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

Nata

LumCAT: 3-2031-M
Luminaire: 92.70.126.00

Report No: NATA0100	Voltage(V): 36.2000
Test No: GC2018082013	Current(A): 0.4000
LampCAT: LUMINUS CHM-9-AA10	Power (W): 14.4800
Lamp flux(lm): 1813.0	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): 1617.75
Efficiency(%): 89.23%
Lumens(lm)/Power(W): 112.07
Central intensity(cd): 21096.240
Maximum intensity(cd): 21096.240
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=10.3
[C90/270]Total=10.3
Field angle(10%Imax): [C0/180]Total=20.8
[C90/270]Total=20.8
Maximum s/h(1/2): C0_180=0.18 C90_270=0.18
Maximum s/h(1/4): C0_180=0.19 C90_270=0.19
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 89.51%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.308%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	21096.236	5.047	5.047	.278%	.312%
1.0	20604.857	39.435	44.482	2.175%	2.750%
2.0	18880.217	72.257	116.738	3.985%	7.216%
3.0	16522.426	94.826	211.564	5.230%	13.078%
4.0	13697.344	104.779	316.343	5.779%	19.555%
5.0	10870.680	103.897	420.24	5.731%	25.977%
6.0	8720.108	99.956	520.196	5.513%	32.156%
7.0	6498.720	86.851	607.047	4.790%	37.524%
8.0	4563.143	69.642	676.689	3.841%	41.829%
9.0	3150.602	54.048	730.736	2.981%	45.170%
10.0	2350.771	44.764	775.501	2.469%	47.937%
11.0	1771.302	37.063	812.564	2.044%	50.228%
12.0	1334.705	30.431	842.995	1.678%	52.109%
13.0	1132.359	27.933	870.928	1.541%	53.836%
14.0	1005.151	26.666	897.594	1.471%	55.484%
15.0	914.267	25.949	923.543	1.431%	57.088%
16.0	855.687	25.865	949.408	1.427%	58.687%
17.0	816.211	26.169	975.577	1.443%	60.305%
18.0	784.678	26.590	1002.167	1.467%	61.948%
19.0	762.655	27.228	1029.396	1.502%	63.631%
20.0	741.754	27.820	1057.216	1.534%	65.351%
21.0	722.663	28.400	1085.616	1.566%	67.107%
22.0	707.440	29.061	1114.678	1.603%	68.903%
23.0	693.539	29.717	1144.394	1.639%	70.740%
24.0	678.839	30.278	1174.673	1.670%	72.612%
25.0	667.118	30.917	1205.59	1.705%	74.523%
26.0	655.577	31.515	1237.105	1.738%	76.471%
27.0	643.706	32.047	1269.152	1.768%	78.452%
28.0	633.183	32.598	1301.75	1.798%	80.467%
29.0	621.146	33.023	1334.773	1.821%	82.508%
30.0	608.882	33.385	1368.158	1.841%	84.572%
31.0	598.284	33.791	1401.949	1.864%	86.661%
32.0	587.383	34.134	1436.083	1.883%	88.771%
33.0	568.533	33.956	1470.039	1.873%	90.870%
34.0	520.586	31.923	1501.962	1.761%	92.843%
35.0	433.886	27.291	1529.253	1.505%	94.530%
36.0	322.259	20.772	1550.024	1.146%	95.814%
37.0	216.640	14.297	1564.322	.789%	96.698%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	113.182	7.641	1571.963	.421%	97.170%
39.0	45.662	3.151	1575.114	.174%	97.365%
40.0	27.033	1.905	1577.02	.105%	97.483%
41.0	20.763	1.494	1578.514	.082%	97.575%
42.0	15.423	1.132	1579.645	.062%	97.645%
43.0	13.682	1.023	1580.669	.056%	97.708%
44.0	12.752	0.971	1581.64	.054%	97.768%
45.0	12.223	0.948	1582.588	.052%	97.827%
46.0	11.837	0.934	1583.521	.052%	97.884%
47.0	11.438	0.917	1584.439	.051%	97.941%
48.0	11.053	0.901	1585.34	.050%	97.997%
49.0	10.702	0.886	1586.225	.049%	98.052%
50.0	10.392	0.873	1587.098	.048%	98.105%
51.0	10.096	0.860	1587.959	.047%	98.159%
52.0	9.841	0.850	1588.809	.047%	98.211%
53.0	9.594	0.840	1589.649	.046%	98.263%
54.0	9.325	0.827	1590.477	.046%	98.314%
55.0	9.105	0.818	1591.294	.045%	98.365%
56.0	8.905	0.810	1592.104	.045%	98.415%
57.0	8.699	0.800	1592.904	.044%	98.464%
58.0	8.534	0.794	1593.698	.044%	98.513%
59.0	8.403	0.790	1594.488	.044%	98.562%
60.0	8.245	0.783	1595.271	.043%	98.611%
61.0	8.114	0.778	1596.049	.043%	98.659%
62.0	8.004	0.775	1596.824	.043%	98.707%
63.0	7.894	0.771	1597.595	.043%	98.754%
64.0	7.797	0.769	1598.364	.042%	98.802%
65.0	7.694	0.765	1599.128	.042%	98.849%
66.0	7.625	0.764	1599.892	.042%	98.896%
67.0	7.550	0.762	1600.654	.042%	98.943%
68.0	7.481	0.761	1601.415	.042%	98.990%
69.0	7.433	0.761	1602.176	.042%	99.038%
70.0	7.378	0.760	1602.936	.042%	99.085%
71.0	7.323	0.759	1603.695	.042%	99.131%
72.0	7.288	0.760	1604.455	.042%	99.178%
73.0	7.240	0.759	1605.215	.042%	99.225%
74.0	7.219	0.761	1605.976	.042%	99.272%
75.0	7.185	0.761	1606.737	.042%	99.319%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	7.150	0.761	1607.497	.042%	99.366%
77.0	7.116	0.760	1608.258	.042%	99.413%
78.0	7.095	0.761	1609.019	.042%	99.461%
79.0	7.089	0.763	1609.782	.042%	99.508%
80.0	7.054	0.762	1610.544	.042%	99.555%
81.0	7.033	0.762	1611.306	.042%	99.602%
82.0	7.033	0.764	1612.069	.042%	99.649%
83.0	7.013	0.763	1612.833	.042%	99.696%
84.0	7.013	0.765	1613.597	.042%	99.744%
85.0	6.965	0.761	1614.358	.042%	99.791%
86.0	6.903	0.755	1615.113	.042%	99.837%
87.0	6.875	0.753	1615.866	.042%	99.884%
88.0	6.861	0.752	1616.618	.041%	99.930%
89.0	6.861	0.752	1617.371	.041%	99.977%
90.0	6.855	0.376	1617.746	.021%	100.000%

Zonal flux distribution table

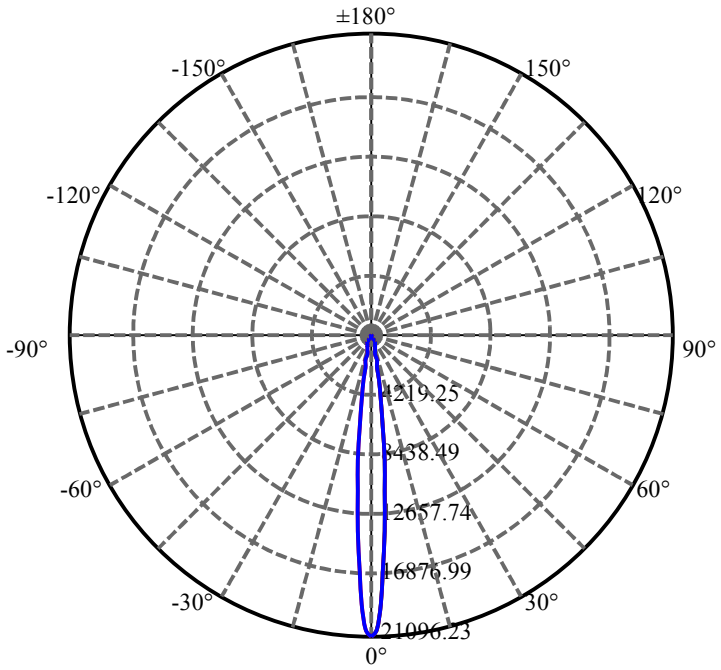
ZONAL LUMEN SUMMARY

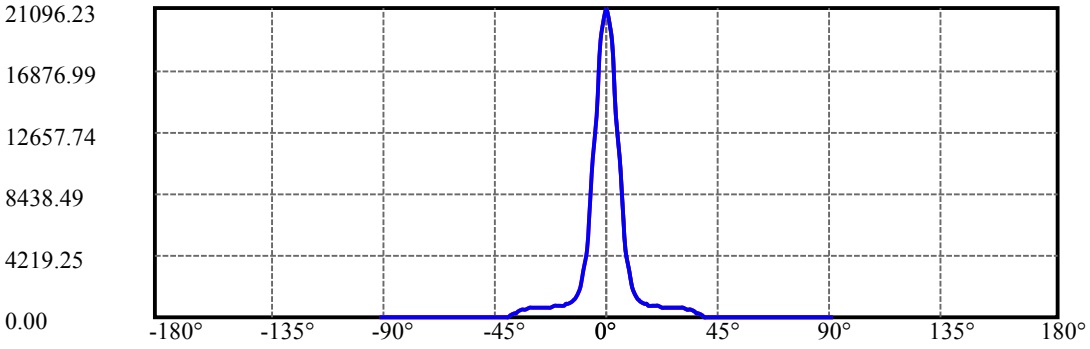
Zone	Lumens	%Lamp	%Fixt
0-30	1368.16	75.46%	84.57%
0-40	1577.02	86.98%	97.48%
0-60	1595.27	87.99%	98.61%
0-90	1617.37	89.21%	99.98%
0-120	1617.37	89.21%	99.98%
0-180	1617.75	89.23%	100.00%
60-90	22.88	1.26%	1.41%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-27.77	1294.20	71.38%	80.00%

ZONAL LUMEN SUMMARY

0-10	775.50
10-20	281.72
20-30	310.94
30-40	208.86
40-50	10.08
50-60	8.17
60-70	7.67
70-80	7.61
80-90	6.83
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):

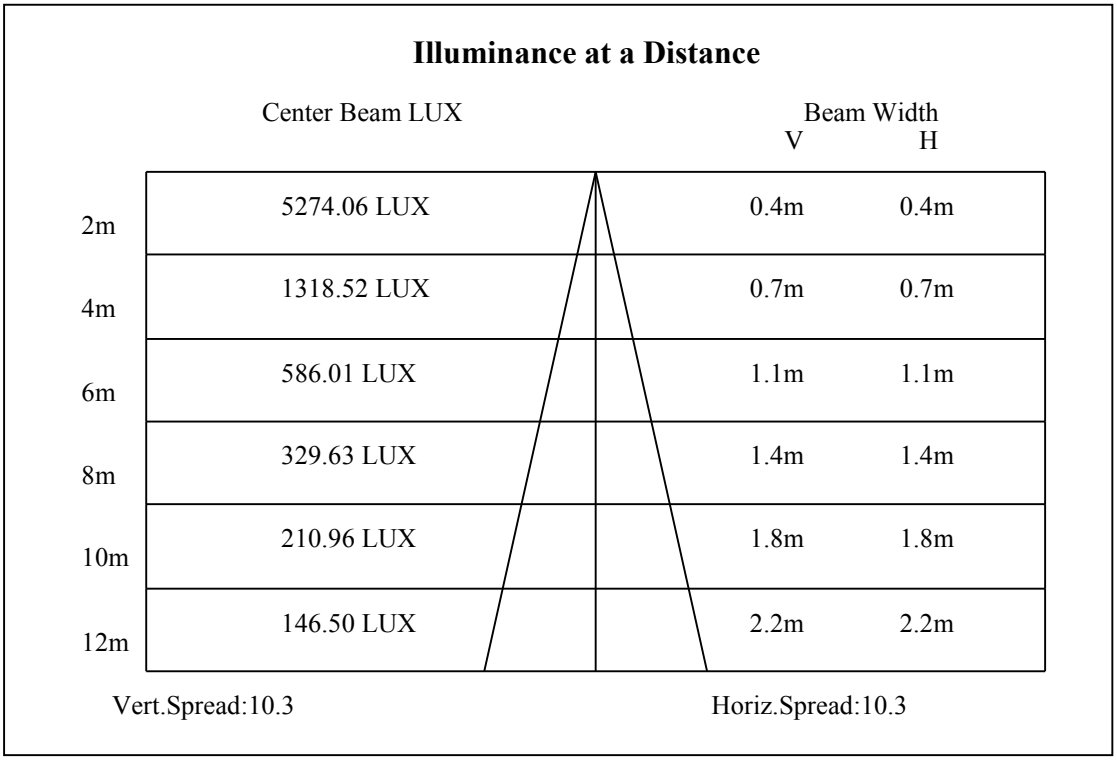
C0/C180:

C90/C270:

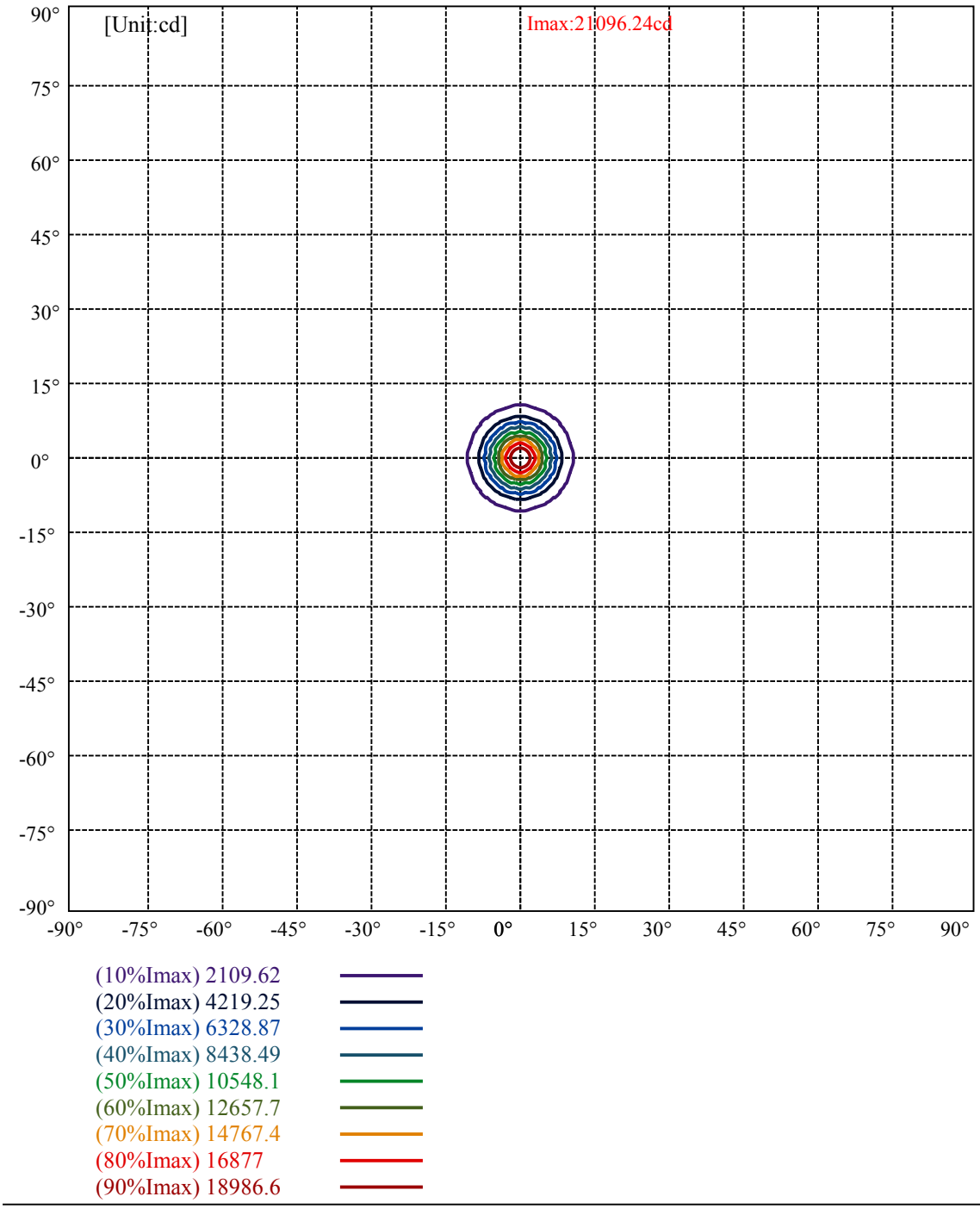
Field angle(10%Imax):C0/180Left:10.4 Right:10.4
:C90/270Left:10.4 Right:10.4

Beam Angle(50%Imax):C0/180Left:5.1 Right:5.1
:C90/270Left:5.1 Right:5.1

Lux distance Curve



ISO-Intensity(V-H)



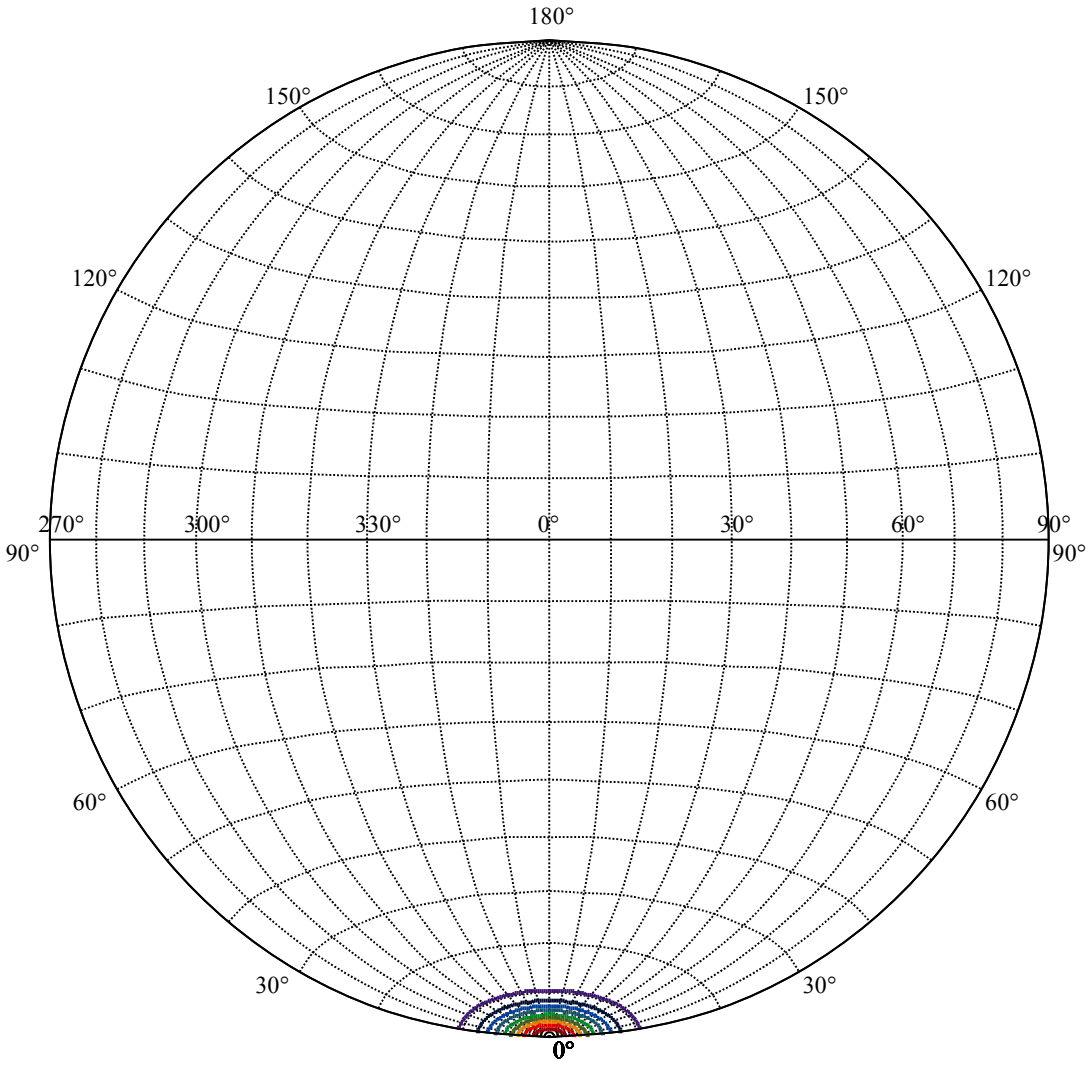
(10%Imax) 2109.62
(20%Imax) 4219.25
(30%Imax) 6328.87
(40%Imax) 8438.49
(50%Imax) 10548.1
(60%Imax) 12657.7
(70%Imax) 14767.4
(80%Imax) 16877
(90%Imax) 18986.6

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/8/20
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:21096.24

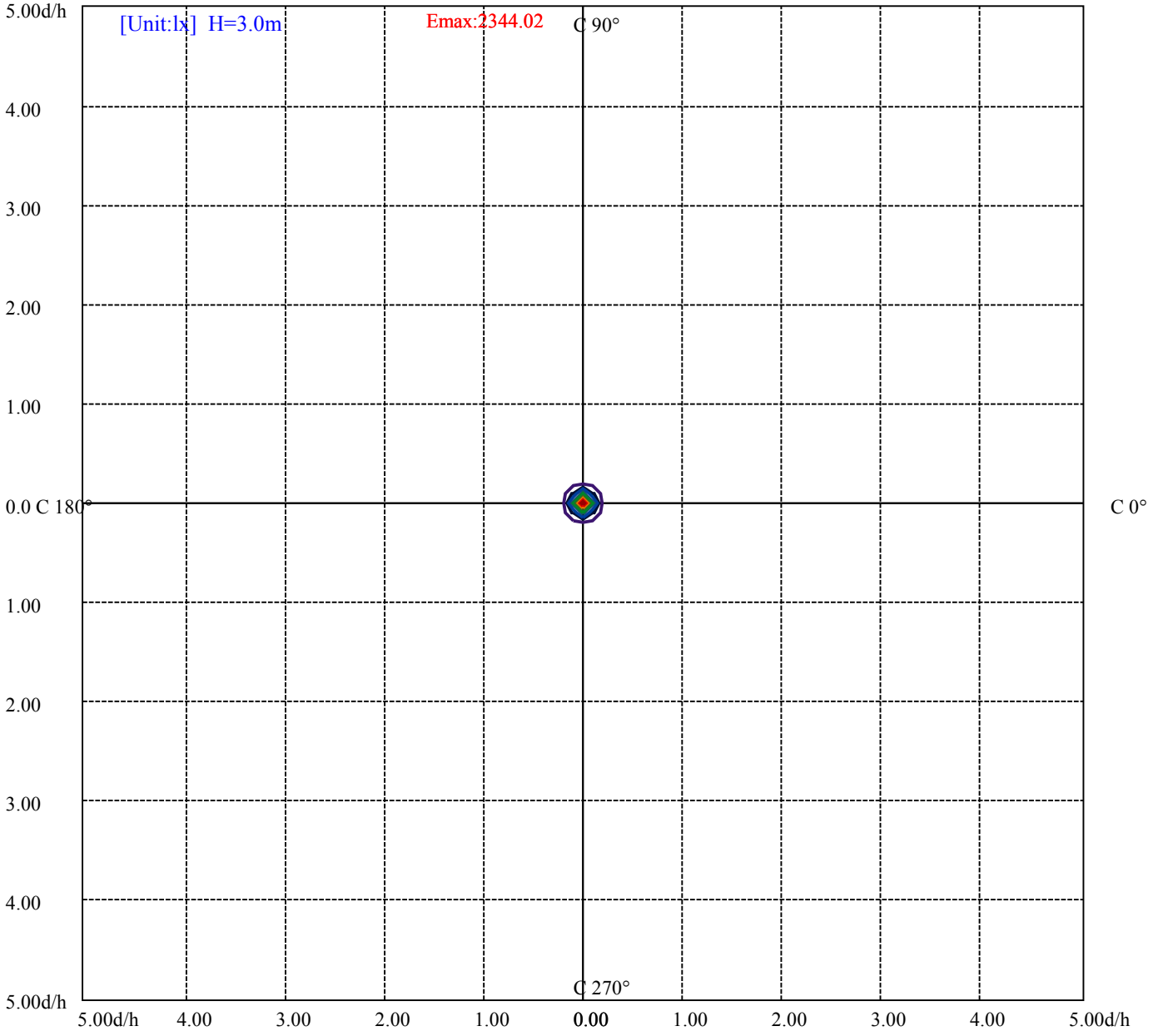
(10%Imax) 2109.62
(20%Imax) 4219.25
(30%Imax) 6328.87
(40%Imax) 8438.49
(50%Imax) 10548.1
(60%Imax) 12657.7
(70%Imax) 14767.4
(80%Imax) 16877
(90%Imax) 18986.6

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/8/20
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

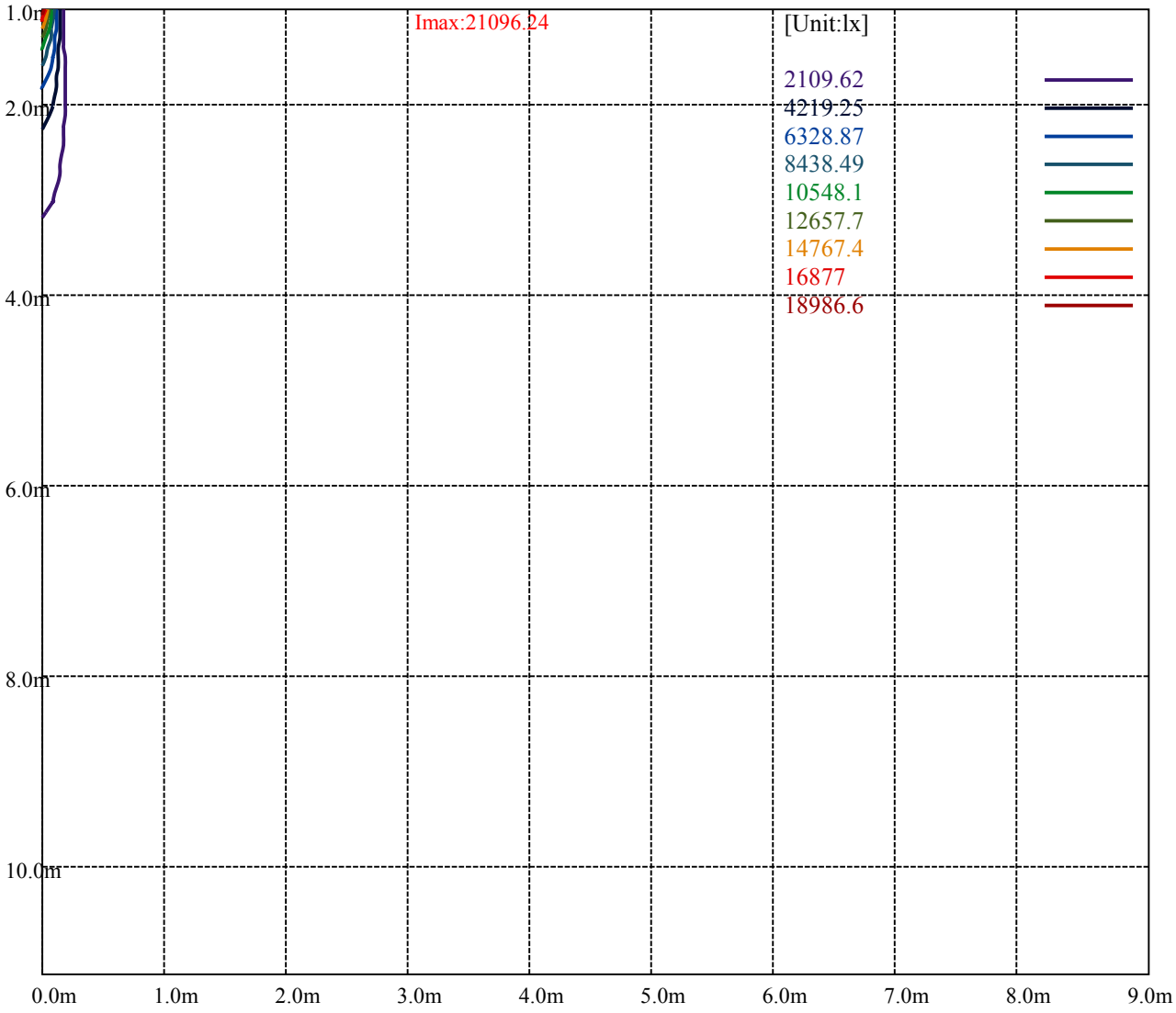
ISO illuminance diagram



(10%Emax) 234.4022
(20%Emax) 468.8033
(30%Emax) 703.2056
(40%Emax) 937.6067
(50%Emax) 1172.011
(60%Emax) 1406.411
(70%Emax) 1640.811
(80%Emax) 1875.211
(90%Emax) 2109.611

Equipment: GMS1980
Temperature(°C): 25.0
Date: 2018/8/20
Humidity(%): 60.0%
Operator: NT07
Distance(m): 7.42

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/8/20
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

Luminance Limitting Curve(no luminous side)

Luminance Table

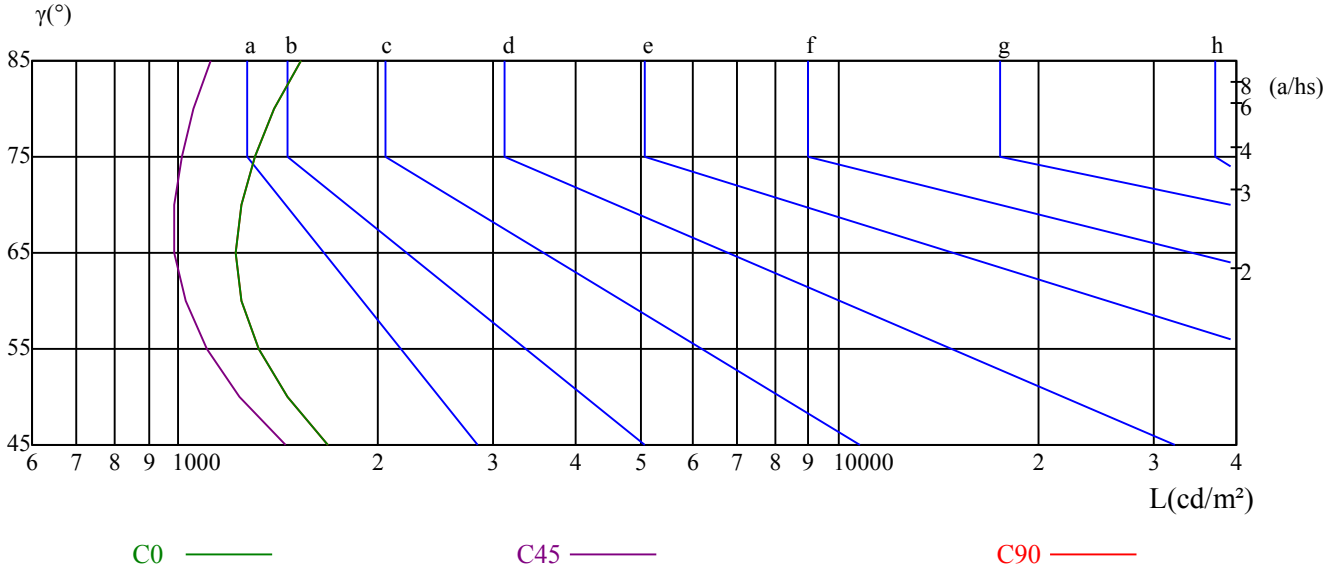
γ	45	50	55	60	65	70	75	80	85
C0	1683	1464	1323	1247	1223	1246	1305	1396	1528
C45	1448	1241	1104	1024	986	985	1009	1054	1120
C90	1683	1464	1323	1247	1223	1246	1305	1396	1528

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
2917	2917	2917	4448	4448	4448	12804	12804	12804

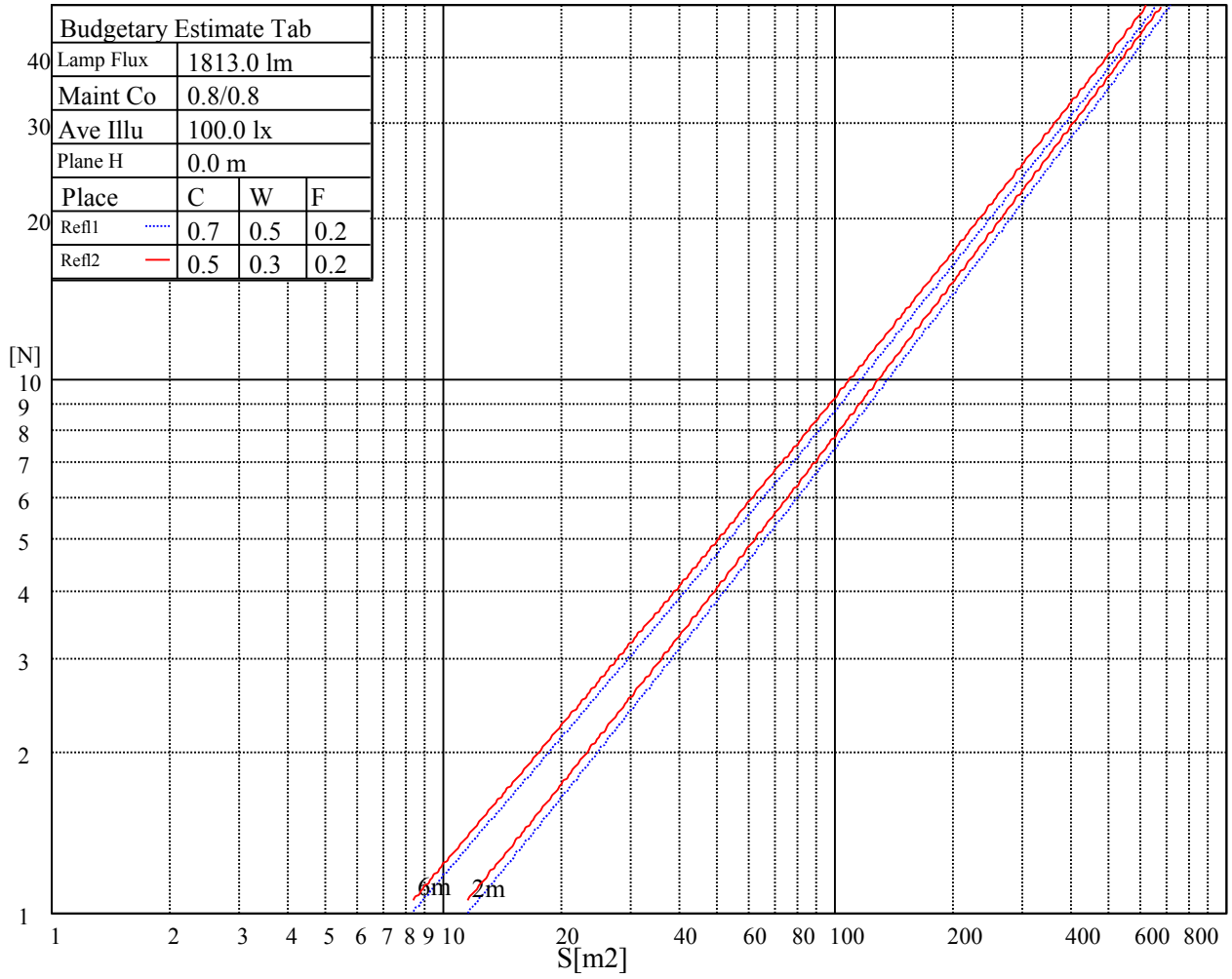
Glare Table

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

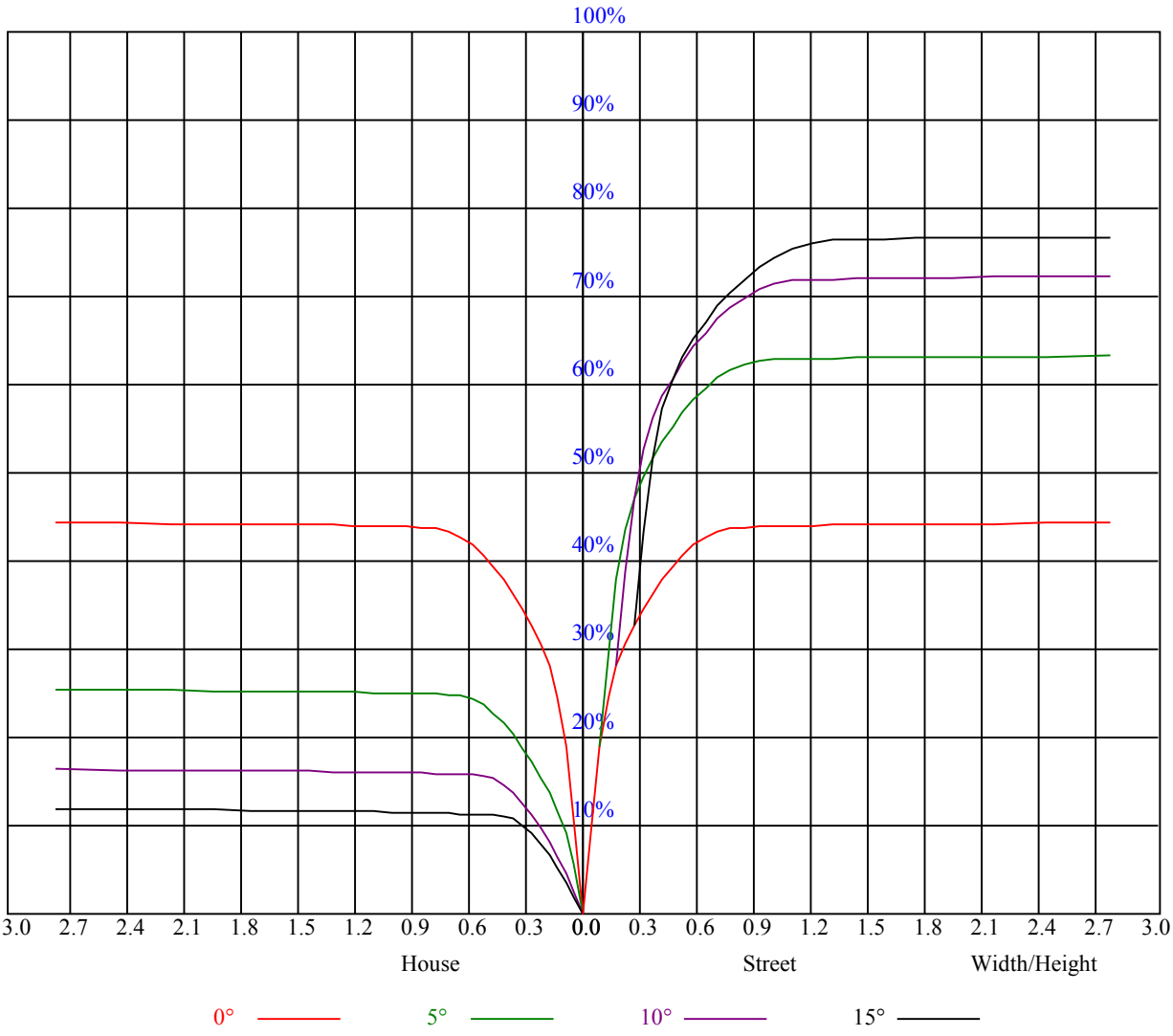


Equipment: GMS1980 Date: 2018/8/20 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

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	1.07	1.07	1.07	1.04	1.04	1.04	0.99	0.99	0.99	0.95	0.95	0.95	0.91	0.91	0.91	0.90
1	1.00	0.98	0.97	0.98	0.97	0.95	0.95	0.93	0.92	0.91	0.90	0.89	0.88	0.88	0.87	0.85
2	0.95	0.92	0.90	0.94	0.91	0.89	0.91	0.89	0.87	0.88	0.87	0.85	0.86	0.85	0.83	0.82
3	0.91	0.87	0.85	0.90	0.86	0.84	0.87	0.85	0.83	0.85	0.83	0.81	0.83	0.82	0.80	0.79
4	0.87	0.83	0.80	0.86	0.83	0.80	0.84	0.81	0.79	0.83	0.80	0.78	0.81	0.79	0.77	0.76
5	0.84	0.80	0.77	0.83	0.79	0.77	0.81	0.78	0.76	0.80	0.77	0.75	0.79	0.77	0.75	0.74
6	0.81	0.77	0.74	0.80	0.76	0.74	0.79	0.76	0.73	0.78	0.75	0.73	0.77	0.74	0.72	0.71
7	0.78	0.74	0.71	0.78	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.71	0.75	0.72	0.70	0.69
8	0.76	0.72	0.69	0.75	0.72	0.69	0.74	0.71	0.69	0.74	0.71	0.69	0.73	0.70	0.68	0.67
9	0.74	0.70	0.67	0.73	0.70	0.67	0.72	0.69	0.67	0.72	0.69	0.67	0.71	0.68	0.66	0.66
10	0.72	0.68	0.65	0.71	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.65	0.69	0.67	0.65	0.64

Coefficient Utilization Curve



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/8/20
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

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	21031.54	20739.75	19225.69	16786.70	14243.09	11044.31	8671.38	6573.73	4773.39
45.0	21037.05	21075.59	19704.69	17733.67	15388.26	12266.57	9855.10	7636.32	5472.61
90.0	21361.88	21317.84	20046.04	17799.73	15371.75	10862.63	9931.62	7375.91	5181.91
135.0	20954.47	21356.38	20453.45	18719.18	16434.34	13274.10	10763.53	8412.62	6105.75
180.0	21031.54	20332.33	18515.47	16026.92	13543.87	10721.13	8409.87	6052.90	4106.11
225.0	21037.05	19957.95	17827.26	15123.99	10700.76	9806.10	7548.78	5363.04	3630.97
270.0	21361.88	20453.45	18086.03	15641.52	13031.85	9910.15	7663.85	5698.34	3925.52
315.0	20954.47	19605.58	17183.10	14347.70	10864.83	9080.45	6916.74	4876.90	3308.89
360.0	21031.54	20739.75	19225.69	16786.70	14243.09	11044.31	8671.38	6573.73	4773.39

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3077.65	2829.90	1754.65	1396.23	1168.30	1034.51	932.66	868.24	828.60
45.0	3721.81	2851.92	1895.04	1498.08	1221.70	1046.62	947.52	870.99	821.44
90.0	3626.01	2543.06	1776.12	1439.72	1096.17	1046.18	937.34	874.46	827.77
135.0	4184.29	2912.48	2785.85	1586.17	1274.56	1112.69	961.28	880.90	839.06
180.0	2855.22	2026.63	1551.49	1286.67	1088.02	959.30	887.23	840.99	798.87
225.0	2570.03	1860.91	1450.19	1085.49	1070.08	951.93	879.86	836.58	808.56
270.0	2780.35	1993.59	1542.13	1287.77	1092.32	967.34	895.22	841.26	806.58
315.0	2389.45	1787.68	1414.95	1097.49	1047.72	922.64	873.03	832.07	798.81
360.0	3077.65	2829.90	1754.65	1396.23	1168.30	1034.51	932.66	868.24	828.60

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	796.67	772.99	750.97	731.15	714.63	700.87	684.35	673.34	661.23
45.0	788.96	763.63	737.76	719.04	701.97	686.55	671.69	661.78	648.56
90.0	787.53	762.53	742.22	719.97	704.89	691.40	674.88	662.00	652.69
135.0	797.22	773.54	753.17	729.50	713.53	701.42	682.70	671.14	659.03
180.0	773.10	751.57	727.79	711.88	697.62	680.06	668.77	655.56	642.12
225.0	777.12	757.52	740.45	720.96	706.70	694.81	680.72	668.99	658.31
270.0	783.45	764.18	743.26	727.85	713.53	700.87	686.00	675.54	664.53
315.0	773.38	755.26	738.42	720.96	706.65	692.33	681.60	668.60	658.14
360.0	796.67	772.99	750.97	731.15	714.63	700.87	684.35	673.34	661.23

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	646.91	637.55	627.09	613.88	601.77	592.96	580.85	558.27	490.00
45.0	638.10	628.74	619.38	607.27	595.71	585.25	574.24	548.91	475.69
90.0	639.92	629.74	618.61	604.96	594.33	584.09	571.27	535.37	458.07
135.0	644.16	633.15	621.04	607.27	595.71	584.70	574.79	553.87	485.60
180.0	633.48	623.18	607.71	596.98	588.50	574.90	563.89	520.34	428.67
225.0	646.42	637.99	623.73	612.45	604.35	593.95	573.25	509.88	415.84
270.0	652.42	640.31	629.85	617.73	607.27	596.26	563.23	477.34	360.07
315.0	648.23	634.80	621.75	610.52	598.63	586.96	546.77	460.71	357.15
360.0	646.91	637.55	627.09	613.88	601.77	592.96	580.85	558.27	490.00

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	379.89	284.64	149.53	61.72	30.67	24.17	16.46	13.76	12.94
45.0	372.73	290.15	158.56	63.65	32.15	25.93	17.29	14.81	13.49
90.0	332.38	225.13	129.49	47.02	28.85	22.68	16.52	14.76	13.10
135.0	385.39	280.79	166.49	69.81	30.45	23.84	16.41	13.82	13.05
180.0	315.69	211.36	106.09	38.59	26.59	18.83	14.76	13.71	12.33
225.0	279.91	174.69	86.22	30.50	24.17	17.89	14.20	12.83	12.33
270.0	289.60	142.10	56.21	27.58	22.24	16.63	13.76	13.10	12.61
315.0	222.48	124.26	52.85	26.43	21.14	16.13	13.98	12.66	12.17
360.0	379.89	284.64	149.53	61.72	30.67	24.17	16.46	13.76	12.94

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	12.33	11.95	11.56	11.18	10.74	10.46	10.13	9.86	9.58
45.0	12.88	12.50	12.11	11.73	11.29	11.01	10.68	10.41	10.13
90.0	12.55	12.17	11.73	11.34	11.01	10.63	10.35	10.08	9.80
135.0	12.50	12.11	11.73	11.34	11.01	10.68	10.35	10.08	9.80
180.0	11.84	11.51	11.07	10.74	10.41	10.08	9.80	9.58	9.36
225.0	11.89	11.45	11.07	10.68	10.41	10.08	9.86	9.63	9.41
270.0	12.11	11.73	11.34	10.90	10.57	10.30	9.97	9.74	9.47
315.0	11.67	11.29	10.90	10.52	10.19	9.91	9.63	9.36	9.19
360.0	12.33	11.95	11.56	11.18	10.74	10.46	10.13	9.86	9.58

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	9.36	9.08	8.86	8.59	8.42	8.31	8.15	8.04	7.93
45.0	9.86	9.58	9.36	9.08	8.86	8.70	8.48	8.31	8.15
90.0	9.52	9.30	9.08	8.86	8.70	8.53	8.42	8.26	8.15
135.0	9.58	9.36	9.08	8.86	8.70	8.59	8.37	8.26	8.15
180.0	9.08	8.92	8.75	8.53	8.42	8.31	8.15	8.04	7.93
225.0	9.08	8.92	8.75	8.59	8.42	8.26	8.15	7.98	7.93
270.0	9.19	8.97	8.81	8.64	8.48	8.37	8.20	8.09	7.98
315.0	8.92	8.70	8.53	8.42	8.26	8.15	8.04	7.93	7.82
360.0	9.36	9.08	8.86	8.59	8.42	8.31	8.15	8.04	7.93

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	7.82	7.71	7.60	7.54	7.49	7.43	7.38	7.32	7.27
45.0	7.98	7.87	7.76	7.65	7.60	7.49	7.49	7.38	7.32
90.0	8.04	7.93	7.82	7.76	7.65	7.60	7.54	7.49	7.43
135.0	8.04	7.93	7.82	7.76	7.65	7.54	7.49	7.43	7.38
180.0	7.87	7.76	7.65	7.60	7.49	7.43	7.38	7.32	7.27
225.0	7.82	7.76	7.65	7.54	7.49	7.43	7.38	7.32	7.27
270.0	7.87	7.82	7.71	7.65	7.60	7.54	7.49	7.49	7.43
315.0	7.71	7.60	7.54	7.49	7.43	7.38	7.32	7.27	7.21
360.0	7.82	7.71	7.60	7.54	7.49	7.43	7.38	7.32	7.27

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	7.21	7.16	7.16	7.10	7.10	7.05	6.99	6.99	6.99
45.0	7.32	7.27	7.21	7.21	7.10	7.10	7.05	7.05	7.05
90.0	7.38	7.32	7.32	7.27	7.27	7.21	7.21	7.16	7.16
135.0	7.32	7.27	7.27	7.21	7.21	7.10	7.10	7.10	7.05
180.0	7.27	7.21	7.16	7.10	7.10	7.05	7.05	7.05	6.99
225.0	7.21	7.16	7.16	7.16	7.10	7.10	7.05	7.05	6.99
270.0	7.38	7.38	7.32	7.32	7.27	7.27	7.27	7.27	7.21
315.0	7.21	7.16	7.16	7.10	7.05	7.05	7.05	7.05	6.99
360.0	7.21	7.16	7.16	7.10	7.10	7.05	6.99	6.99	6.99

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	6.99	6.94	6.94	6.94	6.88	6.88	6.88	6.83	6.83
45.0	6.99	6.99	6.99	6.94	6.94	6.94	6.88	6.88	6.83
90.0	7.16	7.16	7.10	7.10	6.99	6.94	6.88	6.88	6.88
135.0	6.99	7.05	6.99	6.99	6.99	6.94	6.88	6.88	6.88
180.0	6.94	6.94	6.94	6.88	6.88	6.88	6.83	6.83	6.83
225.0	6.99	6.99	6.94	6.94	6.94	6.88	6.88	6.83	6.88
270.0	7.21	7.21	7.27	7.38	7.16	6.88	6.88	6.88	6.88
315.0	6.99	6.99	6.94	6.94	6.94	6.88	6.88	6.88	6.88
360.0	6.99	6.94	6.94	6.94	6.88	6.88	6.88	6.83	6.83

Intensity data(cd)

C/γ(°)	90.0
0.0	6.83
45.0	6.88
90.0	6.83
135.0	6.88
180.0	6.83
225.0	6.83
270.0	6.88
315.0	6.88
360.0	6.83