NATA LIGHTING CO.,LTD.
www.nata.cn
Email:info@nata.cn
Tel:+86-750-3770000 Fax:+86-750-3771111
Address:380 JinOu Road,GaoXin Zone,Jiang Men City,Guangdong,China

NATA

Client:
LumCAT: 3-2116-N
Luminaire: 92.70.131.00

Report No: nata-0100	Voltage(V): 36.7000
Test No: GC2018121205	Current(A): 0.5100
LampCAT: OSRAM SOLERIQ S13	Power (W): 18.7170
Lamp flux(lm): 1828.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 80	Width(mm): 80
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1516.49, Efficiency(%): 82.96% , Luminous Efficacy(lm/W): 81.02
Central intensity(cd): 6918.046, Maximum intensity(cd): 6918.046
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=22.6
[C90/270]Total=22.6
Field angle(10%Imax): [C0/180]Total=49.2
[C90/270]Total=49.2
Maximum s/h(1/2): C0_180=0.39 C90_270=0.39
Maximum s/h(1/4): C0_180=0.38 C90_270=0.38
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 83.05%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.088%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6918.047	1.655	1.655	.091%	.109%
1.0	6899.273	13.204	14.859	.722%	.980%
2.0	6823.828	26.116	40.975	1.429%	2.702%
3.0	6681.516	38.347	79.321	2.098%	5.231%
4.0	6487.031	49.623	128.944	2.715%	8.503%
5.0	6232.570	59.568	188.513	3.259%	12.431%
6.0	5914.617	67.797	256.31	3.709%	16.902%
7.0	5505.328	73.575	329.885	4.025%	21.753%
8.0	5097.516	77.797	407.682	4.256%	26.883%
9.0	4606.945	79.031	486.713	4.323%	32.095%
10.0	4074.891	77.596	564.309	4.245%	37.212%
11.0	3604.641	75.425	639.734	4.126%	42.185%
12.0	3131.297	71.393	711.126	3.906%	46.893%
13.0	2651.977	65.420	776.546	3.579%	51.207%
14.0	2252.531	59.758	836.304	3.269%	55.147%
15.0	1913.273	54.303	890.608	2.971%	58.728%
16.0	1605.094	48.517	939.124	2.654%	61.928%
17.0	1374.469	44.068	983.192	2.411%	64.833%
18.0	1177.615	39.906	1023.098	2.183%	67.465%
19.0	1057.113	37.741	1060.839	2.065%	69.954%
20.0	954.984	35.818	1096.657	1.959%	72.316%
21.0	873.513	34.328	1130.985	1.878%	74.579%
22.0	808.059	33.195	1164.18	1.816%	76.768%
23.0	758.953	32.520	1196.7	1.779%	78.913%
24.0	715.050	31.893	1228.593	1.745%	81.016%
25.0	674.065	31.239	1259.832	1.709%	83.076%
26.0	642.825	30.902	1290.734	1.690%	85.113%
27.0	599.998	29.871	1320.605	1.634%	87.083%
28.0	534.459	27.515	1348.121	1.505%	88.898%
29.0	460.997	24.509	1372.629	1.341%	90.514%
30.0	381.459	20.916	1393.545	1.144%	91.893%
31.0	293.738	16.590	1410.135	.908%	92.987%
32.0	202.887	11.790	1421.925	.645%	93.764%
33.0	137.735	8.226	1430.151	.450%	94.307%
34.0	73.849	4.529	1434.68	.248%	94.605%
35.0	54.183	3.408	1438.088	.186%	94.830%
36.0	47.341	3.051	1441.139	.167%	95.031%
37.0	43.348	2.861	1444	.156%	95.220%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	39.980	2.699	1446.699	.148%	95.398%
39.0	37.716	2.603	1449.302	.142%	95.570%
40.0	35.986	2.537	1451.839	.139%	95.737%
41.0	34.636	2.492	1454.331	.136%	95.901%
42.0	33.349	2.447	1456.778	.134%	96.063%
43.0	31.943	2.389	1459.167	.131%	96.220%
44.0	30.670	2.336	1461.503	.128%	96.374%
45.0	29.278	2.270	1463.773	.124%	96.524%
46.0	27.907	2.201	1465.975	.120%	96.669%
47.0	26.564	2.130	1468.105	.117%	96.810%
48.0	25.284	2.061	1470.166	.113%	96.945%
49.0	23.794	1.969	1472.135	.108%	97.075%
50.0	22.472	1.888	1474.023	.103%	97.200%
51.0	21.094	1.798	1475.82	.098%	97.318%
52.0	19.610	1.695	1477.515	.093%	97.430%
53.0	18.352	1.607	1479.122	.088%	97.536%
54.0	17.332	1.538	1480.66	.084%	97.637%
55.0	16.545	1.486	1482.146	.081%	97.735%
56.0	15.982	1.453	1483.599	.079%	97.831%
57.0	15.405	1.417	1485.016	.078%	97.925%
58.0	14.787	1.375	1486.391	.075%	98.015%
59.0	14.280	1.342	1487.733	.073%	98.104%
60.0	13.894	1.319	1489.053	.072%	98.191%
61.0	13.507	1.295	1490.348	.071%	98.276%
62.0	13.127	1.271	1491.619	.070%	98.360%
63.0	12.776	1.248	1492.868	.068%	98.442%
64.0	12.502	1.232	1494.1	.067%	98.524%
65.0	11.876	1.180	1495.28	.065%	98.601%
66.0	10.498	1.052	1496.332	.058%	98.671%
67.0	9.274	0.936	1497.268	.051%	98.733%
68.0	8.845	0.899	1498.167	.049%	98.792%
69.0	8.698	0.890	1499.058	.049%	98.851%
70.0	8.599	0.886	1499.944	.048%	98.909%
71.0	8.529	0.884	1500.828	.048%	98.967%
72.0	8.438	0.880	1501.708	.048%	99.025%
73.0	8.402	0.881	1502.589	.048%	99.083%
74.0	8.339	0.879	1503.468	.048%	99.141%
75.0	8.248	0.874	1504.342	.048%	99.199%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	8.170	0.869	1505.211	.048%	99.256%
77.0	8.149	0.871	1506.082	.048%	99.314%
78.0	8.114	0.870	1506.952	.048%	99.371%
79.0	8.093	0.871	1507.824	.048%	99.429%
80.0	8.058	0.870	1508.694	.048%	99.486%
81.0	8.051	0.872	1509.566	.048%	99.544%
82.0	8.121	0.882	1510.448	.048%	99.602%
83.0	8.156	0.888	1511.335	.049%	99.660%
84.0	8.044	0.877	1512.213	.048%	99.718%
85.0	7.763	0.848	1513.061	.046%	99.774%
86.0	7.411	0.811	1513.871	.044%	99.827%
87.0	7.024	0.769	1514.641	.042%	99.878%
88.0	6.848	0.751	1515.391	.041%	99.928%
89.0	6.694	0.734	1516.125	.040%	99.976%
90.0	6.623	0.363	1516.488	.020%	100.000%

Zonal flux distribution table

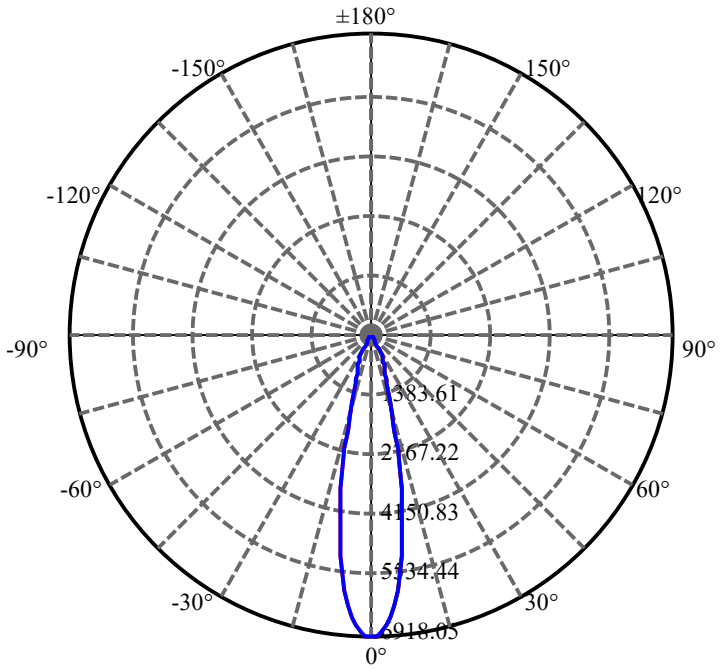
ZONAL LUMEN SUMMARY

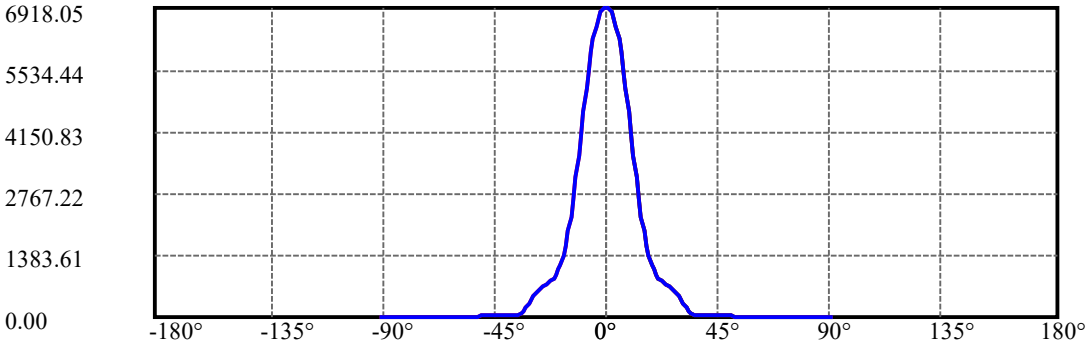
Zone	Lumens	%Lamp	%Fixt
0-30	1393.54	76.23%	91.89%
0-40	1451.84	79.42%	95.74%
0-60	1489.05	81.46%	98.19%
0-90	1516.13	82.94%	99.98%
0-120	1516.13	82.94%	99.98%
0-180	1516.49	82.96%	100.00%
60-90	28.39	1.55%	1.87%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-23.52	1213.19	66.37%	80.00%

ZONAL LUMEN SUMMARY

0-10	564.31
10-20	532.35
20-30	296.89
30-40	58.29
40-50	22.18
50-60	15.03
60-70	10.89
70-80	8.75
80-90	7.43
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):

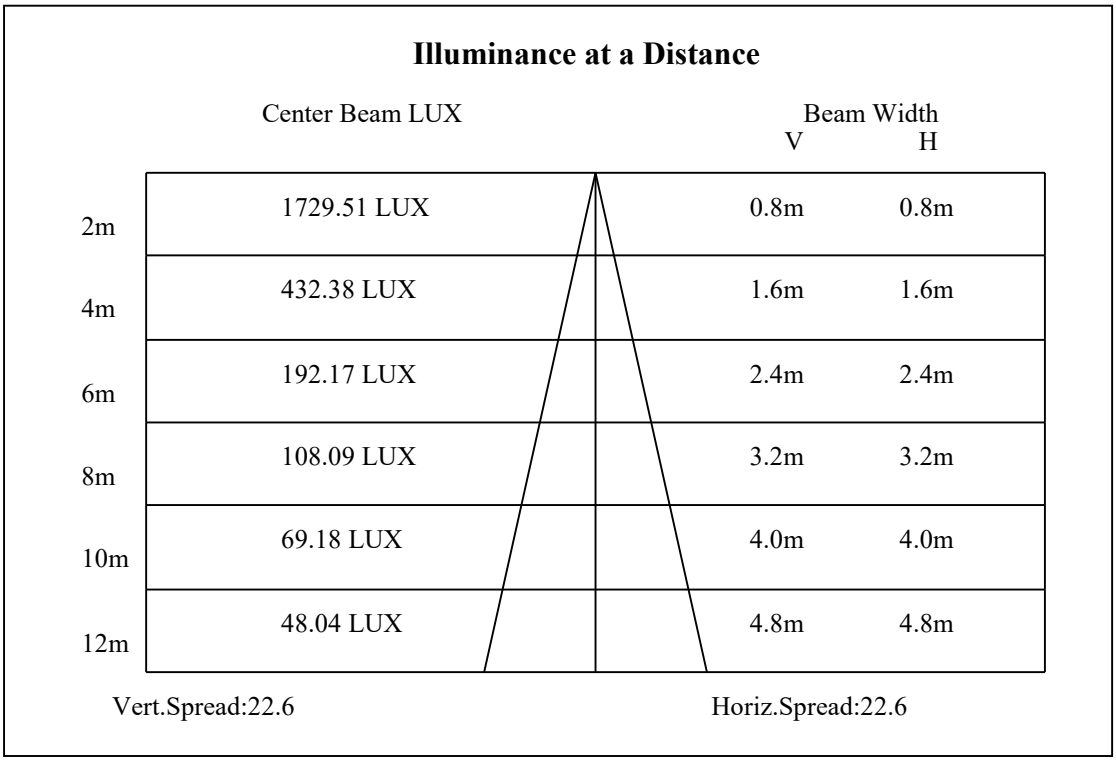
C0/C180:

C90/C270:

Field angle(10%Imax):C0/180Left:24.6 Right:24.6
:C90/270Left:24.6 Right:24.6

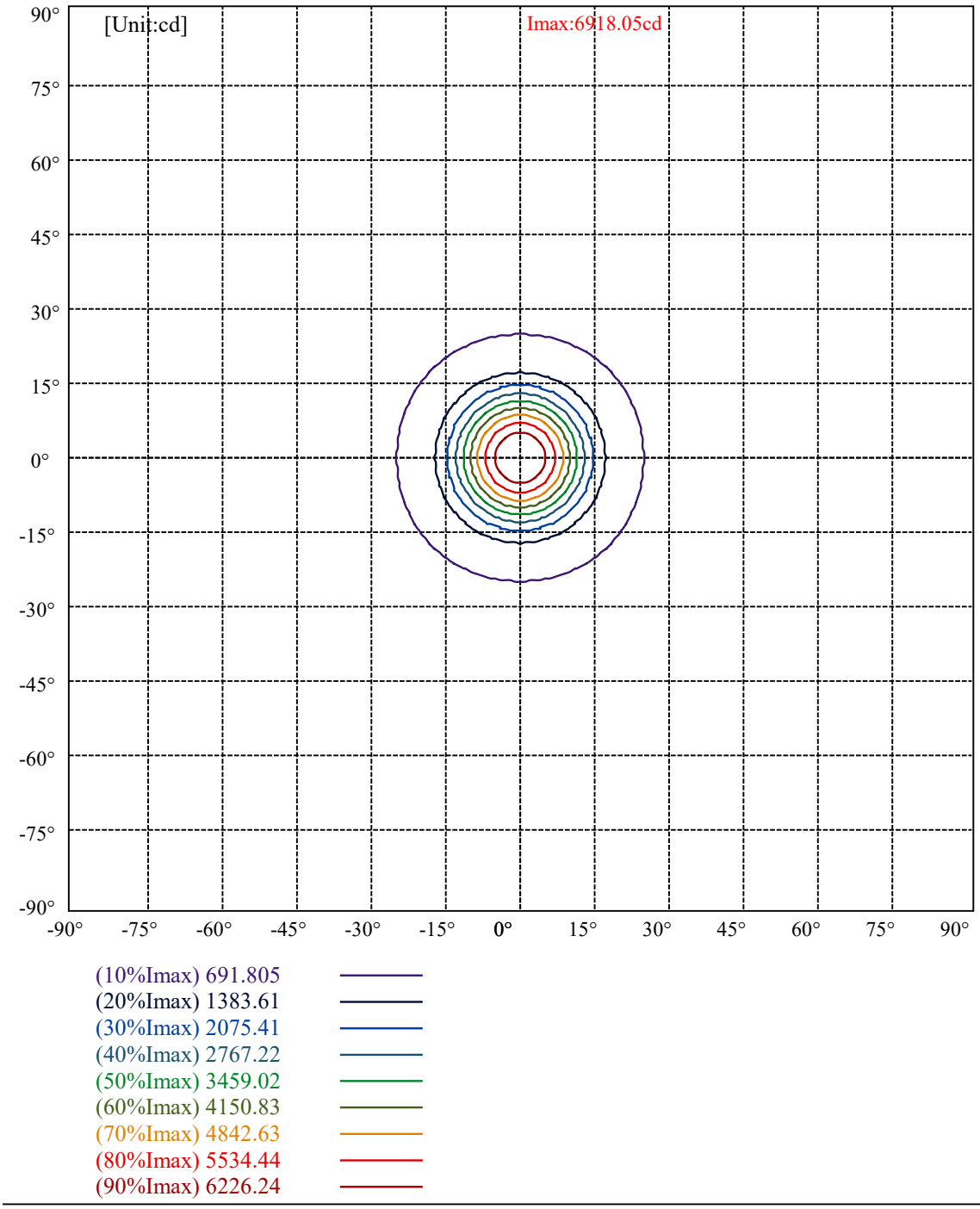
Beam Angle(50%Imax):C0/180Left:11.3 Right:11.3
:C90/270Left:11.3 Right:11.3

Lux distance Curve



Equipment: GMS1980 Date: 2018/12/12 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

ISO-Intensity(V-H)

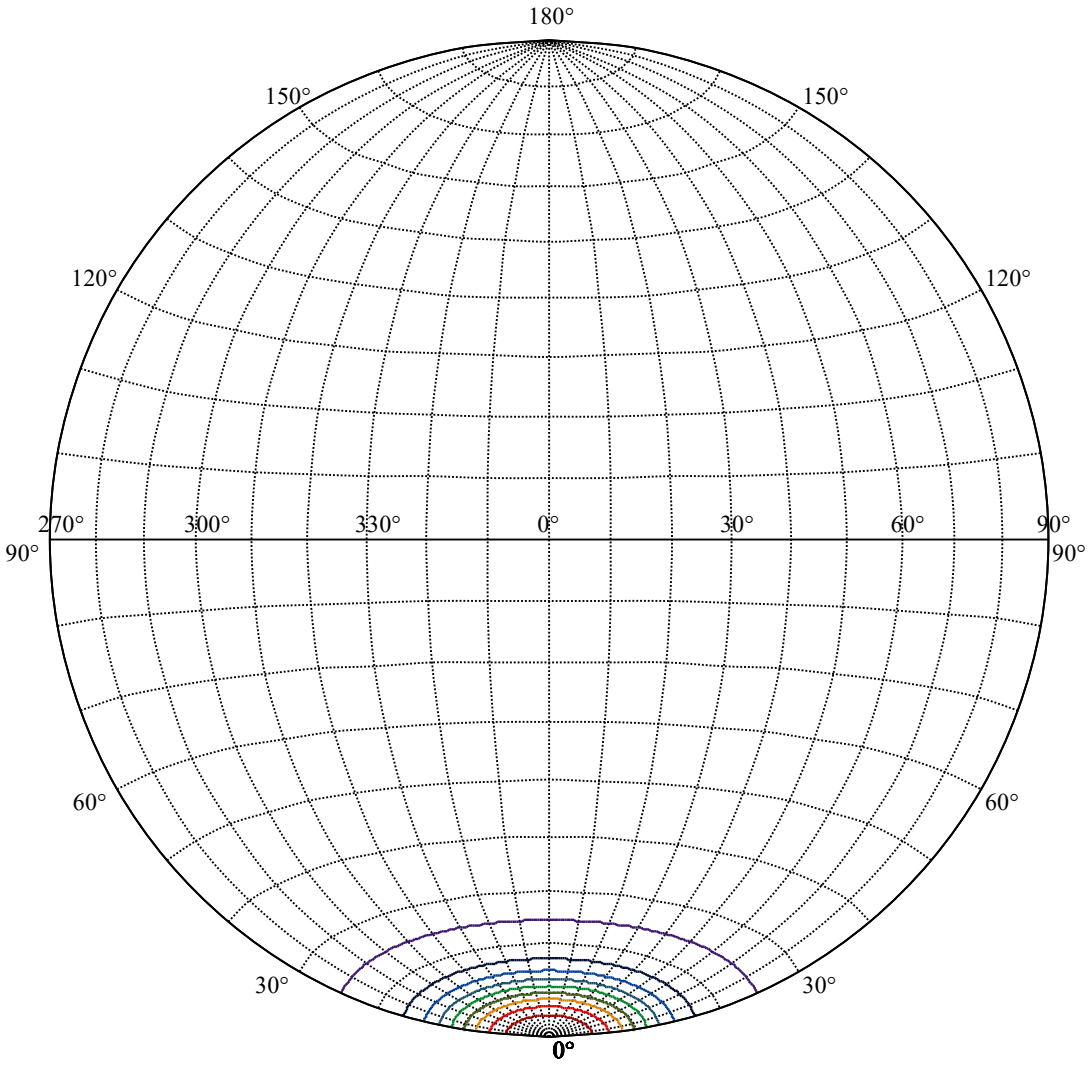


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/12/12
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web

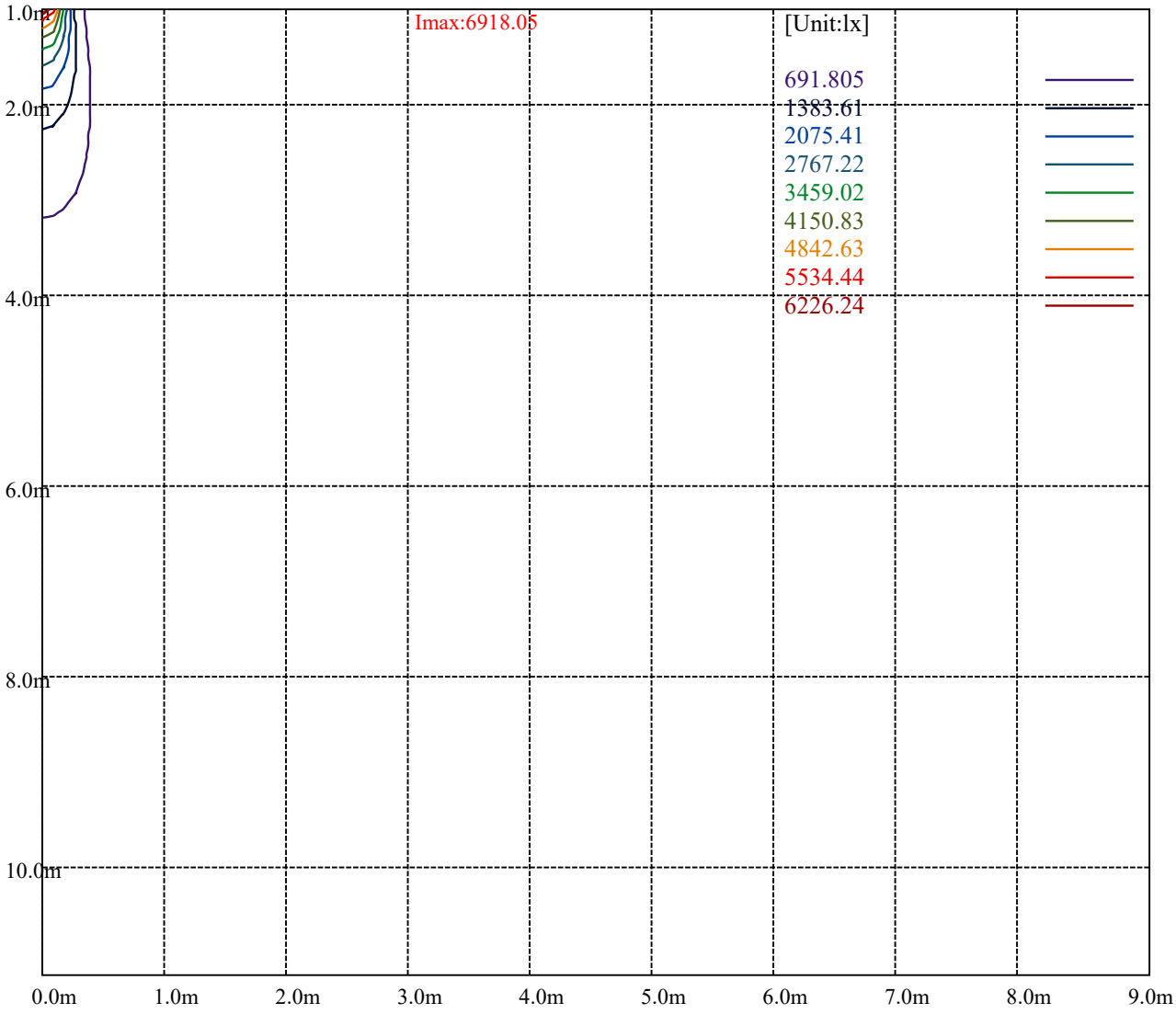


House [Unit:cd] Road

Imax:6918.05

(10%Imax) 691.805
(20%Imax) 1383.61
(30%Imax) 2075.41
(40%Imax) 2767.22
(50%Imax) 3459.02
(60%Imax) 4150.83
(70%Imax) 4842.63
(80%Imax) 5534.44
(90%Imax) 6226.24

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/12/12
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

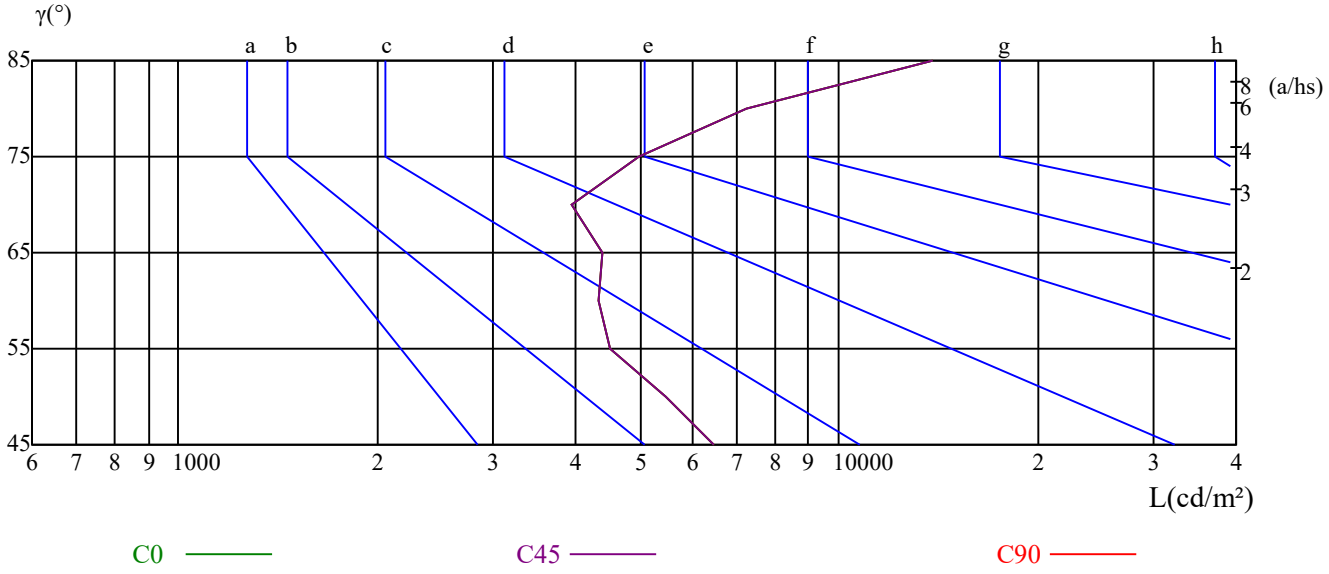
γ	45	50	55	60	65	70	75	80	85
C0	6470	5463	4507	4342	4391	3929	4979	7250	13916
C45	6470	5463	4507	4342	4391	3929	4979	7250	13916
C90	6470	5463	4507	4342	4391	3929	4979	7250	13916

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4391	4391	4391	4979	4979	4979	13916	13916	13916

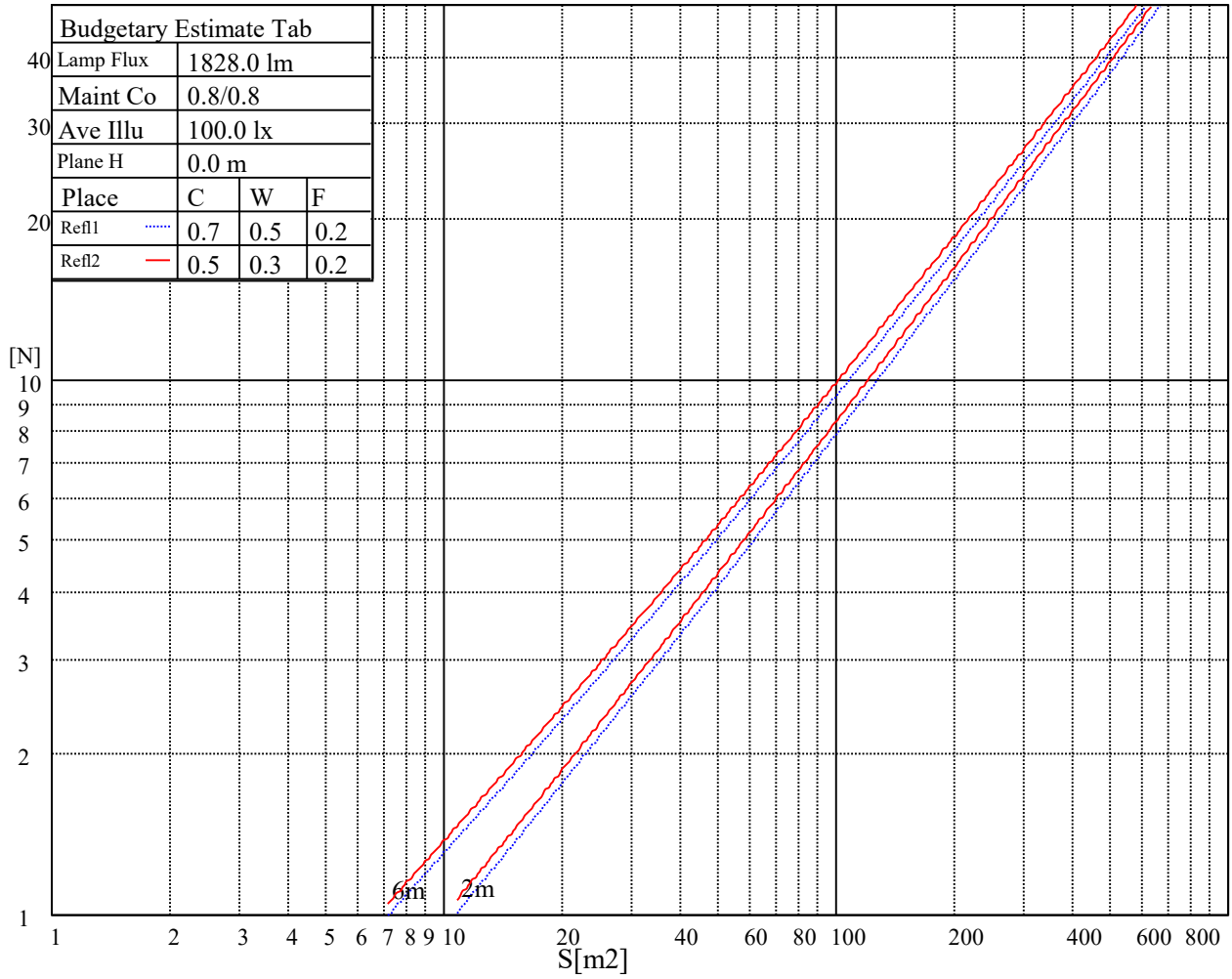
Glare Table

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

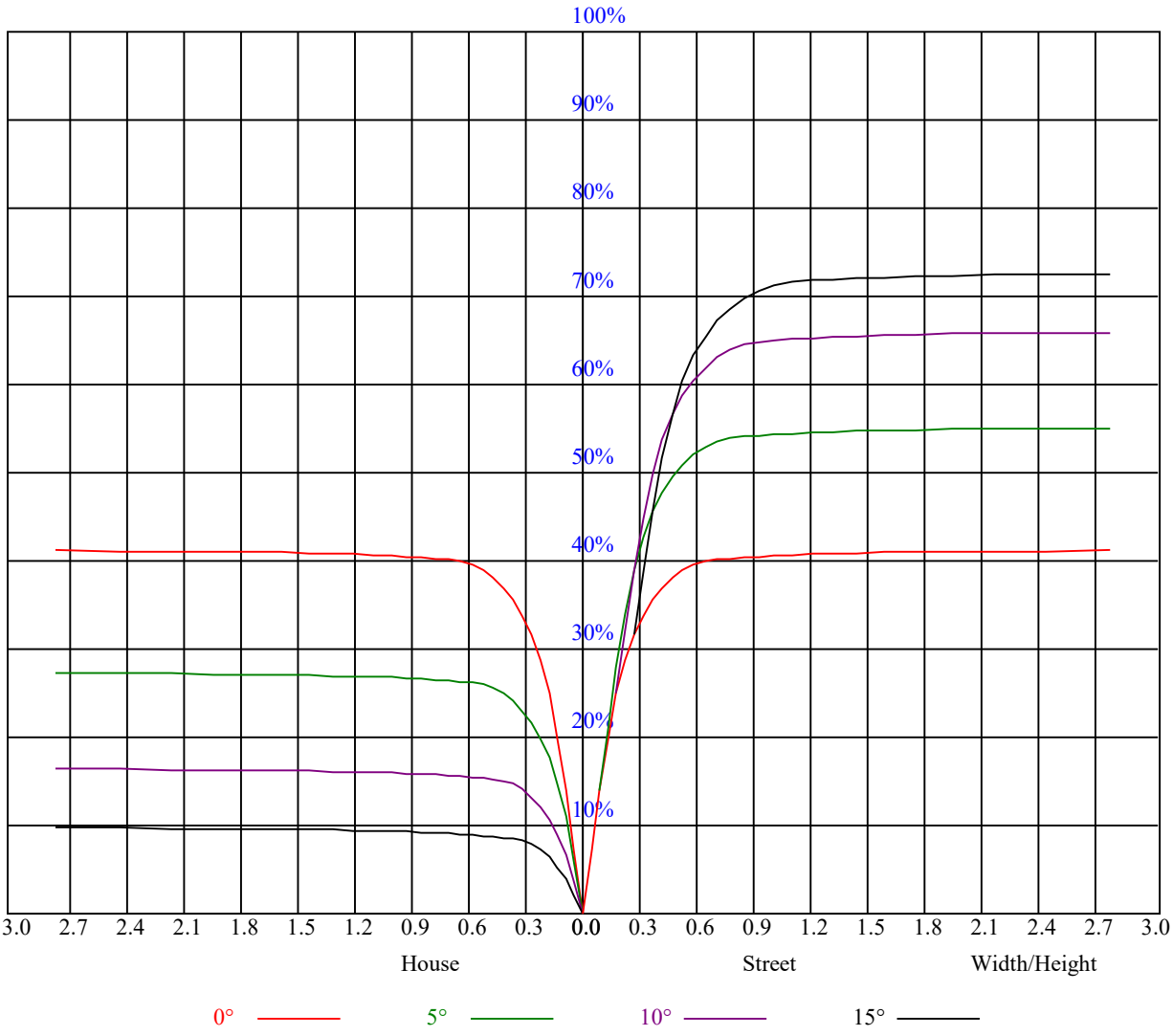


Equipment: GMS1980 Date: 2018/12/12 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Utilization factor table for indoor luminaire

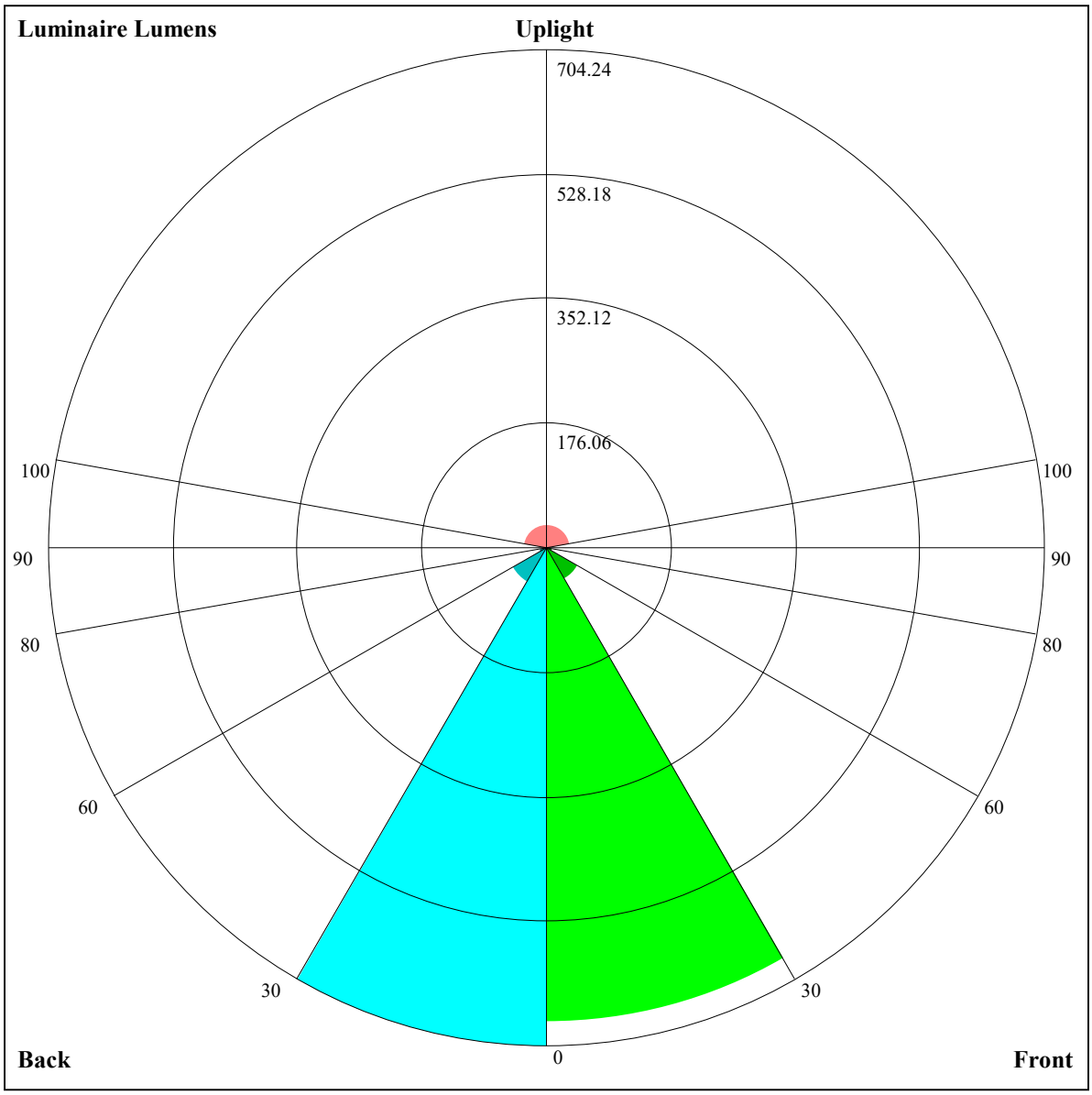
RHOCC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFCIENTS OF UTILIZATION RHOFC=20 CU															
0	0.99	0.99	0.99	0.97	0.97	0.97	0.92	0.92	0.92	0.88	0.88	0.88	0.85	0.85	0.85	0.83
1	0.93	0.91	0.90	0.91	0.90	0.88	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.81	0.79
2	0.88	0.86	0.83	0.87	0.85	0.82	0.84	0.82	0.81	0.82	0.80	0.79	0.80	0.78	0.77	0.76
3	0.84	0.81	0.78	0.83	0.80	0.78	0.81	0.79	0.77	0.79	0.77	0.75	0.77	0.76	0.74	0.73
4	0.81	0.77	0.75	0.80	0.77	0.74	0.78	0.75	0.73	0.77	0.74	0.72	0.75	0.73	0.72	0.71
5	0.78	0.74	0.71	0.77	0.74	0.71	0.76	0.73	0.70	0.74	0.72	0.70	0.73	0.71	0.69	0.68
6	0.75	0.71	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.71	0.69	0.67	0.66
7	0.72	0.69	0.66	0.72	0.68	0.66	0.71	0.68	0.66	0.70	0.67	0.65	0.69	0.67	0.65	0.64
8	0.70	0.66	0.64	0.70	0.66	0.64	0.69	0.66	0.64	0.68	0.65	0.63	0.67	0.65	0.63	0.62
9	0.68	0.64	0.62	0.68	0.64	0.62	0.67	0.64	0.62	0.66	0.64	0.62	0.66	0.63	0.61	0.61
10	0.66	0.63	0.60	0.66	0.62	0.60	0.65	0.62	0.60	0.65	0.62	0.60	0.64	0.62	0.60	0.59

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2018/12/12	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

LCS Graph



Luminaire Lumens:

FL=670.85,FM=51.12,FH=9.95,FVH=4.08

BL=704.24,BM=56.82,BH=10.1,BVH=4.14

UL=7.23,UH=34.39

BUG Rating:B2-U2-G0

Equipment: GMS1980	Date: 2018/12/12	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	6930.00	6897.94	6805.69	6645.94	6441.75	6148.13	5778.00	5400.56	4988.25
45.0	6929.44	6930.56	6873.19	6770.25	6599.81	6366.38	6086.25	5700.38	5304.94
90.0	6922.69	6932.81	6887.81	6764.63	6616.13	6408.56	6060.38	5717.81	5314.50
135.0	6890.06	6944.63	6932.25	6879.94	6739.31	6553.13	6353.44	5991.19	5641.31
180.0	6930.00	6922.69	6871.50	6751.69	6569.44	6346.13	6060.94	5627.25	5225.63
225.0	6929.44	6884.44	6791.63	6611.06	6405.75	6141.38	5784.75	5361.19	4938.19
270.0	6922.69	6869.81	6751.13	6587.44	6339.94	6023.81	5689.13	5253.75	4829.63
315.0	6890.06	6811.31	6677.44	6441.19	6184.13	5873.06	5504.06	4990.50	4537.69
360.0	6930.00	6897.94	6805.69	6645.94	6441.75	6148.13	5778.00	5400.56	4988.25

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4433.06	3969.00	3500.44	3053.25	2544.19	2178.00	1868.06	1540.13	1332.56
45.0	4812.75	4282.88	3808.13	3338.44	2788.31	2386.69	2035.13	1666.13	1421.44
90.0	4754.25	4283.44	3810.38	3231.56	2838.38	2375.44	1935.00	1671.19	1409.63
135.0	5244.19	4682.25	4209.19	3735.00	3167.44	2729.25	2341.13	1937.25	1665.00
180.0	4788.56	4201.88	3729.38	3272.06	2791.69	2367.56	2037.38	1726.31	1491.19
225.0	4426.31	3891.94	3417.19	2911.50	2500.88	2101.50	1770.19	1521.56	1325.25
270.0	4321.69	3800.25	3336.19	2895.19	2390.06	2037.94	1733.63	1424.81	1234.69
315.0	4074.75	3487.50	3026.25	2613.38	2194.88	1843.88	1585.69	1353.38	1116.00
360.0	4433.06	3969.00	3500.44	3053.25	2544.19	2178.00	1868.06	1540.13	1332.56

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1170.56	1037.25	938.25	867.94	805.50	760.50	716.06	679.50	650.25
45.0	1230.19	1080.56	969.75	892.13	820.13	770.06	719.44	680.06	648.00
90.0	1098.56	1014.53	910.69	819.17	747.90	697.78	655.14	609.36	578.14
135.0	1428.19	1238.06	1090.13	988.88	892.13	825.19	771.75	719.44	685.13
180.0	1219.50	1103.23	992.76	899.44	833.06	787.84	749.36	711.62	690.86
225.0	1116.96	1045.58	967.05	880.26	835.03	786.88	737.38	694.63	662.63
270.0	1093.50	974.25	878.63	814.50	758.81	713.25	675.56	637.88	609.19
315.0	1063.46	963.45	892.63	825.81	771.92	730.13	695.70	660.04	618.41
360.0	1170.56	1037.25	938.25	867.94	805.50	760.50	716.06	679.50	650.25

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	596.81	520.31	442.69	371.81	286.88	171.11	104.68	54.00	48.60
45.0	609.75	545.06	474.75	396.56	291.94	240.92	133.76	75.15	52.43
90.0	548.33	493.31	434.42	371.53	298.86	222.69	158.68	99.96	64.07
135.0	651.38	613.13	555.75	480.38	378.00	297.00	287.44	122.34	70.14
180.0	672.30	618.81	535.61	441.68	333.11	231.53	149.18	74.59	50.68
225.0	609.81	533.31	457.59	363.66	278.04	187.37	108.34	58.61	49.84
270.0	557.44	487.69	415.13	337.50	286.88	160.26	97.43	57.94	52.48
315.0	554.18	464.06	372.04	288.56	196.20	112.22	62.38	48.21	45.23
360.0	596.81	520.31	442.69	371.81	286.88	171.11	104.68	54.00	48.60

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	45.28	40.84	37.63	36.17	34.59	33.41	32.40	31.05	30.09
45.0	48.71	45.62	40.78	38.81	37.13	35.33	34.09	32.79	31.16
90.0	53.49	47.98	43.93	40.33	37.91	36.23	34.76	33.02	31.78
135.0	48.94	45.39	41.91	38.70	36.96	35.49	34.09	32.96	31.73
180.0	46.46	42.36	38.76	36.73	35.21	34.09	33.19	32.12	30.99
225.0	45.45	41.57	38.98	37.01	35.55	34.31	33.13	31.61	30.38
270.0	48.38	44.27	40.89	38.76	36.68	35.38	33.64	32.18	30.77
315.0	42.02	38.76	36.96	35.21	33.86	32.85	31.50	29.81	28.46
360.0	45.28	40.84	37.63	36.17	34.59	33.41	32.40	31.05	30.09

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	28.86	27.51	26.38	25.09	23.46	21.99	20.08	18.23	16.88
45.0	29.59	28.52	27.11	25.99	24.53	23.23	21.99	20.48	18.96
90.0	30.32	29.03	27.39	26.27	24.81	23.57	22.44	21.04	19.74
135.0	30.32	28.97	27.68	26.44	24.86	23.63	22.28	20.70	19.35
180.0	29.81	28.41	27.17	25.93	24.08	22.50	20.98	19.24	18.00
225.0	29.08	27.23	25.99	24.47	23.23	22.28	20.70	19.46	18.39
270.0	29.08	27.68	26.33	25.03	23.68	22.33	21.26	19.97	18.62
315.0	27.17	25.93	24.47	23.06	21.71	20.25	19.01	17.78	16.88
360.0	28.86	27.51	26.38	25.09	23.46	21.99	20.08	18.23	16.88

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	15.98	15.24	15.36	15.02	14.46	13.89	13.50	13.16	12.71
45.0	18.00	17.04	16.14	15.41	14.85	14.34	14.18	14.01	13.67
90.0	18.73	17.78	17.04	16.26	15.41	14.85	14.40	13.95	13.56
135.0	18.23	17.10	16.14	15.47	15.13	14.74	14.29	14.01	13.56
180.0	16.82	16.26	16.09	15.75	14.85	14.23	13.78	13.16	12.49
225.0	17.33	16.59	15.92	15.19	14.57	14.18	13.89	13.50	13.33
270.0	17.78	17.10	16.31	15.69	15.02	14.34	13.73	13.39	13.05
315.0	15.81	15.24	14.85	14.46	14.01	13.67	13.39	12.88	12.66
360.0	15.98	15.24	15.36	15.02	14.46	13.89	13.50	13.16	12.71

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	12.38	12.15	11.53	9.79	8.61	8.38	8.33	8.27	8.21
45.0	13.39	12.94	12.66	11.08	9.56	8.89	8.78	8.66	8.55
90.0	13.22	12.83	12.43	11.81	10.24	9.56	9.28	9.11	9.06
135.0	13.16	12.71	12.32	11.93	10.13	9.06	8.55	8.44	8.38
180.0	11.93	12.21	13.33	10.74	8.94	8.55	8.55	8.49	8.38
225.0	12.94	12.54	11.48	9.73	8.89	8.78	8.66	8.55	8.49
270.0	12.83	12.99	11.36	10.07	9.39	9.23	9.17	9.11	9.00
315.0	12.38	11.64	9.90	8.83	8.44	8.33	8.27	8.16	8.16
360.0	12.38	12.15	11.53	9.79	8.61	8.38	8.33	8.27	8.21

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	8.10	8.04	8.04	7.93	7.88	7.99	8.04	8.16	8.21
45.0	8.49	8.44	8.33	8.21	8.10	8.10	7.93	7.99	7.93
90.0	8.83	8.78	8.66	8.55	8.44	8.33	8.33	8.27	8.16
135.0	8.33	8.27	8.16	8.10	8.04	7.99	7.99	8.04	8.10
180.0	8.27	8.21	8.21	8.21	8.10	8.04	8.04	8.04	8.04
225.0	8.49	8.44	8.38	8.27	8.16	8.16	8.10	7.99	7.93
270.0	8.89	8.94	8.89	8.72	8.66	8.61	8.55	8.44	8.33
315.0	8.10	8.10	8.04	7.99	7.99	7.99	7.93	7.82	7.76
360.0	8.10	8.04	8.04	7.93	7.88	7.99	8.04	8.16	8.21

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	7.93	7.71	7.59	7.59	7.54	7.31	7.03	6.86	6.64
45.0	8.10	8.27	8.49	8.38	8.27	7.88	7.37	7.03	6.81
90.0	8.10	8.21	8.21	8.21	7.88	7.54	7.03	6.81	6.69
135.0	8.16	8.38	8.49	8.49	8.04	7.65	7.20	6.98	6.81
180.0	8.21	8.44	8.55	8.21	7.76	7.26	6.92	6.86	6.81
225.0	7.99	8.10	8.27	8.10	7.88	7.43	6.98	6.86	6.69
270.0	8.16	8.10	7.99	7.88	7.43	7.14	6.81	6.69	6.58
315.0	7.76	7.76	7.65	7.48	7.31	7.09	6.86	6.69	6.53
360.0	7.93	7.71	7.59	7.59	7.54	7.31	7.03	6.86	6.64

Intensity data(cd)

C/γ(°)	90.0
0.0	6.53
45.0	6.69
90.0	6.58
135.0	6.75
180.0	6.53
225.0	6.69
270.0	6.58
315.0	6.64
360.0	6.53