
NATA

LumCAT: 3-2115-N	
Luminaire: 92.70.129.00	
Report No: NT2017061606	Voltage(V): 219.4000
Test No: nata-0100	Current(A): 0.0690
LampCAT: CREE CXA1816	Power (W): 14.1000
Lamp flux(lm): 1313.0	PF: 0.9220
Number of Lamps: 1	Ballast type: DC
Length(mm): 78	Width(mm): 78
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1126.77
Efficiency(%): 85.82%
Lumens(lm)/Power(W): 80.08
Central intensity(cd): 9796.186
Maximum intensity(cd): 9796.186
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=13.4
[C90/270]Total=13.4
Field angle(10%Imax): [C0/180]Total=33.5
[C90/270]Total=33.5
Maximum s/h(1/2): C0_180=0.23 C90_270=0.23
Maximum s/h(1/4): C0_180=0.26 C90_270=0.26
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 85.99%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.475%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	9796.185	2.344	2.344	.178%	.208%
1.0	9689.376	18.544	20.888	1.412%	1.854%
2.0	9323.388	35.682	56.569	2.718%	5.020%
3.0	8630.160	49.530	106.1	3.772%	9.416%
4.0	7692.343	58.843	164.943	4.482%	14.638%
5.0	6633.814	63.403	228.346	4.829%	20.265%
6.0	5543.010	63.538	291.884	4.839%	25.904%
7.0	4608.702	61.592	353.476	4.691%	31.371%
8.0	3910.863	59.687	413.163	4.546%	36.668%
9.0	3246.538	55.694	468.856	4.242%	41.610%
10.0	2712.422	51.651	520.507	3.934%	46.194%
11.0	2320.490	48.555	569.062	3.698%	50.504%
12.0	1973.634	44.998	614.06	3.427%	54.497%
13.0	1671.512	41.233	655.294	3.140%	58.157%
14.0	1434.825	38.065	693.359	2.899%	61.535%
15.0	1218.027	34.570	727.929	2.633%	64.603%
16.0	1079.794	32.639	760.568	2.486%	67.500%
17.0	950.267	30.467	791.035	2.320%	70.203%
18.0	832.432	28.209	819.243	2.148%	72.707%
19.0	744.535	26.581	845.825	2.024%	75.066%
20.0	664.008	24.904	870.729	1.897%	77.276%
21.0	598.374	23.515	894.245	1.791%	79.363%
22.0	551.686	22.663	916.908	1.726%	81.375%
23.0	513.635	22.008	938.916	1.676%	83.328%
24.0	482.046	21.501	960.417	1.638%	85.236%
25.0	457.773	21.215	981.632	1.616%	87.119%
26.0	436.859	21.001	1002.633	1.599%	88.983%
27.0	415.834	20.702	1023.335	1.577%	90.820%
28.0	383.234	19.730	1043.065	1.503%	92.571%
29.0	328.198	17.449	1060.514	1.329%	94.119%
30.0	272.722	14.953	1075.467	1.139%	95.447%
31.0	200.027	11.297	1086.764	.860%	96.449%
32.0	124.317	7.224	1093.989	.550%	97.090%
33.0	67.960	4.059	1098.048	.309%	97.451%
34.0	28.402	1.742	1099.789	.133%	97.605%
35.0	11.651	0.733	1100.522	.056%	97.670%
36.0	9.532	0.614	1101.137	.047%	97.725%
37.0	8.272	0.546	1101.683	.042%	97.773%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	7.226	0.488	1102.17	.037%	97.816%
39.0	6.648	0.459	1102.629	.035%	97.857%
40.0	6.304	0.444	1103.074	.034%	97.897%
41.0	5.994	0.431	1103.505	.033%	97.935%
42.0	5.760	0.423	1103.927	.032%	97.972%
43.0	5.602	0.419	1104.346	.032%	98.010%
44.0	5.485	0.418	1104.764	.032%	98.047%
45.0	5.389	0.418	1105.182	.032%	98.084%
46.0	5.292	0.417	1105.6	.032%	98.121%
47.0	5.230	0.419	1106.019	.032%	98.158%
48.0	5.196	0.423	1106.443	.032%	98.196%
49.0	5.168	0.428	1106.87	.033%	98.234%
50.0	5.134	0.431	1107.302	.033%	98.272%
51.0	5.093	0.434	1107.736	.033%	98.310%
52.0	5.072	0.438	1108.174	.033%	98.349%
53.0	5.045	0.442	1108.616	.034%	98.388%
54.0	5.038	0.447	1109.063	.034%	98.428%
55.0	5.031	0.452	1109.514	.034%	98.468%
56.0	5.031	0.457	1109.972	.035%	98.509%
57.0	5.031	0.463	1110.435	.035%	98.550%
58.0	5.017	0.467	1110.901	.036%	98.591%
59.0	5.024	0.472	1111.373	.036%	98.633%
60.0	5.058	0.480	1111.854	.037%	98.676%
61.0	5.072	0.486	1112.34	.037%	98.719%
62.0	5.065	0.490	1112.831	.037%	98.763%
63.0	5.065	0.495	1113.326	.038%	98.806%
64.0	5.072	0.500	1113.825	.038%	98.851%
65.0	5.065	0.503	1114.329	.038%	98.895%
66.0	5.031	0.504	1114.833	.038%	98.940%
67.0	5.017	0.506	1115.339	.039%	98.985%
68.0	4.983	0.507	1115.846	.039%	99.030%
69.0	4.928	0.504	1116.35	.038%	99.075%
70.0	4.886	0.504	1116.854	.038%	99.120%
71.0	4.893	0.507	1117.361	.039%	99.165%
72.0	4.872	0.508	1117.869	.039%	99.210%
73.0	4.859	0.510	1118.379	.039%	99.255%
74.0	4.831	0.509	1118.888	.039%	99.300%
75.0	4.824	0.511	1119.399	.039%	99.345%

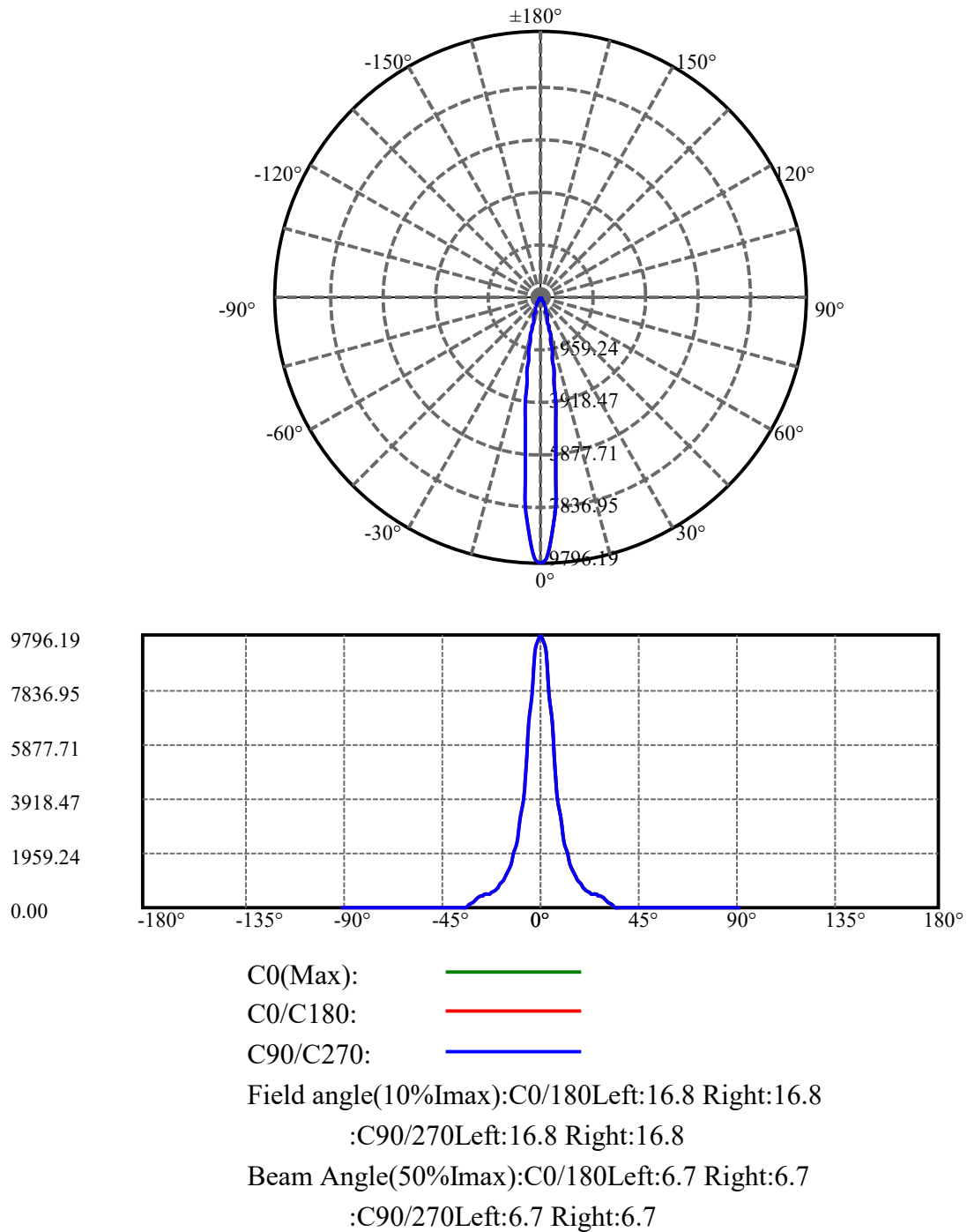
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	4.811	0.512	1119.911	.039%	99.391%
77.0	4.783	0.511	1120.422	.039%	99.436%
78.0	4.762	0.511	1120.933	.039%	99.482%
79.0	4.762	0.513	1121.446	.039%	99.527%
80.0	4.728	0.511	1121.956	.039%	99.572%
81.0	4.721	0.511	1122.468	.039%	99.618%
82.0	4.728	0.513	1122.981	.039%	99.663%
83.0	4.694	0.511	1123.492	.039%	99.709%
84.0	4.694	0.512	1124.004	.039%	99.754%
85.0	4.666	0.510	1124.513	.039%	99.799%
86.0	4.625	0.506	1125.019	.039%	99.844%
87.0	4.583	0.502	1125.521	.038%	99.889%
88.0	4.583	0.502	1126.024	.038%	99.933%
89.0	4.570	0.501	1126.525	.038%	99.978%
90.0	4.549	0.249	1126.774	.019%	100.000%

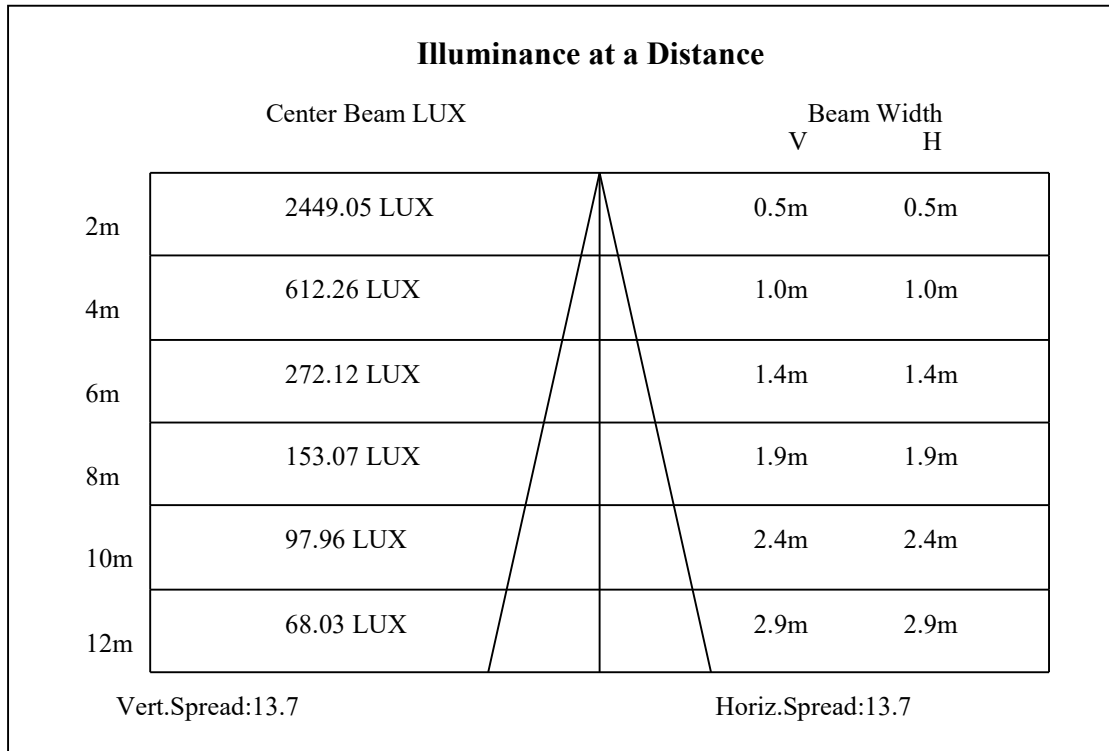
ZONAL LUMEN SUMMARY

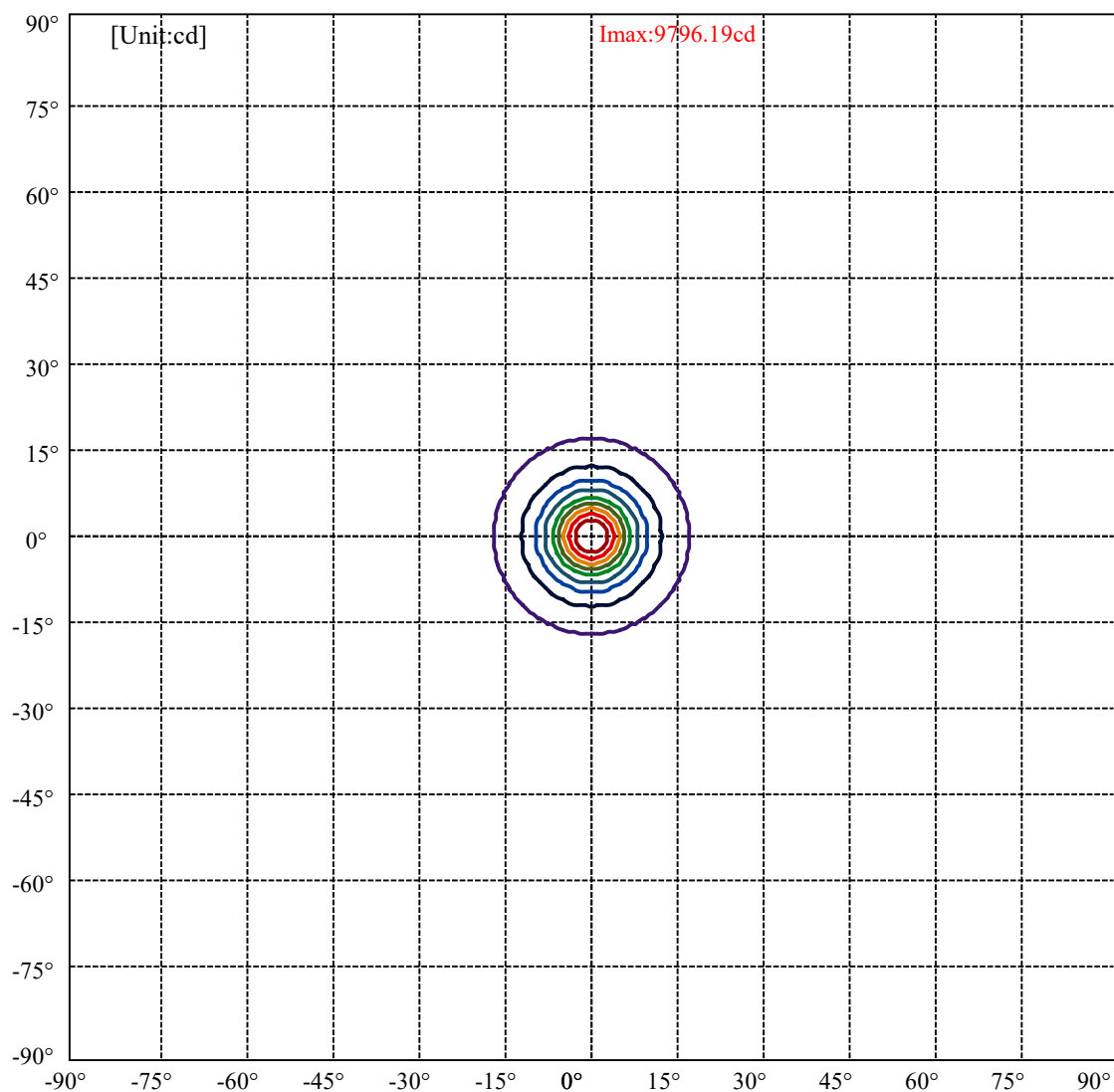
Zone	Lumens	%Lamp	%Fixt
0-30	1075.47	81.91%	95.45%
0-40	1103.07	84.01%	97.90%
0-60	1111.85	84.68%	98.68%
0-90	1126.52	85.80%	99.98%
0-120	1126.52	85.80%	99.98%
0-180	1126.77	85.82%	100.00%
60-90	15.15	1.15%	1.34%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-21.32	901.42	68.65%	80.00%

ZONAL LUMEN SUMMARY

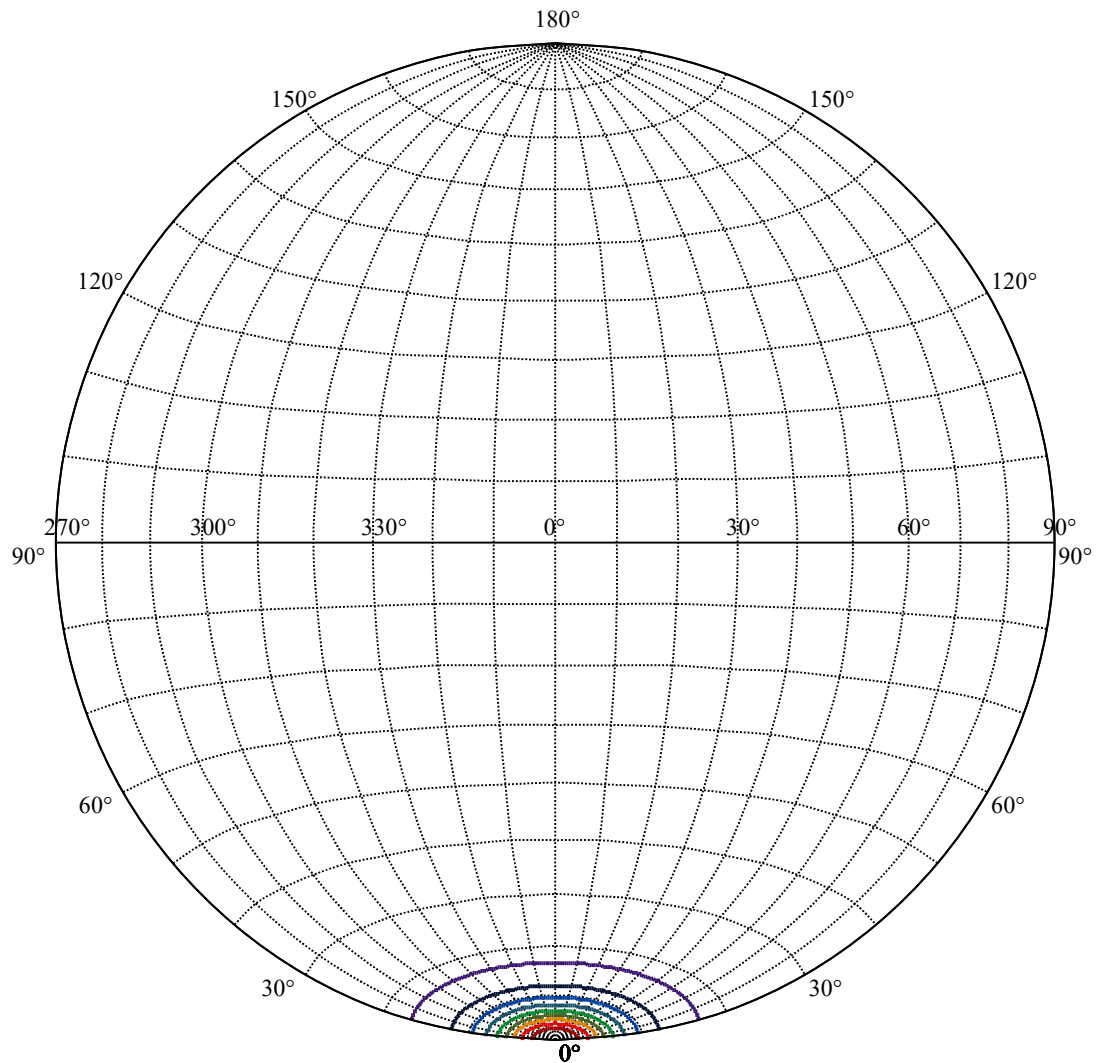
0-10	520.51
10-20	350.22
20-30	204.74
30-40	27.61
40-50	4.23
50-60	4.55
60-70	5.00
70-80	5.10
80-90	4.57
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00







(10%Imax) 979.619	—
(20%Imax) 1959.24	—
(30%Imax) 2938.86	—
(40%Imax) 3918.47	—
(50%Imax) 4898.09	—
(60%Imax) 5877.71	—
(70%Imax) 6857.33	—
(80%Imax) 7836.95	—
(90%Imax) 8816.57	—



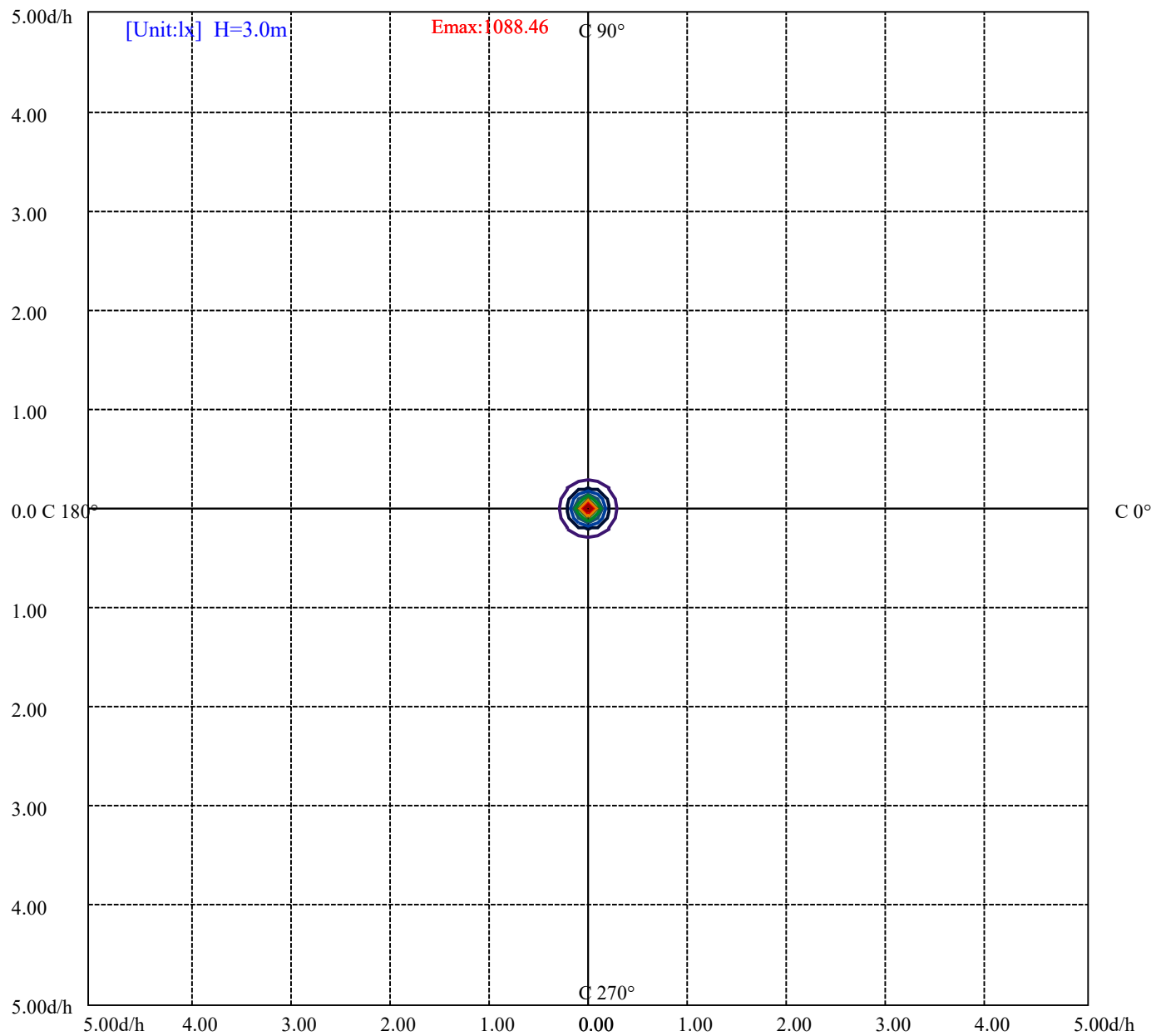
House

[Unit:cd]

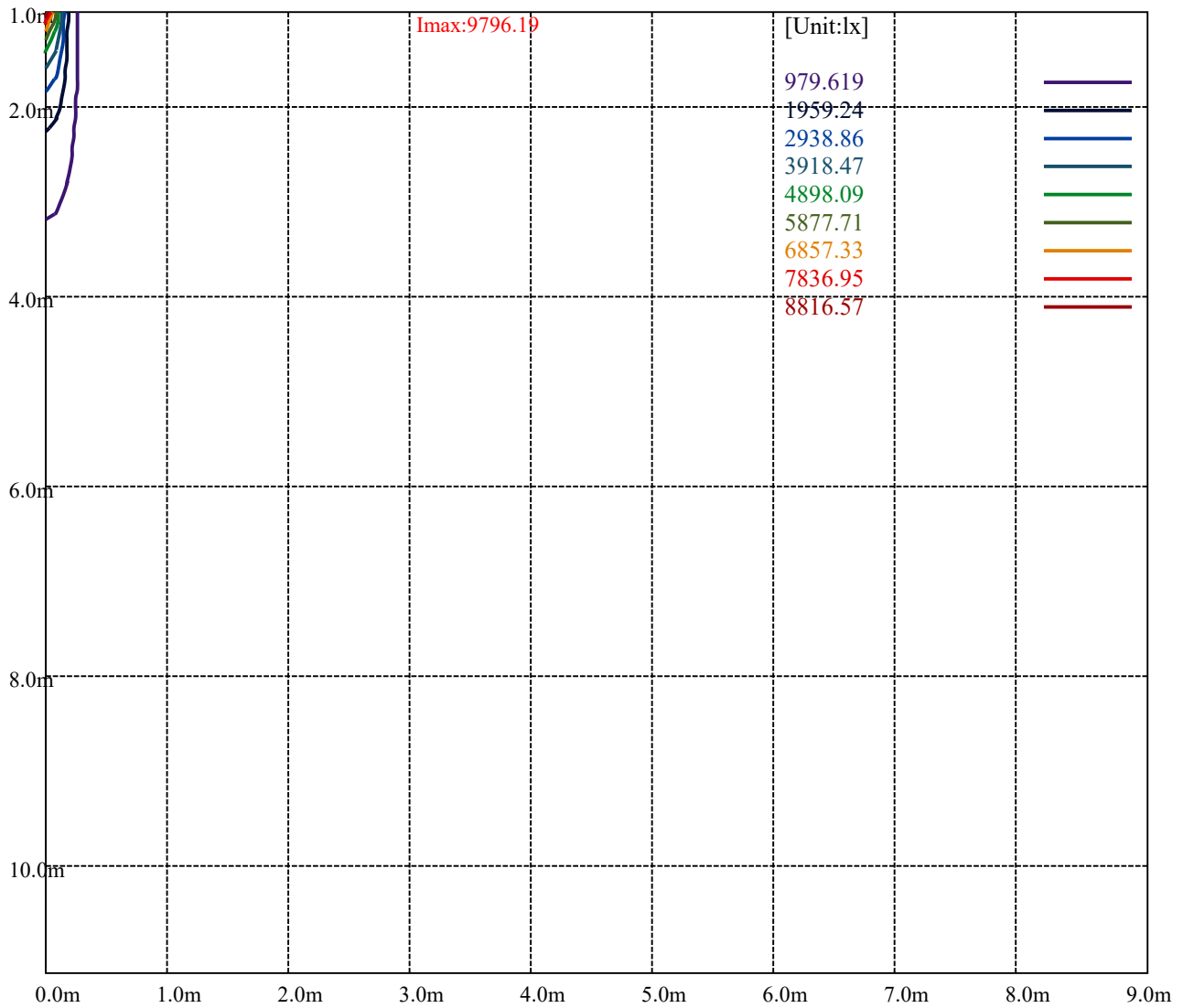
Road

Imax:9796.19

(10%Imax)	979.619	—
(20%Imax)	1959.24	—
(30%Imax)	2938.86	—
(40%Imax)	3918.47	—
(50%Imax)	4898.09	—
(60%Imax)	5877.71	—
(70%Imax)	6857.33	—
(80%Imax)	7836.95	—
(90%Imax)	8816.57	—



(10%Emax)	108.8463	—
(20%Emax)	217.6922	—
(30%Emax)	326.5389	—
(40%Emax)	435.3856	—
(50%Emax)	544.2311	—
(60%Emax)	653.0778	—
(70%Emax)	761.9244	—
(80%Emax)	870.7711	—
(90%Emax)	979.6166	—



Luminance Table

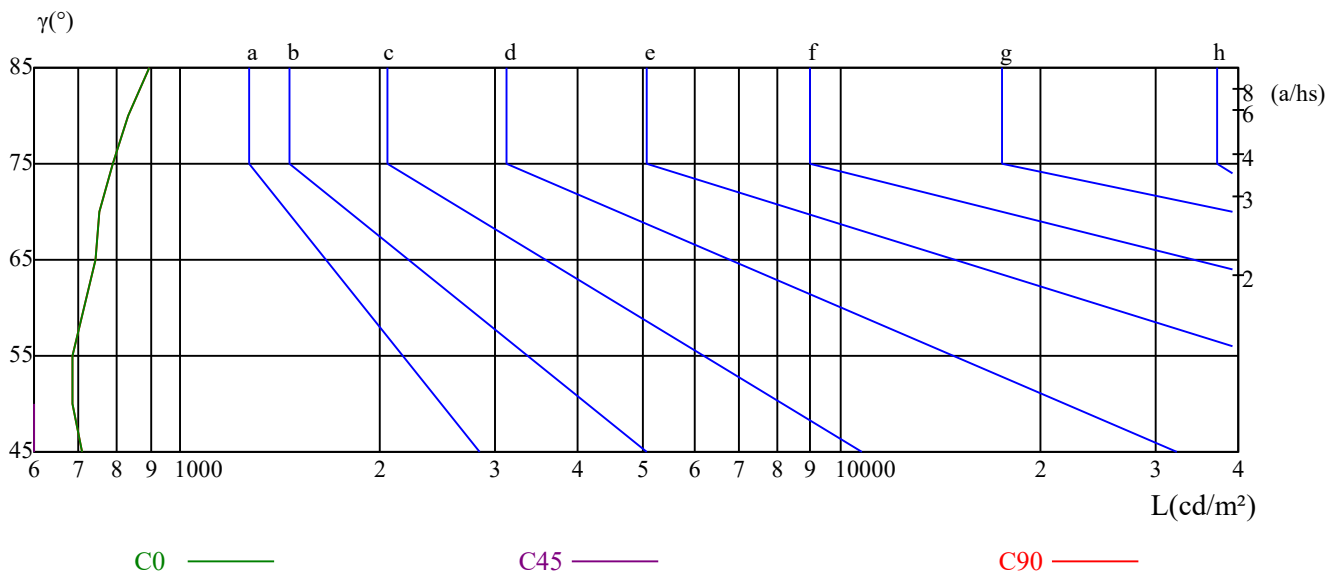
γ	45	50	55	60	65	70	75	80	85
C0	708	685	687	713	743	754	791	835	899
C45	600	572	565	577	591	589	605	624	655
C90	708	685	687	713	743	754	791	835	899

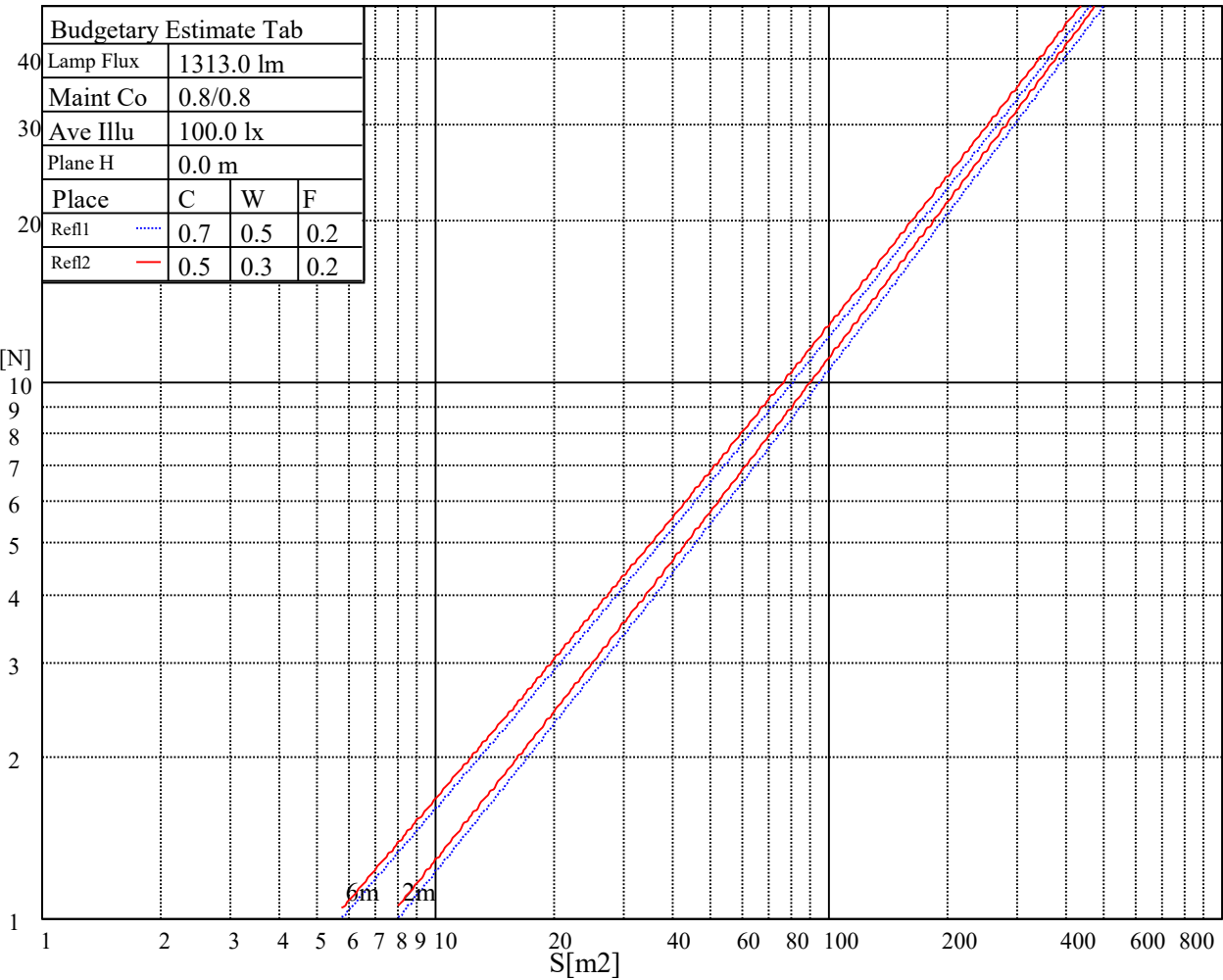
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
1970	1970	1970	3064	3064	3064	8800	8800	8800

Glare Table

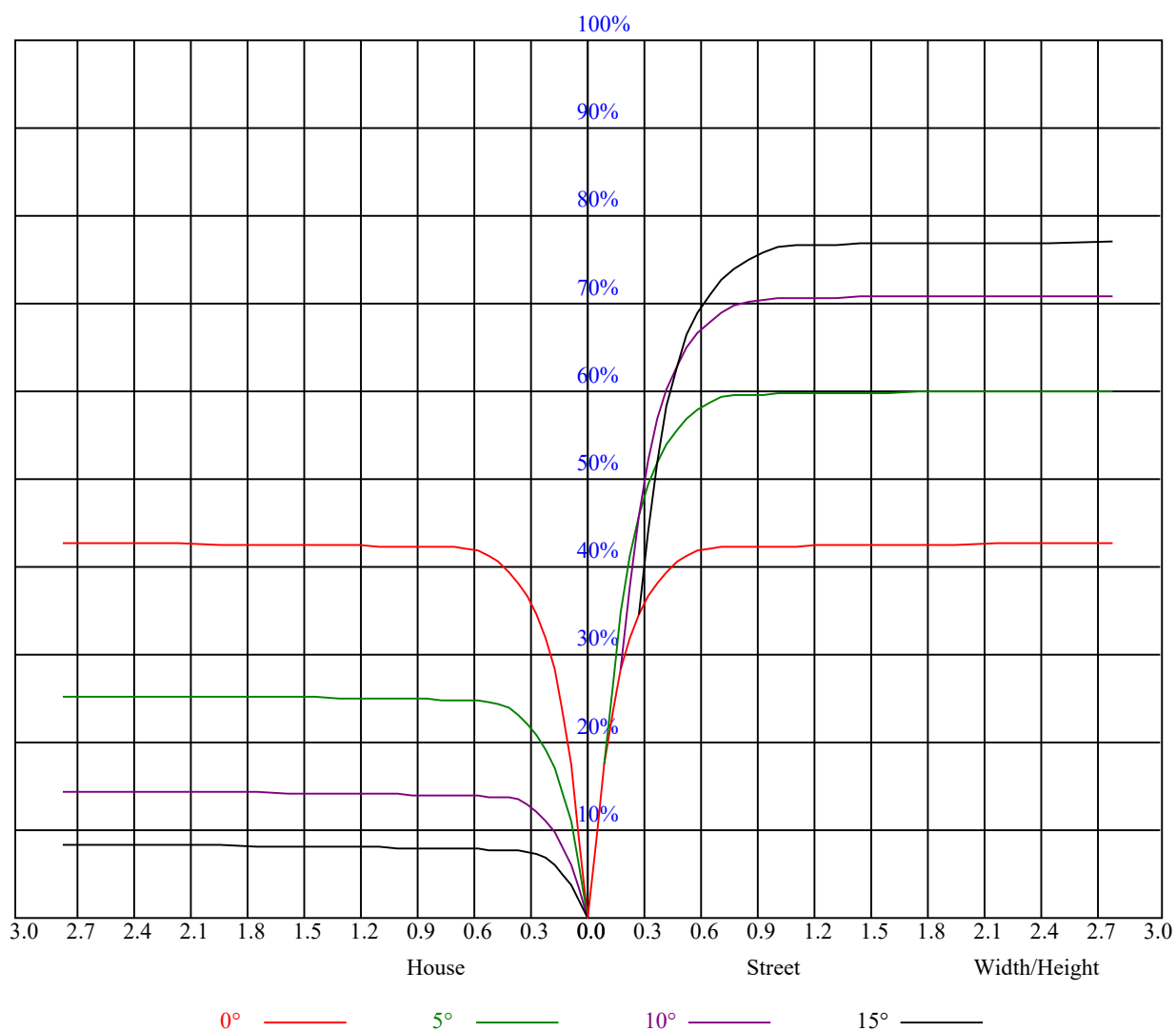
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

Luminance Limiting Curve





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	1.02	1.02	1.02	1.00	1.00	1.00	0.96	0.96	0.96	0.91	0.91	0.91	0.88	0.88	0.88	0.86
1	0.97	0.95	0.93	0.95	0.93	0.92	0.91	0.90	0.89	0.88	0.87	0.87	0.85	0.85	0.84	0.83
2	0.92	0.90	0.88	0.91	0.89	0.87	0.88	0.86	0.85	0.86	0.84	0.83	0.83	0.82	0.81	0.80
3	0.89	0.86	0.83	0.87	0.85	0.82	0.85	0.83	0.81	0.83	0.82	0.80	0.82	0.80	0.79	0.78
4	0.85	0.82	0.79	0.84	0.81	0.79	0.83	0.80	0.78	0.81	0.79	0.77	0.80	0.78	0.76	0.75
5	0.83	0.79	0.77	0.82	0.79	0.76	0.80	0.78	0.76	0.79	0.77	0.75	0.78	0.76	0.74	0.73
6	0.80	0.77	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.77	0.75	0.73	0.76	0.74	0.72	0.72
7	0.78	0.74	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.75	0.73	0.71	0.75	0.72	0.71	0.70
8	0.76	0.72	0.70	0.75	0.72	0.70	0.74	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	0.73	0.70	0.68	0.73	0.70	0.68	0.72	0.69	0.68	0.71	0.69	0.67	0.67
10	0.72	0.69	0.66	0.72	0.69	0.66	0.71	0.68	0.66	0.71	0.68	0.66	0.70	0.68	0.66	0.65



NATA 3-2115-N

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	9809.40	9655.79	9111.83	8333.34	7322.50	5970.32	4993.62	4190.34	3541.23
45.0	9825.37	9742.23	9426.76	8796.91	7947.39	6963.53	5727.52	4846.61	4114.36
90.0	9810.50	9695.43	9443.82	8850.32	7849.94	7015.84	5899.29	4810.28	4173.28
135.0	9739.48	9826.47	9698.74	9267.64	8591.55	7541.63	6352.96	5323.95	4550.96
180.0	9809.40	9782.97	9488.42	8834.35	7962.81	6795.61	5717.06	4641.81	3795.59
225.0	9825.37	9693.78	9251.68	8581.64	7543.83	6515.92	5447.83	4546.01	3875.97
270.0	9810.50	9702.04	9382.71	8590.45	7700.19	6670.08	5502.34	4704.57	4014.16
315.0	9739.48	9416.30	8783.15	7786.63	6620.53	5597.58	4703.47	3806.05	3221.35
360.0	9809.40	9655.79	9111.83	8333.34	7322.50	5970.32	4993.62	4190.34	3541.23
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2895.42	2473.68	2125.73	1772.27	1544.88	1349.43	1163.34	1010.28	895.22
45.0	3386.52	2889.36	2472.58	2087.74	1775.02	1543.78	1326.86	1162.24	1005.88
90.0	3546.73	2847.52	2479.74	2135.64	1748.04	1545.43	1346.68	1086.81	1004.61
135.0	3618.86	3068.29	2613.53	2186.84	1848.79	1635.73	1381.92	1195.83	1073.60
180.0	3206.48	2670.79	2234.74	1925.32	1669.86	1406.14	1080.81	1063.69	914.65
225.0	3297.33	2701.07	2304.11	1976.52	1637.38	1417.70	1096.67	1061.21	919.66
270.0	3282.46	2799.07	2399.91	2024.97	1712.80	1485.97	1271.80	1111.04	959.63
315.0	2738.51	2249.60	1933.58	1679.77	1435.32	1094.41	1076.13	947.25	828.87
360.0	2895.42	2473.68	2125.73	1772.27	1544.88	1349.43	1163.34	1010.28	895.22
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	787.31	713.53	639.76	580.29	540.10	502.66	474.04	450.36	431.09
45.0	881.45	789.51	699.77	627.09	573.69	529.09	488.90	463.57	442.10
90.0	886.57	788.74	697.07	623.51	564.99	523.20	487.25	461.65	438.25
135.0	921.09	821.99	729.50	652.42	596.81	552.22	510.37	483.95	459.72
180.0	795.40	710.01	630.56	573.14	534.54	501.40	483.51	461.92	441.39
225.0	816.93	721.18	651.15	588.83	542.14	507.40	476.62	451.24	429.99
270.0	837.96	748.77	665.63	596.26	548.91	510.92	475.69	452.56	434.95
315.0	732.75	662.55	598.63	545.44	512.30	482.18	460.00	436.93	417.38
360.0	787.31	713.53	639.76	580.29	540.10	502.66	474.04	450.36	431.09
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	406.32	362.82	305.01	281.89	170.34	103.23	47.24	16.02	11.45
45.0	421.73	394.75	344.65	282.99	197.98	132.03	77.46	28.57	9.52
90.0	420.91	396.24	343.22	281.83	218.68	139.02	80.00	33.42	9.63
135.0	434.95	417.33	379.89	320.98	278.59	173.70	108.79	56.38	17.07
180.0	425.81	399.21	333.92	270.55	206.63	127.51	71.35	28.85	12.77
225.0	411.77	371.58	319.60	262.34	198.20	120.24	64.14	25.05	10.68
270.0	415.13	382.09	331.44	278.03	189.67	127.07	64.97	25.49	10.79
315.0	390.07	341.85	267.85	203.16	140.12	71.74	29.73	13.43	11.29
360.0	406.32	362.82	305.01	281.89	170.34	103.23	47.24	16.02	11.45
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	9.86	8.59	7.87	6.99	6.61	6.17	5.84	5.67	5.56
45.0	8.26	6.99	6.06	5.73	5.62	5.51	5.45	5.34	5.29
90.0	8.31	7.21	6.06	5.73	5.56	5.51	5.40	5.34	5.23
135.0	10.30	9.25	7.87	7.05	6.55	6.17	5.84	5.67	5.51
180.0	11.29	9.74	8.48	7.82	7.21	6.61	6.22	5.95	5.78
225.0	9.36	7.87	6.72	6.28	6.00	5.78	5.62	5.45	5.40
270.0	9.36	8.09	6.94	6.39	6.11	5.89	5.73	5.56	5.45
315.0	9.52	8.42	7.82	7.21	6.77	6.33	6.00	5.84	5.67
360.0	9.86	8.59	7.87	6.99	6.61	6.17	5.84	5.67	5.56

NATA 3-2115-N

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	5.45	5.34	5.29	5.29	5.29	5.23	5.12	5.12	5.07		
45.0	5.23	5.18	5.12	5.07	5.07	5.07	5.01	5.01	4.96		
90.0	5.18	5.07	5.07	5.01	4.96	4.96	4.96	4.96	4.90		
135.0	5.34	5.29	5.23	5.23	5.18	5.18	5.12	5.07	5.07		
180.0	5.62	5.51	5.45	5.45	5.40	5.29	5.23	5.18	5.18		
225.0	5.34	5.23	5.12	5.07	5.07	5.07	5.07	5.07	5.07		
270.0	5.40	5.29	5.23	5.18	5.18	5.07	5.07	5.01	5.07		
315.0	5.56	5.45	5.34	5.29	5.23	5.23	5.18	5.18	5.07		
360.0	5.45	5.34	5.29	5.29	5.29	5.23	5.12	5.12	5.07		
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0		
0.0	5.07	5.07	5.07	5.01	5.01	5.07	5.18	5.29	5.34		
45.0	4.96	4.96	5.01	5.07	5.07	5.07	5.07	5.01	5.07		
90.0	4.90	4.90	4.96	5.01	5.01	4.96	5.01	5.01	5.01		
135.0	5.12	5.07	5.01	5.07	5.01	5.01	5.07	5.07	5.07		
180.0	5.18	5.12	5.07	5.01	5.01	5.01	5.01	5.01	4.96		
225.0	5.01	5.01	5.01	5.01	5.01	5.07	5.07	5.07	5.01		
270.0	5.01	5.07	5.07	5.01	5.01	5.01	5.07	5.07	5.07		
315.0	5.07	5.07	5.07	5.07	5.01	5.01	5.01	5.07	5.01		
360.0	5.07	5.07	5.07	5.01	5.01	5.07	5.18	5.29	5.34		
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0		
0.0	5.45	5.40	5.40	5.29	5.18	5.07	4.96	4.90	4.90		
45.0	5.07	5.12	5.12	5.07	5.18	5.18	5.12	5.01	5.01		
90.0	5.07	5.01	5.01	4.96	4.96	4.96	4.96	4.90	4.96		
135.0	5.01	5.12	5.12	5.18	5.07	5.01	4.96	4.90	4.96		
180.0	4.96	5.01	5.01	4.96	4.96	4.96	4.84	4.84	4.79		
225.0	5.01	4.96	4.96	4.96	4.96	4.96	4.90	4.90	4.84		
270.0	5.01	5.01	4.96	4.96	4.96	4.90	4.84	4.84	4.84		
315.0	4.96	4.96	4.96	4.90	4.90	4.84	4.84	4.79	4.84		
360.0	5.45	5.40	5.40	5.29	5.18	5.07	4.96	4.90	4.90		
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0		
0.0	4.96	4.90	4.84	4.84	4.84	4.84	4.79	4.79	4.73		
45.0	4.90	4.90	4.90	4.90	4.84	4.79	4.79	4.84	4.79		
90.0	4.90	4.90	4.79	4.84	4.84	4.84	4.79	4.79	4.73		
135.0	4.90	4.90	4.90	4.84	4.84	4.79	4.84	4.79	4.79		
180.0	4.84	4.79	4.79	4.84	4.79	4.73	4.73	4.68	4.73		
225.0	4.79	4.79	4.79	4.84	4.84	4.79	4.73	4.73	4.68		
270.0	4.84	4.84	4.84	4.73	4.73	4.73	4.68	4.73	4.68		
315.0	4.84	4.84	4.79	4.73	4.73	4.73	4.73	4.73	4.68		
360.0	4.96	4.90	4.84	4.84	4.84	4.84	4.79	4.79	4.73		
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0		
0.0	4.73	4.73	4.62	4.57	4.57	4.51	4.51	4.51	4.46		
45.0	4.79	4.79	4.79	4.79	4.73	4.68	4.68	4.68	4.57		
90.0	4.73	4.73	4.73	4.79	4.73	4.68	4.62	4.62	4.62		
135.0	4.73	4.79	4.73	4.73	4.68	4.68	4.62	4.57	4.62		
180.0	4.68	4.68	4.68	4.57	4.62	4.57	4.51	4.51	4.51		
225.0	4.68	4.73	4.68	4.73	4.68	4.62	4.57	4.57	4.57		
270.0	4.73	4.68	4.68	4.68	4.68	4.62	4.57	4.62	4.62		
315.0	4.68	4.68	4.62	4.68	4.62	4.62	4.57	4.57	4.57		
360.0	4.73	4.73	4.62	4.57	4.57	4.51	4.51	4.51	4.46		

Intensity data(cd)

Appendix Page: 18 Total:18

C/ $\gamma(^{\circ})$	90.0
0.0	4.46
45.0	4.62
90.0	4.57
135.0	4.57
180.0	4.46
225.0	4.57
270.0	4.62
315.0	4.51
360.0	4.46