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NATA

LumCAT: 60.0048.000(CR01D020010BW)
Luminaire:

Report No: NATA0100	Voltage(V): 3.4400
Test No: GC2019030516	Current(A): 0.2500
LampCAT: CREE XPE2	Power (W): 0.8600
Lamp flux(lm): 63.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 18	Width(mm): 18
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 60.92
Efficiency(%): 96.70%
Lumens(lm)/Power(W): 70.84
Central intensity(cd): 1284.750
Maximum intensity(cd): 1284.750
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=8.8
[C90/270]Total=8.8
Field angle(10%Imax): [C0/180]Total=17.7
[C90/270]Total=17.7
Maximum s/h(1/2): C0_180=0.15 C90_270=0.15
Maximum s/h(1/4): C0_180=0.16 C90_270=0.16
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 96.70%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 95.553%

Equipment: GMS1980	Date: 2019/3/5	Operator: NT07
Temperature(°C): 10.0	Humidity(%): 65.0%	Distance(m): 7.50

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	1284.750	0.000	0	.000%	.000%
1.0	1217.320	1.197	1.197	1.900%	1.965%
2.0	1089.963	3.312	4.509	5.257%	7.401%
3.0	917.691	4.802	9.31	7.622%	15.283%
4.0	728.438	5.510	14.821	8.746%	24.327%
5.0	515.468	5.351	20.172	8.494%	33.111%
6.0	363.691	4.620	24.792	7.334%	40.695%
7.0	249.265	3.805	28.597	6.039%	46.940%
8.0	184.711	3.106	31.703	4.930%	52.038%
9.0	119.116	2.462	34.165	3.909%	56.080%
10.0	88.425	1.878	36.043	2.981%	59.162%
11.0	68.309	1.566	37.609	2.486%	61.733%
12.0	55.758	1.356	38.965	2.153%	63.959%
13.0	46.934	1.219	40.184	1.934%	65.960%
14.0	39.994	1.113	41.297	1.766%	67.786%
15.0	35.114	1.031	42.328	1.637%	69.479%
16.0	30.923	0.968	43.295	1.536%	71.067%
17.0	27.443	0.909	44.204	1.443%	72.559%
18.0	24.441	0.855	45.06	1.358%	73.963%
19.0	22.127	0.810	45.87	1.286%	75.293%
20.0	19.898	0.769	46.639	1.221%	76.555%
21.0	18.042	0.729	47.368	1.156%	77.751%
22.0	16.481	0.694	48.062	1.101%	78.890%
23.0	14.920	0.659	48.72	1.046%	79.972%
24.0	13.359	0.618	49.339	.981%	80.986%
25.0	11.925	0.575	49.914	.913%	81.930%
26.0	10.624	0.532	50.446	.845%	82.804%
27.0	9.338	0.488	50.934	.775%	83.605%
28.0	8.346	0.448	51.382	.711%	84.340%
29.0	7.397	0.412	51.794	.654%	85.016%
30.0	6.659	0.379	52.173	.602%	85.639%
31.0	6.047	0.354	52.527	.561%	86.220%
32.0	5.484	0.330	52.857	.524%	86.762%
33.0	5.055	0.311	53.168	.493%	87.272%
34.0	4.676	0.294	53.462	.467%	87.755%
35.0	4.338	0.280	53.742	.444%	88.215%
36.0	4.029	0.266	54.009	.423%	88.652%
37.0	3.755	0.254	54.262	.403%	89.069%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	3.516	0.243	54.505	.385%	89.467%
39.0	3.284	0.232	54.737	.368%	89.848%
40.0	3.094	0.222	54.96	.353%	90.213%
41.0	2.904	0.214	55.173	.339%	90.564%
42.0	2.735	0.205	55.378	.325%	90.900%
43.0	2.602	0.198	55.576	.314%	91.224%
44.0	2.475	0.192	55.767	.304%	91.539%
45.0	2.348	0.185	55.953	.294%	91.843%
46.0	2.236	0.179	56.132	.285%	92.137%
47.0	2.159	0.175	56.307	.277%	92.424%
48.0	2.067	0.171	56.478	.271%	92.705%
49.0	1.948	0.165	56.643	.262%	92.975%
50.0	1.877	0.159	56.802	.253%	93.237%
51.0	1.800	0.156	56.958	.247%	93.492%
52.0	1.744	0.152	57.11	.241%	93.742%
53.0	1.688	0.149	57.259	.237%	93.987%
54.0	1.617	0.146	57.405	.231%	94.226%
55.0	1.561	0.142	57.546	.225%	94.459%
56.0	1.526	0.139	57.686	.221%	94.688%
57.0	1.477	0.137	57.823	.218%	94.913%
58.0	1.399	0.133	57.956	.211%	95.132%
59.0	1.371	0.130	58.086	.206%	95.344%
60.0	1.322	0.127	58.213	.202%	95.553%
61.0	1.294	0.125	58.338	.198%	95.758%
62.0	1.266	0.123	58.461	.196%	95.960%
63.0	1.230	0.121	58.582	.193%	96.160%
64.0	1.195	0.119	58.701	.189%	96.355%
65.0	1.160	0.117	58.818	.185%	96.546%
66.0	1.118	0.114	58.932	.180%	96.733%
67.0	1.090	0.111	59.043	.176%	96.915%
68.0	1.069	0.109	59.152	.174%	97.095%
69.0	1.034	0.107	59.259	.170%	97.271%
70.0	1.005	0.105	59.364	.166%	97.443%
71.0	1.005	0.104	59.468	.165%	97.613%
72.0	0.970	0.103	59.571	.163%	97.782%
73.0	0.949	0.100	59.671	.159%	97.947%
74.0	0.928	0.099	59.77	.157%	98.109%
75.0	0.907	0.097	59.867	.154%	98.268%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	0.872	0.094	59.961	.150%	98.423%
77.0	0.865	0.093	60.054	.147%	98.575%
78.0	0.844	0.091	60.145	.145%	98.725%
79.0	0.809	0.089	60.234	.141%	98.871%
80.0	0.780	0.086	60.32	.136%	99.011%
81.0	0.780	0.084	60.404	.134%	99.150%
82.0	0.759	0.084	60.488	.133%	99.287%
83.0	0.738	0.081	60.569	.129%	99.420%
84.0	0.696	0.078	60.647	.124%	99.549%
85.0	0.675	0.075	60.722	.119%	99.672%
86.0	0.555	0.067	60.789	.107%	99.782%
87.0	0.408	0.053	60.842	.084%	99.868%
88.0	0.246	0.036	60.878	.057%	99.927%
89.0	0.197	0.024	60.902	.039%	99.967%
90.0	0.169	0.020	60.922	.032%	100.000%

Zonal flux distribution table

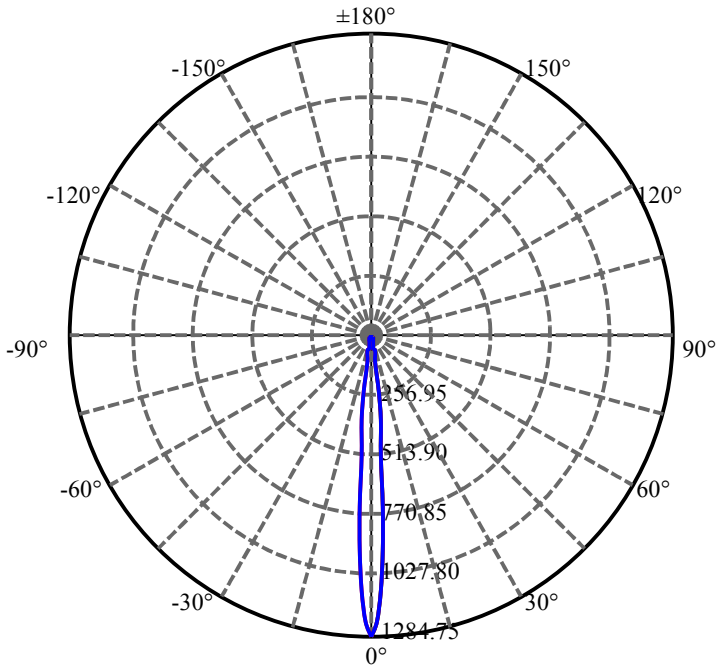
ZONAL LUMEN SUMMARY

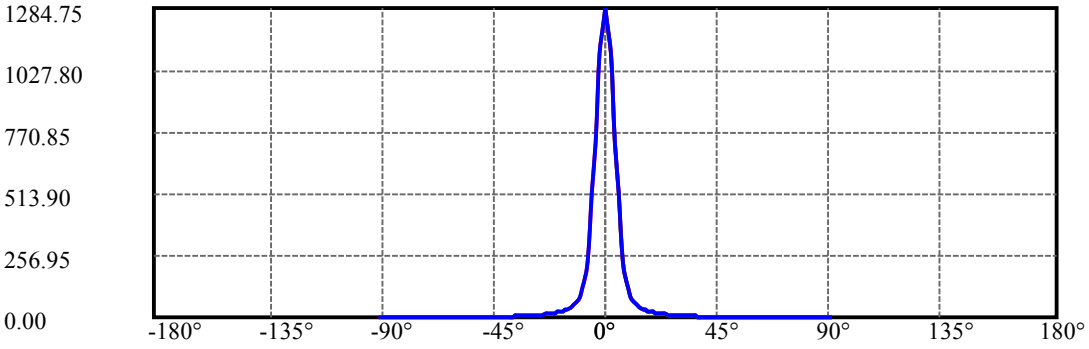
Zone	Lumens	%Lamp	%Fixt
0-30	52.17	82.81%	85.64%
0-40	54.96	87.24%	90.21%
0-60	58.21	92.40%	95.55%
0-90	60.90	96.67%	99.97%
0-120	60.90	96.67%	99.97%
0-180	60.92	96.70%	100.00%
60-90	2.82	4.47%	4.62%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-23.03	48.74	77.36%	80.00%

ZONAL LUMEN SUMMARY

0-10	36.04
10-20	10.60
20-30	5.53
30-40	2.79
40-50	1.84
50-60	1.41
60-70	1.15
70-80	0.96
80-90	0.58
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):

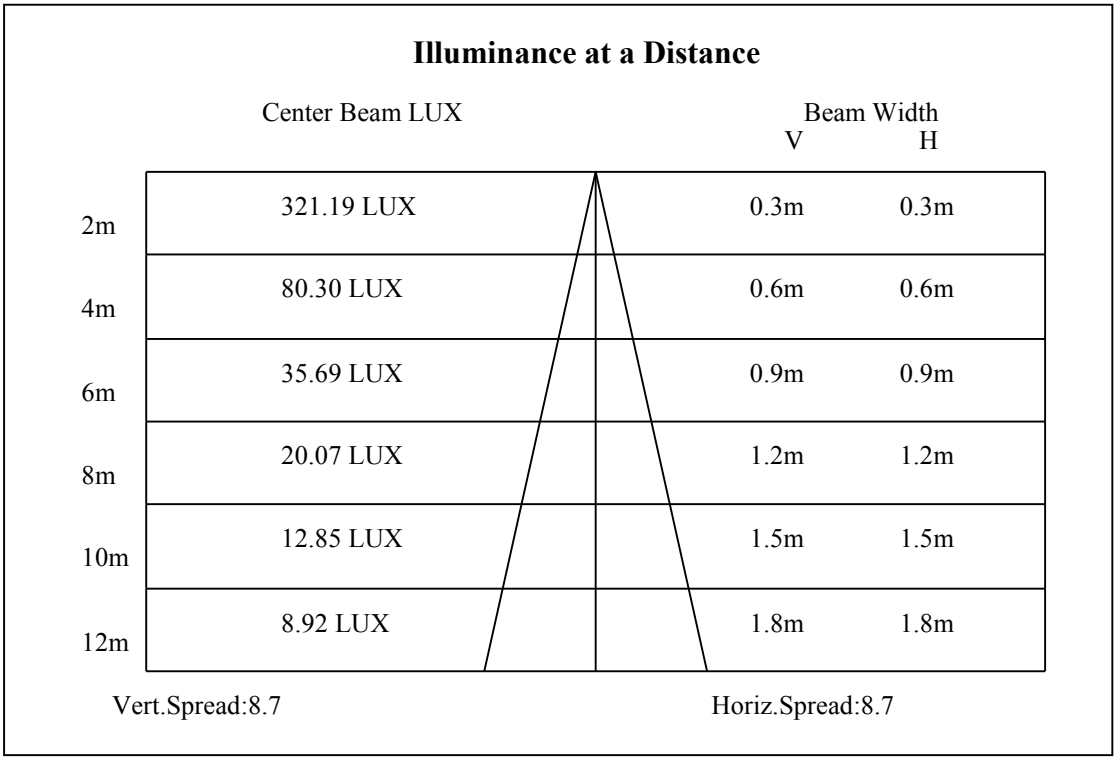
C0/C180:

C90/C270:

Field angle(10%Imax):C0/180Left:8.9 Right:8.9
:C90/270Left:8.9 Right:8.9

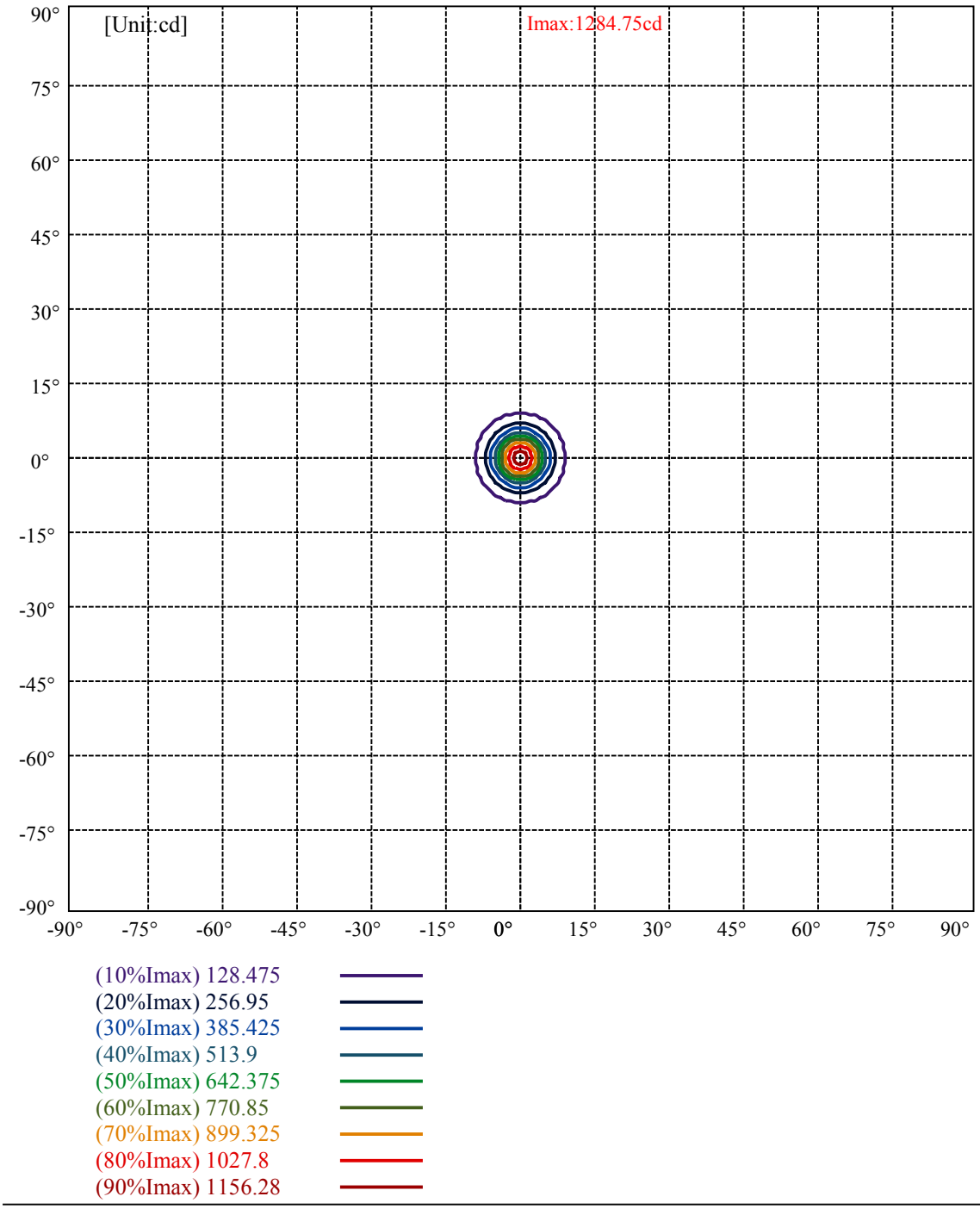
Beam Angle(50%Imax):C0/180Left:4.4 Right:4.4
:C90/270Left:4.4 Right:4.4

Lux distance Curve



Equipment: GMS1980 Date: 2019/3/5 Operator: NT07
Temperature(°C): 10.0 Humidity(%): 65.0% Distance(m): 7.50

ISO-Intensity(V-H)

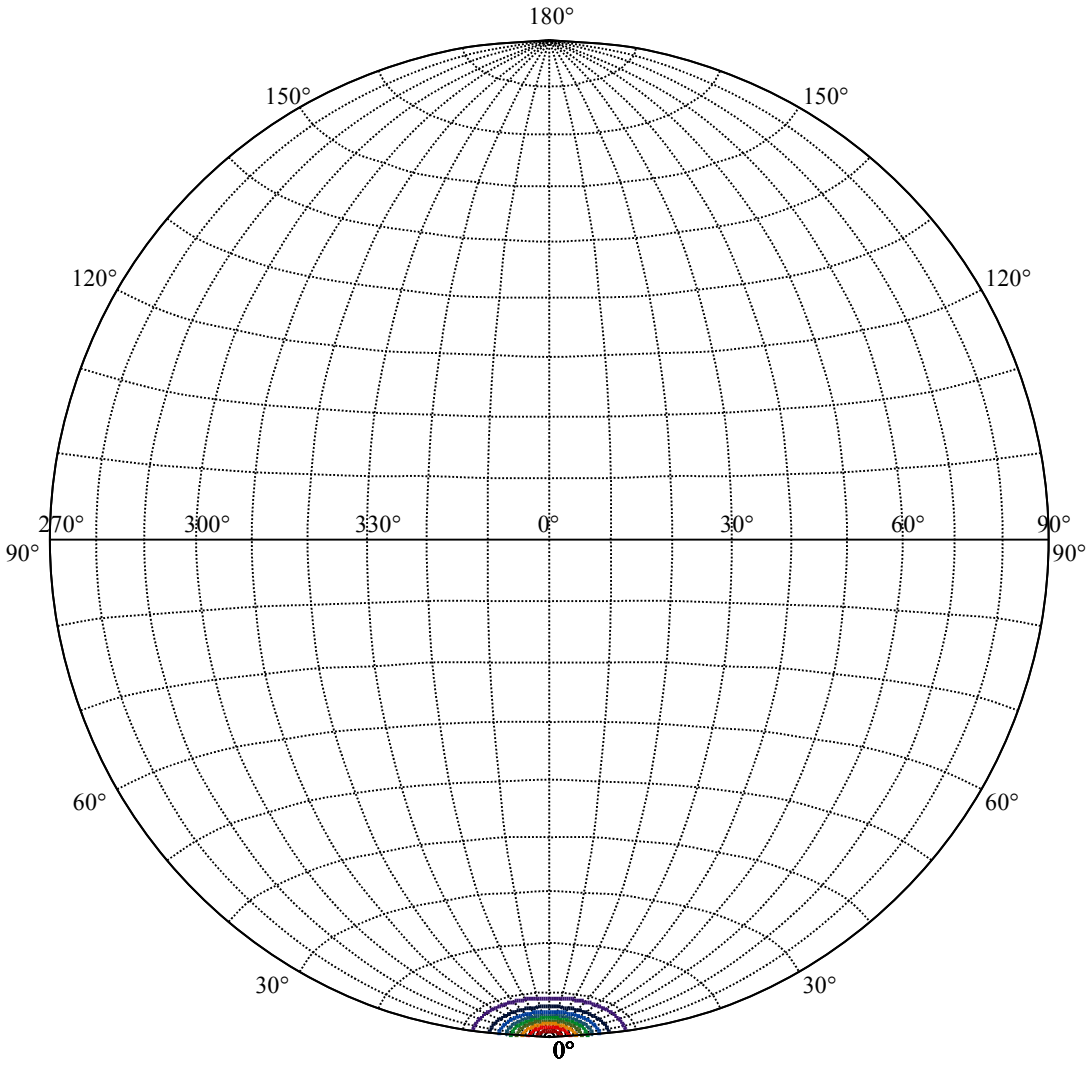


Equipment: GMS1980
Temperature(°C): 10.0

Date: 2019/3/5
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:1284.75

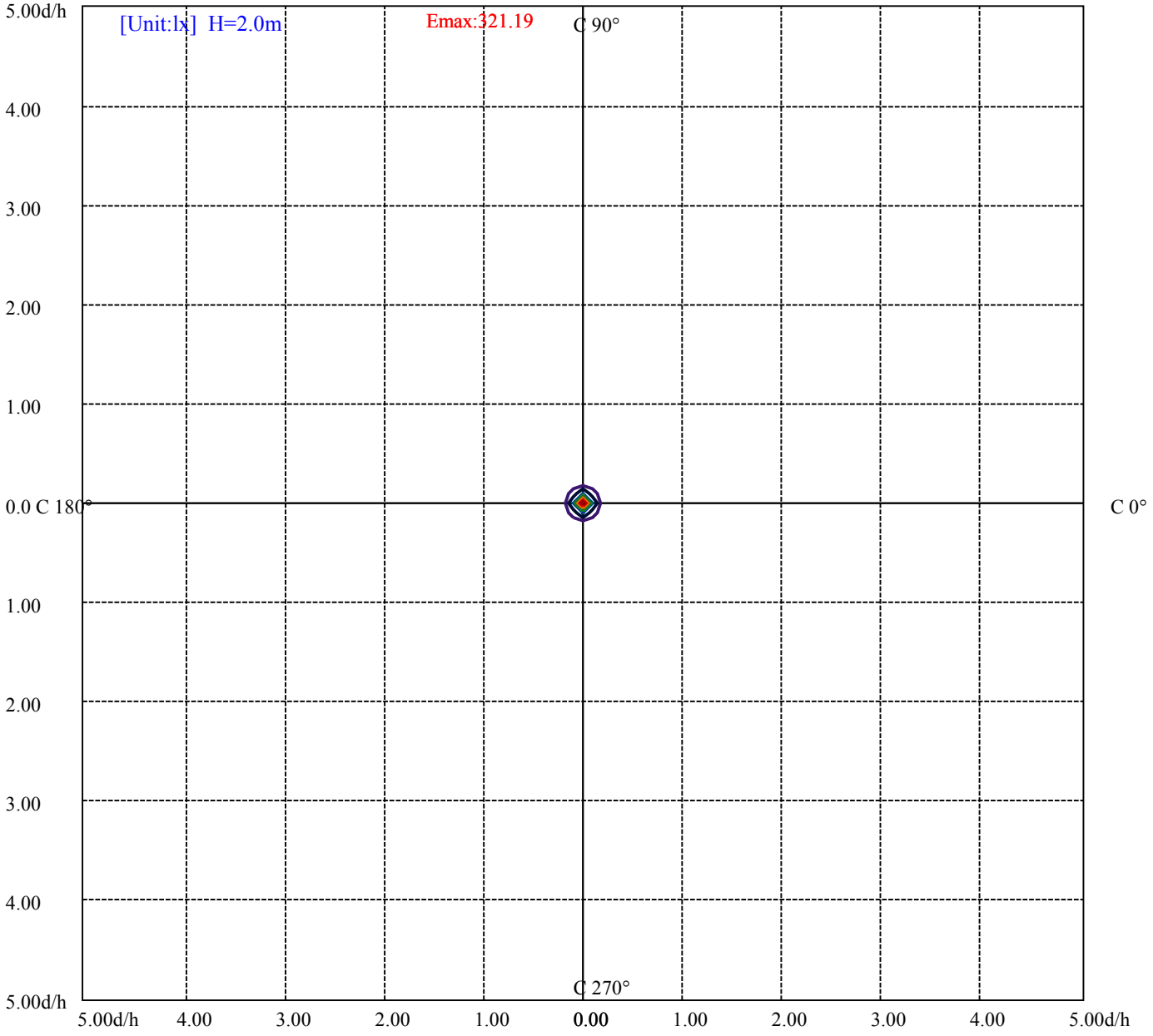
(10%Imax) 128.475
(20%Imax) 256.95
(30%Imax) 385.425
(40%Imax) 513.9
(50%Imax) 642.375
(60%Imax) 770.85
(70%Imax) 899.325
(80%Imax) 1027.8
(90%Imax) 1156.28

Equipment: GMS1980
Temperature(°C): 10.0

Date: 2019/3/5
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

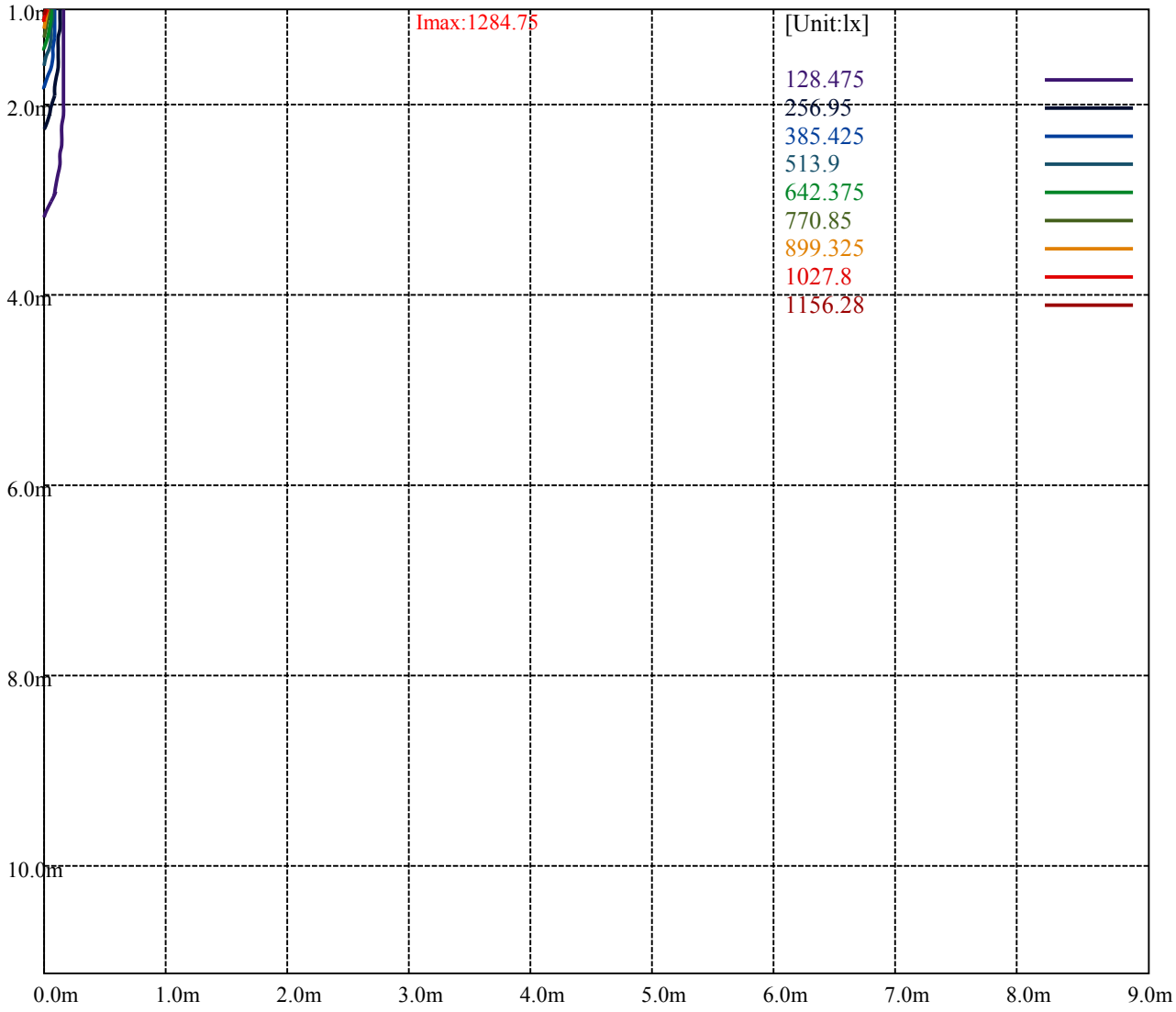
ISO illuminance diagram



(10%Emax) 32.1185
(20%Emax) 64.237
(30%Emax) 96.3555
(40%Emax) 128.474
(50%Emax) 160.5925
(60%Emax) 192.711
(70%Emax) 224.8295
(80%Emax) 256.9475
(90%Emax) 289.0675

Equipment: GMS1980
Temperature(°C): 10.0
Date: 2019/3/5
Humidity(%): 65.0%
Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 10.0

Date: 2019/3/5
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

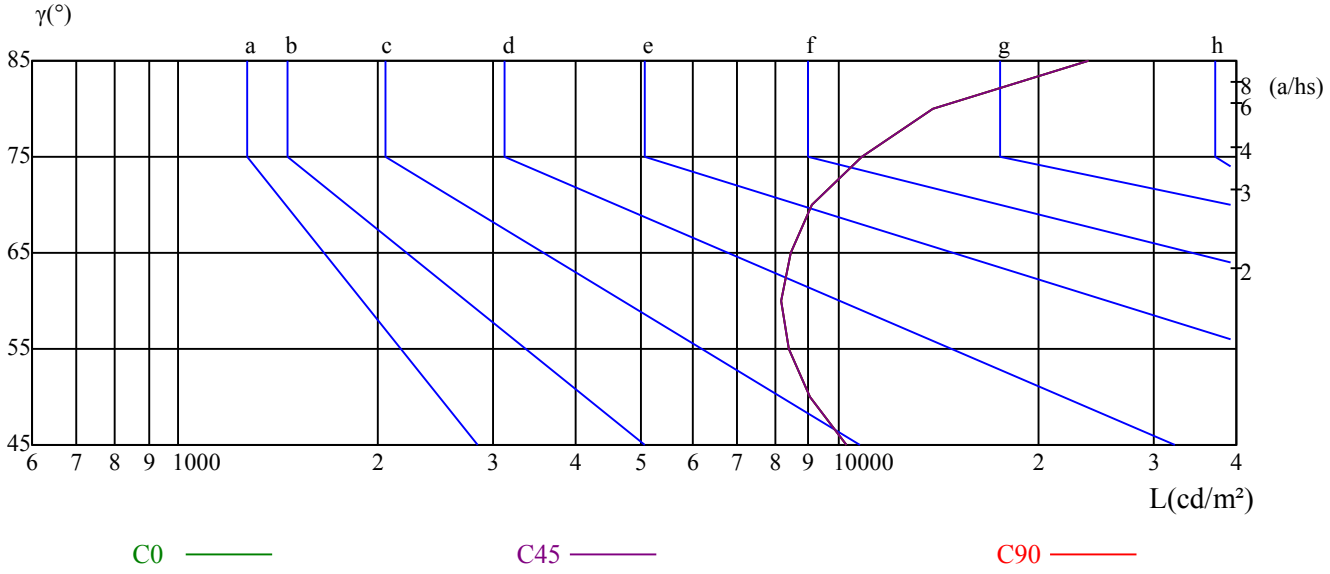
γ	45	50	55	60	65	70	75	80	85
C0	10251	9014	8399	8160	8473	9073	10816	13872	23904
C45	10251	9014	8399	8160	8473	9073	10816	13872	23904
C90	10251	9014	8399	8160	8473	9073	10816	13872	23904

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
8473	8473	8473	10816	10816	10816	23904	23904	23904

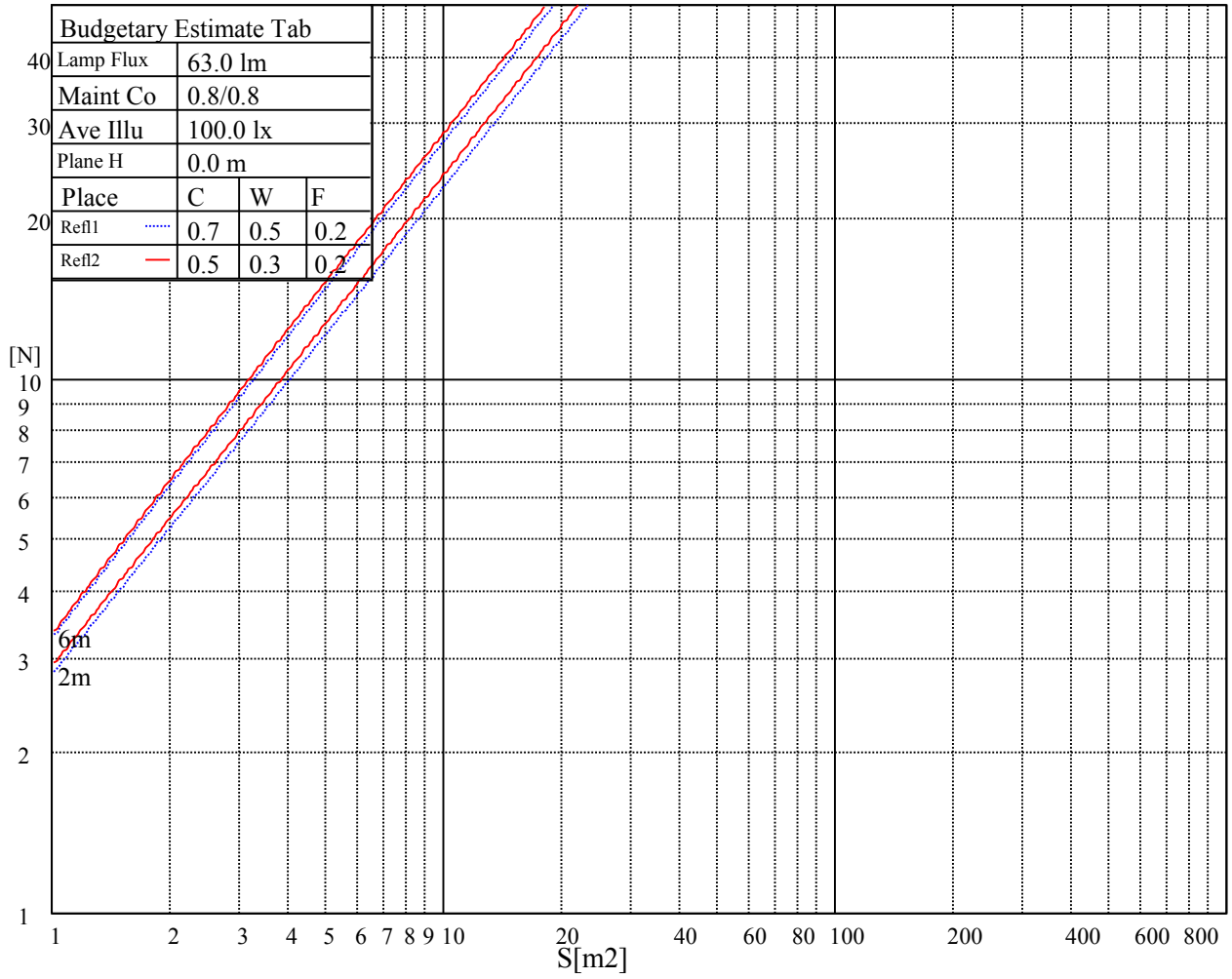
Glare Table

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

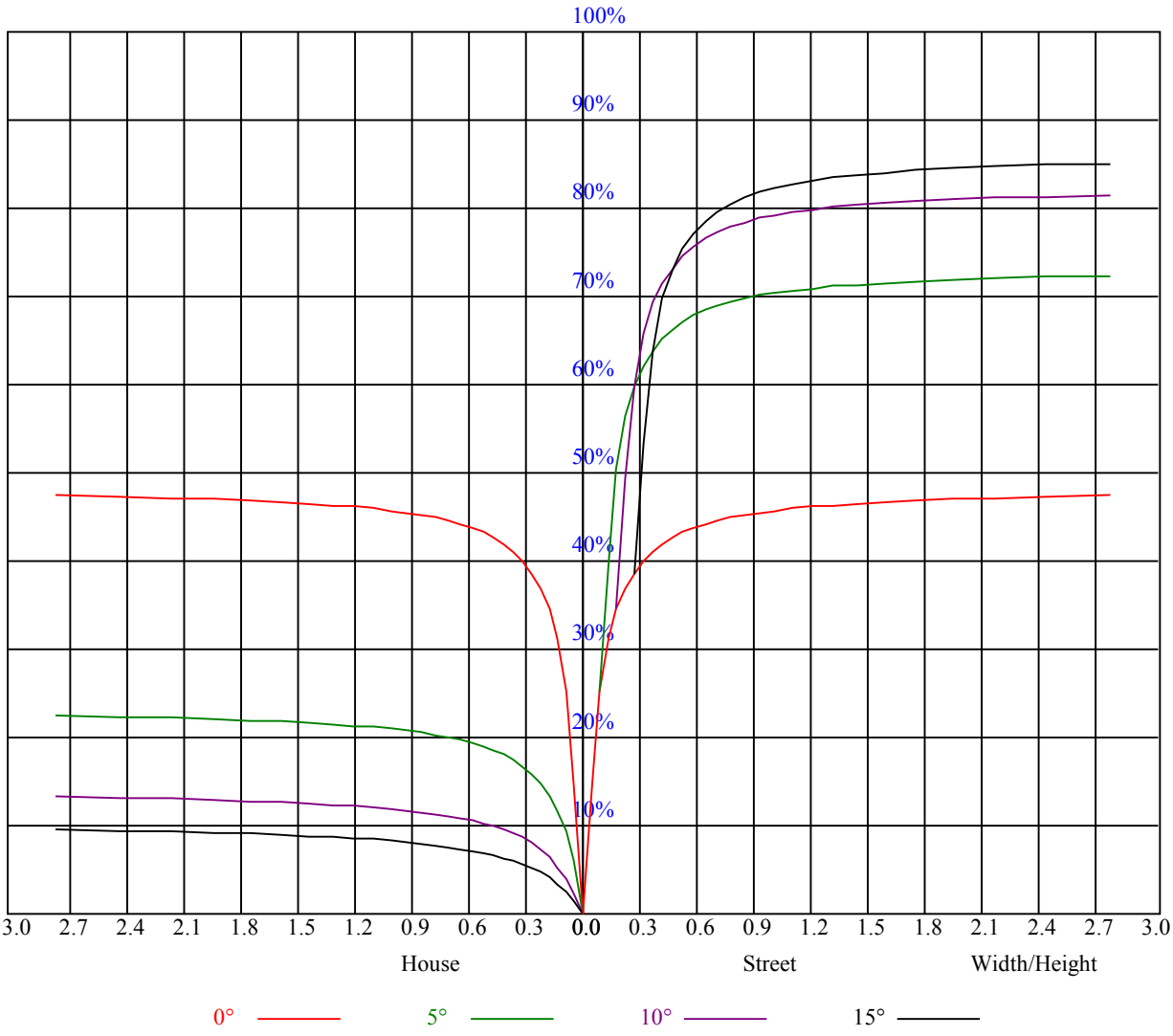


Equipment: GMS1980	Date: 2019/3/5	Operator: NT07
Temperature(°C): 10.0	Humidity(%): 65.0%	Distance(m): 7.50

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	1.15	1.15	1.15	1.12	1.12	1.12	1.07	1.07	1.07	1.03	1.03	1.03	0.99	0.99	0.99	0.97
1	1.08	1.06	1.04	1.06	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.92
2	1.03	1.00	0.97	1.01	0.98	0.96	0.98	0.96	0.94	0.95	0.94	0.92	0.93	0.91	0.90	0.89
3	0.99	0.95	0.92	0.97	0.94	0.91	0.95	0.92	0.90	0.93	0.90	0.88	0.91	0.89	0.87	0.86
4	0.95	0.91	0.88	0.94	0.90	0.87	0.92	0.89	0.86	0.90	0.88	0.86	0.89	0.86	0.85	0.83
5	0.92	0.88	0.85	0.91	0.87	0.85	0.89	0.86	0.84	0.88	0.85	0.83	0.87	0.84	0.82	0.81
6	0.89	0.85	0.82	0.89	0.85	0.82	0.87	0.84	0.82	0.86	0.83	0.81	0.85	0.83	0.81	0.80
7	0.87	0.83	0.80	0.86	0.83	0.80	0.85	0.82	0.80	0.84	0.82	0.79	0.83	0.81	0.79	0.78
8	0.85	0.81	0.79	0.85	0.81	0.78	0.84	0.80	0.78	0.83	0.80	0.78	0.82	0.79	0.78	0.77
9	0.83	0.80	0.77	0.83	0.79	0.77	0.82	0.79	0.77	0.81	0.79	0.76	0.81	0.78	0.76	0.75
10	0.82	0.78	0.76	0.81	0.78	0.76	0.81	0.78	0.75	0.80	0.77	0.75	0.80	0.77	0.75	0.74

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2019/3/5	Operator: NT07
Temperature(°C): 10.0	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	1271.25	1305.56	1213.88	1078.31	930.94	662.63	479.81	333.00	289.69
45.0	1287.00	1263.38	1144.13	969.19	783.00	565.88	380.81	287.44	181.29
90.0	1270.69	1116.06	968.29	751.95	558.79	376.88	262.29	177.86	123.53
135.0	1310.06	1214.44	1010.81	817.31	617.06	401.06	293.63	195.08	135.73
180.0	1271.25	1110.43	980.78	740.87	541.24	376.88	251.38	170.10	123.13
225.0	1287.00	1112.51	1054.41	854.16	630.45	447.24	311.46	200.59	145.13
270.0	1270.69	1309.50	1227.94	1089.56	908.44	684.56	474.75	329.06	287.44
315.0	1310.06	1306.69	1119.49	1040.18	857.59	608.63	455.40	300.99	191.76
360.0	1271.25	1305.56	1213.88	1078.31	930.94	662.63	479.81	333.00	289.69

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	149.06	109.18	79.54	62.83	51.41	43.54	38.08	32.96	28.97
45.0	121.28	90.45	69.98	55.29	45.79	39.71	34.26	29.87	26.72
90.0	92.59	70.14	56.25	47.70	41.12	34.88	30.99	27.68	24.47
135.0	98.10	76.28	60.69	51.13	43.14	37.13	32.85	28.91	25.71
180.0	89.16	68.23	56.59	47.64	41.68	36.28	31.89	28.69	25.82
225.0	108.39	79.14	64.29	54.39	47.31	40.44	35.89	31.84	28.18
270.0	151.20	112.28	85.84	66.49	54.23	46.52	39.94	34.65	30.94
315.0	143.16	101.70	73.29	60.58	50.79	41.46	37.01	32.79	28.74
360.0	149.06	109.18	79.54	62.83	51.41	43.54	38.08	32.96	28.97

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	26.10	23.57	20.93	19.13	17.55	15.98	14.40	12.99	11.53
45.0	23.85	21.43	19.29	17.55	16.09	14.57	12.83	11.59	10.41
90.0	21.71	19.69	17.72	16.09	14.68	13.22	11.87	10.41	9.23
135.0	23.18	20.98	18.79	17.21	15.69	13.84	12.38	11.03	9.84
180.0	22.67	20.64	18.96	16.99	15.47	14.06	12.49	10.97	9.84
225.0	25.14	22.84	20.59	18.68	16.88	15.36	13.84	12.26	10.80
270.0	27.39	24.81	22.22	20.03	18.34	16.82	15.02	13.56	12.21
315.0	25.48	23.06	20.70	18.68	17.16	15.53	14.06	12.60	11.14
360.0	26.10	23.57	20.93	19.13	17.55	15.98	14.40	12.99	11.53

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	10.07	8.94	7.93	7.14	6.36	5.79	5.34	4.89	4.56
45.0	9.00	8.10	7.26	6.47	5.74	5.29	4.84	4.44	4.16
90.0	8.27	7.31	6.47	5.91	5.46	4.95	4.61	4.28	3.99
135.0	8.61	7.71	6.92	6.19	5.68	5.18	4.78	4.44	4.11
180.0	8.66	7.82	6.98	6.30	5.85	5.34	4.89	4.56	4.28
225.0	9.68	8.66	7.54	6.86	6.30	5.68	5.23	4.89	4.50
270.0	10.52	9.34	8.33	7.43	6.64	6.02	5.51	5.06	4.67
315.0	9.90	8.89	7.76	6.98	6.36	5.63	5.23	4.84	4.44
360.0	10.07	8.94	7.93	7.14	6.36	5.79	5.34	4.89	4.56

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	4.22	3.94	3.66	3.43	3.21	2.98	2.81	2.64	2.53
45.0	3.88	3.60	3.38	3.15	2.98	2.81	2.59	2.48	2.36
90.0	3.71	3.49	3.26	3.04	2.93	2.70	2.59	2.48	2.36
135.0	3.88	3.60	3.38	3.15	2.98	2.81	2.64	2.53	2.42
180.0	3.99	3.71	3.54	3.26	3.09	2.93	2.76	2.64	2.53
225.0	4.16	3.83	3.60	3.38	3.21	2.98	2.81	2.70	2.53
270.0	4.33	4.05	3.77	3.54	3.26	3.09	2.93	2.76	2.64
315.0	4.05	3.83	3.54	3.32	3.09	2.93	2.76	2.59	2.42
360.0	4.22	3.94	3.66	3.43	3.21	2.98	2.81	2.64	2.53

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	2.42	2.31	2.19	2.14	2.03	1.91	1.86	1.80	1.74
45.0	2.25	2.14	2.08	2.03	1.86	1.80	1.74	1.69	1.63
90.0	2.25	2.14	2.08	1.97	1.91	1.80	1.74	1.69	1.63
135.0	2.25	2.14	2.08	1.97	1.86	1.80	1.74	1.69	1.58
180.0	2.42	2.25	2.19	2.08	1.97	1.91	1.86	1.74	1.74
225.0	2.42	2.31	2.19	2.08	1.97	1.91	1.80	1.80	1.69
270.0	2.42	2.36	2.31	2.19	2.03	1.97	1.86	1.80	1.80
315.0	2.36	2.25	2.14	2.08	1.97	1.91	1.80	1.74	1.69
360.0	2.42	2.31	2.19	2.14	2.03	1.91	1.86	1.80	1.74

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	1.69	1.63	1.58	1.52	1.46	1.41	1.35	1.29	1.29
45.0	1.58	1.52	1.46	1.41	1.35	1.35	1.29	1.29	1.24
90.0	1.58	1.52	1.46	1.46	1.35	1.35	1.29	1.24	1.24
135.0	1.58	1.46	1.46	1.41	1.35	1.29	1.24	1.24	1.24
180.0	1.58	1.52	1.52	1.46	1.41	1.35	1.35	1.29	1.24
225.0	1.63	1.58	1.52	1.52	1.41	1.41	1.29	1.29	1.29
270.0	1.69	1.63	1.63	1.52	1.46	1.46	1.41	1.41	1.29
315.0	1.63	1.63	1.58	1.52	1.41	1.35	1.35	1.29	1.29
360.0	1.69	1.63	1.58	1.52	1.46	1.41	1.35	1.29	1.29

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	1.24	1.24	1.18	1.18	1.13	1.13	1.07	1.07	1.07
45.0	1.24	1.18	1.13	1.07	1.07	1.01	0.96	0.96	0.96
90.0	1.24	1.18	1.13	1.07	1.07	1.07	1.01	0.96	0.96
135.0	1.18	1.13	1.13	1.07	1.07	1.01	1.01	0.96	1.01
180.0	1.18	1.18	1.13	1.13	1.07	1.07	1.01	1.01	1.01
225.0	1.24	1.24	1.18	1.13	1.13	1.07	1.07	1.01	1.01
270.0	1.29	1.24	1.24	1.18	1.13	1.13	1.07	1.07	1.01
315.0	1.24	1.18	1.18	1.13	1.07	1.07	1.07	1.01	1.01
360.0	1.24	1.24	1.18	1.18	1.13	1.13	1.07	1.07	1.07

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	1.07	1.01	0.96	0.96	0.90	0.90	0.90	0.84	0.84
45.0	0.96	0.90	0.90	0.84	0.84	0.79	0.79	0.79	0.73
90.0	0.96	0.96	0.90	0.90	0.84	0.84	0.84	0.79	0.79
135.0	0.90	0.90	0.90	0.84	0.84	0.84	0.79	0.73	0.73
180.0	0.96	0.96	0.90	0.90	0.84	0.84	0.84	0.79	0.79
225.0	0.96	0.96	0.96	0.96	0.90	0.90	0.90	0.84	0.79
270.0	1.01	0.96	0.96	0.96	0.90	0.90	0.84	0.84	0.79
315.0	0.96	0.96	0.96	0.90	0.90	0.90	0.84	0.84	0.79
360.0	1.07	1.01	0.96	0.96	0.90	0.90	0.90	0.84	0.84

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	0.84	0.79	0.79	0.68	0.68	0.68	0.62	0.34	0.23
45.0	0.73	0.68	0.68	0.62	0.62	0.56	0.39	0.23	0.17
90.0	0.73	0.73	0.73	0.68	0.68	0.45	0.28	0.23	0.17
135.0	0.73	0.73	0.68	0.68	0.68	0.45	0.28	0.17	0.17
180.0	0.79	0.79	0.79	0.73	0.68	0.34	0.28	0.23	0.17
225.0	0.84	0.79	0.79	0.73	0.73	0.62	0.34	0.23	0.23
270.0	0.79	0.79	0.73	0.73	0.68	0.68	0.56	0.28	0.23
315.0	0.79	0.79	0.73	0.73	0.68	0.68	0.51	0.28	0.23
360.0	0.84	0.79	0.79	0.68	0.68	0.68	0.62	0.34	0.23

Intensity data(cd)

C/γ(°)	90.0
0.0	0.17
45.0	0.17
90.0	0.17
135.0	0.17
180.0	0.17
225.0	0.17
270.0	0.17
315.0	0.17
360.0	0.17