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## Nata

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LumCAT: 3-2040-M	
Luminaire: 92.76.129.00	
Report No: GC2017061709	Voltage(V):
Test No: NT-0010	Current(A):
LampCAT: CREE CXA1820	Power (W): 18.0000
Lamp flux(lm): 2283.0	PF:
Number of Lamps: 1	Ballast type:
Length(mm): 79	Width(mm): 79
Phm Type: C	Height(mm): 0

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## Photometric Results

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Lumens(lm): 2035.52  
Efficiency(%): 89.16%  
Lumens(lm)/Power(W): 113.09  
Central intensity(cd): 4519.333  
Maximum intensity(cd): 4519.333  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=20.9  
                                  [C90/270]Total=20.9  
Field angle(10%Imax): [C0/180]Total=47.9  
                                  [C90/270]Total=47.9  
Maximum s/h(1/2): C0\_180=0.35 C90\_270=0.35  
Maximum s/h(1/4): C0\_180=0.37 C90\_270=0.37  
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 : 98.760%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	4519.334	0.000	0	.000%	.000%
1.0	4485.321	4.309	4.309	.384%	.431%
2.0	4382.677	12.728	17.037	1.135%	1.704%
3.0	4216.404	20.566	37.603	1.834%	3.760%
4.0	4030.047	27.604	65.206	2.461%	6.521%
5.0	3824.285	33.789	98.995	3.013%	9.900%
6.0	3542.655	38.715	137.711	3.452%	13.771%
7.0	3282.933	42.366	180.077	3.777%	18.008%
8.0	3012.258	45.053	225.13	4.017%	22.513%
9.0	2698.644	46.284	271.414	4.127%	27.141%
10.0	2382.326	45.981	317.395	4.100%	31.739%
11.0	2106.579	44.853	362.248	3.999%	36.225%
12.0	1830.291	43.036	405.284	3.837%	40.528%
13.0	1557.451	40.204	445.488	3.585%	44.549%
14.0	1348.578	37.197	482.685	3.317%	48.268%
15.0	1163.304	34.484	517.169	3.075%	51.717%
16.0	1002.238	31.731	548.9	2.829%	54.890%
17.0	873.087	29.204	578.104	2.604%	57.810%
18.0	773.756	27.153	605.257	2.421%	60.526%
19.0	690.450	25.474	630.731	2.271%	63.073%
20.0	619.289	23.972	654.703	2.137%	65.470%
21.0	567.817	22.795	677.498	2.032%	67.750%
22.0	523.886	21.938	699.436	1.956%	69.944%
23.0	486.067	21.192	720.628	1.889%	72.063%
24.0	449.398	20.453	741.08	1.824%	74.108%
25.0	421.377	19.799	760.88	1.765%	76.088%
26.0	400.800	19.408	780.287	1.730%	78.029%
27.0	385.140	19.228	799.516	1.714%	79.951%
28.0	371.961	19.168	818.684	1.709%	81.868%
29.0	363.786	19.249	837.933	1.716%	83.793%
30.0	356.754	19.454	857.388	1.735%	85.739%
31.0	347.186	19.590	876.977	1.747%	87.698%
32.0	329.591	19.389	896.366	1.729%	89.636%
33.0	300.759	18.570	914.936	1.656%	91.494%
34.0	256.611	16.868	931.804	1.504%	93.180%
35.0	208.467	14.444	946.248	1.288%	94.625%
36.0	158.328	11.679	957.927	1.041%	95.793%
37.0	111.922	8.814	966.741	.786%	96.674%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	73.589	6.192	972.933	.552%	97.293%
39.0	33.992	3.672	976.605	.327%	97.660%
40.0	16.262	1.753	978.357	.156%	97.836%
41.0	10.549	0.955	979.312	.085%	97.931%
42.0	8.784	0.702	980.014	.063%	98.001%
43.0	7.195	0.592	980.606	.053%	98.061%
44.0	6.309	0.510	981.116	.045%	98.111%
45.0	5.829	0.466	981.582	.042%	98.158%
46.0	5.369	0.438	982.02	.039%	98.202%
47.0	5.119	0.417	982.437	.037%	98.244%
48.0	4.990	0.409	982.846	.036%	98.284%
49.0	4.869	0.405	983.251	.036%	98.325%
50.0	4.754	0.401	983.652	.036%	98.365%
51.0	4.679	0.399	984.051	.036%	98.405%
52.0	4.585	0.398	984.449	.035%	98.445%
53.0	4.510	0.396	984.844	.035%	98.484%
54.0	4.443	0.395	985.239	.035%	98.524%
55.0	4.369	0.393	985.632	.035%	98.563%
56.0	4.328	0.393	986.025	.035%	98.602%
57.0	4.287	0.394	986.419	.035%	98.642%
58.0	4.246	0.395	986.814	.035%	98.681%
59.0	4.206	0.395	987.209	.035%	98.721%
60.0	4.179	0.396	987.605	.035%	98.760%
61.0	4.145	0.397	988.002	.035%	98.800%
62.0	4.118	0.398	988.4	.035%	98.840%
63.0	4.091	0.399	988.799	.036%	98.880%
64.0	4.071	0.400	989.2	.036%	98.920%
65.0	4.050	0.402	989.602	.036%	98.960%
66.0	4.030	0.403	990.005	.036%	99.000%
67.0	4.017	0.405	990.41	.036%	99.041%
68.0	4.003	0.406	990.816	.036%	99.081%
69.0	3.990	0.408	991.224	.036%	99.122%
70.0	3.963	0.408	991.632	.036%	99.163%
71.0	3.963	0.410	992.042	.037%	99.204%
72.0	3.942	0.411	992.453	.037%	99.245%
73.0	3.936	0.412	992.865	.037%	99.286%
74.0	3.929	0.413	993.278	.037%	99.328%
75.0	3.922	0.415	993.693	.037%	99.369%

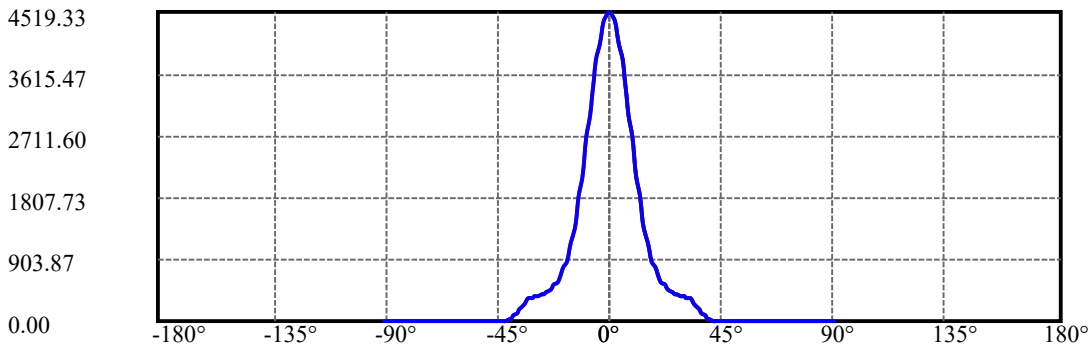
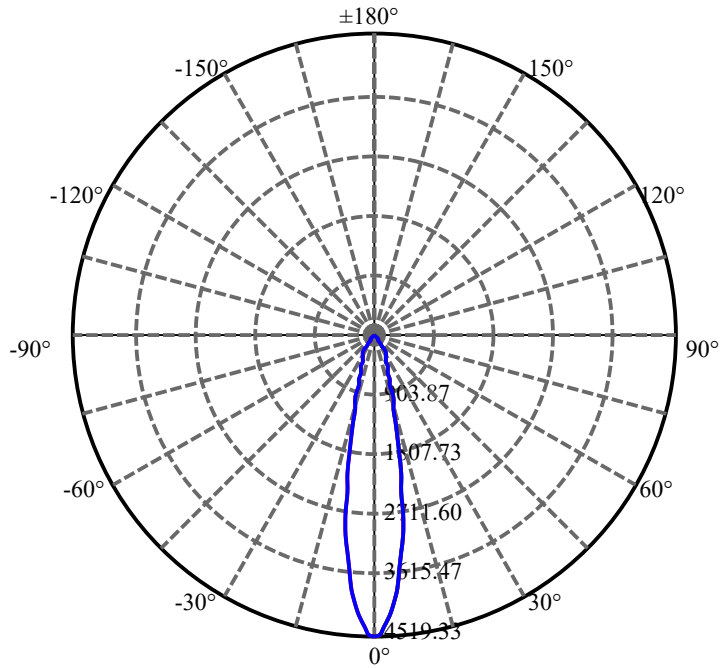
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	3.915	0.416	994.109	.037%	99.411%
77.0	3.909	0.417	994.526	.037%	99.452%
78.0	3.902	0.418	994.944	.037%	99.494%
79.0	3.888	0.419	995.363	.037%	99.536%
80.0	3.888	0.419	995.782	.037%	99.578%
81.0	3.882	0.420	996.202	.037%	99.620%
82.0	3.882	0.421	996.623	.038%	99.662%
83.0	3.882	0.422	997.045	.038%	99.704%
84.0	3.888	0.423	997.468	.038%	99.747%
85.0	3.868	0.423	997.892	.038%	99.789%
86.0	3.861	0.422	998.314	.038%	99.831%
87.0	3.848	0.422	998.736	.038%	99.873%
88.0	3.848	0.422	999.157	.038%	99.916%
89.0	3.848	0.422	999.579	.038%	99.958%
90.0	3.848	0.422	1000.001	.038%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	857.39	37.56%	85.74%
0-40	978.36	42.85%	97.84%
0-60	987.60	43.26%	98.76%
0-90	999.58	43.78%	99.96%
0-120	999.58	43.78%	99.96%
0-180	1000.00	43.80%	100.00%
60-90	12.37	0.54%	1.24%
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%
0-27.03	800.00	35.04%	80.00%

ZONAL LUMEN SUMMARY

0-10	317.40
10-20	337.31
20-30	202.68
30-40	120.97
40-50	5.29
50-60	3.95
60-70	4.03
70-80	4.15
80-90	3.80
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: —————

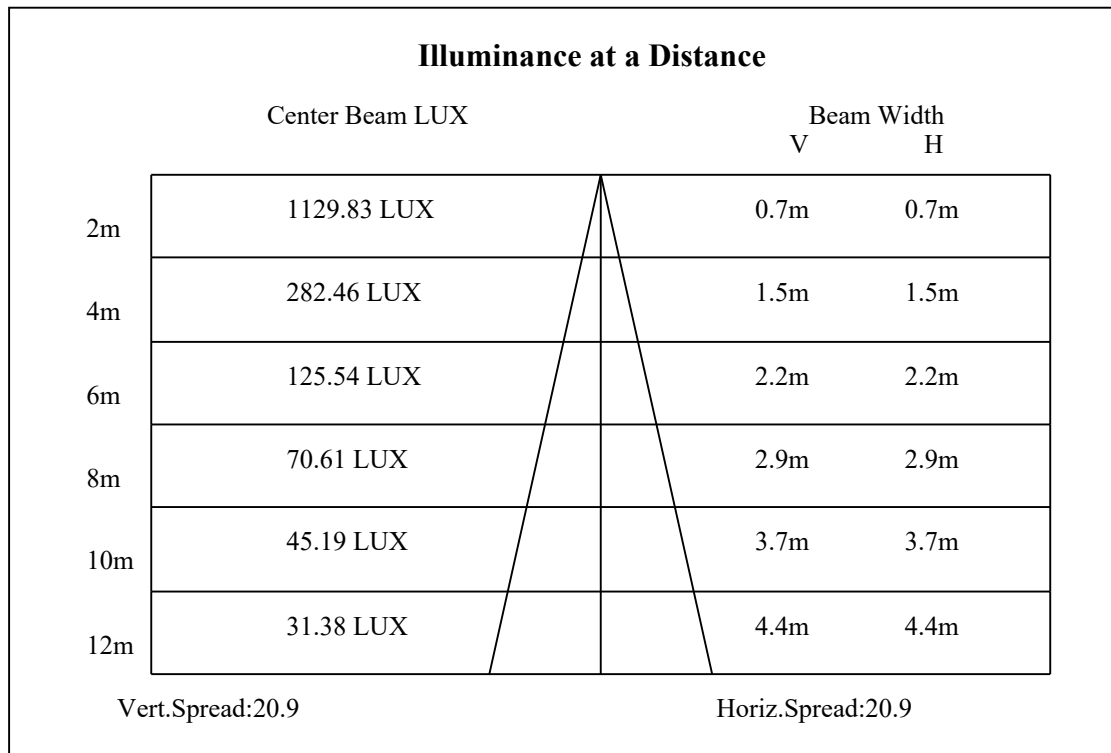
C90/C270: —————

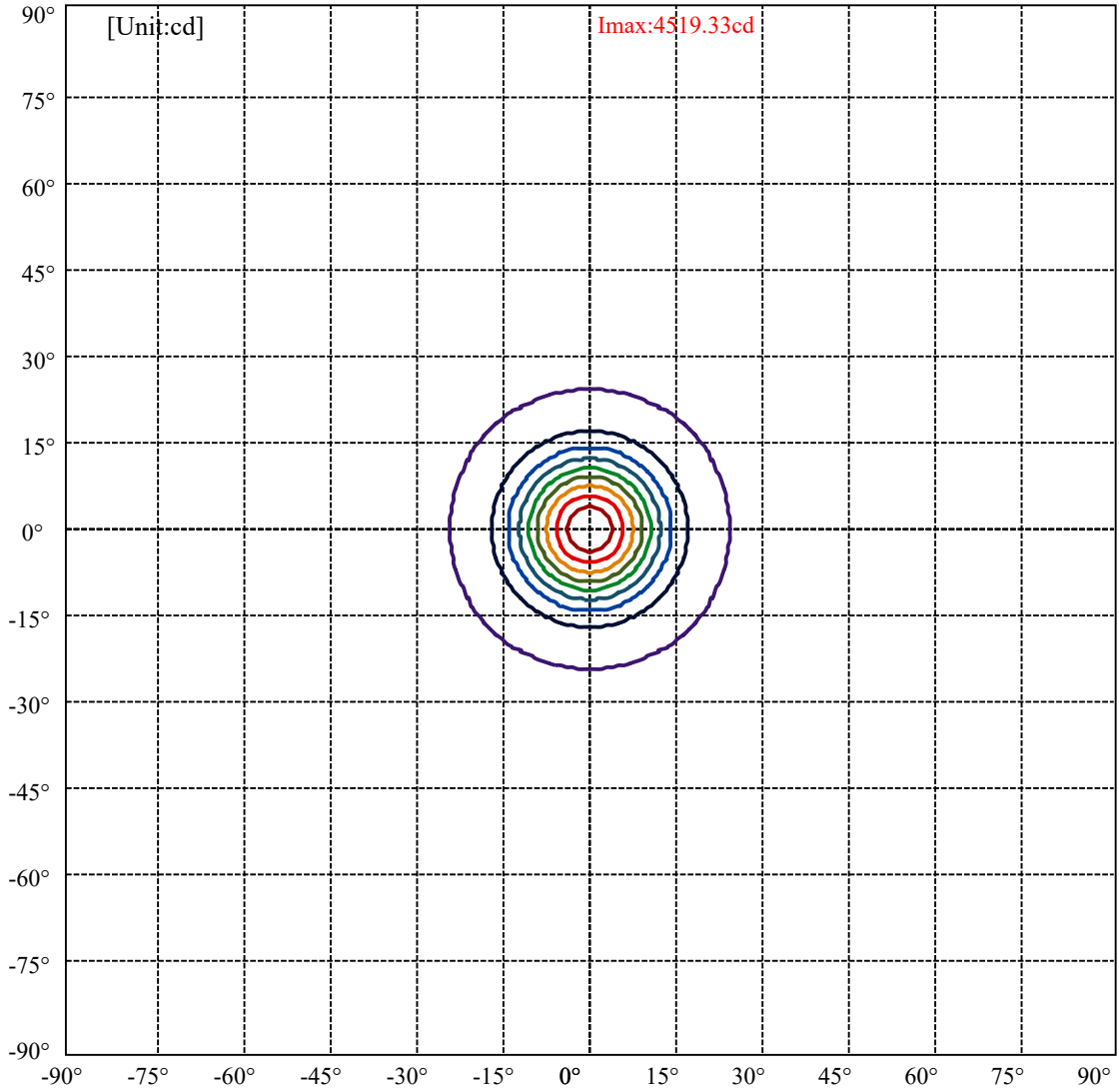
Field angle(10%Imax):C0/180Left:23.9 Right:23.9

:C90/270Left:23.9 Right:23.9

Beam Angle(50%Imax):C0/180Left:10.4 Right:10.4

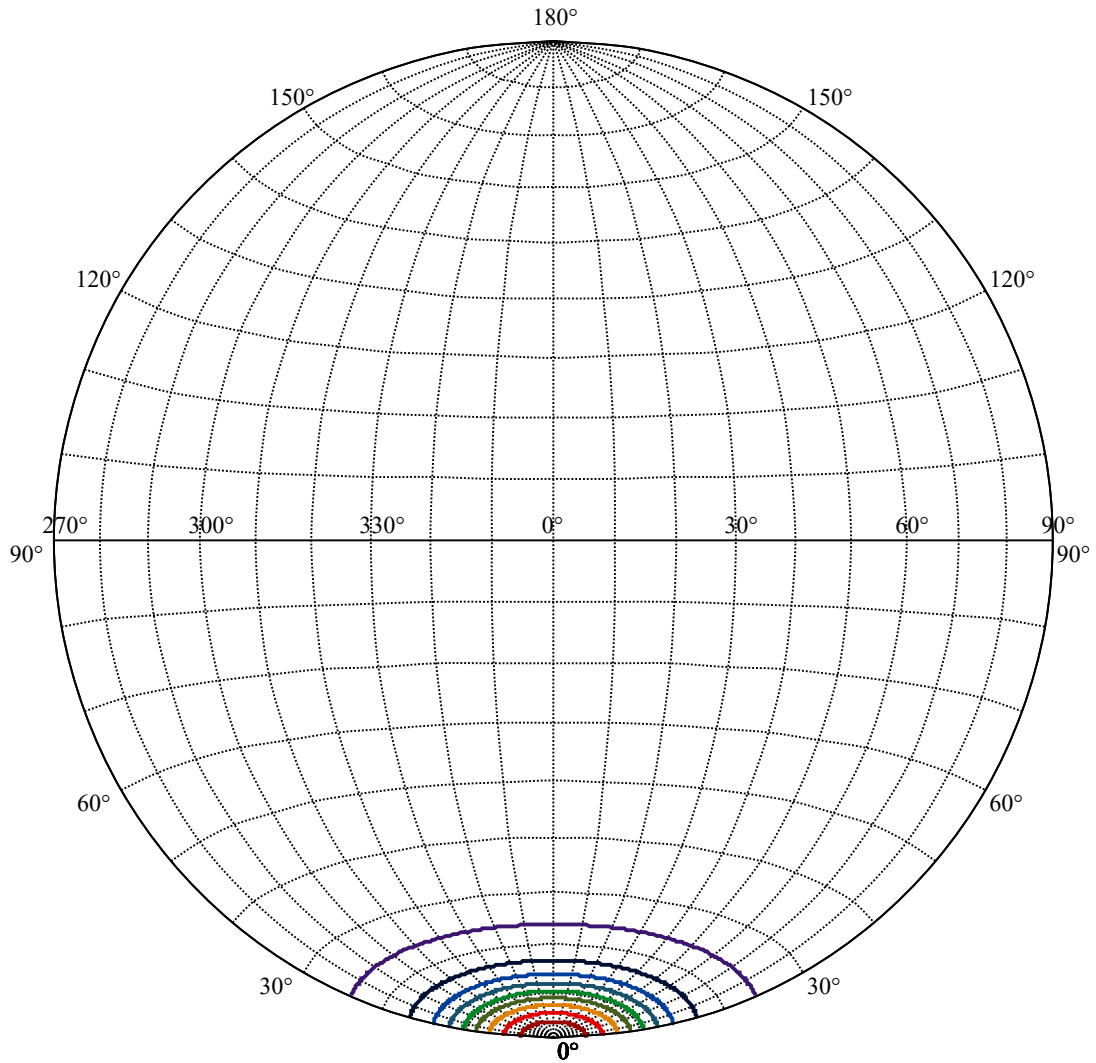
:C90/270Left:10.4 Right:10.4





(10%Imax) 451.933	—
(20%Imax) 903.867	—
(30%Imax) 1355.8	—
(40%Imax) 1807.73	—
(50%Imax) 2259.67	—
(60%Imax) 2711.6	—
(70%Imax) 3163.53	—
(80%Imax) 3615.47	—
(90%Imax) 4067.4	—





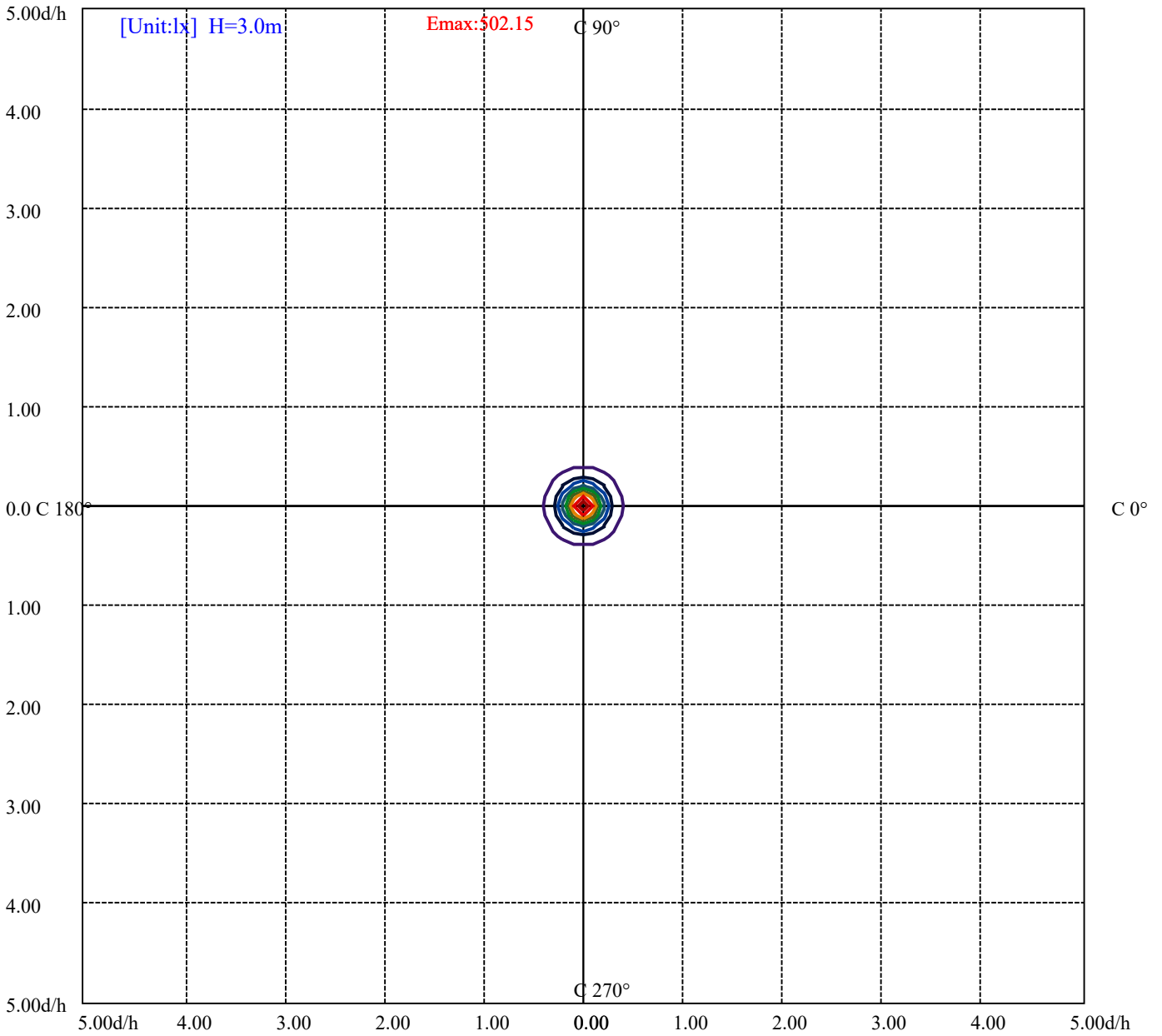
House

[Unit:cd]

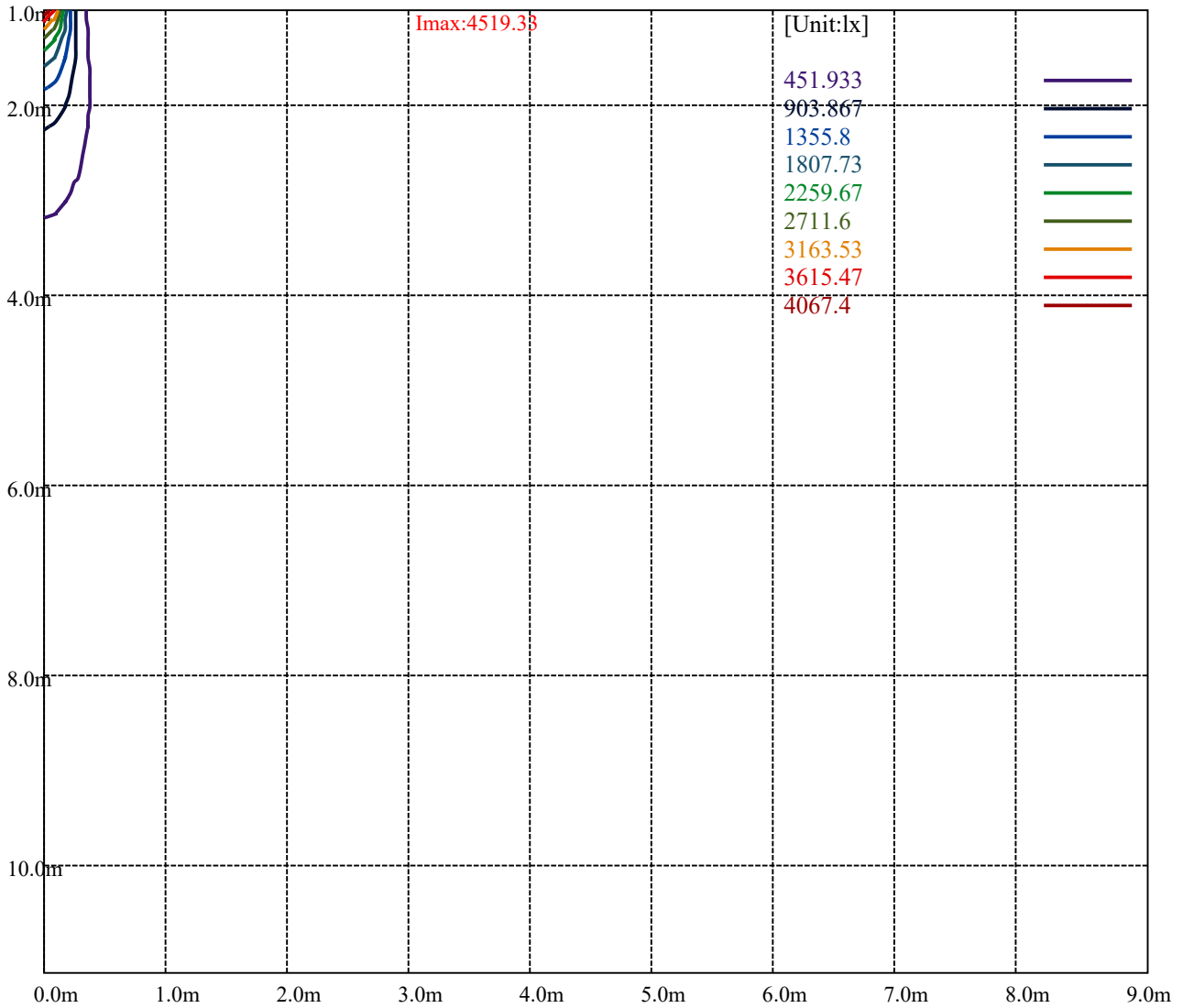
Road

Imax:4519.33

(10%Imax) 451.933	—
(20%Imax) 903.867	—
(30%Imax) 1355.8	—
(40%Imax) 1807.73	—
(50%Imax) 2259.67	—
(60%Imax) 2711.6	—
(70%Imax) 3163.53	—
(80%Imax) 3615.47	—
(90%Imax) 4067.4	—



- (10%Emax) 50.21478
- (20%Emax) 100.4296
- (30%Emax) 150.6445
- (40%Emax) 200.8589
- (50%Emax) 251.0733
- (60%Emax) 301.2889
- (70%Emax) 351.5033
- (80%Emax) 401.7178
- (90%Emax) 451.9333



Luminance Table

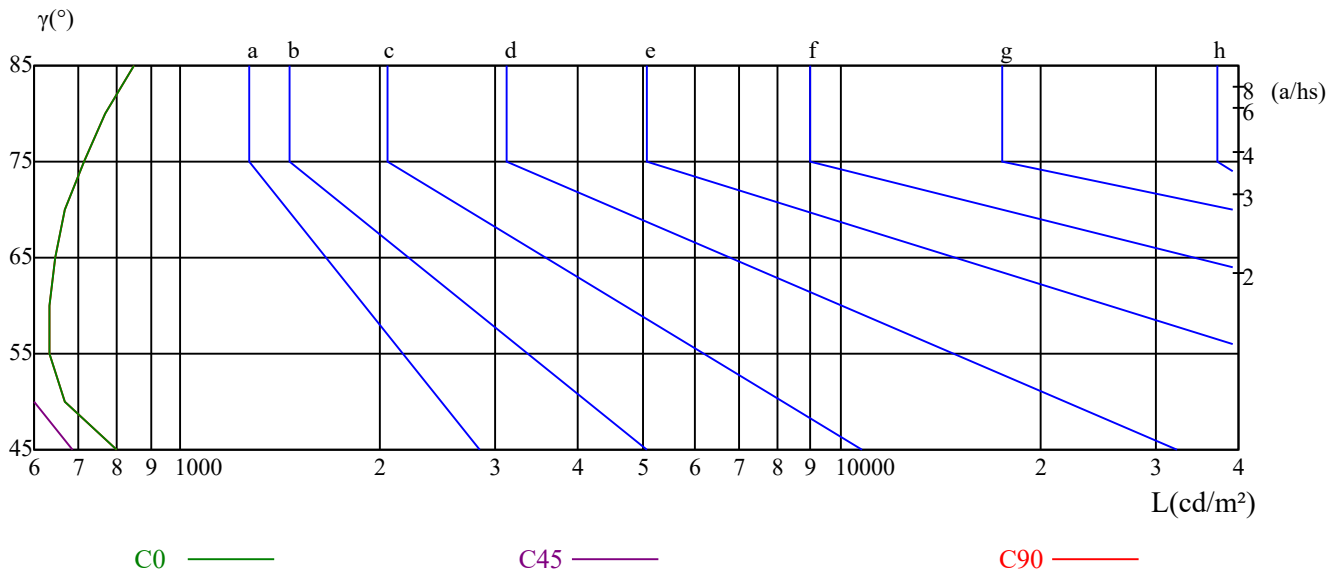
$\gamma$	45	50	55	60	65	70	75	80	85
C0	803	670	635	632	644	669	712	770	849
C45	688	574	540	528	530	544	565	596	641
C90	803	670	635	632	644	669	712	770	849

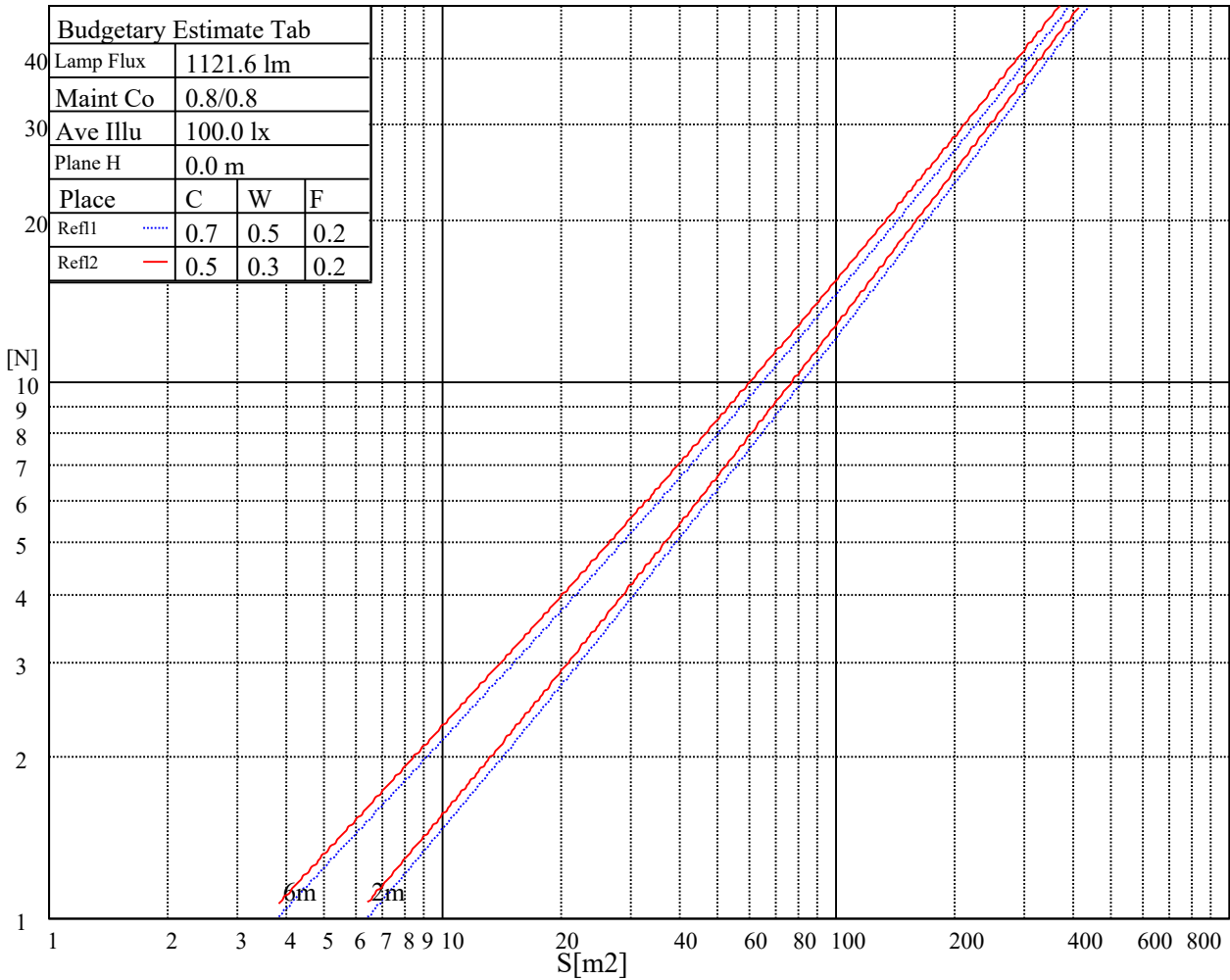
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
1536	1536	1567	2428	2428	2490	7111	7111	7326

Glare Table

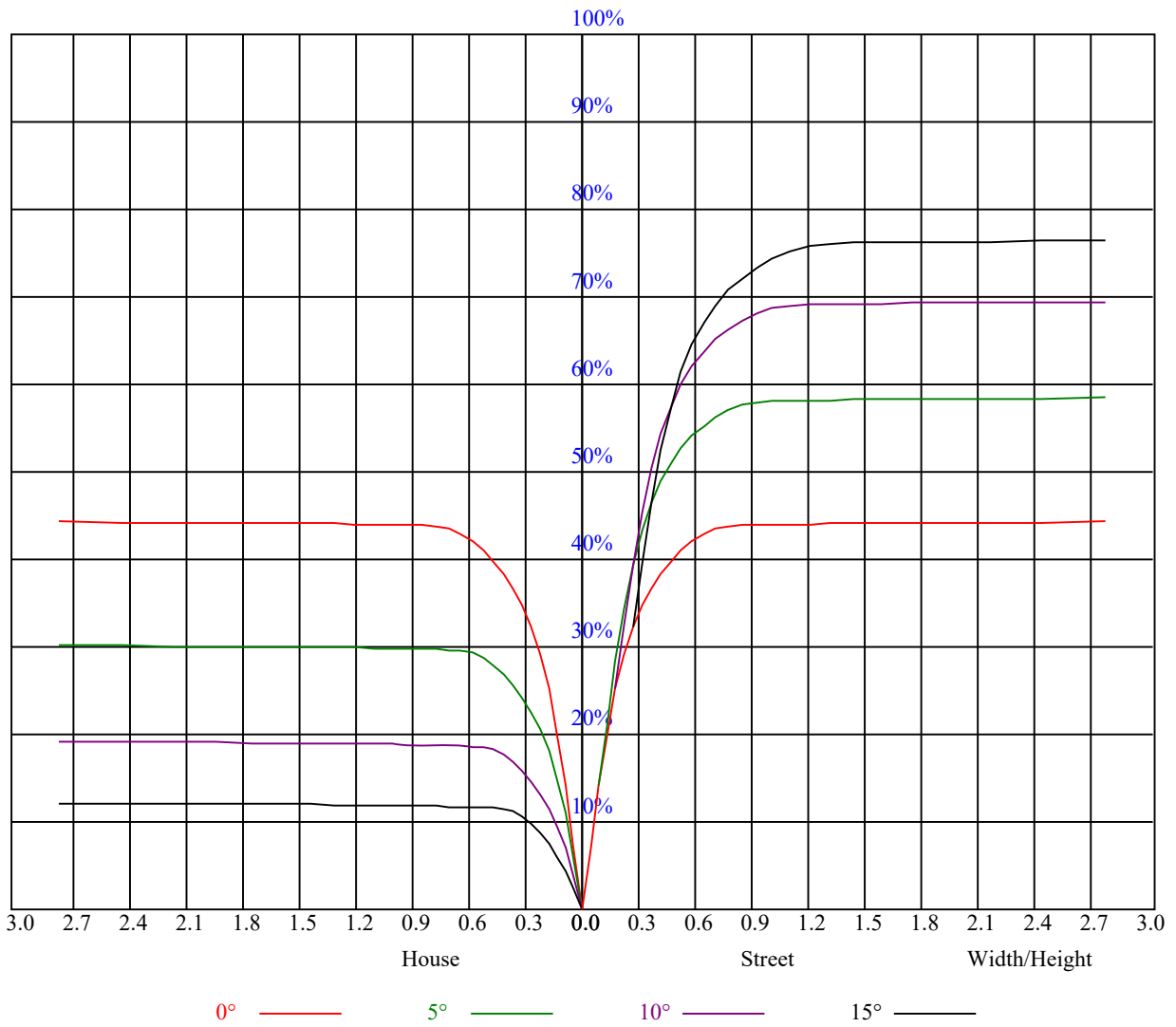
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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



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	4539.08	4603.18	4566.67	4461.45	4292.41	4110.38	3880.48	3621.63	3372.26
90.0	4499.59	4502.83	4424.40	4281.05	4110.65	3920.24	3648.14	3403.63	3141.00
180.0	4539.08	4416.55	4260.76	3998.13	3807.45	3572.95	3213.22	2966.82	2673.90
270.0	4499.59	4418.72	4278.88	4124.98	3909.69	3693.58	3428.79	3139.65	2861.88
360.0	4539.08	4603.18	4566.67	4461.45	4292.41	4110.38	3880.48	3621.63	3372.26
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3074.47	2758.01	2471.04	2187.05	1854.36	1614.45	1398.62	1186.57	1017.79
90.0	2832.66	2513.24	2224.91	1913.60	1629.60	1409.98	1197.65	1041.32	899.86
180.0	2344.46	2030.44	1772.95	1513.03	1312.06	1121.65	967.75	856.32	754.35
270.0	2542.99	2227.62	1957.41	1707.50	1433.78	1248.23	1089.20	924.75	820.35
360.0	3074.47	2758.01	2471.04	2187.05	1854.36	1614.45	1398.62	1186.57	1017.79
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	896.08	785.45	697.55	635.34	578.27	534.46	490.91	453.04	424.91
90.0	788.43	708.91	645.62	582.33	540.95	502.54	459.80	431.40	410.04
180.0	674.29	616.41	538.94	518.69	476.98	444.96	418.72	395.05	380.93
270.0	736.23	651.03	595.04	534.91	499.35	462.32	428.16	406.01	387.32
360.0	896.08	785.45	697.55	635.34	578.27	534.46	490.91	453.04	424.91
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	402.19	383.80	373.79	366.76	358.38	351.89	342.96	313.21	267.50
90.0	391.92	378.93	371.09	362.70	355.40	346.21	317.54	277.24	225.57
180.0	370.90	360.78	353.59	347.53	332.79	295.84	252.70	200.34	152.98
270.0	375.55	364.33	356.67	350.02	342.18	324.43	289.84	235.66	187.82
360.0	402.19	383.80	373.79	366.76	358.38	351.89	342.96	313.21	267.50
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	220.98	167.42	142.00	67.73	29.48	13.50	10.63	8.98	7.60
90.0	171.21	140.92	77.49	37.27	14.69	10.60	9.41	7.60	6.55
180.0	101.18	55.42	25.18	11.52	9.82	8.30	6.87	5.79	5.33
270.0	139.94	83.93	49.69	19.45	11.06	9.79	8.22	6.41	5.76
360.0	220.98	167.42	142.00	67.73	29.48	13.50	10.63	8.98	7.60
C/γ(°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	6.60	5.90	5.30	5.14	4.98	4.87	4.76	4.68	4.60
90.0	6.11	5.36	5.22	5.06	4.95	4.81	4.76	4.65	4.57
180.0	5.19	5.03	4.92	4.84	4.73	4.63	4.57	4.49	4.44
270.0	5.41	5.19	5.03	4.92	4.81	4.71	4.63	4.52	4.44
360.0	6.60	5.90	5.30	5.14	4.98	4.87	4.76	4.68	4.60
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	4.54	4.44	4.38	4.33	4.30	4.25	4.22	4.19	4.17
90.0	4.49	4.44	4.38	4.33	4.27	4.22	4.19	4.17	4.14
180.0	4.38	4.30	4.27	4.25	4.22	4.19	4.17	4.14	4.11
270.0	4.36	4.30	4.27	4.25	4.19	4.17	4.14	4.08	4.06
360.0	4.54	4.44	4.38	4.33	4.30	4.25	4.22	4.19	4.17
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	4.14	4.11	4.08	4.06	4.06	4.06	4.03	4.00	4.00
90.0	4.11	4.08	4.06	4.03	4.00	3.98	3.98	3.95	3.95
180.0	4.08	4.06	4.06	4.03	4.03	4.03	4.00	3.98	3.98
270.0	4.03	4.03	4.00	4.00	3.98	3.95	3.95	3.92	3.92
360.0	4.14	4.11	4.08	4.06	4.06	4.06	4.03	4.00	4.00



Nata 3-2040-M

Intensity data(cd)										Appendix Page: 17 Total:17
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0	
0.0	3.98	3.95	3.95	3.95	3.95	3.95	3.95	3.92	3.92	
90.0	3.95	3.92	3.92	3.90	3.90	3.87	3.87	3.87	3.87	
180.0	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.92	3.92	
270.0	3.90	3.92	3.90	3.90	3.87	3.87	3.84	3.84	3.84	
360.0	3.98	3.95	3.95	3.95	3.95	3.95	3.95	3.92	3.92	
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0	
0.0	3.92	3.92	3.92	3.92	3.92	3.90	3.90	3.90	3.90	
90.0	3.87	3.84	3.87	3.84	3.84	3.84	3.81	3.81	3.81	
180.0	3.90	3.92	3.92	3.95	3.87	3.90	3.87	3.87	3.87	
270.0	3.84	3.84	3.81	3.84	3.84	3.81	3.81	3.81	3.81	
360.0	3.92	3.92	3.92	3.92	3.92	3.90	3.90	3.90	3.90	
C/γ(°)	90.0									
0.0	3.90									
90.0	3.81									
180.0	3.87									
270.0	3.81									
360.0	3.90									