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NATA

LumCAT: CR01D04424AK

Luminaire:

Report No: NATA0100

Test No: GC2018112611

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): 1251.60

Efficiency(%): 87.83%

Lumens(lm)/Power(W): 116.63

Central intensity(cd): 4309.734

Maximum intensity(cd): 4309.734

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=26.4

[C90/270]Total=26.4

Field angle(10%Imax): [C0/180]Total=51.3

[C90/270]Total=51.3

Maximum s/h(1/2): C0_180=0.45 C90_270=0.45

Maximum s/h(1/4): C0_180=0.43 C90_270=0.43

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 87.90%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 92.008%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	4309.734	1.031	1.031	.072%	.082%
1.0	4296.234	8.222	9.253	.577%	.739%
2.0	4250.250	16.266	25.52	1.141%	2.039%
3.0	4180.922	23.995	49.515	1.684%	3.956%
4.0	4093.453	31.313	80.828	2.197%	6.458%
5.0	3973.992	37.982	118.81	2.665%	9.493%
6.0	3832.031	43.925	162.735	3.082%	13.002%
7.0	3684.727	49.244	211.979	3.456%	16.937%
8.0	3505.641	53.503	265.481	3.755%	21.211%
9.0	3296.039	56.543	322.024	3.968%	25.729%
10.0	3059.719	58.264	380.288	4.089%	30.384%
11.0	2788.664	58.351	438.639	4.095%	35.046%
12.0	2512.688	57.289	495.928	4.020%	39.623%
13.0	2214.703	54.633	550.561	3.834%	43.988%
14.0	1918.828	50.905	601.466	3.572%	48.056%
15.0	1672.594	47.472	648.938	3.331%	51.849%
16.0	1462.570	44.209	693.147	3.102%	55.381%
17.0	1229.899	39.433	732.58	2.767%	58.531%
18.0	1086.729	36.826	769.406	2.584%	61.474%
19.0	968.991	34.595	804.001	2.428%	64.238%
20.0	852.694	31.981	835.982	2.244%	66.793%
21.0	756.436	29.727	865.709	2.086%	69.168%
22.0	678.881	27.888	893.597	1.957%	71.396%
23.0	603.197	25.846	919.443	1.814%	73.461%
24.0	530.402	23.658	943.101	1.660%	75.351%
25.0	469.385	21.754	964.854	1.527%	77.089%
26.0	408.129	19.620	984.474	1.377%	78.657%
27.0	350.810	17.465	1001.939	1.226%	80.052%
28.0	296.037	15.241	1017.18	1.070%	81.270%
29.0	250.868	13.337	1030.517	.936%	82.336%
30.0	209.412	11.482	1041.999	.806%	83.253%
31.0	168.884	9.538	1051.538	.669%	84.015%
32.0	137.088	7.966	1059.504	.559%	84.652%
33.0	111.628	6.667	1066.171	.468%	85.184%
34.0	92.130	5.650	1071.821	.396%	85.636%
35.0	74.566	4.690	1076.511	.329%	86.011%
36.0	62.128	4.005	1080.515	.281%	86.330%
37.0	53.803	3.551	1084.066	.249%	86.614%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	48.150	3.251	1087.317	.228%	86.874%
39.0	44.156	3.047	1090.364	.214%	87.117%
40.0	42.054	2.964	1093.329	.208%	87.354%
41.0	40.598	2.921	1096.249	.205%	87.588%
42.0	39.572	2.904	1099.153	.204%	87.820%
43.0	38.805	2.902	1102.055	.204%	88.051%
44.0	38.313	2.919	1104.974	.205%	88.285%
45.0	38.067	2.952	1107.926	.207%	88.520%
46.0	38.046	3.001	1110.927	.211%	88.760%
47.0	38.152	3.060	1113.987	.215%	89.005%
48.0	38.130	3.107	1117.094	.218%	89.253%
49.0	37.898	3.137	1120.231	.220%	89.504%
50.0	37.364	3.139	1123.369	.220%	89.754%
51.0	36.647	3.123	1126.493	.219%	90.004%
52.0	35.852	3.098	1129.591	.217%	90.251%
53.0	34.819	3.049	1132.64	.214%	90.495%
54.0	33.820	3.000	1135.641	.211%	90.735%
55.0	32.934	2.958	1138.599	.208%	90.971%
56.0	31.915	2.901	1141.5	.204%	91.203%
57.0	30.811	2.834	1144.334	.199%	91.429%
58.0	29.862	2.777	1147.111	.195%	91.651%
59.0	28.913	2.718	1149.829	.191%	91.868%
60.0	27.956	2.655	1152.484	.186%	92.081%
61.0	27.169	2.606	1155.09	.183%	92.289%
62.0	26.416	2.558	1157.647	.179%	92.493%
63.0	25.798	2.521	1160.168	.177%	92.695%
64.0	25.249	2.489	1162.657	.175%	92.893%
65.0	24.799	2.465	1165.121	.173%	93.090%
66.0	24.525	2.457	1167.578	.172%	93.287%
67.0	24.363	2.459	1170.038	.173%	93.483%
68.0	24.321	2.473	1172.511	.174%	93.681%
69.0	24.469	2.505	1175.016	.176%	93.881%
70.0	24.666	2.542	1177.557	.178%	94.084%
71.0	25.263	2.619	1180.177	.184%	94.293%
72.0	25.805	2.691	1182.868	.189%	94.508%
73.0	26.613	2.791	1185.659	.196%	94.731%
74.0	28.111	2.963	1188.622	.208%	94.968%
75.0	30.565	3.238	1191.86	.227%	95.227%

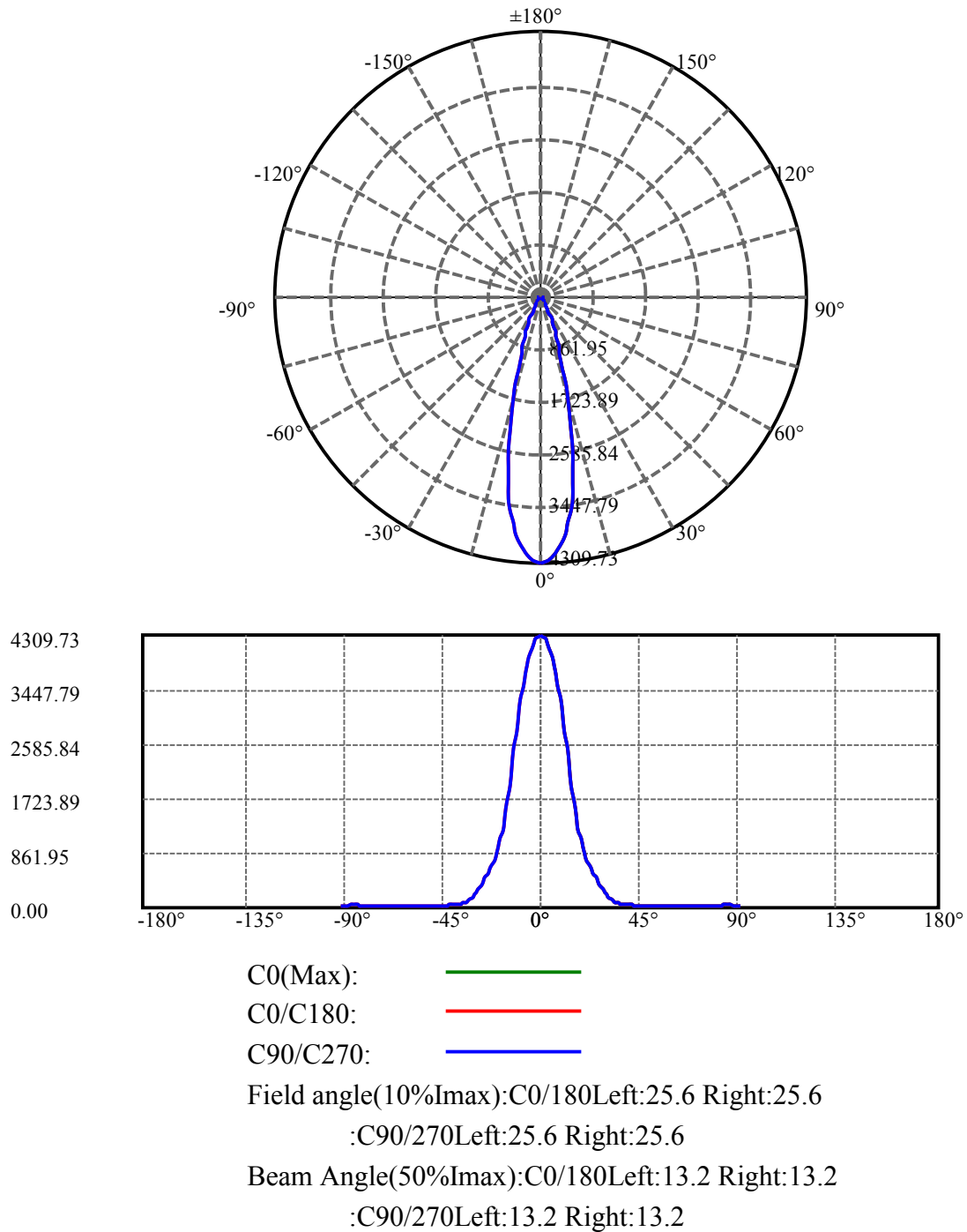
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	33.778	3.594	1195.454	.252%	95.514%
77.0	34.734	3.711	1199.165	.260%	95.810%
78.0	33.898	3.636	1202.801	.255%	96.101%
79.0	32.604	3.510	1206.311	.246%	96.381%
80.0	32.857	3.548	1209.859	.249%	96.665%
81.0	36.035	3.903	1213.762	.274%	96.977%
82.0	39.881	4.331	1218.093	.304%	97.323%
83.0	43.973	4.786	1222.879	.336%	97.705%
84.0	46.223	5.041	1227.921	.354%	98.108%
85.0	44.923	4.908	1232.828	.344%	98.500%
86.0	42.103	4.606	1237.434	.323%	98.868%
87.0	39.565	4.333	1241.767	.304%	99.214%
88.0	38.334	4.201	1245.968	.295%	99.550%
89.0	37.034	4.061	1250.028	.285%	99.874%
90.0	28.730	1.575	1251.604	.111%	100.000%

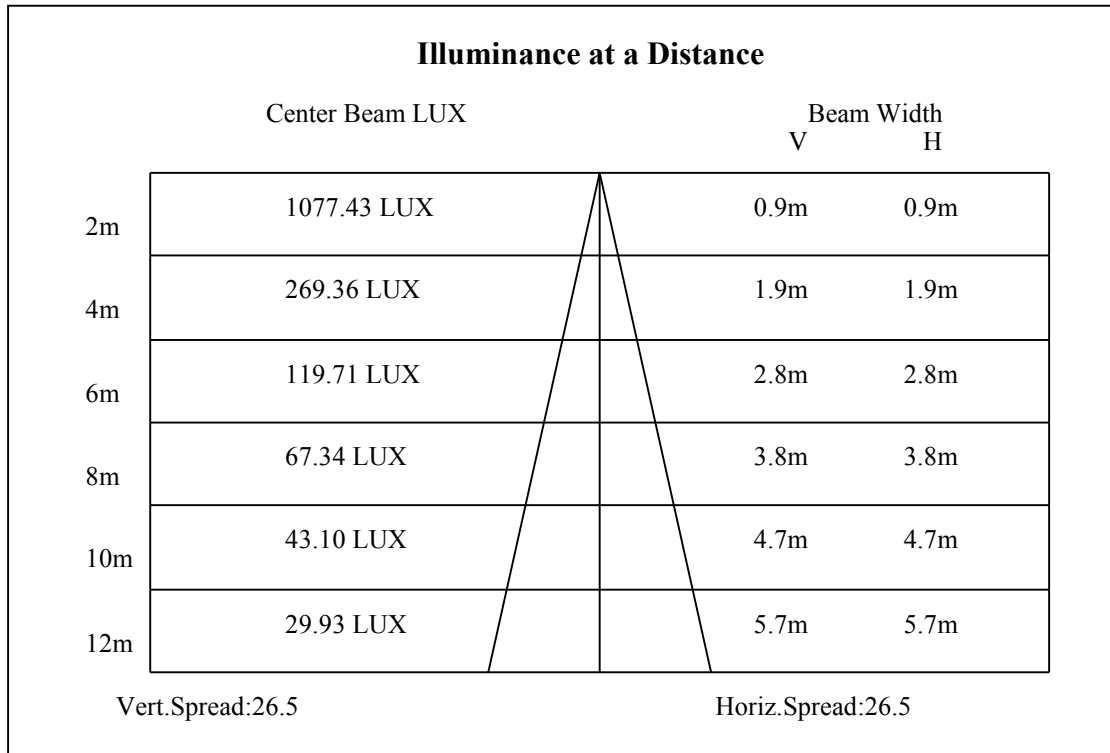
ZONAL LUMEN SUMMARY

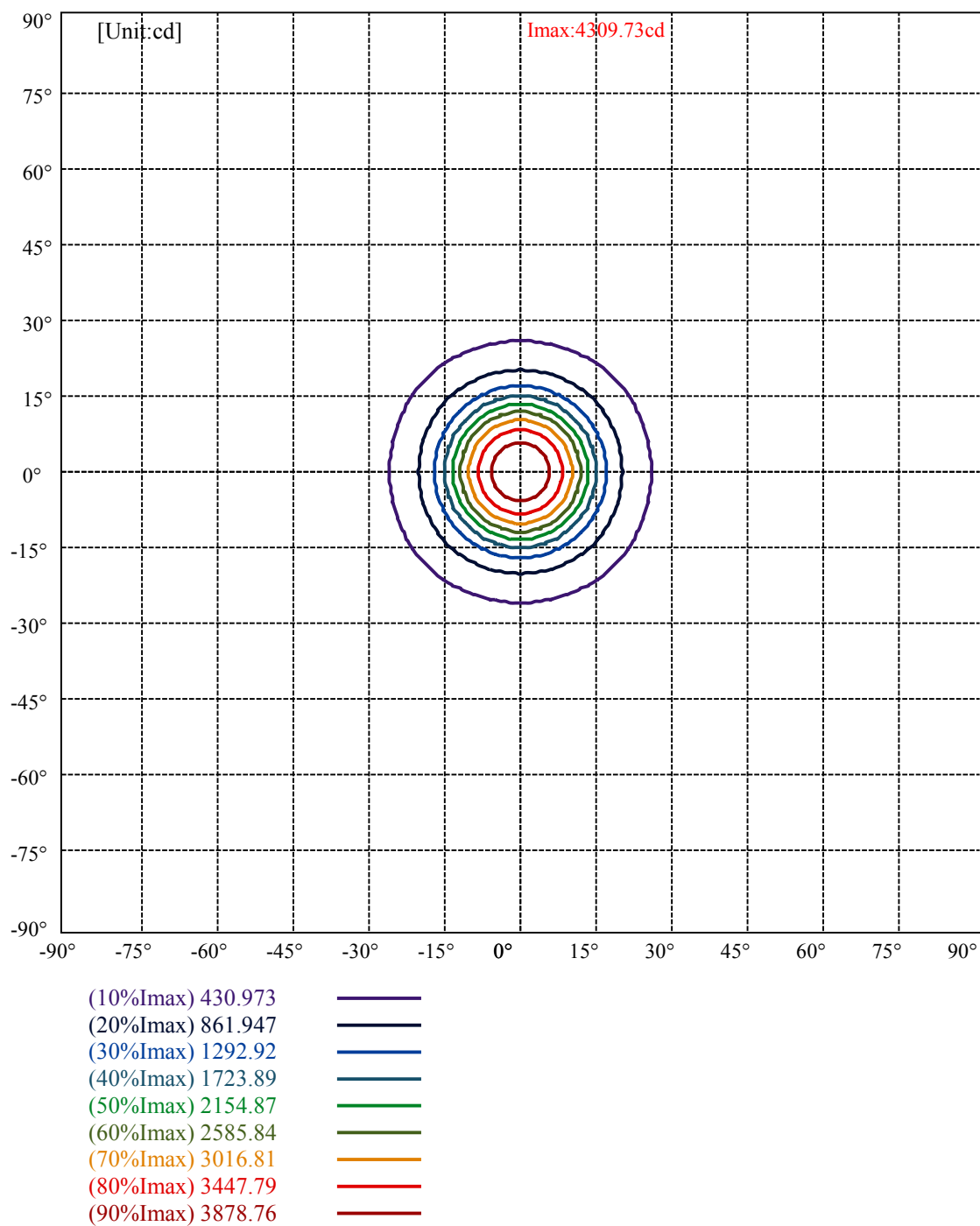
Zone	Lumens	%Lamp	%Fixt
0-30	1042.00	73.12%	83.25%
0-40	1093.33	76.72%	87.35%
0-60	1152.48	80.88%	92.08%
0-90	1250.03	87.72%	99.87%
0-120	1250.03	87.72%	99.87%
0-180	1251.60	87.83%	100.00%
60-90	100.20	7.03%	8.01%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-26.96	1001.28	70.27%	80.00%

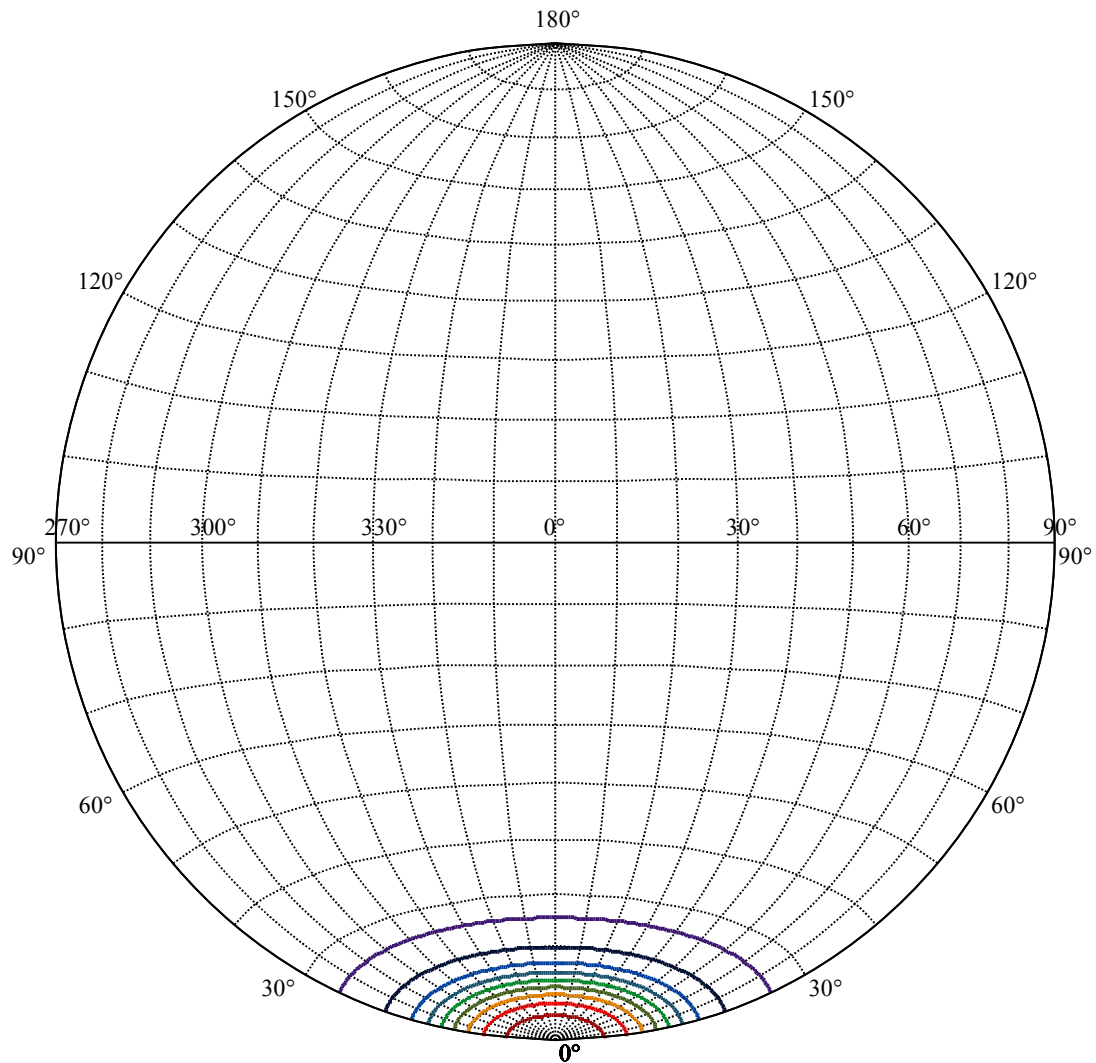
ZONAL LUMEN SUMMARY

0-10	380.29
10-20	455.69
20-30	206.02
30-40	51.33
40-50	30.04
50-60	29.11
60-70	25.07
70-80	32.30
80-90	40.17
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









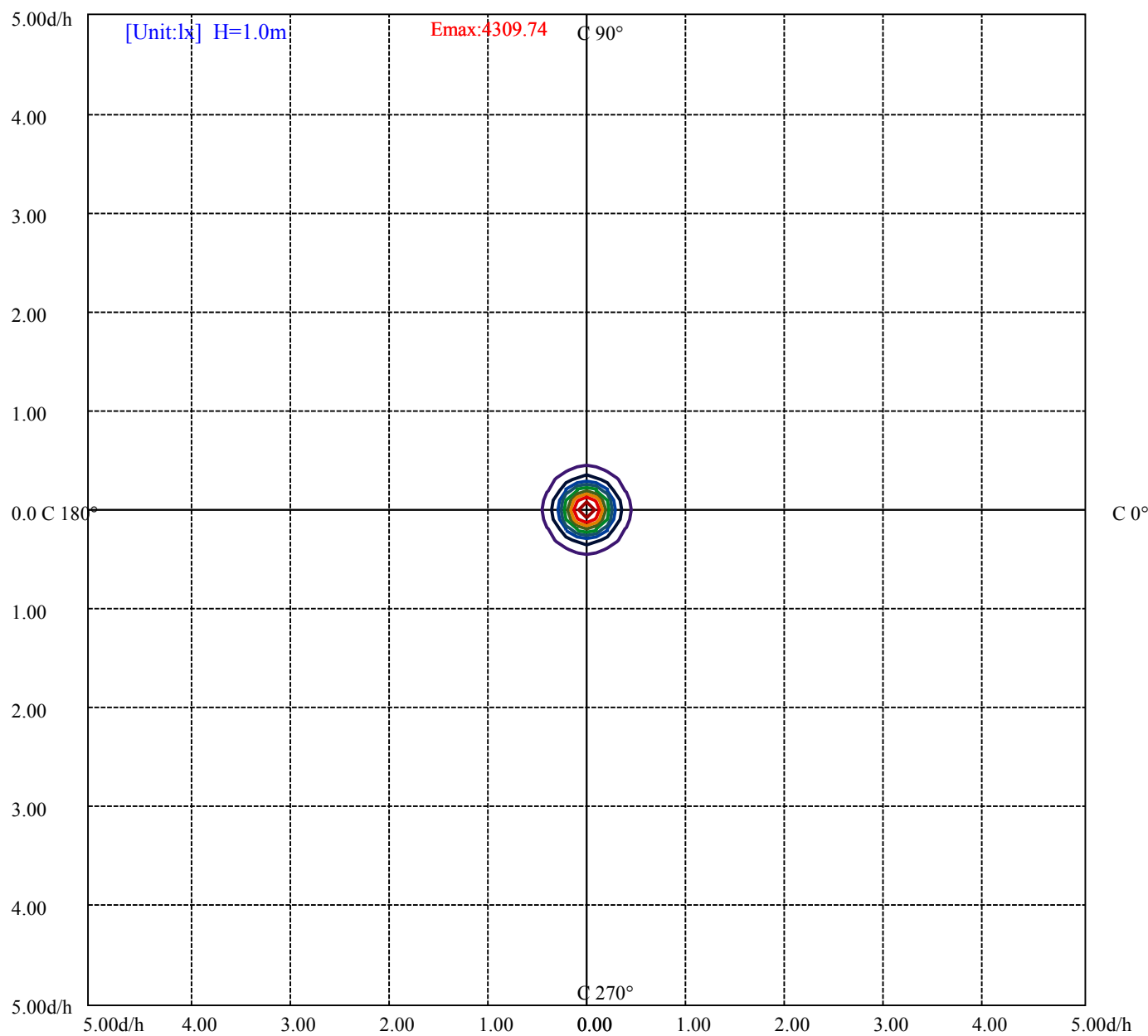
House

[Unit:cd]

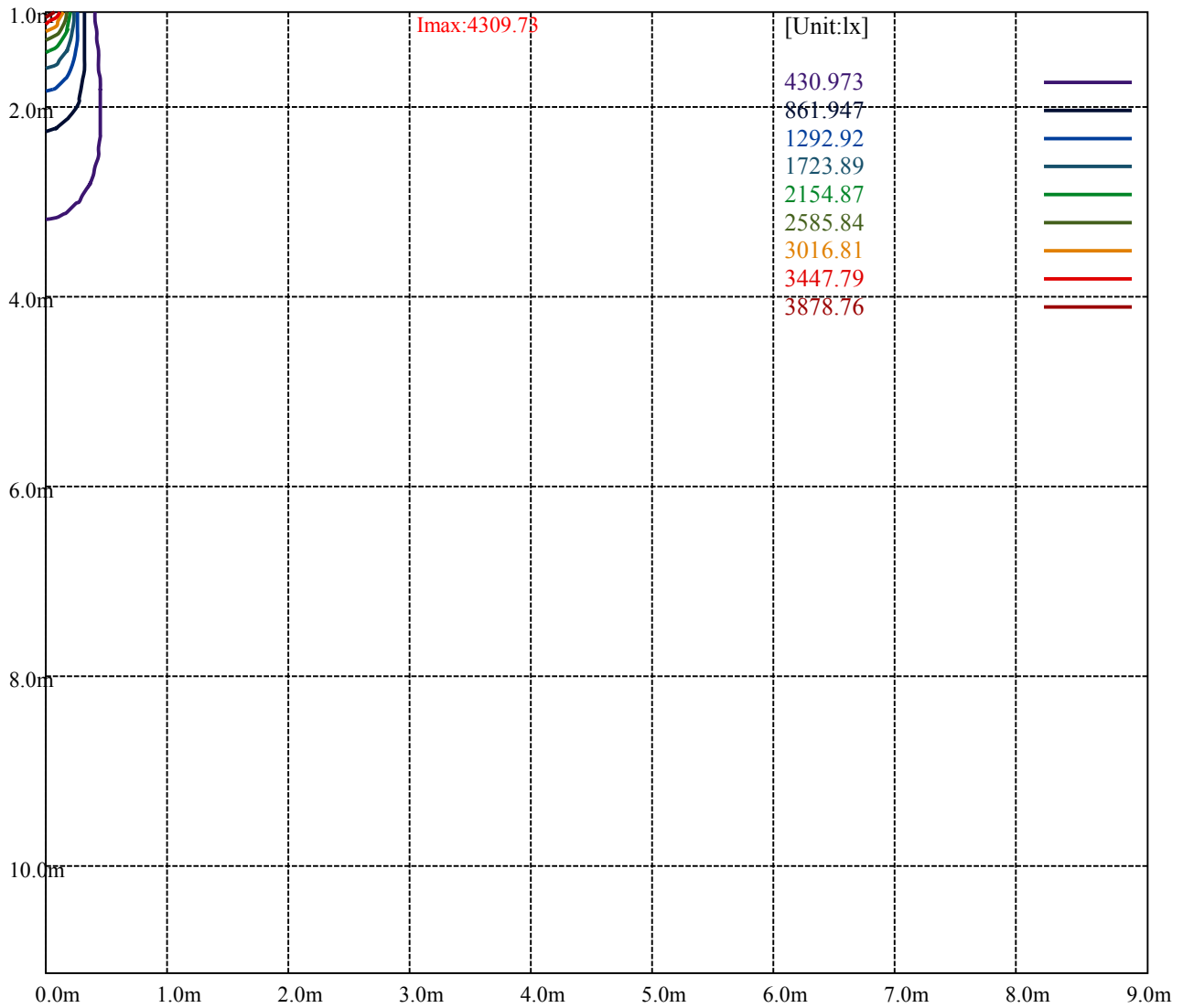
Road

Imax:4309.73

(10%Imax)	430.973	—
(20%Imax)	861.947	—
(30%Imax)	1292.92	—
(40%Imax)	1723.89	—
(50%Imax)	2154.87	—
(60%Imax)	2585.84	—
(70%Imax)	3016.81	—
(80%Imax)	3447.79	—
(90%Imax)	3878.76	—



(10%Emax)	430.973	
(20%Emax)	861.946	
(30%Emax)	1292.92	
(40%Emax)	1723.89	
(50%Emax)	2154.87	
(60%Emax)	2585.84	
(70%Emax)	3016.81	
(80%Emax)	3447.79	
(90%Emax)	3878.76	



Luminance Table

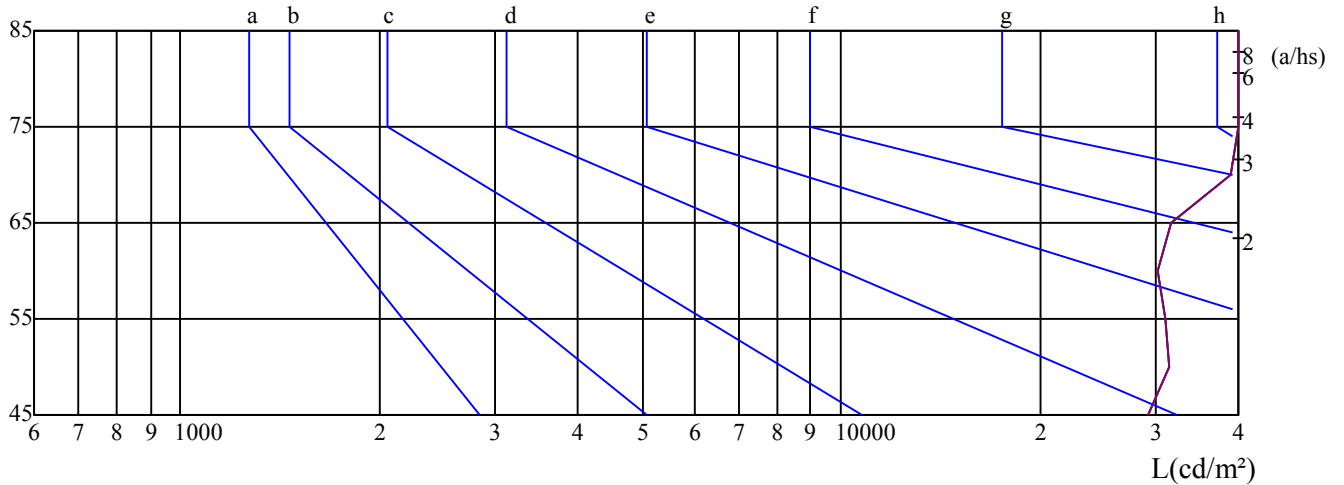
γ	45	50	55	60	65	70	75	80	85
C0	29116	31438	31054	30239	31736	39003	63869	102334	278761
C45	29116	31438	31054	30239	31736	39003	63869	102334	278761
C90	29116	31438	31054	30239	31736	39003	63869	102334	278761

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
31736	31736	31736	63869	63869	63869	278761	278761	278761

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

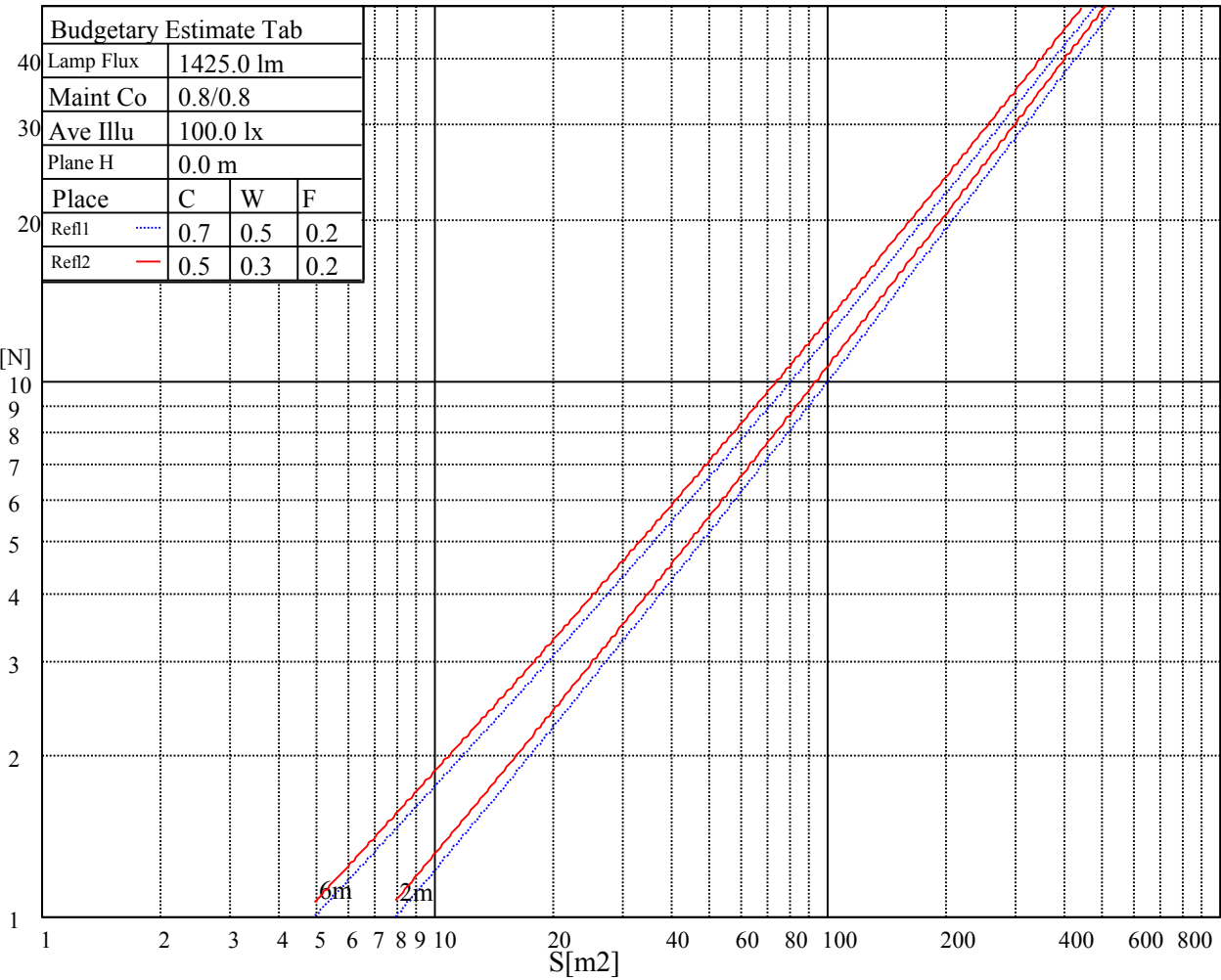
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

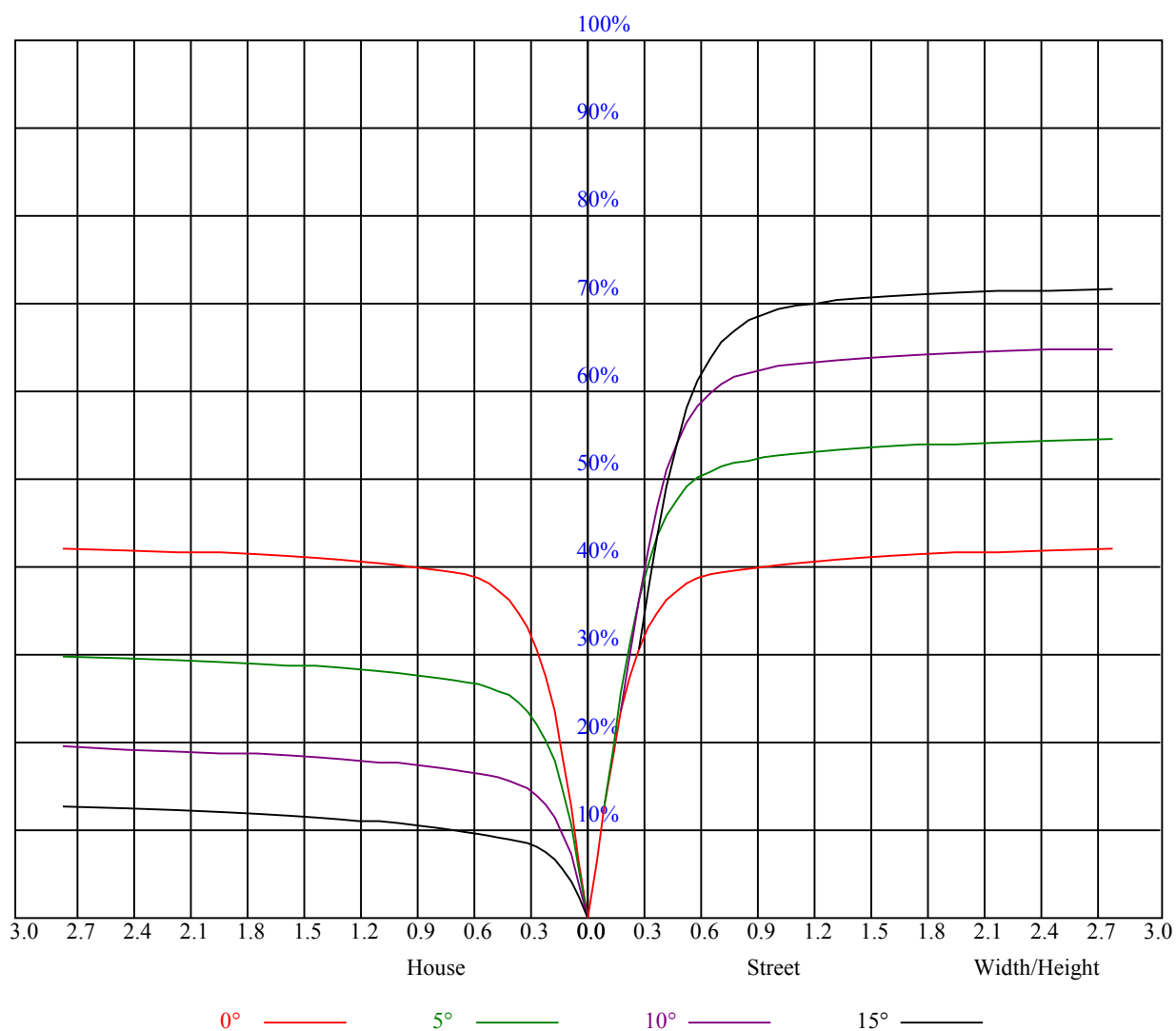
C0 ———

C45 ———

C90 ———



RHOC	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	1.05	1.05	1.05	1.02	1.02	1.02	0.98	0.98	0.98	0.94	0.94	0.94	0.90	0.90	0.90	0.88
1	0.96	0.94	0.91	0.94	0.92	0.90	0.91	0.89	0.87	0.87	0.86	0.84	0.84	0.83	0.82	0.80
2	0.90	0.86	0.83	0.89	0.85	0.82	0.86	0.83	0.81	0.83	0.81	0.79	0.81	0.79	0.77	0.76
3	0.85	0.81	0.78	0.84	0.80	0.77	0.82	0.78	0.76	0.80	0.77	0.75	0.78	0.75	0.73	0.72
4	0.81	0.77	0.73	0.80	0.76	0.73	0.78	0.75	0.72	0.76	0.73	0.71	0.75	0.72	0.70	0.69
5	0.77	0.73	0.70	0.77	0.72	0.69	0.75	0.71	0.69	0.74	0.71	0.68	0.72	0.70	0.67	0.66
6	0.74	0.70	0.66	0.74	0.69	0.66	0.72	0.69	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.64
7	0.71	0.67	0.64	0.71	0.67	0.64	0.70	0.66	0.63	0.69	0.66	0.63	0.68	0.65	0.63	0.62
8	0.69	0.65	0.62	0.68	0.64	0.61	0.68	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.61	0.60
9	0.67	0.62	0.59	0.66	0.62	0.59	0.66	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.58
10	0.65	0.60	0.58	0.64	0.60	0.58	0.64	0.60	0.57	0.63	0.60	0.57	0.62	0.59	0.57	0.56



NATA CR01D04424AK

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	4304.25	4324.50	4322.25	4290.75	4229.44	4122.56	3995.44	3872.25	3709.69
45.0	4308.19	4316.63	4298.06	4245.75	4175.44	4083.19	3950.44	3830.63	3695.63
90.0	4308.19	4293.00	4244.06	4173.19	4093.88	3990.38	3861.56	3732.19	3566.81
135.0	4318.31	4303.13	4252.50	4191.19	4106.25	3981.94	3866.63	3730.50	3563.44
180.0	4304.25	4262.63	4187.81	4084.31	3981.38	3864.94	3693.38	3534.19	3348.56
225.0	4308.19	4272.75	4208.06	4117.50	4008.38	3867.19	3710.25	3548.81	3338.44
270.0	4308.19	4294.69	4232.81	4164.19	4067.44	3929.63	3770.44	3607.88	3408.75
315.0	4318.31	4302.56	4256.44	4180.50	4085.44	3952.13	3808.13	3621.38	3413.81
360.0	4304.25	4324.50	4322.25	4290.75	4229.44	4122.56	3995.44	3872.25	3709.69
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3538.13	3311.44	3051.56	2796.19	2518.88	2162.81	1890.56	1668.94	1362.94
45.0	3496.50	3301.31	3074.06	2787.19	2474.44	2189.25	1878.75	1628.44	1382.06
90.0	3395.25	3169.69	2908.13	2642.63	2330.44	2012.06	1746.00	1517.06	1279.13
135.0	3365.44	3155.06	2881.69	2608.88	2293.88	1986.19	1738.69	1502.44	1305.56
180.0	3071.81	2824.31	2557.69	2251.69	1951.31	1710.00	1470.94	1296.00	1117.74
225.0	3122.44	2850.75	2558.81	2288.25	1996.88	1731.94	1526.63	1338.75	1114.99
270.0	3178.69	2937.94	2647.69	2375.44	2075.06	1794.94	1580.63	1385.44	1169.44
315.0	3200.06	2927.25	2629.69	2351.25	2076.75	1763.44	1548.56	1363.50	1107.34
360.0	3538.13	3311.44	3051.56	2796.19	2518.88	2162.81	1890.56	1668.94	1362.94
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1186.88	1064.25	921.94	816.19	731.25	644.63	572.06	505.69	427.50
45.0	1181.81	1041.19	918.56	813.38	729.56	667.69	577.69	518.63	465.75
90.0	1110.83	1010.53	901.74	808.99	736.31	659.42	587.14	525.21	458.16
135.0	1164.94	1045.13	930.38	842.63	762.75	671.63	609.75	545.63	481.50
180.0	1006.09	911.19	816.41	730.69	659.36	594.06	518.34	460.41	405.73
225.0	998.27	885.32	777.21	687.09	616.61	543.04	474.41	417.43	356.91
270.0	1020.38	891.00	770.06	669.94	594.00	525.94	448.31	391.50	338.63
315.0	1024.65	903.32	785.25	682.59	601.20	519.19	455.51	390.60	330.86
360.0	1186.88	1064.25	921.94	816.19	731.25	644.63	572.06	505.69	427.50
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	369.00	316.13	286.31	215.94	181.13	143.16	118.35	97.99	77.85
45.0	393.75	331.31	290.25	235.01	190.18	160.54	129.99	107.72	88.03
90.0	400.33	340.14	278.10	239.85	201.71	157.44	133.31	109.91	83.98
135.0	417.94	360.56	305.44	288.00	209.53	180.00	141.24	114.02	95.74
180.0	346.50	292.16	247.05	200.08	160.09	129.99	102.83	84.21	67.78
225.0	307.41	256.44	212.51	177.30	147.43	116.33	96.81	81.51	66.32
270.0	289.13	232.26	194.85	158.68	127.80	104.91	84.49	70.26	57.88
315.0	282.43	239.29	192.43	160.43	133.20	104.34	86.01	71.44	58.95
360.0	369.00	316.13	286.31	215.94	181.13	143.16	118.35	97.99	77.85
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	65.53	56.14	48.99	44.89	42.58	40.73	39.38	38.25	37.18
45.0	72.45	61.65	54.73	48.77	46.01	44.44	43.31	42.53	41.79
90.0	71.33	60.30	52.14	46.74	44.16	42.64	41.79	40.95	40.50
135.0	74.64	62.38	54.17	47.87	44.94	43.20	41.96	41.23	41.06
180.0	56.03	48.71	44.33	41.63	39.94	38.81	38.25	38.08	38.08
225.0	57.21	51.13	47.03	44.33	42.98	41.74	40.78	39.94	39.32
270.0	49.28	44.38	41.18	38.48	37.13	36.17	35.10	34.37	33.98
315.0	50.57	45.73	42.64	40.56	38.70	37.07	36.00	35.10	34.59
360.0	65.53	56.14	48.99	44.89	42.58	40.73	39.38	38.25	37.18

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	36.62	36.39	36.51	36.84	37.18	37.18	36.96	36.45	35.72
45.0	41.29	41.01	41.01	41.12	41.06	40.44	39.49	38.53	37.24
90.0	40.28	40.33	40.33	40.05	39.43	38.36	37.35	36.23	34.99
135.0	41.06	41.34	41.63	41.46	40.78	39.83	38.48	37.24	35.61
180.0	38.08	38.19	38.31	38.03	37.46	36.84	35.78	34.93	33.86
225.0	39.04	38.93	38.81	38.59	38.19	37.63	36.96	36.23	35.21
270.0	33.81	33.75	33.75	33.86	33.81	33.58	33.30	32.85	32.29
315.0	34.37	34.43	34.88	35.10	35.27	35.04	34.88	34.37	33.64
360.0	36.62	36.39	36.51	36.84	37.18	37.18	36.96	36.45	35.72
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	34.82	34.03	33.24	32.34	31.44	30.49	29.70	28.74	27.90
45.0	36.00	34.99	33.92	32.57	31.39	30.32	29.03	28.07	27.17
90.0	33.81	32.79	31.73	30.66	29.64	28.63	27.79	26.94	26.33
135.0	34.37	33.24	31.89	30.54	29.48	28.46	27.34	26.49	25.71
180.0	32.74	31.78	30.83	29.59	28.80	27.96	26.89	26.33	25.82
225.0	34.37	33.41	32.01	30.83	29.81	28.63	27.73	26.89	25.88
270.0	31.73	31.22	30.49	29.59	28.86	28.13	27.28	26.72	26.16
315.0	32.74	32.01	31.22	30.38	29.48	28.69	27.90	27.17	26.38
360.0	34.82	34.03	33.24	32.34	31.44	30.49	29.70	28.74	27.90
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	27.17	26.61	25.93	25.59	25.20	25.03	24.92	25.03	25.65
45.0	26.33	25.37	24.64	24.08	23.63	23.29	23.12	23.12	23.68
90.0	25.93	25.59	25.43	25.48	25.71	26.10	26.66	27.06	27.79
135.0	24.81	24.19	23.63	23.18	22.89	22.67	22.73	22.84	23.29
180.0	25.31	24.98	24.81	24.69	24.75	24.98	25.48	25.99	27.17
225.0	25.31	24.58	23.96	23.57	23.29	23.06	22.95	23.01	23.79
270.0	25.76	25.43	25.26	25.26	25.37	25.54	25.88	26.21	26.49
315.0	25.76	25.26	24.75	24.36	24.08	23.91	24.02	24.08	24.24
360.0	27.17	26.61	25.93	25.59	25.20	25.03	24.92	25.03	25.65
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	25.71	26.78	28.13	30.21	36.34	37.18	35.83	33.86	34.26
45.0	23.57	24.19	25.54	28.58	32.40	33.53	32.18	30.71	30.38
90.0	28.35	29.08	30.09	31.84	34.82	35.72	34.76	32.68	32.23
135.0	24.24	25.26	26.78	30.77	34.54	35.49	34.20	33.19	33.69
180.0	28.18	29.59	32.63	35.72	37.13	37.01	35.49	34.71	37.63
225.0	24.30	25.09	26.33	28.01	32.85	35.10	34.71	32.40	32.40
270.0	27.06	27.34	27.73	29.14	30.60	32.06	32.01	31.28	30.38
315.0	25.03	25.59	27.68	30.26	31.56	31.78	32.01	32.01	31.89
360.0	25.71	26.78	28.13	30.21	36.34	37.18	35.83	33.86	34.26
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	35.66	38.36	44.55	49.56	47.53	45.39	44.66	42.24	40.28
45.0	33.08	38.25	43.93	46.97	44.66	42.92	40.73	38.98	39.54
90.0	34.99	38.25	42.19	43.14	42.47	39.54	37.69	37.86	35.38
135.0	39.54	45.06	50.06	51.13	49.05	44.55	41.91	40.61	38.98
180.0	42.69	44.72	46.35	46.35	45.68	42.19	40.16	38.70	34.65
225.0	35.16	38.14	42.19	46.13	43.93	40.39	37.35	37.97	36.06
270.0	31.39	33.81	35.94	38.42	38.25	35.83	34.31	32.85	33.75
315.0	35.78	42.47	46.58	48.09	47.81	46.01	39.71	37.46	37.63
360.0	35.66	38.36	44.55	49.56	47.53	45.39	44.66	42.24	40.28

Intensity data(cd)

Appendix Page: 18 Total:18

C/ γ (°)	90.0
0.0	39.26
45.0	36.62
90.0	21.99
135.0	22.33
180.0	8.04
225.0	33.98
270.0	31.73
315.0	35.89
360.0	39.26