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## NATA

LumCAT: 1407-N  
Luminaire: 92.70.044.00  
Report No: NATA0100  
Test No: GC2019022010  
LampCAT: LUMILEDS LUXEON 1202S  
Lamp flux(lm): 906.0  
Number of Lamps: 1  
Length(mm): 39  
Phm Type: C  
Voltage(V): 35.7000  
Current(A): 0.2000  
Power (W): 7.1400  
PF: 0.0000  
Ballast type: DC  
Width(mm): 39  
Height(mm): 0

## Photometric Results

Lumens(lm): 767.66  
Efficiency(%): 84.73%  
Lumens(lm)/Power(W): 108.23  
Central intensity(cd): 971.283  
Maximum intensity(cd): 971.283  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=43.9  
[C90/270]Total=43.9  
Field angle(10%Imax): [C0/180]Total=92.1  
[C90/270]Total=92.1  
Maximum s/h(1/2): C0\_180=0.68 C90\_270=0.68  
Maximum s/h(1/4): C0\_180=0.76 C90\_270=0.76  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 85.29%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 95.748%

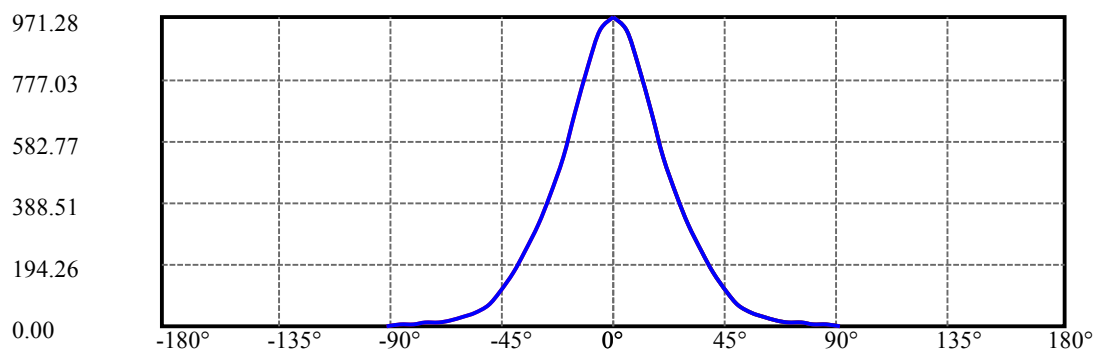
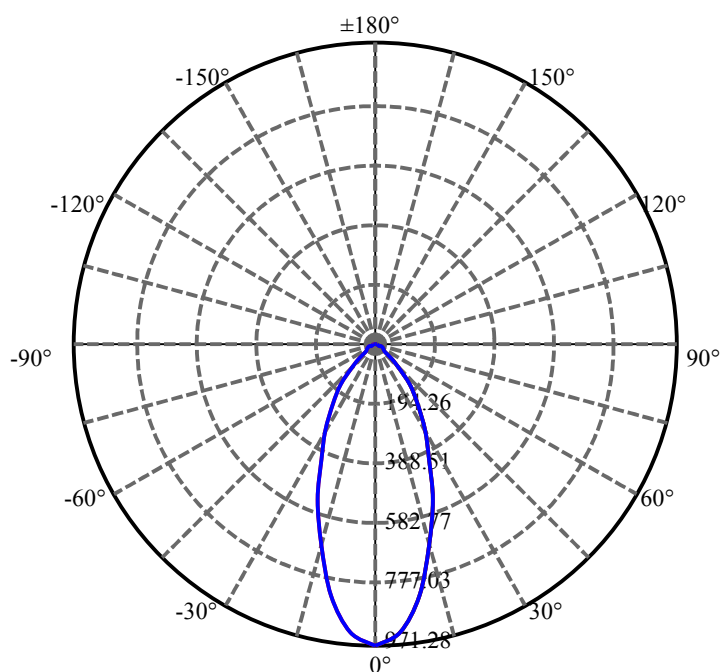
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 971.283       | 5.808       | 5.808     | .641%       | .757%      |
| 5.0                | 931.704       | 44.511      | 50.319    | 4.913%      | 6.555%     |
| 10.0               | 819.809       | 78.032      | 128.351   | 8.613%      | 16.720%    |
| 15.0               | 670.613       | 95.139      | 223.49    | 10.501%     | 29.113%    |
| 20.0               | 533.777       | 100.069     | 323.559   | 11.045%     | 42.149%    |
| 25.0               | 410.857       | 95.176      | 418.735   | 10.505%     | 54.547%    |
| 30.0               | 319.275       | 87.503      | 506.239   | 9.658%      | 65.946%    |
| 35.0               | 237.691       | 74.730      | 580.968   | 8.248%      | 75.681%    |
| 40.0               | 168.434       | 59.345      | 640.314   | 6.550%      | 83.411%    |
| 45.0               | 105.729       | 40.980      | 681.293   | 4.523%      | 88.750%    |
| 50.0               | 65.637        | 27.561      | 708.854   | 3.042%      | 92.340%    |
| 55.0               | 40.373        | 18.128      | 726.982   | 2.001%      | 94.701%    |
| 60.0               | 27.169        | 12.897      | 739.879   | 1.424%      | 96.381%    |
| 65.0               | 18.921        | 9.400       | 749.279   | 1.037%      | 97.606%    |
| 70.0               | 13.795        | 7.106       | 756.384   | .784%       | 98.531%    |
| 75.0               | 9.513         | 5.037       | 761.421   | .556%       | 99.187%    |
| 80.0               | 6.279         | 3.389       | 764.811   | .374%       | 99.629%    |
| 85.0               | 3.811         | 2.081       | 766.892   | .230%       | 99.900%    |
| 90.0               | 2.798         | 0.767       | 767.659   | .085%       | 100.000%   |

## ZONAL LUMEN SUMMARY

| Zone    | Lumens | %Lamp  | %Fixt   |
|---------|--------|--------|---------|
| 0-30    | 506.24 | 55.88% | 65.95%  |
| 0-40    | 640.31 | 70.67% | 83.41%  |
| 0-60    | 739.88 | 81.66% | 96.38%  |
| 0-90    | 766.89 | 84.65% | 99.90%  |
| 0-120   | 766.89 | 84.65% | 99.90%  |
| 0-180   | 767.66 | 84.73% | 100.00% |
| 60-90   | 39.91  | 4.41%  | 5.20%   |
| 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%   |
| 0-37.79 | 614.13 | 67.78% | 80.00%  |

## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 128.35 |
| 10-20   | 195.21 |
| 20-30   | 182.68 |
| 30-40   | 134.08 |
| 40-50   | 68.54  |
| 50-60   | 31.03  |
| 60-70   | 16.51  |
| 70-80   | 8.43   |
| 80-90   | 2.08   |
| 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:

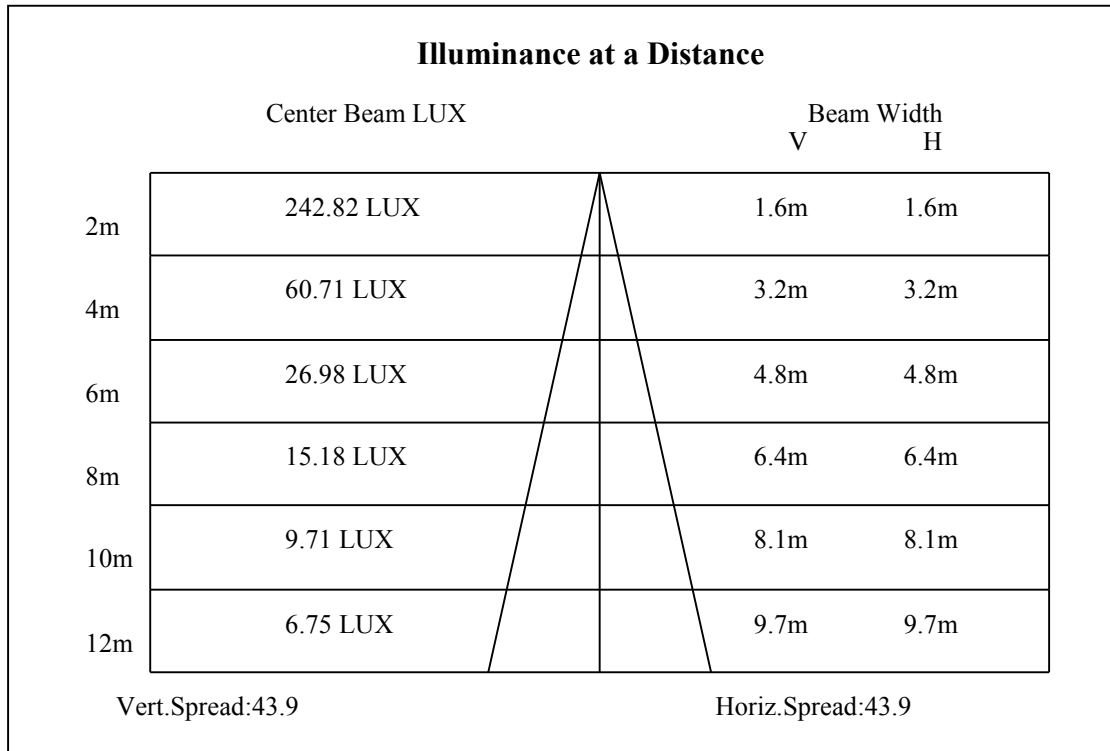
C90/C270:

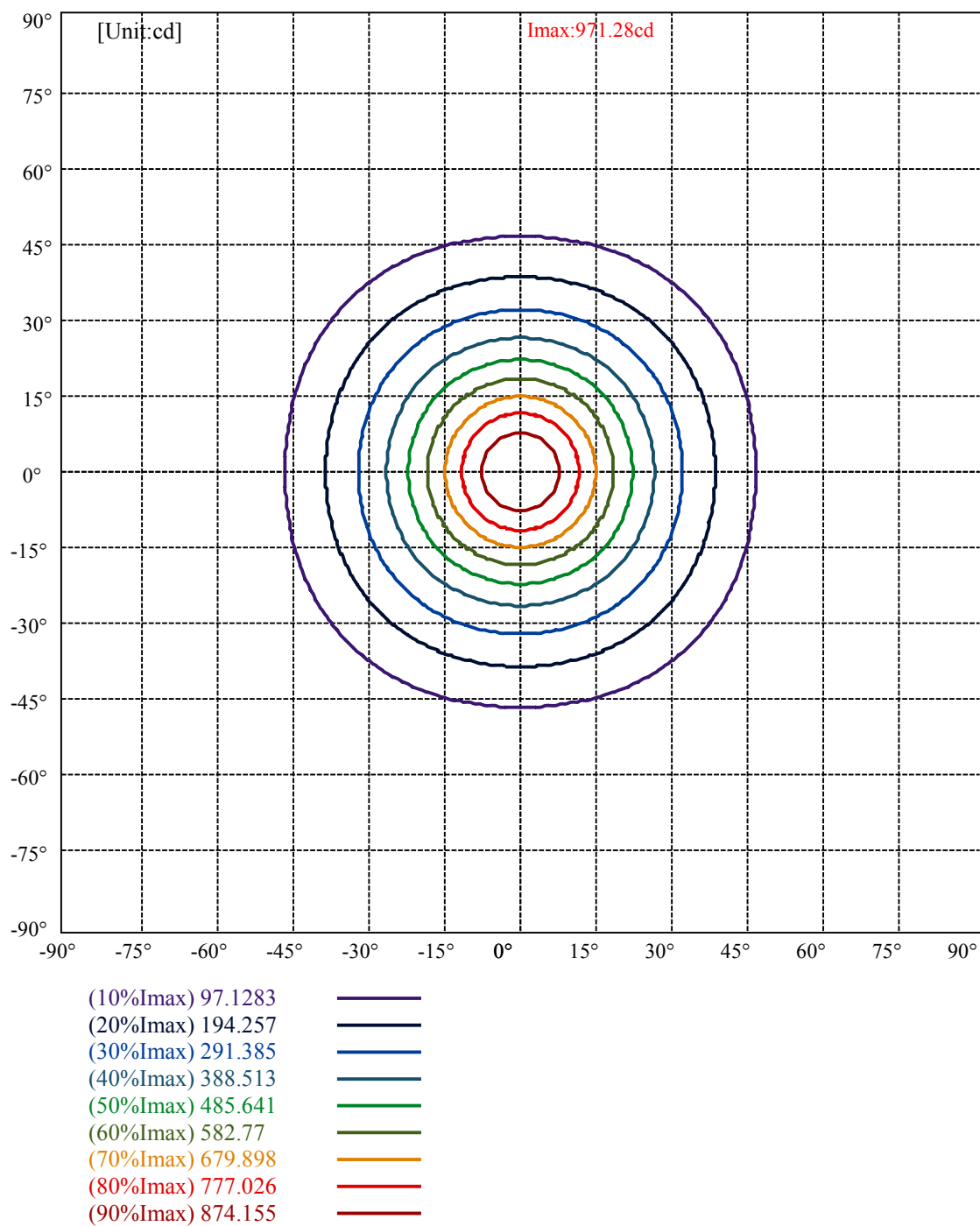
Field angle(10%Imax):C0/180Left:46.1 Right:46.1

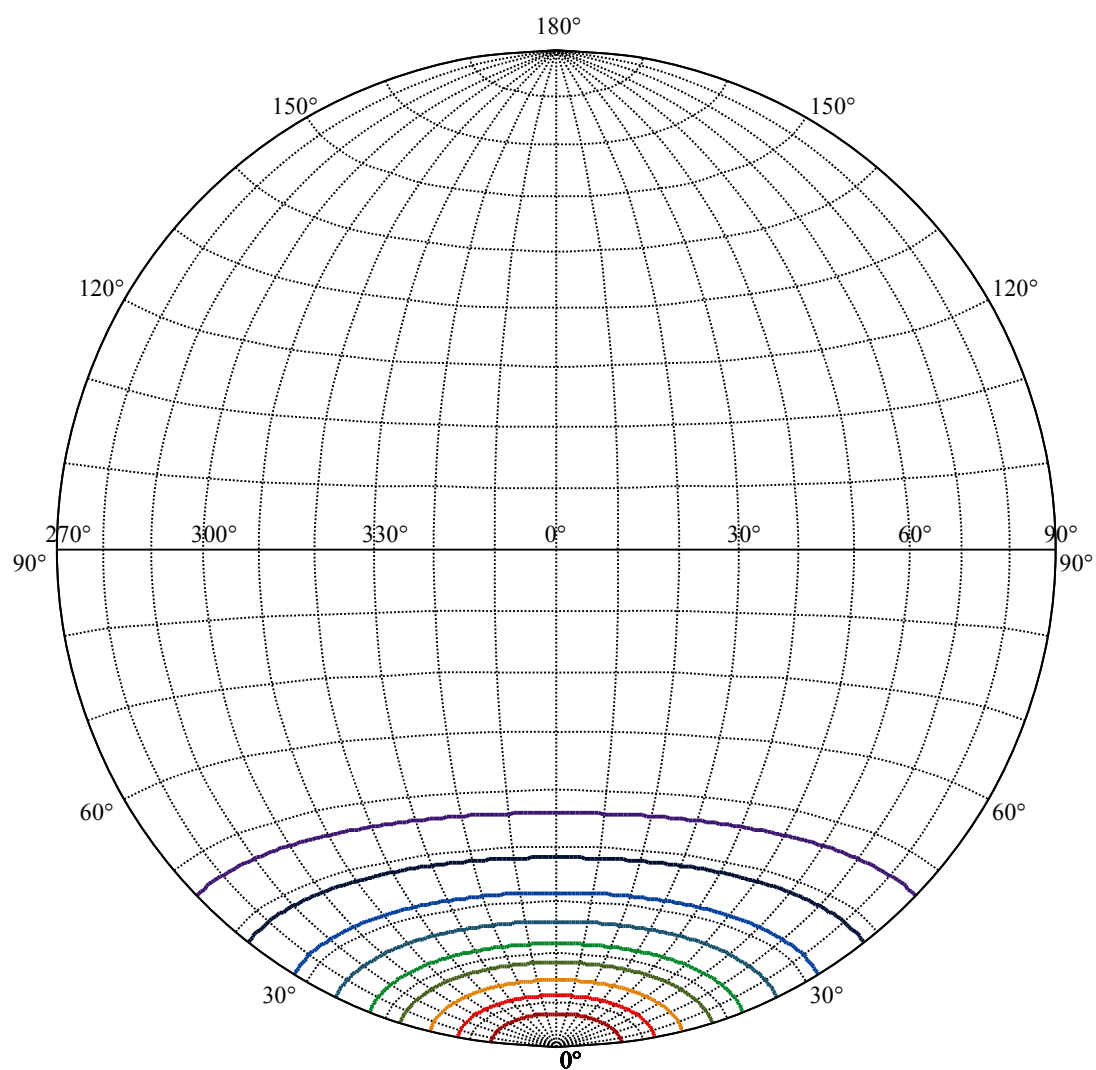
:C90/270Left:46.1 Right:46.1

Beam Angle(50%Imax):C0/180Left:22.0 Right:22.0

:C90/270Left:22.0 Right:22.0





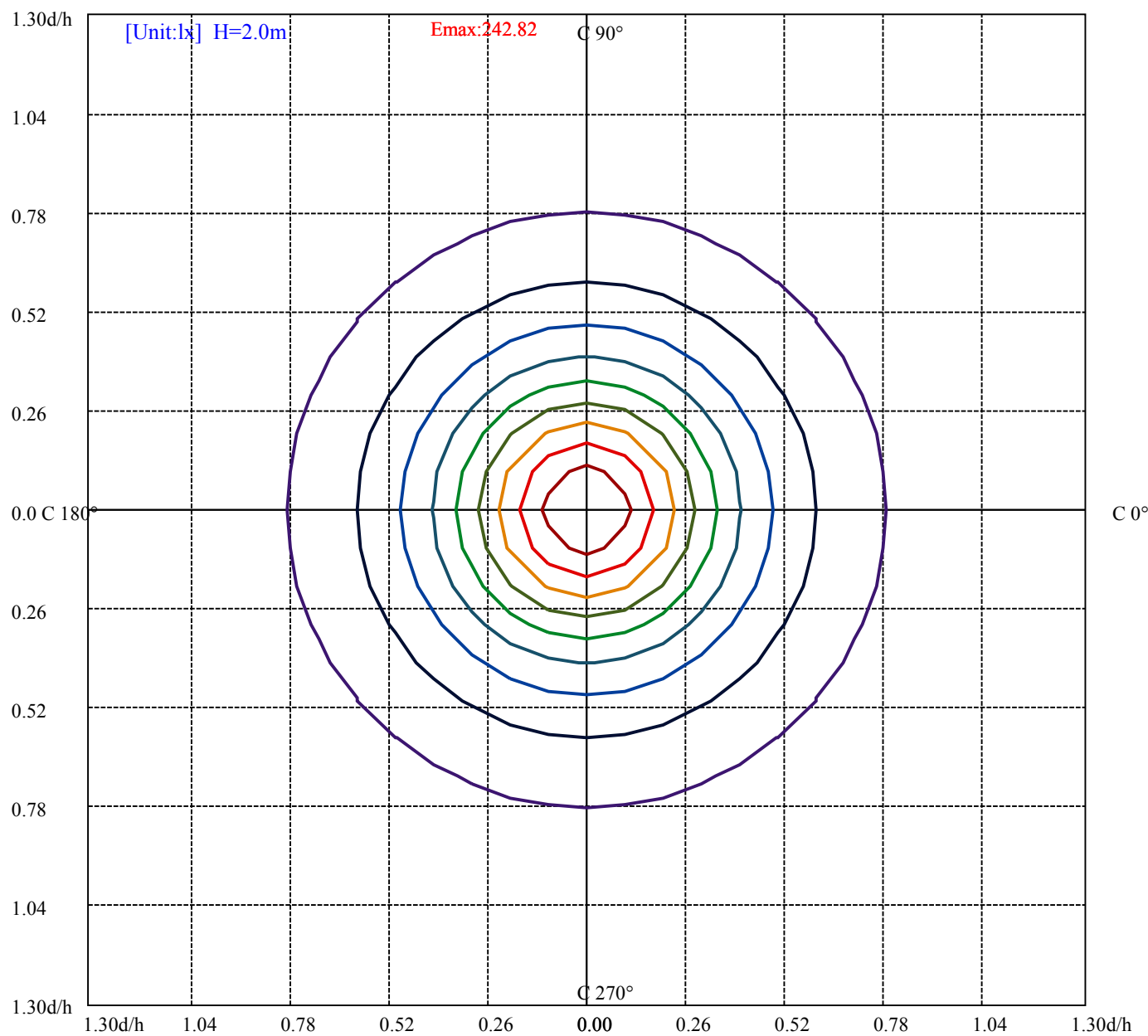


House

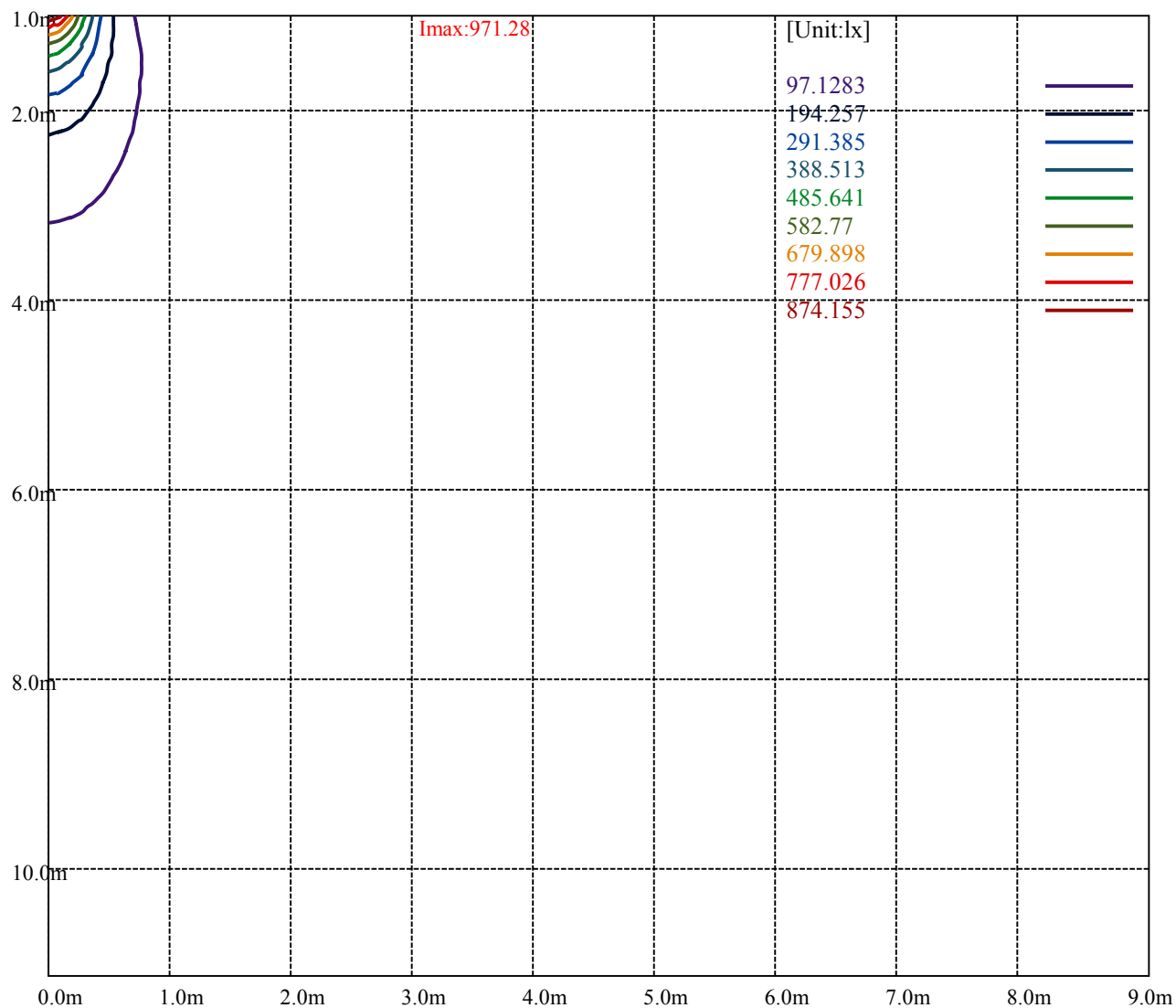
[Unit:cd]

Road

**I<sub>max</sub>:971.28**(10%I<sub>max</sub>) 97.1283(20%I<sub>max</sub>) 194.257(30%I<sub>max</sub>) 291.385(40%I<sub>max</sub>) 388.513(50%I<sub>max</sub>) 485.641(60%I<sub>max</sub>) 582.77(70%I<sub>max</sub>) 679.898(80%I<sub>max</sub>) 777.026(90%I<sub>max</sub>) 874.155



|                    |   |
|--------------------|---|
| (10%Emax) 24.28205 | — |
| (20%Emax) 48.564   | — |
| (30%Emax) 72.846   | — |
| (40%Emax) 97.12825 | — |
| (50%Emax) 121.4102 | — |
| (60%Emax) 145.6922 | — |
| (70%Emax) 169.9742 | — |
| (80%Emax) 194.2563 | — |
| (90%Emax) 218.5383 | — |



Luminance Table

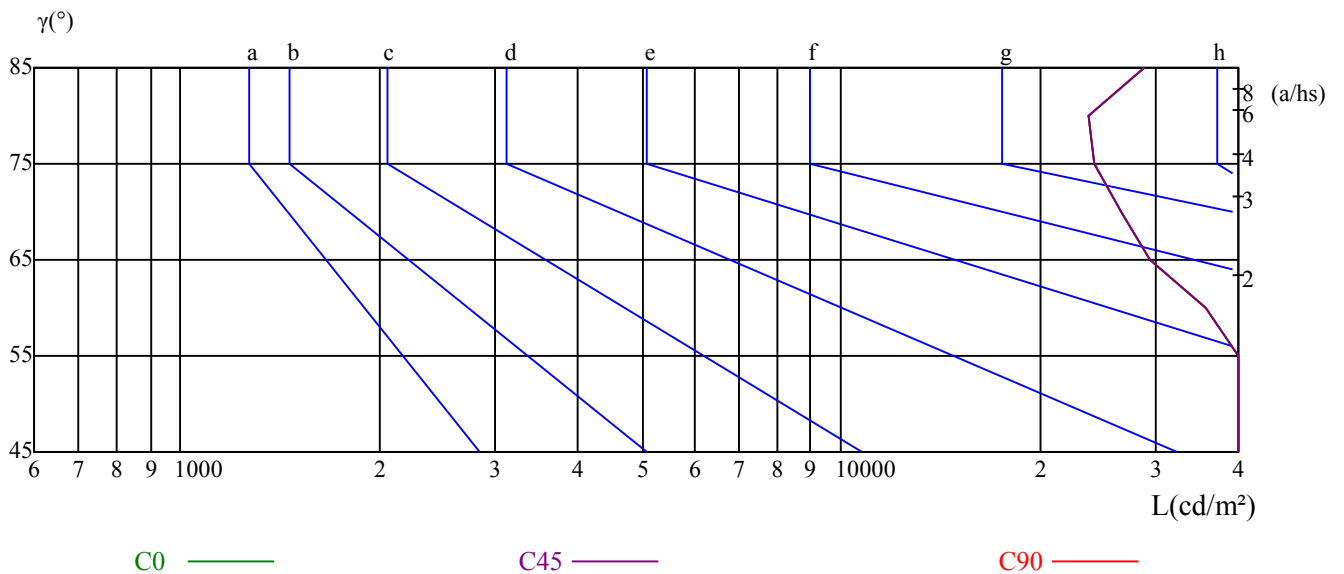
| $\gamma$ | 45    | 50    | 55    | 60    | 65    | 70    | 75    | 80    | 85    |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C0       | 98306 | 67135 | 46278 | 35725 | 29435 | 26519 | 24166 | 23773 | 28748 |
| C45      | 98306 | 67135 | 46278 | 35725 | 29435 | 26519 | 24166 | 23773 | 28748 |
| C90      | 98306 | 67135 | 46278 | 35725 | 29435 | 26519 | 24166 | 23773 | 28748 |

| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 29435      | 29435      | 29435   | 24166      | 24166      | 24166   | 28748      | 28748      | 28748   |

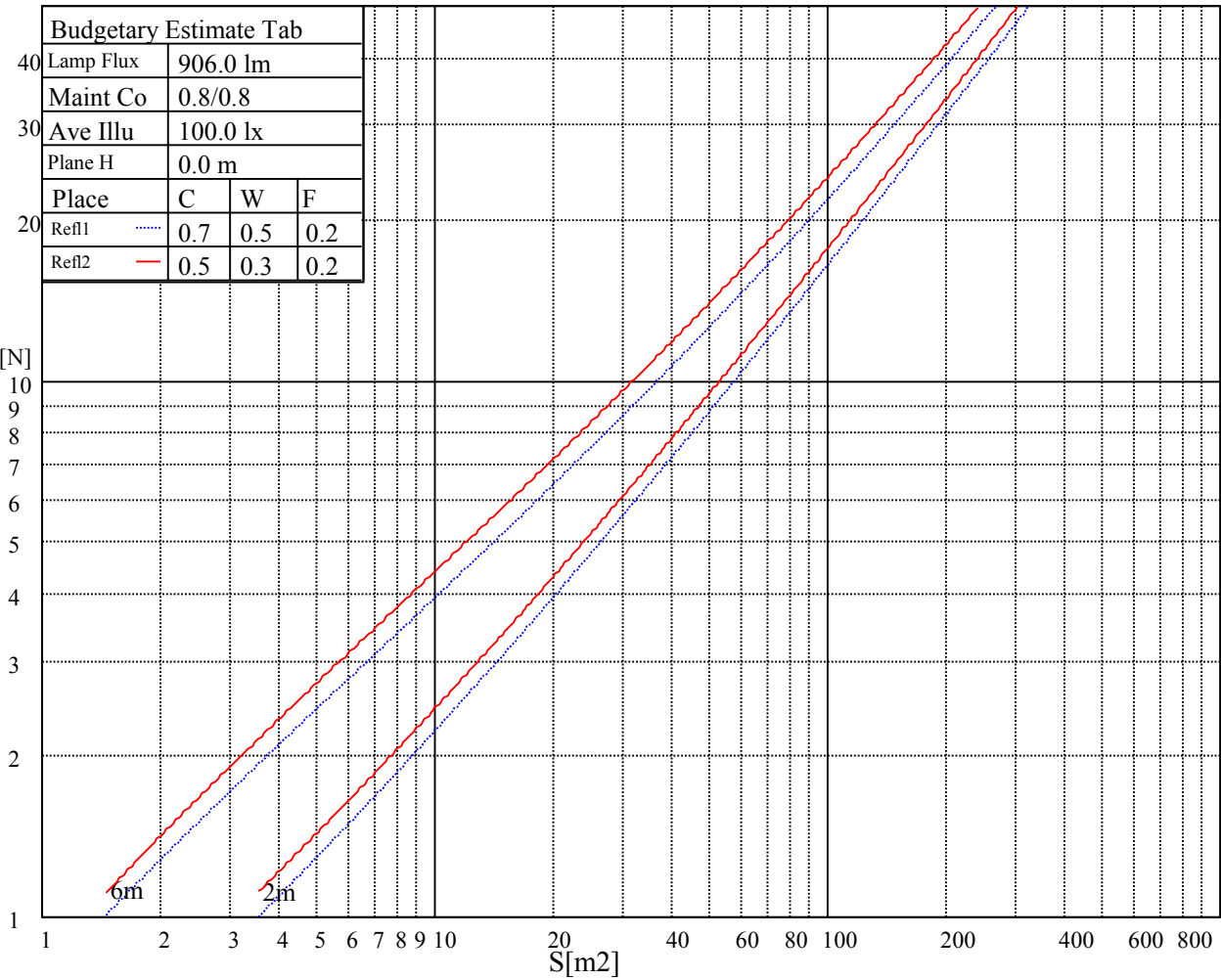
Glare Table

| 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          |

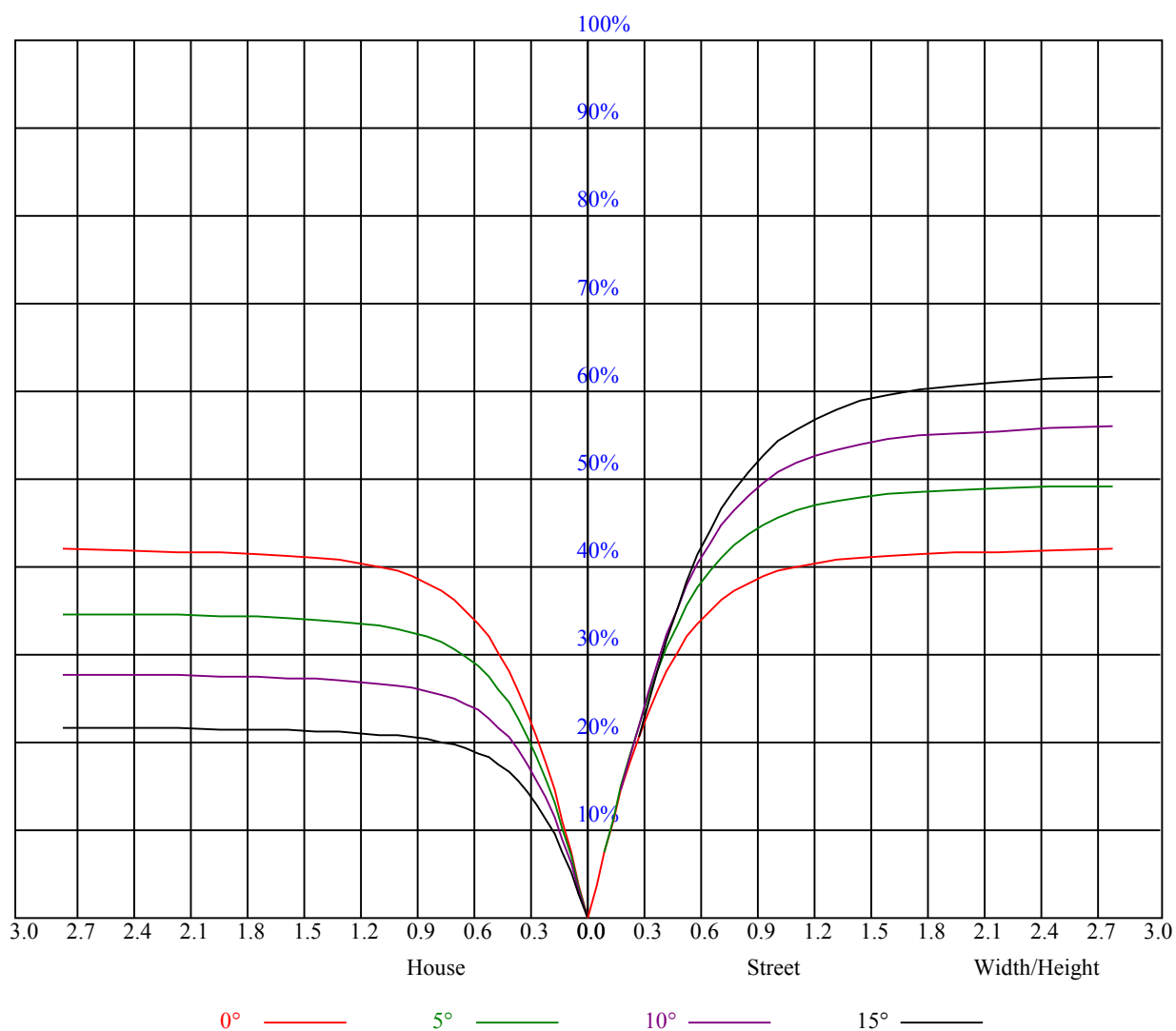
Luminance Limiting Curve



| Illumination assessment according UGR             |     |                  |       |       |       |       |                |       |       |       |       |
|---------------------------------------------------|-----|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Rf of Ceiling                                     |     | 70               | 70    | 50    | 50    | 30    | 70             | 70    | 50    | 50    | 30    |
| Rf of Wall                                        |     | 50               | 30    | 50    | 30    | 30    | 50             | 30    | 50    | 30    | 30    |
| Rf of Floor                                       |     | 20               | 20    | 20    | 20    | 20    | 20             | 20    | 20    | 20    | 20    |
| Room dimensions                                   |     | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X                                                 | Y   |                  |       |       |       |       |                |       |       |       |       |
| 2H                                                | 2H  | 21.93            | 23.09 | 22.29 | 23.40 | 23.71 | 22.00          | 23.16 | 22.37 | 23.48 | 23.79 |
|                                                   | 3H  | 22.94            | 23.96 | 23.32 | 24.29 | 24.66 | 23.00          | 24.03 | 23.38 | 24.36 | 24.73 |
|                                                   | 4H  | 23.34            | 24.29 | 23.74 | 24.64 | 25.03 | 23.40          | 24.35 | 23.80 | 24.70 | 25.09 |
|                                                   | 6H  | 23.67            | 24.54 | 24.09 | 24.92 | 25.31 | 23.74          | 24.61 | 24.16 | 24.99 | 25.38 |
|                                                   | 8H  | 23.81            | 24.64 | 24.25 | 25.03 | 25.44 | 23.89          | 24.71 | 24.32 | 25.10 | 25.51 |
|                                                   | 12H | 24.06            | 24.85 | 24.49 | 25.23 | 25.66 | 24.13          | 24.92 | 24.57 | 25.30 | 25.73 |
| 4H                                                | 2H  | 22.18            | 23.13 | 22.58 | 23.48 | 23.87 | 22.25          | 23.20 | 22.65 | 23.55 | 23.94 |
|                                                   | 3H  | 23.42            | 24.19 | 23.83 | 24.60 | 25.00 | 23.47          | 24.25 | 23.88 | 24.65 | 25.06 |
|                                                   | 4H  | 23.94            | 24.63 | 24.37 | 25.05 | 25.50 | 23.99          | 24.68 | 24.42 | 25.10 | 25.55 |
|                                                   | 6H  | 24.33            | 24.93 | 24.80 | 25.38 | 25.85 | 24.39          | 24.99 | 24.86 | 25.44 | 25.91 |
|                                                   | 8H  | 24.54            | 25.10 | 25.01 | 25.55 | 26.02 | 24.61          | 25.16 | 25.08 | 25.61 | 26.09 |
|                                                   | 12H | 24.83            | 25.32 | 25.32 | 25.81 | 26.28 | 24.90          | 25.38 | 25.38 | 25.87 | 26.35 |
| 8H                                                | 4H  | 24.09            | 24.65 | 24.56 | 25.10 | 25.57 | 24.14          | 24.70 | 24.61 | 25.14 | 25.62 |
|                                                   | 6H  | 24.63            | 25.08 | 25.14 | 25.58 | 26.07 | 24.69          | 25.14 | 25.19 | 25.64 | 26.12 |
|                                                   | 8H  | 24.94            | 25.34 | 25.47 | 25.86 | 26.36 | 25.00          | 25.40 | 25.53 | 25.92 | 26.42 |
|                                                   | 12H | 25.73            | 26.08 | 26.25 | 26.58 | 27.15 | 25.79          | 26.14 | 26.30 | 26.64 | 27.21 |
| 12H                                               | 4H  | 24.09            | 24.58 | 24.58 | 25.06 | 25.54 | 24.14          | 24.62 | 24.62 | 25.11 | 25.59 |
|                                                   | 6H  | 25.11            | 25.08 | 25.21 | 25.55 | 26.10 | 25.17          | 25.14 | 25.26 | 25.60 | 26.15 |
|                                                   | 8H  | 25.05            | 25.40 | 25.57 | 25.90 | 26.47 | 25.11          | 25.46 | 25.62 | 25.96 | 26.53 |
| Variation with the observer position at spacings: |     |                  |       |       |       |       |                |       |       |       |       |
| S = 1.0H                                          |     | 1.4/-2.1         |       |       |       |       | 1.4/-2.1       |       |       |       |       |
| S = 1.5H                                          |     | 2.8/-2.8         |       |       |       |       | 2.8/-2.8       |       |       |       |       |
| S = 2.0H                                          |     | 4.7/-2.8         |       |       |       |       | 4.7/-2.8       |       |       |       |       |
| Standard tables:                                  |     | BK2              |       |       |       |       | BK2            |       |       |       |       |
| Uncorrected UGR                                   |     | 7.7              |       |       |       |       | 7.7            |       |       |       |       |



| 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     | 1.02                                    | 1.02 | 1.02 | 0.99 | 0.99 | 0.99 | 0.95 | 0.95 | 0.95 | 0.91 | 0.91 | 0.91 | 0.87 | 0.87 | 0.87 | 0.85 |
| 1     | 0.93                                    | 0.91 | 0.88 | 0.91 | 0.89 | 0.87 | 0.88 | 0.86 | 0.84 | 0.84 | 0.83 | 0.82 | 0.81 | 0.80 | 0.79 | 0.78 |
| 2     | 0.86                                    | 0.82 | 0.79 | 0.85 | 0.81 | 0.78 | 0.82 | 0.79 | 0.76 | 0.79 | 0.77 | 0.75 | 0.77 | 0.75 | 0.73 | 0.72 |
| 3     | 0.80                                    | 0.75 | 0.71 | 0.79 | 0.74 | 0.71 | 0.76 | 0.73 | 0.70 | 0.74 | 0.71 | 0.69 | 0.72 | 0.70 | 0.68 | 0.66 |
| 4     | 0.74                                    | 0.69 | 0.65 | 0.73 | 0.69 | 0.65 | 0.72 | 0.67 | 0.64 | 0.70 | 0.66 | 0.64 | 0.68 | 0.65 | 0.63 | 0.61 |
| 5     | 0.70                                    | 0.64 | 0.60 | 0.69 | 0.64 | 0.60 | 0.67 | 0.63 | 0.60 | 0.66 | 0.62 | 0.59 | 0.64 | 0.61 | 0.59 | 0.57 |
| 6     | 0.65                                    | 0.60 | 0.56 | 0.65 | 0.60 | 0.56 | 0.63 | 0.59 | 0.56 | 0.62 | 0.58 | 0.55 | 0.61 | 0.58 | 0.55 | 0.54 |
| 7     | 0.62                                    | 0.56 | 0.52 | 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 |
| 8     | 0.58                                    | 0.53 | 0.49 | 0.58 | 0.53 | 0.49 | 0.57 | 0.52 | 0.49 | 0.56 | 0.52 | 0.49 | 0.55 | 0.51 | 0.49 | 0.47 |
| 9     | 0.55                                    | 0.50 | 0.46 | 0.55 | 0.50 | 0.46 | 0.54 | 0.49 | 0.46 | 0.53 | 0.49 | 0.46 | 0.52 | 0.49 | 0.46 | 0.45 |
| 10    | 0.52                                    | 0.47 | 0.44 | 0.52 | 0.47 | 0.44 | 0.51 | 0.47 | 0.44 | 0.51 | 0.47 | 0.44 | 0.50 | 0.46 | 0.44 | 0.42 |



# NATA 1407-N

| 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                | 970.09 | 954.56 | 865.97 | 740.36 | 588.71 | 454.95 | 359.78 | 268.71 | 188.44 |                            |  |
| 45.0               | 968.57 | 943.99 | 838.58 | 685.41 | 546.08 | 418.44 | 324.11 | 240.75 | 175.44 |                            |  |
| 90.0               | 969.41 | 914.12 | 787.39 | 632.87 | 502.48 | 385.82 | 296.10 | 219.71 | 152.38 |                            |  |
| 135.0              | 977.06 | 921.43 | 804.21 | 649.74 | 518.18 | 399.77 | 308.87 | 231.19 | 162.39 |                            |  |
| 180.0              | 970.09 | 909.23 | 778.33 | 623.76 | 492.92 | 377.66 | 290.76 | 210.04 | 150.98 |                            |  |
| 225.0              | 968.57 | 916.82 | 795.26 | 650.08 | 514.69 | 397.74 | 314.04 | 231.36 | 160.71 |                            |  |
| 270.0              | 969.41 | 944.21 | 845.27 | 693.28 | 557.94 | 432.23 | 333.96 | 252.73 | 181.18 |                            |  |
| 315.0              | 977.06 | 949.28 | 843.47 | 689.40 | 549.23 | 420.24 | 326.59 | 247.05 | 175.95 |                            |  |
| 360.0              | 970.09 | 954.56 | 865.97 | 740.36 | 588.71 | 454.95 | 359.78 | 268.71 | 188.44 |                            |  |
| C/γ(°)             | 45.0   | 50.0   | 55.0   | 60.0   | 65.0   | 70.0   | 75.0   | 80.0   | 85.0   |                            |  |
| 0.0                | 121.05 | 75.94  | 45.00  | 29.48  | 20.53  | 14.91  | 10.52  | 7.37   | 4.28   |                            |  |
| 45.0               | 112.39 | 69.19  | 42.30  | 27.73  | 19.07  | 14.06  | 9.90   | 6.64   | 4.05   |                            |  |
| 90.0               | 94.39  | 59.34  | 36.23  | 24.75  | 17.33  | 12.71  | 8.66   | 5.68   | 3.54   |                            |  |
| 135.0              | 99.96  | 64.29  | 38.70  | 26.38  | 18.39  | 13.44  | 9.17   | 5.91   | 3.49   |                            |  |
| 180.0              | 92.31  | 56.81  | 36.39  | 25.14  | 17.55  | 12.77  | 8.55   | 5.46   | 3.32   |                            |  |
| 225.0              | 98.66  | 61.65  | 38.48  | 26.38  | 18.73  | 13.33  | 9.06   | 5.85   | 3.60   |                            |  |
| 270.0              | 115.09 | 69.24  | 43.26  | 29.19  | 20.31  | 14.85  | 10.29  | 6.75   | 4.11   |                            |  |
| 315.0              | 111.99 | 68.63  | 42.64  | 28.29  | 19.46  | 14.29  | 9.96   | 6.58   | 4.11   |                            |  |
| 360.0              | 121.05 | 75.94  | 45.00  | 29.48  | 20.53  | 14.91  | 10.52  | 7.37   | 4.28   |                            |  |
| C/γ(°)             | 90.0   |        |        |        |        |        |        |        |        |                            |  |
| 0.0                | 2.87   |        |        |        |        |        |        |        |        |                            |  |
| 45.0               | 2.81   |        |        |        |        |        |        |        |        |                            |  |
| 90.0               | 2.76   |        |        |        |        |        |        |        |        |                            |  |
| 135.0              | 2.81   |        |        |        |        |        |        |        |        |                            |  |
| 180.0              | 2.76   |        |        |        |        |        |        |        |        |                            |  |
| 225.0              | 2.76   |        |        |        |        |        |        |        |        |                            |  |
| 270.0              | 2.81   |        |        |        |        |        |        |        |        |                            |  |
| 315.0              | 2.81   |        |        |        |        |        |        |        |        |                            |  |
| 360.0              | 2.87   |        |        |        |        |        |        |        |        |                            |  |