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NATA

LumCAT: 2-2004-M
Luminaire: 92.70.131.00
Report No: NATA0100
Test No: GC2019123020
LampCAT: LUMINUS CXM-14-AC40
Lamp flux(lm): 2608.0
Number of Lamps: 1
Length(mm): 0
Phm Type: C

Voltage(V): 34.7100
Current(A): 0.6000
Power (W): 20.8600
PF: 0.0000
Ballast type: DC
Width(mm): 0
Height(mm): 0

Photometric Results

Lumens(lm): 2289.16
Efficiency(%): 87.77%
Lumens(lm)/Power(W): 109.74
Central intensity(cd): 11150.860
Maximum intensity(cd): 11150.860
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=18.9
[C90/270]Total=18.9
Field angle(10%Imax): [C0/180]Total=43.9
[C90/270]Total=43.9
Maximum s/h(1/2): C0_180=0.32 C90_270=0.32
Maximum s/h(1/4): C0_180=0.33 C90_270=0.33
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 87.77%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.559%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	11150.859	0.000	0	.000%	.000%
1.0	11091.305	10.642	10.642	.408%	.465%
2.0	10893.023	31.554	42.196	1.210%	1.843%
3.0	10554.469	51.295	93.492	1.967%	4.084%
4.0	10121.344	69.209	162.7	2.654%	7.107%
5.0	9527.133	84.527	247.227	3.241%	10.800%
6.0	8711.227	95.847	343.075	3.675%	14.987%
7.0	7863.398	102.878	445.953	3.945%	19.481%
8.0	6970.219	106.161	552.114	4.071%	24.119%
9.0	5967.984	104.857	656.971	4.021%	28.699%
10.0	5057.016	99.772	756.744	3.826%	33.058%
11.0	4262.977	93.126	849.869	3.571%	37.126%
12.0	3622.219	86.196	936.066	3.305%	40.891%
13.0	2994.258	78.521	1014.587	3.011%	44.321%
14.0	2565.633	71.166	1085.753	2.729%	47.430%
15.0	2215.055	65.631	1151.384	2.517%	50.297%
16.0	1958.625	61.156	1212.54	2.345%	52.969%
17.0	1705.570	57.061	1269.602	2.188%	55.461%
18.0	1530.492	53.356	1322.958	2.046%	57.792%
19.0	1402.523	51.028	1373.986	1.957%	60.021%
20.0	1275.377	49.013	1422.999	1.879%	62.162%
21.0	1183.282	47.211	1470.21	1.810%	64.225%
22.0	1112.133	46.127	1516.338	1.769%	66.240%
23.0	1042.123	45.202	1561.54	1.733%	68.214%
24.0	986.681	44.357	1605.897	1.701%	70.152%
25.0	948.122	43.993	1649.89	1.687%	72.074%
26.0	913.282	43.939	1693.828	1.685%	73.993%
27.0	883.730	43.964	1737.793	1.686%	75.914%
28.0	860.955	44.172	1781.964	1.694%	77.844%
29.0	841.247	44.534	1826.499	1.708%	79.789%
30.0	823.500	44.948	1871.447	1.723%	81.752%
31.0	799.889	45.177	1916.623	1.732%	83.726%
32.0	762.778	44.769	1961.392	1.717%	85.682%
33.0	715.648	43.555	2004.947	1.670%	87.584%
34.0	658.997	41.601	2046.548	1.595%	89.402%
35.0	577.132	38.390	2084.937	1.472%	91.079%
36.0	497.707	34.223	2119.16	1.312%	92.574%
37.0	424.519	30.078	2149.238	1.153%	93.888%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	353.257	25.961	2175.199	.995%	95.022%
39.0	252.577	20.679	2195.878	.793%	95.925%
40.0	195.145	15.615	2211.493	.599%	96.607%
41.0	122.288	11.304	2222.797	.433%	97.101%
42.0	74.616	7.154	2229.95	.274%	97.413%
43.0	44.198	4.401	2234.352	.169%	97.606%
44.0	26.508	2.669	2237.02	.102%	97.722%
45.0	20.967	1.825	2238.845	.070%	97.802%
46.0	18.323	1.537	2240.381	.059%	97.869%
47.0	16.151	1.371	2241.753	.053%	97.929%
48.0	14.927	1.256	2243.009	.048%	97.984%
49.0	13.957	1.186	2244.195	.045%	98.036%
50.0	13.331	1.138	2245.333	.044%	98.085%
51.0	13.001	1.114	2246.447	.043%	98.134%
52.0	12.741	1.105	2247.551	.042%	98.182%
53.0	12.459	1.096	2248.648	.042%	98.230%
54.0	12.220	1.088	2249.735	.042%	98.278%
55.0	12.002	1.081	2250.817	.041%	98.325%
56.0	11.827	1.077	2251.893	.041%	98.372%
57.0	11.630	1.072	2252.966	.041%	98.419%
58.0	11.489	1.069	2254.035	.041%	98.465%
59.0	11.348	1.068	2255.103	.041%	98.512%
60.0	11.229	1.067	2256.169	.041%	98.559%
61.0	11.123	1.067	2257.236	.041%	98.605%
62.0	11.018	1.067	2258.303	.041%	98.652%
63.0	10.941	1.068	2259.371	.041%	98.699%
64.0	10.877	1.071	2260.441	.041%	98.745%
65.0	10.793	1.072	2261.514	.041%	98.792%
66.0	10.737	1.074	2262.588	.041%	98.839%
67.0	10.688	1.077	2263.665	.041%	98.886%
68.0	10.638	1.080	2264.746	.041%	98.933%
69.0	10.589	1.083	2265.829	.042%	98.981%
70.0	10.554	1.086	2266.914	.042%	99.028%
71.0	10.519	1.089	2268.004	.042%	99.076%
72.0	10.484	1.092	2269.096	.042%	99.123%
73.0	10.463	1.095	2270.191	.042%	99.171%
74.0	10.441	1.099	2271.29	.042%	99.219%
75.0	10.427	1.103	2272.393	.042%	99.267%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.392	1.105	2273.498	.042%	99.316%
77.0	10.371	1.107	2274.605	.042%	99.364%
78.0	10.364	1.110	2275.715	.043%	99.413%
79.0	10.350	1.113	2276.828	.043%	99.461%
80.0	10.336	1.115	2277.943	.043%	99.510%
81.0	10.329	1.118	2279.06	.043%	99.559%
82.0	10.329	1.120	2280.181	.043%	99.608%
83.0	10.308	1.122	2281.303	.043%	99.657%
84.0	10.301	1.123	2282.425	.043%	99.706%
85.0	10.273	1.123	2283.548	.043%	99.755%
86.0	10.266	1.123	2284.671	.043%	99.804%
87.0	10.259	1.123	2285.794	.043%	99.853%
88.0	10.245	1.123	2286.917	.043%	99.902%
89.0	10.238	1.123	2288.04	.043%	99.951%
90.0	10.238	1.123	2289.162	.043%	100.000%

Zonal flux distribution table

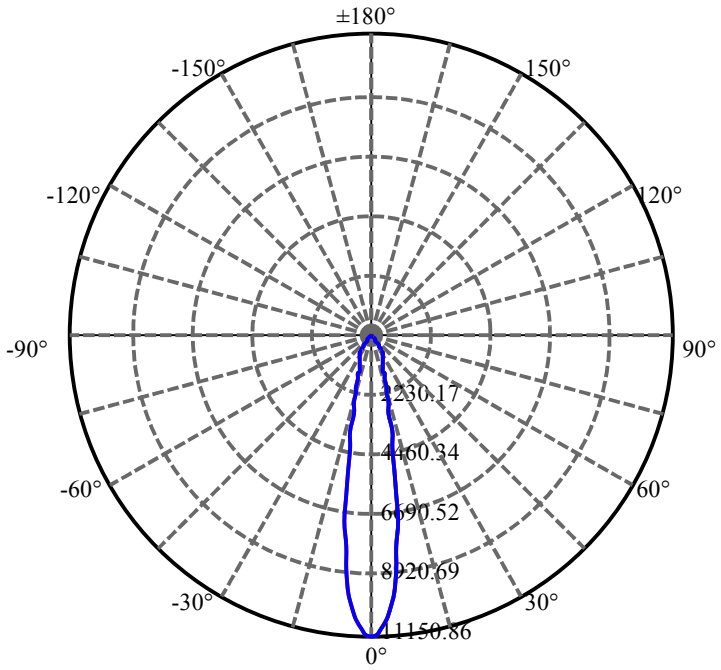
ZONAL LUMEN SUMMARY

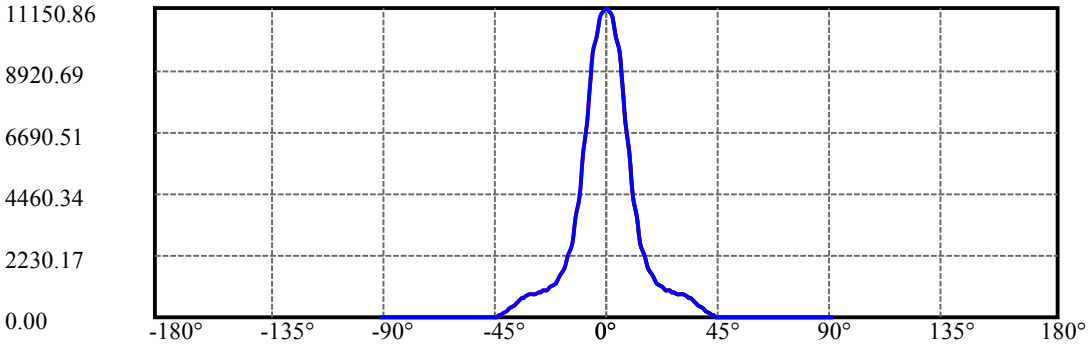
Zone	Lumens	%Lamp	%Fixt
0-30	1871.45	71.76%	81.75%
0-40	2211.49	84.80%	96.61%
0-60	2256.17	86.51%	98.56%
0-90	2288.04	87.73%	99.95%
0-120	2288.04	87.73%	99.95%
0-180	2289.16	87.77%	100.00%
60-90	32.94	1.26%	1.44%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-29.11	1831.33	70.22%	80.00%

ZONAL LUMEN SUMMARY

0-10	756.74
10-20	666.26
20-30	448.45
30-40	340.05
40-50	33.84
50-60	10.84
60-70	10.75
70-80	11.03
80-90	10.10
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

Light Distribution Curve [Unit:cd]





C0(Max):

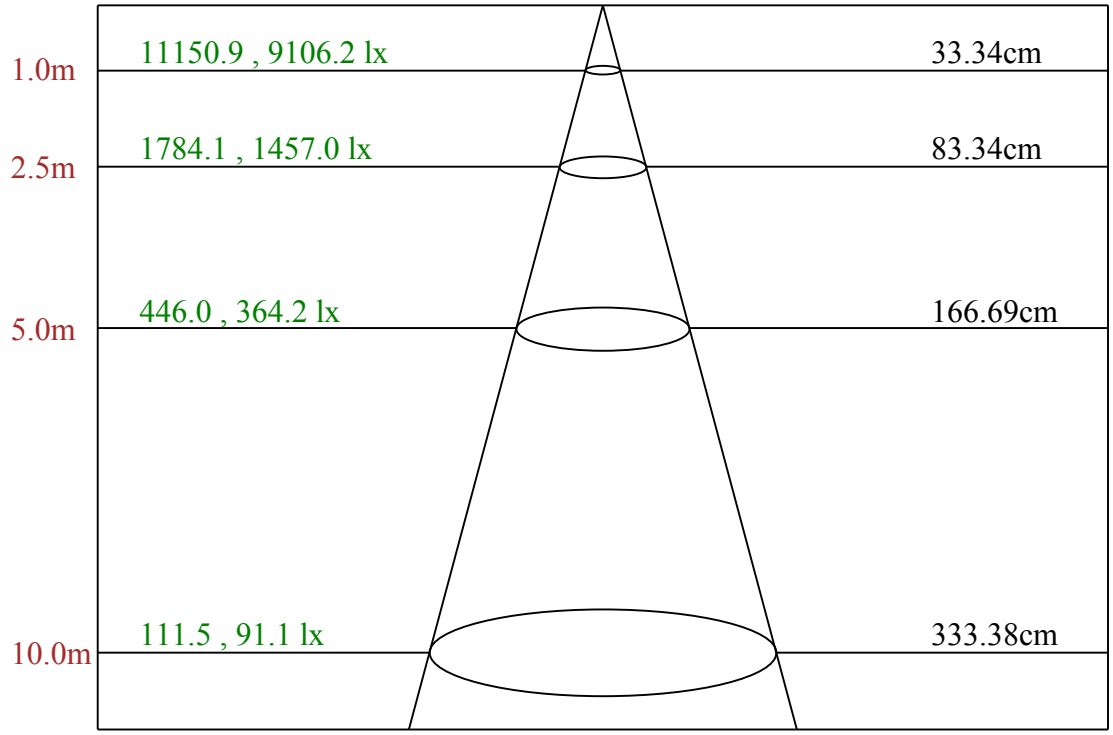
C0/C180:

C90/C270:

Field angle(10%Imax):C0/180Left:22.0 Right:22.0
:C90/270Left:22.0 Right:22.0

Beam Angle(50%Imax):C0/180Left:9.4 Right:9.4
:C90/270Left:9.4 Right:9.4

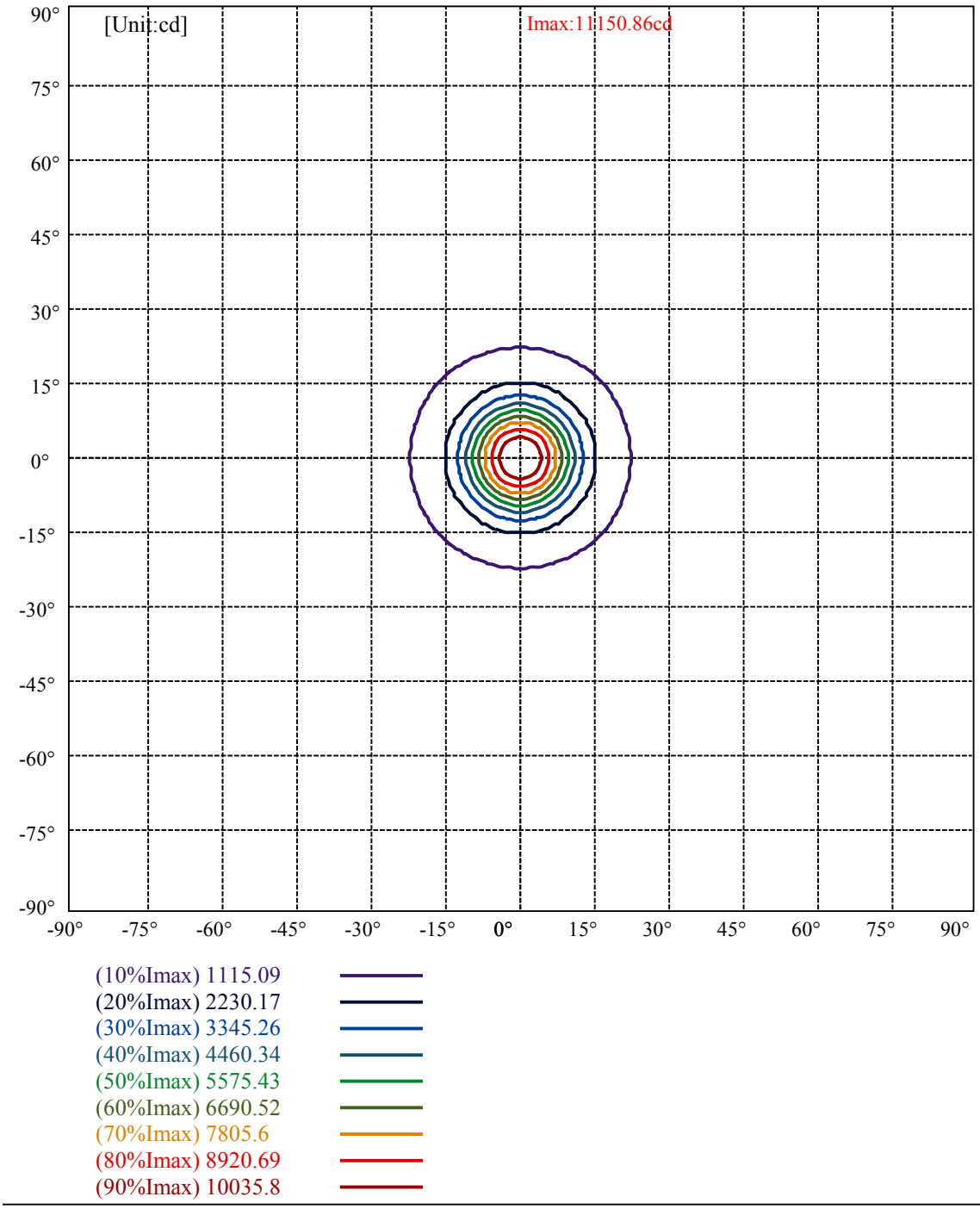
Lux distance Curve



Max , Ave

Beam angle of C0 plane 18.93

ISO-Intensity(V-H)

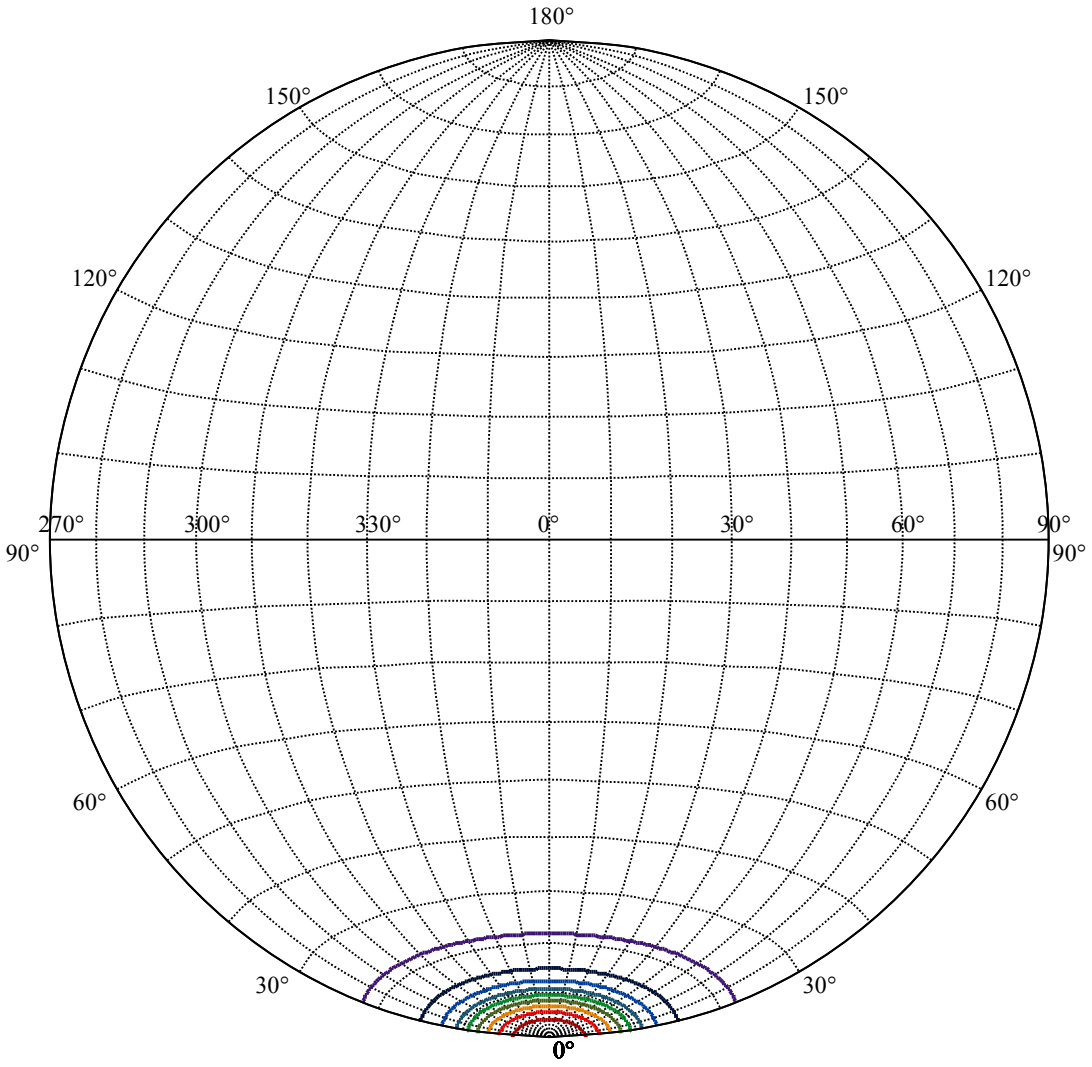


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:11150.86

(10%Imax) 1115.09
(20%Imax) 2230.17
(30%Imax) 3345.26
(40%Imax) 4460.34
(50%Imax) 5575.43
(60%Imax) 6690.52
(70%Imax) 7805.6
(80%Imax) 8920.69
(90%Imax) 10035.8

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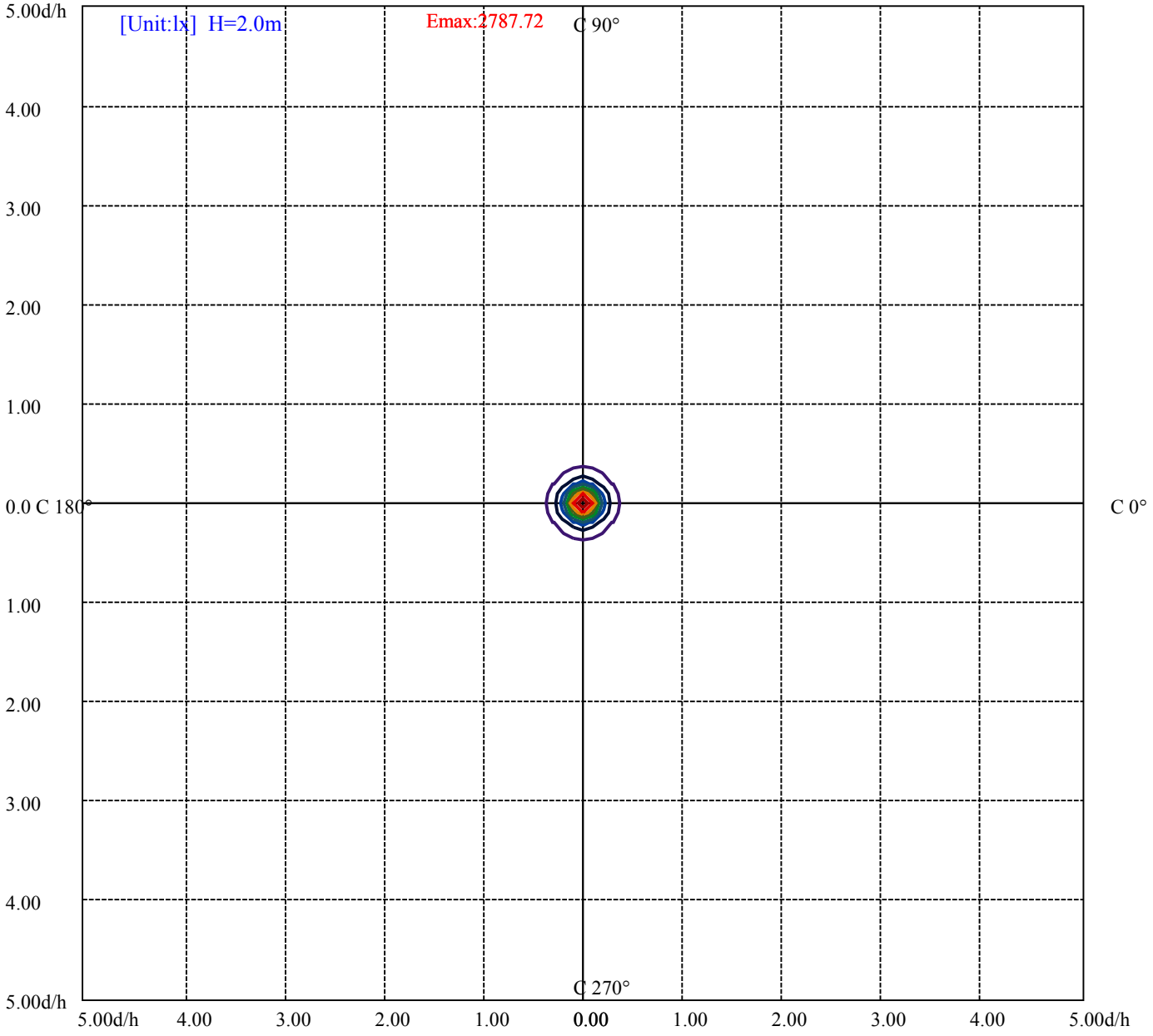
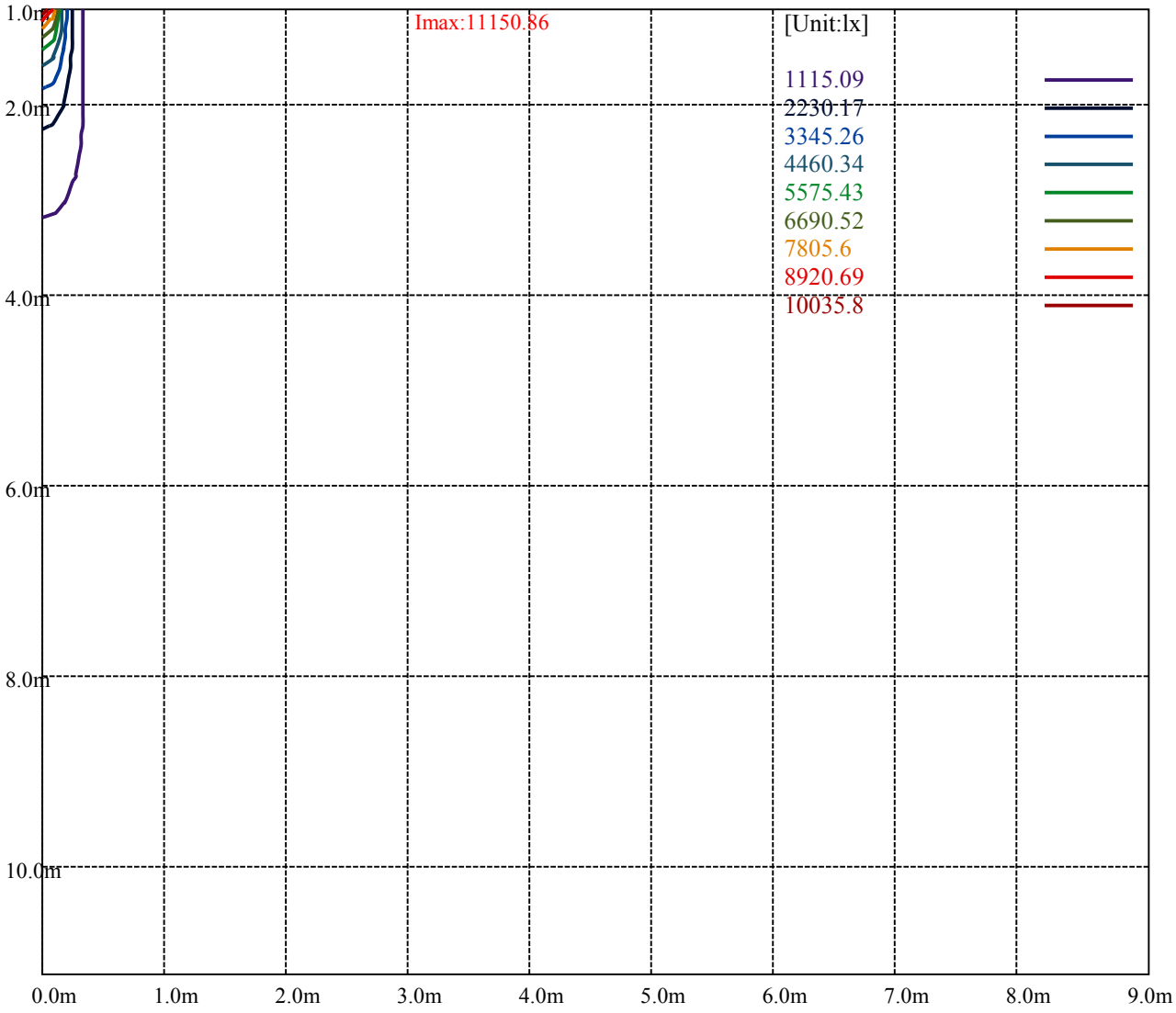
ISO illuminance diagram



(10%Emax) 278.77
(20%Emax) 557.5425
(30%Emax) 836.3125
(40%Emax) 1115.085
(50%Emax) 1393.855
(60%Emax) 1672.627
(70%Emax) 1951.397
(80%Emax) 2230.17
(90%Emax) 2508.95

Equipment: GMS1980 Date: 2019/12/30 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

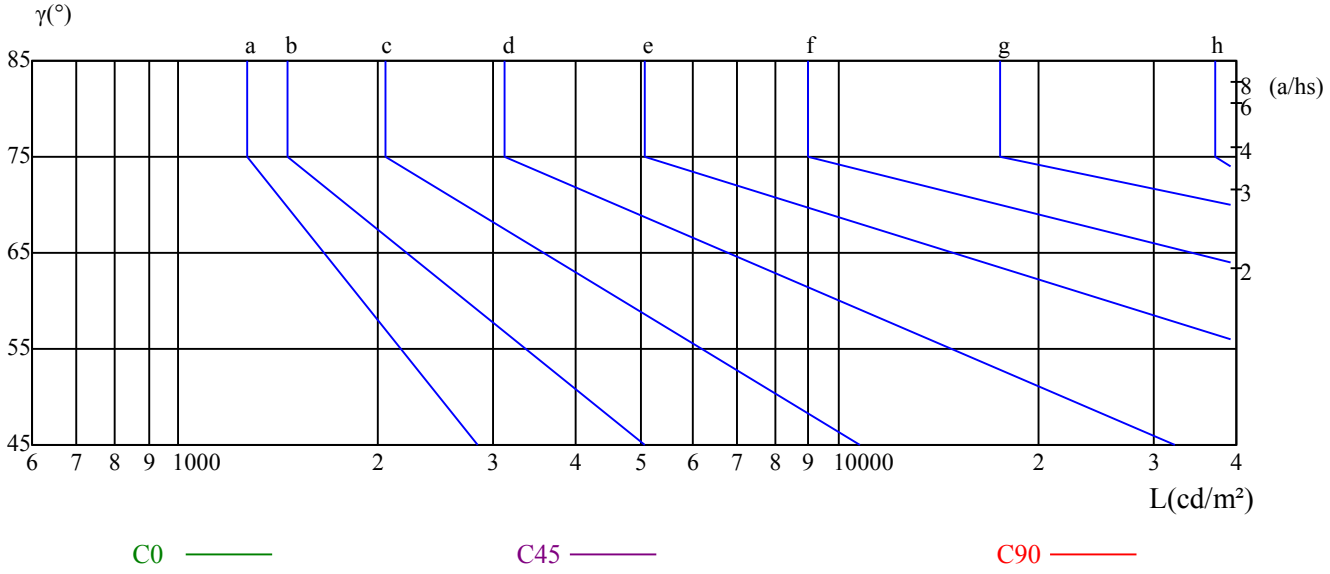
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

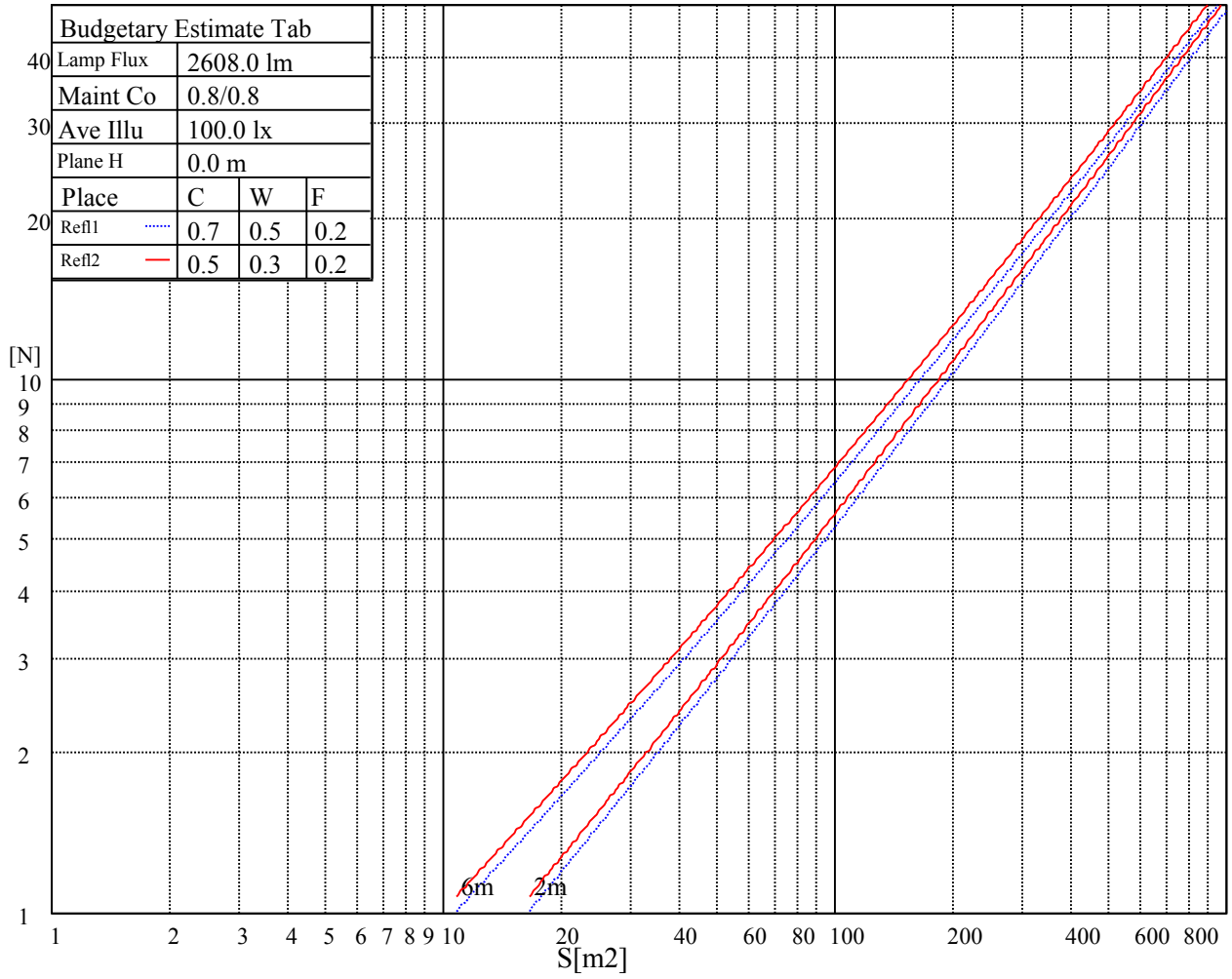
Glare Table

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 Limitting Curve



Budgetary Estimate Table

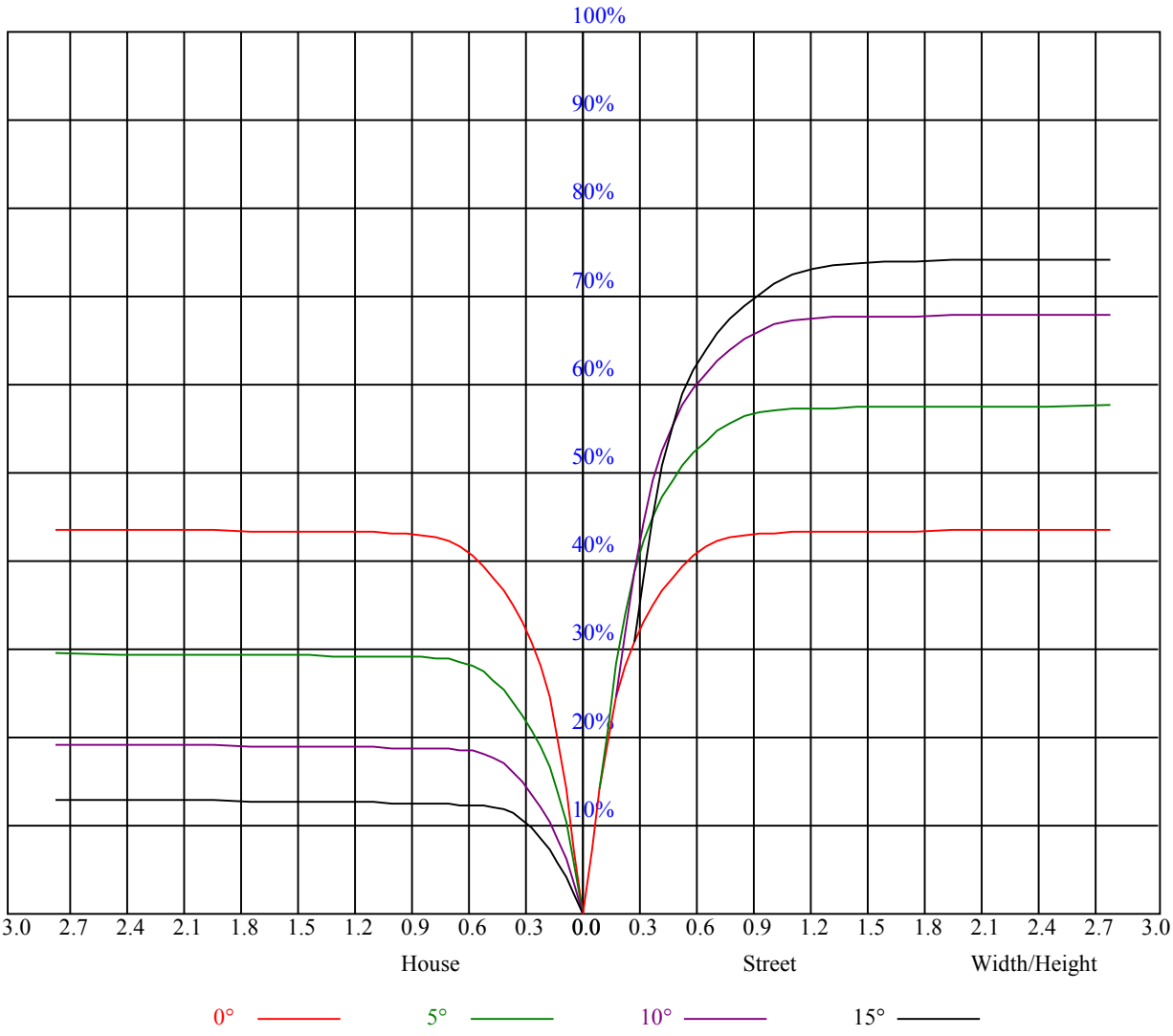


Equipment: GMS1980 Date: 2019/12/30 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Utilization factor table for indoor luminaire

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	COEFFCIENTS OF UTILIZATION RHOFC=20 CU															
0	1.04	1.04	1.04	1.02	1.02	1.02	0.98	0.98	0.98	0.93	0.93	0.93	0.90	0.90	0.90	0.88
1	0.98	0.96	0.94	0.96	0.95	0.93	0.93	0.91	0.90	0.89	0.88	0.87	0.87	0.86	0.85	0.83
2	0.93	0.90	0.87	0.91	0.88	0.86	0.88	0.86	0.84	0.86	0.84	0.83	0.84	0.82	0.81	0.79
3	0.88	0.84	0.81	0.87	0.83	0.81	0.85	0.82	0.79	0.82	0.80	0.78	0.81	0.79	0.77	0.76
4	0.84	0.80	0.77	0.83	0.79	0.76	0.81	0.78	0.75	0.79	0.77	0.75	0.78	0.76	0.74	0.73
5	0.80	0.76	0.73	0.79	0.75	0.72	0.78	0.74	0.72	0.76	0.73	0.71	0.75	0.73	0.71	0.70
6	0.77	0.72	0.69	0.76	0.72	0.69	0.75	0.71	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.67
7	0.74	0.69	0.66	0.73	0.69	0.66	0.72	0.68	0.66	0.71	0.68	0.66	0.70	0.67	0.65	0.64
8	0.71	0.67	0.64	0.70	0.66	0.64	0.69	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.62
9	0.68	0.64	0.61	0.68	0.64	0.61	0.67	0.64	0.61	0.66	0.63	0.61	0.66	0.63	0.61	0.60
10	0.66	0.62	0.59	0.66	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.64	0.61	0.59	0.58

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2019/12/30	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

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	11171.25	10901.25	10428.75	9916.88	9275.63	8392.50	7385.63	6435.00	5377.50
45.0	11205.00	10923.75	10513.13	10035.00	9427.50	8606.25	7644.38	6553.13	5591.25
90.0	11133.56	10983.38	10724.63	10243.69	9722.81	9082.13	8098.88	7192.13	6236.44
135.0	11093.63	11213.44	11175.19	11005.88	10731.38	10301.63	9716.06	8943.19	8137.69
180.0	11171.25	11334.38	11356.88	11224.69	10992.94	10657.13	10059.75	9419.06	8638.31
225.0	11205.00	11334.38	11345.63	11196.00	10937.81	10559.81	9918.00	9253.69	8453.81
270.0	11133.56	11166.19	11053.13	10830.94	10496.81	9968.63	9271.69	8424.56	7572.94
315.0	11093.63	10873.69	10546.88	9982.69	9385.88	8649.00	7595.44	6686.44	5753.81
360.0	11171.25	10901.25	10428.75	9916.88	9275.63	8392.50	7385.63	6435.00	5377.50

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4426.88	3740.63	3121.88	2891.25	2292.19	1975.50	1756.13	1582.31	1412.44
45.0	4618.13	3808.13	3223.13	2863.13	2355.75	2032.88	1806.75	1648.69	1448.44
90.0	5189.63	4284.56	3632.06	3045.38	2580.75	2249.44	1953.00	1744.88	1557.56
135.0	7139.81	6191.44	5135.63	4322.81	3504.38	2984.63	2566.13	2232.00	1905.75
180.0	7626.38	6528.38	5562.56	4594.50	3801.38	3229.31	2713.50	2346.75	2021.06
225.0	7421.06	6325.31	5384.81	4455.00	3688.88	3143.81	2652.19	2298.94	1985.63
270.0	6552.56	5630.63	4683.94	3975.75	3321.00	2793.94	2419.31	2149.88	1819.69
315.0	4769.44	3947.06	3359.81	2829.94	2409.75	2115.56	1853.44	1665.56	1494.00
360.0	4426.88	3740.63	3121.88	2891.25	2292.19	1975.50	1756.13	1582.31	1412.44

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1306.13	1218.38	1128.38	1065.38	1012.50	964.69	923.63	895.50	870.19
45.0	1329.19	1232.44	1137.38	1065.94	1011.38	959.63	918.00	889.31	864.00
90.0	1406.25	1297.13	1207.69	1110.60	1048.73	996.02	944.55	910.29	882.84
135.0	1693.69	1537.31	1379.25	1278.00	1188.56	1104.19	1037.25	988.88	945.00
180.0	1764.56	1586.81	1443.38	1304.44	1213.88	1119.09	1058.23	1005.98	962.94
225.0	1745.44	1577.81	1440.56	1304.44	1215.00	1119.26	1049.96	1006.03	964.46
270.0	1637.44	1506.94	1344.38	1248.75	1177.31	1092.94	1029.38	987.19	939.38
315.0	1361.25	1263.38	1122.02	1088.72	1029.71	981.17	932.46	901.80	877.44
360.0	1306.13	1218.38	1128.38	1065.38	1012.50	964.69	923.63	895.50	870.19

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	849.94	833.63	815.63	799.88	759.38	697.50	630.00	556.31	459.56
45.0	845.44	826.31	807.75	793.13	752.63	689.63	623.81	551.81	457.31
90.0	858.60	838.80	822.04	804.21	787.95	741.60	676.91	609.69	526.22
135.0	911.25	882.00	858.94	842.06	823.50	807.19	788.06	750.94	669.38
180.0	918.00	889.82	867.04	843.81	829.18	810.34	789.36	755.61	694.18
225.0	923.96	894.21	873.96	854.94	837.51	819.51	799.99	748.58	680.46
270.0	909.00	885.94	863.44	847.13	830.81	812.25	774.56	720.56	639.56
315.0	853.65	836.94	821.19	802.86	778.16	724.22	642.49	578.48	490.39
360.0	849.94	833.63	815.63	799.88	759.38	697.50	630.00	556.31	459.56

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	380.81	302.63	245.81	137.70	81.00	37.58	24.75	22.11	18.73
45.0	379.69	306.00	297.00	145.80	89.83	42.75	26.38	23.34	19.58
90.0	440.44	365.96	289.41	198.51	134.49	78.69	33.02	25.26	22.50
135.0	599.63	534.94	437.06	349.88	292.50	187.71	114.24	63.34	29.64
180.0	610.82	546.86	470.48	365.12	297.96	222.86	145.69	80.94	41.18
225.0	609.86	525.04	448.37	359.66	274.89	202.67	138.04	71.10	35.83
270.0	567.00	489.38	388.69	311.63	291.38	154.52	89.44	45.84	25.31
315.0	393.41	325.35	249.24	152.33	99.11	51.53	25.37	21.66	19.29
360.0	380.81	302.63	245.81	137.70	81.00	37.58	24.75	22.11	18.73

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	16.59	14.85	13.56	13.16	12.88	12.54	12.26	12.04	11.81
45.0	16.88	14.79	13.95	13.56	13.33	12.94	12.66	12.43	12.15
90.0	18.73	16.48	15.02	14.29	14.01	13.61	13.22	12.94	12.71
135.0	23.79	20.70	17.49	15.69	14.68	13.56	13.22	12.99	12.66
180.0	25.71	22.11	18.68	15.81	14.51	13.50	13.11	12.88	12.60
225.0	26.27	22.33	19.13	17.10	14.68	13.78	13.44	13.11	12.83
270.0	22.95	20.08	17.66	16.48	14.51	14.01	13.67	13.33	12.94
315.0	16.82	15.24	13.73	13.33	13.05	12.71	12.43	12.21	11.98
360.0	16.59	14.85	13.56	13.16	12.88	12.54	12.26	12.04	11.81

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	11.64	11.48	11.36	11.19	11.08	11.03	10.91	10.86	10.74
45.0	11.98	11.76	11.64	11.48	11.36	11.19	11.14	11.03	10.91
90.0	12.43	12.21	12.04	11.76	11.64	11.53	11.36	11.25	11.19
135.0	12.38	12.15	11.98	11.76	11.59	11.42	11.31	11.19	11.08
180.0	12.32	12.09	11.87	11.70	11.53	11.42	11.25	11.14	11.03
225.0	12.54	12.32	12.04	11.87	11.64	11.48	11.36	11.25	11.14
270.0	12.71	12.43	12.21	11.98	11.87	11.64	11.48	11.36	11.25
315.0	11.76	11.59	11.48	11.31	11.19	11.08	11.03	10.91	10.80
360.0	11.64	11.48	11.36	11.19	11.08	11.03	10.91	10.86	10.74

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.69	10.63	10.58	10.52	10.46	10.46	10.41	10.41	10.41
45.0	10.91	10.86	10.74	10.74	10.63	10.63	10.58	10.52	10.52
90.0	11.08	11.03	10.91	10.86	10.80	10.74	10.69	10.63	10.63
135.0	11.03	10.91	10.86	10.80	10.74	10.69	10.63	10.58	10.52
180.0	10.91	10.86	10.74	10.69	10.69	10.58	10.58	10.52	10.46
225.0	11.03	10.97	10.86	10.80	10.74	10.69	10.63	10.63	10.58
270.0	11.14	11.08	10.97	10.91	10.86	10.80	10.74	10.69	10.63
315.0	10.74	10.69	10.69	10.58	10.58	10.52	10.46	10.46	10.41
360.0	10.69	10.63	10.58	10.52	10.46	10.46	10.41	10.41	10.41

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.35	10.35	10.29	10.29	10.29	10.29	10.24	10.24	10.24
45.0	10.46	10.46	10.46	10.41	10.41	10.35	10.41	10.35	10.35
90.0	10.58	10.58	10.52	10.52	10.46	10.46	10.41	10.41	10.41
135.0	10.46	10.46	10.46	10.46	10.35	10.35	10.35	10.35	10.35
180.0	10.46	10.41	10.41	10.41	10.35	10.35	10.35	10.29	10.29
225.0	10.52	10.46	10.46	10.46	10.46	10.41	10.41	10.41	10.35
270.0	10.63	10.58	10.52	10.52	10.52	10.46	10.46	10.46	10.41
315.0	10.41	10.41	10.41	10.35	10.29	10.29	10.29	10.29	10.29
360.0	10.35	10.35	10.29	10.29	10.29	10.29	10.24	10.24	10.24

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.24	10.24	10.18	10.18	10.18	10.18	10.18	10.18	10.18
45.0	10.35	10.35	10.29	10.29	10.24	10.24	10.24	10.24	10.29
90.0	10.41	10.41	10.41	10.35	10.29	10.24	10.29	10.24	10.24
135.0	10.35	10.35	10.35	10.29	10.29	10.29	10.29	10.24	10.24
180.0	10.24	10.29	10.24	10.24	10.18	10.24	10.24	10.24	10.18
225.0	10.35	10.35	10.35	10.35	10.35	10.29	10.29	10.29	10.24
270.0	10.41	10.41	10.41	10.41	10.41	10.35	10.29	10.29	10.29
315.0	10.29	10.24	10.24	10.29	10.24	10.29	10.24	10.24	10.24
360.0	10.24	10.24	10.18	10.18	10.18	10.18	10.18	10.18	10.18

Intensity data(cd)

C/γ(°)	90.0
0.0	10.18
45.0	10.29
90.0	10.24
135.0	10.24
180.0	10.18
225.0	10.29
270.0	10.24
315.0	10.24
360.0	10.18