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NATA

LumCAT: CR01D04438AK

Luminaire:

Report No: NATA0100

Test No: GC2018112610

LampCAT: CREE CXA1512

Lamp flux(lm): 1425.0

Number of Lamps: 1

Length(mm): 43

Phm Type: C

Voltage(V): 35.8000

Current(A): 0.3000

Power (W): 10.7400

PF: 0.0000

Ballast type: DC

Width(mm): 43

Height(mm): 0

Photometric Results

Lumens(lm): 1169.50

Efficiency(%): 82.07%

Lumens(lm)/Power(W): 108.94

Central intensity(cd): 2403.422

Maximum intensity(cd): 2403.422

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=38.2

[C90/270]Total=38.2

Field angle(10%Imax): [C0/180]Total=61.8

[C90/270]Total=61.8

Maximum s/h(1/2): C0_180=0.63 C90_270=0.63

Maximum s/h(1/4): C0_180=0.60 C90_270=0.60

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 82.11%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 94.178%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	2403.422	0.575	0.575	.040%	.049%
1.0	2402.859	4.599	5.174	.323%	.442%
2.0	2398.781	9.180	14.354	.644%	1.227%
3.0	2388.727	13.709	28.064	.962%	2.400%
4.0	2369.672	18.127	46.19	1.272%	3.950%
5.0	2338.383	22.349	68.54	1.568%	5.861%
6.0	2299.852	26.362	94.902	1.850%	8.115%
7.0	2252.039	30.097	124.999	2.112%	10.688%
8.0	2203.594	33.631	158.63	2.360%	13.564%
9.0	2145.516	36.806	195.436	2.583%	16.711%
10.0	2079.281	39.595	235.03	2.779%	20.097%
11.0	2008.688	42.030	277.061	2.949%	23.690%
12.0	1927.406	43.944	321.005	3.084%	27.448%
13.0	1838.391	45.350	366.355	3.182%	31.326%
14.0	1746.914	46.345	412.7	3.252%	35.288%
15.0	1654.734	46.965	459.665	3.296%	39.304%
16.0	1551.727	46.903	506.568	3.291%	43.315%
17.0	1449.000	46.457	553.026	3.260%	47.287%
18.0	1329.820	45.064	598.089	3.162%	51.140%
19.0	1211.576	43.256	641.345	3.035%	54.839%
20.0	1091.552	40.940	682.285	2.873%	58.340%
21.0	986.927	38.785	721.071	2.722%	61.656%
22.0	880.095	36.154	757.225	2.537%	64.748%
23.0	776.461	33.270	790.494	2.335%	67.592%
24.0	684.956	30.551	821.045	2.144%	70.205%
25.0	598.908	27.756	848.802	1.948%	72.578%
26.0	529.615	25.460	874.261	1.787%	74.755%
27.0	461.805	22.991	897.252	1.613%	76.721%
28.0	400.725	20.630	917.883	1.448%	78.485%
29.0	338.576	18.000	935.883	1.263%	80.024%
30.0	284.435	15.596	951.479	1.094%	81.358%
31.0	235.898	13.323	964.802	.935%	82.497%
32.0	190.470	11.068	975.871	.777%	83.443%
33.0	160.657	9.595	985.466	.673%	84.264%
34.0	136.420	8.366	993.831	.587%	84.979%
35.0	117.970	7.420	1001.252	.521%	85.613%
36.0	101.658	6.553	1007.804	.460%	86.174%
37.0	89.072	5.878	1013.683	.413%	86.676%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	78.012	5.267	1018.949	.370%	87.127%
39.0	69.033	4.764	1023.713	.334%	87.534%
40.0	62.557	4.410	1028.123	.309%	87.911%
41.0	57.248	4.119	1032.242	.289%	88.263%
42.0	53.044	3.892	1036.134	.273%	88.596%
43.0	50.013	3.740	1039.874	.262%	88.916%
44.0	48.066	3.661	1043.536	.257%	89.229%
45.0	46.702	3.621	1047.157	.254%	89.539%
46.0	45.752	3.609	1050.766	.253%	89.847%
47.0	45.000	3.609	1054.375	.253%	90.156%
48.0	44.550	3.631	1058.006	.255%	90.466%
49.0	44.241	3.661	1061.667	.257%	90.779%
50.0	44.079	3.703	1065.37	.260%	91.096%
51.0	43.924	3.743	1069.114	.263%	91.416%
52.0	43.763	3.782	1072.895	.265%	91.739%
53.0	43.390	3.800	1076.695	.267%	92.064%
54.0	42.750	3.793	1080.488	.266%	92.389%
55.0	41.899	3.764	1084.252	.264%	92.710%
56.0	40.704	3.701	1087.952	.260%	93.027%
57.0	39.466	3.630	1091.582	.255%	93.337%
58.0	38.067	3.540	1095.122	.248%	93.640%
59.0	36.675	3.447	1098.569	.242%	93.935%
60.0	35.269	3.349	1101.919	.235%	94.221%
61.0	33.799	3.242	1105.161	.227%	94.498%
62.0	32.407	3.138	1108.298	.220%	94.767%
63.0	30.952	3.024	1111.323	.212%	95.025%
64.0	29.320	2.890	1114.213	.203%	95.272%
65.0	27.633	2.746	1116.959	.193%	95.507%
66.0	26.114	2.616	1119.575	.184%	95.731%
67.0	24.729	2.496	1122.071	.175%	95.944%
68.0	23.590	2.399	1124.47	.168%	96.149%
69.0	22.655	2.319	1126.789	.163%	96.348%
70.0	22.029	2.270	1129.059	.159%	96.542%
71.0	21.389	2.218	1131.277	.156%	96.731%
72.0	20.939	2.184	1133.461	.153%	96.918%
73.0	20.503	2.150	1135.611	.151%	97.102%
74.0	20.201	2.129	1137.74	.149%	97.284%
75.0	19.927	2.111	1139.851	.148%	97.465%

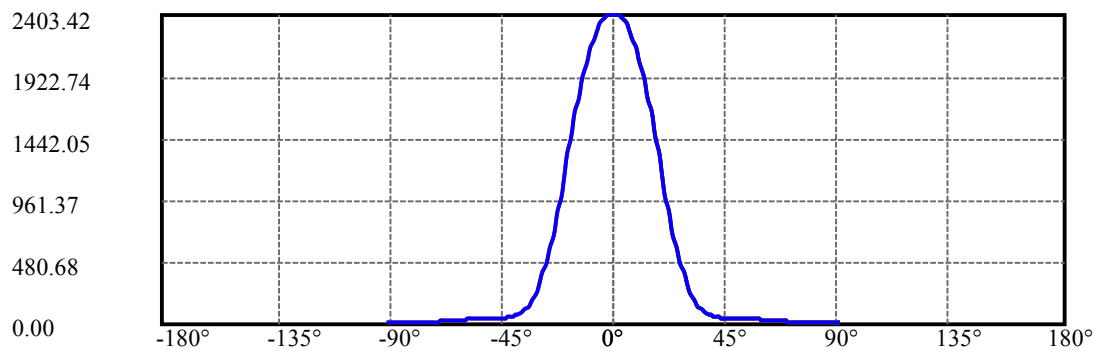
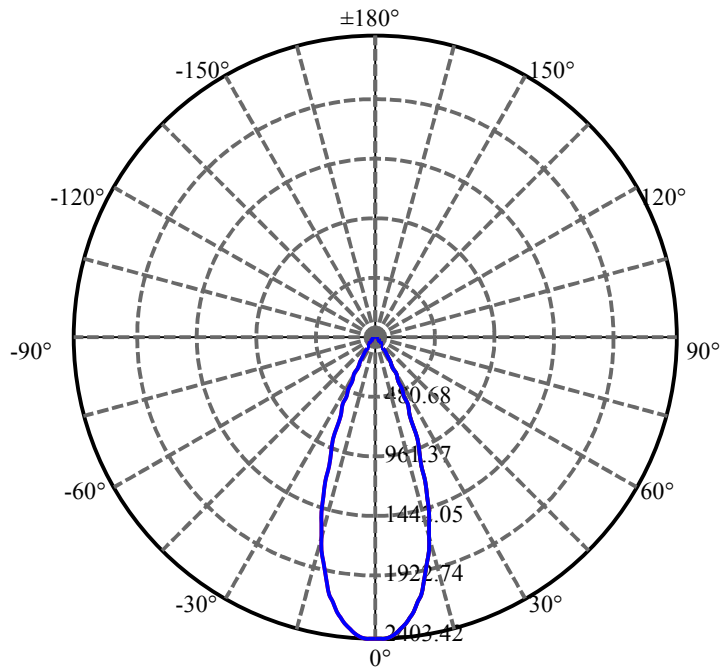
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	19.652	2.091	1141.942	.147%	97.643%
77.0	19.413	2.074	1144.016	.146%	97.821%
78.0	19.160	2.055	1146.071	.144%	97.996%
79.0	19.020	2.047	1148.119	.144%	98.172%
80.0	18.991	2.051	1150.17	.144%	98.347%
81.0	19.076	2.066	1152.236	.145%	98.524%
82.0	18.872	2.049	1154.285	.144%	98.699%
83.0	19.371	2.108	1156.394	.148%	98.879%
84.0	20.334	2.218	1158.611	.156%	99.069%
85.0	20.721	2.264	1160.875	.159%	99.262%
86.0	20.616	2.255	1163.13	.158%	99.455%
87.0	18.091	1.981	1165.111	.139%	99.624%
88.0	16.685	1.829	1166.94	.128%	99.781%
89.0	16.931	1.856	1168.796	.130%	99.940%
90.0	12.888	0.707	1169.503	.050%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	951.48	66.77%	81.36%
0-40	1028.12	72.15%	87.91%
0-60	1101.92	77.33%	94.22%
0-90	1168.80	82.02%	99.94%
0-120	1168.80	82.02%	99.94%
0-180	1169.50	82.07%	100.00%
60-90	70.23	4.93%	6.00%
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%
0-28.98	935.60	65.66%	80.00%

ZONAL LUMEN SUMMARY

0-10	235.03
10-20	447.25
20-30	269.19
30-40	76.64
40-50	37.25
50-60	36.55
60-70	27.14
70-80	21.11
80-90	18.63
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

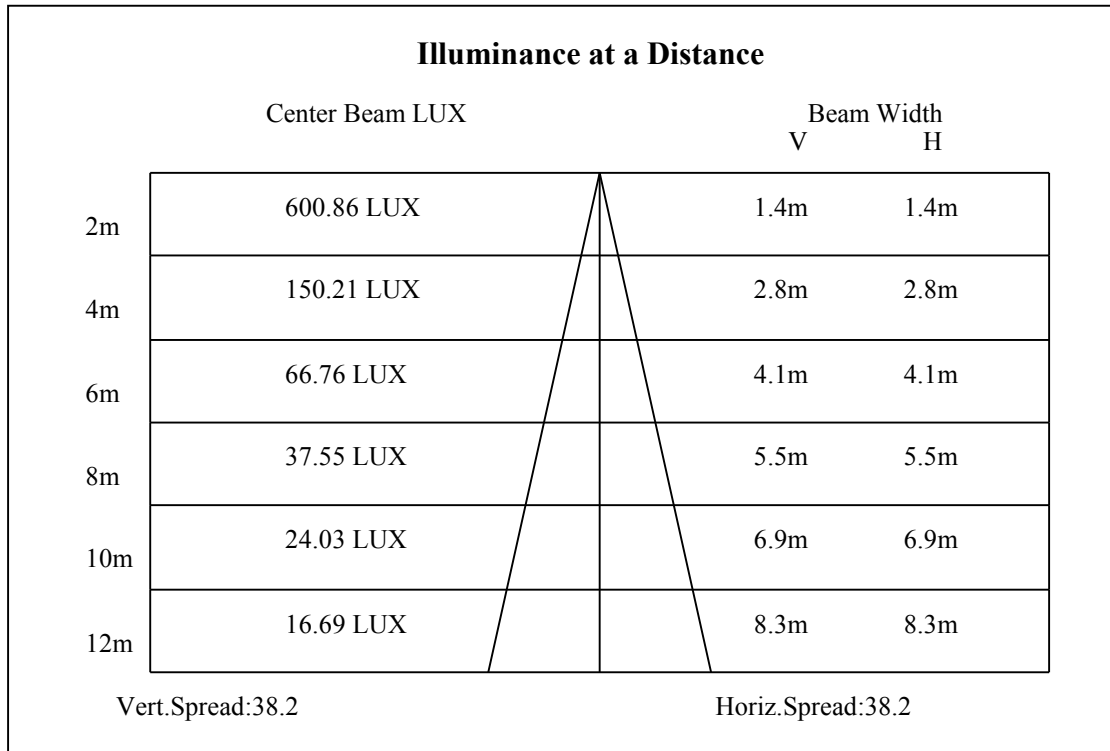
C0(Max): —————C0/C180: —————C90/C270: —————

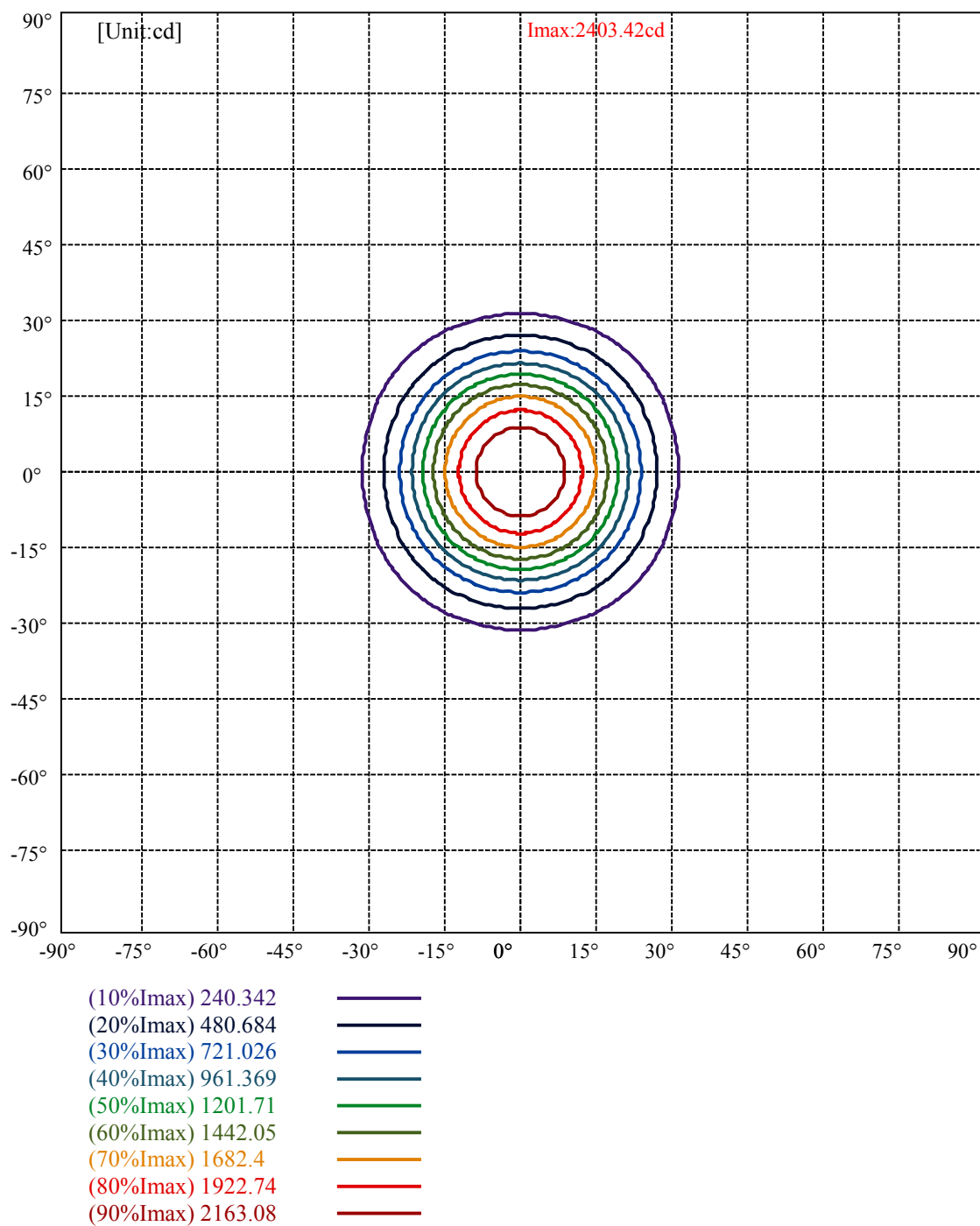
Field angle(10%Imax):C0/180Left:30.9 Right:30.9

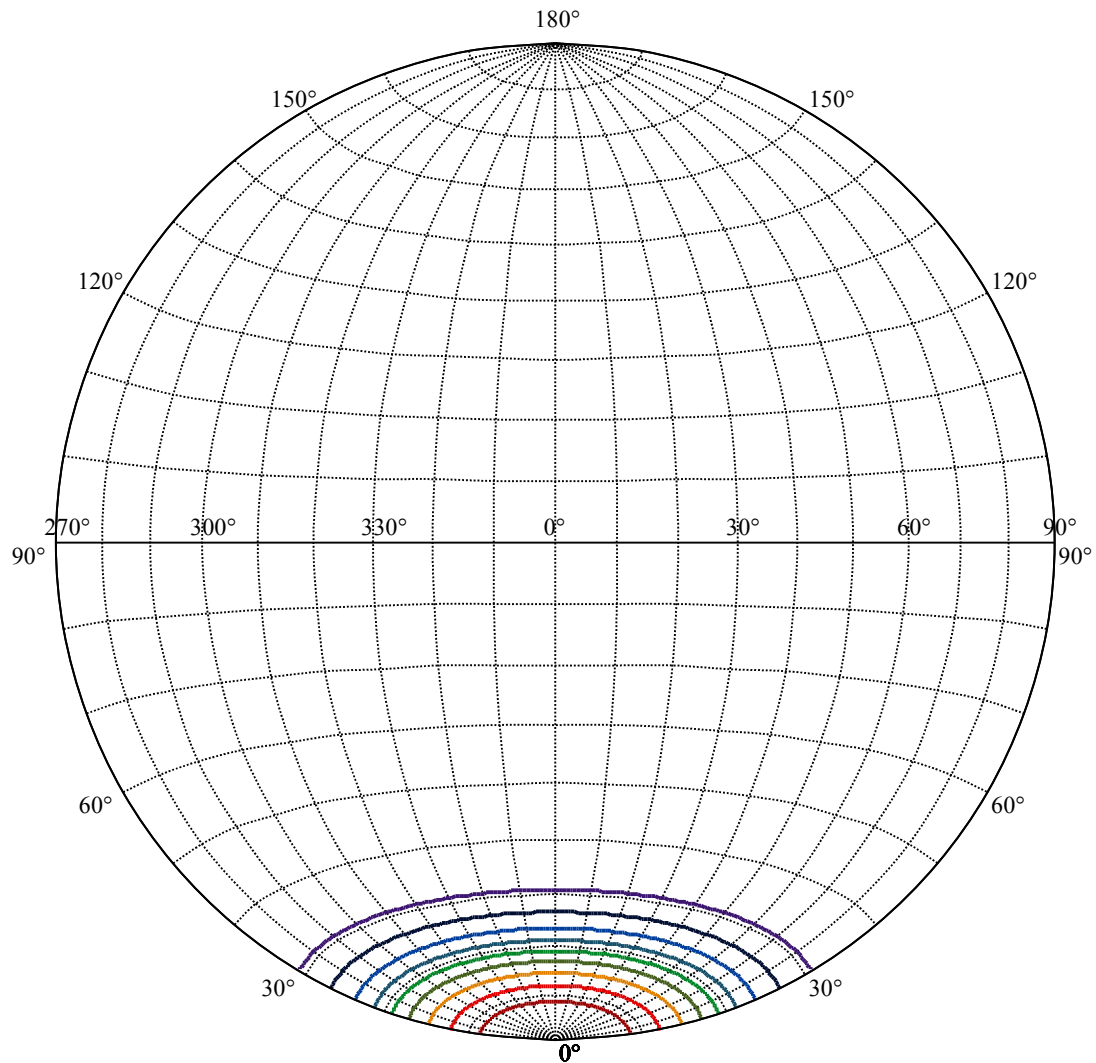
:C90/270Left:30.9 Right:30.9

Beam Angle(50%Imax):C0/180Left:19.1 Right:19.1

:C90/270Left:19.1 Right:19.1







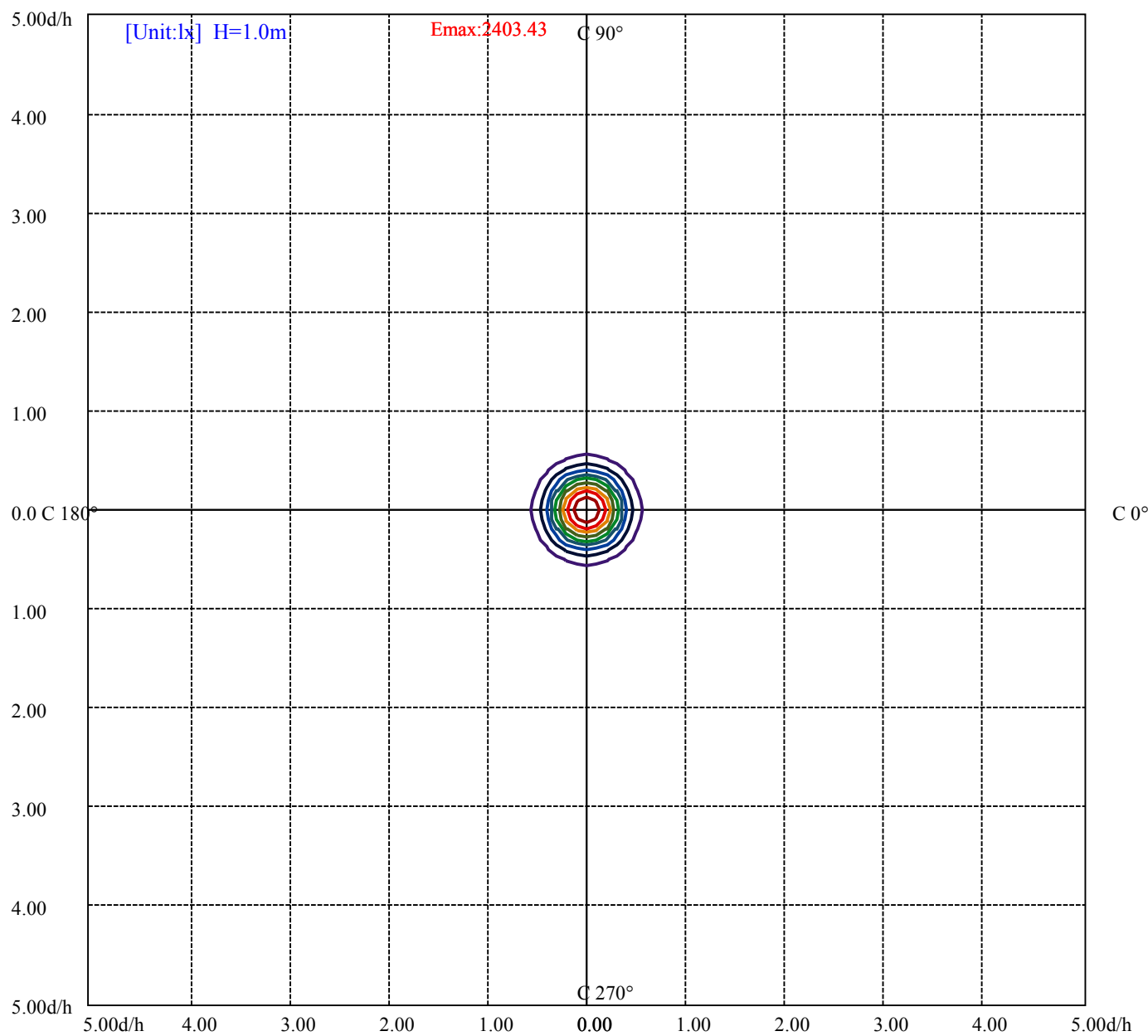
House

[Unit:cd]

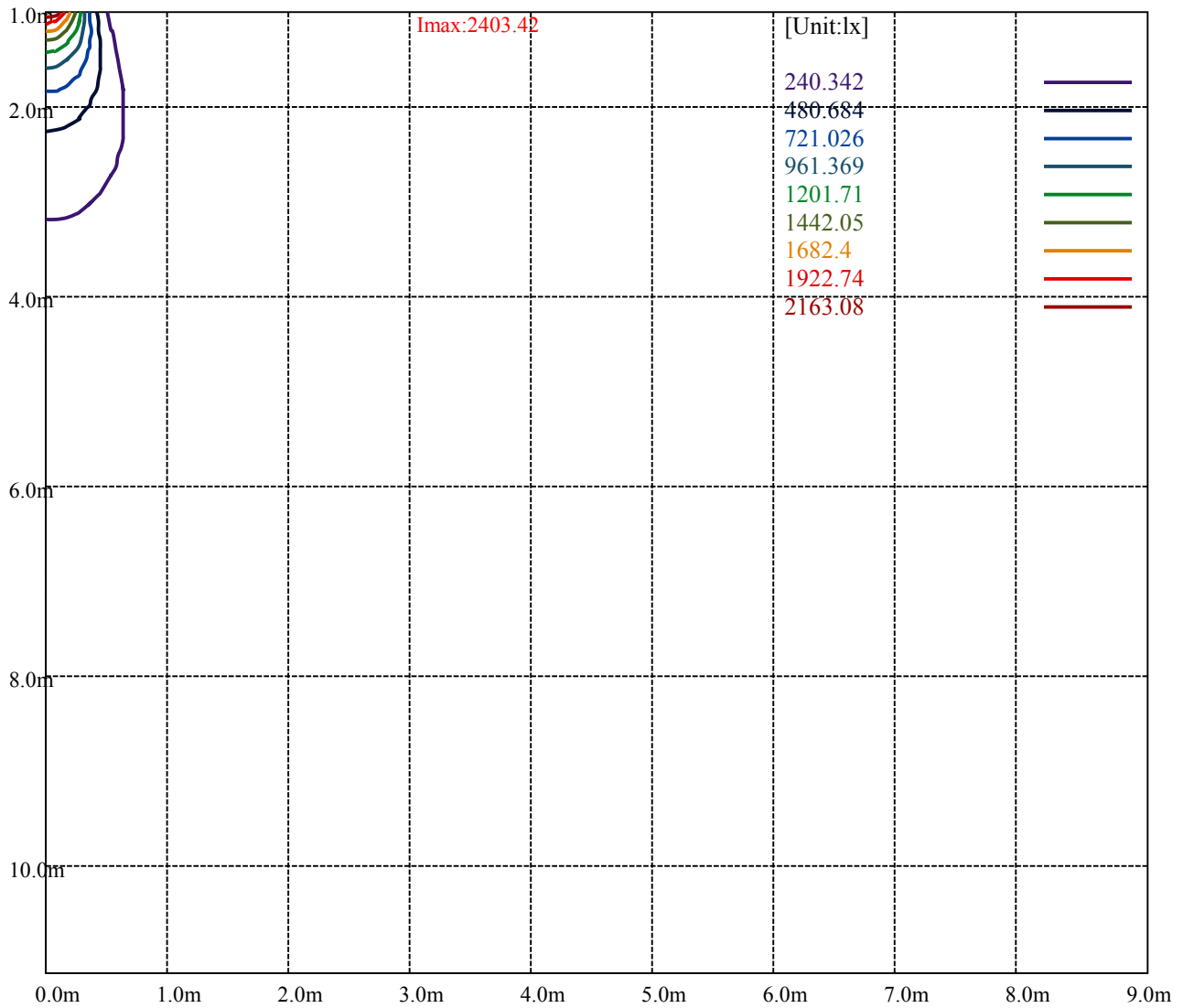
Road

Imax:2403.42

(10%Imax)	240.342	—
(20%Imax)	480.684	—
(30%Imax)	721.026	—
(40%Imax)	961.369	—
(50%Imax)	1201.71	—
(60%Imax)	1442.05	—
(70%Imax)	1682.4	—
(80%Imax)	1922.74	—
(90%Imax)	2163.08	—



(10%Emax) 240.342	—
(20%Emax) 480.684	—
(30%Emax) 721.026	—
(40%Emax) 961.369	—
(50%Emax) 1201.71	—
(60%Emax) 1442.05	—
(70%Emax) 1682.4	—
(80%Emax) 1922.74	—
(90%Emax) 2163.08	—



Luminance Table

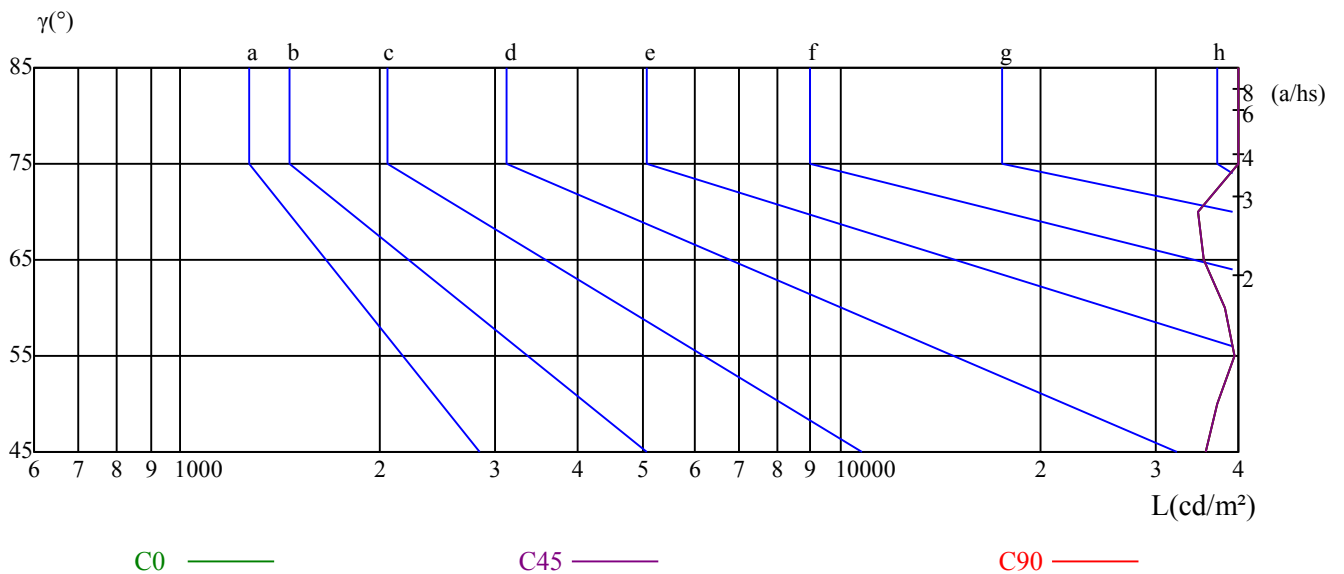
γ	45	50	55	60	65	70	75	80	85
C0	35720	37087	39507	38149	35362	34834	41639	59149	128582
C45	35720	37087	39507	38149	35362	34834	41639	59149	128582
C90	35720	37087	39507	38149	35362	34834	41639	59149	128582

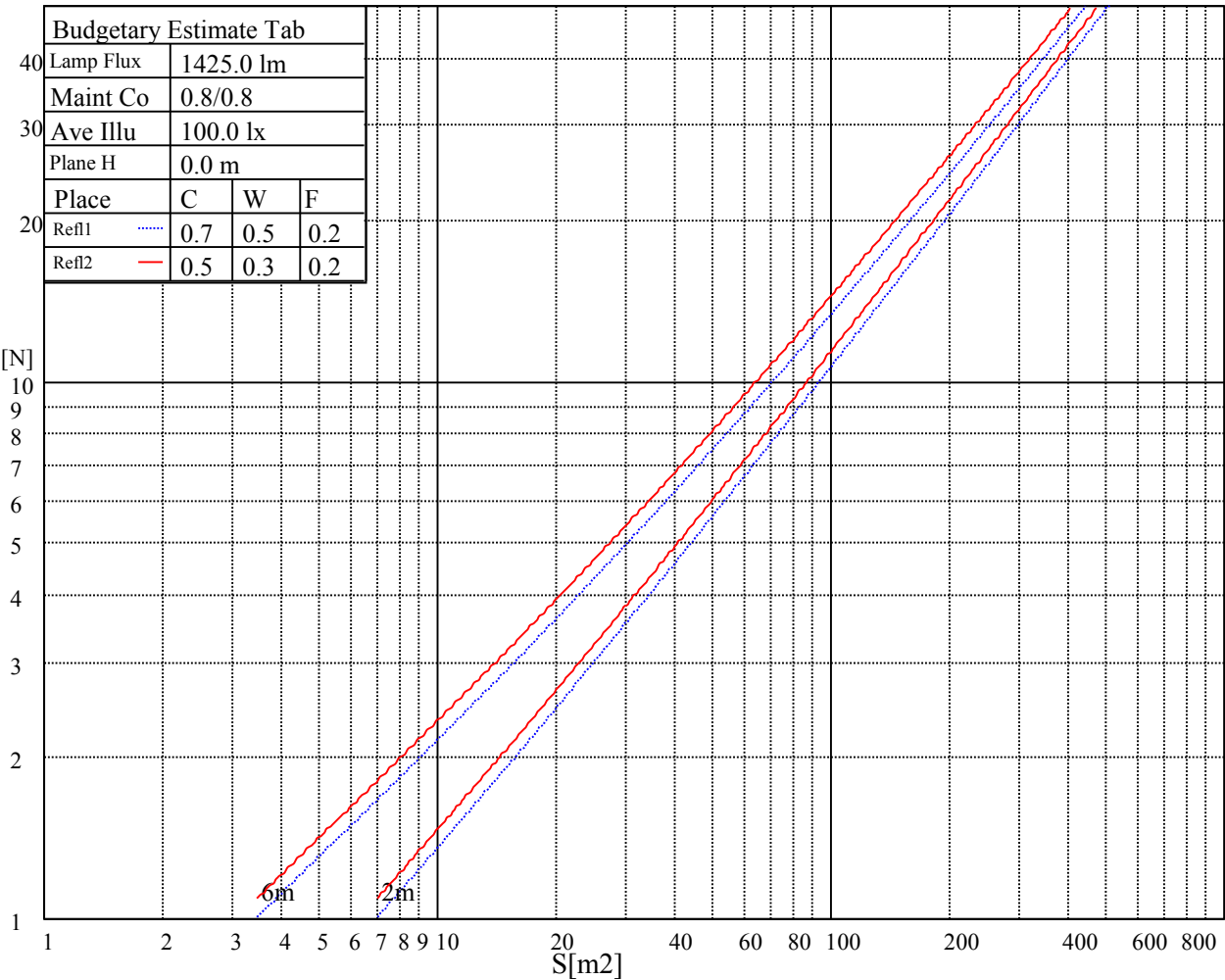
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
35362	35362	35362	41639	41639	41639	128582	128582	128582

Glare Table

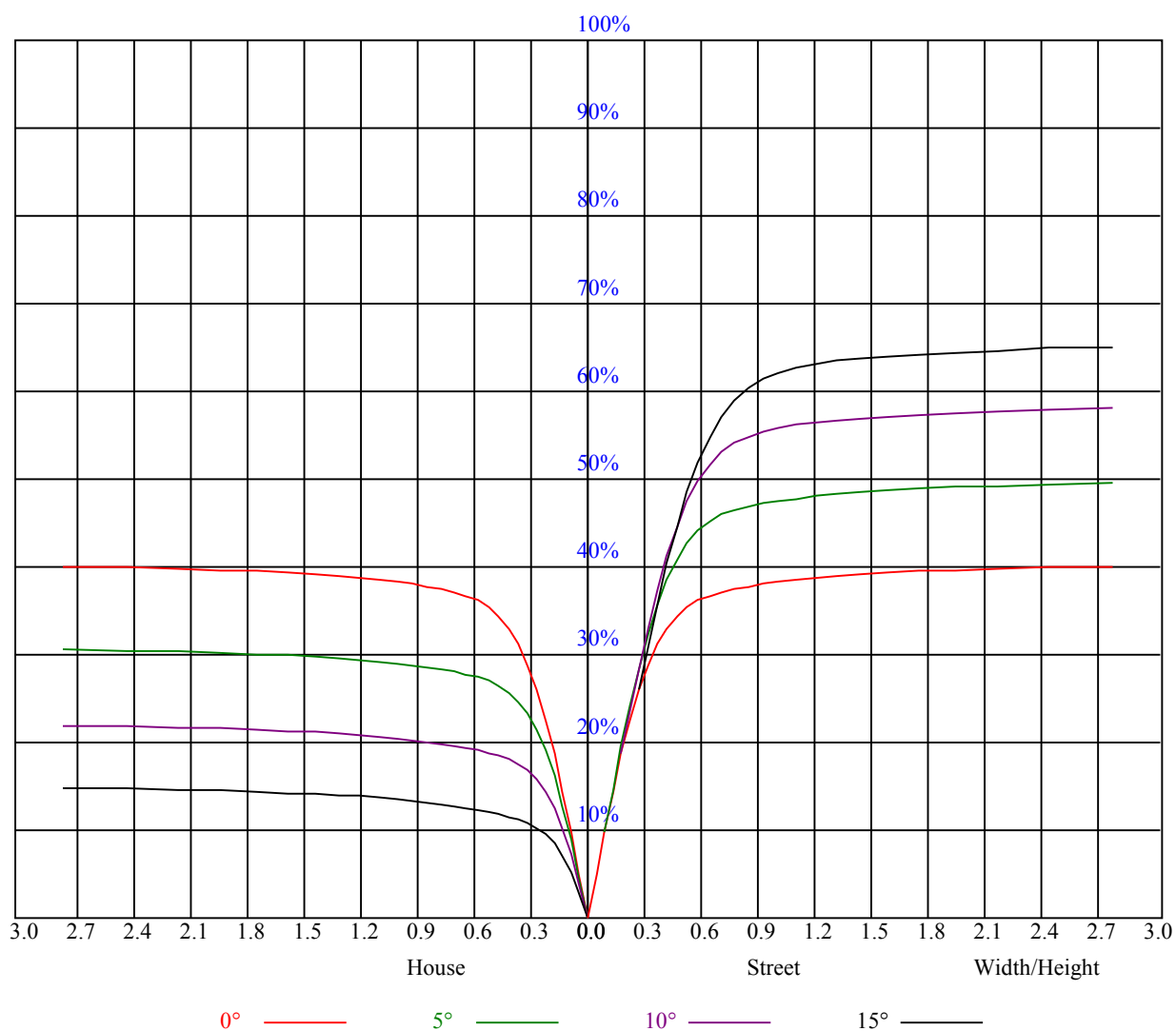
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

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	0.98	0.98	0.98	0.95	0.95	0.95	0.91	0.91	0.91	0.87	0.87	0.87	0.84	0.84	0.84	0.82
1	0.90	0.88	0.86	0.88	0.86	0.85	0.85	0.84	0.82	0.82	0.81	0.80	0.79	0.78	0.77	0.76
2	0.84	0.81	0.78	0.83	0.80	0.77	0.80	0.78	0.75	0.78	0.76	0.74	0.75	0.74	0.72	0.71
3	0.79	0.75	0.72	0.78	0.74	0.71	0.76	0.73	0.70	0.74	0.71	0.69	0.72	0.70	0.68	0.67
4	0.75	0.70	0.67	0.74	0.70	0.67	0.72	0.69	0.66	0.70	0.67	0.65	0.69	0.66	0.64	0.63
5	0.71	0.66	0.63	0.70	0.66	0.63	0.69	0.65	0.62	0.67	0.64	0.62	0.66	0.63	0.61	0.60
6	0.67	0.63	0.60	0.67	0.62	0.59	0.66	0.62	0.59	0.64	0.61	0.59	0.63	0.60	0.58	0.57
7	0.64	0.60	0.57	0.64	0.60	0.56	0.63	0.59	0.56	0.62	0.58	0.56	0.61	0.58	0.56	0.55
8	0.62	0.57	0.54	0.61	0.57	0.54	0.60	0.56	0.54	0.59	0.56	0.53	0.59	0.56	0.53	0.52
9	0.59	0.55	0.52	0.59	0.54	0.52	0.58	0.54	0.51	0.57	0.54	0.51	0.57	0.53	0.51	0.50
10	0.57	0.52	0.50	0.56	0.52	0.50	0.56	0.52	0.49	0.55	0.52	0.49	0.55	0.51	0.49	0.48



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	2397.94	2391.19	2384.44	2376.00	2353.50	2315.81	2279.81	2219.06	2171.25
45.0	2400.75	2403.00	2388.94	2368.69	2347.31	2304.00	2267.44	2221.88	2167.31
90.0	2412.56	2410.31	2402.44	2384.44	2362.50	2331.56	2289.38	2239.88	2186.44
135.0	2402.44	2412.00	2412.56	2408.63	2394.00	2367.56	2330.44	2282.63	2239.31
180.0	2397.94	2404.69	2409.75	2399.63	2386.13	2361.94	2318.63	2268.56	2225.25
225.0	2400.75	2402.44	2401.88	2399.63	2385.00	2363.06	2334.38	2295.56	2247.19
270.0	2412.56	2402.44	2397.38	2391.75	2377.69	2350.13	2320.31	2278.69	2232.00
315.0	2402.44	2396.81	2392.88	2381.06	2351.25	2313.00	2258.44	2210.06	2160.00
360.0	2397.94	2391.19	2384.44	2376.00	2353.50	2315.81	2279.81	2219.06	2171.25
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2119.50	2049.75	1982.81	1900.13	1797.19	1717.31	1636.88	1524.94	1425.38
45.0	2106.00	2041.31	1959.75	1882.69	1787.06	1689.75	1595.25	1484.44	1366.31
90.0	2115.00	2037.94	1964.25	1873.69	1794.94	1696.50	1587.94	1486.13	1380.38
135.0	2186.44	2124.00	2058.75	1982.25	1884.94	1803.38	1713.38	1598.06	1494.00
180.0	2172.94	2107.69	2033.44	1946.81	1870.31	1779.75	1676.81	1583.44	1481.06
225.0	2199.38	2139.75	2069.44	2000.25	1918.69	1814.06	1733.06	1644.75	1542.38
270.0	2170.69	2107.69	2046.94	1969.31	1867.50	1783.69	1696.50	1584.00	1491.19
315.0	2094.19	2026.13	1954.13	1864.13	1786.50	1690.88	1598.06	1508.06	1411.31
360.0	2119.50	2049.75	1982.81	1900.13	1797.19	1717.31	1636.88	1524.94	1425.38
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1323.00	1208.81	1100.25	996.75	880.31	774.56	689.63	595.69	527.06
45.0	1260.56	1152.00	1009.13	917.44	813.94	707.63	623.81	555.75	481.50
90.0	1247.06	1118.36	1023.08	889.14	789.08	697.89	609.69	534.49	475.03
135.0	1383.19	1258.31	1142.44	1033.31	906.75	793.69	706.50	619.88	553.50
180.0	1350.00	1240.31	1113.75	1009.24	891.73	790.76	703.24	609.75	543.66
225.0	1408.50	1308.94	1118.76	1066.05	961.14	859.05	748.35	652.11	577.69
270.0	1388.25	1285.31	1154.81	1049.06	948.38	827.44	733.50	645.19	561.38
315.0	1278.00	1120.56	1070.21	934.43	849.43	760.67	664.93	578.42	517.11
360.0	1323.00	1208.81	1100.25	996.75	880.31	774.56	689.63	595.69	527.06
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	462.38	398.81	342.56	289.13	225.73	186.92	156.21	129.43	112.28
45.0	413.44	351.56	288.56	257.06	191.81	162.17	140.34	119.08	103.28
90.0	406.35	347.01	284.63	231.19	194.68	163.29	138.83	121.11	105.69
135.0	482.63	418.50	358.31	298.69	253.41	201.32	171.68	145.13	124.82
180.0	485.49	420.98	353.25	296.44	243.34	200.31	171.28	145.18	126.84
225.0	506.59	447.47	385.59	321.08	269.04	221.23	182.25	156.09	134.66
270.0	487.13	427.50	365.06	312.19	286.31	207.79	175.95	147.83	125.55
315.0	450.45	393.98	330.64	269.72	222.86	180.73	148.73	127.52	110.64
360.0	462.38	398.81	342.56	289.13	225.73	186.92	156.21	129.43	112.28
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	98.38	85.44	74.76	66.99	60.41	55.91	51.92	48.94	47.03
45.0	89.78	79.93	70.48	63.73	58.73	54.23	51.08	49.28	47.87
90.0	89.66	79.09	70.26	61.82	56.59	52.37	48.43	46.41	45.17
135.0	109.13	95.18	81.79	72.84	66.15	60.02	55.41	52.03	49.50
180.0	110.03	94.95	83.25	72.79	64.52	58.67	54.34	50.85	48.99
225.0	114.02	100.58	89.61	78.86	71.78	65.59	59.79	55.18	52.82
270.0	109.07	95.51	81.45	72.17	64.74	58.05	53.61	50.63	47.81
315.0	93.21	81.90	72.51	63.06	57.54	53.16	49.78	46.80	45.34
360.0	98.38	85.44	74.76	66.99	60.41	55.91	51.92	48.94	47.03

NATA CR01D04438AK

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	45.68	44.66	43.99	43.48	43.14	43.09	43.09	43.09	42.86
45.0	46.80	45.96	45.11	44.72	44.38	44.10	43.93	43.65	43.14
90.0	44.10	43.43	42.98	42.64	42.36	42.30	41.96	41.74	41.29
135.0	47.93	47.03	46.29	45.90	45.62	45.45	45.28	45.11	44.61
180.0	47.59	46.52	45.84	45.68	45.62	45.68	45.62	45.17	44.61
225.0	51.24	50.06	48.94	48.32	47.93	47.70	47.42	47.14	46.63
270.0	45.84	44.66	43.82	43.09	42.58	42.19	42.13	42.19	41.91
315.0	44.44	43.71	43.03	42.58	42.30	42.13	41.96	42.02	42.08
360.0	45.68	44.66	43.99	43.48	43.14	43.09	43.09	43.09	42.86

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	42.41	41.79	40.67	39.60	38.42	36.90	35.21	33.47	31.89
45.0	42.41	41.46	39.94	38.70	37.46	36.11	34.88	33.86	32.79
90.0	40.33	39.21	37.86	36.51	35.04	33.86	32.57	31.22	29.93
135.0	43.99	43.14	41.51	40.28	39.26	37.80	36.34	35.16	33.53
180.0	43.76	42.58	41.34	39.71	37.80	36.28	34.71	32.79	31.16
225.0	45.62	44.55	43.31	41.79	40.11	38.64	37.13	35.44	33.98
270.0	41.74	41.12	40.28	39.21	37.86	36.45	35.16	33.86	32.63
315.0	41.74	41.34	40.73	39.94	38.59	37.35	36.17	34.59	33.36
360.0	42.41	41.79	40.67	39.60	38.42	36.90	35.21	33.47	31.89

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	30.32	28.29	26.78	25.37	24.30	23.63	23.12	22.78	22.61
45.0	31.33	29.70	28.13	26.78	25.26	24.02	22.89	22.16	21.26
90.0	28.41	26.94	25.43	24.08	23.06	22.22	21.32	20.76	20.19
135.0	32.18	30.43	28.35	26.49	24.75	23.06	21.99	21.26	20.42
180.0	29.64	28.07	26.72	25.93	25.20	24.81	24.64	24.58	24.47
225.0	32.34	30.88	29.08	27.06	25.48	24.08	22.78	21.99	21.32
270.0	31.33	29.87	28.13	26.61	24.98	23.51	22.44	21.60	20.48
315.0	32.06	30.38	28.46	26.61	24.81	23.40	22.05	21.09	20.36
360.0	30.32	28.29	26.78	25.37	24.30	23.63	23.12	22.78	22.61

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	22.67	22.61	22.61	22.67	22.61	22.44	22.11	21.66	21.32
45.0	20.64	20.03	19.58	19.13	18.79	18.51	18.06	17.94	18.06
90.0	19.46	18.90	18.45	18.11	17.66	17.27	16.99	16.93	17.10
135.0	19.91	19.41	19.01	18.73	18.51	18.39	18.34	18.45	19.01
180.0	24.53	24.53	24.69	24.86	24.81	24.64	24.58	24.58	23.96
225.0	20.48	19.97	19.58	19.13	18.90	18.68	18.39	18.17	18.23
270.0	20.08	19.41	18.84	18.34	17.94	17.61	17.27	16.93	16.71
315.0	19.74	19.18	18.84	18.45	18.00	17.78	17.55	17.49	17.55
360.0	22.67	22.61	22.61	22.67	22.61	22.44	22.11	21.66	21.32

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	21.09	20.19	18.79	19.18	19.63	20.25	18.62	15.47	15.47
45.0	17.83	17.55	18.62	19.24	19.41	19.07	16.54	17.33	16.54
90.0	16.82	16.65	17.44	18.17	18.23	17.33	15.08	15.36	14.63
135.0	20.76	21.94	24.92	26.78	27.00	25.59	18.84	17.16	18.62
180.0	23.34	21.54	22.11	24.36	24.13	23.79	19.74	17.94	19.46
225.0	18.17	18.23	18.00	17.94	18.39	19.35	19.91	18.39	18.51
270.0	16.71	16.65	16.65	17.04	18.68	18.96	18.45	16.54	15.81
315.0	17.89	18.23	18.45	19.97	20.31	20.59	17.55	15.30	16.43
360.0	21.09	20.19	18.79	19.18	19.63	20.25	18.62	15.47	15.47

Intensity data(cd)

Appendix Page: 18 Total:18

C/ γ (°)	90.0
0.0	14.68
45.0	6.02
90.0	6.08
135.0	11.87
180.0	12.38
225.0	18.96
270.0	16.54
315.0	16.59
360.0	14.68