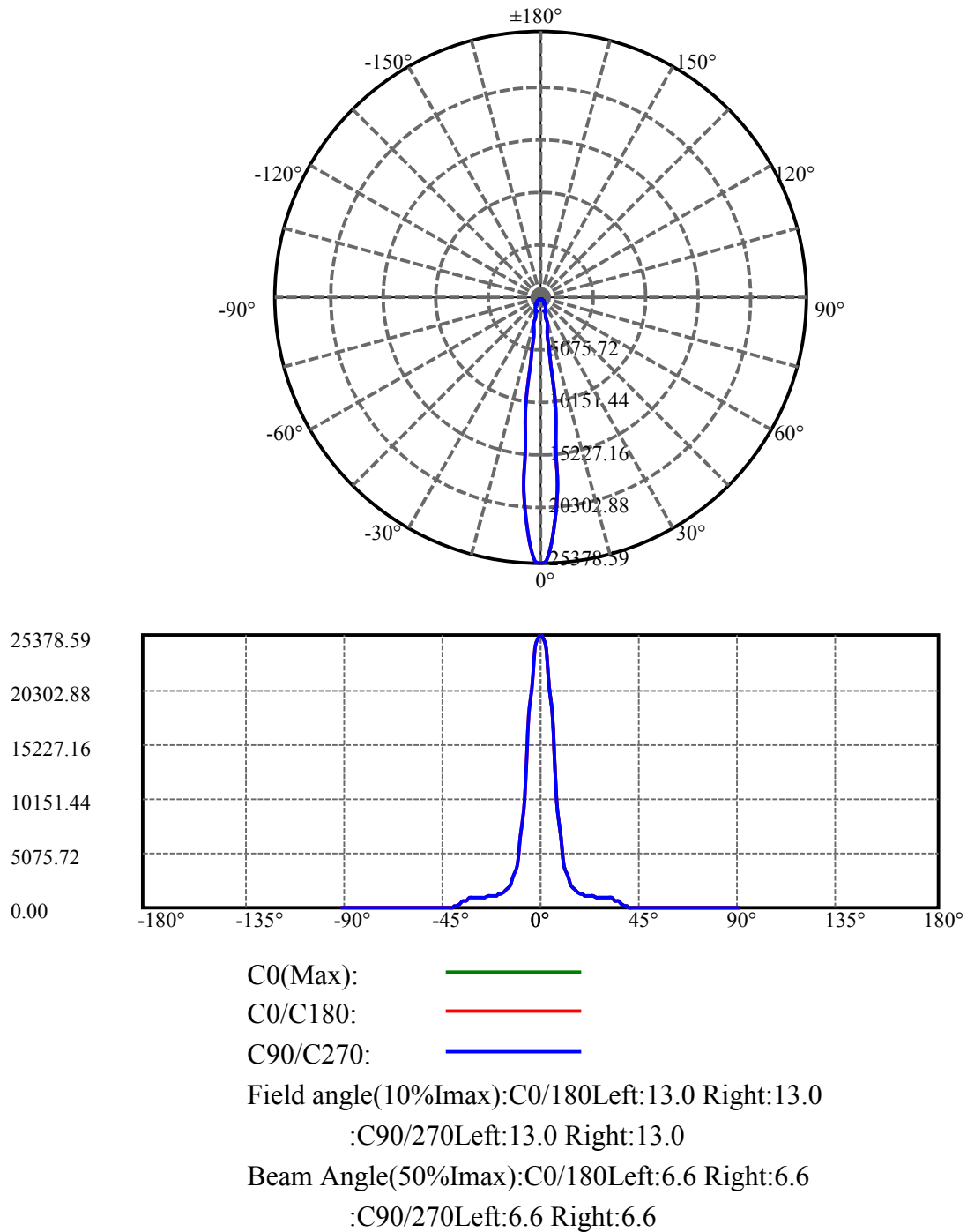
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.849	1.154	2635.947	.039%	99.409%
77.0	10.814	1.155	2637.103	.039%	99.452%
78.0	10.800	1.158	2638.261	.039%	99.496%
79.0	10.765	1.159	2639.42	.039%	99.540%
80.0	10.744	1.160	2640.58	.039%	99.584%
81.0	10.730	1.162	2641.742	.039%	99.627%
82.0	10.695	1.161	2642.904	.039%	99.671%
83.0	10.688	1.163	2644.067	.039%	99.715%
84.0	10.673	1.164	2645.231	.039%	99.759%
85.0	10.652	1.164	2646.395	.039%	99.803%
86.0	10.631	1.163	2647.558	.039%	99.847%
87.0	10.610	1.162	2648.72	.039%	99.890%
88.0	10.596	1.161	2649.881	.039%	99.934%
89.0	10.596	1.162	2651.043	.039%	99.978%
90.0	10.589	0.581	2651.623	.019%	100.000%

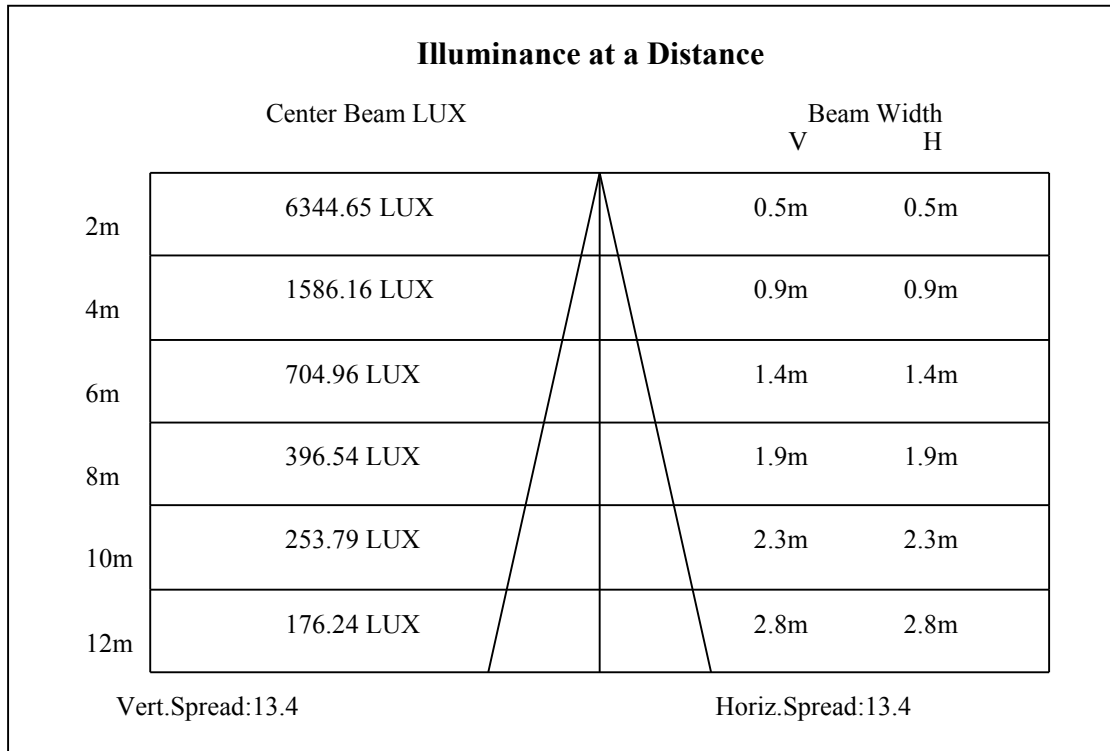
ZONAL LUMEN SUMMARY

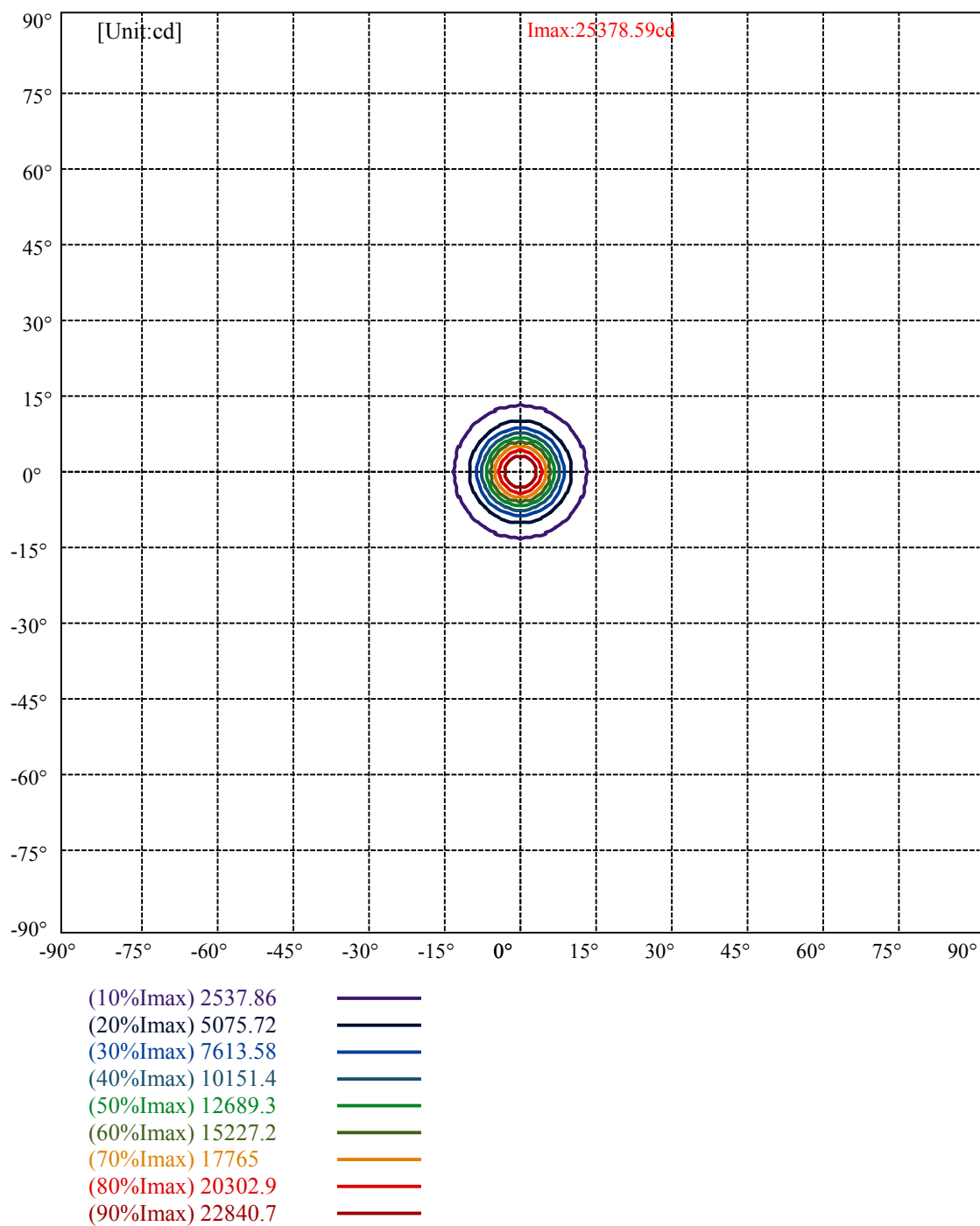
Zone	Lumens	%Lamp	%Fixt
0-30	2285.23	76.71%	86.18%
0-40	2591.93	87.01%	97.75%
0-60	2617.65	87.87%	98.72%
0-90	2651.04	88.99%	99.98%
0-120	2651.04	88.99%	99.98%
0-180	2651.62	89.01%	100.00%
60-90	34.54	1.16%	1.30%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-26.72	2121.30	71.21%	80.00%

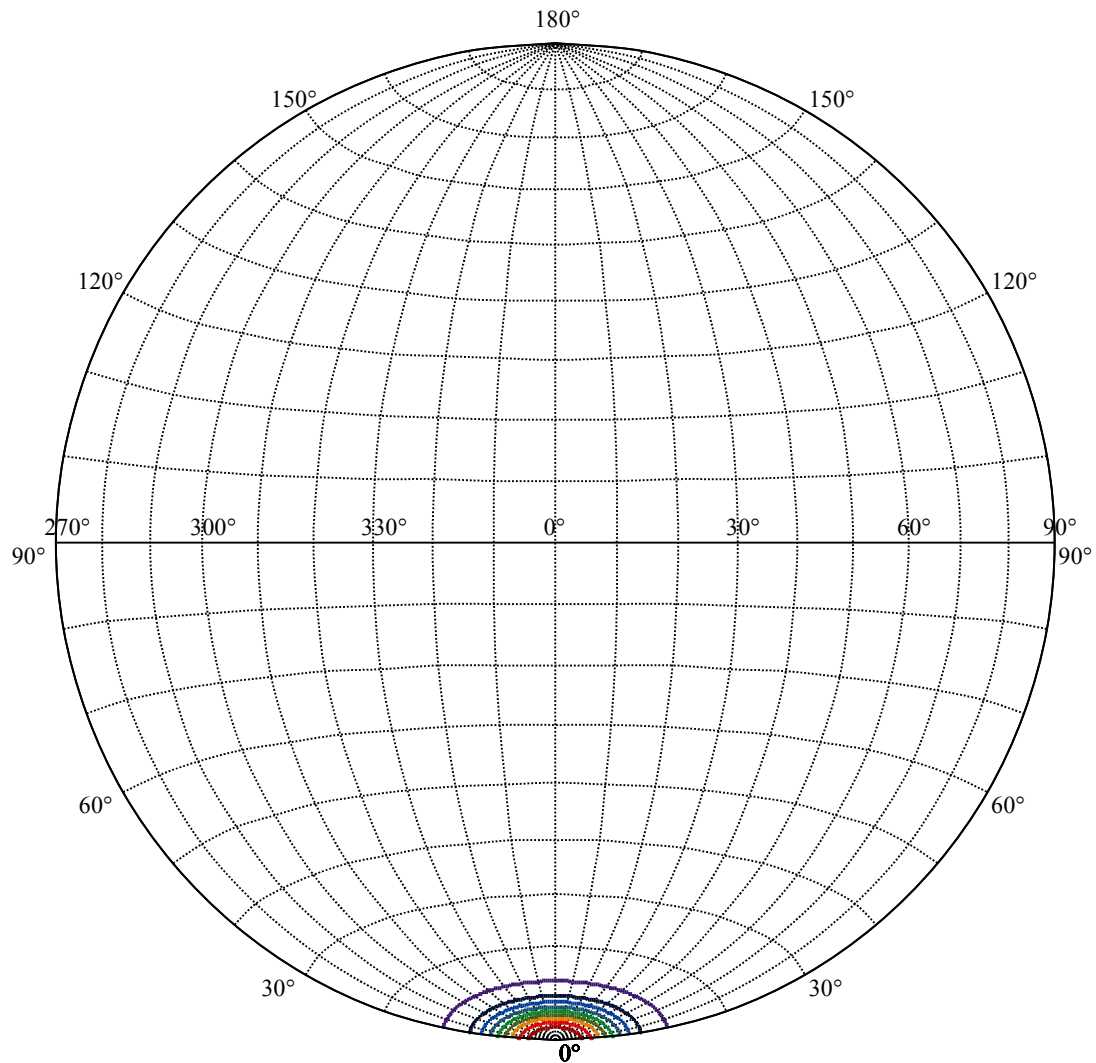
ZONAL LUMEN SUMMARY

0-10	1269.83
10-20	539.22
20-30	476.18
30-40	306.70
40-50	14.25
50-60	11.46
60-70	11.40
70-80	11.54
80-90	10.46
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









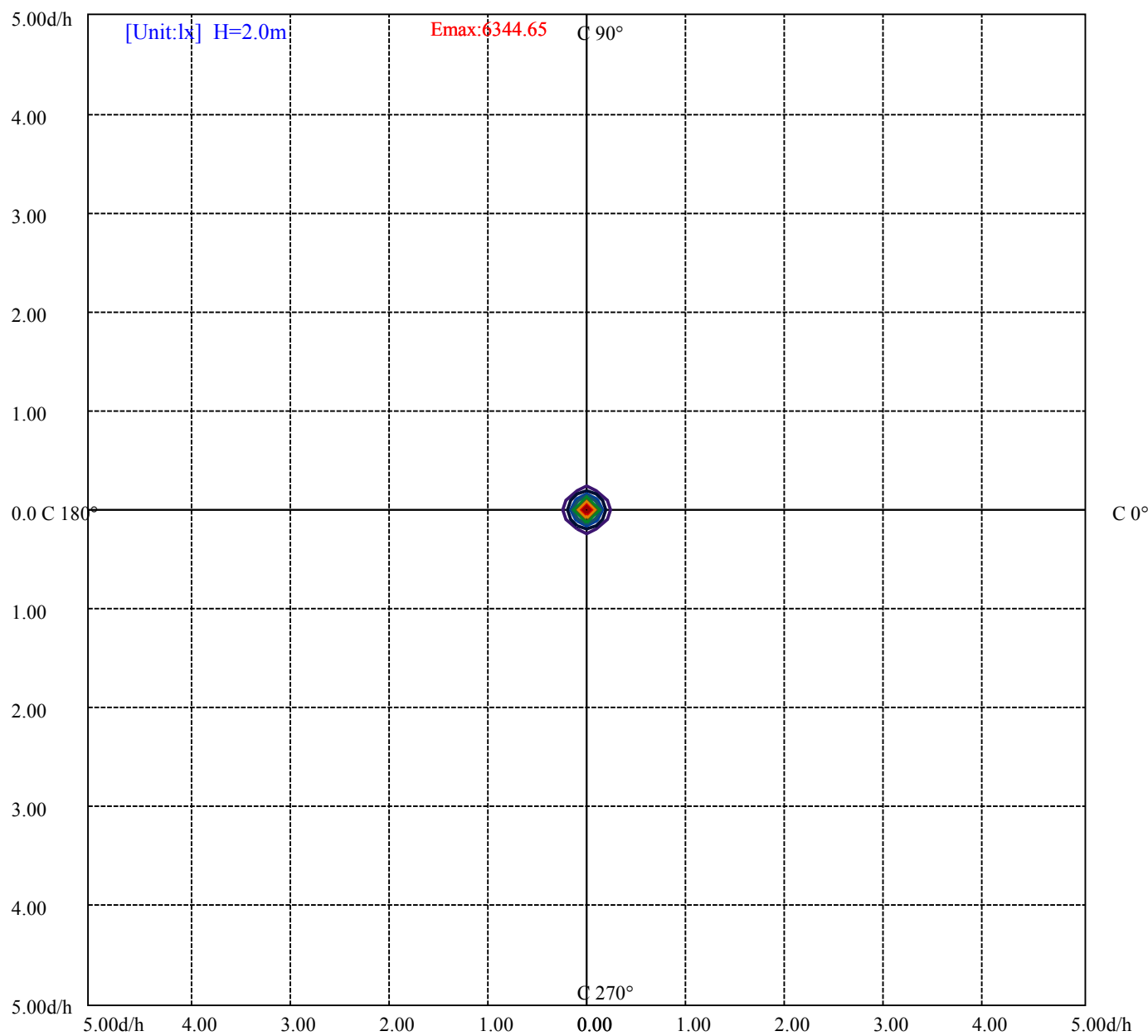
House

[Unit:cd]

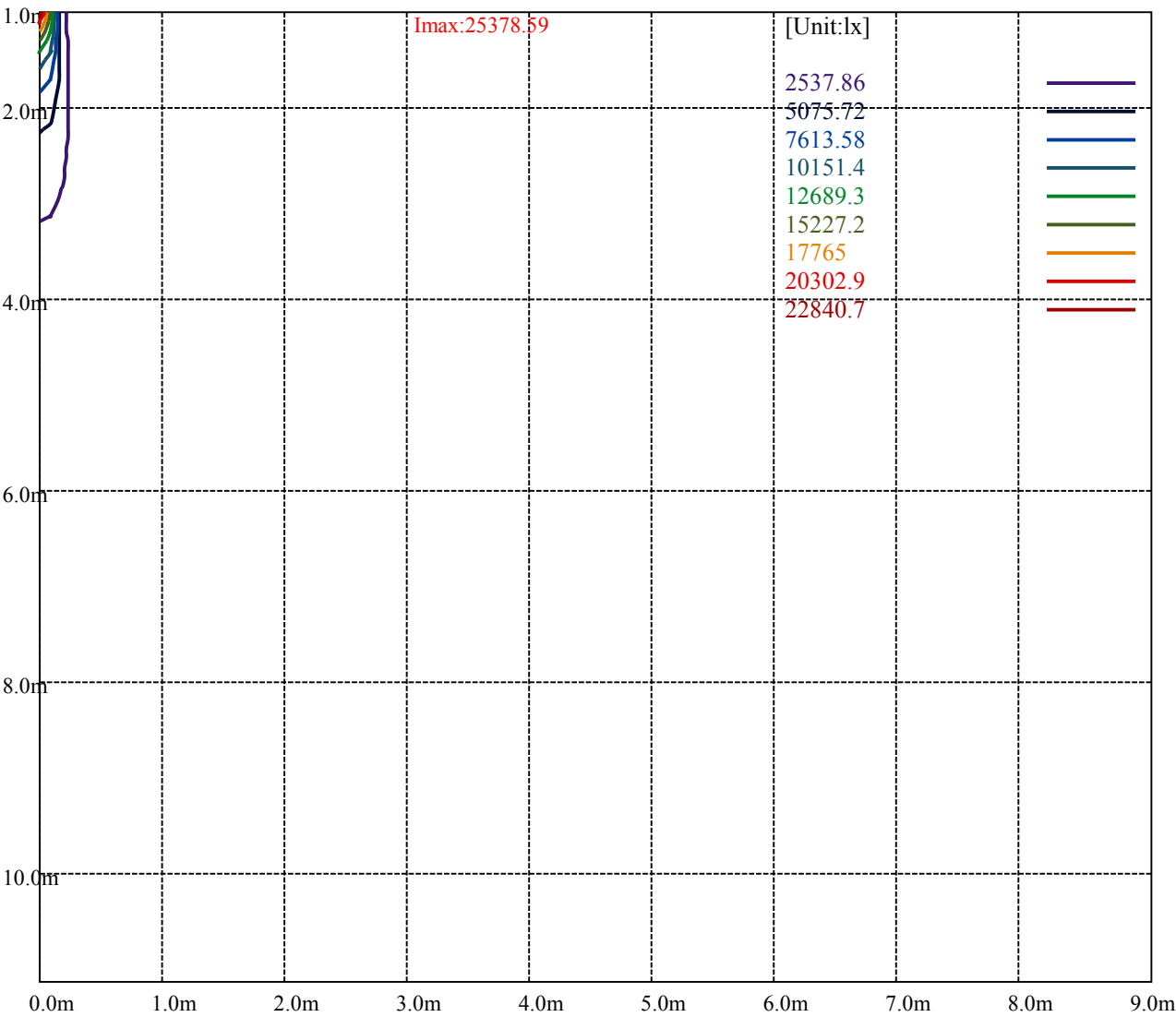
Road

Imax:25378.59

(10%Imax)	2537.86	—
(20%Imax)	5075.72	—
(30%Imax)	7613.58	—
(40%Imax)	10151.4	—
(50%Imax)	12689.3	—
(60%Imax)	15227.2	—
(70%Imax)	17765	—
(80%Imax)	20302.9	—
(90%Imax)	22840.7	—



(10%Emax)	634.465	—
(20%Emax)	1268.927	—
(30%Emax)	1903.392	—
(40%Emax)	2537.85	—
(50%Emax)	3172.325	—
(60%Emax)	3806.775	—
(70%Emax)	4441.25	—
(80%Emax)	5075.7	—
(90%Emax)	5710.175	—



Luminance Table

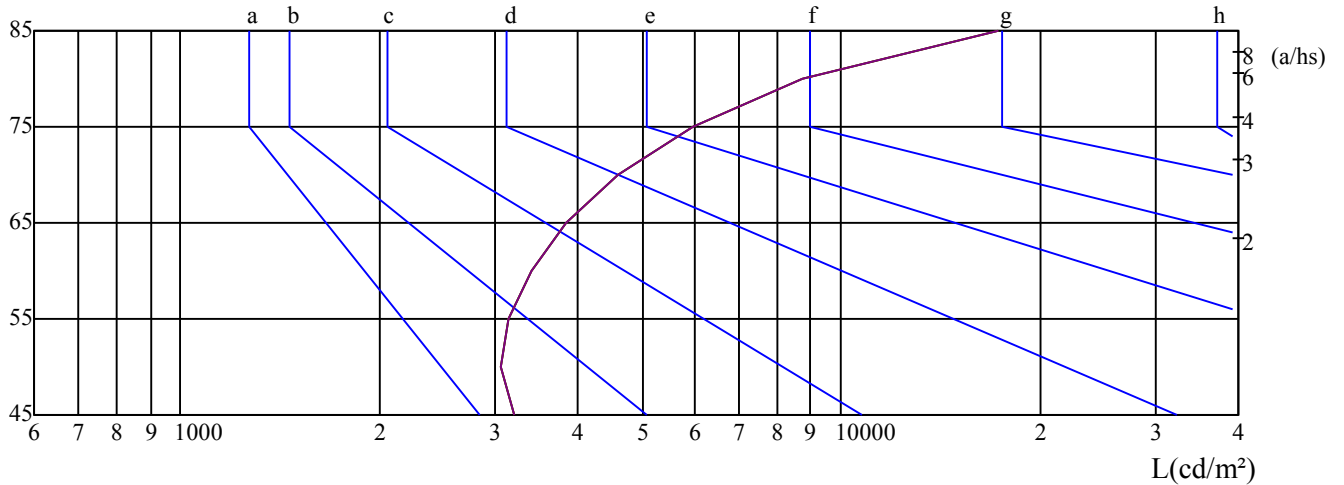
γ	45	50	55	60	65	70	75	80	85
C0	3195	3056	3145	3402	3836	4603	5960	8769	17322
C45	3195	3056	3145	3402	3836	4603	5960	8769	17322
C90	3195	3056	3145	3402	3836	4603	5960	8769	17322

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3836	3836	3836	5960	5960	5960	17322	17322	17322

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

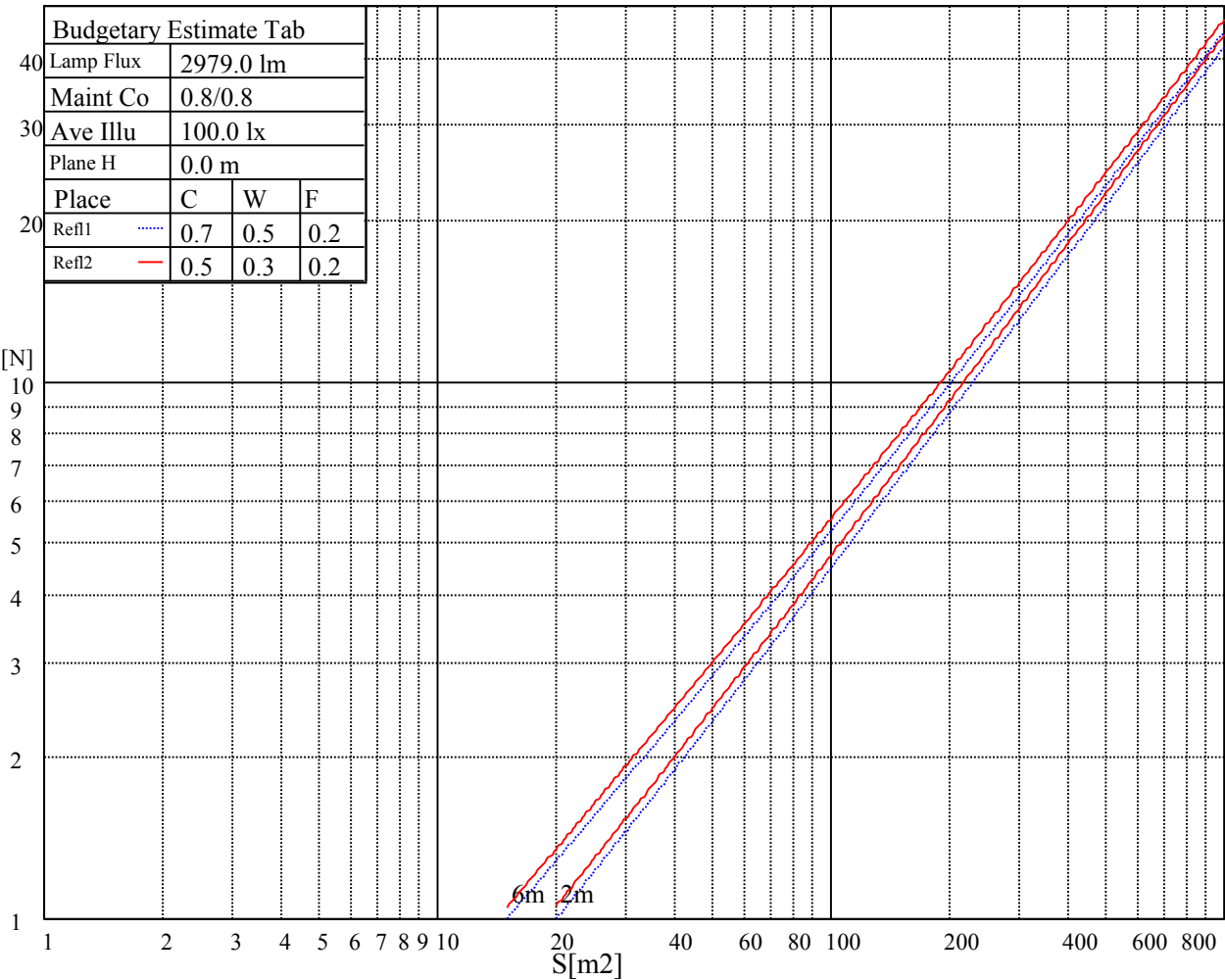
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

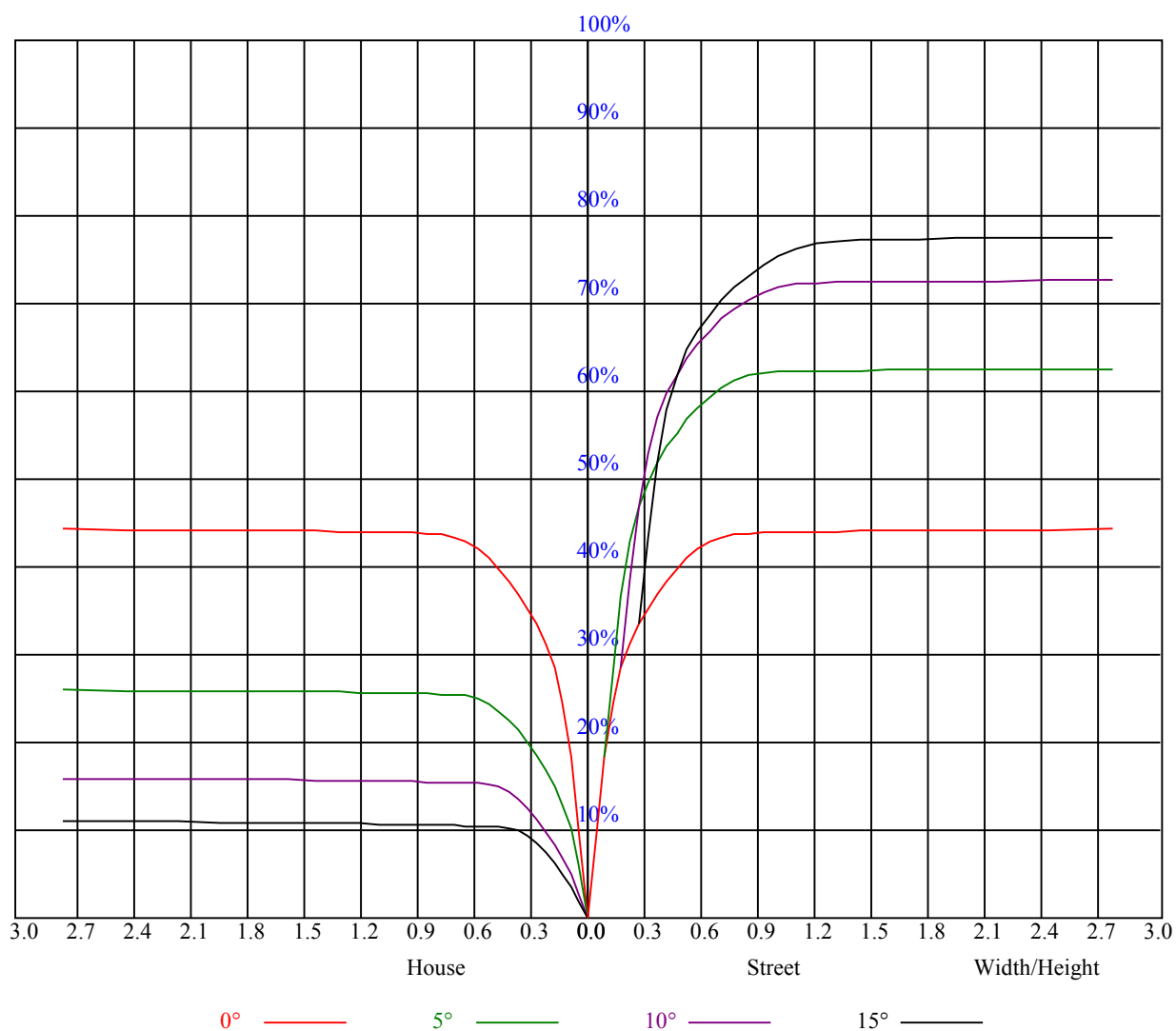
C0 ———

C45 ———

C90 ———



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	1.00	0.98	0.97	0.98	0.97	0.95	0.95	0.93	0.92	0.91	0.90	0.89	0.88	0.88	0.87	0.85
2	0.95	0.92	0.90	0.94	0.91	0.89	0.91	0.89	0.87	0.88	0.87	0.85	0.86	0.85	0.83	0.82
3	0.91	0.88	0.85	0.90	0.87	0.84	0.88	0.85	0.83	0.86	0.83	0.82	0.84	0.82	0.80	0.79
4	0.87	0.84	0.81	0.86	0.83	0.80	0.85	0.82	0.79	0.83	0.80	0.79	0.81	0.79	0.78	0.77
5	0.84	0.80	0.77	0.83	0.80	0.77	0.82	0.79	0.76	0.80	0.78	0.76	0.79	0.77	0.75	0.74
6	0.81	0.77	0.75	0.81	0.77	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.77	0.75	0.73	0.72
7	0.79	0.75	0.72	0.78	0.74	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.75	0.73	0.71	0.70
8	0.76	0.72	0.70	0.76	0.72	0.70	0.75	0.72	0.69	0.74	0.71	0.69	0.73	0.71	0.69	0.68
9	0.74	0.70	0.68	0.74	0.70	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.72	0.69	0.67	0.66
10	0.72	0.69	0.66	0.72	0.68	0.66	0.71	0.68	0.66	0.71	0.68	0.66	0.70	0.67	0.66	0.65



NATA 3-2042-M

Intensity data(cd)									Appendix Page: 16 Total:18	
C/γ(°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	
0.0	25453.13	25306.88	24575.63	23096.25	20992.50	17994.38	14743.13	11851.88	9202.50	
45.0	25368.75	24862.50	23681.25	21909.38	19215.00	16093.13	13151.25	10023.75	7644.38	
90.0	25295.63	24761.25	23675.63	21341.25	18821.25	15986.25	10891.69	9555.75	7226.44	
135.0	25396.88	25329.38	24766.88	23321.25	21352.50	18776.25	15165.00	12268.13	9585.00	
180.0	25453.13	25250.63	24541.88	23006.25	20548.13	17786.25	14833.13	11133.00	8492.06	
225.0	25368.75	25380.00	25053.75	23889.38	22151.25	19721.25	16846.88	11039.06	10375.88	
270.0	25295.63	25391.25	25014.38	24136.88	22320.00	19636.88	16807.50	13494.38	10704.38	
315.0	25396.88	24975.00	24260.63	22550.63	19726.88	17308.13	14377.50	11144.25	8316.00	
360.0	25453.13	25306.88	24575.63	23096.25	20992.50	17994.38	14743.13	11851.88	9202.50	
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	
0.0	6564.38	5028.75	3909.38	3020.63	2868.75	2043.00	1772.44	1539.56	1410.75	
45.0	5608.13	4173.75	3301.88	2896.88	2167.31	1869.75	1658.81	1464.75	1355.06	
90.0	5461.31	3978.00	3193.31	2634.75	2180.25	1861.31	1659.94	1492.88	1384.31	
135.0	6778.13	5135.63	3999.38	3116.25	2885.63	2130.19	1828.13	1611.56	1469.81	
180.0	6363.00	4543.88	3578.63	2903.06	2360.25	1980.00	1737.00	1540.13	1413.00	
225.0	7901.44	5562.56	4261.50	3350.25	2648.81	2167.31	1862.44	1617.19	1466.44	
270.0	7965.00	5861.25	4511.25	3526.88	2885.63	2211.75	1880.44	1596.38	1445.06	
315.0	6341.06	4705.88	3556.69	2835.56	2323.69	1890.00	1654.88	1487.81	1352.25	
360.0	6564.38	5028.75	3909.38	3020.63	2868.75	2043.00	1772.44	1539.56	1410.75	
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	
0.0	1303.31	1234.13	1181.81	1139.06	1107.56	1076.06	1050.75	1029.94	1011.38	
45.0	1274.06	1208.81	1157.06	1119.38	1081.69	1053.00	1028.25	1005.19	978.75	
90.0	1282.50	1222.31	1170.56	1120.39	1082.93	1052.94	1026.45	998.49	975.60	
135.0	1351.13	1280.81	1215.00	1159.31	1122.19	1087.88	1053.00	1028.81	1006.31	
180.0	1311.75	1235.81	1184.06	1120.78	1099.74	1064.19	1038.32	1012.95	988.31	
225.0	1338.19	1266.19	1207.13	1155.94	1112.63	1080.00	1053.11	1024.71	1007.16	
270.0	1337.63	1252.69	1194.75	1153.13	1116.56	1082.81	1057.50	1034.44	1015.88	
315.0	1260.00	1200.38	1121.18	1109.98	1082.03	1055.76	1035.96	1013.85	996.30	
360.0	1303.31	1234.13	1181.81	1139.06	1107.56	1076.06	1050.75	1029.94	1011.38	
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0	
0.0	986.63	970.31	956.81	942.19	924.19	900.56	829.13	710.44	599.63	
45.0	960.19	942.75	929.25	911.81	892.13	832.50	752.06	609.75	504.00	
90.0	957.99	937.86	922.28	907.93	891.62	830.81	742.78	622.46	507.38	
135.0	975.94	957.94	940.50	926.44	909.56	893.25	825.75	717.75	607.50	
180.0	967.33	949.78	932.91	918.28	903.60	865.91	784.29	682.20	558.28	
225.0	988.09	966.38	950.51	935.61	921.77	904.89	852.86	740.19	645.24	
270.0	995.06	975.94	961.88	948.38	930.94	915.75	870.75	762.75	657.56	
315.0	977.23	963.62	947.36	929.87	918.51	871.26	788.51	688.05	559.86	
360.0	986.63	970.31	956.81	942.19	924.19	900.56	829.13	710.44	599.63	
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0	
0.0	465.75	345.38	289.69	119.48	47.14	32.74	28.01	22.28	19.41	
45.0	387.00	284.06	143.44	70.82	33.53	29.25	22.95	19.13	15.86	
90.0	372.88	247.44	150.58	73.01	33.58	28.91	23.06	18.23	15.86	
135.0	477.00	357.19	287.44	137.48	56.19	33.41	27.84	21.49	18.45	
180.0	425.48	308.98	194.68	98.72	42.69	29.53	24.92	19.41	16.76	
225.0	515.25	366.86	267.81	151.76	58.78	32.46	28.07	21.99	18.62	
270.0	542.81	403.88	286.88	162.68	80.89	34.37	28.80	24.64	19.91	
315.0	422.66	307.24	189.90	90.96	40.11	30.60	26.61	21.38	17.66	
360.0	465.75	345.38	289.69	119.48	47.14	32.74	28.01	22.28	19.41	

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	15.69	15.13	14.74	14.40	14.01	13.78	13.50	13.22	12.99
45.0	15.19	14.85	14.46	14.23	13.89	13.67	13.44	13.22	12.99
90.0	15.41	14.96	14.68	14.40	14.12	13.89	13.67	13.44	13.28
135.0	16.48	15.47	15.13	14.79	14.46	14.18	13.95	13.67	13.39
180.0	15.36	15.02	14.63	14.34	14.12	13.78	13.56	13.33	13.11
225.0	16.59	15.47	15.02	14.63	14.29	14.01	13.67	13.44	13.22
270.0	17.38	15.53	15.02	14.68	14.29	14.01	13.73	13.50	13.22
315.0	15.41	14.91	14.51	14.18	13.89	13.56	13.39	13.16	12.94
360.0	15.69	15.13	14.74	14.40	14.01	13.78	13.50	13.22	12.99
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	12.77	12.54	12.43	12.26	12.15	11.98	11.87	11.76	11.64
45.0	12.83	12.60	12.49	12.32	12.21	12.04	11.93	11.81	11.70
90.0	13.05	12.83	12.71	12.54	12.38	12.26	12.15	11.98	11.81
135.0	13.16	12.94	12.71	12.60	12.43	12.26	12.09	11.98	11.81
180.0	12.94	12.77	12.54	12.43	12.26	12.09	11.98	11.87	11.76
225.0	12.99	12.77	12.60	12.43	12.32	12.21	12.04	11.87	11.76
270.0	12.99	12.83	12.66	12.49	12.38	12.21	12.09	11.98	11.81
315.0	12.71	12.54	12.38	12.26	12.09	11.98	11.87	11.76	11.64
360.0	12.77	12.54	12.43	12.26	12.15	11.98	11.87	11.76	11.64
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	11.59	11.42	11.36	11.31	11.25	11.19	11.14	11.08	11.03
45.0	11.59	11.48	11.42	11.31	11.25	11.19	11.14	11.08	11.03
90.0	11.64	11.53	11.42	11.36	11.25	11.19	11.14	11.08	11.03
135.0	11.76	11.59	11.53	11.42	11.36	11.25	11.19	11.14	11.08
180.0	11.64	11.53	11.42	11.36	11.31	11.19	11.14	11.08	11.03
225.0	11.70	11.59	11.48	11.42	11.31	11.25	11.19	11.14	11.08
270.0	11.76	11.64	11.53	11.48	11.36	11.31	11.25	11.19	11.14
315.0	11.59	11.53	11.36	11.31	11.31	11.19	11.14	11.08	11.03
360.0	11.59	11.42	11.36	11.31	11.25	11.19	11.14	11.08	11.03
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.97	10.97	10.91	10.86	10.86	10.80	10.80	10.74	10.74
45.0	10.97	10.97	10.91	10.86	10.80	10.80	10.80	10.74	10.74
90.0	10.97	10.91	10.91	10.86	10.86	10.80	10.80	10.74	10.74
135.0	11.03	11.03	10.97	10.91	10.86	10.80	10.80	10.80	10.74
180.0	10.97	10.91	10.91	10.86	10.80	10.80	10.74	10.74	10.69
225.0	10.97	10.97	10.91	10.91	10.86	10.80	10.80	10.74	10.74
270.0	11.08	11.03	10.97	10.97	10.91	10.91	10.86	10.86	10.80
315.0	11.03	10.97	10.91	10.86	10.86	10.80	10.80	10.74	10.74
360.0	10.97	10.97	10.91	10.86	10.86	10.80	10.80	10.74	10.74
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.69	10.69	10.69	10.63	10.63	10.63	10.58	10.58	10.63
45.0	10.74	10.63	10.69	10.69	10.63	10.63	10.63	10.63	10.58
90.0	10.74	10.69	10.69	10.69	10.63	10.63	10.58	10.58	10.58
135.0	10.74	10.69	10.69	10.69	10.69	10.63	10.63	10.58	10.58
180.0	10.69	10.69	10.63	10.63	10.63	10.63	10.58	10.58	10.58
225.0	10.74	10.69	10.69	10.69	10.63	10.63	10.63	10.63	10.63
270.0	10.80	10.80	10.74	10.74	10.69	10.63	10.63	10.63	10.63
315.0	10.69	10.69	10.69	10.63	10.69	10.63	10.63	10.58	10.58
360.0	10.69	10.69	10.69	10.63	10.63	10.63	10.58	10.58	10.63

Intensity data(cd)

C/ $\gamma(^{\circ})$	90.0
0.0	10.58
45.0	10.63
90.0	10.58
135.0	10.58
180.0	10.58
225.0	10.58
270.0	10.63
315.0	10.58
360.0	10.58