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NATA

LumCAT: 3-2033-M
Luminaire: 92.70.135.00
Report No: NATA0100
Test No: GC2018102512
LampCAT: LUMILEDS LUXEON 1205
Lamp flux(lm): 2979.0
Number of Lamps: 1
Length(mm): 79
Phm Type: C

Voltage(V): 35.7000
Current(A): 0.6000
Power (W): 21.4200
PF: 0.0000
Ballast type: DC
Width(mm): 79
Height(mm): 0

Photometric Results

Lumens(lm): 2645.15
Efficiency(%): 88.79%
Lumens(lm)/Power(W): 123.73
Central intensity(cd): 21863.670
Maximum intensity(cd): 21863.670
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=14.0
[C90/270]Total=14.0
Field angle(10%Imax): [C0/180]Total=28.9
[C90/270]Total=28.9
Maximum s/h(1/2): C0_180=0.24 C90_270=0.24
Maximum s/h(1/4): C0_180=0.25 C90_270=0.25
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 88.97%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.538%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	21863.672	5.231	5.231	.176%	.198%
1.0	21581.719	41.304	46.535	1.387%	1.759%
2.0	20766.094	79.474	126.009	2.668%	4.764%
3.0	19409.766	111.397	237.406	3.739%	8.975%
4.0	17729.297	135.621	373.027	4.553%	14.102%
5.0	15746.484	150.498	523.525	5.052%	19.792%
6.0	13310.297	152.572	676.097	5.122%	25.560%
7.0	10964.250	146.530	822.626	4.919%	31.099%
8.0	9222.117	140.747	963.373	4.725%	36.420%
9.0	7270.945	124.731	1088.104	4.187%	41.136%
10.0	5536.688	105.432	1193.536	3.539%	45.122%
11.0	4303.898	90.056	1283.592	3.023%	48.526%
12.0	3391.805	77.332	1360.924	2.596%	51.450%
13.0	2699.156	66.584	1427.508	2.235%	53.967%
14.0	2363.063	62.691	1490.199	2.104%	56.337%
15.0	1962.211	55.692	1545.891	1.869%	58.442%
16.0	1721.180	52.025	1597.916	1.746%	60.409%
17.0	1554.047	49.825	1647.742	1.673%	62.293%
18.0	1422.070	48.190	1695.931	1.618%	64.115%
19.0	1317.656	47.043	1742.974	1.579%	65.893%
20.0	1237.219	46.403	1789.378	1.558%	67.648%
21.0	1157.843	45.502	1834.88	1.527%	69.368%
22.0	1114.671	45.790	1880.67	1.537%	71.099%
23.0	1080.598	46.301	1926.972	1.554%	72.849%
24.0	1047.459	46.720	1973.691	1.568%	74.615%
25.0	1018.856	47.219	2020.91	1.585%	76.401%
26.0	995.414	47.852	2068.762	1.606%	78.210%
27.0	973.020	48.442	2117.204	1.626%	80.041%
28.0	954.141	49.122	2166.325	1.649%	81.898%
29.0	937.631	49.849	2216.174	1.673%	83.783%
30.0	922.317	50.571	2266.745	1.698%	85.694%
31.0	904.514	51.087	2317.832	1.715%	87.626%
32.0	871.523	50.645	2368.477	1.700%	89.540%
33.0	806.259	48.154	2416.631	1.616%	91.361%
34.0	702.169	43.058	2459.69	1.445%	92.989%
35.0	596.053	37.491	2497.181	1.259%	94.406%
36.0	480.959	31.001	2528.182	1.041%	95.578%
37.0	362.440	23.919	2552.101	.803%	96.482%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	253.252	17.098	2569.199	.574%	97.129%
39.0	163.955	11.315	2580.514	.380%	97.556%
40.0	69.729	4.915	2585.429	.165%	97.742%
41.0	35.733	2.571	2588	.086%	97.839%
42.0	27.366	2.008	2590.008	.067%	97.915%
43.0	22.507	1.683	2591.691	.057%	97.979%
44.0	18.893	1.439	2593.13	.048%	98.033%
45.0	16.629	1.289	2594.42	.043%	98.082%
46.0	15.307	1.207	2595.627	.041%	98.128%
47.0	14.730	1.181	2596.809	.040%	98.172%
48.0	14.386	1.172	2597.981	.039%	98.217%
49.0	14.013	1.160	2599.141	.039%	98.261%
50.0	13.697	1.151	2600.291	.039%	98.304%
51.0	13.451	1.146	2601.438	.038%	98.347%
52.0	13.177	1.139	2602.576	.038%	98.391%
53.0	12.945	1.134	2603.71	.038%	98.433%
54.0	12.720	1.128	2604.839	.038%	98.476%
55.0	12.473	1.120	2605.959	.038%	98.518%
56.0	12.270	1.115	2607.074	.037%	98.561%
57.0	12.115	1.114	2608.189	.037%	98.603%
58.0	11.967	1.113	2609.302	.037%	98.645%
59.0	11.820	1.111	2610.413	.037%	98.687%
60.0	11.714	1.112	2611.525	.037%	98.729%
61.0	11.602	1.113	2612.638	.037%	98.771%
62.0	11.489	1.112	2613.75	.037%	98.813%
63.0	11.398	1.114	2614.864	.037%	98.855%
64.0	11.327	1.116	2615.98	.037%	98.897%
65.0	11.222	1.115	2617.096	.037%	98.939%
66.0	11.180	1.120	2618.216	.038%	98.982%
67.0	11.102	1.121	2619.336	.038%	99.024%
68.0	11.046	1.123	2620.459	.038%	99.067%
69.0	10.997	1.126	2621.585	.038%	99.109%
70.0	10.962	1.130	2622.715	.038%	99.152%
71.0	10.920	1.132	2623.847	.038%	99.195%
72.0	10.870	1.134	2624.981	.038%	99.238%
73.0	10.821	1.135	2626.116	.038%	99.280%
74.0	10.814	1.140	2627.255	.038%	99.324%
75.0	10.779	1.142	2628.397	.038%	99.367%

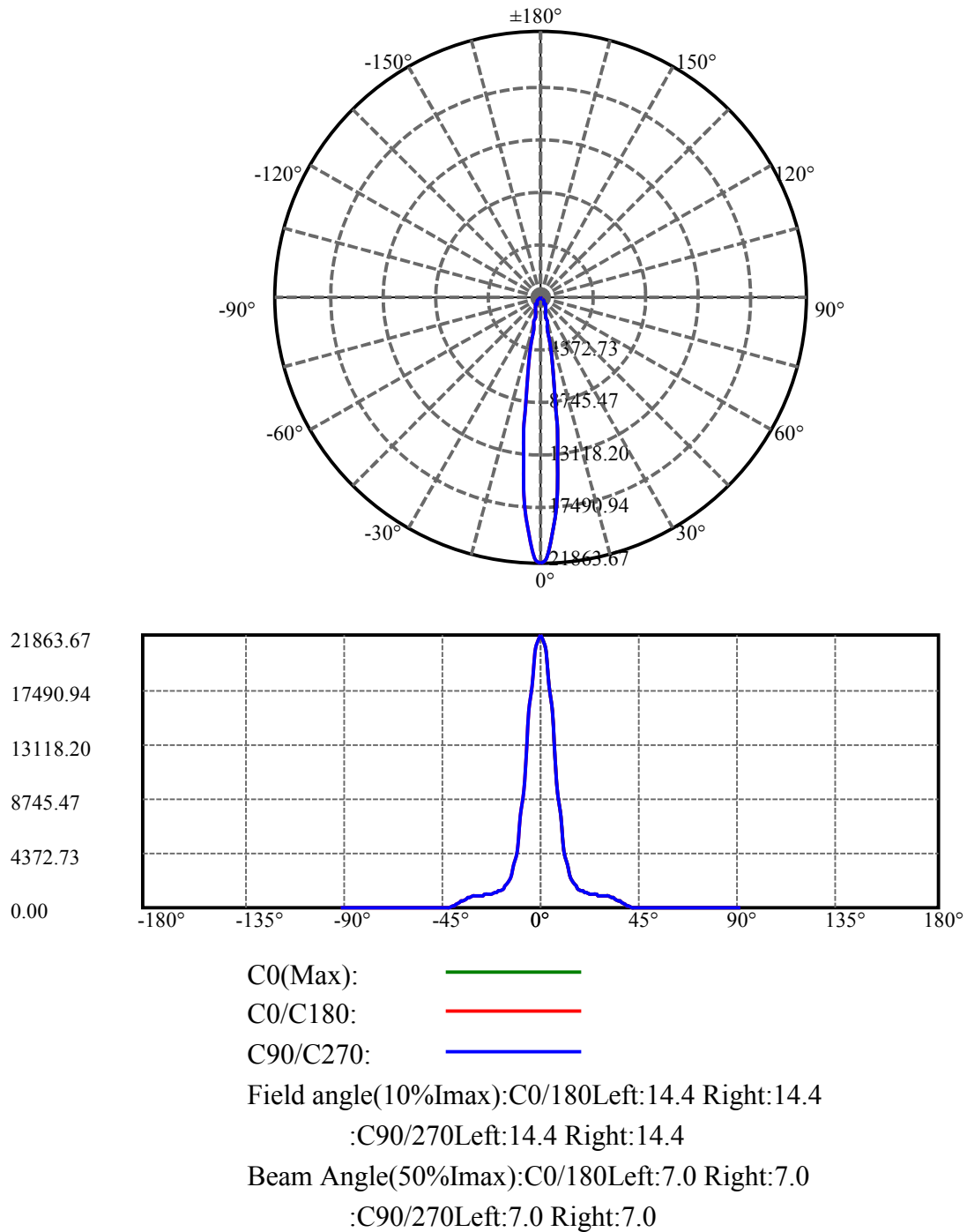
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.758	1.145	2629.542	.038%	99.410%
77.0	10.737	1.147	2630.689	.039%	99.453%
78.0	10.716	1.149	2631.839	.039%	99.497%
79.0	10.702	1.152	2632.991	.039%	99.540%
80.0	10.666	1.152	2634.142	.039%	99.584%
81.0	10.666	1.155	2635.298	.039%	99.628%
82.0	10.652	1.157	2636.454	.039%	99.671%
83.0	10.638	1.158	2637.612	.039%	99.715%
84.0	10.631	1.159	2638.772	.039%	99.759%
85.0	10.617	1.160	2639.932	.039%	99.803%
86.0	10.603	1.160	2641.092	.039%	99.847%
87.0	10.596	1.160	2642.252	.039%	99.890%
88.0	10.575	1.159	2643.411	.039%	99.934%
89.0	10.575	1.159	2644.57	.039%	99.978%
90.0	10.568	0.579	2645.15	.019%	100.000%

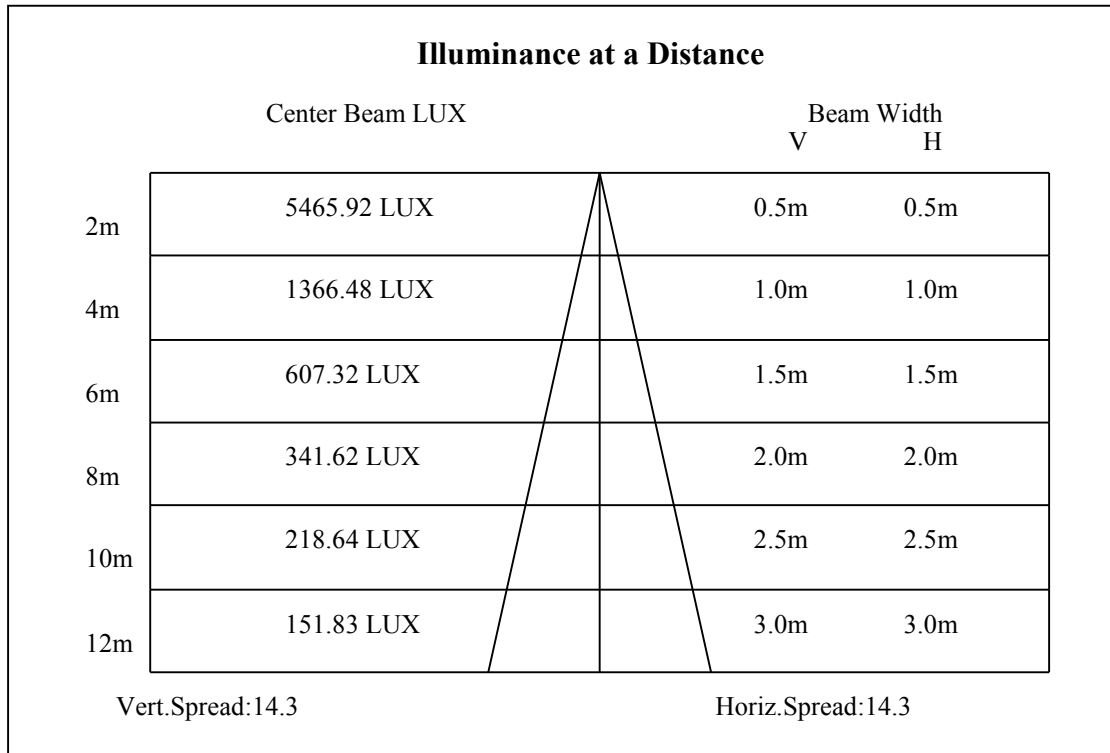
ZONAL LUMEN SUMMARY

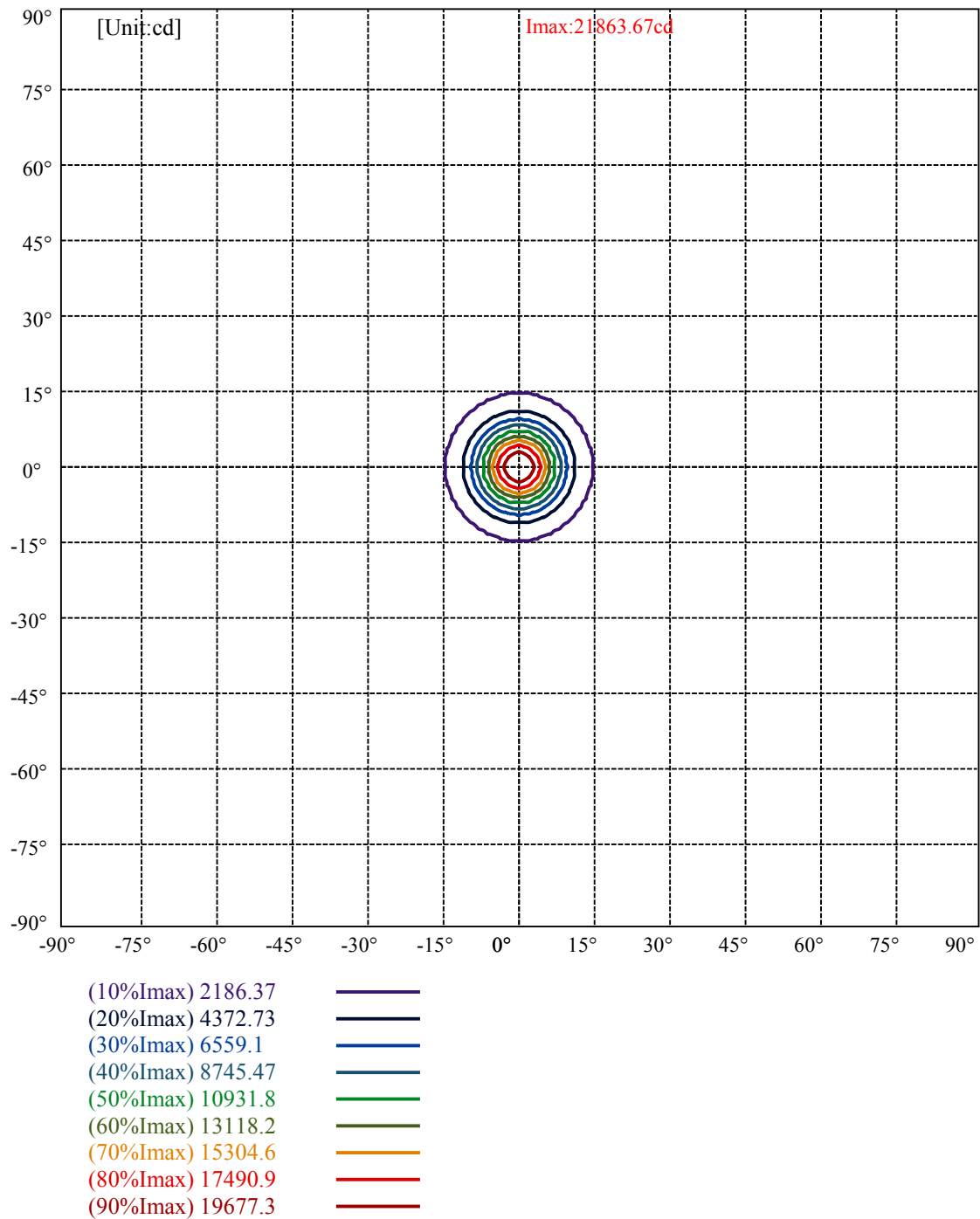
Zone	Lumens	%Lamp	%Fixt
0-30	2266.75	76.09%	85.69%
0-40	2585.43	86.79%	97.74%
0-60	2611.53	87.66%	98.73%
0-90	2644.57	88.77%	99.98%
0-120	2644.57	88.77%	99.98%
0-180	2645.15	88.79%	100.00%
60-90	34.16	1.15%	1.29%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-26.98	2116.12	71.03%	80.00%

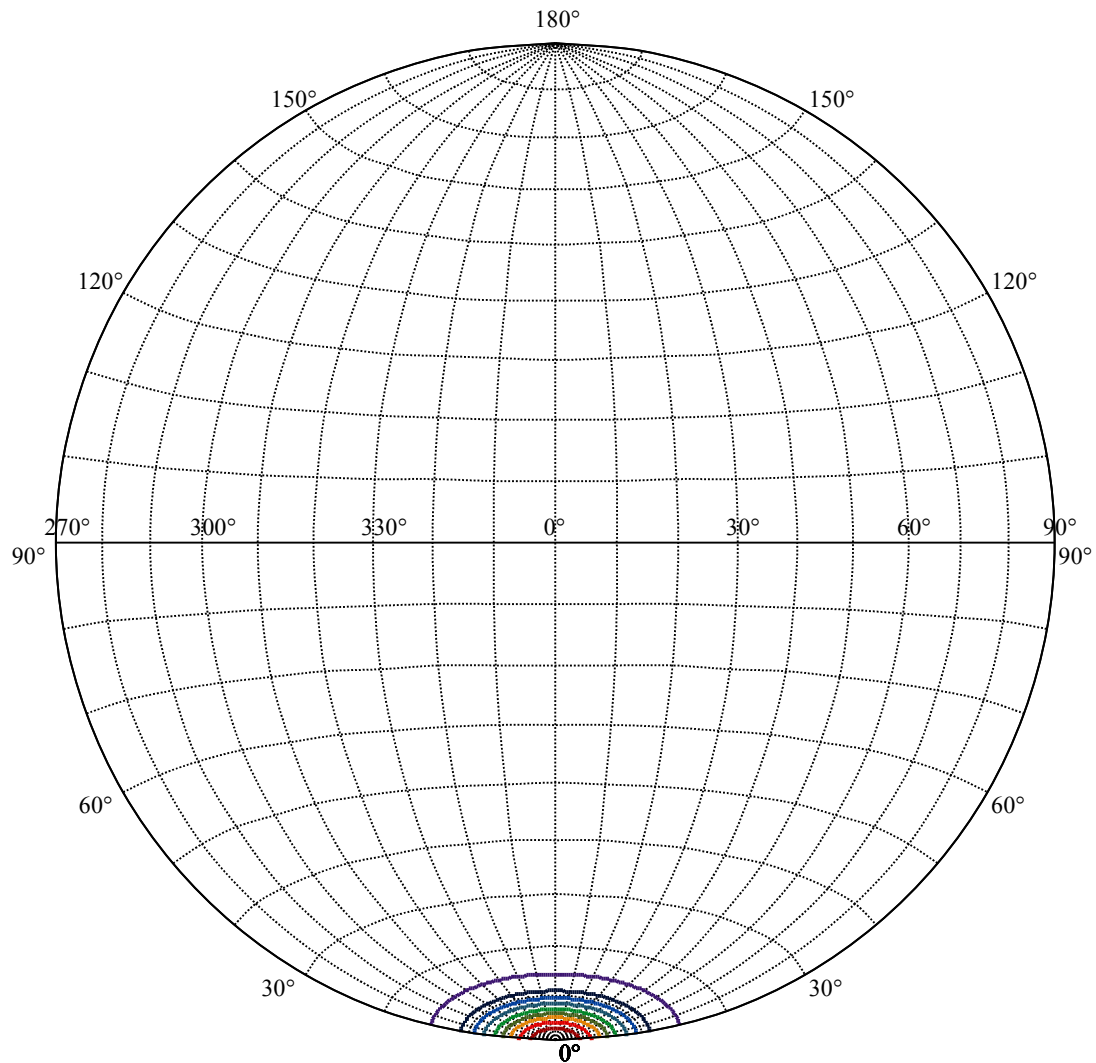
ZONAL LUMEN SUMMARY

0-10	1193.54
10-20	595.84
20-30	477.37
30-40	318.68
40-50	14.86
50-60	11.23
60-70	11.19
70-80	11.43
80-90	10.43
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









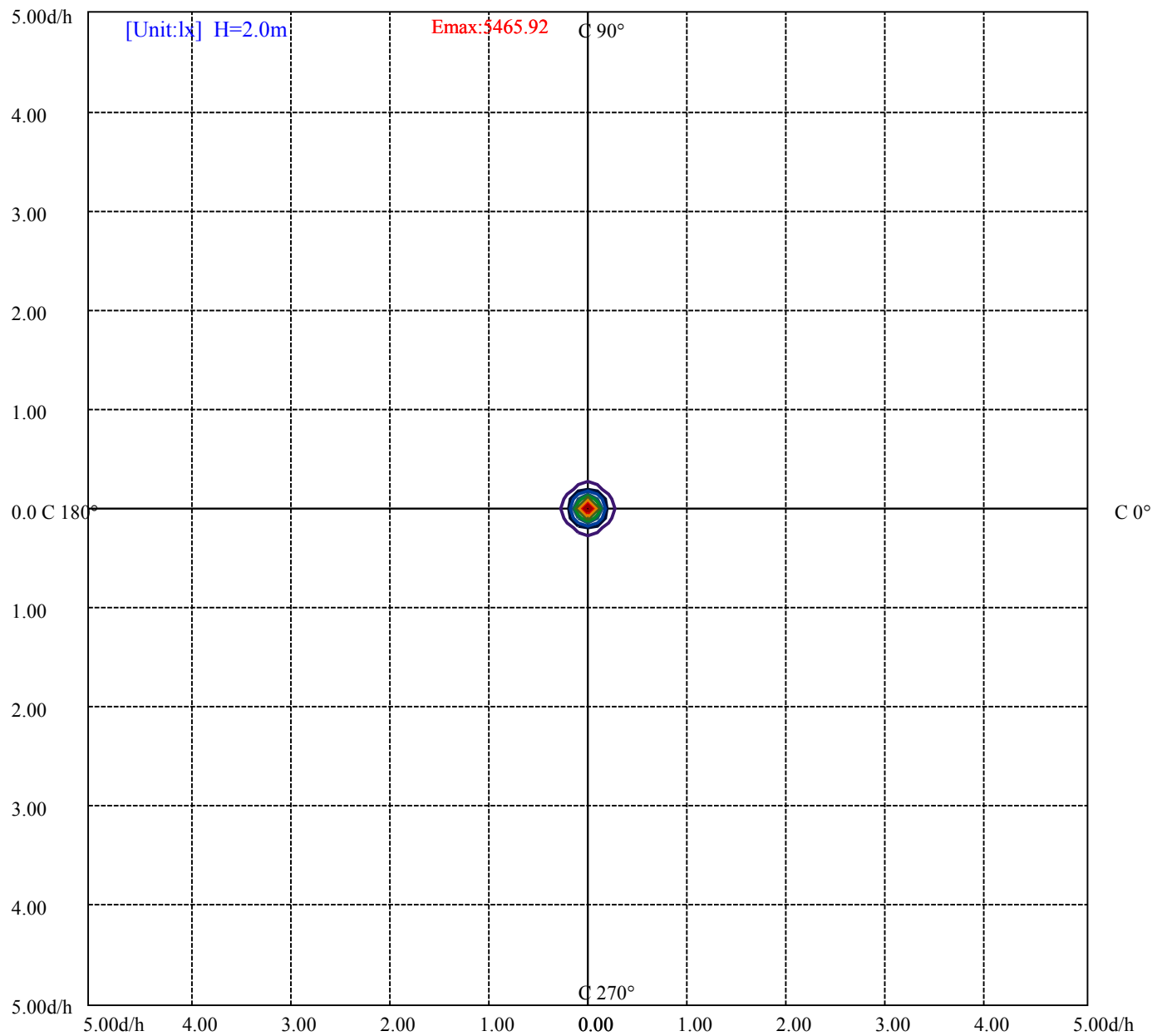
House

[Unit:cd]

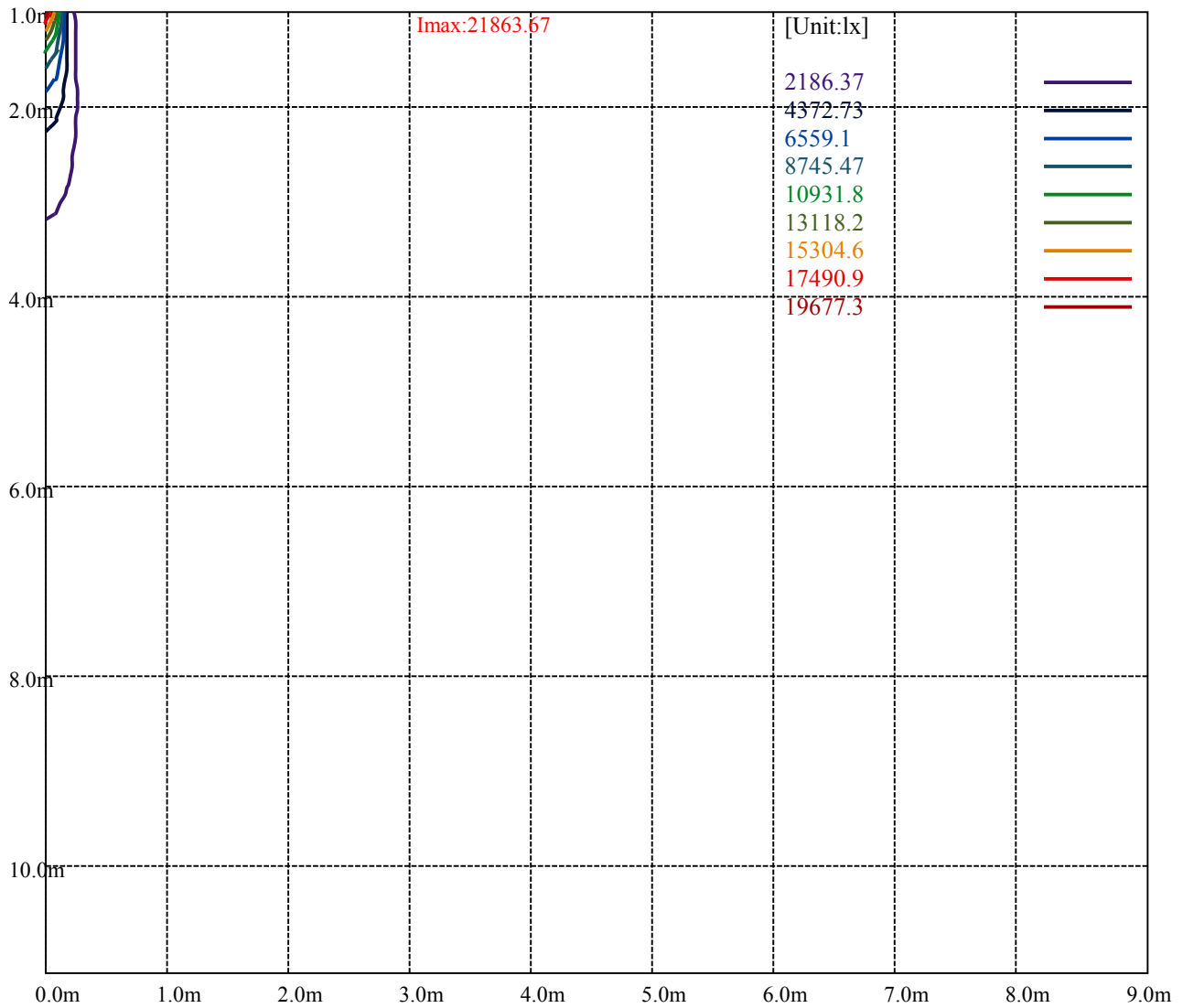
Road

Imax:21863.67

(10%Imax)	2186.37	—
(20%Imax)	4372.73	—
(30%Imax)	6559.1	—
(40%Imax)	8745.47	—
(50%Imax)	10931.8	—
(60%Imax)	13118.2	—
(70%Imax)	15304.6	—
(80%Imax)	17490.9	—
(90%Imax)	19677.3	—



(10%Emax)	546.59	
(20%Emax)	1093.182	
(30%Emax)	1639.772	
(40%Emax)	2186.363	
(50%Emax)	2732.95	
(60%Emax)	3279.55	
(70%Emax)	3826.125	
(80%Emax)	4372.725	
(90%Emax)	4919.325	



Luminance Table

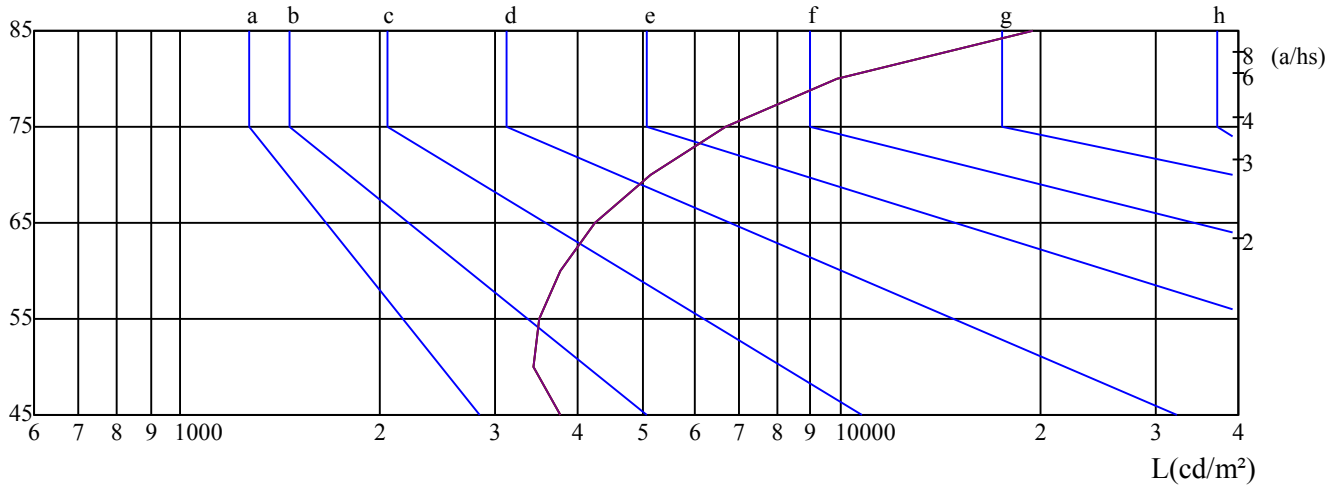
γ	45	50	55	60	65	70	75	80	85
C0	3768	3414	3485	3754	4255	5135	6673	9842	19519
C45	3768	3414	3485	3754	4255	5135	6673	9842	19519
C90	3768	3414	3485	3754	4255	5135	6673	9842	19519

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4255	4255	4255	6673	6673	6673	19519	19519	19519

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

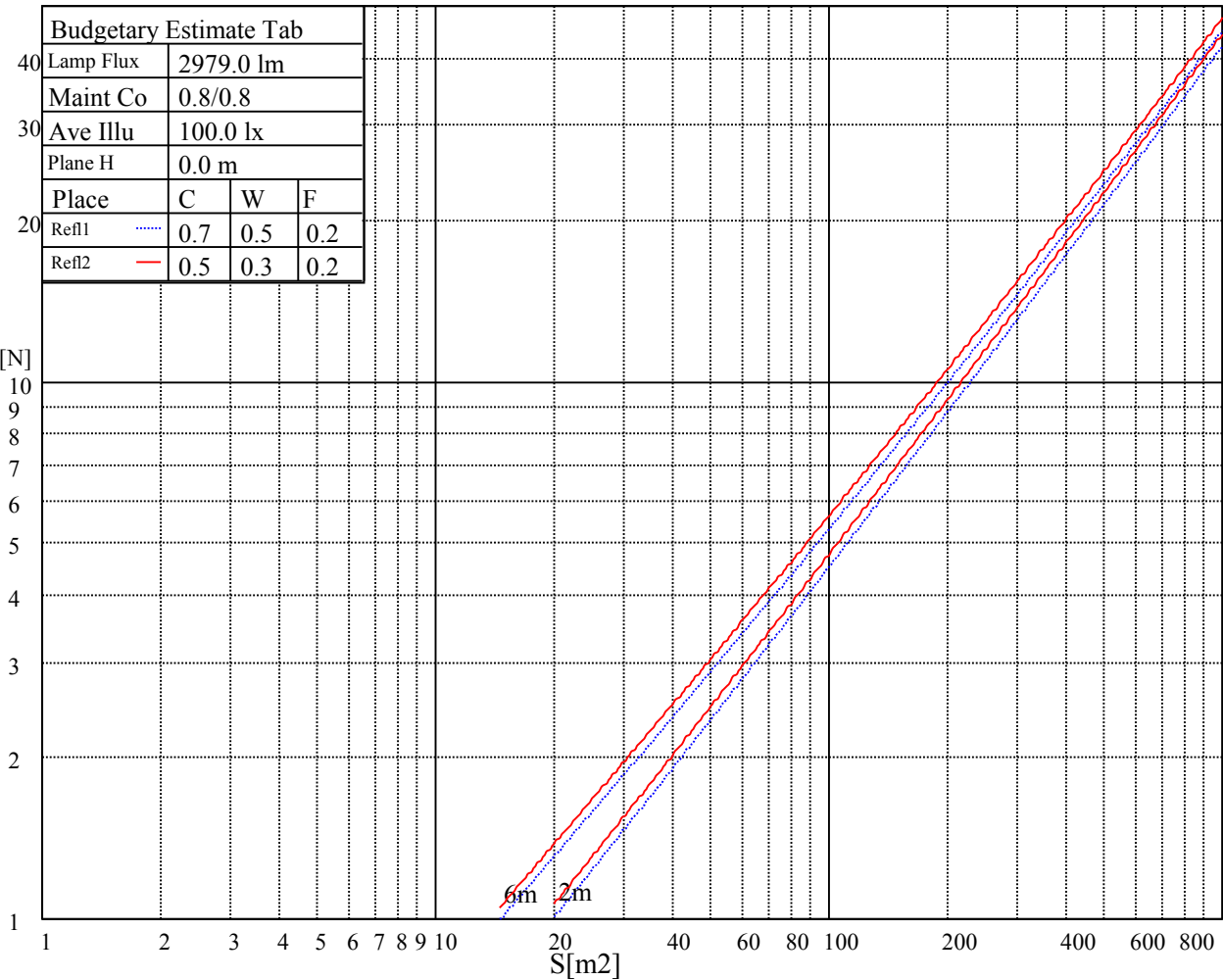
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

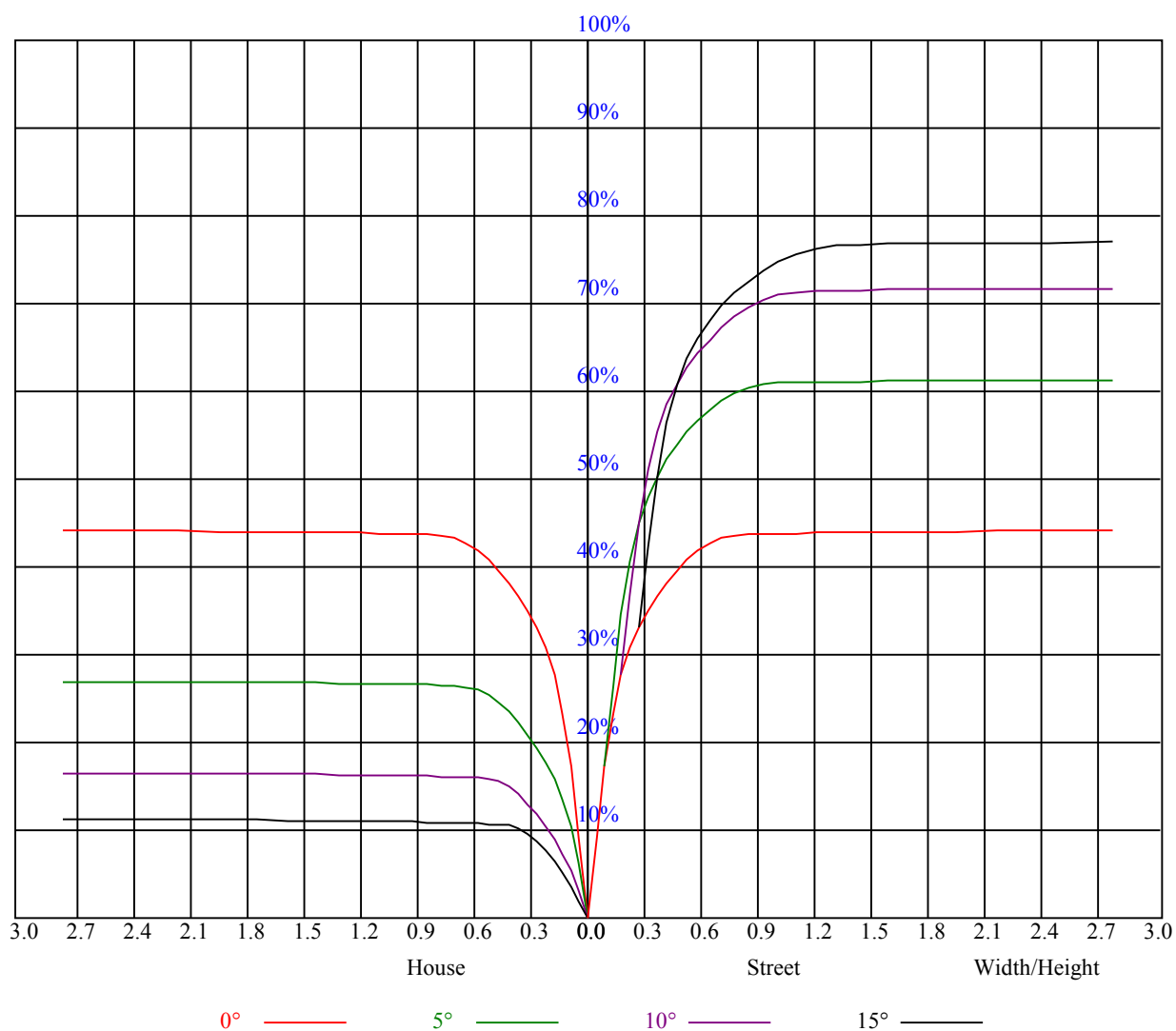
C0 ———

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	1.03	1.03	1.03	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	0.96	0.98	0.96	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87	0.87	0.85
2	0.95	0.92	0.89	0.93	0.91	0.88	0.91	0.88	0.87	0.88	0.86	0.85	0.86	0.84	0.83	0.82
3	0.90	0.87	0.84	0.89	0.86	0.84	0.87	0.84	0.82	0.85	0.83	0.81	0.83	0.81	0.80	0.79
4	0.87	0.83	0.80	0.86	0.82	0.80	0.84	0.81	0.79	0.82	0.80	0.78	0.81	0.79	0.77	0.76
5	0.83	0.80	0.77	0.83	0.79	0.76	0.81	0.78	0.76	0.80	0.77	0.75	0.79	0.76	0.74	0.73
6	0.80	0.77	0.74	0.80	0.76	0.73	0.79	0.75	0.73	0.77	0.75	0.73	0.76	0.74	0.72	0.71
7	0.78	0.74	0.71	0.77	0.74	0.71	0.76	0.73	0.71	0.75	0.72	0.70	0.74	0.72	0.70	0.69
8	0.75	0.72	0.69	0.75	0.71	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.73	0.70	0.68	0.67
9	0.73	0.69	0.67	0.73	0.69	0.67	0.72	0.69	0.67	0.71	0.68	0.66	0.71	0.68	0.66	0.65
10	0.71	0.67	0.65	0.71	0.67	0.65	0.70	0.67	0.65	0.70	0.67	0.65	0.69	0.66	0.64	0.64



NATA 3-2033-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	21988.13	21684.38	20778.75	19546.88	17724.38	15508.13	13398.75	11075.63	9157.50		
45.0	21813.75	21189.38	19974.38	18331.88	16543.13	14236.88	11806.88	9793.13	7970.63		
90.0	21746.25	21026.25	19918.13	18275.63	16228.13	14180.63	10975.50	9495.56	7691.63		
135.0	21909.38	21746.25	20981.25	19670.63	18163.13	16104.38	13781.25	11739.38	9804.38		
180.0	21982.50	21729.38	20975.63	19468.13	17853.75	15975.00	13882.50	11208.38	9213.19		
225.0	21813.75	21943.13	21515.63	20486.25	19006.88	17302.50	15300.00	11082.38	10574.44		
270.0	21746.25	21875.63	21420.00	20396.25	19068.75	17381.25	14889.38	12768.75	10715.63		
315.0	21909.38	21459.38	20565.00	19102.50	17246.25	15283.13	12448.13	10550.81	8649.56		
360.0	21988.13	21684.38	20778.75	19546.88	17724.38	15508.13	13398.75	11075.63	9157.50		
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0		
0.0	7222.50	5540.63	4314.38	3521.25	2874.38	2286.00	1980.56	1710.56	1555.31		
45.0	5968.13	4629.38	3622.50	2868.75	2377.13	2057.63	1792.69	1595.25	1459.69		
90.0	6084.00	4326.19	3542.63	2907.00	2320.31	2054.81	1826.44	1630.13	1477.69		
135.0	7605.00	6035.63	4741.88	3763.13	2919.38	2851.88	2115.00	1802.81	1617.19		
180.0	7399.13	5630.06	4244.63	3367.13	2698.88	2248.88	1962.00	1723.50	1559.81		
225.0	8640.00	6476.63	4986.00	3836.25	2971.13	2432.25	2103.75	1851.19	1640.25		
270.0	8341.88	6637.50	5135.63	3825.00	2958.75	2880.00	2070.00	1811.25	1610.44		
315.0	6906.94	5017.50	3843.56	3045.94	2473.31	2093.06	1847.25	1644.75	1512.00		
360.0	7222.50	5540.63	4314.38	3521.25	2874.38	2286.00	1980.56	1710.56	1555.31		
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0		
0.0	1432.13	1324.69	1243.13	1184.63	1133.44	1091.25	1060.88	1034.44	1009.13		
45.0	1339.31	1256.06	1184.06	1127.81	1085.63	1057.50	1024.31	999.00	975.94		
90.0	1370.81	1275.19	1205.44	1117.58	1089.06	1047.88	1016.72	992.93	966.83		
135.0	1469.25	1351.13	1261.69	1194.19	1130.63	1090.69	1053.00	1020.94	998.44		
180.0	1418.06	1311.19	1234.69	1111.78	1106.38	1068.24	1037.36	1007.44	983.98		
225.0	1485.00	1375.88	1279.13	1203.75	1115.16	1100.08	1063.80	1032.24	1006.09		
270.0	1474.31	1356.75	1269.00	1200.94	1154.25	1116.56	1078.88	1047.94	1025.44		
315.0	1387.69	1290.38	1220.63	1122.08	1102.84	1072.58	1044.73	1015.93	997.48		
360.0	1432.13	1324.69	1243.13	1184.63	1133.44	1091.25	1060.88	1034.44	1009.13		
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0		
0.0	986.06	966.94	951.75	936.00	918.00	885.38	813.38	698.06	594.56		
45.0	953.44	938.25	922.50	905.63	882.00	819.00	731.81	608.63	504.56		
90.0	948.94	931.11	913.95	899.38	885.49	830.31	750.71	654.69	522.17		
135.0	970.88	950.63	934.88	919.69	901.13	887.63	856.13	750.38	656.44		
180.0	962.94	942.98	925.43	910.52	893.14	874.07	810.73	701.55	615.09		
225.0	982.80	965.36	947.19	932.51	917.61	895.89	836.44	750.43	637.09		
270.0	1000.13	976.50	960.75	946.69	927.56	910.69	858.94	767.25	656.44		
315.0	978.98	961.37	944.61	928.13	911.19	869.23	791.94	686.36	582.08		
360.0	986.06	966.94	951.75	936.00	918.00	885.38	813.38	698.06	594.56		
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0		
0.0	484.31	357.75	290.81	141.08	59.12	32.29	28.18	23.18	19.41		
45.0	381.94	291.38	169.03	88.48	36.56	29.76	24.69	19.74	17.89		
90.0	410.68	301.44	191.76	100.29	44.72	29.87	25.14	19.46	16.71		
135.0	554.63	423.00	299.25	288.00	104.85	46.24	29.81	24.75	19.91		
180.0	497.19	358.26	269.38	164.08	68.79	34.93	27.56	21.77	17.94		
225.0	515.19	402.08	282.38	173.08	93.99	38.87	27.90	24.02	19.58		
270.0	549.00	419.63	294.19	229.50	96.75	43.37	28.35	24.75	20.93		
315.0	454.73	345.99	229.22	127.13	53.04	30.54	27.28	22.39	18.79		
360.0	484.31	357.75	290.81	141.08	59.12	32.29	28.18	23.18	19.41		

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Intensity data(cd)										Appendix Page: 17 Total:18	
C/ γ (°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0		
0.0	17.10	15.64	15.19	14.79	14.34	14.06	13.78	13.50	13.22		
45.0	15.86	15.41	15.02	14.74	14.29	14.01	13.73	13.39	13.11		
90.0	15.36	14.91	14.51	14.18	13.89	13.56	13.33	13.05	12.83		
135.0	17.10	15.19	14.68	14.34	13.95	13.67	13.44	13.16	12.94		
180.0	16.03	14.63	14.23	13.95	13.61	13.33	13.11	12.88	12.71		
225.0	16.99	15.13	14.46	14.12	13.78	13.44	13.22	12.99	12.77		
270.0	17.94	16.20	14.91	14.51	14.12	13.78	13.50	13.22	13.05		
315.0	16.65	15.36	14.85	14.46	14.12	13.73	13.50	13.22	12.94		
360.0	17.10	15.64	15.19	14.79	14.34	14.06	13.78	13.50	13.22		
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0		
0.0	12.99	12.77	12.49	12.32	12.15	11.98	11.81	11.70	11.59		
45.0	12.83	12.49	12.21	12.09	11.93	11.76	11.70	11.53	11.42		
90.0	12.60	12.38	12.15	11.98	11.87	11.70	11.59	11.53	11.42		
135.0	12.71	12.49	12.32	12.15	12.04	11.93	11.81	11.70	11.59		
180.0	12.49	12.26	12.09	11.98	11.81	11.70	11.59	11.53	11.42		
225.0	12.60	12.38	12.21	12.04	11.87	11.76	11.70	11.53	11.48		
270.0	12.83	12.54	12.38	12.21	12.04	11.87	11.76	11.64	11.53		
315.0	12.71	12.49	12.32	12.15	12.04	11.87	11.76	11.64	11.48		
360.0	12.99	12.77	12.49	12.32	12.15	11.98	11.81	11.70	11.59		
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0		
0.0	11.42	11.36	11.25	11.19	11.08	11.08	11.03	10.97	10.91		
45.0	11.36	11.25	11.19	11.14	11.08	11.03	11.03	10.97	10.91		
90.0	11.31	11.25	11.14	11.14	11.03	10.97	10.97	10.91	10.91		
135.0	11.48	11.36	11.31	11.25	11.14	11.08	11.03	11.03	10.91		
180.0	11.36	11.31	11.19	11.14	11.08	11.08	10.97	10.97	10.91		
225.0	11.42	11.36	11.19	11.19	11.14	11.03	10.97	10.97	10.91		
270.0	11.42	11.36	11.25	11.19	11.14	11.08	11.03	10.97	10.97		
315.0	11.42	11.36	11.25	11.19	11.14	11.03	10.97	10.91	10.91		
360.0	11.42	11.36	11.25	11.19	11.08	11.08	11.03	10.97	10.91		
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0		
0.0	10.86	10.80	10.80	10.80	10.74	10.74	10.69	10.69	10.63		
45.0	10.86	10.80	10.80	10.80	10.74	10.74	10.69	10.69	10.63		
90.0	10.86	10.80	10.80	10.74	10.74	10.74	10.69	10.69	10.69		
135.0	10.91	10.86	10.86	10.80	10.80	10.74	10.74	10.69	10.69		
180.0	10.86	10.80	10.80	10.80	10.74	10.69	10.69	10.69	10.69		
225.0	10.86	10.80	10.80	10.74	10.74	10.74	10.74	10.74	10.69		
270.0	10.91	10.86	10.86	10.80	10.80	10.74	10.80	10.74	10.69		
315.0	10.86	10.86	10.80	10.74	10.74	10.74	10.69	10.69	10.63		
360.0	10.86	10.80	10.80	10.80	10.74	10.74	10.69	10.69	10.63		
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0		
0.0	10.69	10.63	10.63	10.63	10.58	10.58	10.58	10.58	10.58		
45.0	10.63	10.63	10.63	10.63	10.63	10.63	10.63	10.58	10.58		
90.0	10.69	10.69	10.63	10.63	10.58	10.63	10.58	10.58	10.58		
135.0	10.69	10.63	10.63	10.63	10.63	10.58	10.58	10.58	10.58		
180.0	10.63	10.63	10.63	10.58	10.58	10.58	10.58	10.52	10.52		
225.0	10.63	10.63	10.63	10.63	10.63	10.63	10.63	10.58	10.58		
270.0	10.74	10.74	10.69	10.69	10.69	10.63	10.63	10.63	10.63		
315.0	10.63	10.63	10.63	10.63	10.63	10.58	10.58	10.58	10.58		
360.0	10.69	10.63	10.63	10.63	10.58	10.58	10.58	10.58	10.58		

Intensity data(cd)

C/ $\gamma(^{\circ})$	90.0
0.0	10.58
45.0	10.58
90.0	10.58
135.0	10.58
180.0	10.52
225.0	10.58
270.0	10.58
315.0	10.58
360.0	10.58