NATA LIGHTING CO.,LTD.
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Address:380 JinOu Road,GaoXin Zone,Jiang Men City,Guangdong,China

NATA

Client:
LumCAT: 3-1698-N
Luminaire: 92.70.065.00+92.70.089.00

Report No: nata-0100	Voltage(V): 36.2000
Test No: GC2018112004	Current(A): 0.5000
LampCAT: OSRAM SOLERIQ S13	Power (W): 18.1000
Lamp flux(lm): 1776.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 79	Width(mm): 79
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1407.15, Efficiency(%): 79.23% , Luminous Efficacy(lm/W): 77.74
Central intensity(cd): 10828.130, Maximum intensity(cd): 10828.130
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=15.8
[C90/270]Total=15.8
Field angle(10%Imax): [C0/180]Total=30.2
[C90/270]Total=30.2
Maximum s/h(1/2): C0_180=0.27 C90_270=0.27
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(%): 79.37%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.957%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10828.125	2.591	2.591	.146%	.184%
1.0	10706.977	20.492	23.082	1.154%	1.640%
2.0	10399.852	39.801	62.883	2.241%	4.469%
3.0	9869.133	56.641	119.524	3.189%	8.494%
4.0	9159.188	70.064	189.588	3.945%	13.473%
5.0	8316.000	79.481	269.069	4.475%	19.122%
6.0	7325.438	83.969	353.038	4.728%	25.089%
7.0	6232.430	83.292	436.33	4.690%	31.008%
8.0	5277.445	80.544	516.874	4.535%	36.732%
9.0	4278.023	73.388	590.262	4.132%	41.947%
10.0	3371.906	64.209	654.471	3.615%	46.510%
11.0	2691.141	56.310	710.782	3.171%	50.512%
12.0	2108.742	48.079	758.86	2.707%	53.929%
13.0	1625.759	40.105	798.965	2.258%	56.779%
14.0	1296.823	34.404	833.369	1.937%	59.224%
15.0	1094.639	31.068	864.437	1.749%	61.432%
16.0	950.231	28.722	893.16	1.617%	63.473%
17.0	852.659	27.338	920.497	1.539%	65.416%
18.0	774.731	26.253	946.751	1.478%	67.281%
19.0	710.648	25.372	972.122	1.429%	69.084%
20.0	655.882	24.600	996.722	1.385%	70.833%
21.0	605.299	23.788	1020.51	1.339%	72.523%
22.0	557.543	22.904	1043.413	1.290%	74.151%
23.0	513.246	21.992	1065.405	1.238%	75.714%
24.0	471.178	21.016	1086.421	1.183%	77.207%
25.0	429.314	19.896	1106.317	1.120%	78.621%
26.0	395.817	19.028	1125.345	1.071%	79.973%
27.0	362.025	18.023	1143.369	1.015%	81.254%
28.0	330.785	17.030	1160.398	.959%	82.464%
29.0	303.919	16.158	1176.556	.910%	83.613%
30.0	281.827	15.453	1192.009	.870%	84.711%
31.0	252.127	14.240	1206.249	.802%	85.723%
32.0	232.355	13.502	1219.751	.760%	86.682%
33.0	213.855	12.773	1232.524	.719%	87.590%
34.0	191.588	11.748	1244.272	.662%	88.425%
35.0	175.718	11.052	1255.325	.622%	89.210%
36.0	161.677	10.421	1265.746	.587%	89.951%
37.0	147.860	9.758	1275.504	.549%	90.644%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	136.688	9.228	1284.732	.520%	91.300%
39.0	127.104	8.772	1293.504	.494%	91.924%
40.0	117.429	8.277	1301.781	.466%	92.512%
41.0	109.329	7.866	1309.647	.443%	93.071%
42.0	101.271	7.431	1317.078	.418%	93.599%
43.0	92.130	6.890	1323.968	.388%	94.089%
44.0	84.839	6.463	1330.431	.364%	94.548%
45.0	77.794	6.032	1336.463	.340%	94.976%
46.0	70.038	5.525	1341.988	.311%	95.369%
47.0	63.204	5.069	1347.057	.285%	95.729%
48.0	56.855	4.633	1351.691	.261%	96.059%
49.0	50.027	4.140	1355.831	.233%	96.353%
50.0	44.234	3.716	1359.547	.209%	96.617%
51.0	39.424	3.360	1362.907	.189%	96.856%
52.0	34.713	3.000	1365.906	.169%	97.069%
53.0	30.600	2.680	1368.586	.151%	97.259%
54.0	27.035	2.398	1370.985	.135%	97.430%
55.0	23.604	2.120	1373.105	.119%	97.580%
56.0	20.848	1.895	1375	.107%	97.715%
57.0	18.534	1.705	1376.705	.096%	97.836%
58.0	16.341	1.520	1378.225	.086%	97.944%
59.0	14.766	1.388	1379.612	.078%	98.043%
60.0	13.507	1.283	1380.895	.072%	98.134%
61.0	12.544	1.203	1382.098	.068%	98.220%
62.0	11.988	1.161	1383.259	.065%	98.302%
63.0	11.595	1.133	1384.392	.064%	98.383%
64.0	11.208	1.105	1385.497	.062%	98.461%
65.0	10.877	1.081	1386.578	.061%	98.538%
66.0	10.610	1.063	1387.641	.060%	98.613%
67.0	10.294	1.039	1388.68	.059%	98.687%
68.0	10.020	1.019	1389.698	.057%	98.760%
69.0	9.802	1.003	1390.702	.057%	98.831%
70.0	9.555	0.985	1391.687	.055%	98.901%
71.0	9.302	0.965	1392.651	.054%	98.969%
72.0	9.070	0.946	1393.597	.053%	99.037%
73.0	8.859	0.929	1394.526	.052%	99.103%
74.0	8.627	0.909	1395.436	.051%	99.167%
75.0	8.466	0.897	1396.332	.050%	99.231%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	8.255	0.878	1397.211	.049%	99.294%
77.0	8.079	0.863	1398.074	.049%	99.355%
78.0	7.938	0.851	1398.925	.048%	99.415%
79.0	7.763	0.836	1399.761	.047%	99.475%
80.0	7.559	0.816	1400.577	.046%	99.533%
81.0	7.376	0.799	1401.376	.045%	99.590%
82.0	7.109	0.772	1402.148	.043%	99.644%
83.0	6.870	0.748	1402.896	.042%	99.698%
84.0	6.609	0.721	1403.617	.041%	99.749%
85.0	6.342	0.693	1404.309	.039%	99.798%
86.0	6.096	0.667	1404.976	.038%	99.845%
87.0	5.843	0.640	1405.616	.036%	99.891%
88.0	5.681	0.623	1406.239	.035%	99.935%
89.0	5.576	0.611	1406.85	.034%	99.979%
90.0	5.505	0.302	1407.152	.017%	100.000%

Zonal flux distribution table

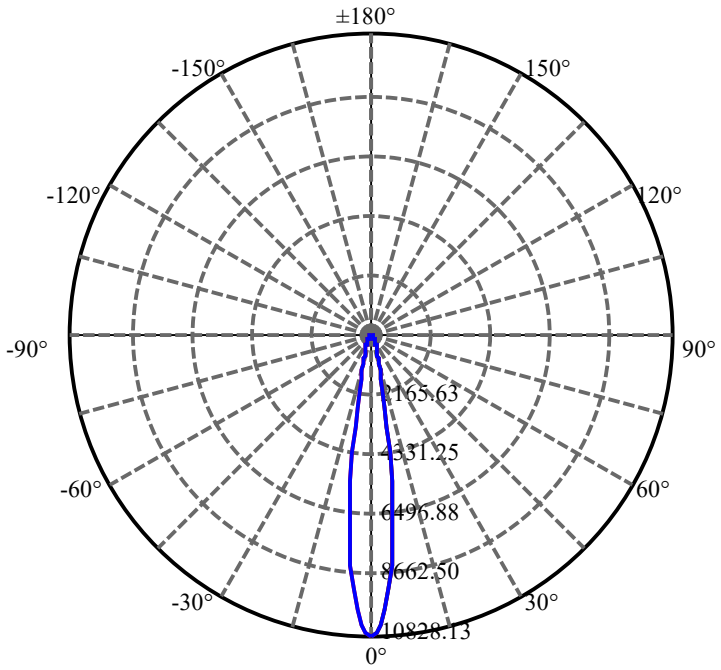
ZONAL LUMEN SUMMARY

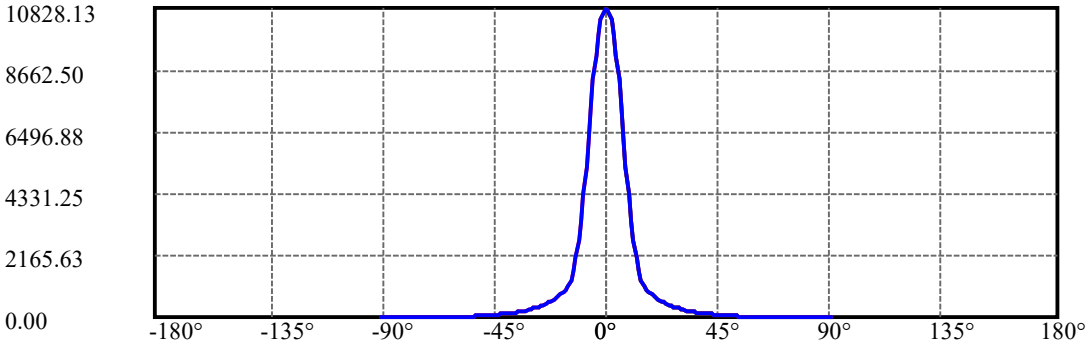
Zone	Lumens	%Lamp	%Fixt
0-30	1192.01	67.12%	84.71%
0-40	1301.78	73.30%	92.51%
0-60	1380.90	77.75%	98.13%
0-90	1406.85	79.21%	99.98%
0-120	1406.85	79.21%	99.98%
0-180	1407.15	79.23%	100.00%
60-90	27.24	1.53%	1.94%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-26.02	1125.72	63.39%	80.00%

ZONAL LUMEN SUMMARY

0-10	654.47
10-20	342.25
20-30	195.29
30-40	109.77
40-50	57.77
50-60	21.35
60-70	10.79
70-80	8.89
80-90	6.27
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):

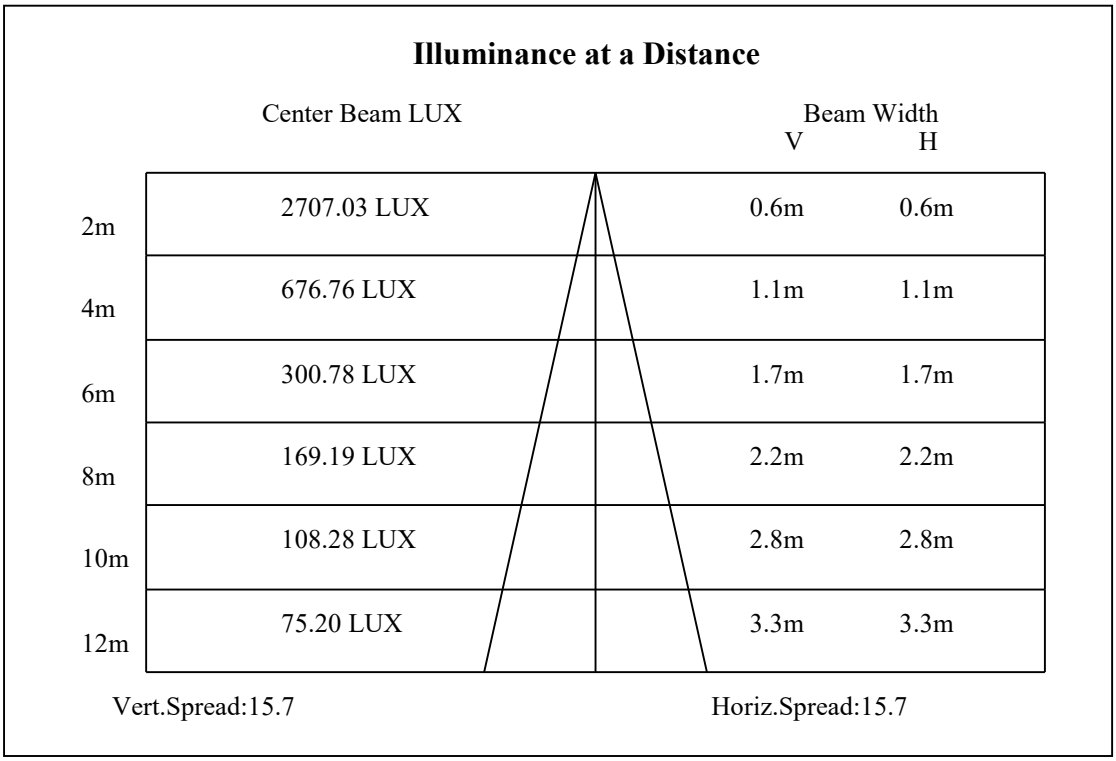
C0/C180:

C90/C270:

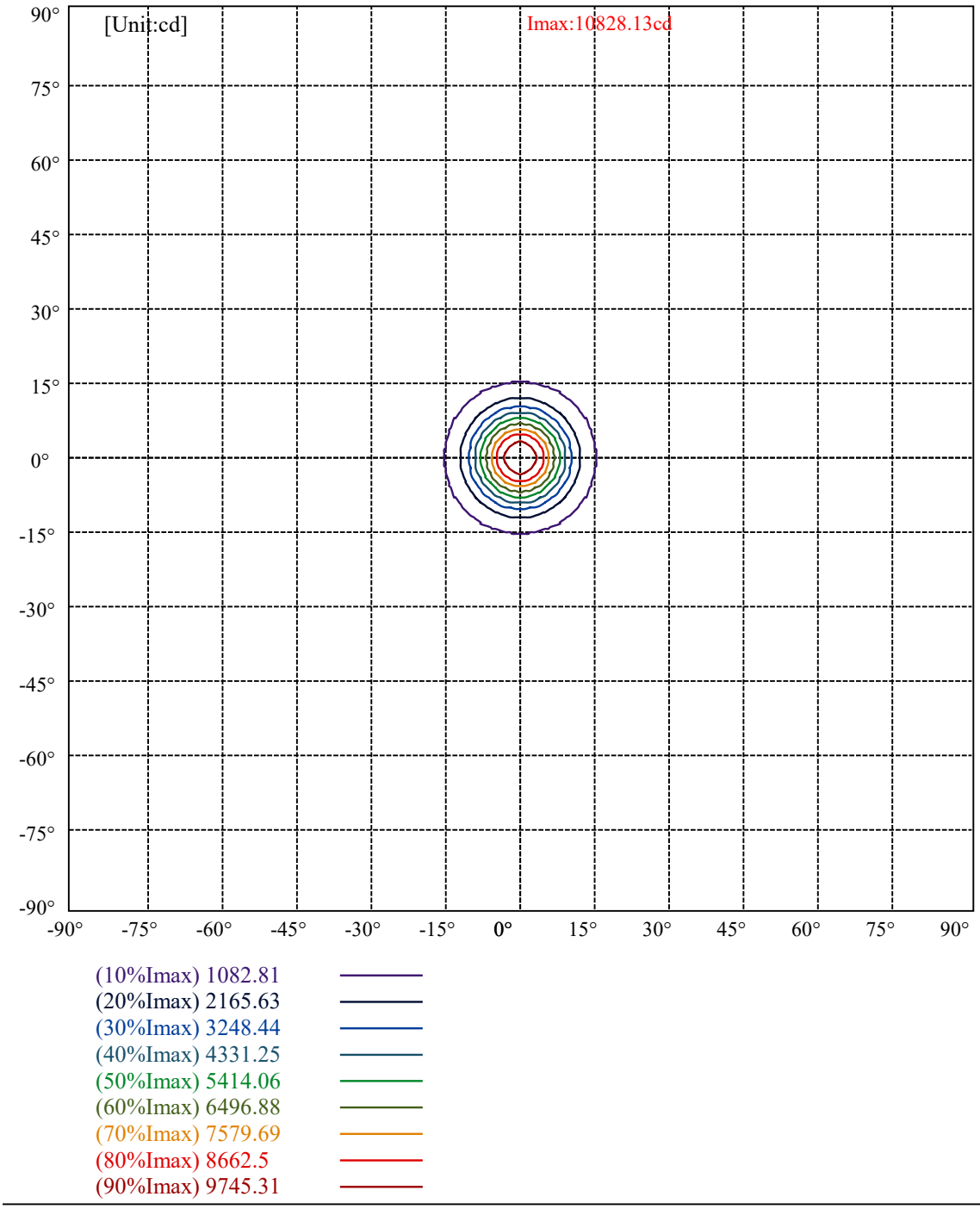
Field angle(10%Imax):C0/180Left:15.1 Right:15.1
:C90/270Left:15.1 Right:15.1

Beam Angle(50%Imax):C0/180Left:7.9 Right:7.9
:C90/270Left:7.9 Right:7.9

Lux distance Curve



ISO-Intensity(V-H)

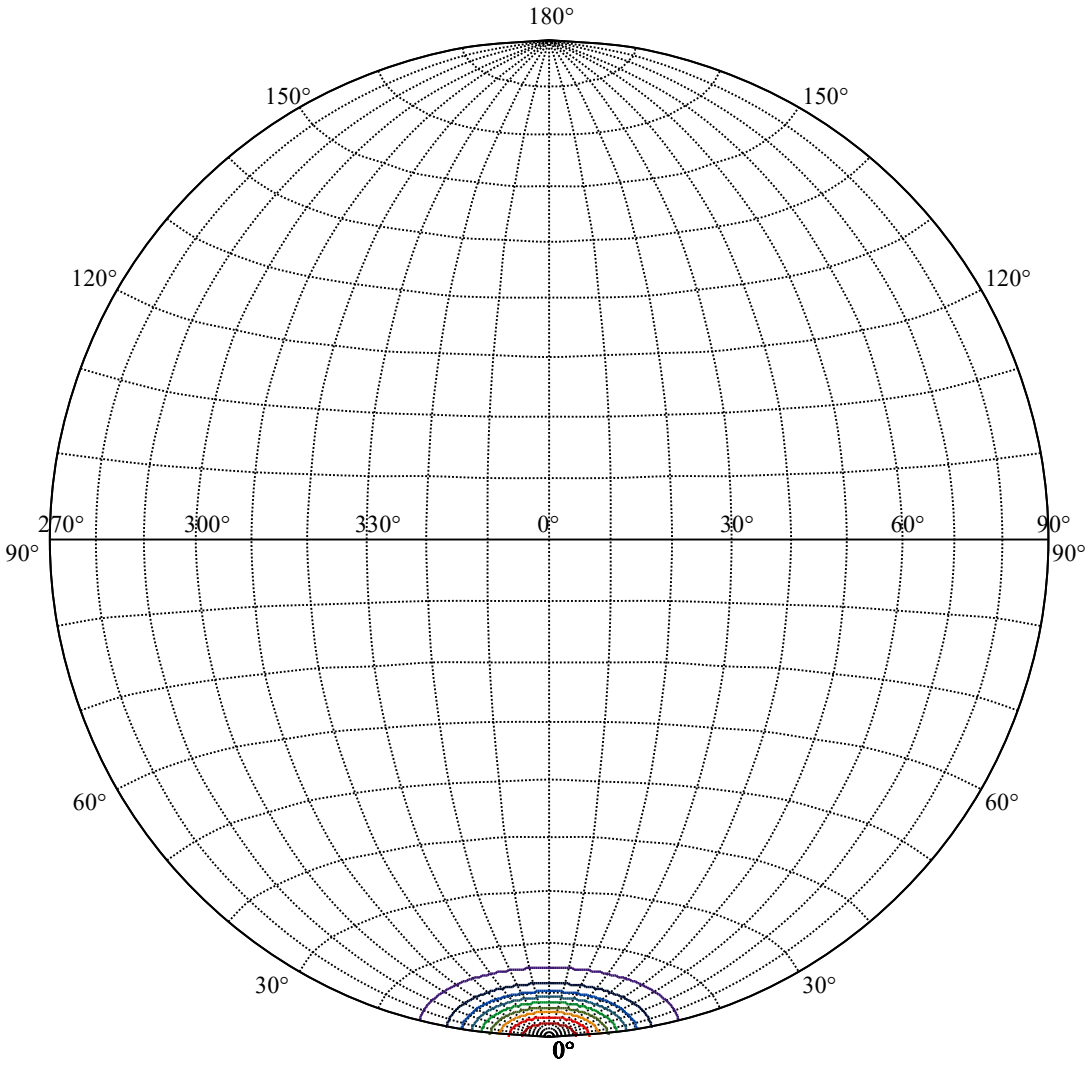


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/11/20
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



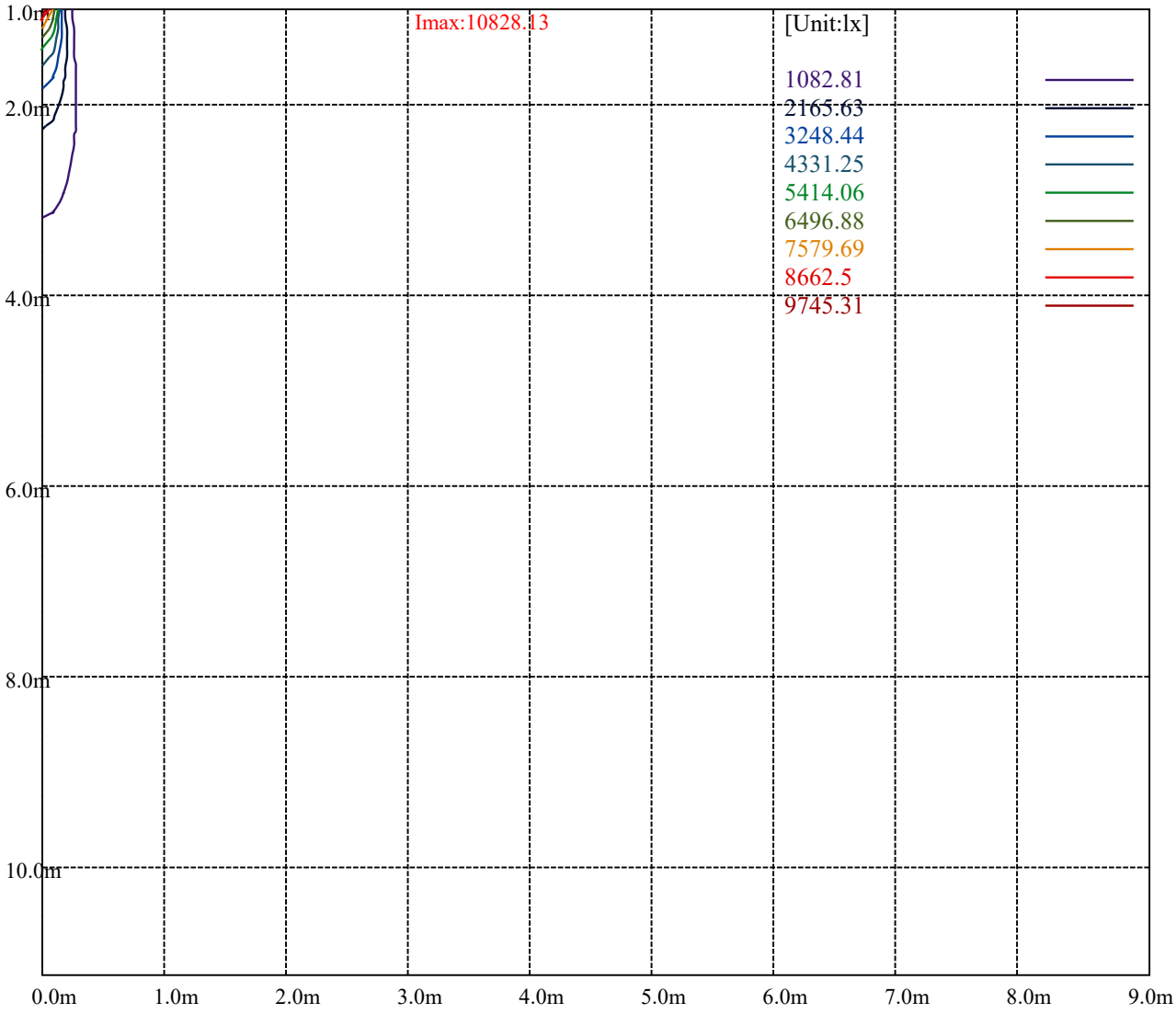
House [Unit:cd] Road

Imax:10828.13

(10%Imax) 1082.81
(20%Imax) 2165.63
(30%Imax) 3248.44
(40%Imax) 4331.25
(50%Imax) 5414.06
(60%Imax) 6496.88
(70%Imax) 7579.69
(80%Imax) 8662.5
(90%Imax) 9745.31

Equipment: GMS1980 Date: 2018/11/20 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/11/20
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

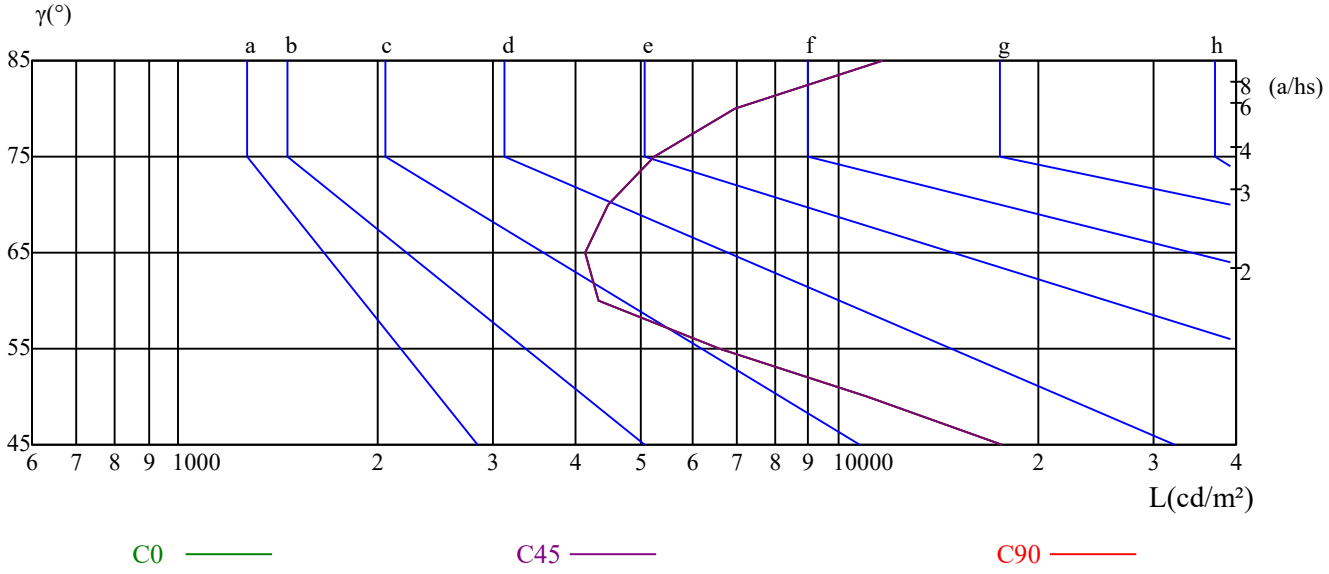
γ	45	50	55	60	65	70	75	80	85
C0	17628	11026	6594	4328	4124	4477	5241	6975	11660
C45	17628	11026	6594	4328	4124	4477	5241	6975	11660
C90	17628	11026	6594	4328	4124	4477	5241	6975	11660

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4124	4124	4124	5241	5241	5241	11660	11660	11660

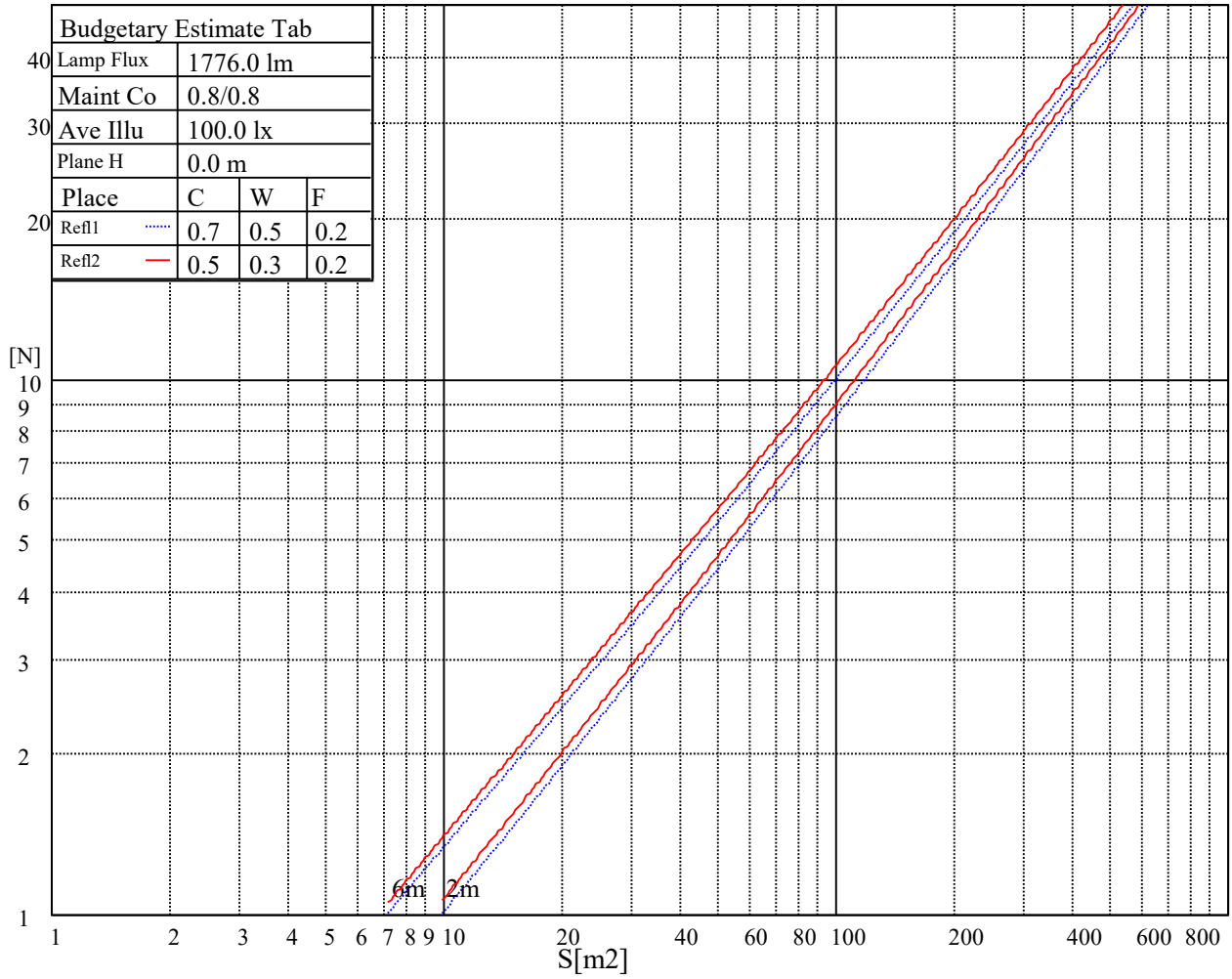
Glare Table

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

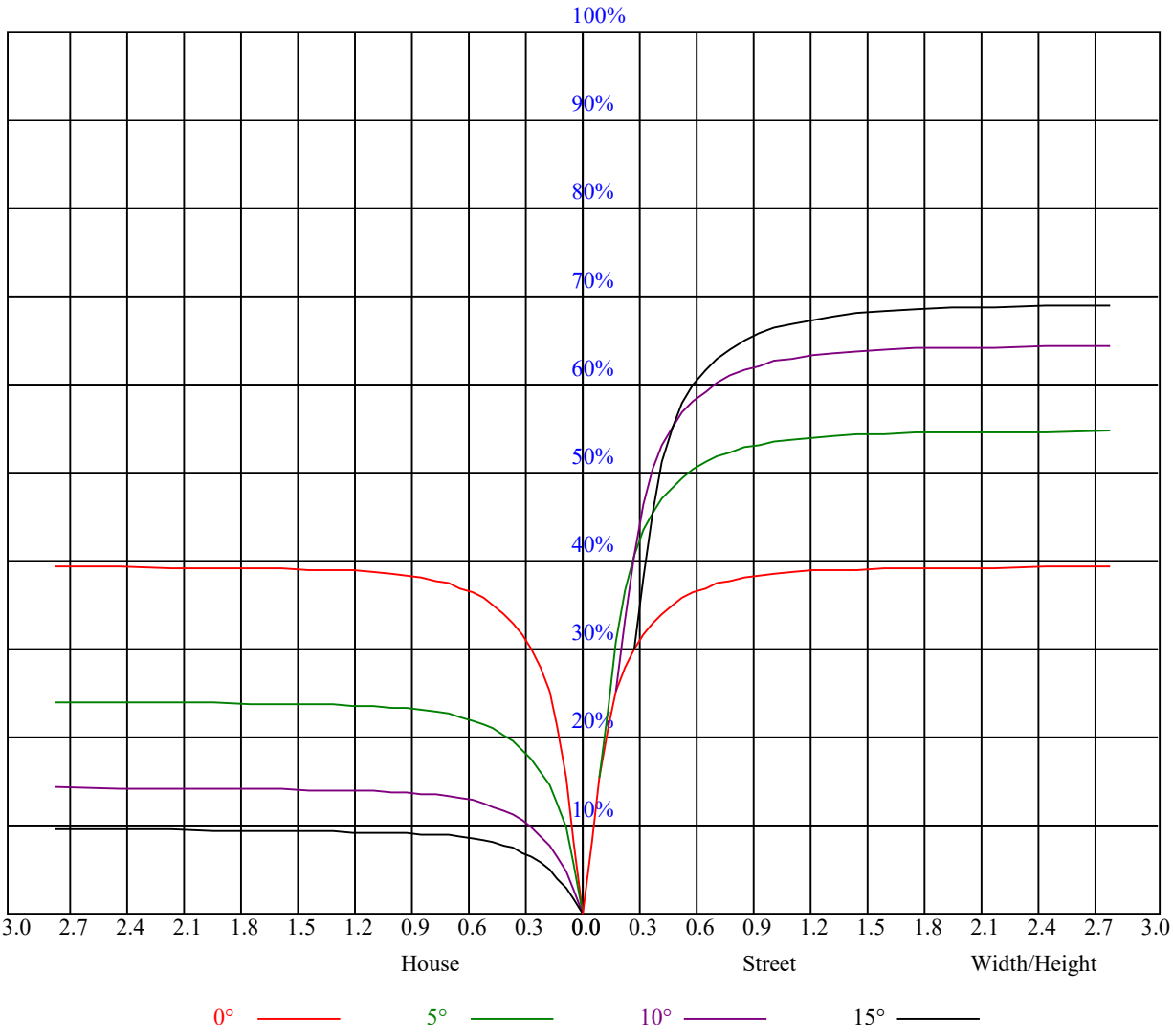


Equipment: GMS1980 Date: 2018/11/20 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Utilization factor table for indoor luminaire

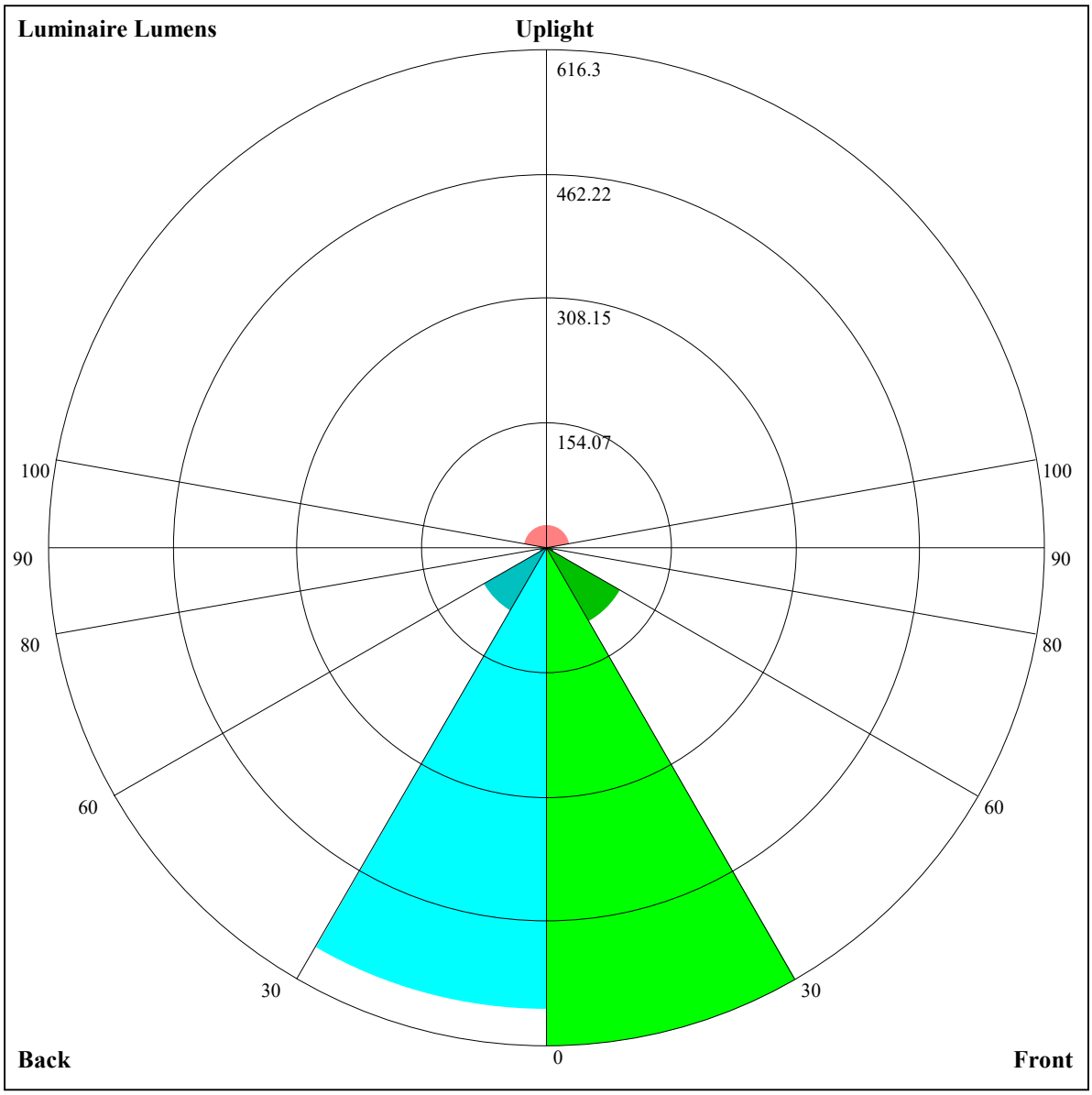
RHOCC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFCIENTS OF UTILIZATION RHOFC=20 CU															
0	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.84	0.84	0.84	0.81	0.81	0.81	0.79
1	0.89	0.87	0.86	0.87	0.86	0.84	0.84	0.83	0.82	0.81	0.80	0.79	0.78	0.78	0.77	0.76
2	0.84	0.82	0.79	0.83	0.81	0.79	0.80	0.79	0.77	0.78	0.77	0.75	0.76	0.75	0.74	0.73
3	0.80	0.77	0.75	0.79	0.76	0.74	0.77	0.75	0.73	0.76	0.74	0.72	0.74	0.72	0.71	0.70
4	0.77	0.74	0.71	0.76	0.73	0.71	0.75	0.72	0.70	0.73	0.71	0.69	0.72	0.70	0.68	0.67
5	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.71	0.68	0.67	0.70	0.68	0.66	0.65
6	0.71	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.65	0.69	0.66	0.64	0.68	0.66	0.64	0.63
7	0.69	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.67	0.64	0.62	0.66	0.64	0.62	0.61
8	0.67	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.61	0.65	0.63	0.61	0.65	0.62	0.61	0.60
9	0.65	0.62	0.60	0.65	0.62	0.60	0.64	0.61	0.59	0.64	0.61	0.59	0.63	0.61	0.59	0.58
10	0.64	0.60	0.58	0.63	0.60	0.58	0.63	0.60	0.58	0.62	0.60	0.58	0.62	0.59	0.58	0.57

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2018/11/20	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

LCS Graph



Luminaire Lumens:

FL=616.3,FM=106.15,FH=10.05,FVH=3.49

BL=572.45,BM=90.14,BH=9.88,BVH=3.49

UL=6.01,UH=28.59

BUG Rating:B2-U2-G0

Equipment: GMS1980	Date: 2018/11/20	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	10825.31	10895.63	10762.88	10378.13	9825.19	9134.44	8084.81	7151.63	6187.50
45.0	10848.94	10490.06	9916.88	9351.56	8378.44	7345.13	6459.19	5221.69	4344.75
90.0	10754.44	10362.38	9822.38	9033.75	8078.06	7120.13	6118.88	4894.88	3998.25
135.0	10883.81	10693.69	10271.25	9623.25	8880.19	7882.31	6786.00	5806.13	4852.69
180.0	10825.31	10533.38	10090.69	9401.63	8508.38	7571.81	6427.13	5276.25	4300.88
225.0	10848.94	10910.25	10800.56	10352.25	9906.19	9250.31	8304.75	7210.13	6188.06
270.0	10754.44	10896.19	10847.81	10558.69	10106.44	9377.44	8457.19	7530.75	6548.63
315.0	10883.81	10874.25	10686.38	10253.81	9590.63	8846.44	7965.56	6768.00	5798.81
360.0	10825.31	10895.63	10762.88	10378.13	9825.19	9134.44	8084.81	7151.63	6187.50

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5009.63	4140.56	3372.19	2648.25	2082.38	1702.69	1383.19	1188.00	1038.38
45.0	3476.25	2749.50	2228.06	1815.19	1455.75	1271.81	1133.44	997.88	907.31
90.0	3227.06	2451.94	1978.31	1621.69	1329.19	1109.42	1005.19	900.06	824.63
135.0	3732.19	2957.63	2323.13	1791.56	1414.69	1171.69	983.81	867.38	788.63
180.0	3434.06	2515.50	1936.13	1499.06	1077.13	948.49	834.08	755.21	683.04
225.0	5052.38	3990.94	3133.69	2319.75	1760.06	1112.74	1058.57	880.31	786.49
270.0	5425.31	4365.56	3502.13	2745.56	1998.56	1559.81	1238.63	986.63	867.38
315.0	4867.31	3803.63	3055.50	2428.88	1888.31	1497.94	1120.22	1026.39	925.43
360.0	5009.63	4140.56	3372.19	2648.25	2082.38	1702.69	1383.19	1188.00	1038.38

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	927.56	849.94	777.38	714.38	663.75	617.63	564.19	523.13	483.75
45.0	833.06	765.56	704.25	653.63	600.75	551.81	510.75	470.25	437.06
90.0	754.71	695.03	646.20	594.79	546.08	504.45	465.02	420.92	388.74
135.0	718.31	665.44	610.88	565.88	518.63	471.94	428.63	394.31	363.94
180.0	634.89	591.53	545.85	502.76	465.19	423.90	384.69	352.63	320.91
225.0	712.91	654.86	608.12	561.09	518.12	480.54	443.42	397.86	364.33
270.0	788.06	718.88	660.94	614.81	565.88	518.63	478.69	435.38	398.81
315.0	828.34	743.96	693.45	635.06	581.96	537.08	494.04	440.04	408.99
360.0	927.56	849.94	777.38	714.38	663.75	617.63	564.19	523.13	483.75

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	442.69	405.56	375.19	343.13	312.75	289.13	286.31	243.56	223.14
45.0	401.63	370.13	343.69	317.81	288.00	285.19	244.18	221.34	204.02
90.0	359.49	328.05	298.46	274.95	250.93	230.06	213.13	195.53	181.18
135.0	327.38	303.19	284.06	268.99	228.94	208.13	193.61	172.24	158.12
180.0	294.98	267.75	240.98	217.97	198.39	177.41	162.34	148.44	133.65
225.0	334.01	303.02	275.79	254.42	231.13	209.31	190.97	172.52	157.78
270.0	359.44	324.56	298.13	285.75	242.33	220.56	201.26	180.28	165.21
315.0	376.59	344.03	315.06	291.60	264.54	239.06	219.04	198.79	182.64
360.0	442.69	405.56	375.19	343.13	312.75	289.13	286.31	243.56	223.14

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	206.21	188.89	174.88	160.59	148.05	138.54	127.80	116.72	108.11
45.0	189.00	173.42	160.26	150.02	137.76	127.13	116.27	106.43	96.36
90.0	166.33	153.06	142.65	132.36	121.89	112.78	104.18	93.99	85.89
135.0	147.66	133.54	123.53	116.89	108.11	99.96	92.76	84.88	78.08
180.0	123.53	114.64	106.20	99.00	93.21	85.16	78.86	72.73	66.83
225.0	142.71	129.83	119.93	111.49	103.22	97.37	91.35	81.00	74.98
270.0	151.48	137.81	125.78	116.44	108.00	101.76	95.01	86.68	80.66
315.0	166.50	151.71	140.29	130.05	119.19	111.94	103.95	94.61	87.81
360.0	206.21	188.89	174.88	160.59	148.05	138.54	127.80	116.72	108.11

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	99.73	89.38	81.17	72.68	63.62	55.46	48.99	42.69	37.41
45.0	85.95	75.88	67.44	59.68	50.57	44.78	39.60	34.65	29.87
90.0	77.85	67.78	60.19	53.33	45.84	40.67	36.17	31.16	27.90
135.0	72.00	64.24	58.22	51.92	45.00	40.11	35.89	31.61	27.56
180.0	61.82	56.42	51.13	46.41	42.13	36.96	33.08	29.59	26.04
225.0	69.58	63.84	58.39	53.72	48.60	43.59	39.26	34.76	31.16
270.0	74.25	68.18	62.78	57.49	51.02	46.01	41.40	36.73	32.68
315.0	81.17	74.59	66.32	59.63	53.44	46.29	41.01	36.51	32.18
360.0	99.73	89.38	81.17	72.68	63.62	55.46	48.99	42.69	37.41

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	33.30	28.91	25.54	22.39	19.58	17.38	15.24	13.50	12.71
45.0	26.38	22.89	19.86	17.49	15.41	13.95	12.94	12.43	11.98
90.0	24.08	20.64	18.62	16.65	14.29	13.22	12.49	11.81	11.48
135.0	24.30	21.09	18.56	16.71	14.91	13.61	12.60	12.04	11.64
180.0	22.84	20.36	18.00	16.09	14.57	13.22	12.43	11.87	11.42
225.0	27.62	24.30	21.60	19.35	16.93	15.41	14.12	12.88	12.21
270.0	29.42	25.93	22.73	20.14	17.89	16.14	14.46	13.16	12.38
315.0	28.35	24.69	21.88	19.46	17.16	15.19	13.78	12.66	12.09
360.0	33.30	28.91	25.54	22.39	19.58	17.38	15.24	13.50	12.71

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	12.26	11.76	11.36	11.14	10.74	10.41	10.18	9.90	9.62
45.0	11.59	11.19	10.91	10.63	10.29	9.96	9.79	9.56	9.28
90.0	11.14	10.86	10.52	10.24	9.90	9.68	9.45	9.17	8.94
135.0	11.31	10.91	10.58	10.35	10.07	9.84	9.68	9.39	9.17
180.0	11.08	10.74	10.46	10.18	9.96	9.68	9.45	9.28	9.00
225.0	11.81	11.42	11.08	10.80	10.46	10.18	9.96	9.73	9.51
270.0	11.87	11.42	11.08	10.80	10.46	10.24	10.01	9.73	9.45
315.0	11.70	11.36	11.03	10.74	10.46	10.18	9.90	9.68	9.45
360.0	12.26	11.76	11.36	11.14	10.74	10.41	10.18	9.90	9.62

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.45	9.17	8.94	8.78	8.55	8.33	8.16	7.93	7.76
45.0	9.00	8.83	8.49	8.33	8.10	7.88	7.71	7.48	7.20
90.0	8.72	8.49	8.33	8.16	7.88	7.71	7.54	7.37	7.09
135.0	8.94	8.72	8.49	8.33	8.10	7.99	7.82	7.65	7.43
180.0	8.78	8.61	8.38	8.33	8.16	7.99	7.88	7.71	7.48
225.0	9.23	9.06	8.83	8.66	8.44	8.33	8.21	8.04	7.93
270.0	9.23	9.00	8.78	8.61	8.44	8.27	8.16	8.04	7.88
315.0	9.23	9.00	8.78	8.55	8.38	8.16	8.04	7.88	7.71
360.0	9.45	9.17	8.94	8.78	8.55	8.33	8.16	7.93	7.76

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	7.59	7.31	7.09	6.81	6.53	6.24	5.96	5.79	5.63
45.0	6.98	6.69	6.47	6.24	6.02	5.79	5.63	5.51	5.46
90.0	6.92	6.64	6.41	6.13	5.91	5.74	5.57	5.51	5.46
135.0	7.20	6.92	6.69	6.41	6.19	5.91	5.68	5.57	5.51
180.0	7.26	7.03	6.69	6.41	6.13	5.91	5.68	5.51	5.51
225.0	7.76	7.48	7.31	6.98	6.75	6.47	6.13	5.91	5.68
270.0	7.76	7.48	7.26	7.09	6.69	6.41	6.13	5.91	5.74
315.0	7.54	7.31	7.03	6.81	6.53	6.30	5.96	5.74	5.63
360.0	7.59	7.31	7.09	6.81	6.53	6.24	5.96	5.79	5.63

Intensity data(cd)

C/γ(°)	90.0
0.0	5.51
45.0	5.46
90.0	5.51
135.0	5.46
180.0	5.51
225.0	5.57
270.0	5.57
315.0	5.46
360.0	5.51