NATA LIGHTING CO.,LTD.
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Nata

LumCAT: LN01D03517EE-N
Luminaire: 92.70.307.00
Report No: 210520-B005
Test No: 210520-C005
LampCAT: CITIZEN CLU7A2 LES4.5
Lamp flux(lm): 671.4
Number of Lamps: 1
Length(mm): 74
Phm Type: C

Voltage(V): 221.5000
Current(A): 0.0770
Power (W): 8.6000
PF: 0.5050
Ballast type: DC
Width(mm): 74
Height(mm): 56

Photometric Results

Lumens(lm): 454.25
Efficiency(%): 67.66%
Lumens(lm)/Power(W): 52.82
Central intensity(cd): 2388.656
Maximum intensity(cd): 2388.656
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=18.8
[C90/270]Total=18.8
Field angle(10%Imax): [C0/180]Total=40.5
[C90/270]Total=40.5
Maximum s/h(1/2): C0_180=0.32 C90_270=0.32
Maximum s/h(1/4): C0_180=0.34 C90_270=0.34
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 67.66%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 94.077%

Equipment: GMS1980
Temperature(°C): 25.0
Date: 2021/05/20
Humidity(%): 65.0%
Operator: NT07
Distance(m): 7.50

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	2388.656	0.000	0	.000%	.000%
1.0	2370.727	2.277	2.277	.339%	.501%
2.0	2305.617	6.712	8.989	1.000%	1.979%
3.0	2210.625	10.801	19.791	1.609%	4.357%
4.0	2091.656	14.401	34.192	2.145%	7.527%
5.0	1937.250	17.332	51.524	2.581%	11.343%
6.0	1768.852	19.477	71	2.901%	15.630%
7.0	1601.367	20.919	91.919	3.116%	20.235%
8.0	1411.748	21.564	113.484	3.212%	24.983%
9.0	1256.625	21.626	135.109	3.221%	29.743%
10.0	1100.602	21.332	156.441	3.177%	34.439%
11.0	931.148	20.301	176.743	3.024%	38.909%
12.0	824.407	19.191	195.933	2.858%	43.133%
13.0	705.094	18.151	214.085	2.703%	47.129%
14.0	600.384	16.710	230.795	2.489%	50.808%
15.0	517.134	15.342	246.137	2.285%	54.185%
16.0	445.148	14.100	260.237	2.100%	57.289%
17.0	378.738	12.830	273.067	1.911%	60.114%
18.0	328.451	11.660	284.727	1.737%	62.681%
19.0	284.520	10.664	295.391	1.588%	65.028%
20.0	248.372	9.753	305.145	1.453%	67.176%
21.0	210.776	8.817	313.961	1.313%	69.116%
22.0	185.709	7.968	321.929	1.187%	70.870%
23.0	163.013	7.317	329.246	1.090%	72.481%
24.0	143.037	6.691	335.937	.997%	73.954%
25.0	126.780	6.135	342.072	.914%	75.305%
26.0	113.126	5.663	347.735	.843%	76.552%
27.0	101.489	5.251	352.986	.782%	77.707%
28.0	91.013	4.874	357.86	.726%	78.780%
29.0	81.900	4.524	362.383	.674%	79.776%
30.0	74.496	4.223	366.606	.629%	80.706%
31.0	67.802	3.960	370.566	.590%	81.578%
32.0	61.538	3.705	374.272	.552%	82.393%
33.0	56.299	3.472	377.743	.517%	83.158%
34.0	51.645	3.267	381.01	.487%	83.877%
35.0	47.334	3.074	384.084	.458%	84.553%
36.0	43.636	2.897	386.98	.431%	85.191%
37.0	40.507	2.744	389.724	.409%	85.795%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	37.540	2.605	392.33	.388%	86.369%
39.0	34.552	2.461	394.79	.366%	86.910%
40.0	32.147	2.326	397.116	.346%	87.422%
41.0	30.122	2.217	399.334	.330%	87.911%
42.0	28.111	2.116	401.449	.315%	88.376%
43.0	26.297	2.015	403.465	.300%	88.820%
44.0	24.666	1.923	405.388	.286%	89.243%
45.0	23.020	1.833	407.221	.273%	89.647%
46.0	21.656	1.747	408.968	.260%	90.032%
47.0	20.426	1.674	410.642	.249%	90.400%
48.0	19.322	1.607	412.249	.239%	90.754%
49.0	18.323	1.546	413.795	.230%	91.094%
50.0	17.177	1.480	415.275	.220%	91.420%
51.0	16.263	1.415	416.69	.211%	91.731%
52.0	15.497	1.363	418.052	.203%	92.031%
53.0	14.730	1.315	419.367	.196%	92.321%
54.0	13.971	1.265	420.632	.188%	92.599%
55.0	13.338	1.219	421.851	.182%	92.868%
56.0	12.713	1.177	423.029	.175%	93.127%
57.0	12.115	1.135	424.164	.169%	93.377%
58.0	11.580	1.096	425.26	.163%	93.618%
59.0	11.095	1.060	426.32	.158%	93.851%
60.0	10.596	1.025	427.344	.153%	94.077%
61.0	10.139	0.990	428.334	.147%	94.295%
62.0	9.766	0.959	429.293	.143%	94.506%
63.0	9.387	0.932	430.225	.139%	94.711%
64.0	9.028	0.904	431.128	.135%	94.910%
65.0	8.712	0.878	432.006	.131%	95.103%
66.0	8.578	0.863	432.869	.128%	95.293%
67.0	8.655	0.867	433.735	.129%	95.484%
68.0	8.895	0.889	434.624	.132%	95.680%
69.0	9.211	0.924	435.548	.138%	95.883%
70.0	9.816	0.977	436.525	.146%	96.098%
71.0	10.688	1.060	437.585	.158%	96.331%
72.0	11.419	1.149	438.734	.171%	96.584%
73.0	12.108	1.230	439.965	.183%	96.855%
74.0	12.523	1.295	441.26	.193%	97.140%
75.0	12.516	1.323	442.582	.197%	97.432%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	12.649	1.336	443.918	.199%	97.726%
77.0	12.445	1.338	445.256	.199%	98.020%
78.0	11.967	1.307	446.563	.195%	98.308%
79.0	11.187	1.244	447.807	.185%	98.582%
80.0	10.160	1.151	448.958	.171%	98.835%
81.0	8.670	1.018	449.976	.152%	99.059%
82.0	7.186	0.860	450.836	.128%	99.248%
83.0	6.455	0.742	451.578	.110%	99.412%
84.0	5.491	0.651	452.228	.097%	99.555%
85.0	3.923	0.514	452.742	.077%	99.668%
86.0	3.030	0.380	453.122	.057%	99.752%
87.0	2.707	0.314	453.436	.047%	99.821%
88.0	2.510	0.286	453.722	.043%	99.884%
89.0	2.412	0.270	453.992	.040%	99.943%
90.0	2.292	0.258	454.25	.038%	100.000%

Zonal flux distribution table

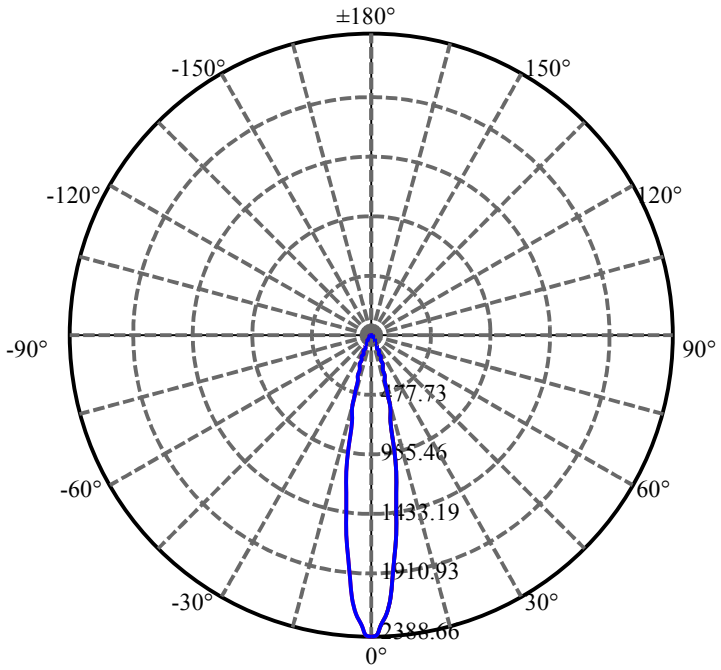
ZONAL LUMEN SUMMARY

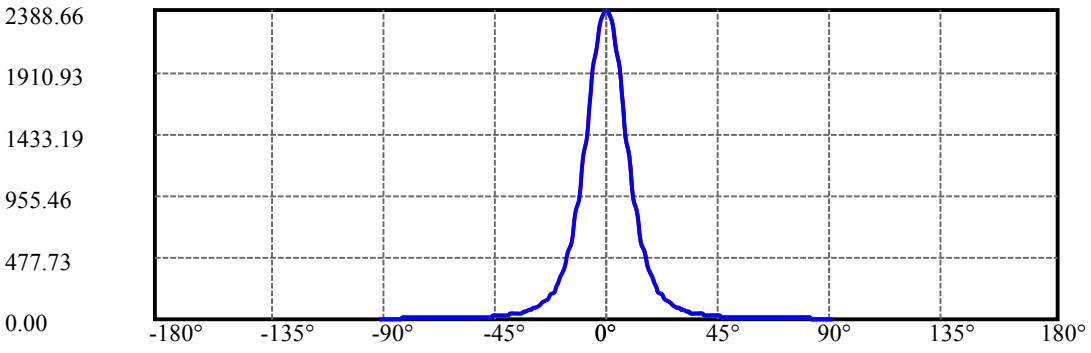
Zone	Lumens	%Lamp	%Fixt
0-30	366.61	54.60%	80.71%
0-40	397.12	59.15%	87.42%
0-60	427.34	63.65%	94.08%
0-90	453.99	67.62%	99.94%
0-120	453.99	67.62%	99.94%
0-180	454.25	67.66%	100.00%
60-90	27.67	4.12%	6.09%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-29.24	363.40	54.12%	80.00%

ZONAL LUMEN SUMMARY

0-10	156.44
10-20	148.70
20-30	61.46
30-40	30.51
40-50	18.16
50-60	12.07
60-70	9.18
70-80	12.43
80-90	5.03
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:20.3 Right:20.3
:C90/270Left:20.3 Right:20.3

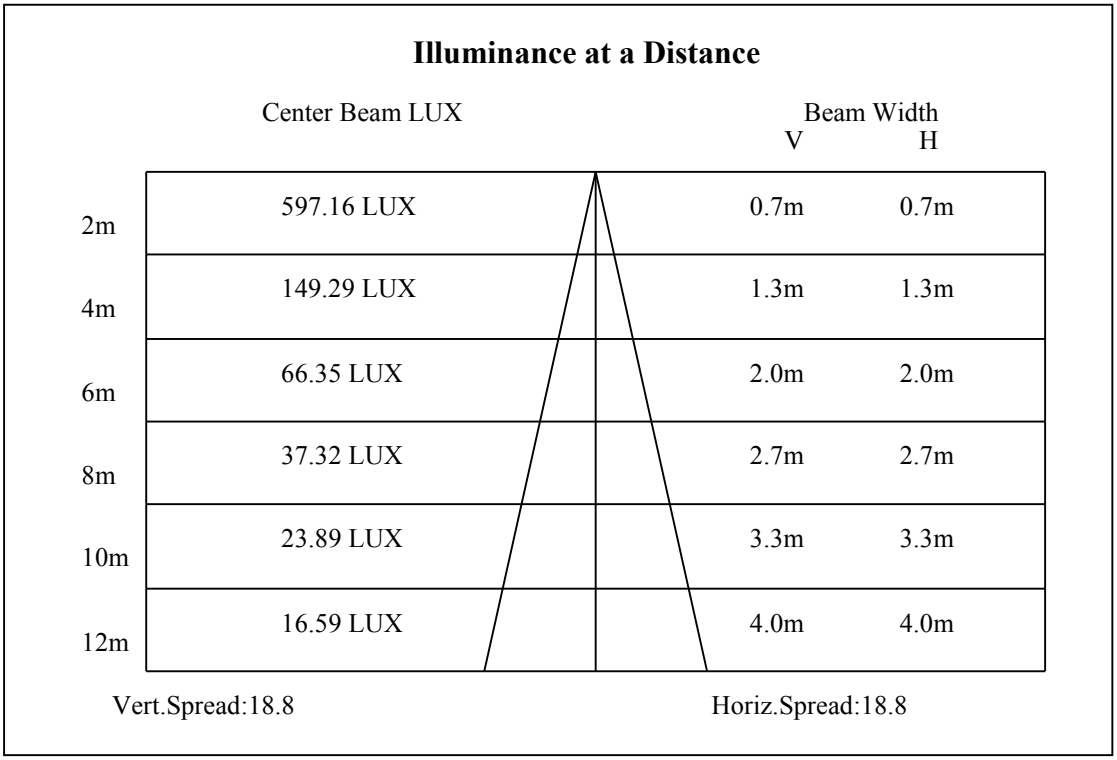
Beam Angle(50%Imax):C0/180Left:9.4 Right:9.4
:C90/270Left:9.4 Right:9.4

Equipment: GMS1980
Temperature(°C): 25.0

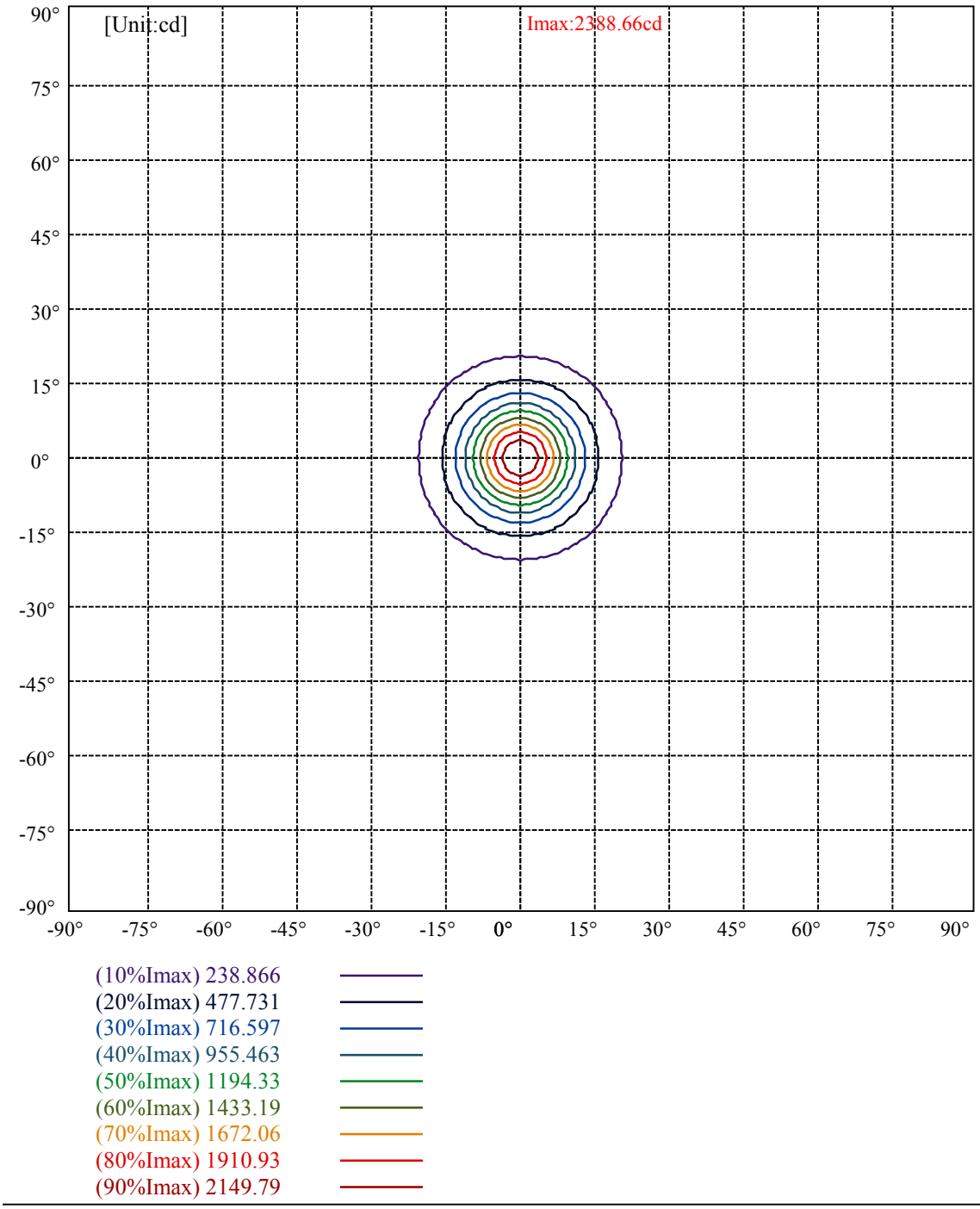
Date: 2021/05/20
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Lux distance Curve



ISO-Intensity(V-H)



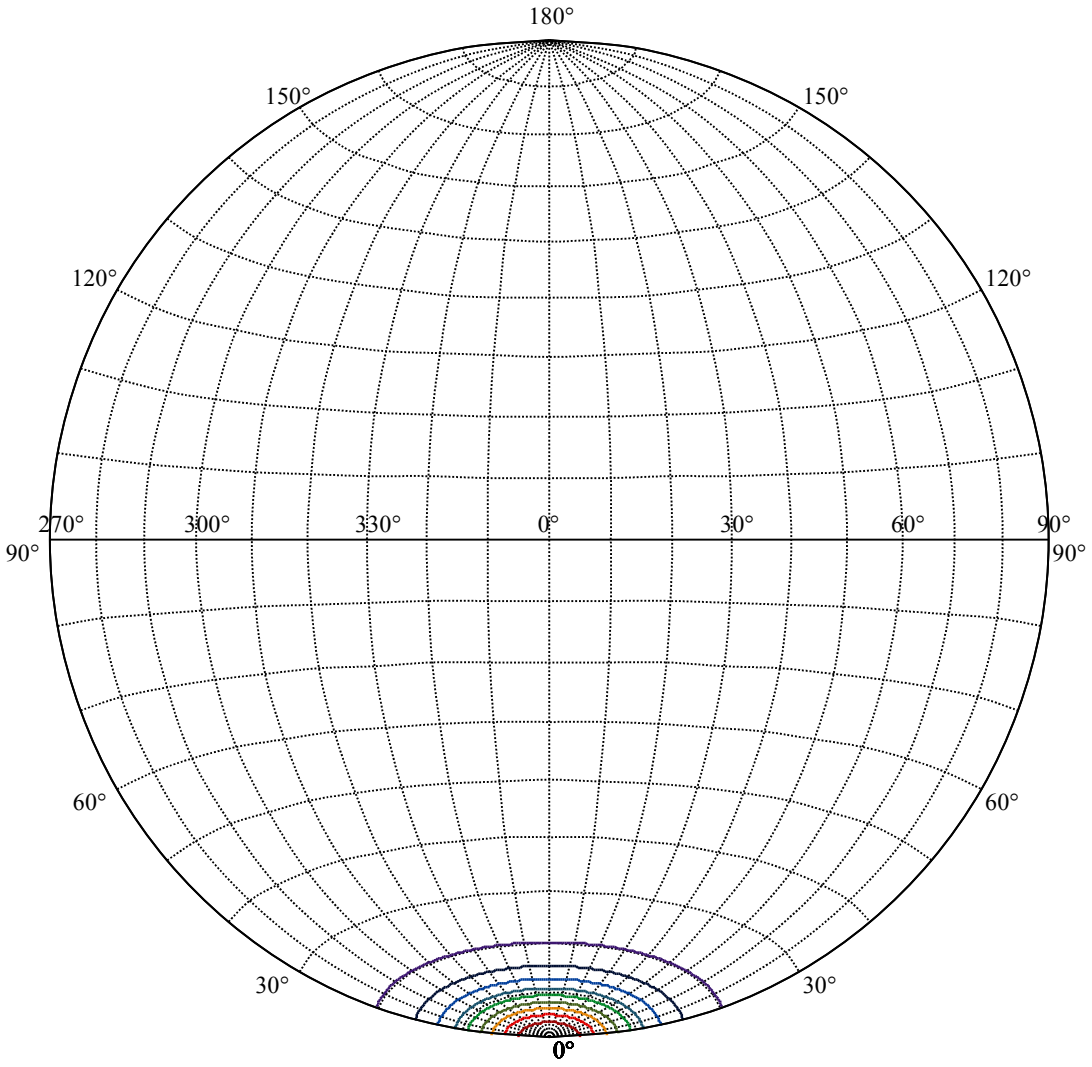
(10%Imax) 238.866
(20%Imax) 477.731
(30%Imax) 716.597
(40%Imax) 955.463
(50%Imax) 1194.33
(60%Imax) 1433.19
(70%Imax) 1672.06
(80%Imax) 1910.93
(90%Imax) 2149.79

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2021/05/20
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:2388.66

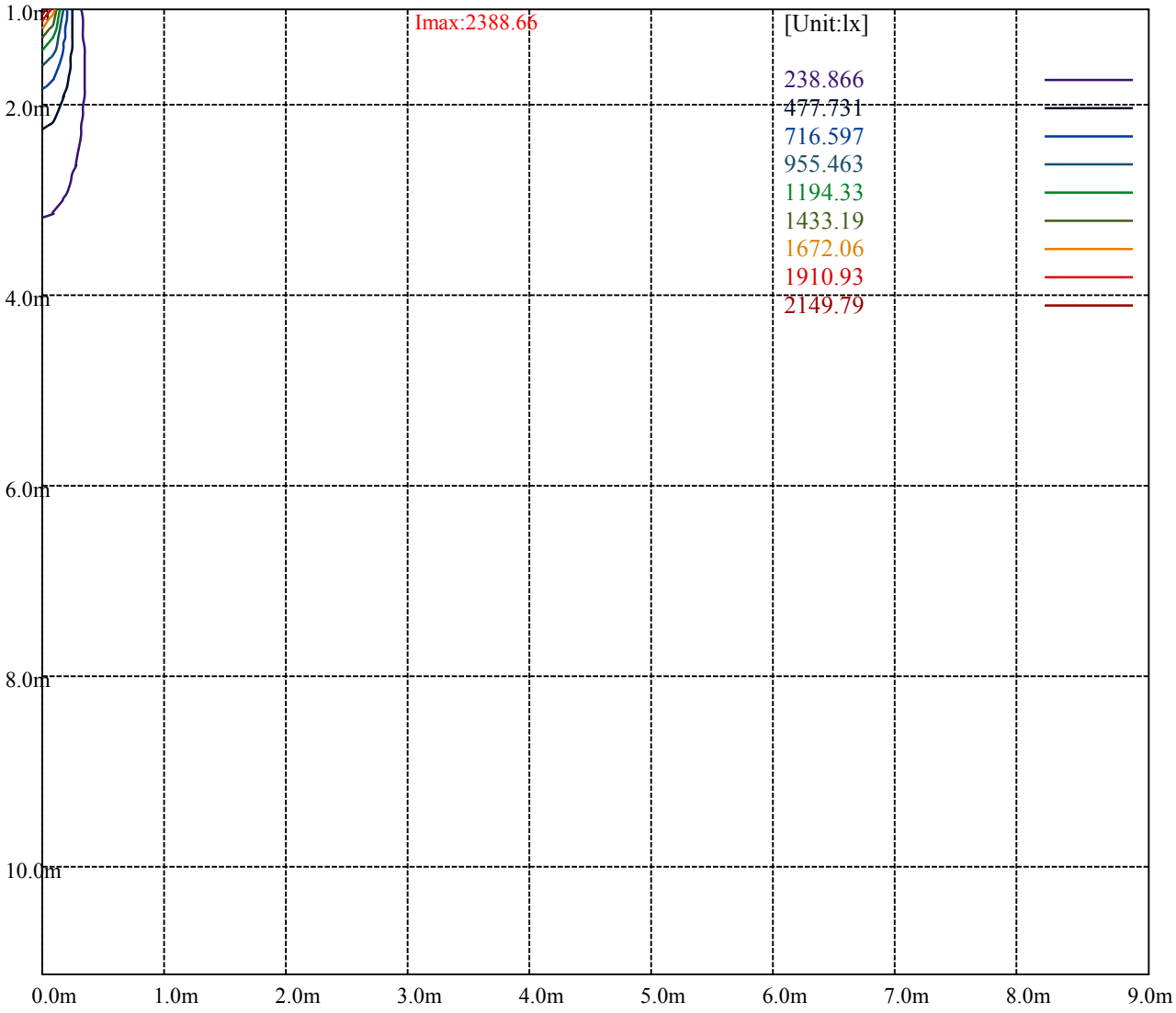
(10%Imax) 238.866
(20%Imax) 477.731
(30%Imax) 716.597
(40%Imax) 955.463
(50%Imax) 1194.33
(60%Imax) 1433.19
(70%Imax) 1672.06
(80%Imax) 1910.93
(90%Imax) 2149.79

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2021/05/20
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2021/05/20
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Nata LN01D03517EE-N

Luminance Limitting Curve(no luminous side)

Luminance Table

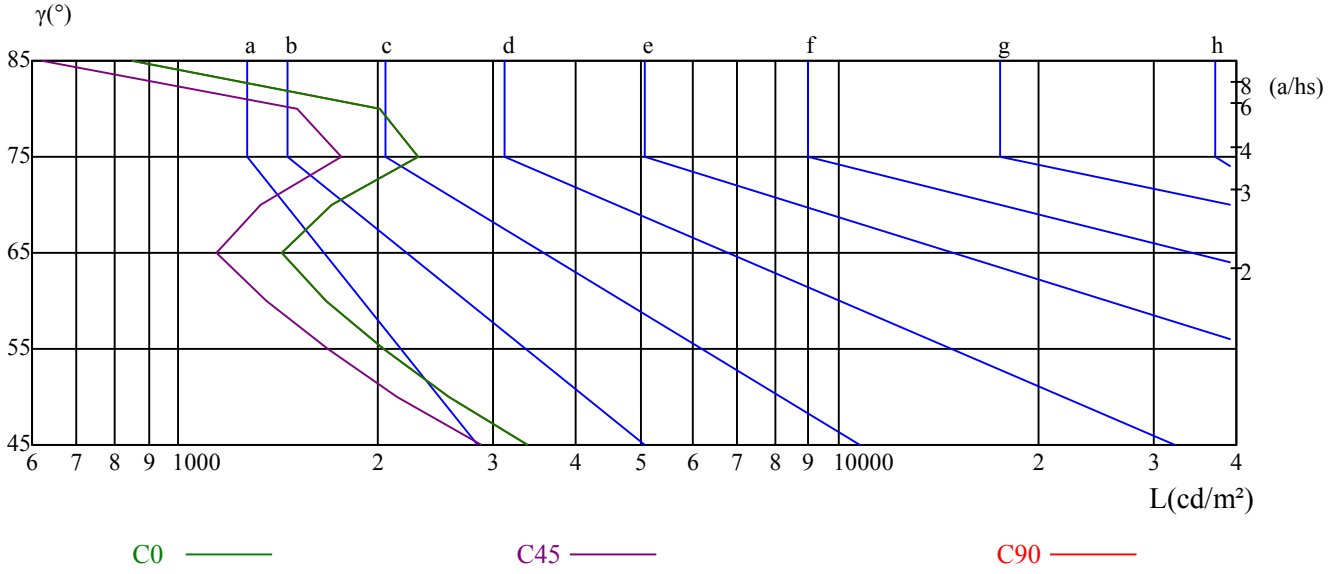
γ	45	50	55	60	65	70	75	80	85
C0	3384	2566	2041	1675	1435	1702	2309	2019	852
C45	2872	2145	1680	1356	1142	1330	1768	1511	621
C90	3384	2566	2041	1675	1435	1702	2309	2019	852

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3764	3764	3764	8831	8831	8831	8221	8221	8221

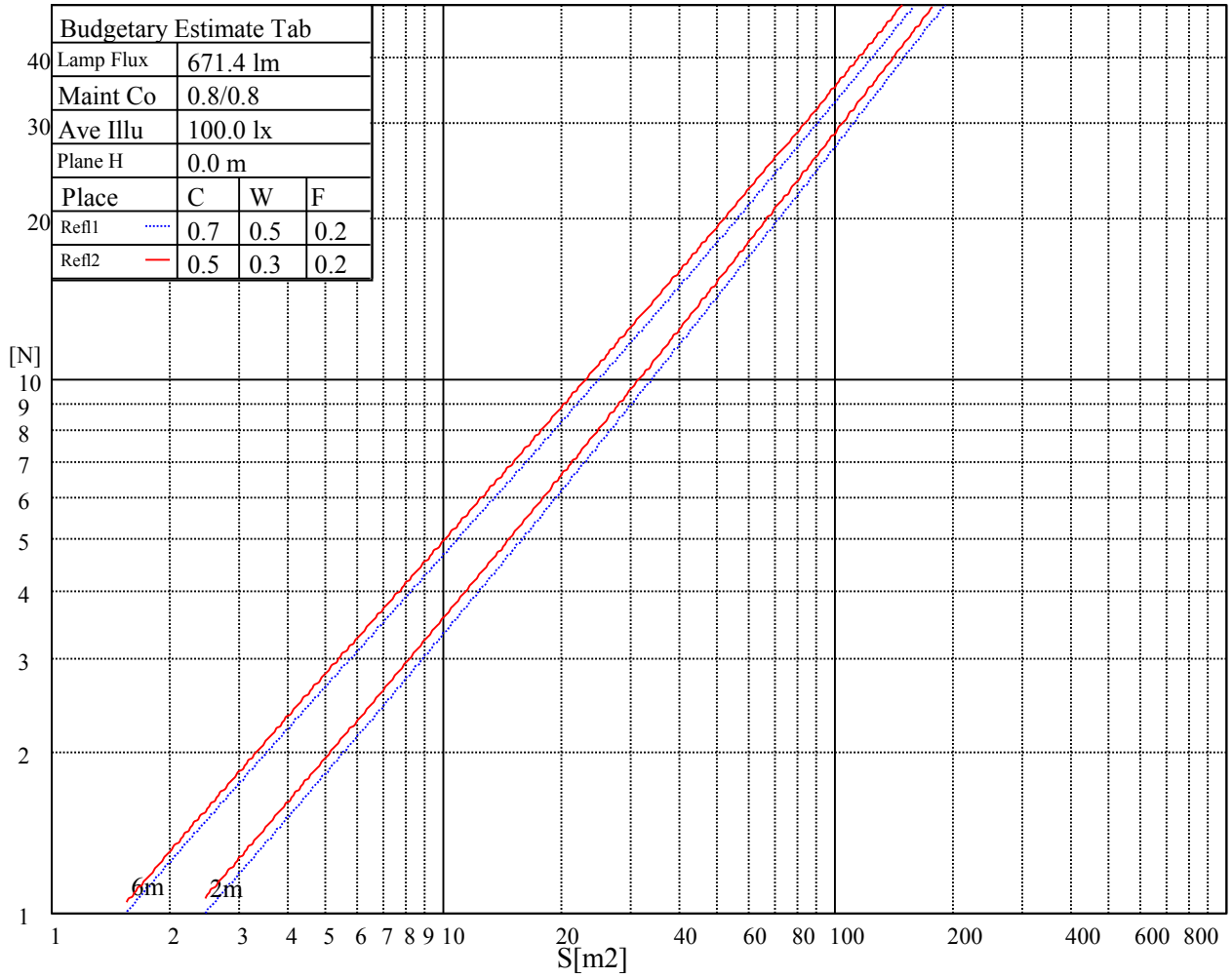
Glare Table

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

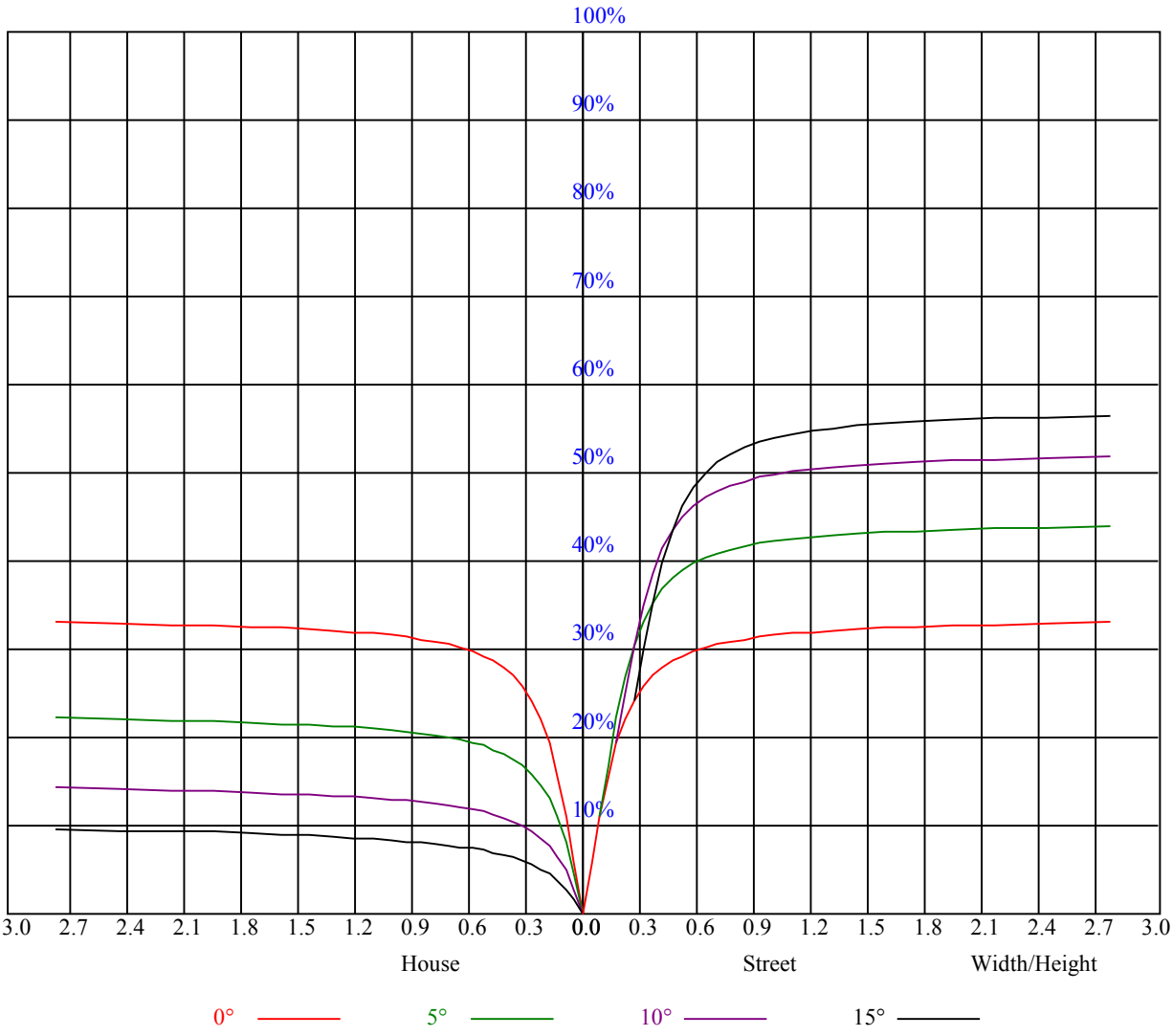


Equipment: GMS1980 Date: 2021/05/20 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

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	0.81	0.81	0.81	0.79	0.79	0.79	0.75	0.75	0.75	0.72	0.72	0.72	0.69	0.69	0.69	0.68
1	0.75	0.73	0.72	0.73	0.72	0.70	0.71	0.69	0.68	0.68	0.67	0.66	0.66	0.65	0.64	0.63
2	0.70	0.68	0.65	0.69	0.67	0.65	0.67	0.65	0.63	0.65	0.63	0.62	0.63	0.62	0.61	0.60
3	0.66	0.63	0.61	0.65	0.63	0.60	0.64	0.61	0.59	0.62	0.60	0.58	0.61	0.59	0.58	0.57
4	0.63	0.60	0.57	0.62	0.59	0.57	0.61	0.58	0.56	0.60	0.57	0.56	0.58	0.57	0.55	0.54
5	0.60	0.57	0.54	0.60	0.57	0.54	0.59	0.56	0.54	0.57	0.55	0.53	0.56	0.54	0.53	0.52
6	0.58	0.54	0.52	0.57	0.54	0.52	0.56	0.54	0.52	0.56	0.53	0.51	0.55	0.53	0.51	0.50
7	0.56	0.52	0.50	0.55	0.52	0.50	0.55	0.52	0.50	0.54	0.51	0.49	0.53	0.51	0.49	0.48
8	0.54	0.50	0.48	0.53	0.50	0.48	0.53	0.50	0.48	0.52	0.50	0.48	0.52	0.49	0.48	0.47
9	0.52	0.49	0.47	0.52	0.49	0.47	0.51	0.48	0.46	0.51	0.48	0.46	0.50	0.48	0.46	0.45
10	0.50	0.47	0.45	0.50	0.47	0.45	0.50	0.47	0.45	0.49	0.47	0.45	0.49	0.46	0.45	0.44

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2021/05/20	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	2439.00	2376.00	2254.50	2123.44	1971.56	1764.56	1595.81	1427.63	1248.75
45.0	2349.56	2253.94	2120.63	1983.38	1810.13	1627.88	1461.38	1279.69	1130.06
90.0	2365.31	2325.38	2236.50	2109.94	1977.19	1803.94	1620.00	1452.94	1218.38
135.0	2400.75	2437.88	2428.31	2378.81	2292.75	2164.50	2003.63	1845.00	1658.81
180.0	2439.00	2465.44	2449.69	2390.63	2301.75	2168.44	2024.44	1845.00	1654.31
225.0	2349.56	2401.31	2414.81	2381.63	2319.75	2223.00	2082.94	1922.06	1766.25
270.0	2365.31	2373.75	2328.75	2254.50	2151.56	2021.63	1833.19	1674.00	1511.44
315.0	2400.75	2332.13	2211.75	2062.69	1908.56	1724.06	1529.44	1364.63	1105.99
360.0	2439.00	2376.00	2254.50	2123.44	1971.56	1764.56	1595.81	1427.63	1248.75

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	1082.81	948.94	812.81	705.38	600.75	511.88	444.38	379.13	324.00
45.0	974.25	833.06	722.81	624.94	523.69	455.06	396.56	334.69	292.50
90.0	1114.09	957.94	819.39	709.48	603.00	511.26	442.80	383.34	320.74
135.0	1468.69	1303.88	1127.81	980.44	834.19	706.50	608.63	525.38	434.81
180.0	1483.88	1298.25	1085.91	980.21	850.78	709.20	611.33	526.05	451.69
225.0	1584.00	1421.44	1111.05	1075.73	940.84	805.11	687.77	595.86	516.09
270.0	1312.88	1160.44	1022.06	876.94	746.44	647.44	551.81	476.44	405.56
315.0	1032.41	880.88	747.34	642.15	541.07	456.64	393.81	340.31	284.51
360.0	1082.81	948.94	812.81	705.38	600.75	511.88	444.38	379.13	324.00

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	284.06	261.51	212.46	188.66	166.95	144.06	128.64	115.43	102.60
45.0	288.00	225.06	198.56	174.99	153.73	137.25	122.06	108.90	97.88
90.0	278.89	243.62	210.54	182.53	161.44	141.36	124.26	111.49	99.34
135.0	374.63	324.56	286.88	234.45	205.03	179.21	153.79	135.96	121.33
180.0	374.01	323.49	275.46	236.31	207.11	182.25	158.51	138.88	124.09
225.0	433.13	377.55	330.02	280.86	248.12	219.32	193.78	167.96	150.41
270.0	347.06	303.19	288.00	225.11	198.62	175.44	151.14	134.61	120.32
315.0	247.84	217.18	185.06	163.29	144.68	125.21	112.11	101.03	89.04
360.0	284.06	261.51	212.46	188.66	166.95	144.06	128.64	115.43	102.60

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	91.69	83.14	75.15	68.79	63.00	57.32	52.71	47.93	43.88
45.0	88.20	80.33	72.17	66.26	59.79	55.13	50.79	45.96	42.98
90.0	89.83	80.83	72.90	66.66	60.81	54.62	50.29	46.69	42.36
135.0	108.17	96.02	86.68	78.53	71.55	65.59	58.61	54.45	49.50
180.0	110.25	99.11	88.76	80.10	73.29	65.48	59.91	55.07	50.85
225.0	134.89	119.64	106.71	96.64	86.91	78.36	71.72	64.91	59.63
270.0	106.48	94.73	85.67	77.46	70.31	64.35	58.56	53.83	48.83
315.0	82.41	74.31	67.16	61.54	56.76	51.47	47.81	44.33	40.67
360.0	91.69	83.14	75.15	68.79	63.00	57.32	52.71	47.93	43.88

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	40.67	37.80	34.54	32.34	30.38	28.46	26.61	25.20	23.29
45.0	40.50	37.74	34.14	31.39	28.86	27.00	25.43	24.02	22.78
90.0	39.26	36.45	33.86	31.22	29.31	27.51	25.88	24.30	22.67
135.0	45.45	42.69	40.28	36.62	34.48	32.46	29.93	27.73	26.27
180.0	46.13	42.75	39.71	36.62	33.64	31.50	29.42	27.62	25.82
225.0	54.39	49.67	45.96	42.02	38.53	35.78	33.24	30.54	28.58
270.0	44.61	41.34	38.53	35.16	32.96	31.05	28.80	26.94	25.31
315.0	38.08	35.61	33.30	31.05	29.03	27.23	25.59	24.02	22.61
360.0	40.67	37.80	34.54	32.34	30.38	28.46	26.61	25.20	23.29

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	21.66	20.42	19.41	18.39	17.55	16.71	15.86	15.13	14.29
45.0	21.60	20.70	19.52	18.84	18.00	16.03	14.79	14.12	13.33
90.0	21.26	19.97	18.79	17.94	17.10	16.09	15.30	14.63	13.89
135.0	24.19	22.89	21.94	20.31	18.84	17.78	16.71	15.98	15.36
180.0	23.91	22.50	21.04	19.80	18.79	17.78	16.99	16.20	15.30
225.0	26.78	24.98	23.40	22.11	20.81	19.52	18.45	17.27	16.37
270.0	23.51	21.94	20.70	19.46	18.51	17.44	16.54	15.75	14.96
315.0	21.26	19.86	18.62	17.72	16.99	16.09	15.47	14.91	14.34
360.0	21.66	20.42	19.41	18.39	17.55	16.71	15.86	15.13	14.29

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	13.61	12.99	12.26	11.81	11.31	10.91	10.35	9.90	9.51
45.0	12.66	12.09	11.59	11.14	10.80	10.35	10.01	9.68	9.39
90.0	13.28	12.66	12.04	11.53	11.03	10.58	10.18	9.79	9.34
135.0	14.57	14.01	13.44	12.83	12.21	11.64	10.91	10.41	10.01
180.0	14.40	13.78	13.16	12.60	12.04	11.53	11.03	10.58	10.18
225.0	15.36	14.51	13.78	13.11	12.38	11.87	11.42	10.86	10.52
270.0	14.18	13.56	12.94	12.26	11.76	11.31	10.74	10.24	9.90
315.0	13.73	13.11	12.49	11.64	11.14	10.58	10.13	9.68	9.28
360.0	13.61	12.99	12.26	11.81	11.31	10.91	10.35	9.90	9.51

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.11	8.72	8.44	8.10	7.76	7.48	7.14	6.92	6.58
45.0	9.17	8.89	8.78	10.01	12.66	16.71	20.70	24.08	28.91
90.0	9.00	8.66	8.21	7.99	7.71	7.37	7.09	6.86	6.58
135.0	9.56	9.11	8.78	8.38	8.10	7.76	7.43	7.09	6.81
180.0	9.79	9.45	9.11	8.72	8.44	8.10	7.76	7.48	7.20
225.0	10.18	9.84	9.51	9.17	8.94	8.78	9.23	12.26	16.14
270.0	9.45	9.06	8.78	8.44	8.10	7.82	7.48	7.26	6.92
315.0	8.83	8.49	8.10	7.82	7.54	7.14	6.86	6.58	6.36
360.0	9.11	8.72	8.44	8.10	7.76	7.48	7.14	6.92	6.58

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	6.24	5.96	5.68	5.40	5.18	4.95	4.67	4.39	4.22
45.0	32.06	34.37	35.21	32.91	31.28	28.80	26.61	24.58	20.59
90.0	6.30	6.02	5.68	5.40	5.12	4.78	4.56	4.28	4.05
135.0	6.47	6.24	5.96	5.68	5.51	5.51	5.40	5.01	4.56
180.0	6.81	6.53	6.30	6.08	5.74	5.46	5.23	4.95	4.50
225.0	20.76	25.54	29.59	33.47	37.63	39.83	39.49	37.01	34.59
270.0	6.64	6.41	6.19	5.91	5.68	5.40	5.18	4.89	4.67
315.0	6.08	5.79	5.57	5.29	5.06	4.84	4.61	4.39	4.11
360.0	6.24	5.96	5.68	5.40	5.18	4.95	4.67	4.39	4.22

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	3.88	3.71	3.54	3.43	3.38	3.15	2.98	2.53	2.48
45.0	12.54	4.95	3.66	3.26	2.64	2.53	2.31	2.19	2.19
90.0	3.88	3.54	3.26	2.87	2.70	2.59	2.42	2.31	2.08
135.0	4.22	3.99	3.77	3.43	3.04	2.87	2.70	2.48	2.36
180.0	4.22	3.99	3.71	3.49	3.15	2.81	2.70	2.53	2.36
225.0	32.34	29.48	26.44	20.59	10.07	4.28	3.04	2.81	2.64
270.0	4.39	4.11	3.83	3.60	3.38	3.15	2.87	2.64	2.64
315.0	3.88	3.71	3.43	3.26	3.04	2.87	2.64	2.59	2.53
360.0	3.88	3.71	3.54	3.43	3.38	3.15	2.98	2.53	2.48

Intensity data(cd)

C/γ(°)	90.0
0.0	2.48
45.0	2.14
90.0	1.91
135.0	2.08
180.0	2.25
225.0	2.48
270.0	2.53
315.0	2.48
360.0	2.48