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NATA

LumCAT: CR01D07015BM

Luminaire: 92.70.109.00

Report No: NATA0100

Test No: GC2018112617

LampCAT: CREE CXA1507

Lamp flux(lm): 1171.0

Number of Lamps: 1

Length(mm): 70

Phm Type: C

Voltage(V): 36.9000

Current(A): 0.3000

Power (W): 11.0700

PF: 0.0000

Ballast type: DC

Width(mm): 70

Height(mm): 0

Photometric Results

Lumens(lm): 1065.67

Efficiency(%): 91.01%

Lumens(lm)/Power(W): 96.48

Central intensity(cd): 9959.344

Maximum intensity(cd): 9959.344

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=15.2

[C90/270]Total=15.2

Field angle(10%Imax): [C0/180]Total=29.6

[C90/270]Total=29.6

Maximum s/h(1/2): C0_180=0.26 C90_270=0.26

Maximum s/h(1/4): C0_180=0.27 C90_270=0.27

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 91.21%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 95.598%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	9959.344	2.383	2.383	.203%	.224%
1.0	9838.336	18.829	21.212	1.608%	1.990%
2.0	9427.992	36.082	57.294	3.081%	5.376%
3.0	8898.328	51.069	108.363	4.361%	10.169%
4.0	8297.578	63.473	171.836	5.420%	16.125%
5.0	7450.172	71.206	243.041	6.081%	22.806%
6.0	6536.883	74.930	317.972	6.399%	29.838%
7.0	5556.656	74.261	392.232	6.342%	36.806%
8.0	4609.406	70.348	462.581	6.008%	43.408%
9.0	3761.859	64.534	527.114	5.511%	49.463%
10.0	3014.156	57.397	584.511	4.902%	54.849%
11.0	2373.047	49.654	634.165	4.240%	59.509%
12.0	1893.586	43.173	677.339	3.687%	63.560%
13.0	1469.503	36.250	713.589	3.096%	66.962%
14.0	1154.363	30.625	744.213	2.615%	69.835%
15.0	961.552	27.291	771.504	2.331%	72.396%
16.0	793.357	23.981	795.485	2.048%	74.647%
17.0	658.554	21.114	816.599	1.803%	76.628%
18.0	552.009	18.706	835.305	1.597%	78.383%
19.0	473.252	16.896	852.201	1.443%	79.969%
20.0	396.408	14.868	867.069	1.270%	81.364%
21.0	328.001	12.890	879.959	1.101%	82.573%
22.0	282.748	11.615	891.574	.992%	83.663%
23.0	222.230	9.522	901.097	.813%	84.557%
24.0	178.249	7.950	909.047	.679%	85.303%
25.0	146.637	6.796	915.843	.580%	85.941%
26.0	119.967	5.767	921.61	.492%	86.482%
27.0	99.541	4.956	926.566	.423%	86.947%
28.0	86.836	4.471	931.036	.382%	87.366%
29.0	76.894	4.088	935.124	.349%	87.750%
30.0	70.045	3.841	938.965	.328%	88.110%
31.0	64.603	3.649	942.614	.312%	88.453%
32.0	59.562	3.461	946.075	.296%	88.778%
33.0	55.533	3.317	949.391	.283%	89.089%
34.0	52.088	3.194	952.586	.273%	89.388%
35.0	48.839	3.072	955.658	.262%	89.677%
36.0	45.809	2.953	958.61	.252%	89.954%
37.0	43.545	2.874	961.484	.245%	90.223%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	41.576	2.807	964.291	.240%	90.487%
39.0	39.980	2.759	967.05	.236%	90.746%
40.0	38.897	2.742	969.792	.234%	91.003%
41.0	37.336	2.686	972.478	.229%	91.255%
42.0	35.311	2.591	975.069	.221%	91.498%
43.0	34.545	2.584	977.652	.221%	91.741%
44.0	36.338	2.768	980.42	.236%	92.000%
45.0	40.303	3.125	983.546	.267%	92.294%
46.0	44.993	3.549	987.095	.303%	92.627%
47.0	48.888	3.921	991.016	.335%	92.995%
48.0	48.480	3.951	994.967	.337%	93.365%
49.0	46.273	3.830	998.796	.327%	93.725%
50.0	43.952	3.692	1002.488	.315%	94.071%
51.0	35.550	3.030	1005.518	.259%	94.356%
52.0	27.345	2.363	1007.881	.202%	94.577%
53.0	21.888	1.917	1009.798	.164%	94.757%
54.0	19.610	1.740	1011.538	.149%	94.920%
55.0	18.612	1.672	1013.21	.143%	95.077%
56.0	17.796	1.618	1014.828	.138%	95.229%
57.0	17.163	1.578	1016.406	.135%	95.377%
58.0	16.629	1.546	1017.952	.132%	95.522%
59.0	16.263	1.529	1019.481	.131%	95.666%
60.0	15.968	1.516	1020.998	.130%	95.808%
61.0	15.778	1.513	1022.511	.129%	95.950%
62.0	15.638	1.514	1024.025	.129%	96.092%
63.0	15.567	1.521	1025.546	.130%	96.235%
64.0	15.623	1.540	1027.086	.132%	96.379%
65.0	15.652	1.556	1028.642	.133%	96.525%
66.0	15.799	1.583	1030.224	.135%	96.674%
67.0	16.059	1.621	1031.845	.138%	96.826%
68.0	16.362	1.664	1033.509	.142%	96.982%
69.0	16.741	1.714	1035.223	.146%	97.143%
70.0	17.058	1.758	1036.981	.150%	97.308%
71.0	17.522	1.817	1038.797	.155%	97.478%
72.0	18.204	1.899	1040.696	.162%	97.657%
73.0	19.765	2.073	1042.769	.177%	97.851%
74.0	22.732	2.396	1045.165	.205%	98.076%
75.0	25.341	2.684	1047.849	.229%	98.328%

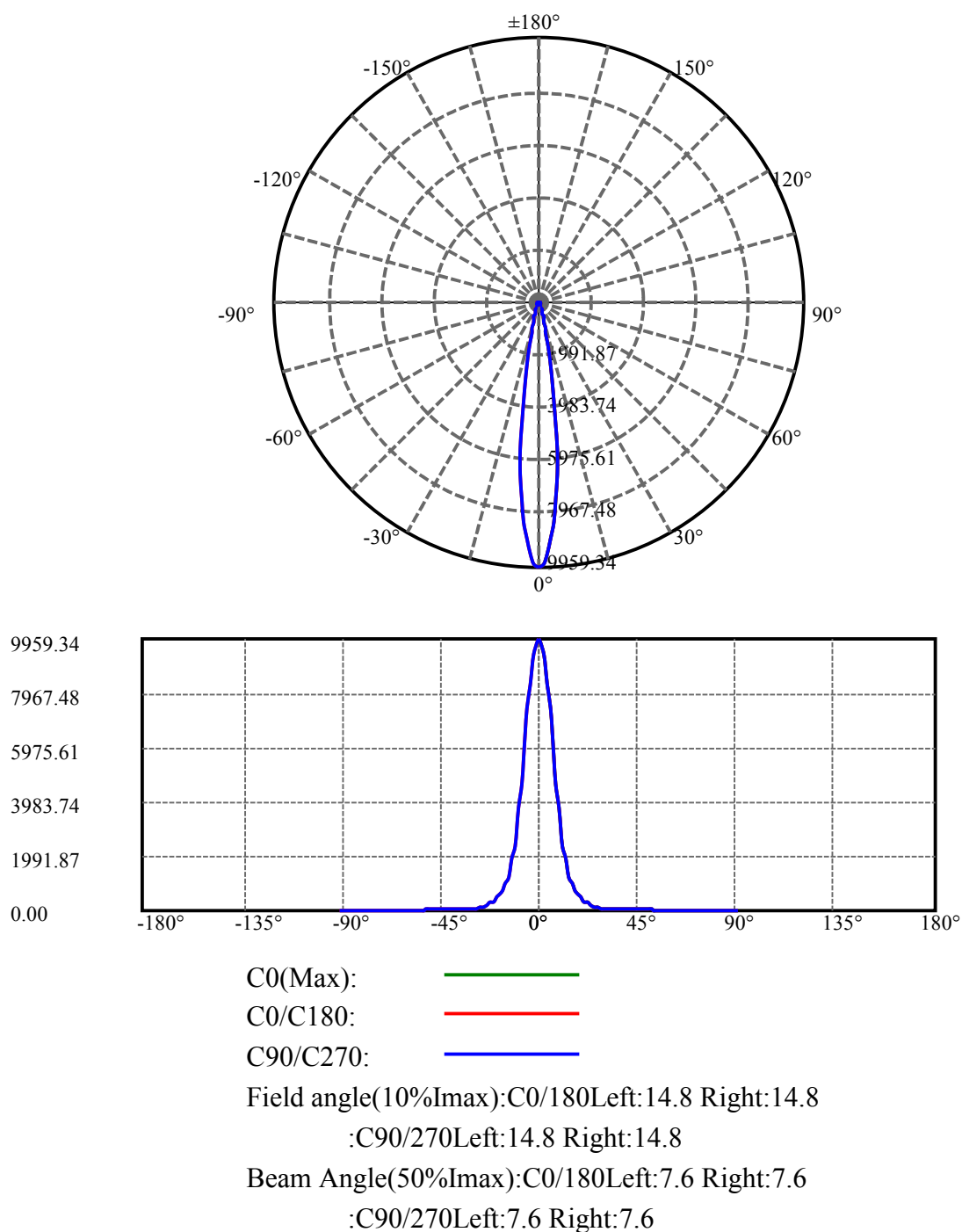
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	23.576	2.509	1050.358	.214%	98.563%
77.0	19.069	2.038	1052.395	.174%	98.754%
78.0	15.638	1.677	1054.073	.143%	98.912%
79.0	13.732	1.478	1055.551	.126%	99.051%
80.0	12.101	1.307	1056.858	.112%	99.173%
81.0	10.969	1.188	1058.046	.101%	99.285%
82.0	10.174	1.105	1059.151	.094%	99.388%
83.0	9.591	1.044	1060.194	.089%	99.486%
84.0	9.323	1.017	1061.211	.087%	99.582%
85.0	8.831	0.965	1062.176	.082%	99.672%
86.0	8.508	0.931	1063.107	.079%	99.760%
87.0	7.523	0.824	1063.931	.070%	99.837%
88.0	6.616	0.725	1064.656	.062%	99.905%
89.0	6.279	0.688	1065.344	.059%	99.970%
90.0	5.927	0.325	1065.669	.028%	100.000%

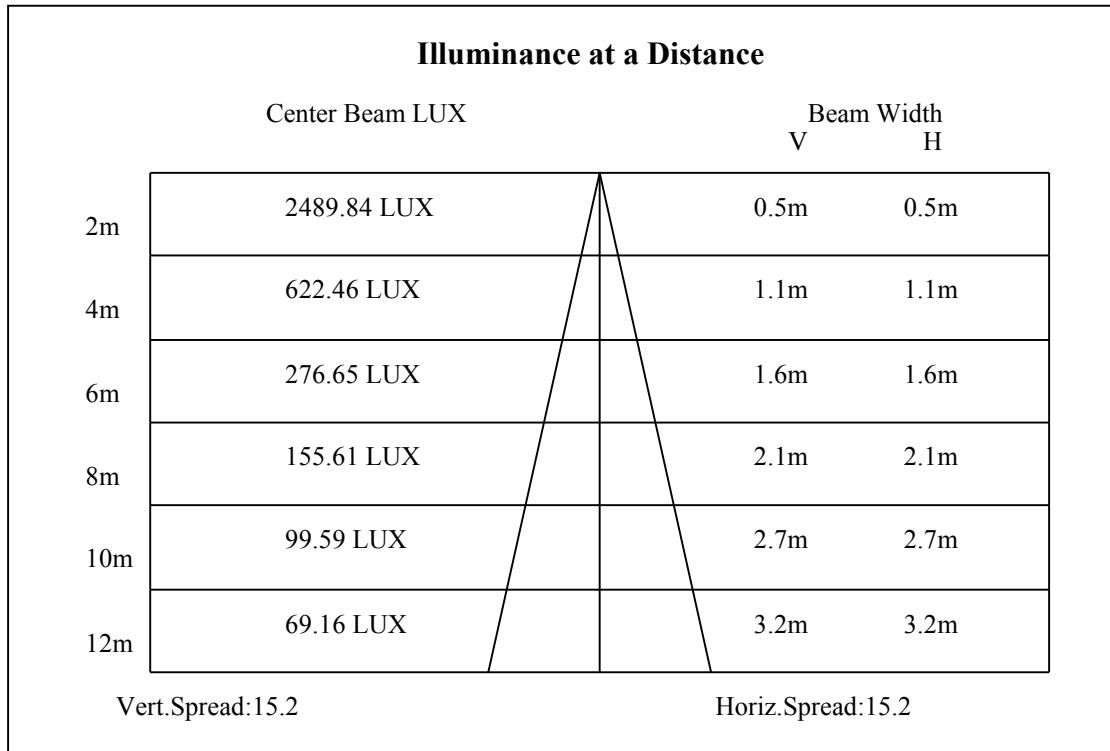
ZONAL LUMEN SUMMARY

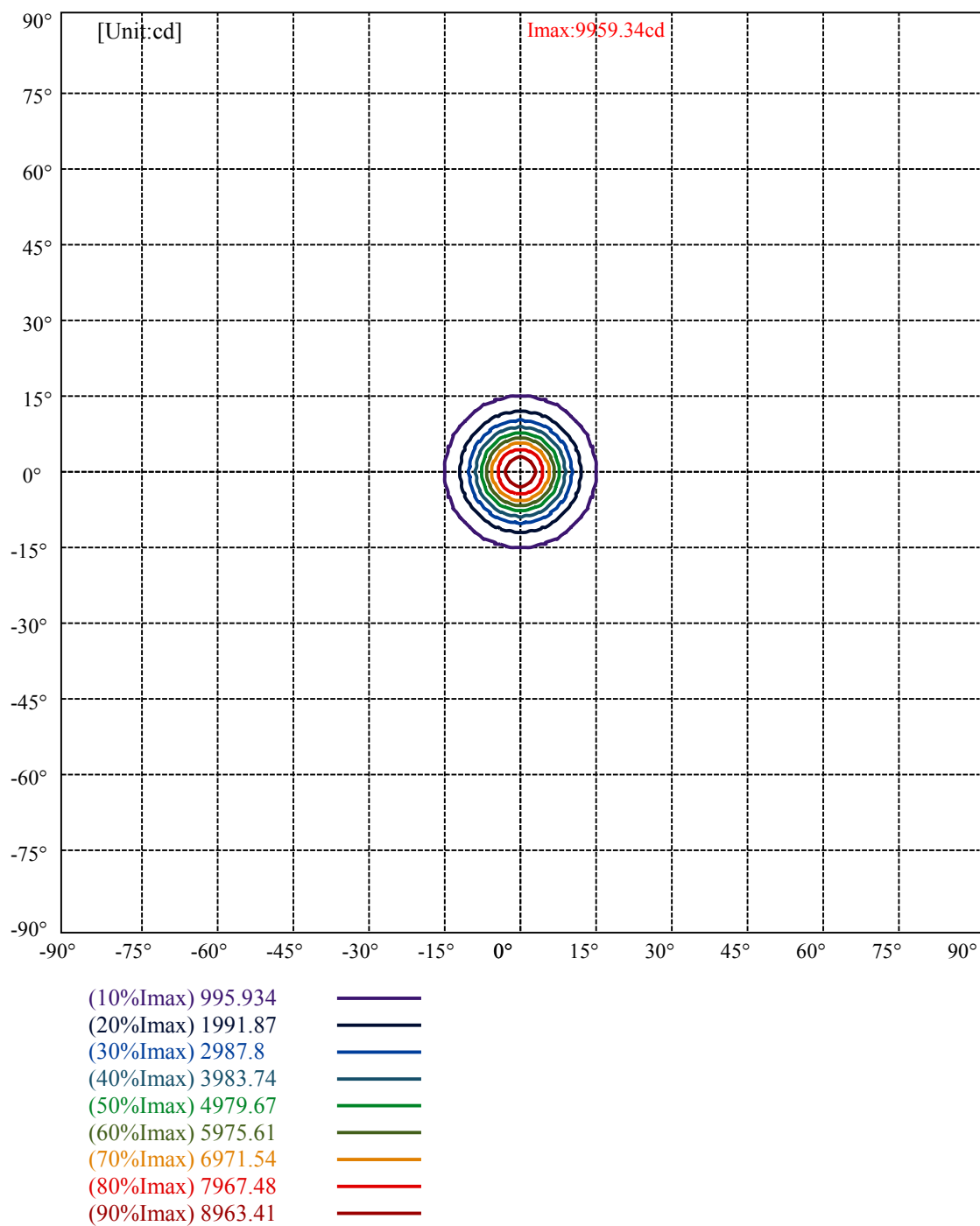
Zone	Lumens	%Lamp	%Fixt
0-30	938.96	80.18%	88.11%
0-40	969.79	82.82%	91.00%
0-60	1021.00	87.19%	95.81%
0-90	1065.34	90.98%	99.97%
0-120	1065.34	90.98%	99.97%
0-180	1065.67	91.01%	100.00%
60-90	45.86	3.92%	4.30%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-19.02	852.54	72.80%	80.00%

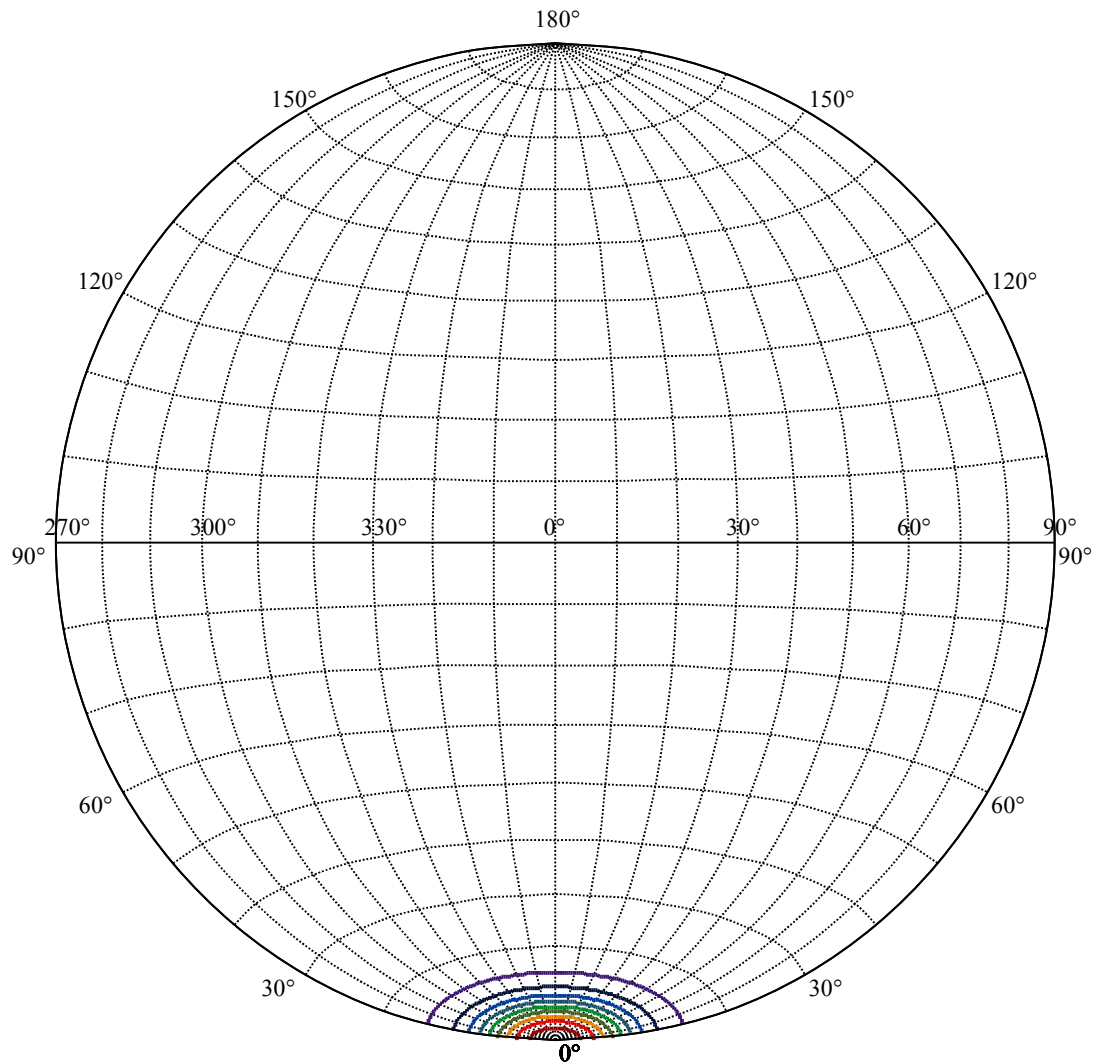
ZONAL LUMEN SUMMARY

0-10	584.51
10-20	282.56
20-30	71.90
30-40	30.83
40-50	32.70
50-60	18.51
60-70	15.98
70-80	19.88
80-90	8.49
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









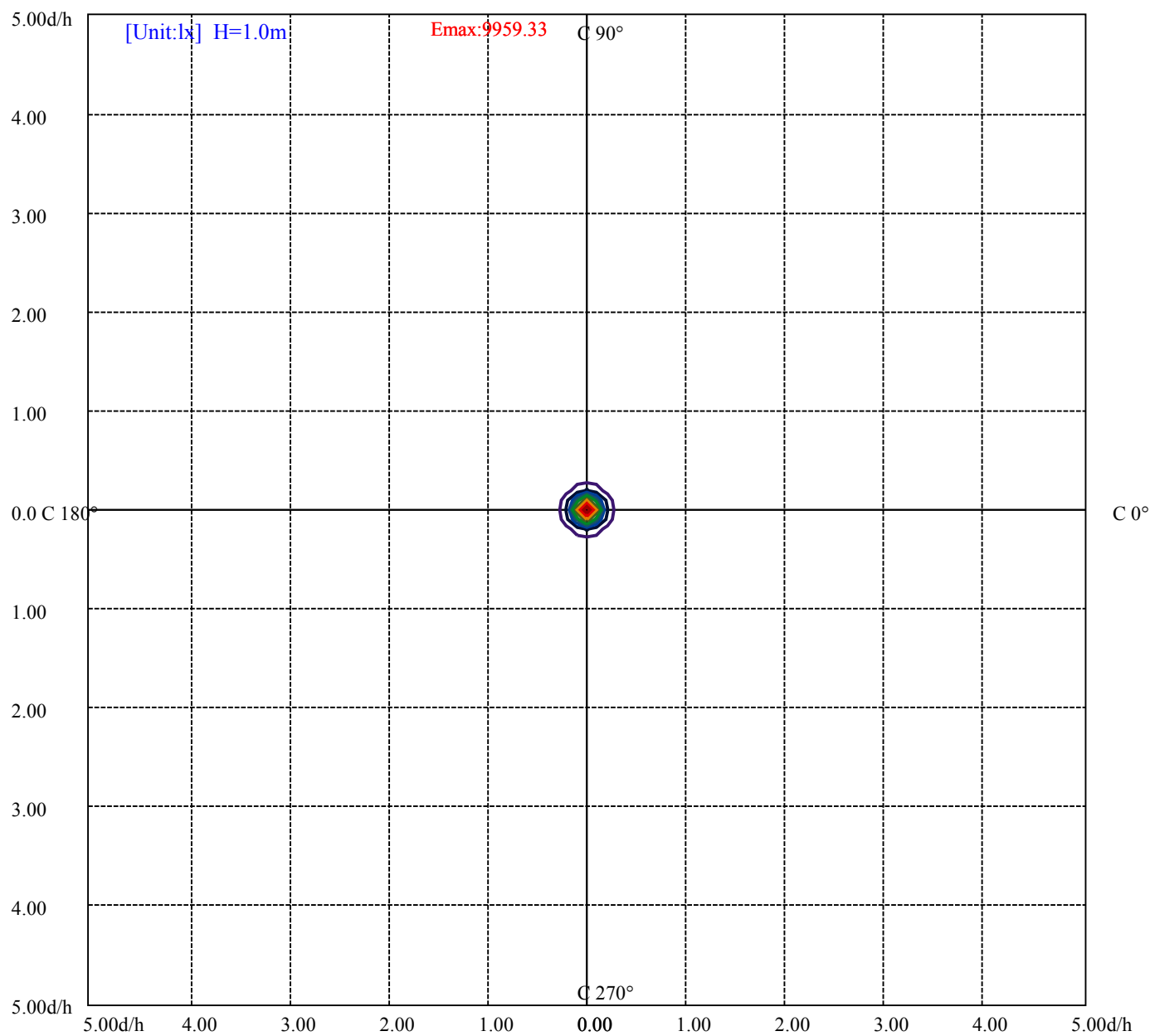
House

[Unit:cd]

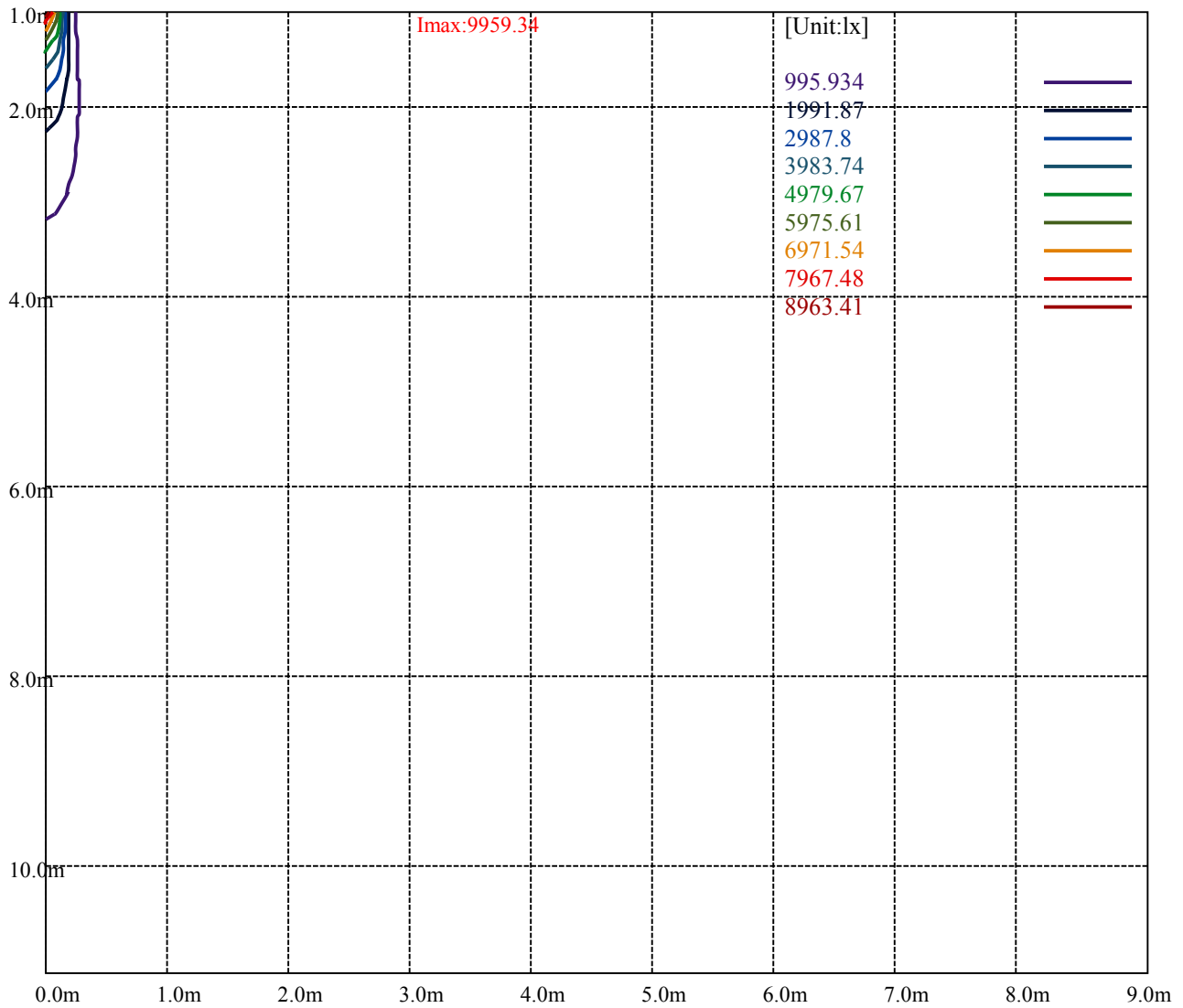
Road

Imax:9959.34

(10%Imax)	995.934	—
(20%Imax)	1991.87	—
(30%Imax)	2987.8	—
(40%Imax)	3983.74	—
(50%Imax)	4979.67	—
(60%Imax)	5975.61	—
(70%Imax)	6971.54	—
(80%Imax)	7967.48	—
(90%Imax)	8963.41	—



(10%Emax) 995.932	—
(20%Emax) 1991.86	—
(30%Emax) 2987.8	—
(40%Emax) 3983.73	—
(50%Emax) 4979.66	—
(60%Emax) 5975.6	—
(70%Emax) 6971.53	—
(80%Emax) 7967.46	—
(90%Emax) 8963.39	—



Luminance Table

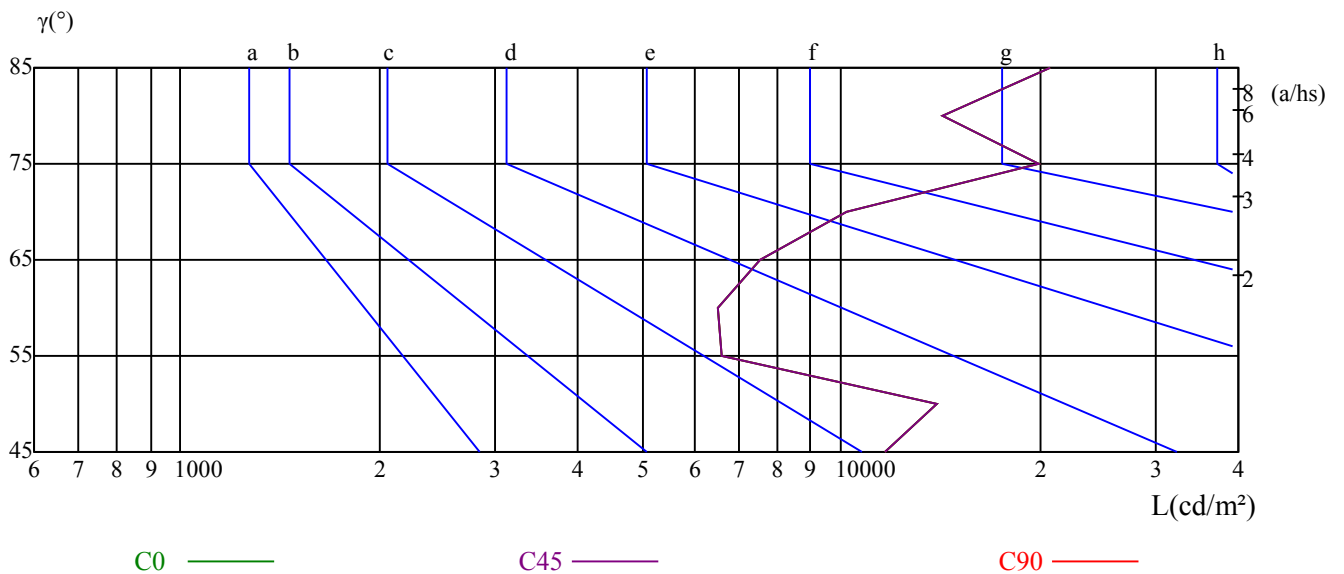
γ	45	50	55	60	65	70	75	80	85
C0	11632	13955	6622	6518	7558	10178	19981	14222	20679
C45	11632	13955	6622	6518	7558	10178	19981	14222	20679
C90	11632	13955	6622	6518	7558	10178	19981	14222	20679

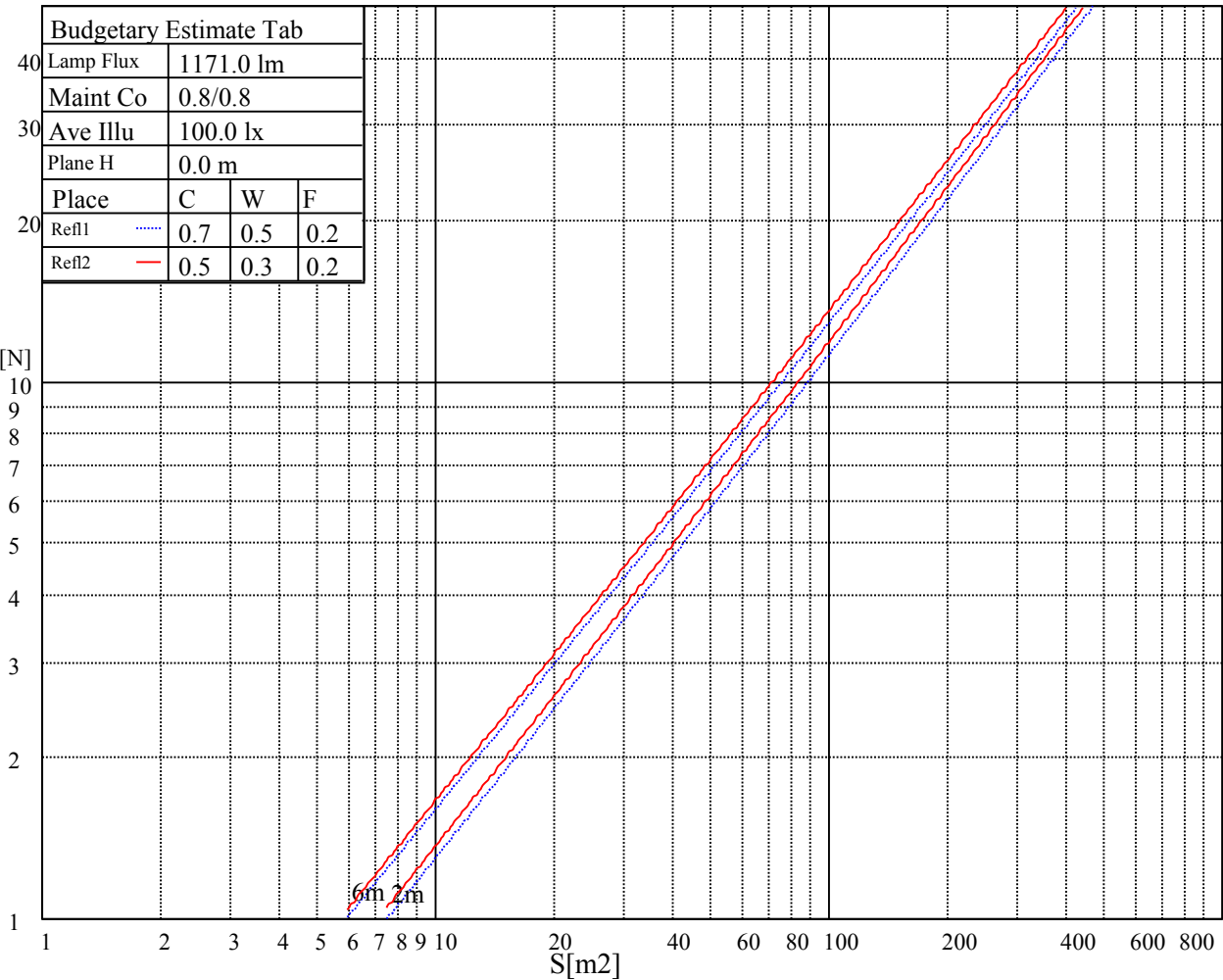
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
7558	7558	7558	19981	19981	19981	20679	20679	20679

Glare Table

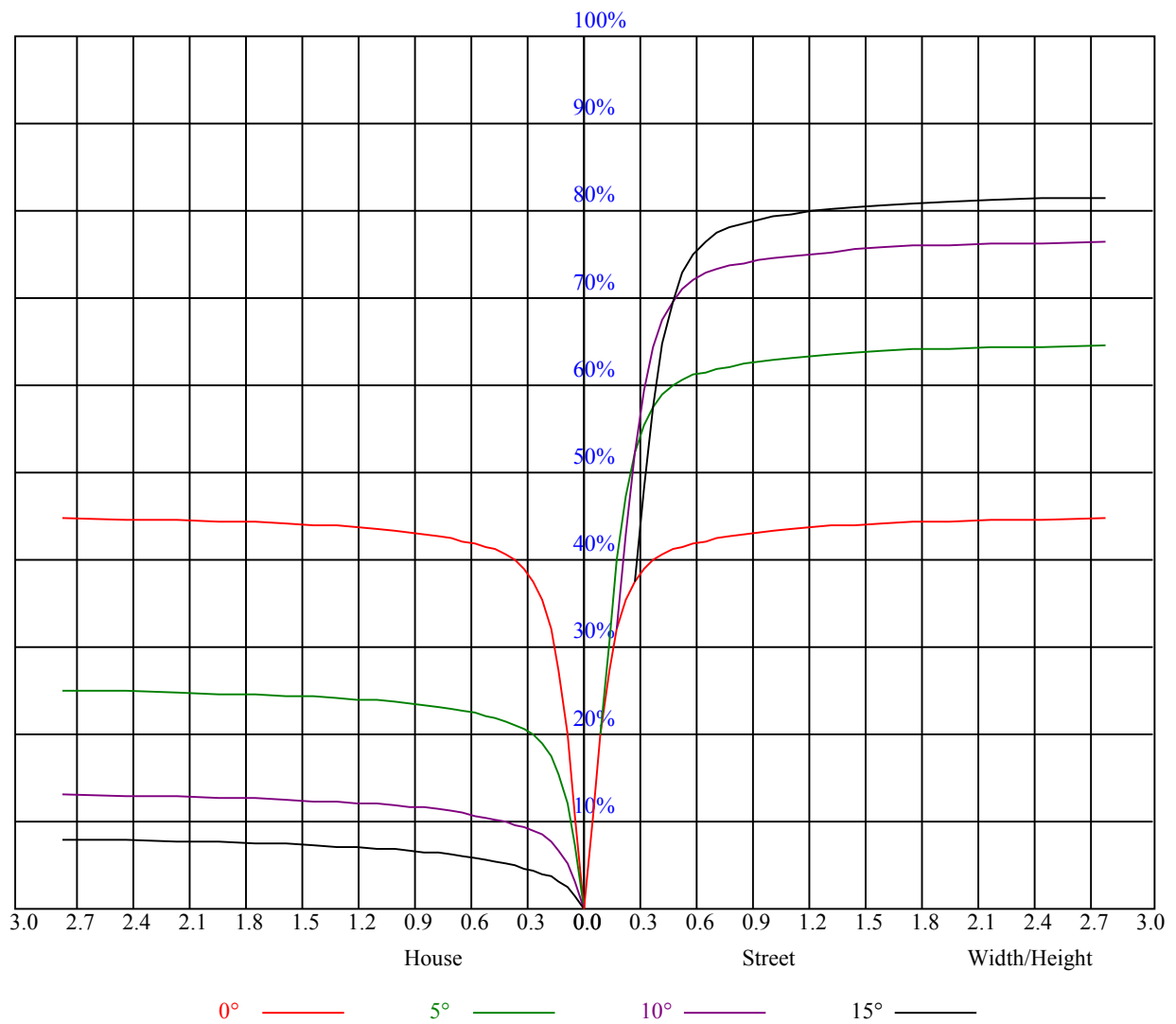
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

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	1.09	1.09	1.09	1.06	1.06	1.06	1.01	1.01	1.01	0.97	0.97	0.97	0.93	0.93	0.93	0.91
1	1.02	1.00	0.98	1.00	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87
2	0.97	0.94	0.91	0.95	0.93	0.90	0.93	0.90	0.89	0.90	0.88	0.87	0.88	0.86	0.85	0.83
3	0.93	0.89	0.87	0.92	0.89	0.86	0.89	0.87	0.85	0.87	0.85	0.83	0.85	0.84	0.82	0.81
4	0.90	0.86	0.83	0.89	0.85	0.83	0.87	0.84	0.82	0.85	0.83	0.81	0.84	0.82	0.80	0.79
5	0.87	0.83	0.80	0.86	0.82	0.80	0.84	0.81	0.79	0.83	0.81	0.78	0.82	0.80	0.78	0.77
6	0.84	0.80	0.78	0.84	0.80	0.78	0.82	0.79	0.77	0.81	0.79	0.77	0.80	0.78	0.76	0.75
7	0.82	0.78	0.76	0.82	0.78	0.76	0.81	0.78	0.75	0.80	0.77	0.75	0.79	0.76	0.75	0.74
8	0.80	0.77	0.74	0.80	0.76	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.77	0.75	0.73	0.72
9	0.78	0.75	0.73	0.78	0.75	0.73	0.77	0.74	0.72	0.77	0.74	0.72	0.76	0.74	0.72	0.71
10	0.77	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.71	0.75	0.73	0.71	0.75	0.73	0.71	0.70



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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	10018.13	9857.25	9369.00	8805.38	8115.19	7243.88	6276.38	5190.75	4334.63
45.0	9952.88	9628.88	9008.44	8454.94	7799.63	6730.88	5752.69	4860.56	3970.13
90.0	9892.13	9561.94	9056.25	8462.25	7803.56	6863.63	5925.38	4944.38	4055.06
135.0	9974.25	9941.06	9559.69	9128.81	8614.13	7821.00	6997.50	6080.63	5097.94
180.0	10018.13	9937.69	9602.44	9015.75	8480.25	7801.31	6743.81	5806.13	4920.19
225.0	9952.88	10010.25	9836.44	9340.88	8796.38	8087.06	7318.13	6302.25	5267.81
270.0	9892.13	9982.13	9792.56	9354.94	8766.56	7955.44	7154.44	6219.00	5143.50
315.0	9974.25	9787.50	9199.13	8623.69	8004.94	7098.19	6126.75	5049.56	4086.00
360.0	10018.13	9857.25	9369.00	8805.38	8115.19	7243.88	6276.38	5190.75	4334.63

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3488.06	2733.75	2158.88	1700.44	1276.31	1033.88	856.69	691.88	590.63
45.0	3165.75	2535.75	1962.56	1573.88	1241.44	1000.69	843.75	703.69	589.50
90.0	3322.13	2620.13	2064.94	1671.19	1264.50	1067.40	886.11	744.81	622.41
135.0	4187.81	3448.13	2733.19	2215.13	1749.94	1382.63	1130.06	918.00	757.69
180.0	4001.06	3202.88	2599.31	2044.69	1649.25	1102.78	1053.11	876.77	733.44
225.0	4419.00	3560.63	2810.81	2257.31	1814.63	1386.00	1101.83	931.05	755.33
270.0	4179.38	3421.69	2671.88	2122.31	1657.13	1293.75	1044.00	835.31	677.25
315.0	3331.69	2590.31	1982.81	1563.75	1102.84	967.78	776.87	645.36	542.19
360.0	3488.06	2733.75	2158.88	1700.44	1276.31	1033.88	856.69	691.88	590.63

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	509.63	441.00	362.81	301.50	286.88	197.89	160.43	136.41	109.13
45.0	508.50	438.19	363.38	300.38	286.31	201.43	159.92	133.37	112.73
90.0	526.50	454.95	381.60	317.48	267.75	217.63	179.94	145.24	117.73
135.0	640.13	542.25	452.81	384.75	325.69	286.88	217.80	179.66	145.58
180.0	594.28	511.37	442.46	360.79	299.42	246.54	194.79	161.27	132.98
225.0	623.64	531.23	442.91	362.76	298.52	234.28	198.96	160.99	126.79
270.0	567.56	484.31	401.06	339.19	285.75	219.09	174.43	142.59	117.96
315.0	445.84	382.73	324.23	257.18	211.67	174.09	139.73	113.57	96.86
360.0	509.63	441.00	362.81	301.50	286.88	197.89	160.43	136.41	109.13

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	91.46	82.41	73.07	67.05	62.04	56.87	53.33	50.01	46.29
45.0	92.64	81.45	73.74	66.71	61.09	57.15	52.59	48.60	45.56
90.0	98.78	84.54	73.35	67.11	61.88	56.48	52.88	49.67	46.46
135.0	118.86	98.78	83.59	75.26	68.01	62.66	58.33	54.23	50.68
180.0	104.79	90.11	80.83	72.28	67.50	62.33	57.49	54.62	51.41
225.0	108.17	93.88	81.45	75.38	69.58	62.78	59.23	55.63	52.03
270.0	96.98	86.74	79.31	72.51	66.88	62.61	58.44	54.84	51.75
315.0	84.66	76.78	69.81	64.07	59.85	55.63	51.98	49.11	46.52
360.0	91.46	82.41	73.07	67.05	62.04	56.87	53.33	50.01	46.29

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	43.71	41.34	39.32	38.03	36.96	35.72	34.26	34.09	37.46
45.0	42.69	40.61	39.21	38.19	37.18	35.66	33.69	33.75	37.91
90.0	43.54	41.40	39.99	38.64	37.52	36.23	34.37	33.86	36.90
135.0	47.93	45.45	42.92	41.18	39.94	38.70	37.01	35.44	34.76
180.0	47.36	45.06	42.81	40.39	39.38	37.74	35.44	33.92	33.58
225.0	48.66	45.96	43.14	41.01	40.11	37.74	35.44	33.53	32.91
270.0	48.88	46.52	44.33	42.81	41.46	40.16	37.24	35.55	35.66
315.0	43.71	42.02	40.89	39.60	38.64	36.73	35.04	36.23	41.51
360.0	43.71	41.34	39.32	38.03	36.96	35.72	34.26	34.09	37.46

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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	42.58	45.51	49.56	47.19	44.66	42.08	31.95	22.95	19.91		
45.0	42.64	46.74	47.48	43.65	41.23	35.94	24.19	20.87	19.01		
90.0	37.91	40.61	44.21	43.54	43.43	43.20	26.83	22.16	20.42		
135.0	37.63	37.91	41.01	46.29	46.24	44.78	41.85	29.08	21.88		
180.0	37.80	46.63	51.36	50.12	48.49	46.97	38.42	26.66	22.50		
225.0	36.11	45.62	56.93	55.07	49.33	46.07	43.26	36.39	25.71		
270.0	41.12	46.29	48.66	51.36	50.34	48.09	45.73	37.97	25.59		
315.0	46.63	50.63	51.92	50.63	46.46	44.49	32.18	22.67	20.08		
360.0	42.58	45.51	49.56	47.19	44.66	42.08	31.95	22.95	19.91		
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0		
0.0	18.73	17.94	17.21	16.76	16.48	16.14	15.92	15.75	15.64		
45.0	18.06	17.27	16.65	16.14	15.75	15.47	15.24	15.13	15.02		
90.0	19.07	18.28	17.72	17.27	16.82	16.54	16.31	16.26	16.14		
135.0	19.80	18.79	17.83	17.27	16.76	16.43	16.03	15.86	15.81		
180.0	20.42	19.58	18.79	18.11	17.44	17.16	16.99	16.76	16.48		
225.0	21.32	19.97	18.73	17.78	16.88	16.26	15.92	15.58	15.41		
270.0	20.98	19.46	18.51	17.61	17.04	16.54	16.09	15.81	15.64		
315.0	18.51	17.61	16.93	16.37	15.86	15.58	15.24	15.08	14.96		
360.0	18.73	17.94	17.21	16.76	16.48	16.14	15.92	15.75	15.64		
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0		
0.0	15.53	15.41	15.36	15.47	15.75	16.20	16.59	17.04	17.89		
45.0	15.02	15.13	15.30	15.58	15.92	16.20	16.54	16.93	17.49		
90.0	16.03	16.09	16.14	16.26	16.48	16.71	16.88	17.04	17.21		
135.0	15.75	15.69	15.69	15.86	16.09	16.48	16.99	17.16	17.55		
180.0	16.31	16.37	16.31	16.48	16.71	16.99	17.21	17.55	17.89		
225.0	15.36	15.53	15.69	15.81	16.03	16.20	16.54	16.88	17.38		
270.0	15.58	15.64	15.75	15.75	16.03	16.31	16.93	17.27	17.78		
315.0	14.96	15.13	14.96	15.19	15.47	15.81	16.26	16.59	16.99		
360.0	15.53	15.41	15.36	15.47	15.75	16.20	16.59	17.04	17.89		
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0		
0.0	18.68	19.80	22.05	23.85	22.56	18.06	14.68	12.99	11.76		
45.0	18.17	20.87	24.47	23.63	19.35	15.30	12.99	11.76	10.97		
90.0	17.72	20.48	26.78	28.13	21.38	16.88	14.01	12.32	11.19		
135.0	17.94	18.73	19.97	24.08	24.64	20.70	15.86	13.56	12.26		
180.0	18.56	19.63	21.32	22.95	21.99	17.38	14.85	13.11	11.98		
225.0	17.94	18.45	19.74	24.98	27.00	20.48	17.61	15.13	12.71		
270.0	18.68	19.86	21.99	26.10	26.44	24.02	19.13	17.33	14.18		
315.0	17.94	20.31	25.54	29.03	25.26	19.74	15.98	13.67	11.76		
360.0	18.68	19.80	22.05	23.85	22.56	18.06	14.68	12.99	11.76		
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0		
0.0	10.80	9.96	9.28	8.83	8.27	8.21	7.37	6.47	6.24		
45.0	10.13	9.51	9.06	8.66	9.06	7.82	6.86	6.36	6.13		
90.0	10.41	9.73	9.17	9.06	9.28	7.93	6.86	6.41	6.13		
135.0	11.14	10.46	9.96	10.35	9.00	8.83	7.82	6.64	6.41		
180.0	11.03	10.24	9.56	8.94	8.55	8.49	7.03	6.36	6.24		
225.0	11.70	10.74	9.96	9.39	8.94	9.00	8.33	7.09	6.41		
270.0	11.81	10.63	9.90	9.28	8.94	8.94	8.27	7.09	6.41		
315.0	10.74	10.13	9.84	10.07	8.61	8.83	7.65	6.53	6.24		
360.0	10.80	9.96	9.28	8.83	8.27	8.21	7.37	6.47	6.24		

Intensity data(cd)

Appendix Page: 18 Total:18

C/ γ (°)	90.0
0.0	5.85
45.0	5.46
90.0	5.57
135.0	6.08
180.0	5.74
225.0	6.36
270.0	6.24
315.0	6.13
360.0	5.85