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## NATA

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|                                |                     |
|--------------------------------|---------------------|
| LumCAT: 1546-E                 |                     |
| Luminaire: 92.70.044.00        |                     |
| Report No: NATA0100            | Voltage(V): 35.2000 |
| Test No: GC2019011215          | Current(A): 0.1500  |
| LampCAT: LUMILEDS LUXEON 1202S | Power (W): 5.2800   |
| Lamp flux(lm): 805.0           | PF: 0.0000          |
| Number of Lamps: 1             | Ballast type: DC    |
| Length(mm): 21                 | Width(mm): 21       |
| Phm Type: C                    | Height(mm): 0       |

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## Photometric Results

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Lumens(lm): 691.78  
Efficiency(%): 85.94%  
Lumens(lm)/Power(W): 132.02  
Central intensity(cd): 990.773  
Maximum intensity(cd): 990.773  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=41.8  
                                  [C90/270]Total=41.8  
Field angle(10%Imax): [C0/180]Total=87.7  
                                  [C90/270]Total=87.7  
Maximum s/h(1/2): C0\_180=0.65 C90\_270=0.65  
Maximum s/h(1/4): C0\_180=0.72 C90\_270=0.72  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 86.59%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 97.068%

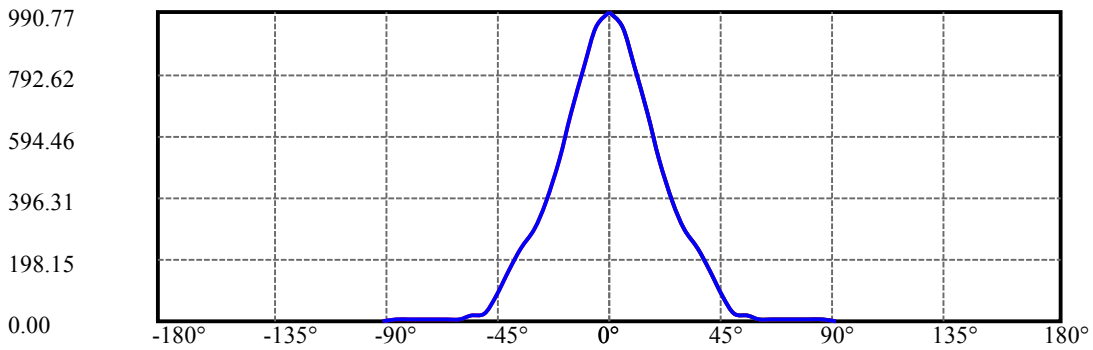
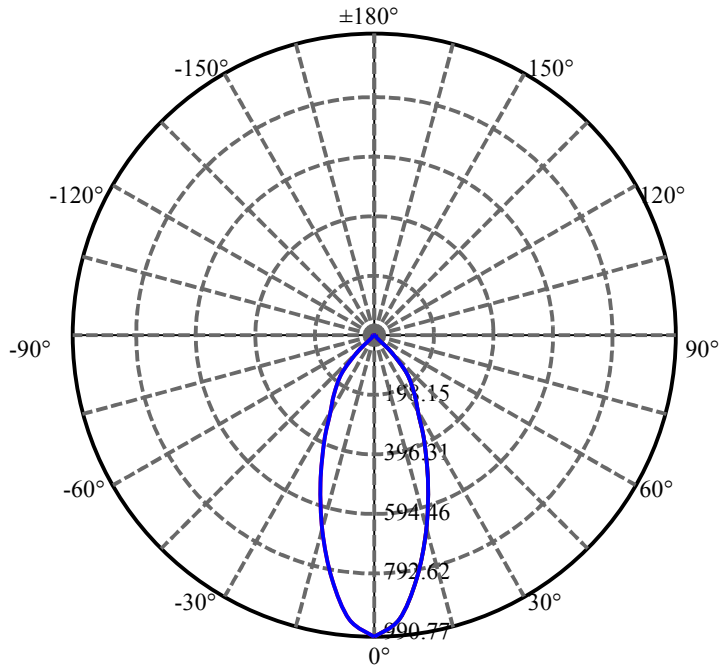
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 990.773       | 5.925       | 5.925     | .736%       | .856%      |
| 5.0                | 940.268       | 44.920      | 50.845    | 5.580%      | 7.350%     |
| 10.0               | 816.961       | 77.761      | 128.606   | 9.660%      | 18.591%    |
| 15.0               | 664.481       | 94.269      | 222.874   | 11.710%     | 32.218%    |
| 20.0               | 519.884       | 97.465      | 320.339   | 12.107%     | 46.307%    |
| 25.0               | 383.520       | 88.843      | 409.183   | 11.036%     | 59.149%    |
| 30.0               | 295.221       | 80.911      | 490.093   | 10.051%     | 70.845%    |
| 35.0               | 235.948       | 74.182      | 564.275   | 9.215%      | 81.569%    |
| 40.0               | 164.412       | 57.928      | 622.203   | 7.196%      | 89.942%    |
| 45.0               | 79.692        | 30.888      | 653.091   | 3.837%      | 94.407%    |
| 50.0               | 27.211        | 11.426      | 664.517   | 1.419%      | 96.059%    |
| 55.0               | 18.028        | 8.095       | 672.612   | 1.006%      | 97.229%    |
| 60.0               | 8.416         | 3.995       | 676.607   | .496%       | 97.807%    |
| 65.0               | 6.736         | 3.346       | 679.953   | .416%       | 98.291%    |
| 70.0               | 6.054         | 3.118       | 683.072   | .387%       | 98.741%    |
| 75.0               | 5.597         | 2.963       | 686.035   | .368%       | 99.170%    |
| 80.0               | 4.971         | 2.683       | 688.718   | .333%       | 99.558%    |
| 85.0               | 4.282         | 2.338       | 691.057   | .290%       | 99.896%    |
| 90.0               | 2.637         | 0.723       | 691.779   | .090%       | 100.000%   |

ZONAL LUMEN SUMMARY

| Zone    | Lumens | %Lamp  | %Fixt   |
|---------|--------|--------|---------|
| 0-30    | 490.09 | 60.88% | 70.85%  |
| 0-40    | 622.20 | 77.29% | 89.94%  |
| 0-60    | 676.61 | 84.05% | 97.81%  |
| 0-90    | 691.06 | 85.85% | 99.90%  |
| 0-120   | 691.06 | 85.85% | 99.90%  |
| 0-180   | 691.78 | 85.94% | 100.00% |
| 60-90   | 18.44  | 2.29%  | 2.67%   |
| 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%   |
| 0-34.27 | 553.42 | 68.75% | 80.00%  |

ZONAL LUMEN SUMMARY

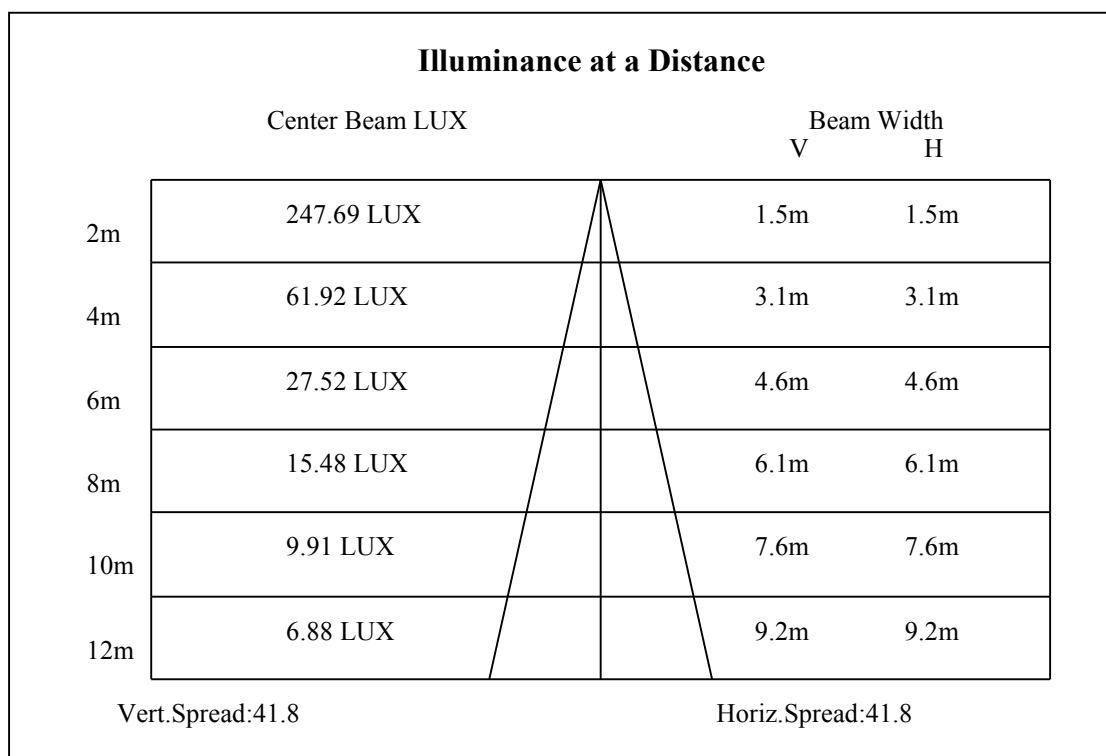
|         |        |
|---------|--------|
| 0-10    | 128.61 |
| 10-20   | 191.73 |
| 20-30   | 169.75 |
| 30-40   | 132.11 |
| 40-50   | 42.31  |
| 50-60   | 12.09  |
| 60-70   | 6.46   |
| 70-80   | 5.65   |
| 80-90   | 2.34   |
| 90-100  | 0.00   |
| 100-110 | 0.00   |
| 110-120 | 0.00   |
| 120-130 | 0.00   |
| 130-140 | 0.00   |
| 140-150 | 0.00   |
| 150-160 | 0.00   |
| 160-170 | 0.00   |
| 170-180 | 0.00   |

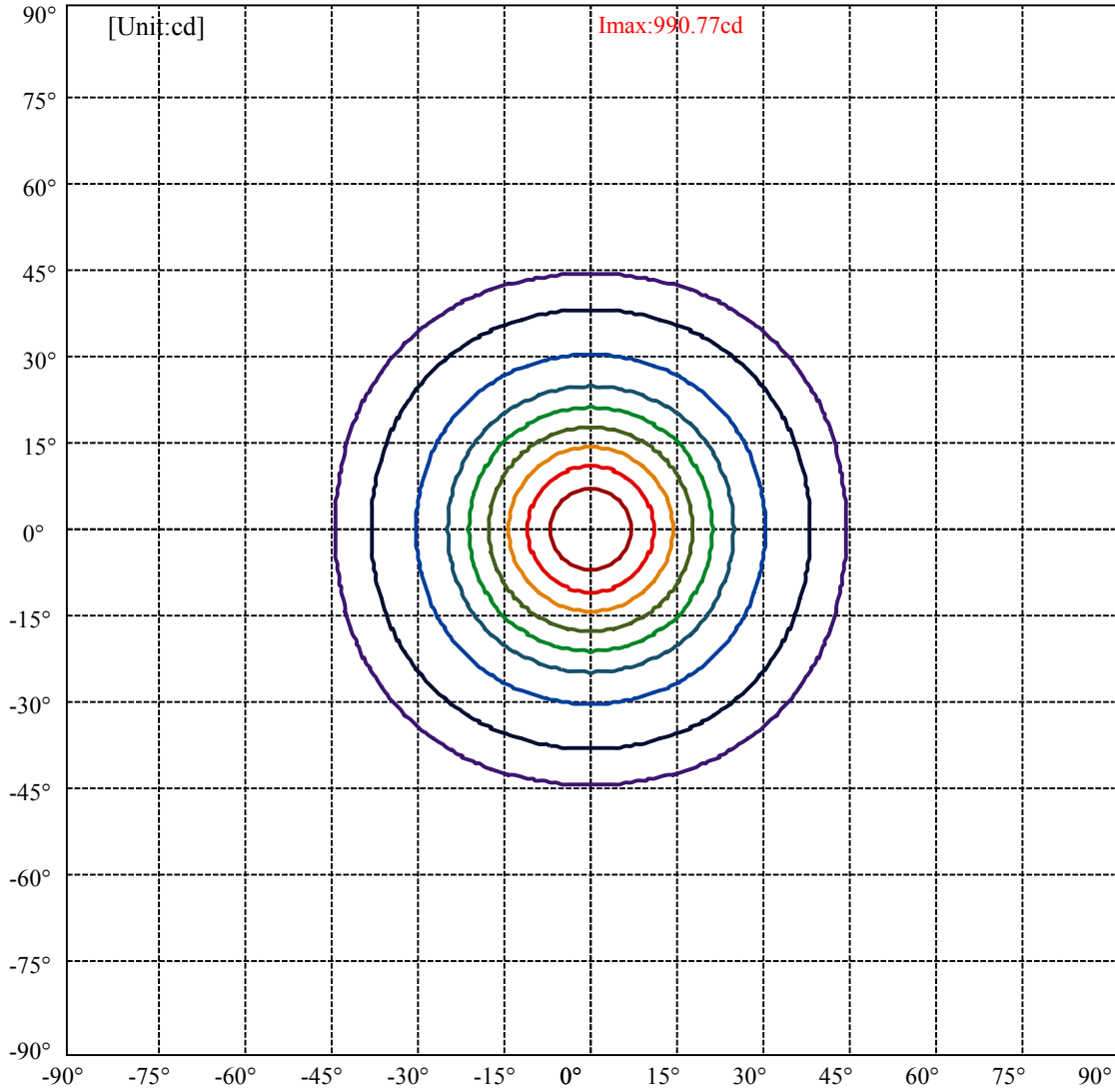


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

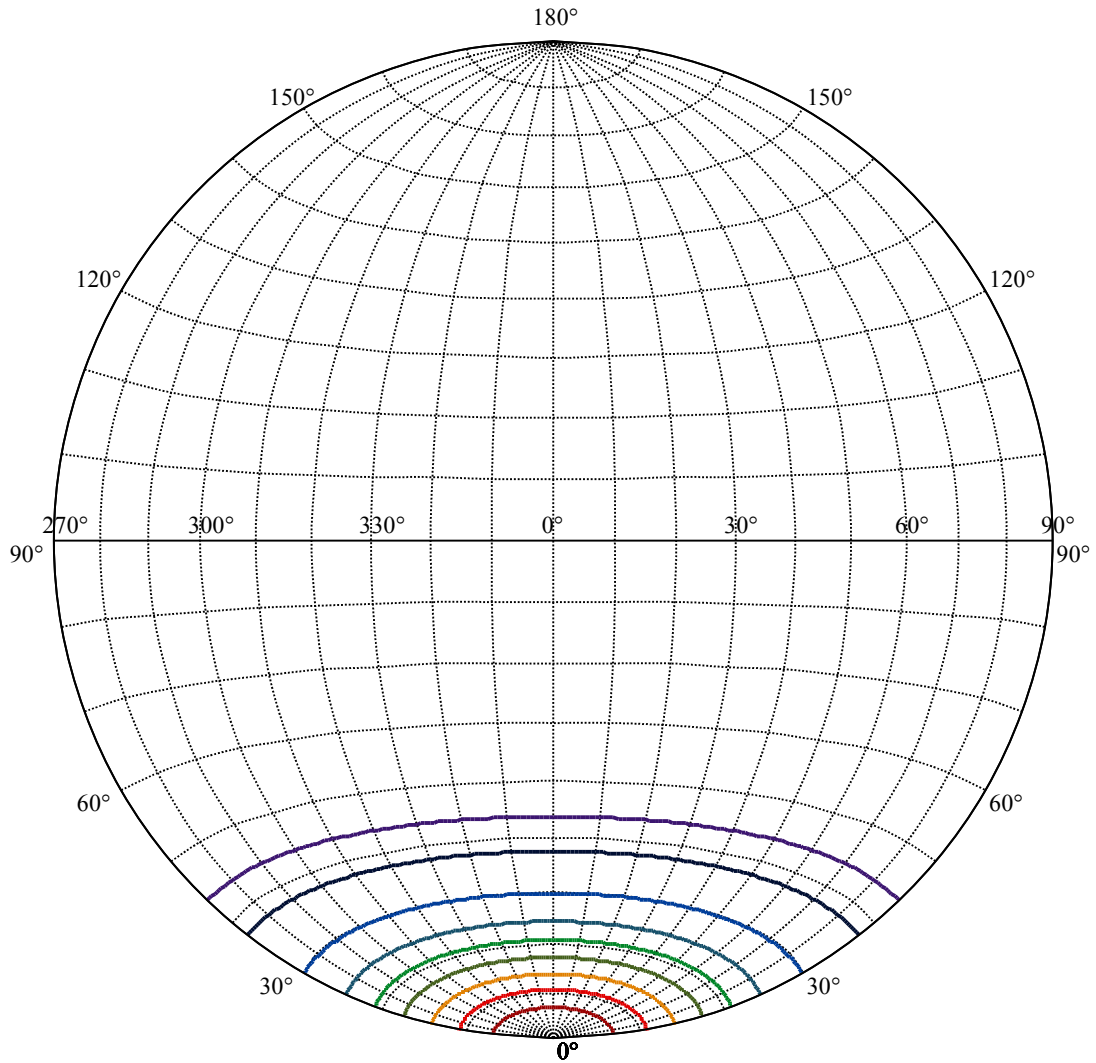
Field angle(10%Imax):C0/180Left:43.9 Right:43.9  
:C90/270Left:43.9 Right:43.9

Beam Angle(50%Imax):C0/180Left:20.9 Right:20.9  
:C90/270Left:20.9 Right:20.9





|                   |   |
|-------------------|---|
| (10%Imax) 99.0773 | — |
| (20%Imax) 198.155 | — |
| (30%Imax) 297.232 | — |
| (40%Imax) 396.309 | — |
| (50%Imax) 495.387 | — |
| (60%Imax) 594.464 | — |
| (70%Imax) 693.541 | — |
| (80%Imax) 792.619 | — |
| (90%Imax) 891.696 | — |



House

[Unit:cd]

Road

Imax:990.77

(10%Imax) 99.0773

(20%Imax) 198.155

(30%Imax) 297.232

(40%Imax) 396.309

(50%Imax) 495.387

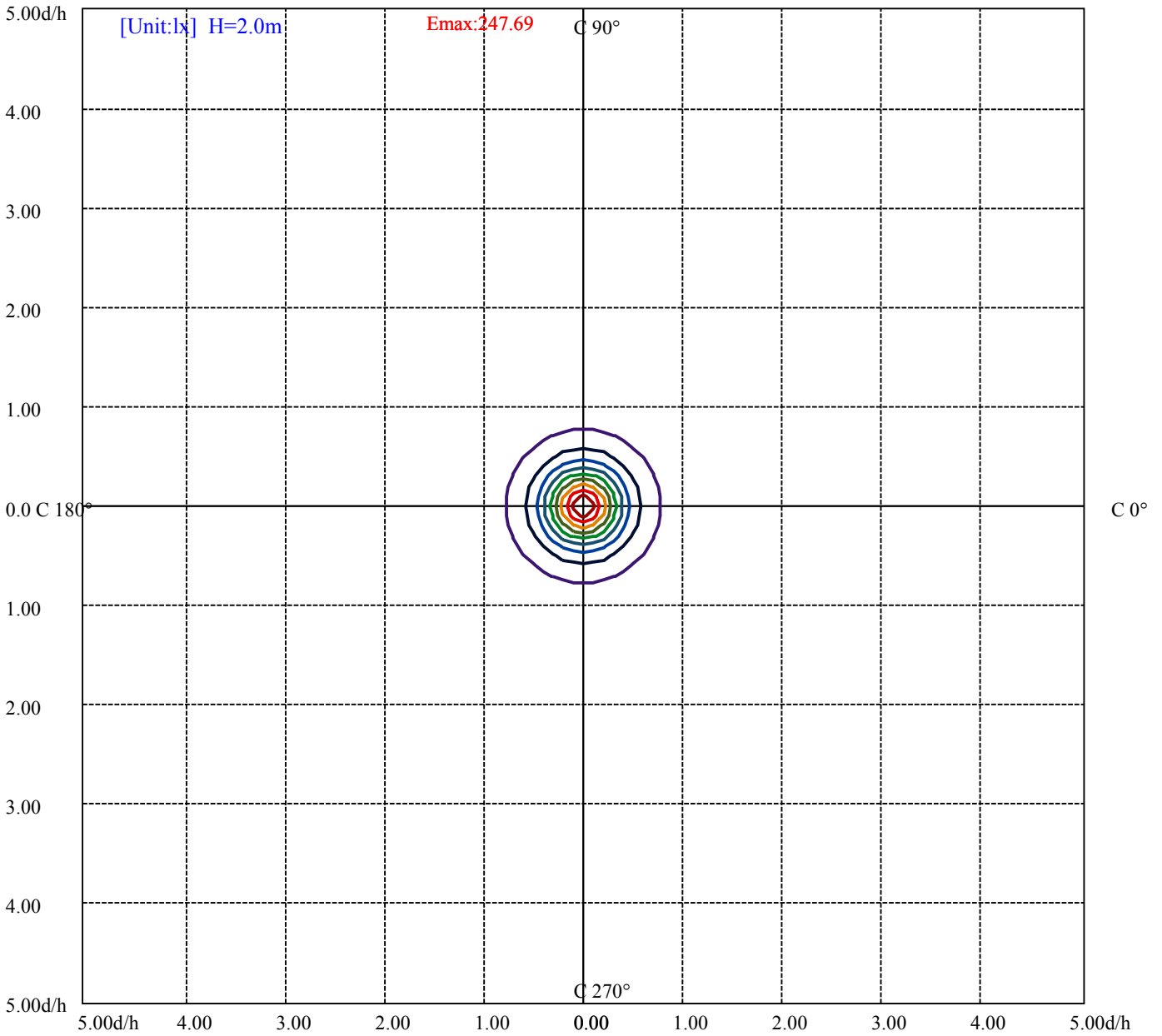
(60%Imax) 594.464

(70%Imax) 693.541

(80%Imax) 792.619

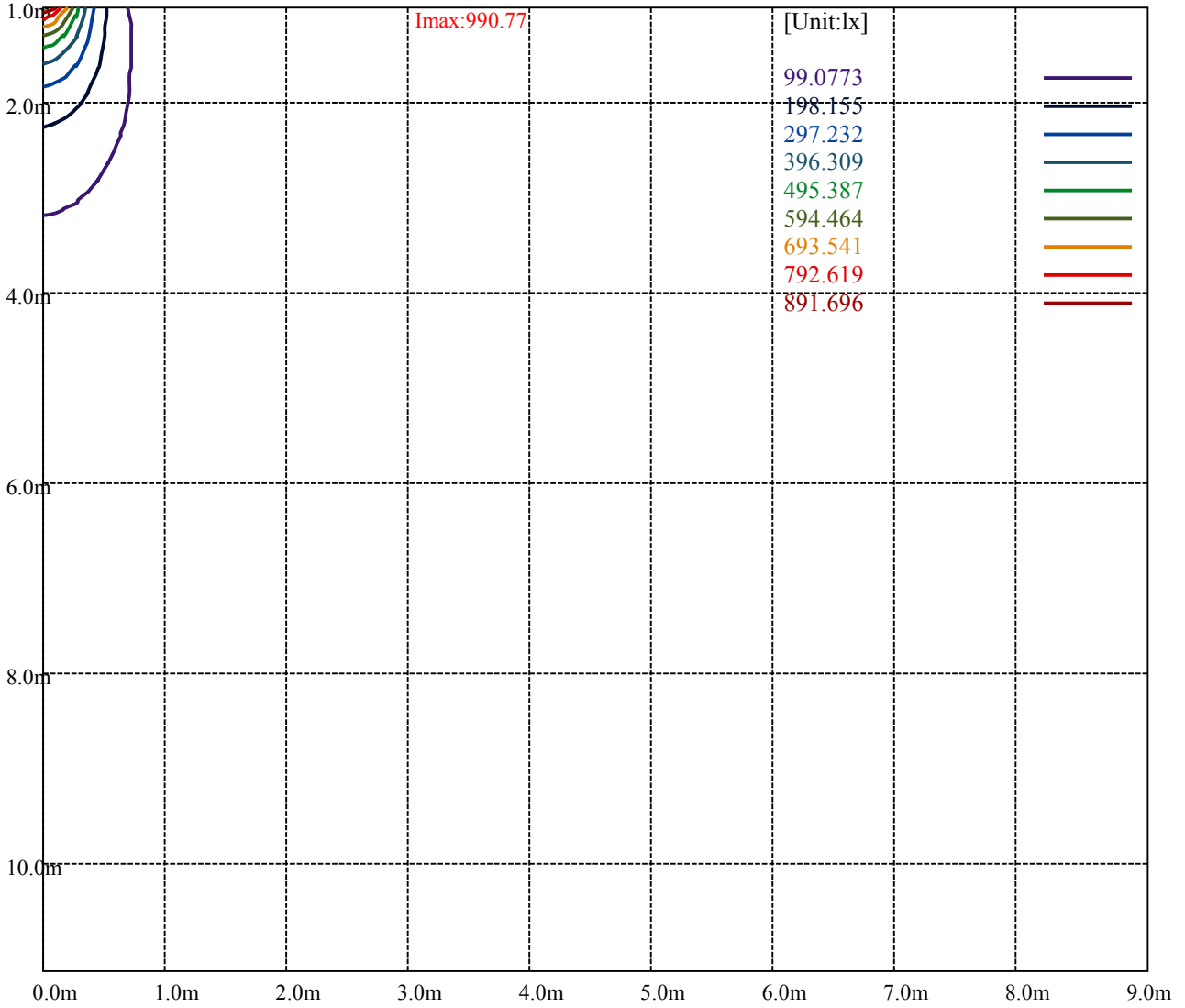
(90%Imax) 891.696





|                    |   |
|--------------------|---|
| (10%Emax) 24.7693  | — |
| (20%Emax) 49.5385  | — |
| (30%Emax) 74.308   | — |
| (40%Emax) 99.07725 | — |
| (50%Emax) 123.8465 | — |
| (60%Emax) 148.6158 | — |
| (70%Emax) 173.385  | — |
| (80%Emax) 198.1543 | — |
| (90%Emax) 222.9238 | — |





Luminance Table

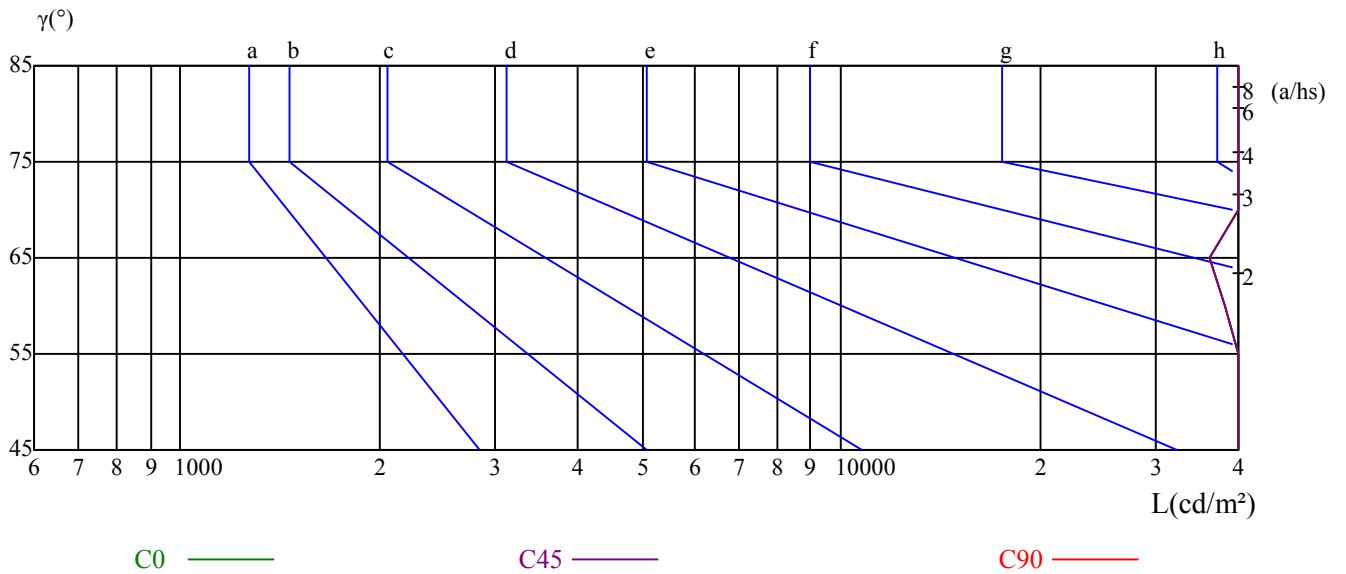
| $\gamma$ | 45     | 50    | 55    | 60    | 65    | 70    | 75    | 80    | 85     |
|----------|--------|-------|-------|-------|-------|-------|-------|-------|--------|
| C0       | 255560 | 95993 | 71272 | 38170 | 36142 | 40137 | 49036 | 64915 | 111408 |
| C45      | 255560 | 95993 | 71272 | 38170 | 36142 | 40137 | 49036 | 64915 | 111408 |
| C90      | 255560 | 95993 | 71272 | 38170 | 36142 | 40137 | 49036 | 64915 | 111408 |

| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 36142      | 36142      | 36142   | 49036      | 49036      | 49036   | 111408     | 111408     | 111408  |

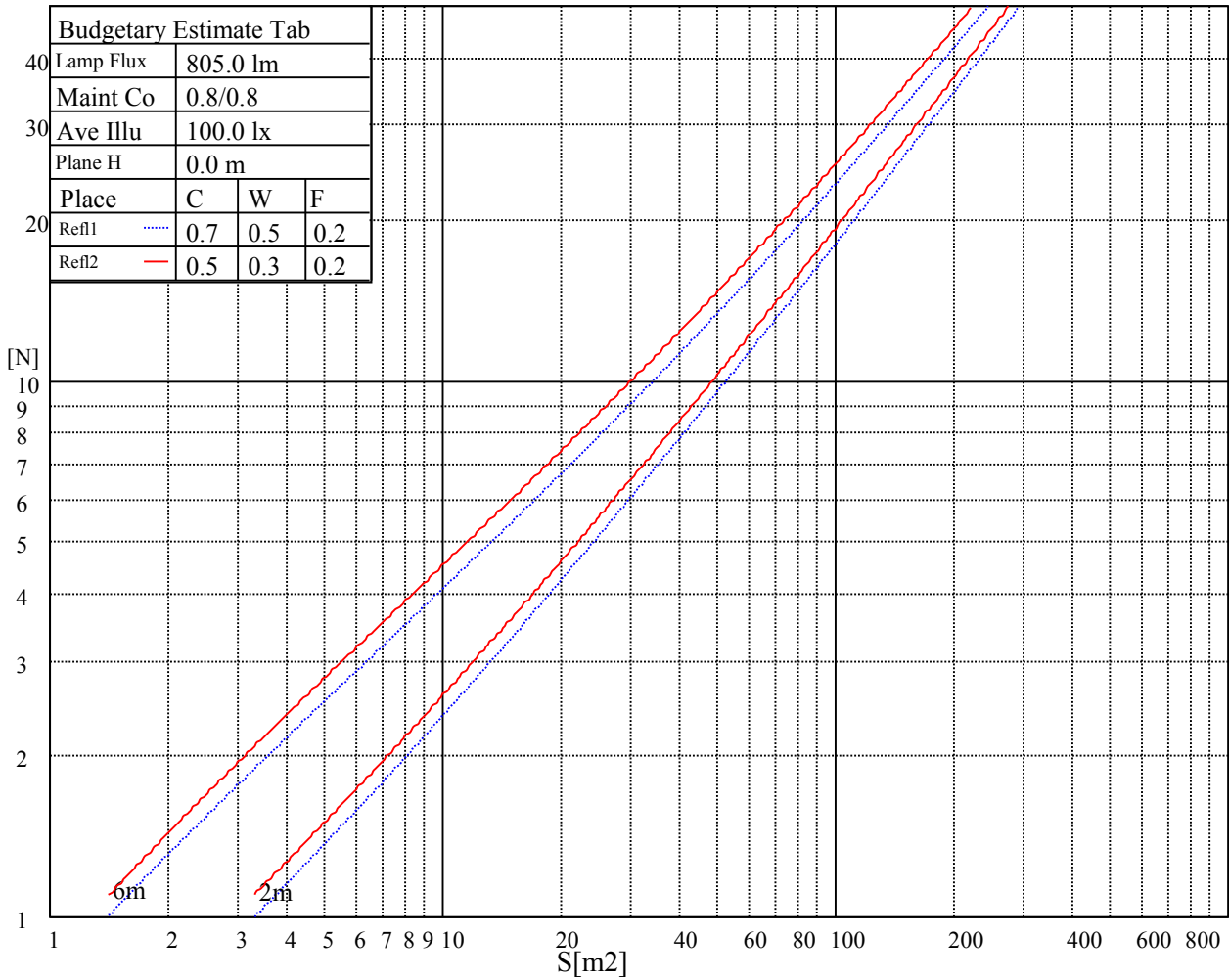
Glare Table

| 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     |

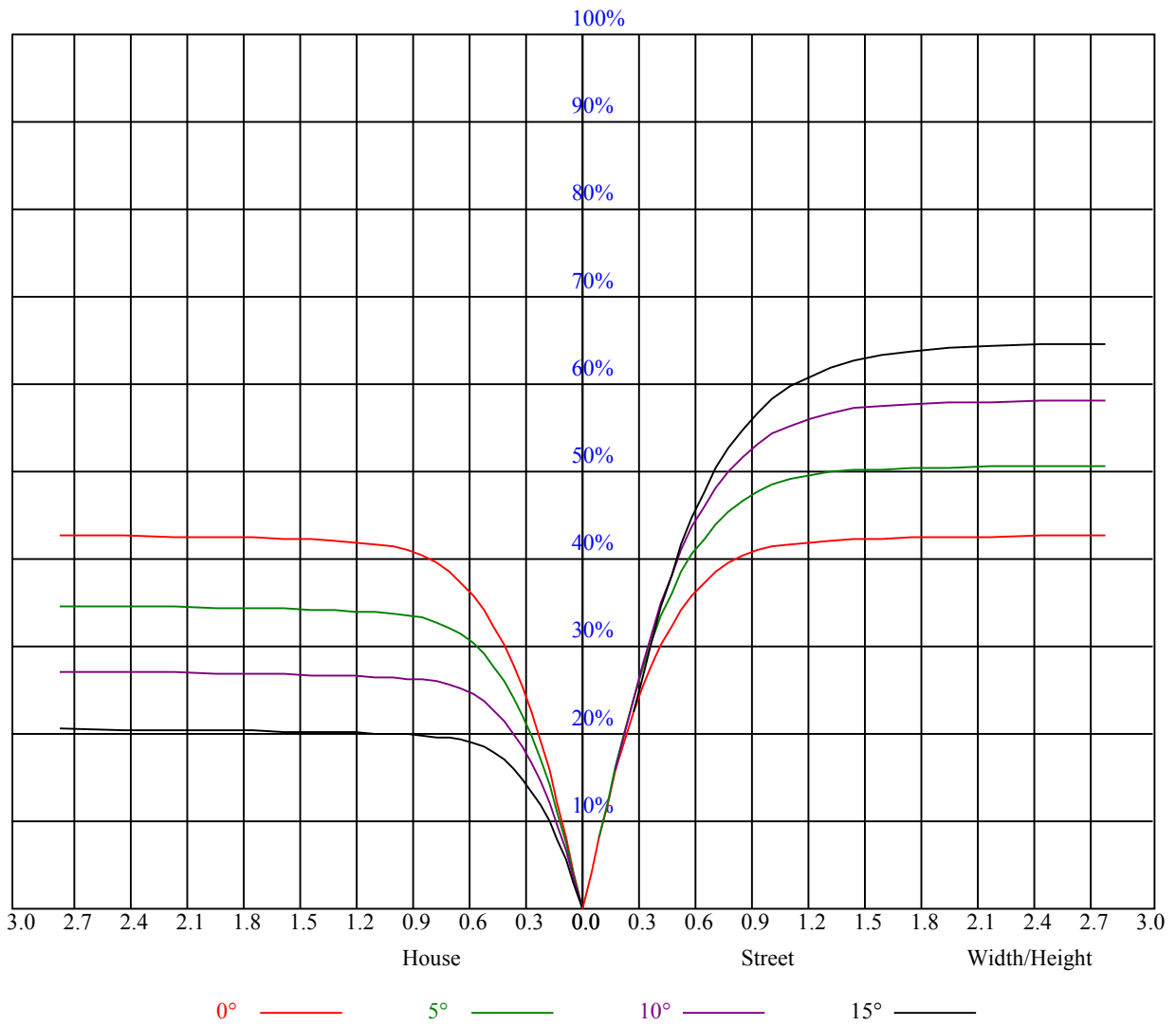
Luminance Limiting Curve



| 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       | 20.70            | 21.77 | 21.06 | 22.08 | 22.40    | 20.34          | 21.41 | 20.70 | 21.72 | 22.04 |
|   | 3H       | 21.69            | 22.64 | 22.07 | 22.97 | 23.34    | 21.56          | 22.50 | 21.94 | 22.84 | 23.20 |
|   | 4H       | 22.42            | 23.30 | 22.83 | 23.65 | 24.04    | 22.42          | 23.30 | 22.83 | 23.65 | 24.04 |
|   | 6H       | 23.34            | 24.14 | 23.76 | 24.52 | 24.91    | 23.52          | 24.32 | 23.93 | 24.69 | 25.09 |
|   | 8H       | 23.89            | 24.64 | 24.32 | 25.04 | 25.45    | 24.14          | 24.90 | 24.57 | 25.29 | 25.70 |
|   | 12H      | 24.89            | 25.62 | 25.33 | 26.00 | 26.43    | 25.20          | 25.92 | 25.64 | 26.31 | 26.74 |
| 4H  | 2H       | 20.82            | 21.70 | 21.23 | 22.05 | 22.44    | 20.50          | 21.38 | 20.91 | 21.73 | 22.12 |
|   | 3H       | 22.18            | 22.90 | 22.60 | 23.31 | 23.71    | 22.11          | 22.82 | 22.52 | 23.23 | 23.64 |
|   | 4H       | 23.18            | 23.82 | 23.62 | 24.24 | 24.69    | 23.23          | 23.87 | 23.67 | 24.29 | 24.74 |
|   | 6H       | 24.22            | 24.77 | 24.69 | 25.22 | 25.69    | 24.42          | 24.96 | 24.88 | 25.41 | 25.89 |
|   | 8H       | 24.95            | 25.46 | 25.42 | 25.91 | 26.38    | 25.22          | 25.73 | 25.69 | 26.18 | 26.66 |
|   | 12H      | 26.03            | 26.48 | 26.52 | 26.97 | 27.44    | 26.35          | 26.80 | 26.84 | 27.28 | 27.76 |
| 8H  | 4H       | 23.62            | 24.13 | 24.09 | 24.58 | 25.05    | 23.66          | 24.17 | 24.13 | 24.62 | 25.10 |
|   | 6H       | 24.98            | 25.40 | 25.49 | 25.90 | 26.38    | 25.17          | 25.58 | 25.68 | 26.08 | 26.57 |
|   | 8H       | 25.90            | 26.27 | 26.43 | 26.80 | 27.29    | 26.16          | 26.53 | 26.69 | 27.05 | 27.55 |
|   | 12H      | 27.24            | 27.56 | 27.76 | 28.06 | 28.64    | 27.52          | 27.85 | 28.04 | 28.34 | 28.92 |
| 12H   | 4H       | 23.72            | 24.17 | 24.21 | 24.66 | 25.14    | 23.75          | 24.20 | 24.24 | 24.69 | 25.16 |
|   | 6H       | 25.57            | 25.58 | 25.75 | 26.05 | 26.60    | 25.73          | 25.75 | 25.91 | 26.22 | 26.77 |
|   | 8H       | 26.26            | 26.58 | 26.78 | 27.08 | 27.66    | 26.49          | 26.81 | 27.01 | 27.31 | 27.89 |
| Variation with the observer position at spacings: |          |                  |       |       |       |          |                |       |       |       |       |
| S = 1.0H  | 2.6/-5.3 |                  |       |       |       | 2.6/-5.3 |                |       |       |       |       |
| S = 1.5H  | 4.6/-5.0 |                  |       |       |       | 4.6/-5.0 |                |       |       |       |       |
| S = 2.0H  | 6.2/-4.2 |                  |       |       |       | 6.2/-4.2 |                |       |       |       |       |
| Standard tables:                                  | BK2      |                  |       |       |       | BK2      |                |       |       |       |       |
| Uncorrected UGR                                   | 10.0     |                  |       |       |       | 10.0     |                |       |       |       |       |



| 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     | 1.03                                    | 1.03 | 1.03 | 1.01 | 1.01 | 1.01 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.88 | 0.88 | 0.88 | 0.87 |
| 1     | 0.95                                    | 0.92 | 0.90 | 0.93 | 0.91 | 0.89 | 0.89 | 0.88 | 0.86 | 0.86 | 0.85 | 0.83 | 0.83 | 0.82 | 0.81 | 0.79 |
| 2     | 0.88                                    | 0.85 | 0.82 | 0.87 | 0.83 | 0.81 | 0.84 | 0.81 | 0.79 | 0.81 | 0.79 | 0.77 | 0.79 | 0.77 | 0.75 | 0.74 |
| 3     | 0.83                                    | 0.78 | 0.75 | 0.81 | 0.77 | 0.74 | 0.79 | 0.76 | 0.73 | 0.77 | 0.74 | 0.72 | 0.75 | 0.73 | 0.71 | 0.69 |
| 4     | 0.77                                    | 0.73 | 0.69 | 0.76 | 0.72 | 0.68 | 0.75 | 0.71 | 0.68 | 0.73 | 0.69 | 0.67 | 0.71 | 0.68 | 0.66 | 0.65 |
| 5     | 0.73                                    | 0.68 | 0.64 | 0.72 | 0.67 | 0.64 | 0.70 | 0.66 | 0.63 | 0.69 | 0.65 | 0.63 | 0.68 | 0.65 | 0.62 | 0.61 |
| 6     | 0.69                                    | 0.64 | 0.60 | 0.68 | 0.63 | 0.60 | 0.67 | 0.62 | 0.59 | 0.65 | 0.62 | 0.59 | 0.64 | 0.61 | 0.58 | 0.57 |
| 7     | 0.65                                    | 0.60 | 0.56 | 0.64 | 0.60 | 0.56 | 0.63 | 0.59 | 0.56 | 0.62 | 0.58 | 0.55 | 0.61 | 0.58 | 0.55 | 0.54 |
| 8     | 0.62                                    | 0.57 | 0.53 | 0.61 | 0.56 | 0.53 | 0.60 | 0.56 | 0.53 | 0.59 | 0.55 | 0.52 | 0.58 | 0.55 | 0.52 | 0.51 |
| 9     | 0.59                                    | 0.54 | 0.50 | 0.58 | 0.53 | 0.50 | 0.57 | 0.53 | 0.50 | 0.57 | 0.53 | 0.50 | 0.56 | 0.52 | 0.50 | 0.49 |
| 10    | 0.56                                    | 0.51 | 0.48 | 0.55 | 0.51 | 0.48 | 0.55 | 0.50 | 0.47 | 0.54 | 0.50 | 0.47 | 0.53 | 0.50 | 0.47 | 0.46 |



NATA 1546-E

Intensity data(cd)

| C/ $\gamma$ (°) | 0.0    | 5.0    | 10.0   | 15.0   | 20.0   | 25.0   | 30.0   | 35.0   | 40.0   |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.0             | 985.33 | 968.68 | 854.33 | 704.93 | 553.84 | 413.21 | 320.46 | 266.68 | 194.79 |
| 45.0            | 992.87 | 954.00 | 829.86 | 665.66 | 520.54 | 380.31 | 292.33 | 234.56 | 168.08 |
| 90.0            | 990.90 | 920.87 | 784.91 | 633.94 | 485.66 | 356.46 | 274.11 | 218.98 | 144.73 |
| 135.0           | 993.99 | 930.21 | 810.79 | 654.58 | 513.79 | 376.37 | 292.39 | 236.25 | 161.66 |
| 180.0           | 985.33 | 912.83 | 781.03 | 624.83 | 486.34 | 358.26 | 282.43 | 219.49 | 147.99 |
| 225.0           | 992.87 | 928.80 | 805.89 | 662.34 | 515.93 | 379.13 | 288.34 | 223.37 | 148.16 |
| 270.0           | 990.90 | 952.76 | 844.43 | 694.13 | 554.85 | 412.59 | 308.64 | 237.77 | 170.27 |
| 315.0           | 993.99 | 954.00 | 824.46 | 675.45 | 528.13 | 391.84 | 303.08 | 250.48 | 179.61 |
| 360.0           | 985.33 | 968.68 | 854.33 | 704.93 | 553.84 | 413.21 | 320.46 | 266.68 | 194.79 |

| C/ $\gamma$ (°) | 45.0   | 50.0  | 55.0  | 60.0  | 65.0 | 70.0 | 75.0 | 80.0 | 85.0 |
|-----------------|--------|-------|-------|-------|------|------|------|------|------|
| 0.0             | 103.44 | 37.97 | 19.46 | 7.82  | 6.08 | 5.29 | 5.12 | 5.63 | 4.05 |
| 45.0            | 84.38  | 26.38 | 14.79 | 7.71  | 6.47 | 5.85 | 6.24 | 6.30 | 4.56 |
| 90.0            | 63.96  | 18.84 | 13.33 | 7.37  | 6.36 | 5.68 | 5.40 | 4.61 | 4.22 |
| 135.0           | 76.73  | 21.54 | 13.89 | 8.83  | 6.92 | 6.19 | 5.46 | 4.73 | 4.39 |
| 180.0           | 62.10  | 18.45 | 15.92 | 8.49  | 7.71 | 7.26 | 6.30 | 4.73 | 4.61 |
| 225.0           | 63.79  | 25.43 | 19.46 | 8.61  | 7.82 | 7.31 | 6.69 | 5.29 | 4.73 |
| 270.0           | 90.11  | 35.66 | 23.74 | 11.53 | 6.75 | 5.85 | 5.18 | 4.56 | 3.99 |
| 315.0           | 93.04  | 33.41 | 23.63 | 6.98  | 5.79 | 5.01 | 4.39 | 3.94 | 3.71 |
| 360.0           | 103.44 | 37.97 | 19.46 | 7.82  | 6.08 | 5.29 | 5.12 | 5.63 | 4.05 |

| C/ $\gamma$ (°) | 90.0 |
|-----------------|------|
| 0.0             | 2.64 |
| 45.0            | 2.59 |
| 90.0            | 2.59 |
| 135.0           | 2.70 |
| 180.0           | 2.70 |
| 225.0           | 2.64 |
| 270.0           | 2.64 |
| 315.0           | 2.59 |
| 360.0           | 2.64 |