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## NATA

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Client:

LumCAT: 1546-S

Luminaire: 92.70.064.00

Report No: nt0100

Test No: GC20191225121

LampCAT: LUMINUS CXM-9-AC40

Lamp flux(lm): 1100.0

Number of Lamps: 1

Length(mm): 0

Phm Type: C

Voltage(V): 33.5900

Current(A): 0.2970

Power (W): 9.9700

PF: 1.0000

Ballast type: DC

Width(mm): 0

Height(mm): 0

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## Photometric Results

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Lumens(lm): 911.99, Efficiency(%): 82.91% , Luminous Efficacy(lm/W): 91.47

Central intensity(cd): 990.056, Maximum intensity(cd): 990.056

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=53.4

[C90/270]Total=53.4

Field angle(10%Imax): [C0/180]Total=95.4

[C90/270]Total=95.4

Maximum s/h(1/2): C0\_180=0.79 C90\_270=0.79

Maximum s/h(1/4): C0\_180=0.86 C90\_270=0.86

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 82.91%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 97.213%

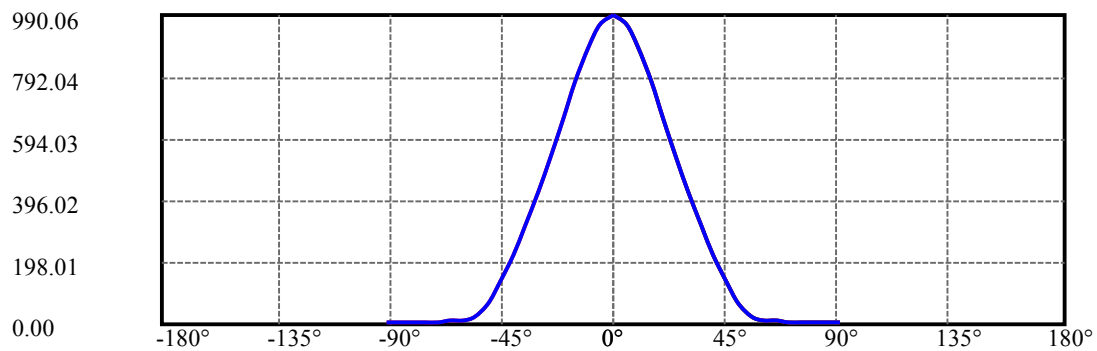
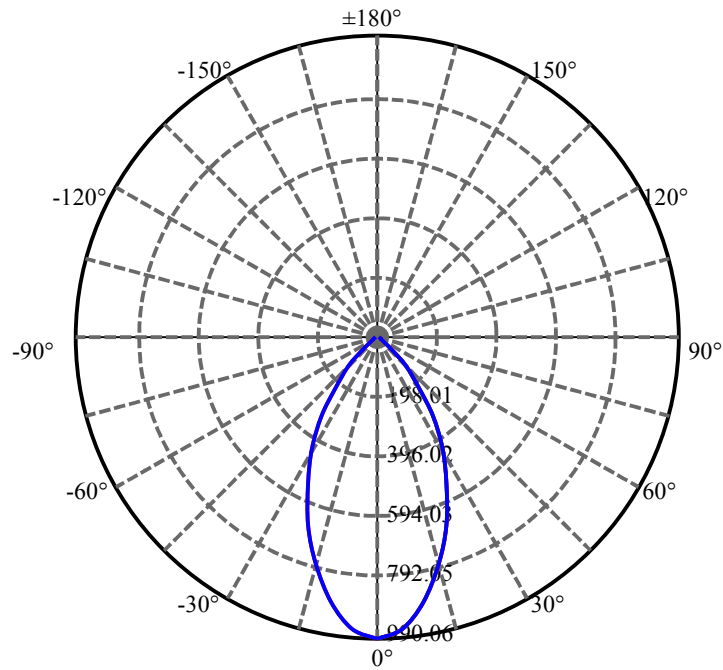
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 990.056       | 0.000       | 0         | .000%       | .000%      |
| 5.0                | 961.938       | 23.336      | 23.336    | 2.121%      | 2.559%     |
| 10.0               | 882.527       | 65.982      | 89.318    | 5.998%      | 9.794%     |
| 15.0               | 771.855       | 98.137      | 187.455   | 8.922%      | 20.555%    |
| 20.0               | 655.643       | 117.646     | 305.101   | 10.695%     | 33.454%    |
| 25.0               | 531.323       | 124.491     | 429.592   | 11.317%     | 47.105%    |
| 30.0               | 424.990       | 121.022     | 550.614   | 11.002%     | 60.375%    |
| 35.0               | 314.909       | 108.955     | 659.569   | 9.905%      | 72.322%    |
| 40.0               | 220.043       | 89.253      | 748.822   | 8.114%      | 82.109%    |
| 45.0               | 134.670       | 65.678      | 814.5     | 5.971%      | 89.310%    |
| 50.0               | 69.363        | 41.228      | 855.727   | 3.748%      | 93.831%    |
| 55.0               | 27.598        | 21.083      | 876.81    | 1.917%      | 96.143%    |
| 60.0               | 14.646        | 9.765       | 886.574   | .888%       | 97.213%    |
| 65.0               | 10.575        | 6.131       | 892.706   | .557%       | 97.886%    |
| 70.0               | 9.197         | 5.006       | 897.712   | .455%       | 98.435%    |
| 75.0               | 8.037         | 4.505       | 902.217   | .410%       | 98.929%    |
| 80.0               | 6.891         | 3.994       | 906.211   | .363%       | 99.367%    |
| 85.0               | 5.337         | 3.322       | 909.533   | .302%       | 99.731%    |
| 90.0               | 3.628         | 2.455       | 911.988   | .223%       | 100.000%   |

## ZONAL LUMEN SUMMARY

| Zone    | Lumens | %Lamp  | %Fixt   |
|---------|--------|--------|---------|
| 0-30    | 550.61 | 50.06% | 60.38%  |
| 0-40    | 748.82 | 68.07% | 82.11%  |
| 0-60    | 886.57 | 80.60% | 97.21%  |
| 0-90    | 909.53 | 82.68% | 99.73%  |
| 0-120   | 909.53 | 82.68% | 99.73%  |
| 0-180   | 911.99 | 82.91% | 100.00% |
| 60-90   | 32.72  | 2.97%  | 3.59%   |
| 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%   |
| 0-38.92 | 729.59 | 66.33% | 80.00%  |

## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 89.32  |
| 10-20   | 215.78 |
| 20-30   | 245.51 |
| 30-40   | 198.21 |
| 40-50   | 106.91 |
| 50-60   | 30.85  |
| 60-70   | 11.14  |
| 70-80   | 8.50   |
| 80-90   | 3.32   |
| 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   |

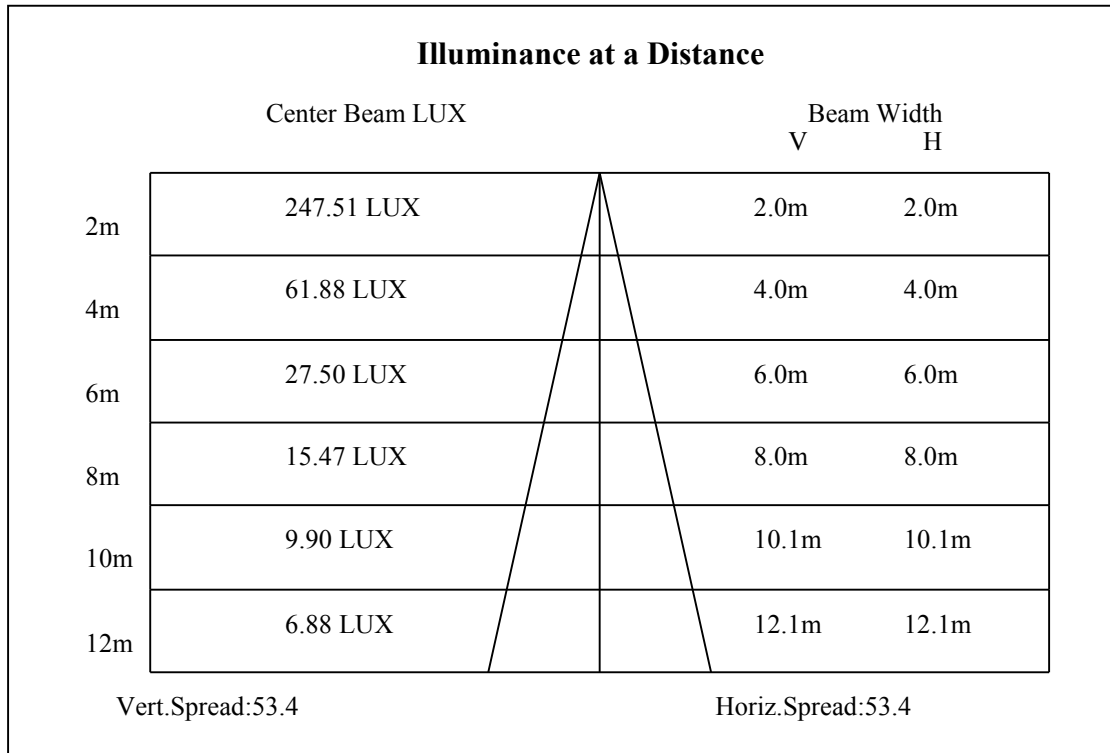
C0(Max): —————C0/C180: —————C90/C270: —————

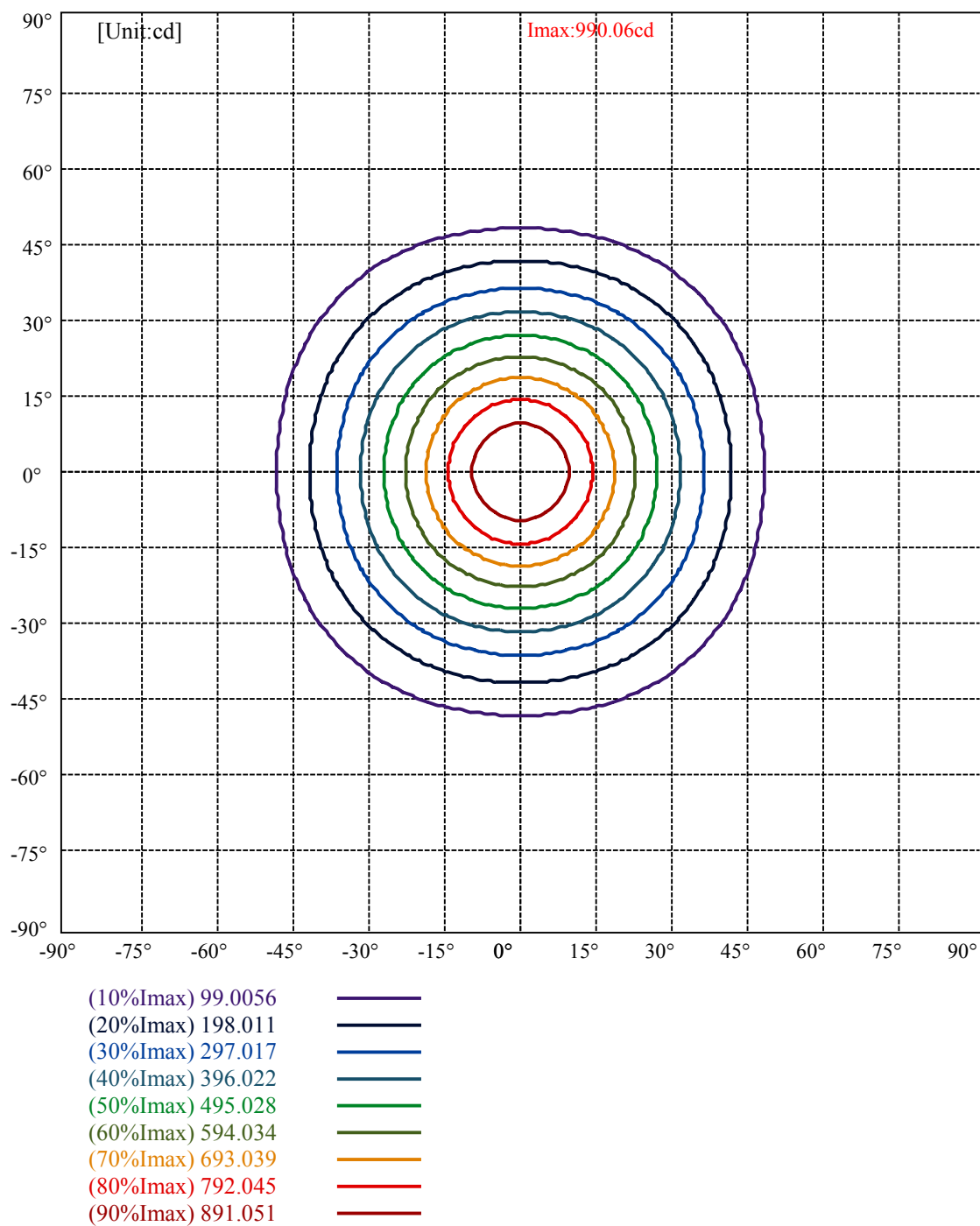
Field angle(10%Imax):C0/180Left:47.7 Right:47.7

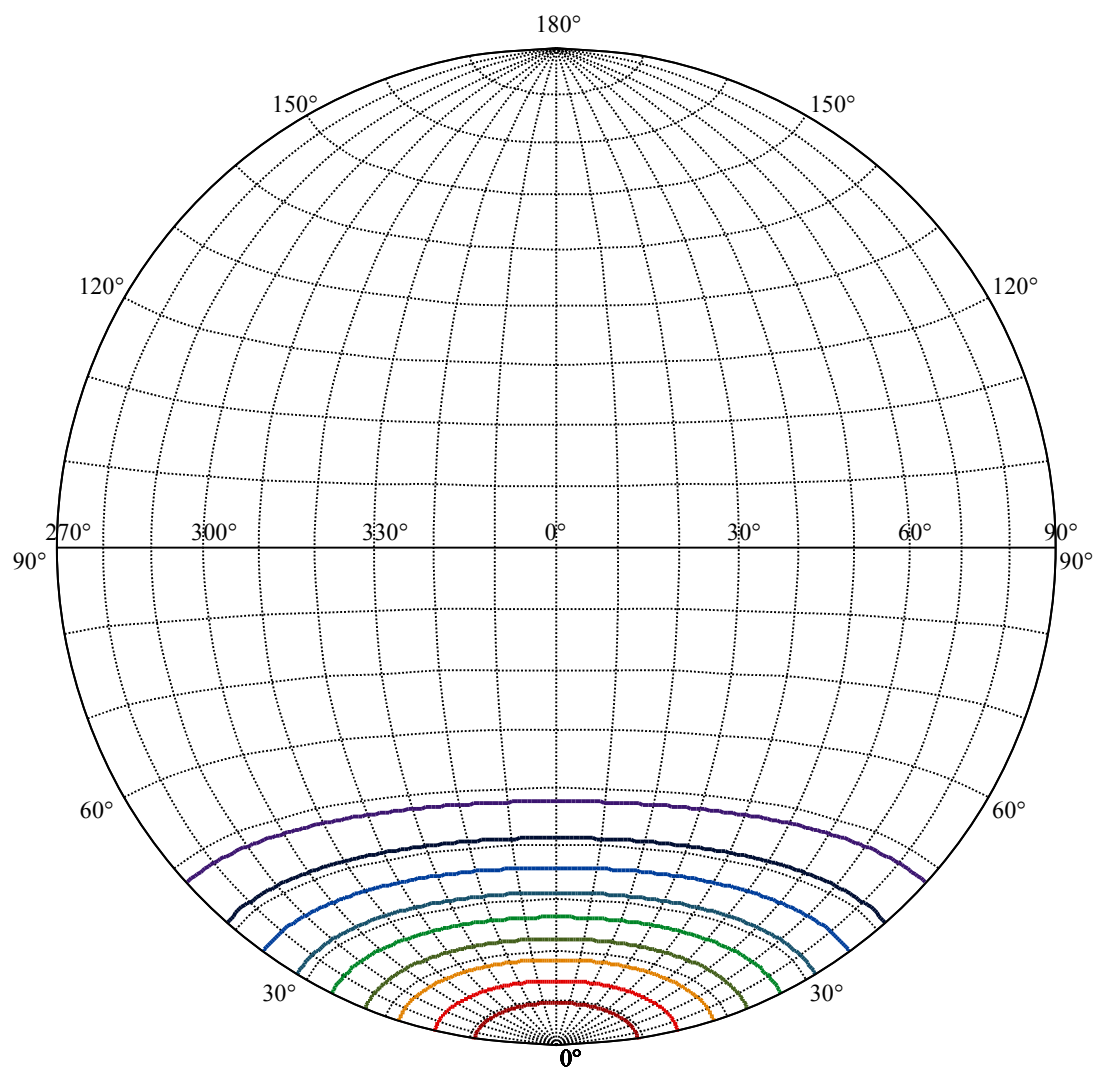
:C90/270Left:47.7 Right:47.7

Beam Angle(50%Imax):C0/180Left:26.7 Right:26.7

:C90/270Left:26.7 Right:26.7





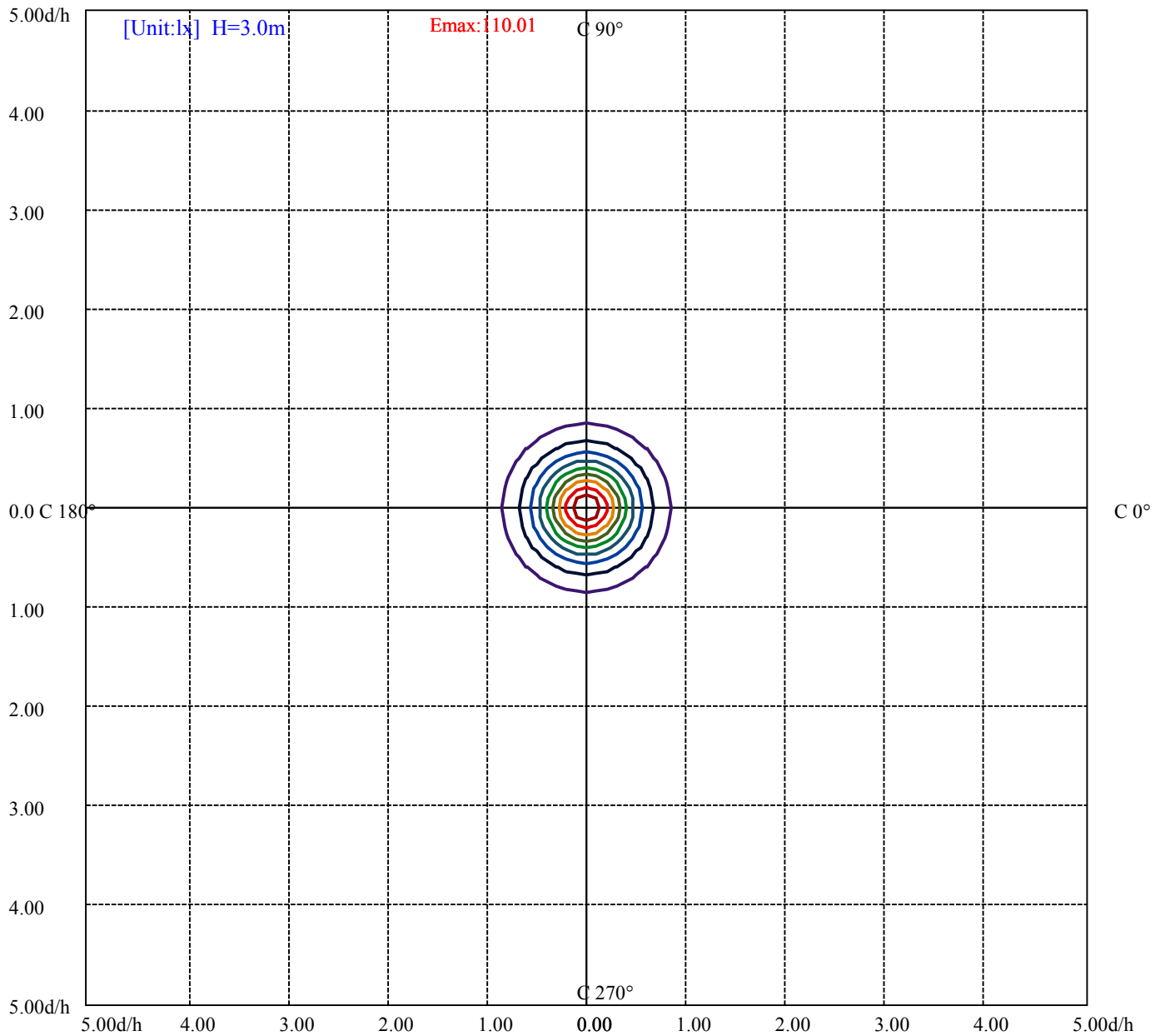


House

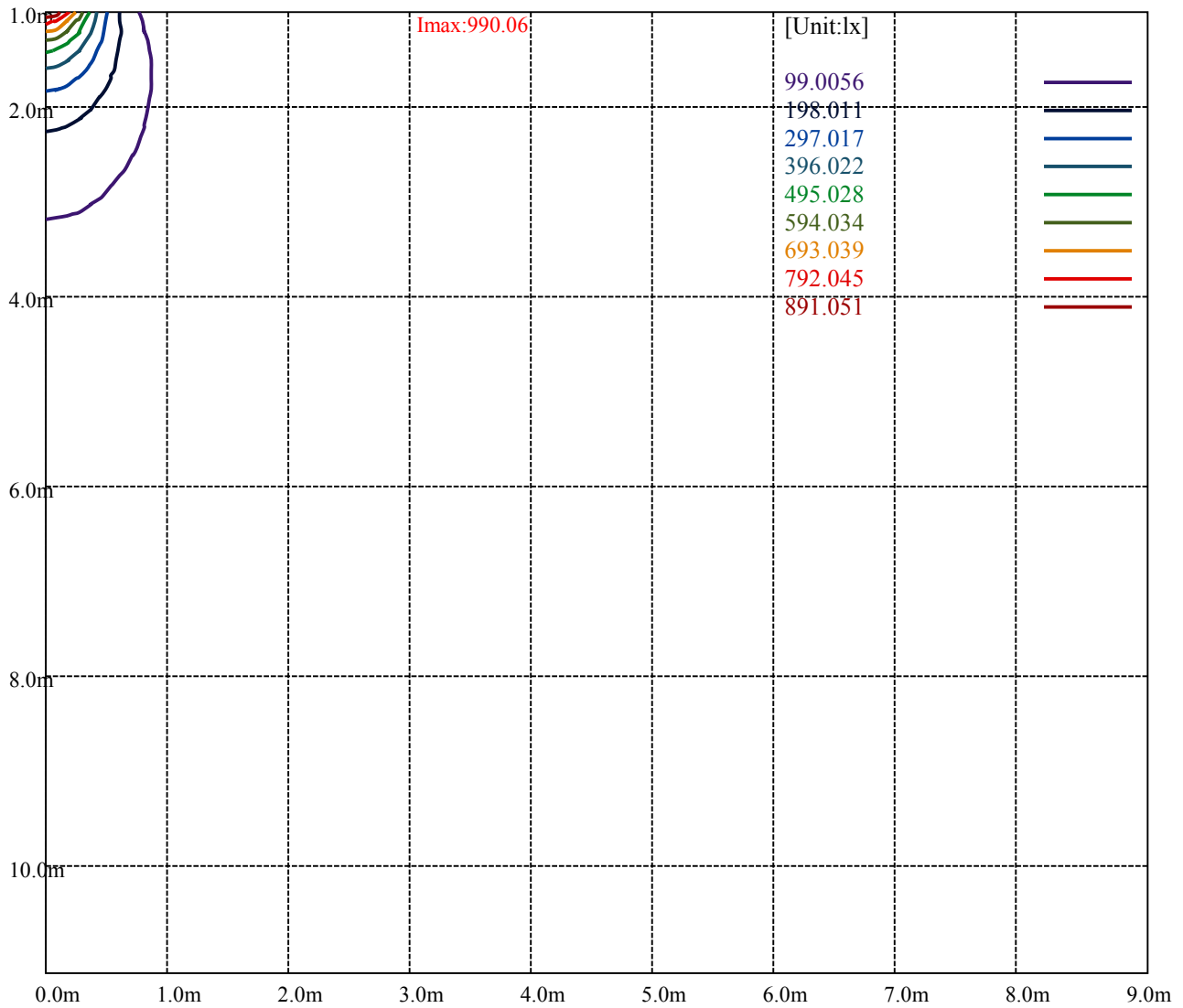
[Unit:cd]

Road

I<sub>max</sub>:990.06(10%I<sub>max</sub>) 99.0056(20%I<sub>max</sub>) 198.011(30%I<sub>max</sub>) 297.017(40%I<sub>max</sub>) 396.022(50%I<sub>max</sub>) 495.028(60%I<sub>max</sub>) 594.034(70%I<sub>max</sub>) 693.039(80%I<sub>max</sub>) 792.045(90%I<sub>max</sub>) 891.051



|           |          |   |
|-----------|----------|---|
| (10%Emax) | 11.00061 | — |
| (20%Emax) | 22.00122 | — |
| (30%Emax) | 33.00189 | — |
| (40%Emax) | 44.00245 | — |
| (50%Emax) | 55.00311 | — |
| (60%Emax) | 66.00367 | — |
| (70%Emax) | 77.00433 | — |
| (80%Emax) | 88.00489 | — |
| (90%Emax) | 99.00555 | — |



Luminance Table

| $\gamma$ | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
|----------|----|----|----|----|----|----|----|----|----|
| C0       | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C45      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| C90      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

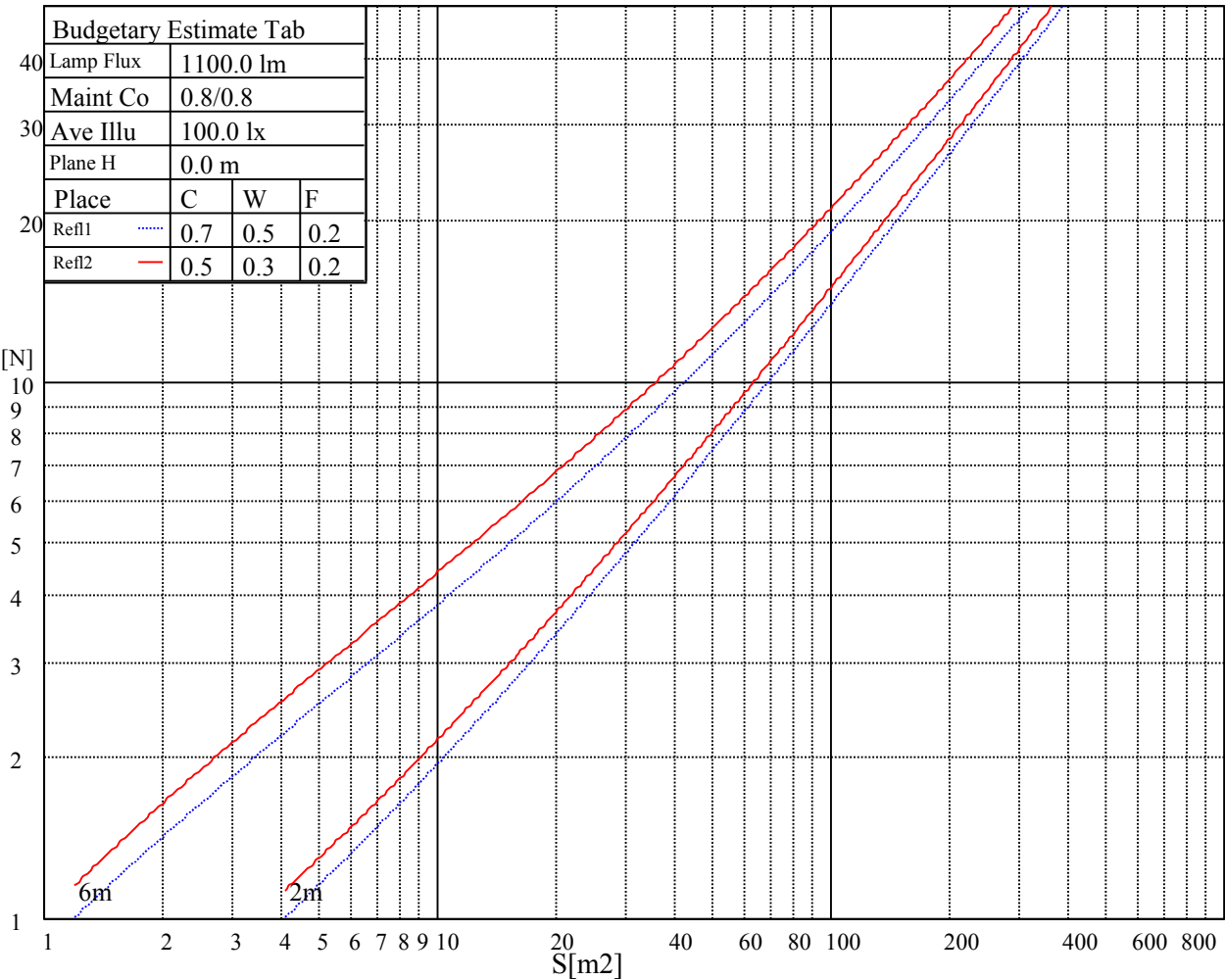
| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 0          | 0          | 0       | 0          | 0          | 0       | 0          | 0          | 0       |

Glare Table

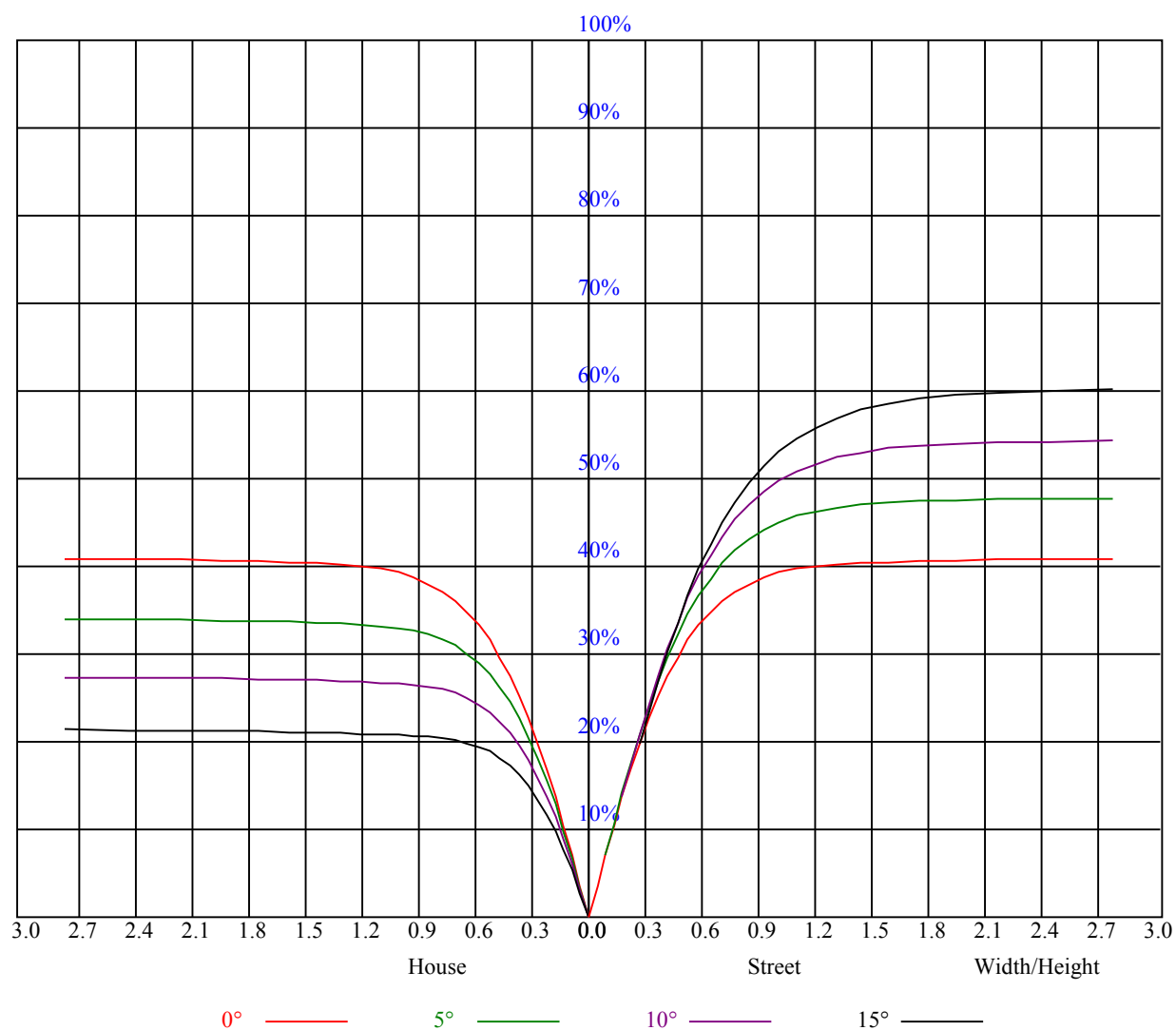
| Glare | Quality | Service Values Illuminance(lx) |      |      |            |            |            |            |            |
|-------|---------|--------------------------------|------|------|------------|------------|------------|------------|------------|
| 1.15  | A       | 2000                           | 1000 | 500  | $\leq 300$ |            |            |            |            |
| 1.5   | B       |                                | 2000 | 1000 | 500        | $\leq 300$ |            |            |            |
| 1.85  | C       |                                |      | 2000 | 1000       | 500        | $\leq 300$ |            |            |
| 2.2   | D       |                                |      |      | 2000       | 1000       | 500        | $\leq 300$ |            |
| 2.55  | E       |                                |      |      |            | 2000       | 1000       | 500        | $\leq 300$ |
|       |         | a                              | b    | c    | d          | e          | f          | g          | h          |

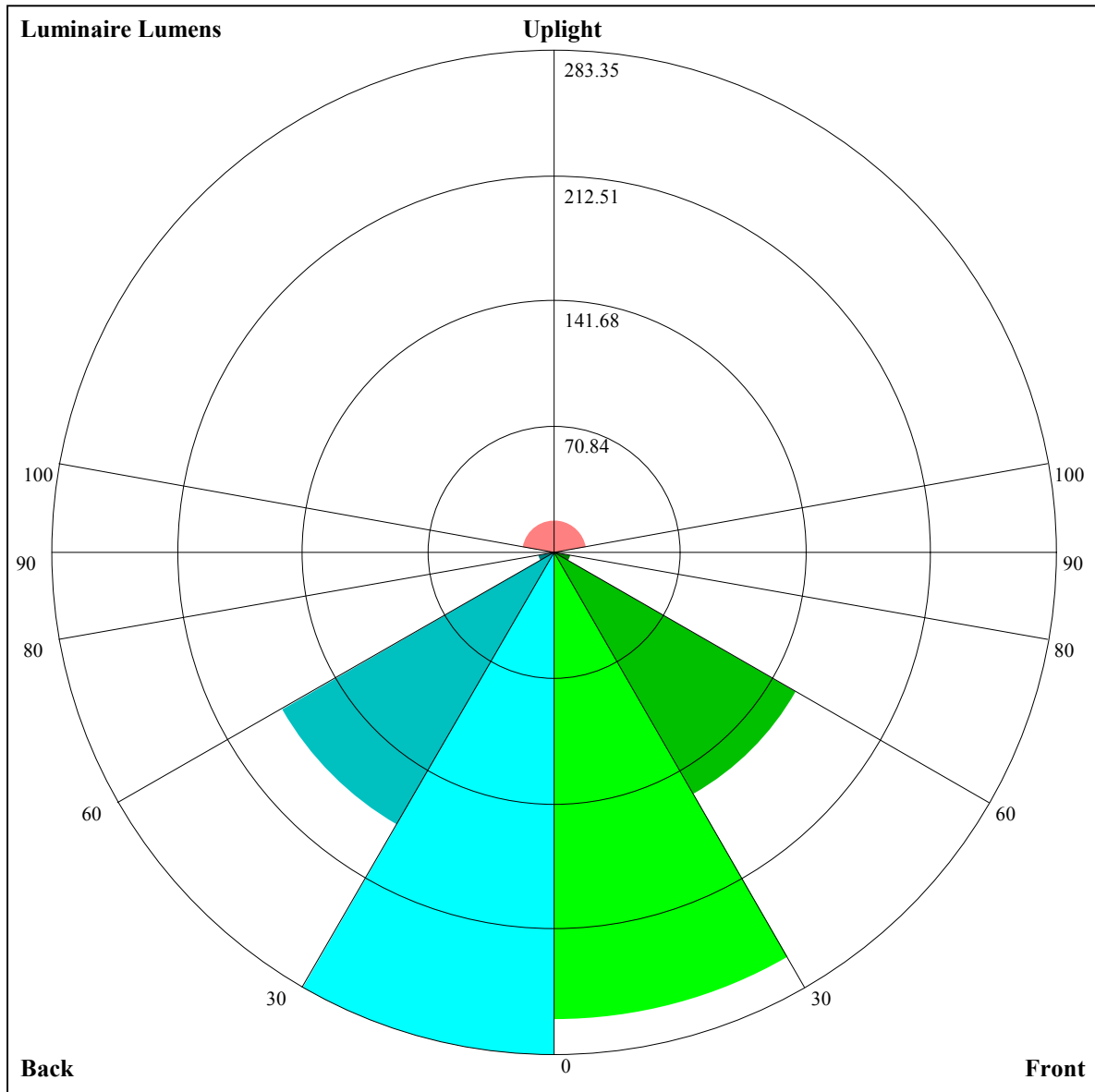
Luminance Limiting Curve





| 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   | COEFFICIENTS OF UTILIZATION RHOFC=20 CU |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 0     | 0.99                                    | 0.99 | 0.99 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.88 | 0.88 | 0.88 | 0.85 | 0.85 | 0.85 | 0.83 |
| 1     | 0.91                                    | 0.88 | 0.86 | 0.89 | 0.87 | 0.85 | 0.86 | 0.84 | 0.82 | 0.83 | 0.81 | 0.80 | 0.80 | 0.79 | 0.78 | 0.76 |
| 2     | 0.84                                    | 0.80 | 0.77 | 0.82 | 0.79 | 0.76 | 0.79 | 0.77 | 0.74 | 0.77 | 0.75 | 0.73 | 0.75 | 0.73 | 0.71 | 0.70 |
| 3     | 0.77                                    | 0.73 | 0.69 | 0.76 | 0.72 | 0.68 | 0.74 | 0.70 | 0.67 | 0.72 | 0.69 | 0.66 | 0.70 | 0.67 | 0.65 | 0.64 |
| 4     | 0.72                                    | 0.66 | 0.63 | 0.71 | 0.66 | 0.62 | 0.69 | 0.65 | 0.61 | 0.67 | 0.64 | 0.61 | 0.65 | 0.62 | 0.60 | 0.59 |
| 5     | 0.66                                    | 0.61 | 0.57 | 0.66 | 0.61 | 0.57 | 0.64 | 0.60 | 0.56 | 0.63 | 0.59 | 0.56 | 0.61 | 0.58 | 0.55 | 0.54 |
| 6     | 0.62                                    | 0.57 | 0.53 | 0.61 | 0.56 | 0.52 | 0.60 | 0.55 | 0.52 | 0.59 | 0.55 | 0.52 | 0.58 | 0.54 | 0.51 | 0.50 |
| 7     | 0.58                                    | 0.52 | 0.49 | 0.57 | 0.52 | 0.49 | 0.56 | 0.52 | 0.48 | 0.55 | 0.51 | 0.48 | 0.54 | 0.51 | 0.48 | 0.46 |
| 8     | 0.54                                    | 0.49 | 0.45 | 0.54 | 0.49 | 0.45 | 0.53 | 0.48 | 0.45 | 0.52 | 0.48 | 0.45 | 0.51 | 0.47 | 0.44 | 0.43 |
| 9     | 0.51                                    | 0.46 | 0.42 | 0.51 | 0.45 | 0.42 | 0.50 | 0.45 | 0.42 | 0.49 | 0.45 | 0.42 | 0.48 | 0.44 | 0.42 | 0.40 |
| 10    | 0.48                                    | 0.43 | 0.39 | 0.48 | 0.43 | 0.39 | 0.47 | 0.42 | 0.39 | 0.46 | 0.42 | 0.39 | 0.46 | 0.42 | 0.39 | 0.38 |





Luminaire Lumens:

FL=264.23,FM=157.48,FH=9.64,FVH=2.86

BL=283.35,BM=177.31,BH=9.83,BVH=2.89

UL=3.96,UH=18.84

BUG Rating:B1-U2-G0

NATA 1546-S

| Intensity data(cd) |        |        |        |        |        |        |        |        |        | Appendix Page: 15 Total:15 |  |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------------------|--|
| C/γ(°)             | 0.0    | 5.0    | 10.0   | 15.0   | 20.0   | 25.0   | 30.0   | 35.0   | 40.0   |                            |  |
| 0.0                | 996.24 | 936.90 | 851.51 | 743.12 | 626.23 | 507.88 | 419.12 | 306.90 | 212.85 |                            |  |
| 45.0               | 984.38 | 932.34 | 835.37 | 715.33 | 596.64 | 471.38 | 374.34 | 271.74 | 188.10 |                            |  |
| 90.0               | 989.66 | 954.11 | 866.25 | 738.23 | 627.47 | 501.30 | 394.71 | 289.58 | 199.91 |                            |  |
| 135.0              | 989.94 | 997.82 | 927.11 | 824.01 | 699.41 | 572.79 | 457.09 | 348.86 | 248.18 |                            |  |
| 180.0              | 996.24 | 993.88 | 919.63 | 809.33 | 685.86 | 560.48 | 441.96 | 322.71 | 226.46 |                            |  |
| 225.0              | 984.38 | 982.01 | 923.74 | 828.39 | 710.83 | 576.51 | 461.31 | 346.84 | 242.38 |                            |  |
| 270.0              | 989.66 | 962.10 | 892.58 | 787.50 | 678.54 | 556.31 | 450.17 | 338.79 | 237.54 |                            |  |
| 315.0              | 989.94 | 936.34 | 844.03 | 728.94 | 620.16 | 503.94 | 401.23 | 293.85 | 204.92 |                            |  |
| 360.0              | 996.24 | 936.90 | 851.51 | 743.12 | 626.23 | 507.88 | 419.12 | 306.90 | 212.85 |                            |  |
| C/γ(°)             | 45.0   | 50.0   | 55.0   | 60.0   | 65.0   | 70.0   | 75.0   | 80.0   | 85.0   |                            |  |
| 0.0                | 131.12 | 63.28  | 22.05  | 12.54  | 11.03  | 9.96   | 9.17   | 8.38   | 6.24   |                            |  |
| 45.0               | 109.52 | 51.36  | 23.01  | 12.21  | 10.07  | 8.78   | 7.59   | 6.41   | 3.94   |                            |  |
| 90.0               | 123.08 | 61.48  | 28.18  | 12.83  | 10.07  | 8.55   | 7.26   | 6.24   | 4.22   |                            |  |
| 135.0              | 157.50 | 89.61  | 37.18  | 21.66  | 11.08  | 9.11   | 7.59   | 6.41   | 5.40   |                            |  |
| 180.0              | 138.32 | 70.09  | 29.36  | 15.98  | 10.18  | 8.61   | 7.37   | 6.47   | 5.63   |                            |  |
| 225.0              | 152.27 | 85.22  | 33.30  | 16.99  | 10.97  | 9.39   | 7.99   | 6.92   | 5.96   |                            |  |
| 270.0              | 150.58 | 83.31  | 28.63  | 13.11  | 10.63  | 9.51   | 8.33   | 7.20   | 6.02   |                            |  |
| 315.0              | 114.98 | 50.57  | 19.07  | 11.87  | 10.58  | 9.68   | 9.00   | 7.09   | 5.29   |                            |  |
| 360.0              | 131.12 | 63.28  | 22.05  | 12.54  | 11.03  | 9.96   | 9.17   | 8.38   | 6.24   |                            |  |
| C/γ(°)             | 90.0   |        |        |        |        |        |        |        |        |                            |  |
| 0.0                | 3.60   |        |        |        |        |        |        |        |        |                            |  |
| 45.0               | 3.60   |        |        |        |        |        |        |        |        |                            |  |
| 90.0               | 3.60   |        |        |        |        |        |        |        |        |                            |  |
| 135.0              | 3.60   |        |        |        |        |        |        |        |        |                            |  |
| 180.0              | 3.60   |        |        |        |        |        |        |        |        |                            |  |
| 225.0              | 3.77   |        |        |        |        |        |        |        |        |                            |  |
| 270.0              | 3.66   |        |        |        |        |        |        |        |        |                            |  |
| 315.0              | 3.60   |        |        |        |        |        |        |        |        |                            |  |
| 360.0              | 3.60   |        |        |        |        |        |        |        |        |                            |  |