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## NATA

LumCAT: 3-2071-A

Luminaire:

Report No: NATA0100

Test No: GC2019021818

LampCAT: PHILIPS SLM1211

Lamp flux(lm): 3045.0

Number of Lamps: 1

Length(mm): 76

Phm Type: C

Voltage(V): 35.2000

Current(A): 0.7000

Power (W): 24.6400

PF: 1.0000

Ballast type: DC

Width(mm): 76

Height(mm): 0

## Photometric Results

Lumens(lm): 2675.16

Efficiency(%): 87.85%

Lumens(lm)/Power(W): 108.59

Central intensity(cd): 2821.500

Maximum intensity(cd): 2821.992

Angle of maximum intensity:  $C=0.0$   $\gamma=1.0$

Beam Angle(50%Imax): [C0/180]Total=62.6

[C90/270]Total=62.6

Field angle(10%Imax): [C0/180]Total=79.6

[C90/270]Total=79.6

Maximum s/h(1/2): C0\_180=1.01 C90\_270=1.01

Maximum s/h(1/4): C0\_180=0.91 C90\_270=0.91

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 87.87%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 98.499%

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 2821.500      | 0.675       | 0.675     | .022%       | .025%      |
| 1.0                | 2821.992      | 5.401       | 6.076     | .177%       | .227%      |
| 2.0                | 2821.852      | 10.800      | 16.875    | .355%       | .631%      |
| 3.0                | 2821.852      | 16.195      | 33.071    | .532%       | 1.236%     |
| 4.0                | 2821.289      | 21.582      | 54.652    | .709%       | 2.043%     |
| 5.0                | 2820.867      | 26.961      | 81.613    | .885%       | 3.051%     |
| 6.0                | 2817.914      | 32.301      | 113.914   | 1.061%      | 4.258%     |
| 7.0                | 2812.430      | 37.586      | 151.5     | 1.234%      | 5.663%     |
| 8.0                | 2806.242      | 42.828      | 194.328   | 1.407%      | 7.264%     |
| 9.0                | 2798.438      | 48.006      | 242.335   | 1.577%      | 9.059%     |
| 10.0               | 2788.734      | 53.104      | 295.439   | 1.744%      | 11.044%    |
| 11.0               | 2778.469      | 58.137      | 353.576   | 1.909%      | 13.217%    |
| 12.0               | 2765.813      | 63.060      | 416.636   | 2.071%      | 15.574%    |
| 13.0               | 2751.047      | 67.864      | 484.5     | 2.229%      | 18.111%    |
| 14.0               | 2734.172      | 72.536      | 557.036   | 2.382%      | 20.823%    |
| 15.0               | 2712.516      | 76.987      | 634.023   | 2.528%      | 23.700%    |
| 16.0               | 2684.039      | 81.129      | 715.153   | 2.664%      | 26.733%    |
| 17.0               | 2654.859      | 85.119      | 800.272   | 2.795%      | 29.915%    |
| 18.0               | 2621.602      | 88.838      | 889.111   | 2.918%      | 33.236%    |
| 19.0               | 2585.813      | 92.319      | 981.43    | 3.032%      | 36.687%    |
| 20.0               | 2542.219      | 95.349      | 1076.779  | 3.131%      | 40.251%    |
| 21.0               | 2489.555      | 97.837      | 1174.616  | 3.213%      | 43.908%    |
| 22.0               | 2433.727      | 99.977      | 1274.592  | 3.283%      | 47.645%    |
| 23.0               | 2367.773      | 101.454     | 1376.046  | 3.332%      | 51.438%    |
| 24.0               | 2281.219      | 101.749     | 1477.796  | 3.342%      | 55.241%    |
| 25.0               | 2181.656      | 101.108     | 1578.904  | 3.320%      | 59.021%    |
| 26.0               | 2083.500      | 100.158     | 1679.062  | 3.289%      | 62.765%    |
| 27.0               | 1966.781      | 97.916      | 1776.979  | 3.216%      | 66.425%    |
| 28.0               | 1841.977      | 94.830      | 1871.808  | 3.114%      | 69.970%    |
| 29.0               | 1720.828      | 91.487      | 1963.296  | 3.005%      | 73.390%    |
| 30.0               | 1596.164      | 87.518      | 2050.814  | 2.874%      | 76.661%    |
| 31.0               | 1453.430      | 82.089      | 2132.903  | 2.696%      | 79.730%    |
| 32.0               | 1311.588      | 76.218      | 2209.121  | 2.503%      | 82.579%    |
| 33.0               | 1146.298      | 68.463      | 2277.585  | 2.248%      | 85.138%    |
| 34.0               | 1032.230      | 63.298      | 2340.883  | 2.079%      | 87.504%    |
| 35.0               | 897.743       | 56.467      | 2397.35   | 1.854%      | 89.615%    |
| 36.0               | 751.395       | 48.433      | 2445.782  | 1.591%      | 91.426%    |
| 37.0               | 614.363       | 40.545      | 2486.328  | 1.332%      | 92.941%    |

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 38.0               | 478.934       | 32.335      | 2518.662  | 1.062%      | 94.150%    |
| 39.0               | 357.799       | 24.692      | 2543.355  | .811%       | 95.073%    |
| 40.0               | 264.002       | 18.609      | 2561.964  | .611%       | 95.768%    |
| 41.0               | 189.724       | 13.650      | 2575.613  | .448%       | 96.279%    |
| 42.0               | 140.590       | 10.316      | 2585.929  | .339%       | 96.664%    |
| 43.0               | 108.225       | 8.094       | 2594.023  | .266%       | 96.967%    |
| 44.0               | 85.254        | 6.494       | 2600.518  | .213%       | 97.210%    |
| 45.0               | 67.451        | 5.230       | 2605.748  | .172%       | 97.405%    |
| 46.0               | 53.677        | 4.234       | 2609.982  | .139%       | 97.563%    |
| 47.0               | 43.102        | 3.457       | 2613.439  | .114%       | 97.693%    |
| 48.0               | 35.515        | 2.894       | 2616.333  | .095%       | 97.801%    |
| 49.0               | 29.152        | 2.413       | 2618.746  | .079%       | 97.891%    |
| 50.0               | 24.799        | 2.083       | 2620.829  | .068%       | 97.969%    |
| 51.0               | 21.874        | 1.864       | 2622.693  | .061%       | 98.039%    |
| 52.0               | 19.666        | 1.699       | 2624.393  | .056%       | 98.102%    |
| 53.0               | 18.049        | 1.581       | 2625.974  | .052%       | 98.161%    |
| 54.0               | 16.826        | 1.493       | 2627.466  | .049%       | 98.217%    |
| 55.0               | 15.891        | 1.427       | 2628.894  | .047%       | 98.270%    |
| 56.0               | 15.110        | 1.374       | 2630.267  | .045%       | 98.322%    |
| 57.0               | 14.590        | 1.342       | 2631.609  | .044%       | 98.372%    |
| 58.0               | 14.231        | 1.323       | 2632.933  | .043%       | 98.421%    |
| 59.0               | 14.006        | 1.317       | 2634.249  | .043%       | 98.471%    |
| 60.0               | 13.845        | 1.315       | 2635.564  | .043%       | 98.520%    |
| 61.0               | 13.725        | 1.316       | 2636.88   | .043%       | 98.569%    |
| 62.0               | 13.634        | 1.320       | 2638.201  | .043%       | 98.618%    |
| 63.0               | 13.591        | 1.328       | 2639.529  | .044%       | 98.668%    |
| 64.0               | 13.556        | 1.336       | 2640.865  | .044%       | 98.718%    |
| 65.0               | 13.563        | 1.348       | 2642.213  | .044%       | 98.768%    |
| 66.0               | 13.563        | 1.359       | 2643.571  | .045%       | 98.819%    |
| 67.0               | 13.648        | 1.378       | 2644.949  | .045%       | 98.871%    |
| 68.0               | 13.760        | 1.399       | 2646.348  | .046%       | 98.923%    |
| 69.0               | 13.901        | 1.423       | 2647.771  | .047%       | 98.976%    |
| 70.0               | 14.020        | 1.445       | 2649.216  | .047%       | 99.030%    |
| 71.0               | 14.133        | 1.465       | 2650.681  | .048%       | 99.085%    |
| 72.0               | 14.140        | 1.475       | 2652.156  | .048%       | 99.140%    |
| 73.0               | 13.964        | 1.464       | 2653.621  | .048%       | 99.195%    |
| 74.0               | 13.711        | 1.445       | 2655.066  | .047%       | 99.249%    |
| 75.0               | 13.514        | 1.431       | 2656.497  | .047%       | 99.302%    |

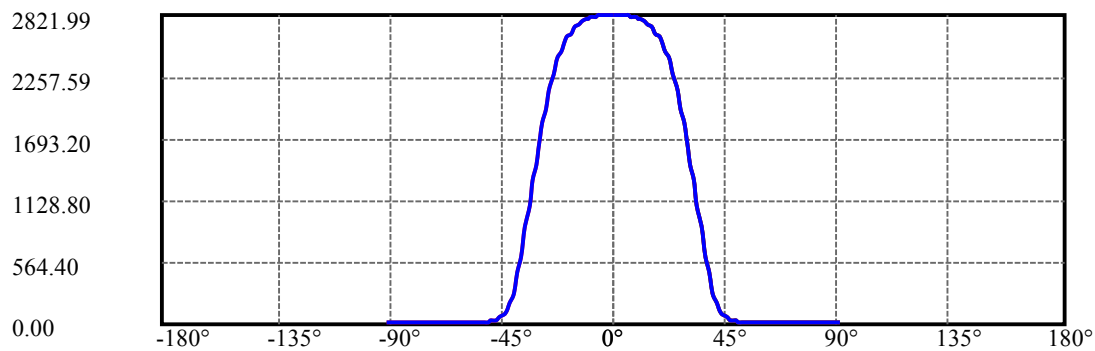
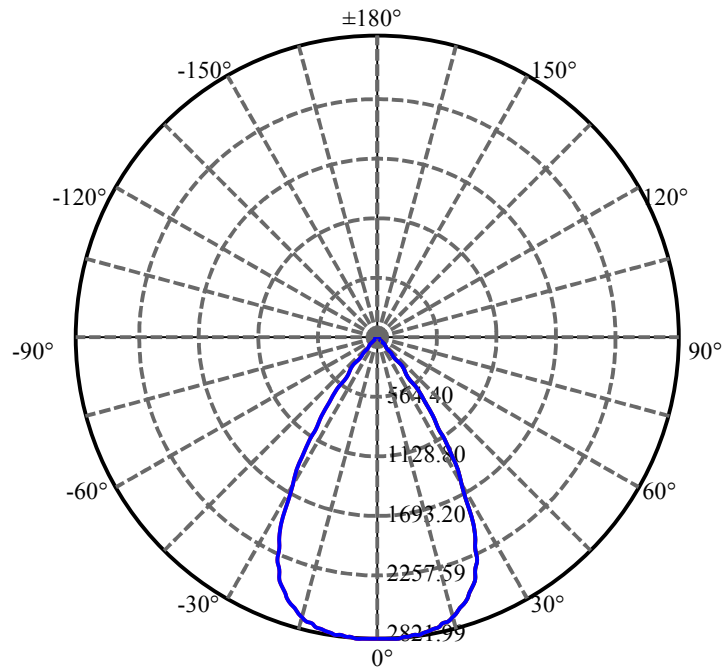
| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 76.0               | 13.338        | 1.419       | 2657.917  | .047%       | 99.355%    |
| 77.0               | 13.191        | 1.409       | 2659.326  | .046%       | 99.408%    |
| 78.0               | 12.959        | 1.390       | 2660.716  | .046%       | 99.460%    |
| 79.0               | 12.607        | 1.357       | 2662.073  | .045%       | 99.511%    |
| 80.0               | 12.255        | 1.324       | 2663.397  | .043%       | 99.560%    |
| 81.0               | 12.009        | 1.301       | 2664.697  | .043%       | 99.609%    |
| 82.0               | 11.805        | 1.282       | 2665.979  | .042%       | 99.657%    |
| 83.0               | 11.545        | 1.257       | 2667.236  | .041%       | 99.704%    |
| 84.0               | 11.405        | 1.244       | 2668.48   | .041%       | 99.750%    |
| 85.0               | 11.257        | 1.230       | 2669.71   | .040%       | 99.796%    |
| 86.0               | 11.222        | 1.228       | 2670.937  | .040%       | 99.842%    |
| 87.0               | 11.215        | 1.228       | 2672.165  | .040%       | 99.888%    |
| 88.0               | 11.145        | 1.221       | 2673.387  | .040%       | 99.934%    |
| 89.0               | 10.856        | 1.190       | 2674.577  | .039%       | 99.978%    |
| 90.0               | 10.695        | 0.586       | 2675.163  | .019%       | 100.000%   |

## ZONAL LUMEN SUMMARY

| Zone    | Lumens  | %Lamp  | %Fixt   |
|---------|---------|--------|---------|
| 0-30    | 2050.81 | 67.35% | 76.66%  |
| 0-40    | 2561.96 | 84.14% | 95.77%  |
| 0-60    | 2635.56 | 86.55% | 98.52%  |
| 0-90    | 2674.58 | 87.84% | 99.98%  |
| 0-120   | 2674.58 | 87.84% | 99.98%  |
| 0-180   | 2675.16 | 87.85% | 100.00% |
| 60-90   | 40.33   | 1.32%  | 1.51%   |
| 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%   |
| 0-31.09 | 2140.13 | 70.28% | 80.00%  |

## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 295.44 |
| 10-20   | 781.34 |
| 20-30   | 974.04 |
| 30-40   | 511.15 |
| 40-50   | 58.87  |
| 50-60   | 14.73  |
| 60-70   | 13.65  |
| 70-80   | 14.18  |
| 80-90   | 11.18  |
| 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:

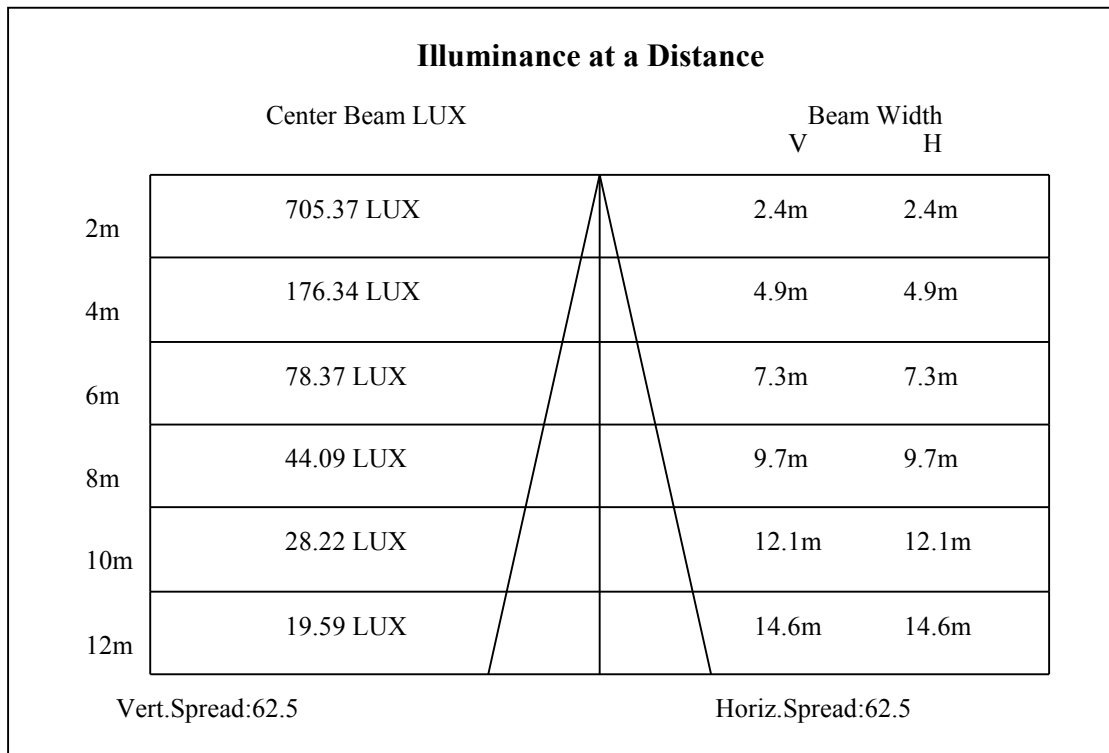
C90/C270:

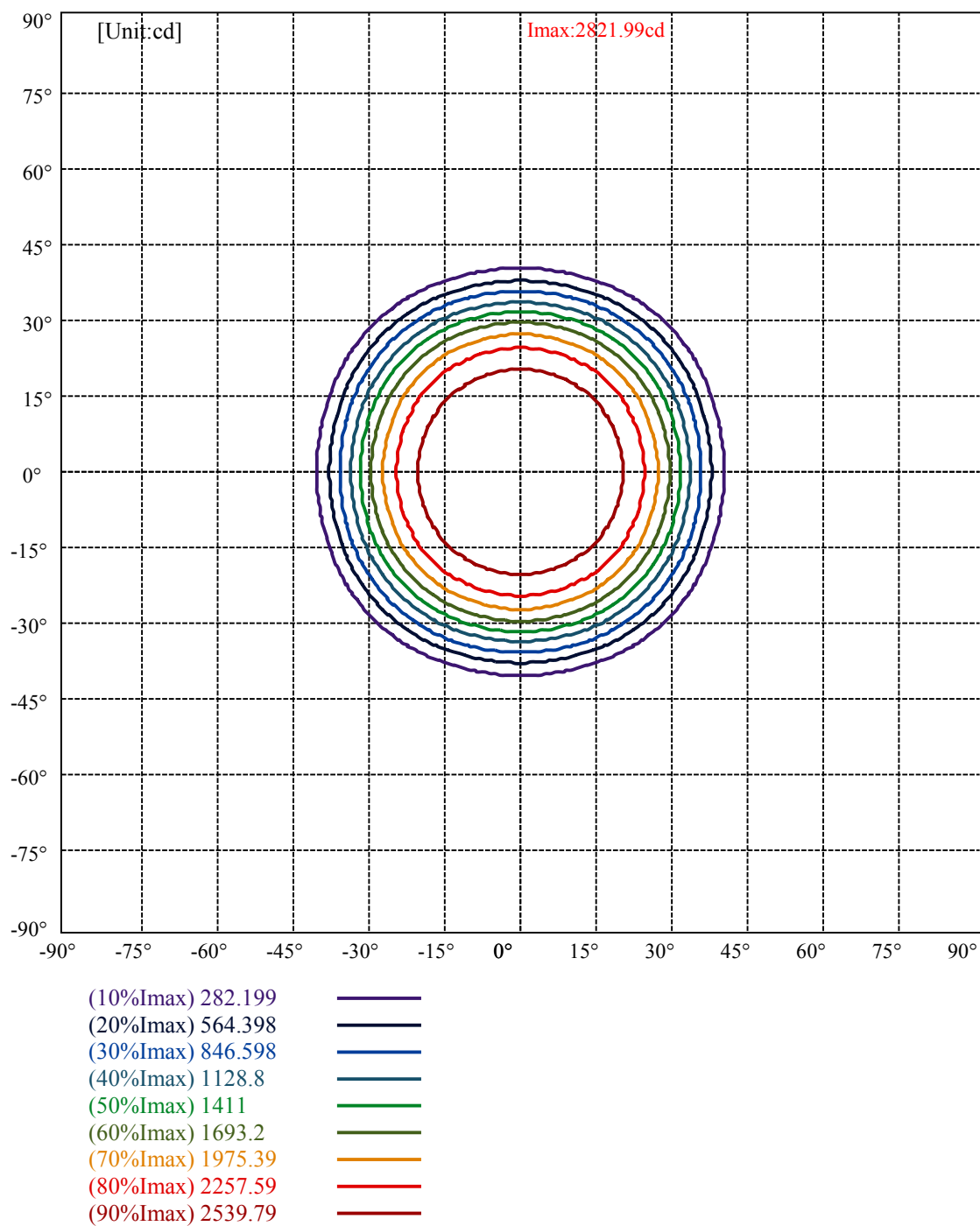
Field angle(10%Imax):C0/180Left:40.8 Right:38.8

:C90/270Left:40.8 Right:38.8

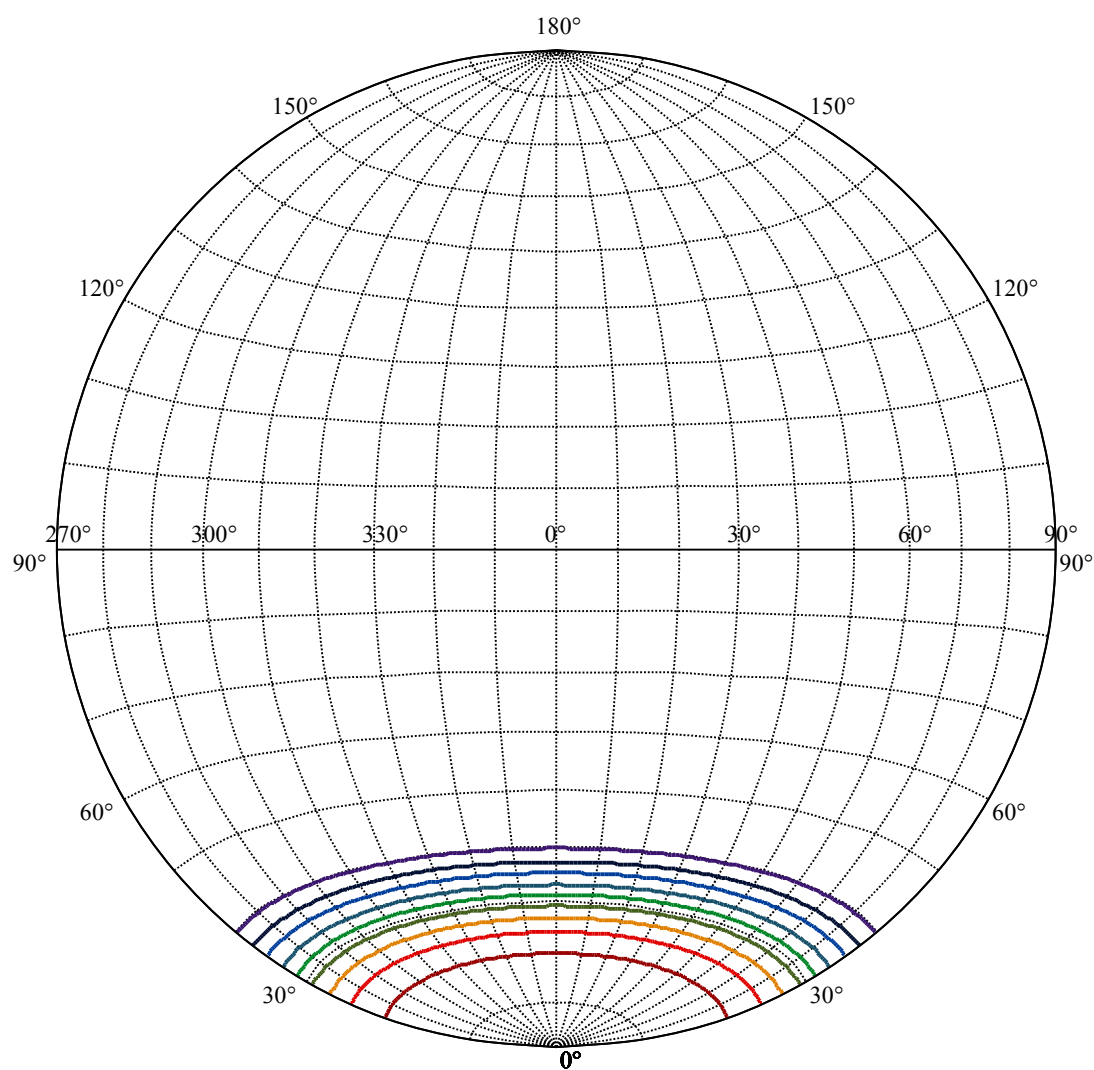
Beam Angle(50%Imax):C0/180Left:32.3 Right:30.3

:C90/270Left:32.3 Right:30.3









House

[Unit:cd]

Road

Imax:2821.99

(10%Imax) 282.199

(20%Imax) 564.398

(30%Imax) 846.598

(40%Imax) 1128.8

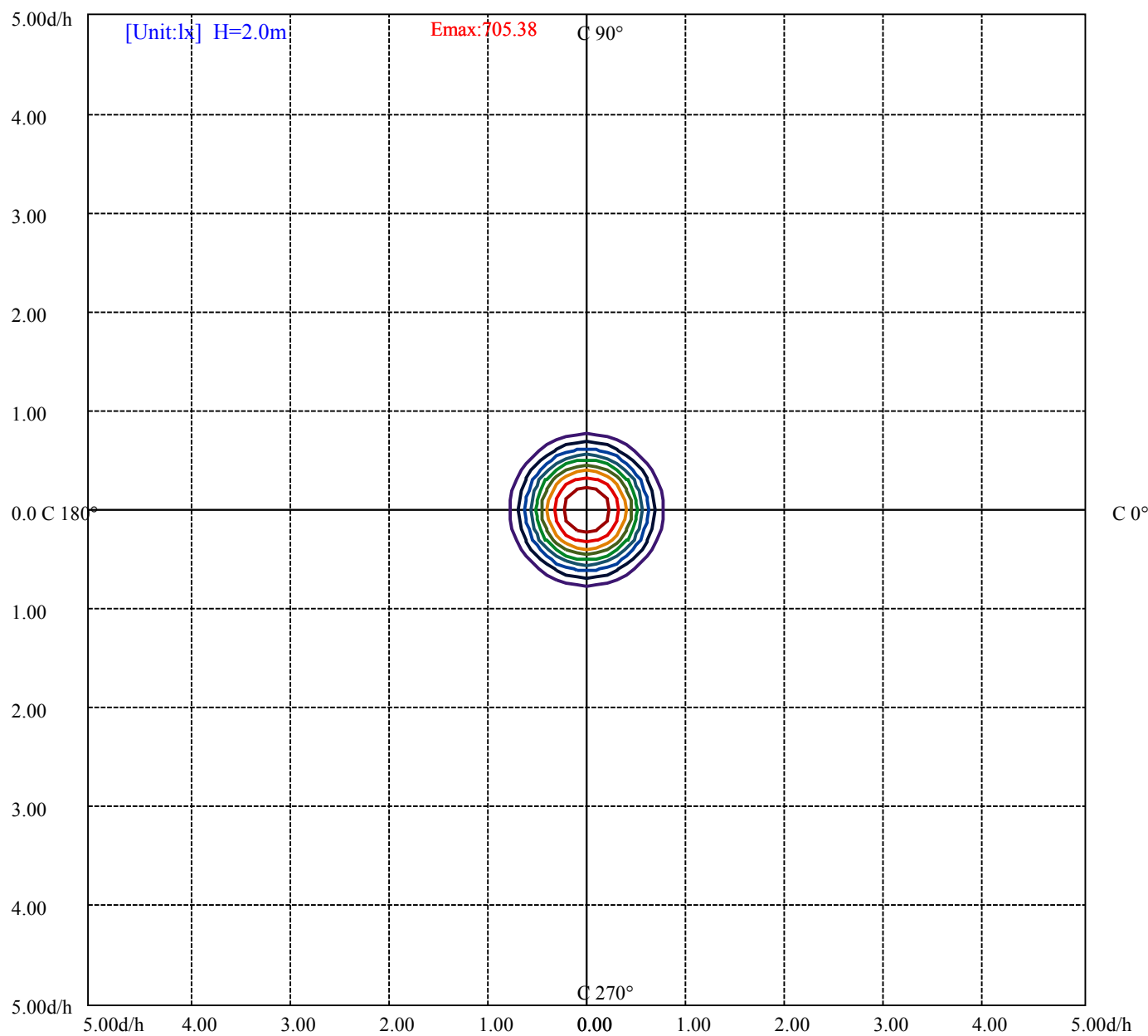
(50%Imax) 1411

(60%Imax) 1693.2

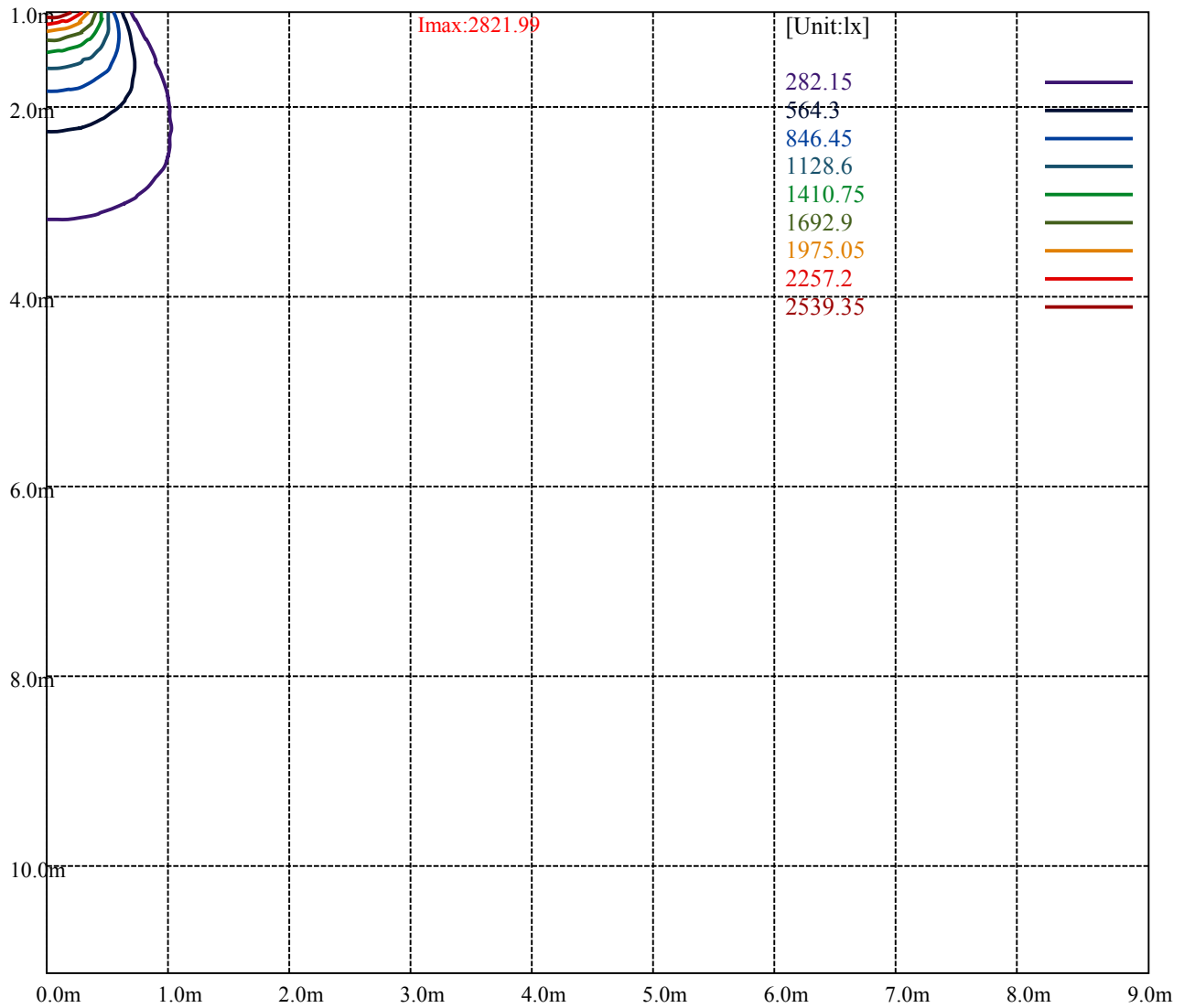
(70%Imax) 1975.39

(80%Imax) 2257.59

(90%Imax) 2539.79



|                                 |   |
|---------------------------------|---|
| (10%E <sub>max</sub> ) 70.5375  | — |
| (20%E <sub>max</sub> ) 141.075  | — |
| (30%E <sub>max</sub> ) 211.6125 | — |
| (40%E <sub>max</sub> ) 282.15   | — |
| (50%E <sub>max</sub> ) 352.6875 | — |
| (60%E <sub>max</sub> ) 423.225  | — |
| (70%E <sub>max</sub> ) 493.7625 | — |
| (80%E <sub>max</sub> ) 564.3    | — |
| (90%E <sub>max</sub> ) 634.8375 | — |



Luminance Table

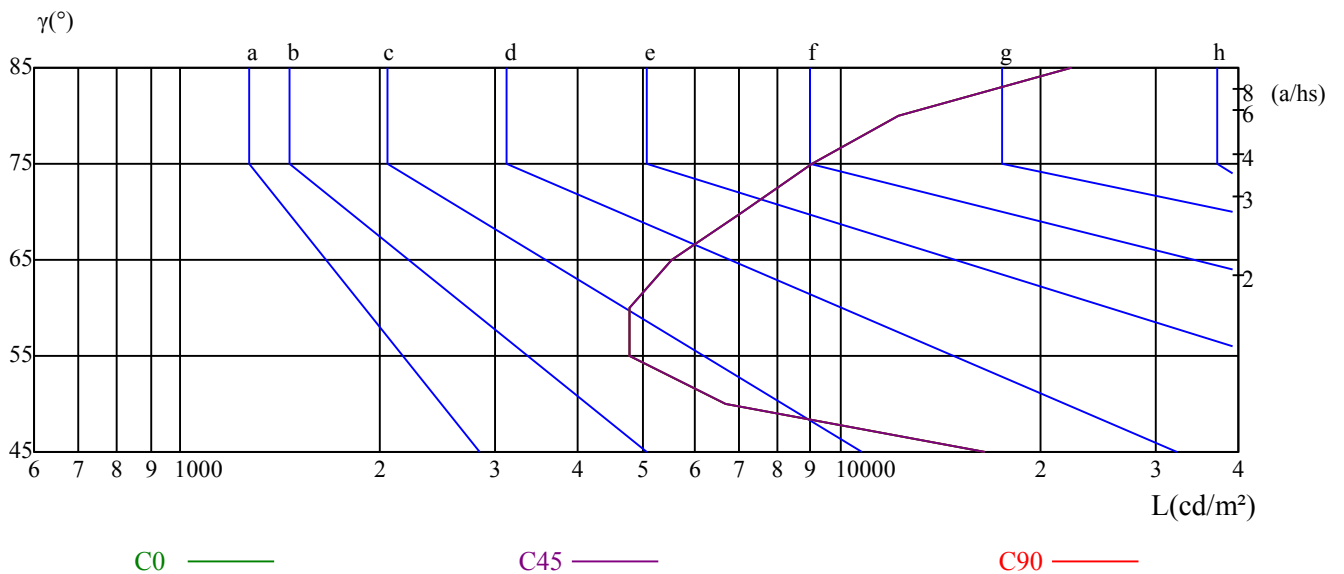
| $\gamma$ | 45    | 50   | 55   | 60   | 65   | 70   | 75   | 80    | 85    |
|----------|-------|------|------|------|------|------|------|-------|-------|
| C0       | 16515 | 6679 | 4796 | 4794 | 5556 | 7097 | 9040 | 12219 | 22361 |
| C45      | 16515 | 6679 | 4796 | 4794 | 5556 | 7097 | 9040 | 12219 | 22361 |
| C90      | 16515 | 6679 | 4796 | 4794 | 5556 | 7097 | 9040 | 12219 | 22361 |

| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|------------|------------|---------|------------|------------|---------|------------|------------|---------|
| 5556       | 5556       | 5556    | 9040       | 9040       | 9040    | 22361      | 22361      | 22361   |

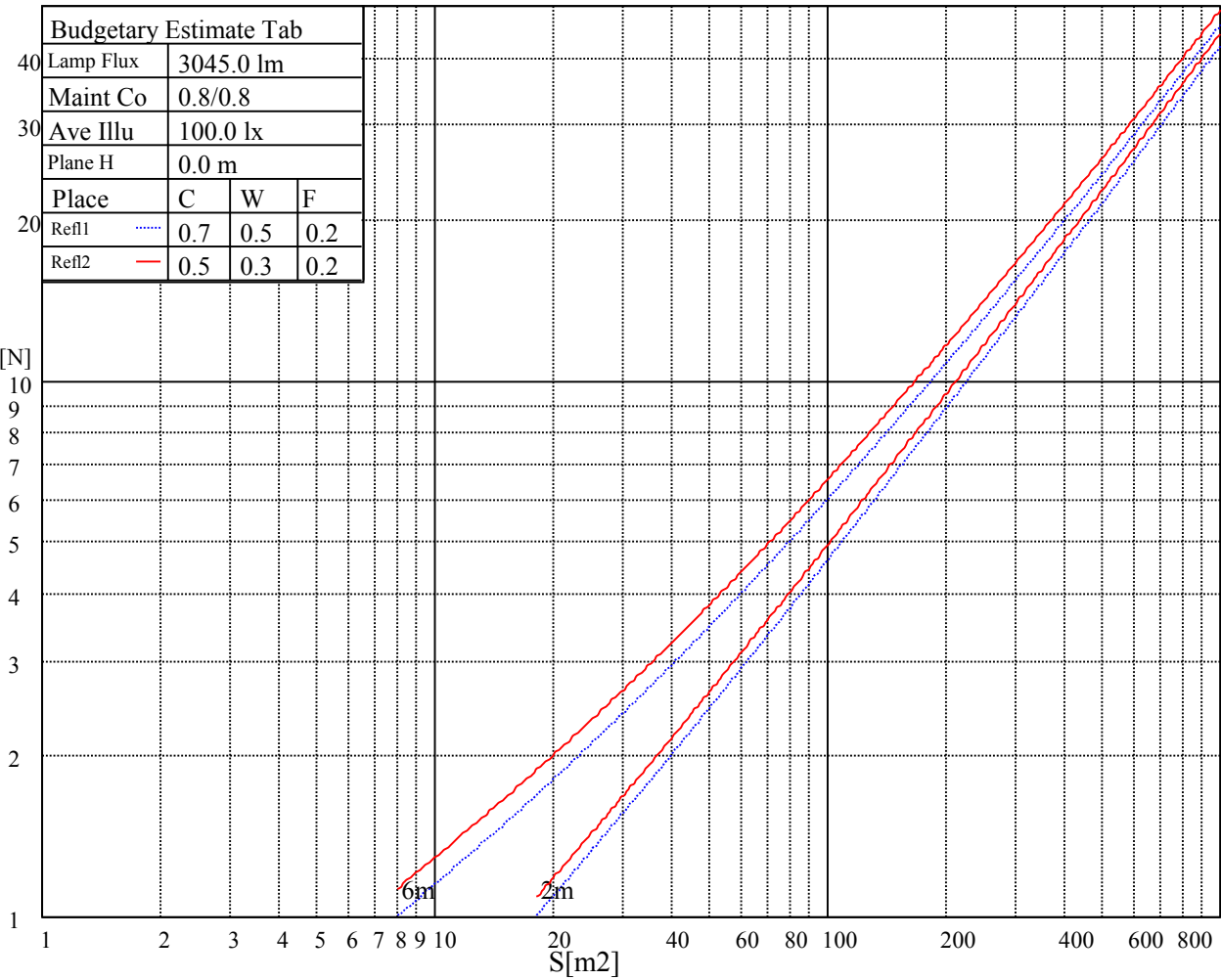
Glare Table

| 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          |

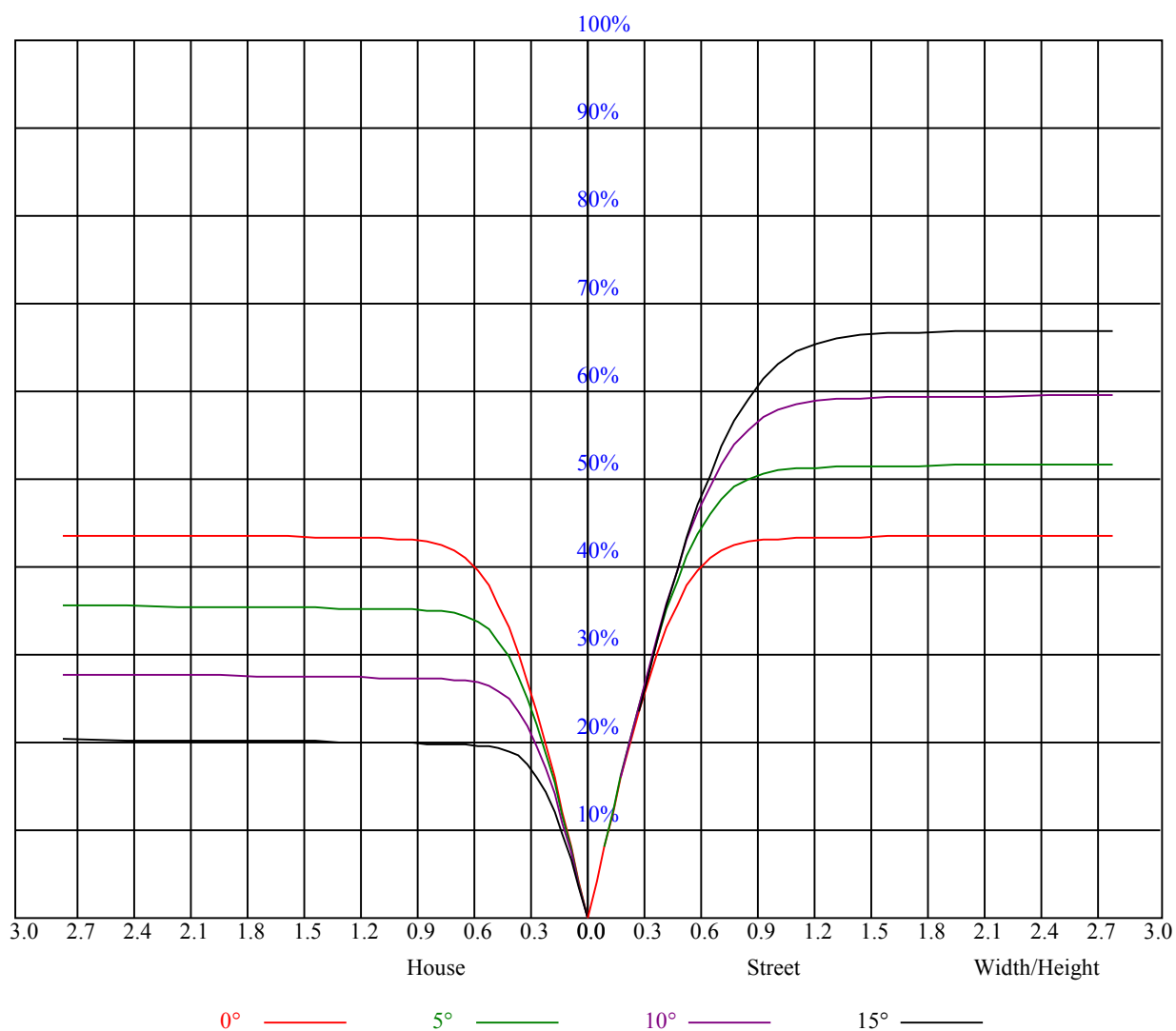
Luminance Limiting Curve



| 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  | 3.52             | 4.45  | 3.88  | 4.76  | 5.08  | 3.12           | 4.06  | 3.48  | 4.37  | 4.68  |
|                                                   | 3H  | 7.30             | 8.12  | 7.68  | 8.46  | 8.83  | 6.04           | 6.86  | 6.42  | 7.20  | 7.57  |
|                                                   | 4H  | 9.36             | 10.12 | 9.77  | 10.47 | 10.87 | 7.58           | 8.34  | 7.99  | 8.69  | 9.09  |
|                                                   | 6H  | 11.22            | 11.91 | 11.64 | 12.29 | 12.69 | 9.35           | 10.05 | 9.77  | 10.42 | 10.82 |
|                                                   | 8H  | 12.07            | 12.72 | 12.51 | 13.12 | 13.53 | 10.36          | 11.01 | 10.79 | 11.40 | 11.82 |
|                                                   | 12H | 13.35            | 13.98 | 13.79 | 14.36 | 14.79 | 12.03          | 12.65 | 12.46 | 13.04 | 13.47 |
| 4H                                                | 2H  | 4.20             | 4.97  | 4.61  | 5.32  | 5.71  | 3.91           | 4.68  | 4.32  | 5.03  | 5.42  |
|                                                   | 3H  | 8.23             | 8.86  | 8.65  | 9.27  | 9.67  | 7.17           | 7.79  | 7.58  | 8.20  | 8.61  |
|                                                   | 4H  | 10.43            | 10.99 | 10.87 | 11.42 | 11.86 | 8.89           | 9.45  | 9.33  | 9.88  | 10.33 |
|                                                   | 6H  | 12.34            | 12.82 | 12.81 | 13.27 | 13.74 | 10.80          | 11.27 | 11.27 | 11.73 | 12.20 |
|                                                   | 8H  | 13.33            | 13.78 | 13.81 | 14.23 | 14.70 | 11.91          | 12.35 | 12.39 | 12.81 | 13.28 |
|                                                   | 12H | 14.61            | 14.99 | 15.10 | 15.48 | 15.96 | 13.49          | 13.88 | 13.99 | 14.37 | 14.84 |
| 8H                                                | 4H  | 10.88            | 11.33 | 11.36 | 11.78 | 12.26 | 9.66           | 10.11 | 10.14 | 10.56 | 11.03 |
|                                                   | 6H  | 13.05            | 13.40 | 13.56 | 13.91 | 14.39 | 11.81          | 12.16 | 12.32 | 12.67 | 13.15 |
|                                                   | 8H  | 14.23            | 14.54 | 14.77 | 15.07 | 15.57 | 13.10          | 13.41 | 13.63 | 13.94 | 14.43 |
|                                                   | 12H | 15.72            | 15.98 | 16.24 | 16.48 | 17.06 | 14.83          | 15.09 | 15.35 | 15.59 | 16.18 |
| 12H                                               | 4H  | 10.99            | 11.37 | 11.48 | 11.86 | 12.34 | 9.89           | 10.27 | 10.38 | 10.76 | 11.24 |
|                                                   | 6H  | 13.46            | 13.56 | 13.78 | 14.03 | 14.58 | 12.35          | 12.45 | 12.67 | 12.92 | 13.47 |
|                                                   | 8H  | 14.54            | 14.81 | 15.07 | 15.31 | 15.89 | 13.55          | 13.81 | 14.07 | 14.31 | 14.89 |
| Variation with the observer position at spacings: |     |                  |       |       |       |       |                |       |       |       |       |
| S = 1.0H                                          |     | 5.6/-8.4         |       |       |       |       | 5.6/-8.4       |       |       |       |       |
| S = 1.5H                                          |     | 8.0/-6.5         |       |       |       |       | 8.0/-6.5       |       |       |       |       |
| S = 2.0H                                          |     | 9.6/-5.4         |       |       |       |       | 9.6/-5.4       |       |       |       |       |
| Standard tables:                                  |     | BK2              |       |       |       |       | BK2            |       |       |       |       |
| Uncorrected UGR                                   |     | 3.6              |       |       |       |       | 3.6            |       |       |       |       |



| RHOC | 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    | 1.05                                    | 1.05 | 1.05 | 1.02 | 1.02 | 1.02 | 0.98 | 0.98 | 0.98 | 0.93 | 0.93 | 0.93 | 0.90 | 0.90 | 0.90 | 0.88 |
| 1    | 0.97                                    | 0.95 | 0.93 | 0.95 | 0.93 | 0.92 | 0.92 | 0.90 | 0.89 | 0.88 | 0.87 | 0.86 | 0.85 | 0.85 | 0.84 | 0.82 |
| 2    | 0.91                                    | 0.87 | 0.84 | 0.89 | 0.86 | 0.83 | 0.86 | 0.84 | 0.81 | 0.84 | 0.82 | 0.80 | 0.81 | 0.80 | 0.78 | 0.77 |
| 3    | 0.85                                    | 0.80 | 0.77 | 0.84 | 0.80 | 0.76 | 0.81 | 0.78 | 0.75 | 0.79 | 0.76 | 0.74 | 0.77 | 0.75 | 0.73 | 0.72 |
| 4    | 0.79                                    | 0.75 | 0.71 | 0.78 | 0.74 | 0.71 | 0.77 | 0.73 | 0.70 | 0.75 | 0.72 | 0.69 | 0.73 | 0.71 | 0.68 | 0.67 |
| 5    | 0.75                                    | 0.70 | 0.66 | 0.74 | 0.69 | 0.66 | 0.72 | 0.68 | 0.65 | 0.71 | 0.67 | 0.65 | 0.69 | 0.66 | 0.64 | 0.63 |
| 6    | 0.70                                    | 0.65 | 0.62 | 0.70 | 0.65 | 0.61 | 0.68 | 0.64 | 0.61 | 0.67 | 0.63 | 0.60 | 0.66 | 0.63 | 0.60 | 0.59 |
| 7    | 0.66                                    | 0.61 | 0.58 | 0.66 | 0.61 | 0.57 | 0.65 | 0.60 | 0.57 | 0.64 | 0.60 | 0.57 | 0.63 | 0.59 | 0.57 | 0.55 |
| 8    | 0.63                                    | 0.58 | 0.54 | 0.62 | 0.57 | 0.54 | 0.61 | 0.57 | 0.54 | 0.60 | 0.56 | 0.53 | 0.59 | 0.56 | 0.53 | 0.52 |
| 9    | 0.59                                    | 0.54 | 0.51 | 0.59 | 0.54 | 0.51 | 0.58 | 0.54 | 0.51 | 0.57 | 0.53 | 0.50 | 0.57 | 0.53 | 0.50 | 0.49 |
| 10   | 0.56                                    | 0.51 | 0.48 | 0.56 | 0.51 | 0.48 | 0.55 | 0.51 | 0.48 | 0.54 | 0.50 | 0.48 | 0.54 | 0.50 | 0.47 | 0.46 |





| Intensity data(cd) |         |         |         |         |         |         |         |         |         | Appendix Page: 17 Total:19 |  |
|--------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------------------|--|
| C/ $\gamma$ (°)    | 0.0     | 1.0     | 2.0     | 3.0     | 4.0     | 5.0     | 6.0     | 7.0     | 8.0     |                            |  |
| 0.0                | 2822.06 | 2818.69 | 2814.75 | 2808.00 | 2804.63 | 2805.19 | 2801.81 | 2798.44 | 2793.94 |                            |  |
| 45.0               | 2822.06 | 2819.25 | 2817.00 | 2816.44 | 2811.94 | 2808.00 | 2802.38 | 2796.19 | 2789.44 |                            |  |
| 90.0               | 2820.94 | 2823.19 | 2823.19 | 2825.44 | 2823.75 | 2821.50 | 2816.44 | 2808.56 | 2801.81 |                            |  |
| 135.0              | 2820.94 | 2825.44 | 2829.38 | 2831.06 | 2833.88 | 2832.75 | 2830.50 | 2826.00 | 2822.06 |                            |  |
| 180.0              | 2822.06 | 2827.13 | 2828.81 | 2831.06 | 2833.88 | 2835.56 | 2834.44 | 2828.81 | 2823.19 |                            |  |
| 225.0              | 2822.06 | 2824.88 | 2825.44 | 2828.81 | 2828.25 | 2831.63 | 2829.38 | 2824.88 | 2818.13 |                            |  |
| 270.0              | 2820.94 | 2819.81 | 2819.81 | 2820.94 | 2822.06 | 2823.19 | 2823.19 | 2819.25 | 2813.06 |                            |  |
| 315.0              | 2820.94 | 2817.56 | 2816.44 | 2813.06 | 2811.94 | 2809.13 | 2805.19 | 2797.31 | 2788.31 |                            |  |
| 360.0              | 2822.06 | 2818.69 | 2814.75 | 2808.00 | 2804.63 | 2805.19 | 2801.81 | 2798.44 | 2793.94 |                            |  |
| C/ $\gamma$ (°)    | 9.0     | 10.0    | 11.0    | 12.0    | 13.0    | 14.0    | 15.0    | 16.0    | 17.0    |                            |  |
| 0.0                | 2788.88 | 2785.50 | 2780.44 | 2770.31 | 2760.75 | 2748.94 | 2728.13 | 2702.81 | 2679.19 |                            |  |
| 45.0               | 2781.56 | 2772.56 | 2765.25 | 2757.38 | 2743.88 | 2733.19 | 2716.88 | 2685.94 | 2662.88 |                            |  |
| 90.0               | 2793.94 | 2784.94 | 2774.25 | 2762.44 | 2748.38 | 2725.88 | 2703.38 | 2674.13 | 2647.13 |                            |  |
| 135.0              | 2814.19 | 2808.56 | 2800.13 | 2791.69 | 2778.75 | 2768.06 | 2745.56 | 2710.13 | 2684.25 |                            |  |
| 180.0              | 2816.44 | 2802.94 | 2791.13 | 2774.81 | 2761.31 | 2740.50 | 2716.88 | 2689.88 | 2648.25 |                            |  |
| 225.0              | 2809.69 | 2798.44 | 2786.06 | 2769.19 | 2754.56 | 2731.50 | 2708.44 | 2680.31 | 2647.69 |                            |  |
| 270.0              | 2804.06 | 2792.25 | 2779.31 | 2763.56 | 2740.50 | 2721.94 | 2694.94 | 2670.19 | 2641.50 |                            |  |
| 315.0              | 2778.75 | 2764.69 | 2751.19 | 2737.13 | 2720.25 | 2703.38 | 2685.94 | 2658.94 | 2628.00 |                            |  |
| 360.0              | 2788.88 | 2785.50 | 2780.44 | 2770.31 | 2760.75 | 2748.94 | 2728.13 | 2702.81 | 2679.19 |                            |  |
| C/ $\gamma$ (°)    | 18.0    | 19.0    | 20.0    | 21.0    | 22.0    | 23.0    | 24.0    | 25.0    | 26.0    |                            |  |
| 0.0                | 2643.19 | 2619.00 | 2581.88 | 2530.69 | 2480.06 | 2418.19 | 2324.25 | 2236.50 | 2140.31 |                            |  |
| 45.0               | 2639.81 | 2604.38 | 2560.50 | 2513.81 | 2454.19 | 2386.69 | 2292.75 | 2185.88 | 2085.75 |                            |  |
| 90.0               | 2610.00 | 2561.63 | 2509.31 | 2447.44 | 2369.81 | 2291.06 | 2199.38 | 2075.06 | 1966.50 |                            |  |
| 135.0              | 2651.63 | 2612.81 | 2564.44 | 2507.63 | 2450.25 | 2379.38 | 2274.19 | 2176.31 | 2077.31 |                            |  |
| 180.0              | 2623.50 | 2584.13 | 2536.88 | 2484.56 | 2430.00 | 2356.88 | 2274.19 | 2176.88 | 2064.38 |                            |  |
| 225.0              | 2604.94 | 2571.19 | 2530.69 | 2472.75 | 2424.38 | 2360.25 | 2289.38 | 2185.88 | 2092.50 |                            |  |
| 270.0              | 2603.81 | 2571.19 | 2529.56 | 2482.88 | 2436.19 | 2384.44 | 2301.19 | 2224.69 | 2139.75 |                            |  |
| 315.0              | 2595.94 | 2562.19 | 2524.50 | 2476.69 | 2424.94 | 2365.31 | 2294.44 | 2192.06 | 2101.50 |                            |  |
| 360.0              | 2643.19 | 2619.00 | 2581.88 | 2530.69 | 2480.06 | 2418.19 | 2324.25 | 2236.50 | 2140.31 |                            |  |
| C/ $\gamma$ (°)    | 27.0    | 28.0    | 29.0    | 30.0    | 31.0    | 32.0    | 33.0    | 34.0    | 35.0    |                            |  |
| 0.0                | 2003.63 | 1890.00 | 1774.69 | 1639.69 | 1499.63 | 1373.63 | 1228.50 | 1086.19 | 955.13  |                            |  |
| 45.0               | 1963.13 | 1834.31 | 1707.19 | 1579.50 | 1422.56 | 1278.56 | 1145.81 | 975.94  | 849.94  |                            |  |
| 90.0               | 1854.00 | 1717.31 | 1573.88 | 1447.88 | 1299.38 | 1120.89 | 1004.01 | 853.43  | 719.16  |                            |  |
| 135.0              | 1942.31 | 1825.31 | 1708.31 | 1559.81 | 1420.88 | 1277.44 | 1118.25 | 967.50  | 837.56  |                            |  |
| 180.0              | 1958.06 | 1832.63 | 1692.00 | 1567.69 | 1445.63 | 1279.13 | 1108.24 | 1011.09 | 862.43  |                            |  |
| 225.0              | 1992.94 | 1854.00 | 1743.19 | 1631.81 | 1495.13 | 1355.63 | 1118.87 | 1086.36 | 953.55  |                            |  |
| 270.0              | 2019.94 | 1916.44 | 1811.81 | 1702.69 | 1557.56 | 1441.13 | 1325.25 | 1171.69 | 1045.13 |                            |  |
| 315.0              | 2000.25 | 1865.81 | 1755.56 | 1640.25 | 1486.69 | 1366.31 | 1121.46 | 1105.65 | 959.06  |                            |  |
| 360.0              | 2003.63 | 1890.00 | 1774.69 | 1639.69 | 1499.63 | 1373.63 | 1228.50 | 1086.19 | 955.13  |                            |  |
| C/ $\gamma$ (°)    | 36.0    | 37.0    | 38.0    | 39.0    | 40.0    | 41.0    | 42.0    | 43.0    | 44.0    |                            |  |
| 0.0                | 801.56  | 667.13  | 522.00  | 387.56  | 285.75  | 231.92  | 147.83  | 120.49  | 94.56   |                            |  |
| 45.0               | 709.88  | 564.19  | 420.19  | 308.81  | 240.41  | 147.26  | 115.31  | 88.03   | 70.82   |                            |  |
| 90.0               | 572.12  | 432.39  | 322.09  | 223.09  | 153.11  | 120.04  | 94.50   | 69.81   | 56.64   |                            |  |
| 135.0              | 680.06  | 548.44  | 414.56  | 293.06  | 235.18  | 146.70  | 113.01  | 86.01   | 68.85   |                            |  |
| 180.0              | 709.71  | 581.34  | 443.87  | 319.78  | 228.71  | 160.88  | 128.53  | 97.20   | 74.42   |                            |  |
| 225.0              | 806.34  | 661.73  | 536.51  | 402.36  | 289.46  | 211.11  | 164.31  | 124.31  | 96.86   |                            |  |
| 270.0              | 919.13  | 776.25  | 628.88  | 504.56  | 375.75  | 289.69  | 199.69  | 153.96  | 122.91  |                            |  |
| 315.0              | 812.36  | 683.44  | 543.38  | 423.17  | 303.64  | 210.21  | 161.55  | 126.00  | 96.98   |                            |  |
| 360.0              | 801.56  | 667.13  | 522.00  | 387.56  | 285.75  | 231.92  | 147.83  | 120.49  | 94.56   |                            |  |

## Intensity data(cd)

| C/ $\gamma$ (°) | 45.0  | 46.0  | 47.0  | 48.0  | 49.0  | 50.0  | 51.0  | 52.0  | 53.0  |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0             | 72.45 | 59.51 | 48.60 | 38.98 | 31.61 | 27.00 | 23.29 | 20.98 | 18.90 |
| 45.0            | 56.19 | 45.06 | 37.58 | 31.61 | 26.27 | 23.34 | 21.04 | 19.01 | 17.49 |
| 90.0            | 46.46 | 36.45 | 30.71 | 26.33 | 23.01 | 20.59 | 19.07 | 17.55 | 16.82 |
| 135.0           | 53.61 | 42.98 | 35.49 | 29.64 | 24.47 | 21.71 | 19.63 | 18.00 | 16.76 |
| 180.0           | 59.18 | 48.09 | 37.52 | 31.05 | 26.33 | 22.39 | 20.25 | 18.56 | 17.27 |
| 225.0           | 77.40 | 59.51 | 46.80 | 38.31 | 31.05 | 25.65 | 22.28 | 19.69 | 18.06 |
| 270.0           | 95.51 | 75.04 | 59.57 | 48.15 | 37.46 | 31.05 | 26.21 | 22.84 | 20.48 |
| 315.0           | 78.81 | 62.78 | 48.54 | 40.05 | 33.02 | 26.66 | 23.23 | 20.70 | 18.62 |
| 360.0           | 72.45 | 59.51 | 48.60 | 38.98 | 31.61 | 27.00 | 23.29 | 20.98 | 18.90 |
|                 |       |       |       |       |       |       |       |       |       |
| C/ $\gamma$ (°) | 54.0  | 55.0  | 56.0  | 57.0  | 58.0  | 59.0  | 60.0  | 61.0  | 62.0  |
| 0.0             | 17.33 | 16.26 | 15.13 | 14.23 | 13.78 | 13.50 | 13.22 | 12.99 | 12.83 |
| 45.0            | 16.43 | 15.41 | 14.46 | 14.01 | 13.61 | 13.33 | 13.05 | 12.83 | 12.66 |
| 90.0            | 16.03 | 15.24 | 14.96 | 14.85 | 14.74 | 14.74 | 14.74 | 14.85 | 14.91 |
| 135.0           | 15.86 | 15.19 | 14.57 | 14.29 | 13.95 | 13.84 | 13.78 | 13.73 | 13.73 |
| 180.0           | 16.14 | 15.47 | 14.68 | 14.23 | 13.89 | 13.56 | 13.33 | 13.05 | 12.94 |
| 225.0           | 16.76 | 15.75 | 15.13 | 14.51 | 14.12 | 13.84 | 13.73 | 13.56 | 13.44 |
| 270.0           | 18.96 | 17.78 | 16.88 | 16.37 | 15.98 | 15.86 | 15.81 | 15.92 | 15.98 |
| 315.0           | 17.10 | 16.03 | 15.08 | 14.23 | 13.78 | 13.39 | 13.11 | 12.88 | 12.60 |
| 360.0           | 17.33 | 16.26 | 15.13 | 14.23 | 13.78 | 13.50 | 13.22 | 12.99 | 12.83 |
|                 |       |       |       |       |       |       |       |       |       |
| C/ $\gamma$ (°) | 63.0  | 64.0  | 65.0  | 66.0  | 67.0  | 68.0  | 69.0  | 70.0  | 71.0  |
| 0.0             | 12.66 | 12.43 | 12.26 | 12.09 | 11.93 | 11.81 | 11.76 | 11.70 | 11.64 |
| 45.0            | 12.49 | 12.26 | 12.15 | 11.98 | 11.87 | 11.81 | 11.76 | 11.70 | 11.64 |
| 90.0            | 15.13 | 15.47 | 15.81 | 16.20 | 16.76 | 17.27 | 17.83 | 18.34 | 18.73 |
| 135.0           | 13.73 | 13.84 | 13.89 | 13.89 | 14.23 | 14.51 | 14.79 | 15.02 | 15.30 |
| 180.0           | 12.83 | 12.71 | 12.66 | 12.60 | 12.60 | 12.77 | 12.94 | 12.94 | 13.05 |
| 225.0           | 13.39 | 13.28 | 13.33 | 13.33 | 13.44 | 13.56 | 13.78 | 13.95 | 14.06 |
| 270.0           | 16.09 | 16.20 | 16.31 | 16.43 | 16.54 | 16.71 | 16.76 | 16.93 | 17.16 |
| 315.0           | 12.43 | 12.26 | 12.09 | 11.98 | 11.81 | 11.64 | 11.59 | 11.59 | 11.48 |
| 360.0           | 12.66 | 12.43 | 12.26 | 12.09 | 11.93 | 11.81 | 11.76 | 11.70 | 11.64 |
|                 |       |       |       |       |       |       |       |       |       |
| C/ $\gamma$ (°) | 72.0  | 73.0  | 74.0  | 75.0  | 76.0  | 77.0  | 78.0  | 79.0  | 80.0  |
| 0.0             | 11.59 | 11.59 | 11.53 | 11.48 | 11.48 | 11.42 | 11.42 | 11.42 | 11.42 |
| 45.0            | 11.59 | 11.59 | 11.59 | 11.53 | 11.48 | 11.48 | 11.42 | 11.36 | 11.36 |
| 90.0            | 18.84 | 18.73 | 18.56 | 18.28 | 17.83 | 17.38 | 16.59 | 15.75 | 14.29 |
| 135.0           | 15.24 | 14.63 | 14.12 | 13.78 | 13.56 | 13.33 | 13.05 | 12.21 | 11.76 |
| 180.0           | 12.83 | 12.21 | 11.42 | 11.25 | 11.25 | 11.19 | 11.19 | 11.19 | 11.19 |
| 225.0           | 14.29 | 14.12 | 13.73 | 13.22 | 12.71 | 12.54 | 12.32 | 11.76 | 11.36 |
| 270.0           | 17.27 | 17.44 | 17.38 | 17.21 | 17.10 | 16.88 | 16.43 | 15.92 | 15.47 |
| 315.0           | 11.48 | 11.42 | 11.36 | 11.36 | 11.31 | 11.31 | 11.25 | 11.25 | 11.19 |
| 360.0           | 11.59 | 11.59 | 11.53 | 11.48 | 11.48 | 11.42 | 11.42 | 11.42 | 11.42 |
|                 |       |       |       |       |       |       |       |       |       |
| C/ $\gamma$ (°) | 81.0  | 82.0  | 83.0  | 84.0  | 85.0  | 86.0  | 87.0  | 88.0  | 89.0  |
| 0.0             | 11.36 | 11.53 | 11.70 | 11.76 | 11.25 | 11.31 | 11.36 | 11.48 | 11.42 |
| 45.0            | 11.36 | 11.25 | 11.25 | 11.19 | 11.14 | 11.08 | 11.03 | 10.97 | 10.91 |
| 90.0            | 13.78 | 13.16 | 11.87 | 11.42 | 11.48 | 11.53 | 11.59 | 11.42 | 10.69 |
| 135.0           | 11.31 | 11.19 | 11.25 | 11.31 | 11.31 | 11.42 | 11.42 | 11.19 | 10.63 |
| 180.0           | 11.14 | 11.14 | 11.08 | 11.08 | 11.03 | 11.03 | 11.03 | 10.97 | 10.63 |
| 225.0           | 11.31 | 11.31 | 11.19 | 11.19 | 11.14 | 11.19 | 11.25 | 11.31 | 10.97 |
| 270.0           | 14.63 | 13.67 | 12.88 | 12.21 | 11.64 | 11.19 | 11.03 | 10.86 | 10.74 |
| 315.0           | 11.19 | 11.19 | 11.14 | 11.08 | 11.08 | 11.03 | 11.03 | 10.97 | 10.86 |
| 360.0           | 11.36 | 11.53 | 11.70 | 11.76 | 11.25 | 11.31 | 11.36 | 11.48 | 11.42 |

## Intensity data(cd)

Appendix Page: 19 Total:19

|                                 |              |
|---------------------------------|--------------|
| <b>C/<math>\gamma</math>(°)</b> | <b>90.0</b>  |
| <b>0.0</b>                      | <b>10.86</b> |
| <b>45.0</b>                     | <b>10.80</b> |
| <b>90.0</b>                     | <b>10.69</b> |
| <b>135.0</b>                    | <b>10.58</b> |
| <b>180.0</b>                    | <b>10.46</b> |
| <b>225.0</b>                    | <b>10.80</b> |
| <b>270.0</b>                    | <b>10.63</b> |
| <b>315.0</b>                    | <b>10.74</b> |
| <b>360.0</b>                    | <b>10.86</b> |