NATA LIGHTING CO.,LTD
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Nata

Client:
LumCAT: 1709-M2
Luminaire: 92.70.125.00+92.70.152.00

Report No: 200915-B016	Voltage(V): 34.9900
Test No: 200914-C016	Current(A): 0.3700
LampCAT: Vesta DW LES9 Gen2 PD	Power (W): 12.9460
Lamp flux(lm): 1286.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 0	Width(mm): 0
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1104.12, Efficiency(%): 85.86% , Luminous Efficacy(lm/W): 85.29
Central intensity(cd): 2488.430, Maximum intensity(cd): 2488.430
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=22.8
[C90/270]Total=22.8
Field angle(10%Imax): [C0/180]Total=83.0
[C90/270]Total=83.0
Maximum s/h(1/2): C0_180=0.38 C90_270=0.38
Maximum s/h(1/4): C0_180=0.48 C90_270=0.48
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 85.86%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.420%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	2488.430	0.000	0	.000%	.000%
1.0	2474.578	2.375	2.375	.185%	.215%
2.0	2425.008	7.032	9.407	.547%	.852%
3.0	2342.813	11.403	20.81	.887%	1.885%
4.0	2239.102	15.337	36.147	1.193%	3.274%
5.0	2122.242	18.762	54.91	1.459%	4.973%
6.0	1969.242	21.502	76.411	1.672%	6.921%
7.0	1825.453	23.554	99.965	1.832%	9.054%
8.0	1689.328	25.155	125.12	1.956%	11.332%
9.0	1549.195	26.246	151.366	2.041%	13.709%
10.0	1408.922	26.770	178.136	2.082%	16.134%
11.0	1296.281	27.031	205.166	2.102%	18.582%
12.0	1177.348	27.040	232.207	2.103%	21.031%
13.0	1088.205	26.886	259.093	2.091%	23.466%
14.0	1012.219	26.885	285.978	2.091%	25.901%
15.0	944.508	26.863	312.841	2.089%	28.334%
16.0	879.792	26.731	339.572	2.079%	30.755%
17.0	819.900	26.469	366.041	2.058%	33.152%
18.0	772.538	26.256	392.297	2.042%	35.530%
19.0	728.522	26.115	418.412	2.031%	37.896%
20.0	690.230	25.967	444.379	2.019%	40.247%
21.0	656.409	25.858	470.238	2.011%	42.589%
22.0	625.929	25.769	496.007	2.004%	44.923%
23.0	599.386	25.710	521.717	1.999%	47.252%
24.0	573.933	25.653	547.37	1.995%	49.575%
25.0	551.299	25.585	572.955	1.990%	51.893%
26.0	530.297	25.531	598.487	1.985%	54.205%
27.0	509.934	25.449	623.936	1.979%	56.510%
28.0	487.294	25.248	649.184	1.963%	58.797%
29.0	468.190	24.998	674.182	1.944%	61.061%
30.0	450.513	24.805	698.987	1.929%	63.307%
31.0	433.069	24.589	723.576	1.912%	65.534%
32.0	418.134	24.386	747.962	1.896%	67.743%
33.0	404.332	24.230	772.192	1.884%	69.937%
34.0	391.008	24.069	796.261	1.872%	72.117%
35.0	375.736	23.812	820.073	1.852%	74.274%
36.0	360.401	23.439	843.512	1.823%	76.397%
37.0	344.595	22.993	866.505	1.788%	78.479%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	327.347	22.428	888.933	1.744%	80.511%
39.0	305.508	21.601	910.535	1.680%	82.467%
40.0	284.590	20.581	931.115	1.600%	84.331%
41.0	265.479	19.588	950.703	1.523%	86.105%
42.0	234.316	18.158	968.861	1.412%	87.750%
43.0	206.283	16.321	985.182	1.269%	89.228%
44.0	181.920	14.652	999.834	1.139%	90.555%
45.0	158.189	13.071	1012.905	1.016%	91.739%
46.0	132.792	11.380	1024.284	.885%	92.770%
47.0	113.048	9.778	1034.062	.760%	93.655%
48.0	95.358	8.425	1042.487	.655%	94.418%
49.0	80.079	7.204	1049.691	.560%	95.071%
50.0	66.874	6.127	1055.818	.476%	95.626%
51.0	57.178	5.248	1061.067	.408%	96.101%
52.0	49.092	4.560	1065.627	.355%	96.514%
53.0	42.363	3.978	1069.605	.309%	96.874%
54.0	36.591	3.480	1073.085	.271%	97.189%
55.0	31.936	3.059	1076.144	.238%	97.466%
56.0	27.977	2.707	1078.852	.211%	97.712%
57.0	23.948	2.374	1081.226	.185%	97.927%
58.0	20.672	2.063	1083.289	.160%	98.114%
59.0	17.993	1.808	1085.097	.141%	98.277%
60.0	15.441	1.580	1086.676	.123%	98.420%
61.0	12.973	1.356	1088.032	.105%	98.543%
62.0	10.920	1.151	1089.183	.090%	98.647%
63.0	9.021	0.970	1090.153	.075%	98.735%
64.0	7.151	0.794	1090.947	.062%	98.807%
65.0	5.920	0.647	1091.594	.050%	98.866%
66.0	5.203	0.555	1092.149	.043%	98.916%
67.0	4.823	0.504	1092.653	.039%	98.962%
68.0	4.739	0.484	1093.137	.038%	99.006%
69.0	4.718	0.482	1093.62	.038%	99.049%
70.0	4.711	0.484	1094.104	.038%	99.093%
71.0	4.697	0.486	1094.59	.038%	99.137%
72.0	4.690	0.488	1095.078	.038%	99.181%
73.0	4.683	0.490	1095.568	.038%	99.226%
74.0	4.676	0.492	1096.06	.038%	99.270%
75.0	4.669	0.494	1096.554	.038%	99.315%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	4.676	0.496	1097.05	.039%	99.360%
77.0	4.669	0.498	1097.548	.039%	99.405%
78.0	4.683	0.501	1098.049	.039%	99.450%
79.0	4.697	0.504	1098.553	.039%	99.496%
80.0	4.711	0.507	1099.06	.039%	99.542%
81.0	4.732	0.511	1099.571	.040%	99.588%
82.0	4.746	0.514	1100.085	.040%	99.635%
83.0	4.760	0.517	1100.602	.040%	99.682%
84.0	4.767	0.519	1101.121	.040%	99.729%
85.0	4.718	0.518	1101.638	.040%	99.775%
86.0	4.535	0.506	1102.144	.039%	99.821%
87.0	4.493	0.494	1102.638	.038%	99.866%
88.0	4.493	0.492	1103.13	.038%	99.911%
89.0	4.486	0.492	1103.623	.038%	99.955%
90.0	4.535	0.495	1104.117	.038%	100.000%

Zonal flux distribution table

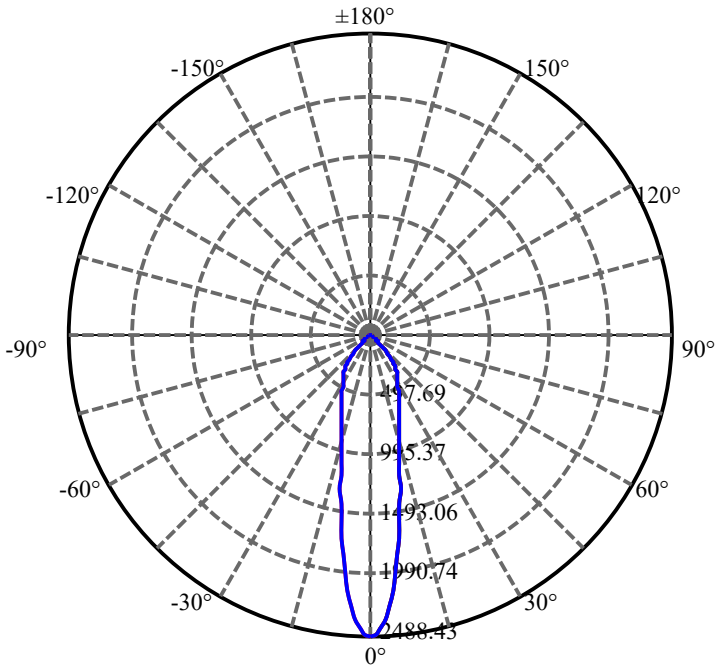
ZONAL LUMEN SUMMARY

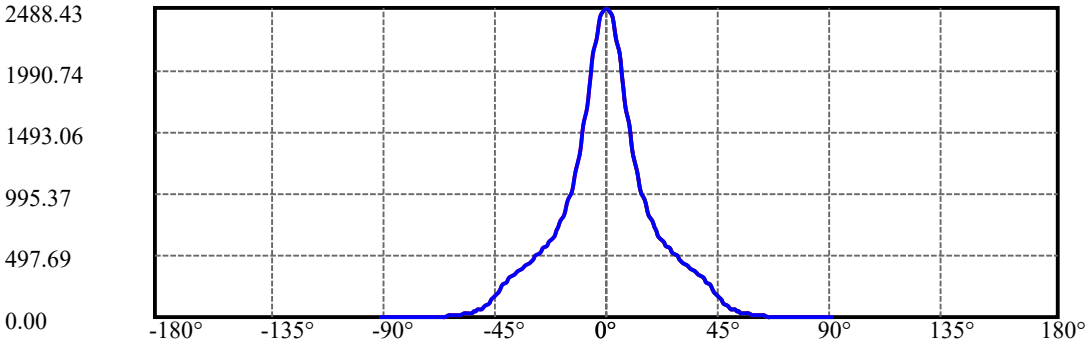
Zone	Lumens	%Lamp	%Fixt
0-30	698.99	54.35%	63.31%
0-40	931.12	72.40%	84.33%
0-60	1086.68	84.50%	98.42%
0-90	1103.62	85.82%	99.96%
0-120	1103.62	85.82%	99.96%
0-180	1104.12	85.86%	100.00%
60-90	18.53	1.44%	1.68%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-37.75	883.29	68.69%	80.00%

ZONAL LUMEN SUMMARY

0-10	178.14
10-20	266.24
20-30	254.61
30-40	232.13
40-50	124.70
50-60	30.86
60-70	7.43
70-80	4.96
80-90	4.56
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:

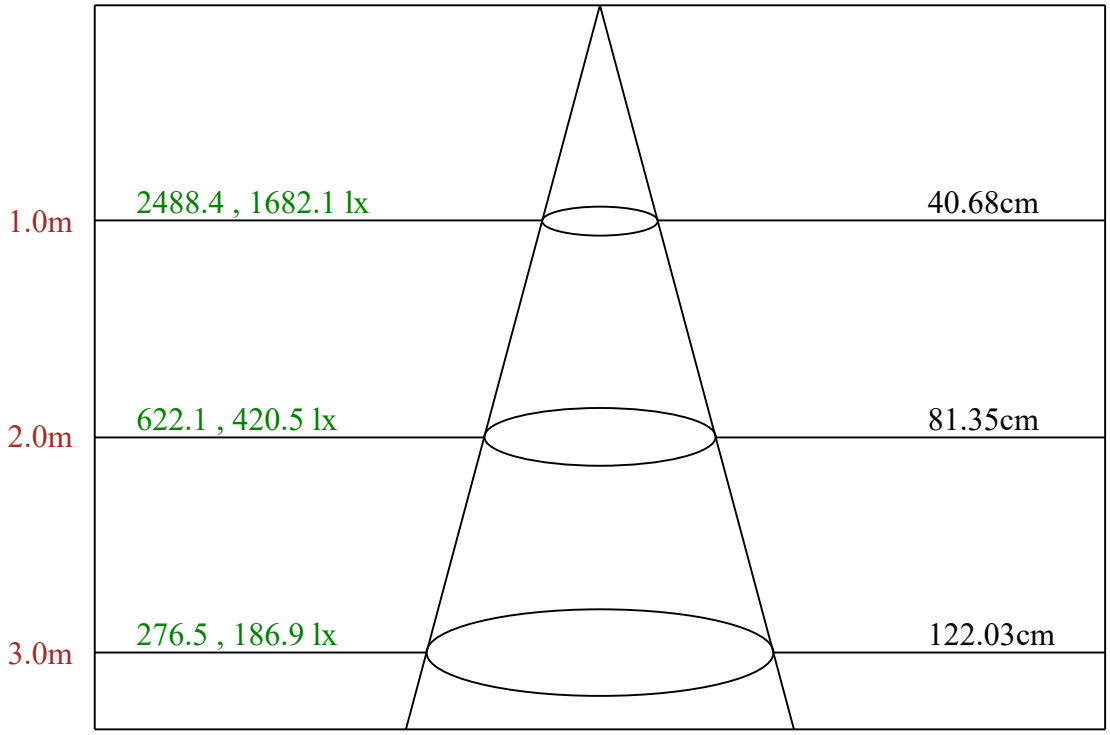
C90/C270:

Field angle(10%Imax):C0/180Left:41.5 Right:41.5
:C90/270Left:41.5 Right:41.5

Beam Angle(50%Imax):C0/180Left:11.4 Right:11.4
:C90/270Left:11.4 Right:11.4

Equipment: GMS1980 Date: 2020/9/14 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Lux distance Curve



Max , Ave

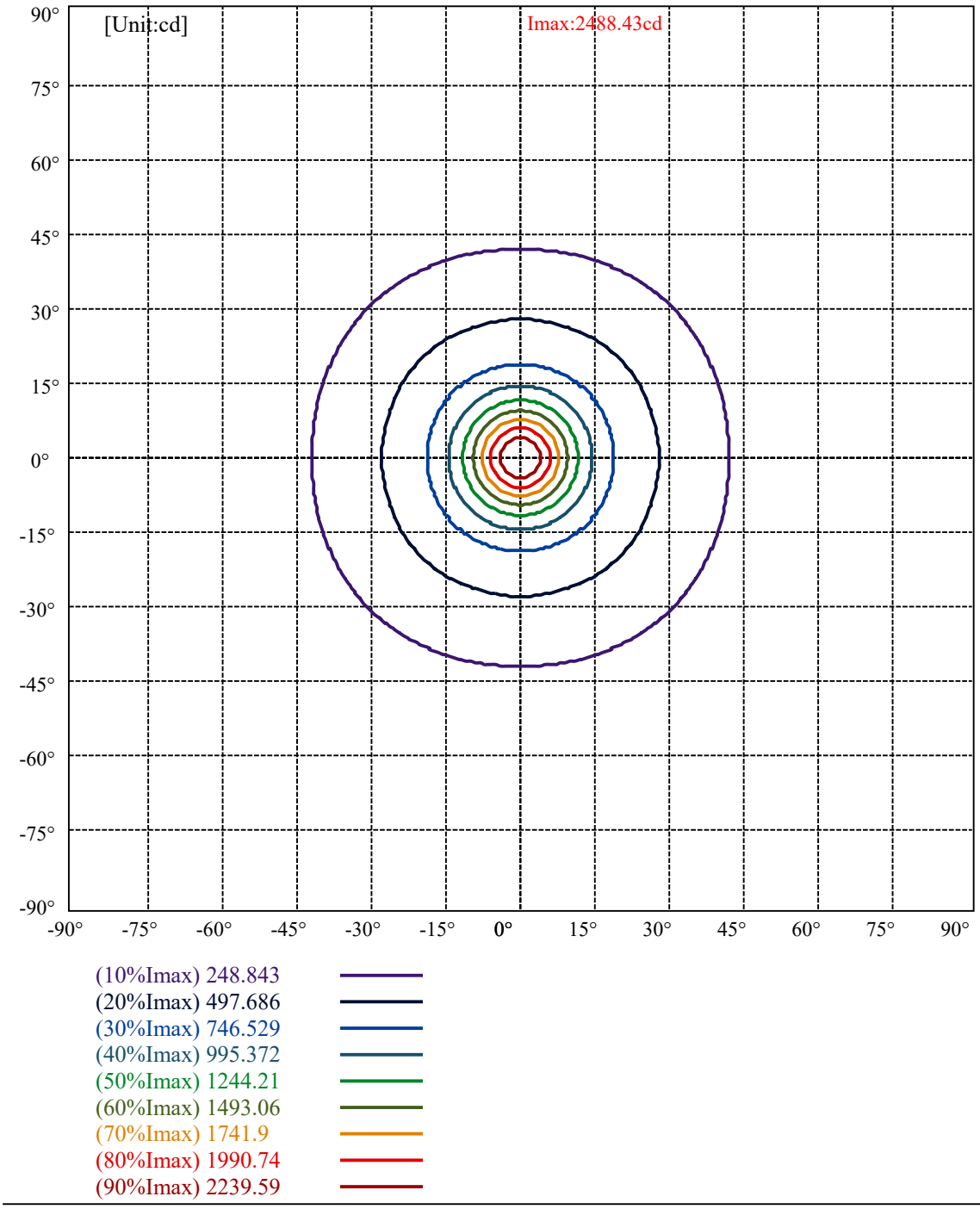
Beam angle of C0 plane 22.99

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2020/9/14
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO-Intensity(V-H)

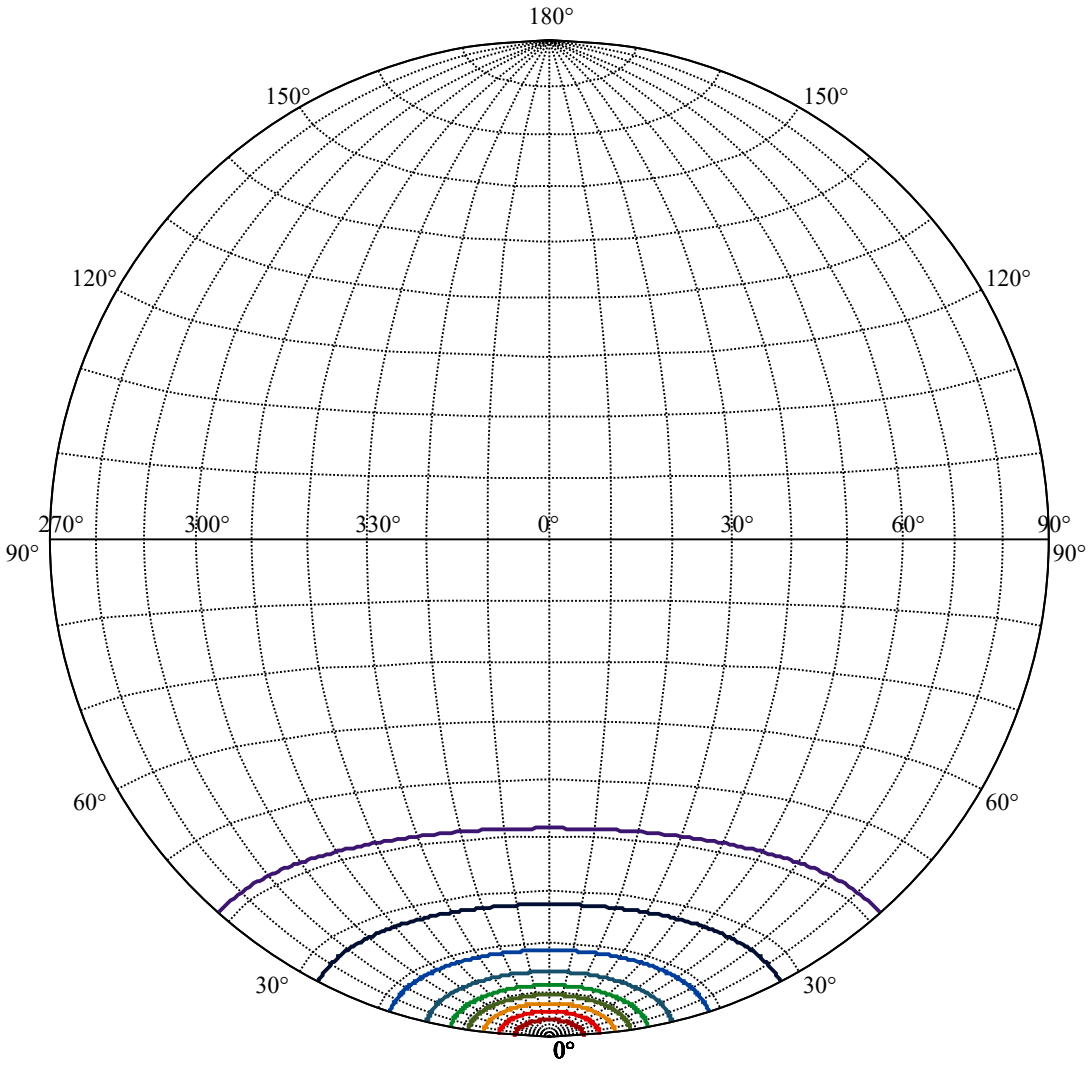


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2020/9/14
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

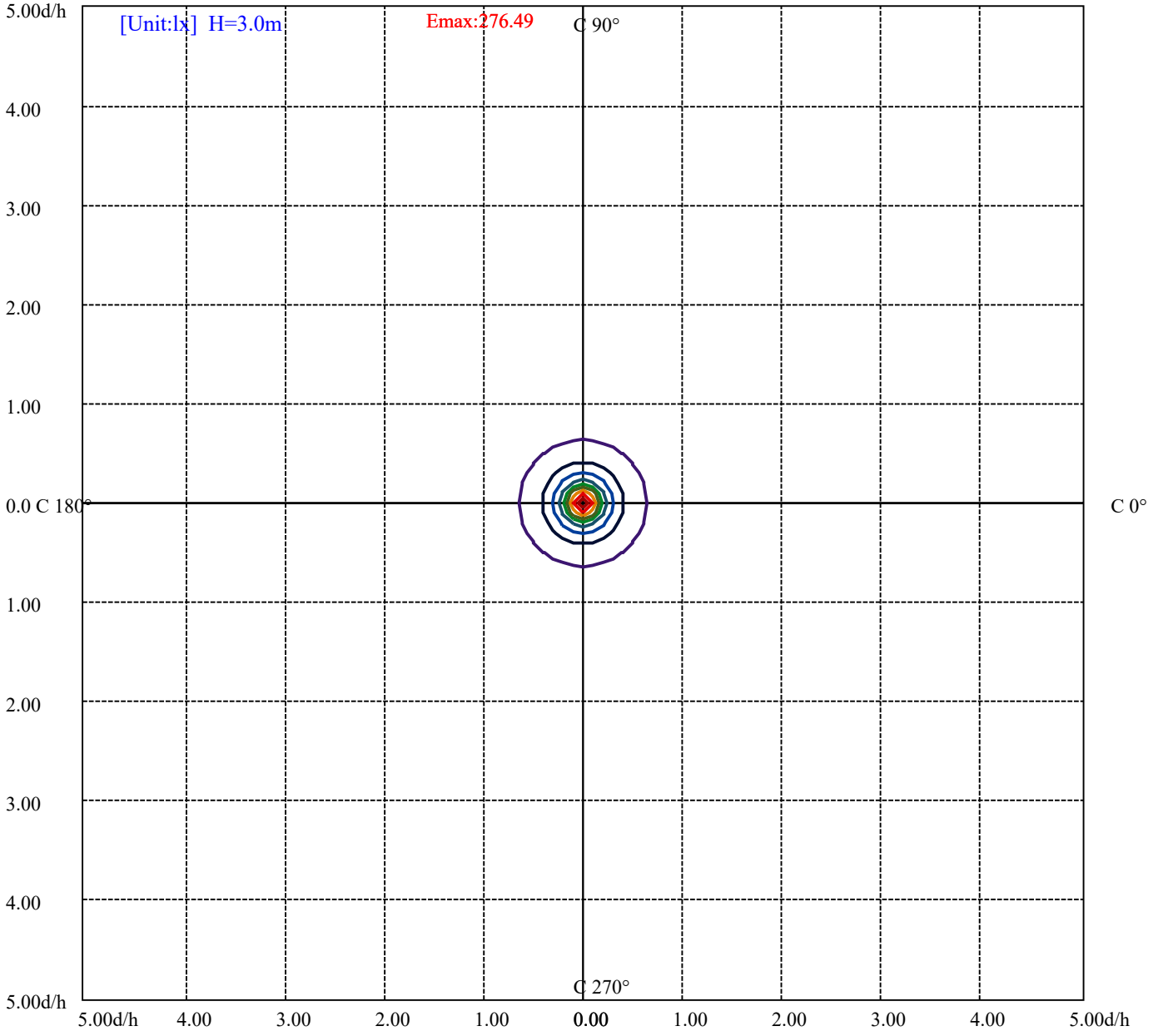
Imax:2488.43

(10%Imax) 248.843
(20%Imax) 497.686
(30%Imax) 746.529
(40%Imax) 995.372
(50%Imax) 1244.21
(60%Imax) 1493.06
(70%Imax) 1741.9
(80%Imax) 1990.74
(90%Imax) 2239.59

Equipment: GMS1980 Date: 2020/9/14 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Nata 1709-M2

ISO illuminance diagram



Equipment: GMS1980
Date: 2020/9/14
Operator: NT07
Temperature(°C): 25.0
Humidity(%): 65.0%
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

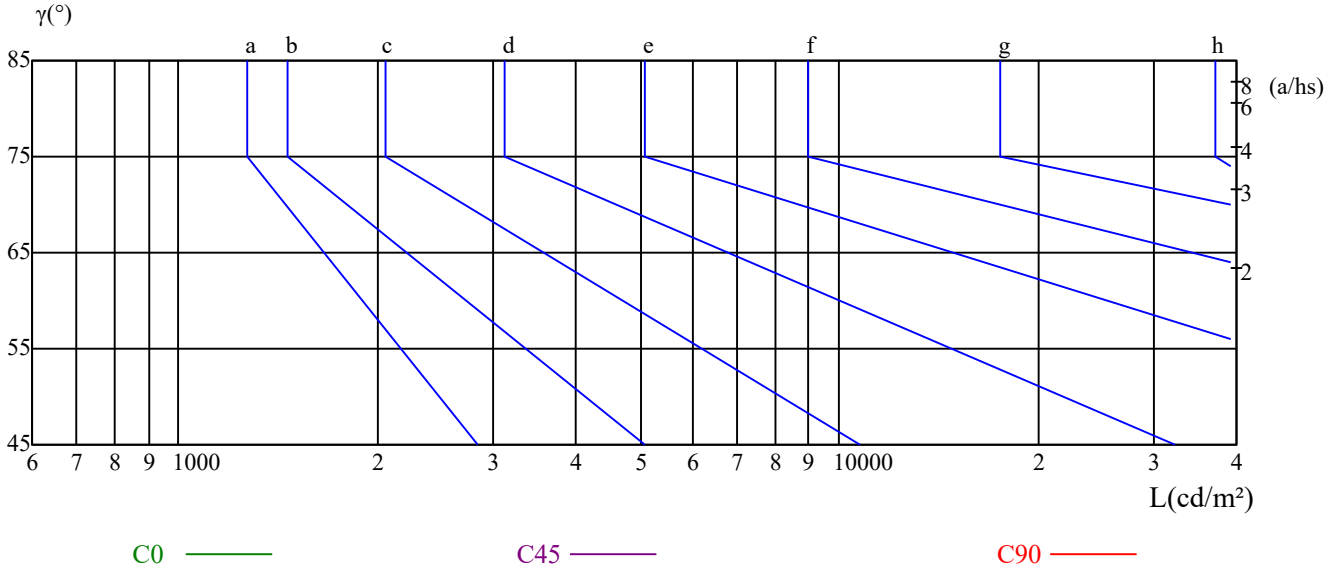
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

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

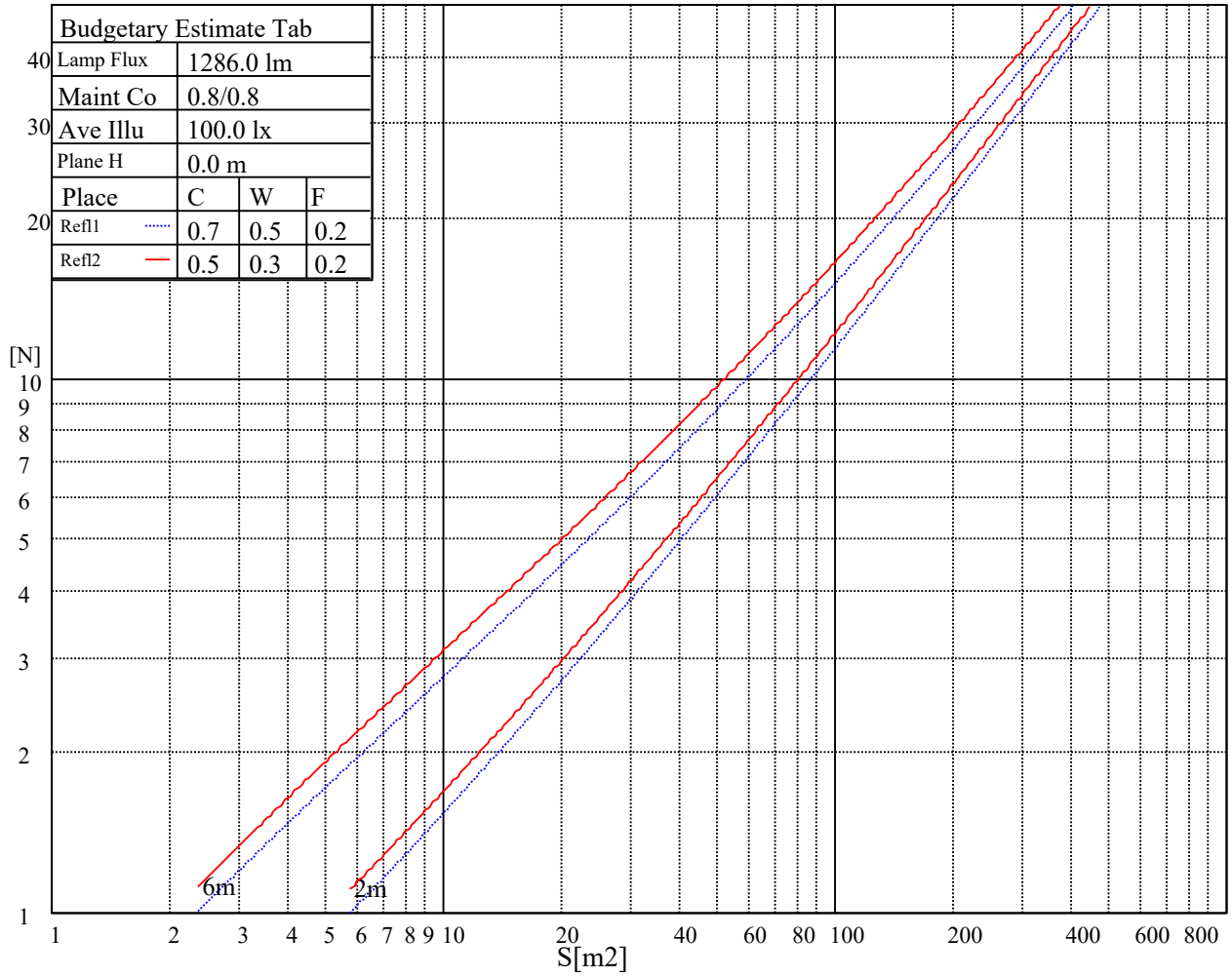
Glare Table

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: 2020/9/14 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	1.02	1.02	1.02	1.00	1.00	1.00	0.95	0.95	0.95	0.91	0.91	0.91	0.88	0.88	0.88	0.86
1	0.95	0.92	0.90	0.93	0.91	0.89	0.89	0.88	0.86	0.86	0.85	0.84	0.83	0.82	0.81	0.80
2	0.88	0.84	0.81	0.86	0.83	0.80	0.83	0.81	0.78	0.81	0.79	0.77	0.78	0.77	0.75	0.74
3	0.82	0.77	0.74	0.80	0.76	0.73	0.78	0.75	0.72	0.76	0.73	0.71	0.74	0.72	0.70	0.68
4	0.76	0.71	0.67	0.75	0.70	0.67	0.73	0.69	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.63
5	0.71	0.66	0.62	0.70	0.65	0.62	0.69	0.64	0.61	0.67	0.64	0.61	0.66	0.63	0.60	0.59
6	0.67	0.61	0.58	0.66	0.61	0.57	0.65	0.60	0.57	0.63	0.60	0.57	0.62	0.59	0.56	0.55
7	0.63	0.57	0.54	0.62	0.57	0.54	0.61	0.57	0.53	0.60	0.56	0.53	0.59	0.55	0.53	0.51
8	0.59	0.54	0.50	0.59	0.54	0.50	0.58	0.53	0.50	0.57	0.53	0.50	0.56	0.52	0.50	0.48
9	0.56	0.51	0.47	0.56	0.51	0.47	0.55	0.50	0.47	0.54	0.50	0.47	0.53	0.49	0.47	0.46
10	0.53	0.48	0.45	0.53	0.48	0.45	0.52	0.48	0.45	0.51	0.47	0.44	0.51	0.47	0.44	0.43

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	2483.44	2485.13	2445.19	2381.06	2280.38	2169.56	2035.13	1890.56	1760.63
45.0	2494.13	2495.25	2458.69	2396.81	2298.38	2192.63	2054.81	1923.75	1775.25
90.0	2491.31	2478.94	2427.19	2347.31	2254.50	2140.88	1971.56	1830.38	1685.81
135.0	2484.00	2478.94	2436.75	2378.25	2264.06	2153.25	2023.31	1846.13	1703.25
180.0	2485.13	2448.56	2389.50	2274.19	2161.13	2035.69	1879.88	1722.94	1588.50
225.0	2494.13	2467.13	2403.56	2298.94	2187.00	2056.50	1883.25	1751.06	1620.56
270.0	2491.31	2480.63	2435.63	2364.19	2255.06	2139.75	1993.50	1841.06	1712.81
315.0	2484.00	2462.06	2403.56	2301.75	2212.31	2089.69	1912.50	1797.75	1667.81
360.0	2483.44	2485.13	2445.19	2381.06	2280.38	2169.56	2035.13	1890.56	1760.63

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	1621.69	1488.94	1382.63	1296.00	1172.25	1092.38	1028.81	947.25	882.56
45.0	1630.69	1505.25	1373.06	1269.56	1153.69	1071.56	999.00	934.31	860.63
90.0	1526.63	1380.38	1261.69	1117.52	1042.03	965.70	891.68	837.62	783.68
135.0	1566.56	1404.00	1281.94	1173.38	1056.94	977.63	909.56	844.88	789.19
180.0	1460.81	1318.50	1218.38	1115.44	1031.40	960.81	898.59	836.27	783.56
225.0	1480.50	1351.69	1250.44	1117.29	1059.92	990.06	921.77	866.64	808.43
270.0	1563.75	1425.94	1311.19	1211.06	1101.38	1023.19	955.69	887.63	828.56
315.0	1542.94	1396.69	1290.94	1118.53	1088.04	1016.44	950.96	883.74	822.60
360.0	1621.69	1488.94	1382.63	1296.00	1172.25	1092.38	1028.81	947.25	882.56

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	837.56	780.75	736.31	707.06	669.94	644.06	620.44	592.88	571.50
45.0	805.50	759.38	709.31	672.19	642.38	606.38	580.50	561.94	536.06
90.0	737.78	701.10	668.64	634.16	609.02	584.89	558.06	538.37	519.53
135.0	742.50	702.56	666.00	636.19	607.50	581.63	558.56	537.19	519.75
180.0	740.76	698.51	666.17	634.05	605.98	583.31	558.62	533.19	510.64
225.0	756.90	718.48	684.45	645.30	618.13	592.43	565.26	543.43	524.19
270.0	784.13	739.69	701.44	669.94	636.19	610.88	583.88	561.38	537.19
315.0	775.18	727.71	689.51	652.39	618.30	591.53	566.16	542.03	523.52
360.0	837.56	780.75	736.31	707.06	669.94	644.06	620.44	592.88	571.50

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	547.31	516.94	492.19	469.13	444.94	428.63	414.00	399.38	385.31
45.0	516.94	499.50	475.88	459.00	441.00	426.94	412.88	399.94	383.63
90.0	498.04	480.26	465.24	445.84	434.31	419.79	406.29	396.00	382.95
135.0	502.88	483.19	465.75	450.56	432.56	419.63	406.69	392.63	379.13
180.0	487.63	458.78	438.75	420.47	403.03	386.16	372.94	358.76	343.58
225.0	501.92	480.21	462.04	444.32	428.96	412.99	397.46	384.24	365.06
270.0	518.63	495.00	479.25	463.50	445.50	432.56	419.63	407.25	391.50
315.0	506.14	484.48	466.43	451.29	434.25	418.39	404.78	389.87	374.74
360.0	547.31	516.94	492.19	469.13	444.94	428.63	414.00	399.38	385.31

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	372.94	360.00	347.06	330.75	312.19	289.69	270.56	231.81	206.78
45.0	367.31	351.56	332.44	312.19	294.75	284.06	236.08	212.34	184.67
90.0	366.08	353.31	333.90	306.11	287.66	263.42	236.48	209.48	185.74
135.0	362.81	343.69	326.25	306.56	284.06	269.44	233.04	206.38	183.26
180.0	331.59	316.52	301.89	281.81	257.18	233.33	209.36	180.34	157.78
225.0	344.98	328.67	310.33	285.08	263.48	239.91	213.41	186.86	163.80
270.0	378.00	362.25	343.13	318.38	295.88	284.06	238.67	214.76	188.16
315.0	359.49	340.76	323.78	303.19	281.53	259.93	236.93	208.29	185.18
360.0	372.94	360.00	347.06	330.75	312.19	289.69	270.56	231.81	206.78

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	181.52	150.86	129.04	108.79	88.82	73.41	62.72	52.93	45.39
45.0	160.43	135.34	113.46	96.08	81.79	67.33	57.71	50.23	42.47
90.0	159.41	134.72	114.41	94.84	80.83	67.95	57.26	49.89	43.59
135.0	160.76	133.71	114.53	97.43	80.55	67.50	57.94	49.16	42.19
180.0	136.18	112.50	95.91	81.17	66.54	57.04	48.94	41.23	36.73
225.0	139.16	117.28	99.96	81.84	71.38	59.68	50.74	44.21	38.48
270.0	165.60	141.53	119.64	102.15	86.85	71.61	61.37	53.27	44.89
315.0	162.45	136.41	117.45	100.58	83.87	70.48	60.75	51.81	45.17
360.0	181.52	150.86	129.04	108.79	88.82	73.41	62.72	52.93	45.39

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	39.77	34.43	30.49	26.49	22.95	20.14	17.21	14.57	12.43
45.0	37.24	32.85	28.52	24.81	21.71	18.68	16.09	14.12	11.93
90.0	36.96	32.51	28.52	24.02	20.76	17.94	15.53	12.83	10.80
135.0	36.79	31.73	27.84	23.91	20.53	17.83	15.30	13.16	11.19
180.0	31.73	27.11	24.30	21.04	17.78	15.81	13.73	11.08	9.51
225.0	32.23	28.91	25.31	21.15	18.84	16.48	13.73	11.64	9.68
270.0	39.15	34.43	29.59	25.31	21.66	18.73	16.09	13.39	10.91
315.0	38.87	33.53	29.25	24.86	21.15	18.34	15.86	12.99	10.91
360.0	39.77	34.43	30.49	26.49	22.95	20.14	17.21	14.57	12.43

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.41	8.21	6.69	5.63	5.01	4.73	4.67	4.67	4.61
45.0	9.84	7.76	6.19	5.29	4.84	4.67	4.67	4.67	4.61
90.0	9.00	7.20	5.85	5.12	4.78	4.78	4.73	4.73	4.73
135.0	9.39	7.37	6.19	5.40	4.89	4.78	4.73	4.73	4.73
180.0	7.88	6.13	5.40	4.95	4.78	4.73	4.73	4.73	4.73
225.0	7.76	6.19	5.29	4.84	4.73	4.73	4.73	4.73	4.73
270.0	8.89	7.31	5.85	5.18	4.84	4.78	4.78	4.78	4.78
315.0	9.00	7.03	5.91	5.23	4.73	4.73	4.73	4.67	4.67
360.0	10.41	8.21	6.69	5.63	5.01	4.73	4.67	4.67	4.61

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	4.67	4.61	4.61	4.61	4.61	4.61	4.61	4.67	4.67
45.0	4.61	4.61	4.61	4.56	4.56	4.56	4.56	4.56	4.56
90.0	4.73	4.73	4.73	4.73	4.73	4.67	4.73	4.73	4.73
135.0	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67
180.0	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.73
225.0	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.78	4.84
270.0	4.78	4.78	4.78	4.78	4.78	4.78	4.84	4.84	4.84
315.0	4.67	4.67	4.61	4.61	4.67	4.67	4.67	4.67	4.67
360.0	4.67	4.61	4.61	4.61	4.61	4.61	4.61	4.67	4.67

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	4.67	4.67	4.73	4.78	4.73	4.50	4.50	4.50	4.50
45.0	4.56	4.56	4.50	4.56	4.56	4.50	4.50	4.44	4.50
90.0	4.73	4.73	4.73	4.67	4.56	4.50	4.50	4.50	4.50
135.0	4.73	4.73	4.67	4.67	4.61	4.61	4.50	4.50	4.50
180.0	4.73	4.73	4.78	4.78	4.84	4.61	4.50	4.50	4.50
225.0	4.89	4.95	5.01	5.06	5.12	4.56	4.50	4.50	4.44
270.0	4.84	4.84	4.84	4.84	4.78	4.50	4.50	4.50	4.44
315.0	4.73	4.78	4.84	4.78	4.56	4.50	4.44	4.50	4.50
360.0	4.67	4.67	4.73	4.78	4.73	4.50	4.50	4.50	4.50

Intensity data(cd)

C/γ(°)	90.0
0.0	4.50
45.0	4.44
90.0	4.44
135.0	4.50
180.0	4.89
225.0	4.50
270.0	4.50
315.0	4.50
360.0	4.50