

Report No.: 1

Test Time: 05.03.2020 14:40

## Luminaire Property

Luminaire Manufacturer:

Luminaire Description: FL 1500 A30 2x84LED 40W 4000K opal

Luminous Length (mm): 1500

Luminous Width (mm): 80

Luminous Height (mm): 91

Voltage: 228.6 V

Current: 0.180 A

Power: 40.36 W

Power Factor: 0.979

## Photometric Results

CIE Class: Direct

Total Rated Lamp Lumens: 4599.0 lm

Measurement Flux: 4599 lm

Efficiency: 100%

Downward Ratio: 93%

Upward Ratio: 7%

Field Angle(C0/C180,C90/C270,C45/C225,C135/315): 168.7, 163.8, 165.2, 159.8

Beam Angle(C0/C180,C90/C270,C45/C225,C135/315): 115.7, 110.4, 113.1, 112.0

Luminaire Efficacy Rating (LER): 114.00

Central Intensity: 1253.27 cd

Max. Intensity: 1571.62 cd

Pos of Max. Intensity: H112.5 V30

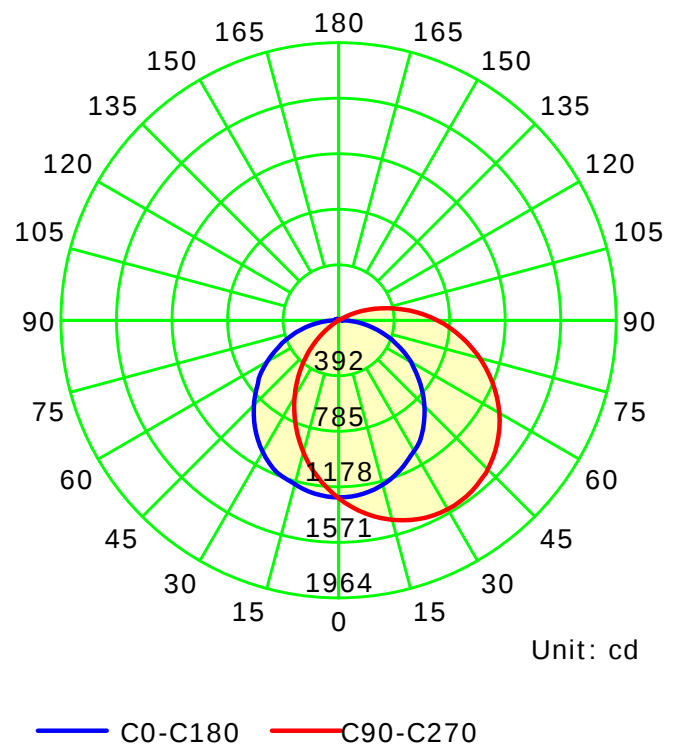
S/MH(C0/C180): 1.27

S/MH(C90/C270): 1.28

Termogramma



Luminous Intensity Distribution Curve



C Plane (°):0.0-360.0: 22.5

Test Lab:

Test Type: TYPE C

Temperature:

Operator:

Gamma Plane (°):0.0-180.0:2.0

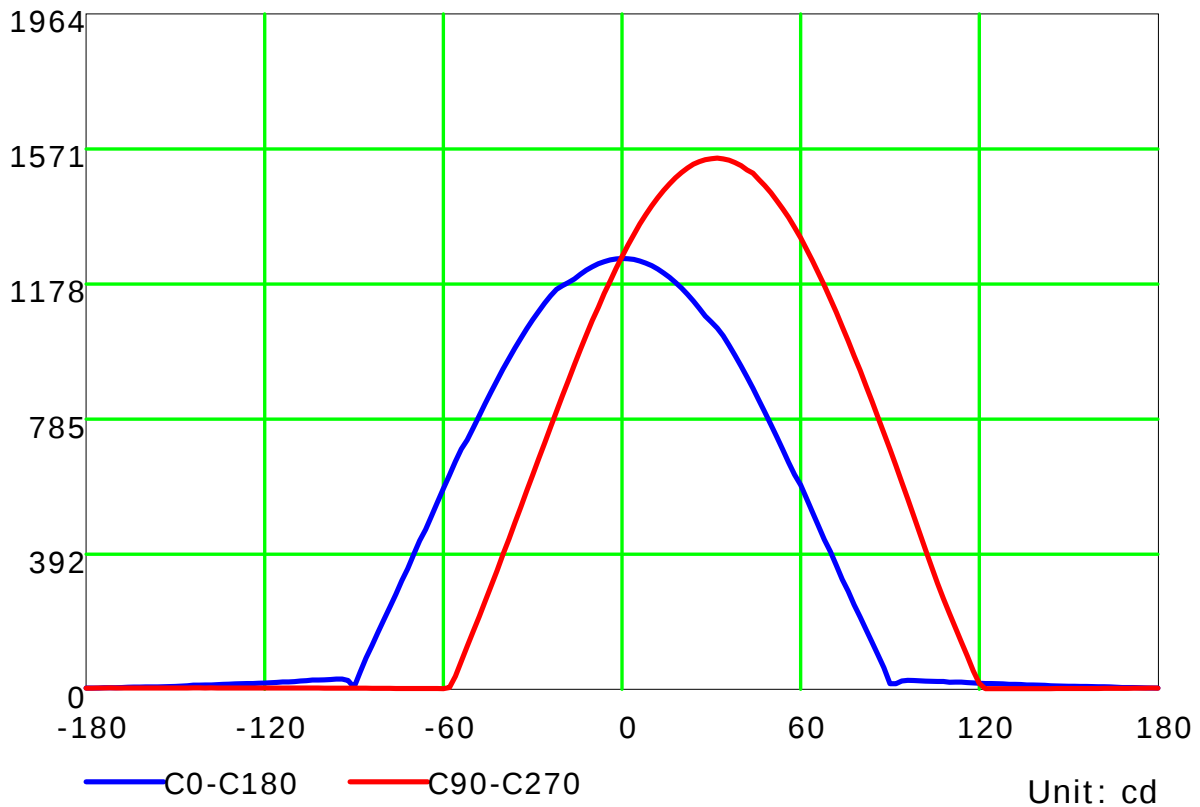
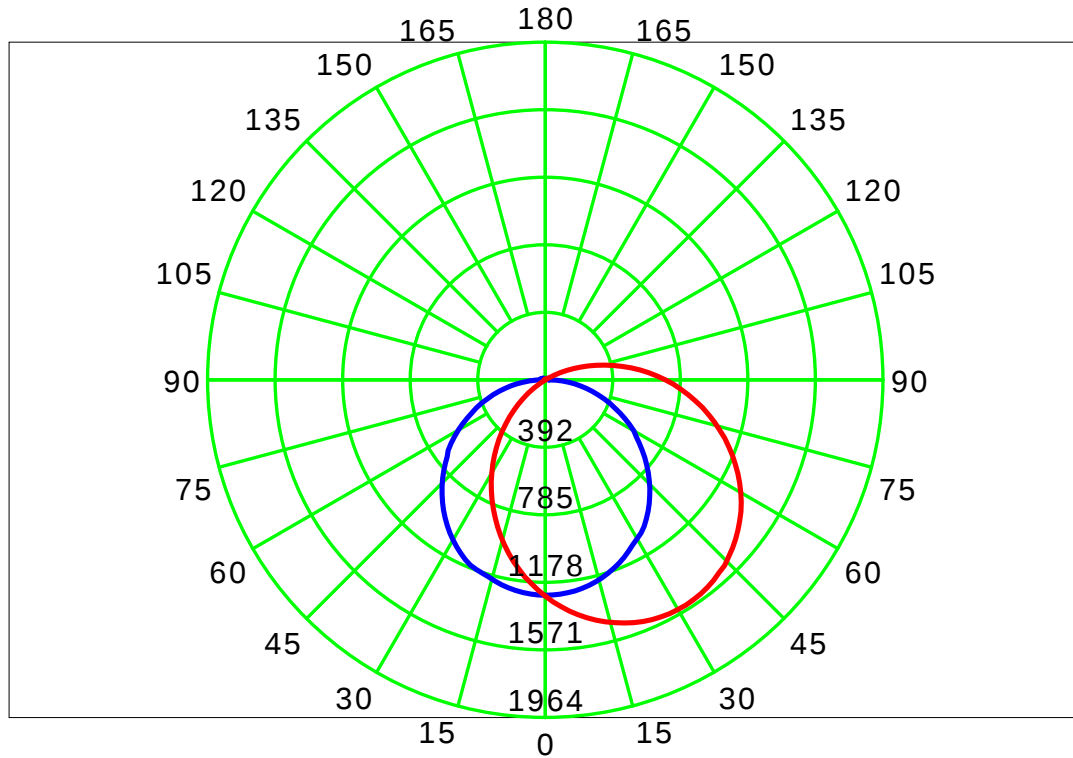
Test Device: LSG-1800B

Distance: 12.677 m

Humidity:

Inspector:

## Luminous Intensity Distribution Curve



C Plane (°):0.0-360.0: 22.5

Test Lab:

Test Type: TYPE C

Temperature:

Operator:

Gamma Plane (°):0.0-180.0:2.0

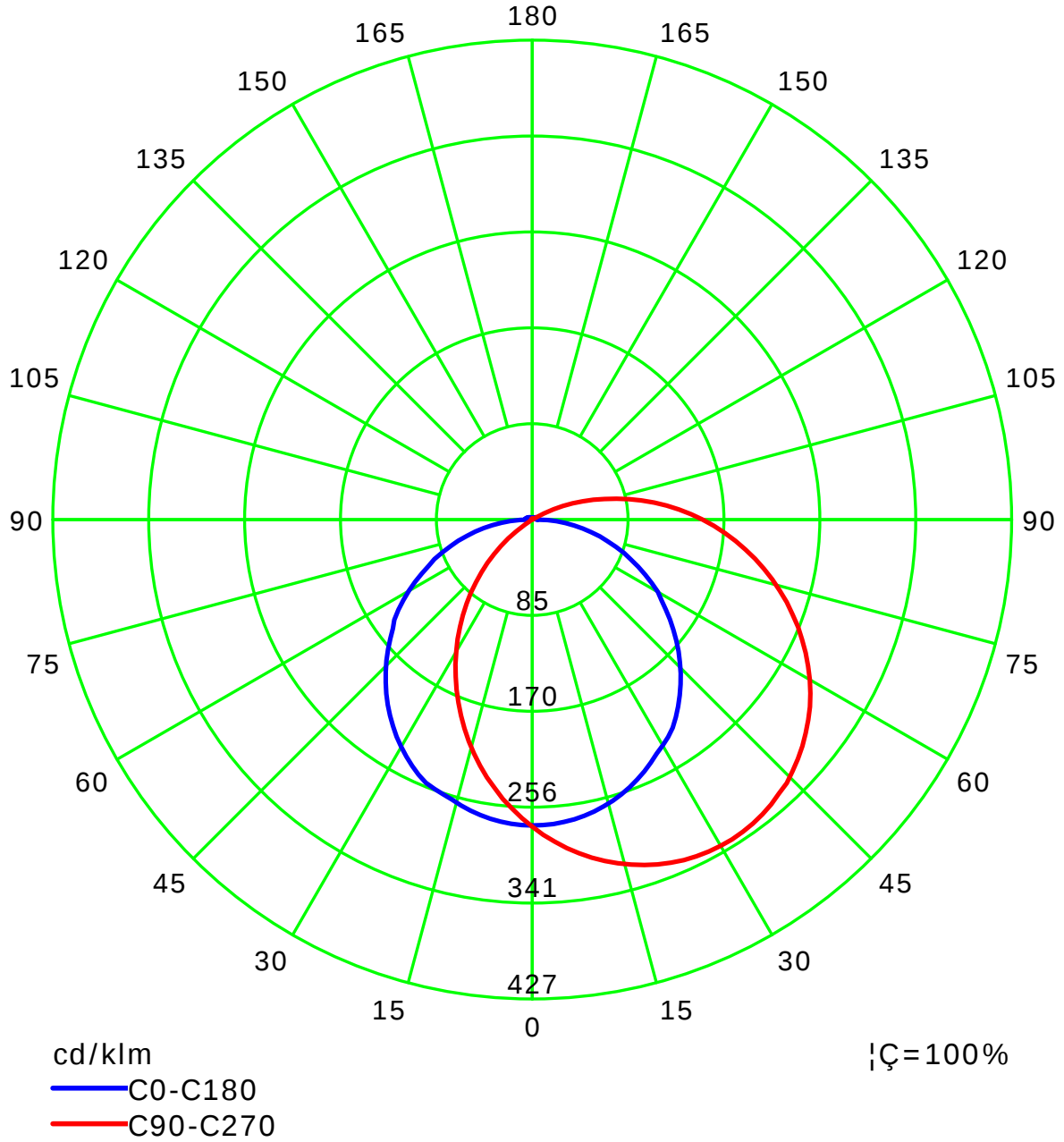
Test Device: LSG-1800B

Distance: 12.677 m

Humidity:

Inspector:

## Luminous Intensity Distribution Curve(cd / klm)



C Plane (°): 0.0-360.0: 22.5

Test Lab:

Test Type: TYPE C

Temperature:

Operator:

Gamma Plane (°): 0.0-180.0: 2.0

Test Device: LSG-1800B

Distance: 12.677 m

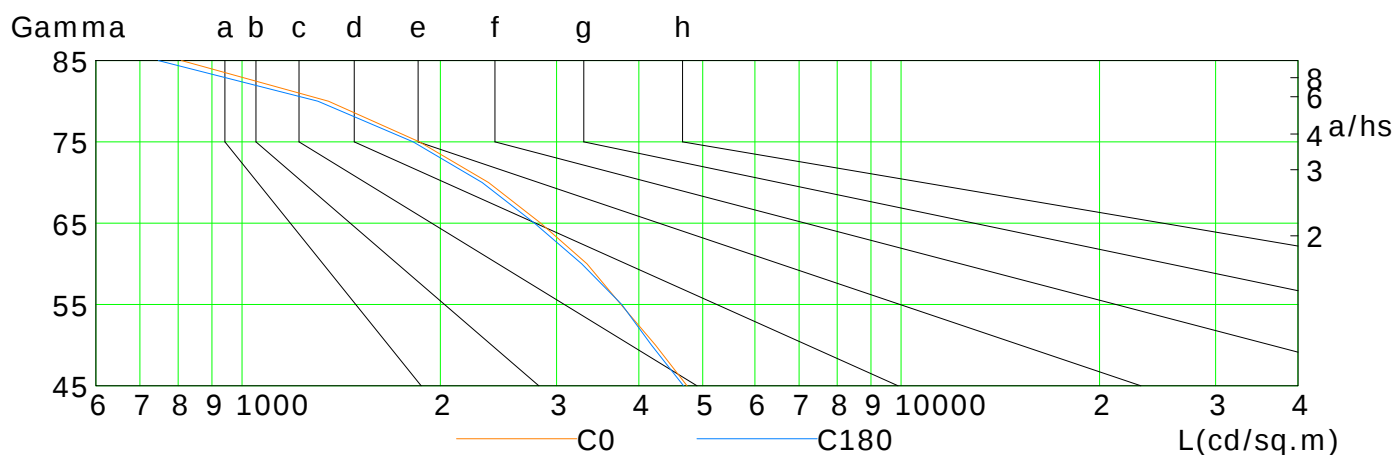
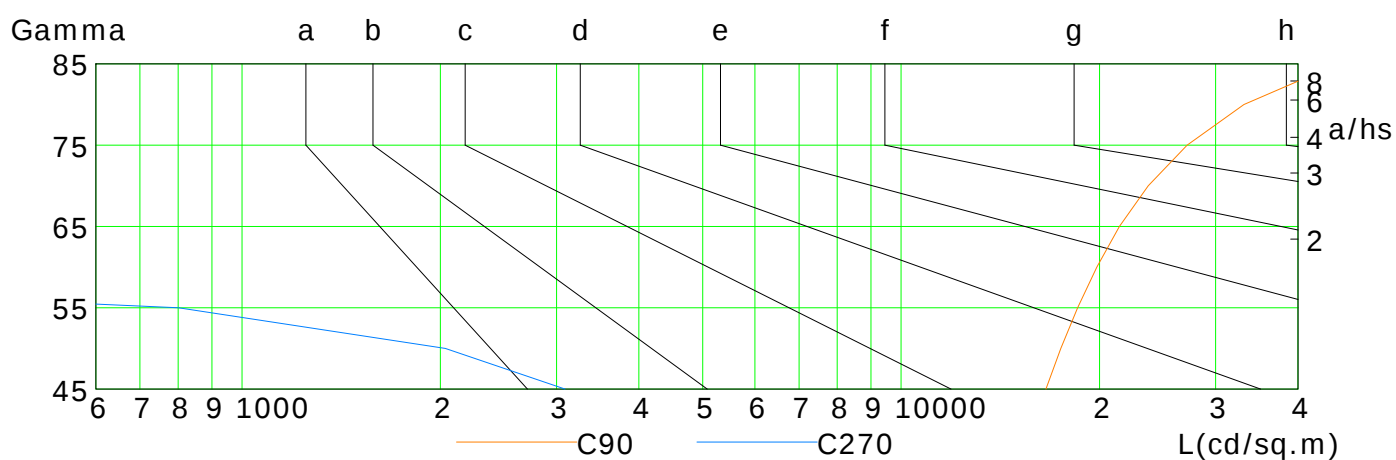
Humidity:

Inspector:

## Lum Limit Curve

| Dazzle | Quality | Illuminance (lx) |      |      |       |       |       |       |       |
|--------|---------|------------------|------|------|-------|-------|-------|-------|-------|
| 1.15   | A       | 2000             | 1000 | 500  | <=300 |       |       |       |       |
| 1.50   | B       |                  | 2000 | 1000 | 500   | <=300 |       |       |       |
| 1.85   | C       |                  |      | 2000 | 1000  | 500   | <=300 |       |       |
| 2.20   | D       |                  |      |      | 2000  | 1000  | 500   | <=300 |       |
| 2.55   | E       |                  |      |      |       | 2000  | 1000  | 500   | <=300 |

a b c d e f g h



| L(cd/sq.m) | G45   | G50   | G55   | G60   | G65   | G70   | G75   | G80   | G85   |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C0         | 4733  | 4239  | 3757  | 3337  | 2840  | 2366  | 1858  | 1353  | 810   |
| C90        | 16581 | 17470 | 18520 | 19810 | 21436 | 23705 | 27153 | 33117 | 45988 |
| C180       | 4676  | 4182  | 3768  | 3277  | 2778  | 2314  | 1818  | 1303  | 746   |
| C270       | 3092  | 2035  | 801   | 35    | 44    | 54    | 71    | 107   | 182   |

C Plane (°):0.0-360.0: 22.5

Test Lab:

Test Type: TYPE C

Temperature:

Operator:

Gamma Plane (°):0.0-180.0:2.0

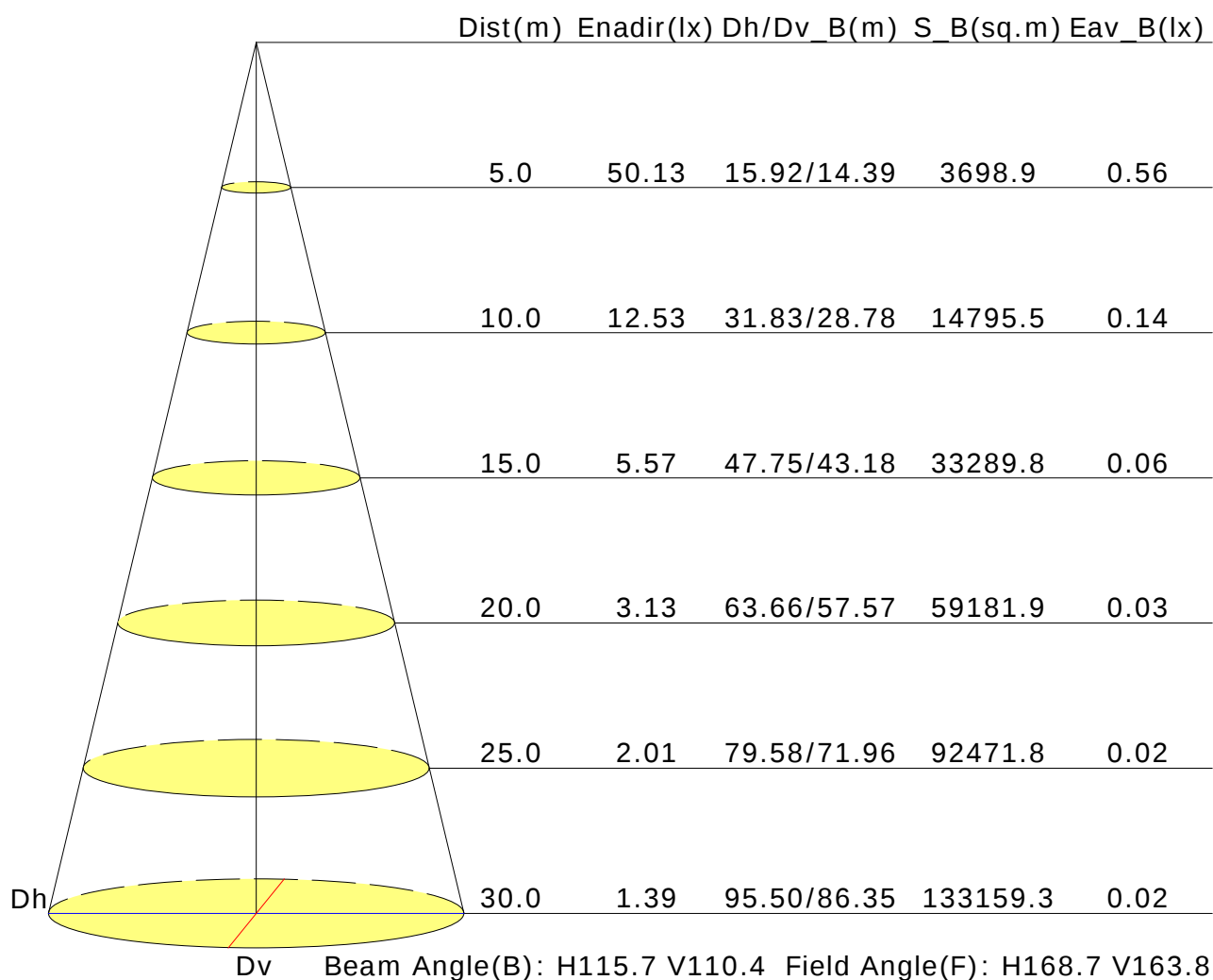
Test Device: LSG-1800B

Distance: 12.677 m

Humidity:

Inspector:

## Illuminance at a Distance



## UGR Table

|                                                    |                  |      |      |      |      |                |      |      |      |      |
|----------------------------------------------------|------------------|------|------|------|------|----------------|------|------|------|------|
| Reflectance:                                       |                  |      |      |      |      |                |      |      |      |      |
| Ceiling (cavity)                                   | 0.7              | 0.7  | 0.5  | 0.5  | 0.3  | 0.7            | 0.7  | 0.5  | 0.5  | 0.3  |
| Wall                                               | 0.5              | 0.3  | 0.5  | 0.3  | 0.3  | 0.5            | 0.3  | 0.5  | 0.3  | 0.3  |
| Reference plane                                    | 0.2              | 0.2  | 0.2  | 0.2  | 0.2  | 0.2            | 0.2  | 0.2  | 0.2  | 0.2  |
| Room dimensions                                    | Viewed crosswise |      |      |      |      | Viewed endwise |      |      |      |      |
| X=2H Y=2H                                          | 17.0             | 18.3 | 17.4 | 18.7 | 19.1 | 20.6           | 22.0 | 21.0 | 22.4 | 22.8 |
| 3H                                                 | 18.1             | 19.4 | 18.6 | 19.8 | 20.2 | 23.3           | 24.5 | 23.7 | 24.9 | 25.4 |
| 4H                                                 | 18.6             | 19.8 | 19.0 | 20.2 | 20.7 | 24.7           | 25.8 | 25.1 | 26.3 | 26.7 |
| 6H                                                 | 18.9             | 20.0 | 19.4 | 20.5 | 21.0 | 26.1           | 27.2 | 26.6 | 27.7 | 28.1 |
| 8H                                                 | 19.0             | 20.1 | 19.5 | 20.5 | 21.0 | 26.9           | 27.9 | 27.3 | 28.4 | 28.9 |
| 12H                                                | 19.1             | 20.1 | 19.5 | 20.6 | 21.1 | 27.7           | 28.7 | 28.2 | 29.2 | 29.7 |
| X=4H Y=2H                                          | 18.2             | 19.4 | 18.6 | 19.8 | 20.2 | 21.0           | 22.2 | 21.4 | 22.6 | 23.0 |
| 3H                                                 | 19.6             | 20.6 | 20.1 | 21.1 | 21.6 | 23.8           | 24.8 | 24.3 | 25.3 | 25.8 |
| 4H                                                 | 20.2             | 21.1 | 20.7 | 21.6 | 22.1 | 25.3           | 26.2 | 25.8 | 26.7 | 27.3 |
| 6H                                                 | 20.6             | 21.4 | 21.1 | 22.0 | 22.5 | 26.9           | 27.7 | 27.4 | 28.3 | 28.8 |
| 8H                                                 | 20.7             | 21.5 | 21.3 | 22.1 | 22.6 | 27.7           | 28.5 | 28.3 | 29.1 | 29.6 |
| 12H                                                | 20.8             | 21.5 | 21.4 | 22.1 | 22.7 | 28.7           | 29.4 | 29.2 | 29.9 | 30.5 |
| X=8H Y=4H                                          | 21.1             | 21.9 | 21.6 | 22.4 | 23.0 | 25.4           | 26.2 | 26.0 | 26.7 | 27.3 |
| 6H                                                 | 21.8             | 22.4 | 22.3 | 23.0 | 23.6 | 27.2           | 27.8 | 27.8 | 28.4 | 29.0 |
| 8H                                                 | 22.0             | 22.6 | 22.6 | 23.2 | 23.8 | 28.2           | 28.7 | 28.8 | 29.3 | 30.0 |
| 12H                                                | 22.2             | 22.7 | 22.8 | 23.3 | 24.0 | 29.2           | 29.7 | 29.8 | 30.3 | 31.0 |
| X=12H Y=4H                                         | 21.3             | 22.0 | 21.9 | 22.6 | 23.2 | 25.4           | 26.1 | 26.0 | 26.7 | 27.3 |
| 6H                                                 | 22.2             | 22.7 | 22.7 | 23.3 | 24.0 | 27.2           | 27.8 | 27.8 | 28.4 | 29.0 |
| 8H                                                 | 22.5             | 23.0 | 23.1 | 23.6 | 24.3 | 28.2           | 28.7 | 28.8 | 29.3 | 30.0 |
| Variations with the observer position at spacings: |                  |      |      |      |      |                |      |      |      |      |
| S=1.0H                                             | +0.2/-0.2        |      |      |      |      | +0.7/-0.8      |      |      |      |      |
| S=1.5H                                             | +0.4/-0.5        |      |      |      |      | +1.3/-1.6      |      |      |      |      |
| S=2.0H                                             | +0.6/-1.1        |      |      |      |      | +1.8/-2.5      |      |      |      |      |

Calculate in accordance with CIE Pub.117. The table is revised with 4599lm ( $8\log(F/F_0) = 5.3$ ).

C Plane (°):0.0-360.0: 22.5

Test Lab:

Test Type: TYPE C

Temperature:

Operator:

Gamma Plane (°):0.0-180.0:2.0

Test Device: LSG-1800B

Distance: 12.677 m

Humidity:

Inspector:

## Utilisation Factor Table(Floor cavity)

| Utilisation Factors UF(F)                                                                                                                                                         |      |       | SHR NOM = 1.50 |      |      |      |      |      |      |      |      |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|----------------|------|------|------|------|------|------|------|------|--|
| Room Reflectance                                                                                                                                                                  |      |       | Room Index(RI) |      |      |      |      |      |      |      |      |  |
| Ceiling                                                                                                                                                                           | Wall | Floor | 0.75           | 1.00 | 1.25 | 1.50 | 2.00 | 2.50 | 3.00 | 4.00 | 5.00 |  |
| 0.70                                                                                                                                                                              | 0.50 | 0.20  | 0.54           | 0.62 | 0.69 | 0.74 | 0.81 | 0.86 | 0.89 | 0.94 | 0.97 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.46           | 0.53 | 0.61 | 0.66 | 0.74 | 0.79 | 0.83 | 0.89 | 0.93 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.40           | 0.47 | 0.55 | 0.60 | 0.68 | 0.74 | 0.78 | 0.85 | 0.89 |  |
| 0.50                                                                                                                                                                              | 0.50 | 0.20  | 0.51           | 0.59 | 0.65 | 0.70 | 0.76 | 0.81 | 0.84 | 0.89 | 0.92 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.44           | 0.52 | 0.58 | 0.63 | 0.71 | 0.76 | 0.79 | 0.84 | 0.88 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.39           | 0.46 | 0.53 | 0.58 | 0.66 | 0.71 | 0.75 | 0.81 | 0.85 |  |
| 0.30                                                                                                                                                                              | 0.50 | 0.20  | 0.49           | 0.56 | 0.62 | 0.66 | 0.72 | 0.77 | 0.80 | 0.84 | 0.86 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.43           | 0.50 | 0.56 | 0.61 | 0.67 | 0.72 | 0.76 | 0.80 | 0.84 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.38           | 0.45 | 0.52 | 0.56 | 0.63 | 0.68 | 0.72 | 0.77 | 0.81 |  |
| 0.00                                                                                                                                                                              | 0.00 | 0.00  | 0.36           | 0.42 | 0.48 | 0.52 | 0.59 | 0.63 | 0.67 | 0.71 | 0.75 |  |
| Rating:40W Photometrically tested without ceiling board.<br>Multiply UF values by service correction factors<br>Calculate in accordance with CIBSE Technical Memorandum NO.5 1980 |      |       |                |      |      |      |      |      |      |      |      |  |

## Utilisation Factor Table(Wall)

| Utilisation Factors UF(W)                                                                                                                                                         |      |       | SHR NOM = 1.50 |      |      |      |      |      |      |      |      |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|----------------|------|------|------|------|------|------|------|------|--|
| Room Reflectance                                                                                                                                                                  |      |       | Room Index(RI) |      |      |      |      |      |      |      |      |  |
| Ceiling                                                                                                                                                                           | Wall | Floor | 0.75           | 1.00 | 1.25 | 1.50 | 2.00 | 2.50 | 3.00 | 4.00 | 5.00 |  |
| 0.70                                                                                                                                                                              | 0.50 | 0.20  | 1.00           | 0.87 | 0.75 | 0.66 | 0.55 | 0.46 | 0.40 | 0.32 | 0.27 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.84           | 0.74 | 0.65 | 0.59 | 0.49 | 0.43 | 0.38 | 0.31 | 0.26 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.72           | 0.65 | 0.58 | 0.53 | 0.45 | 0.39 | 0.35 | 0.29 | 0.25 |  |
| 0.50                                                                                                                                                                              | 0.50 | 0.20  | 0.95           | 0.82 | 0.71 | 0.63 | 0.52 | 0.47 | 0.38 | 0.31 | 0.26 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.81           | 0.71 | 0.63 | 0.56 | 0.47 | 0.41 | 0.36 | 0.29 | 0.25 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.70           | 0.63 | 0.56 | 0.51 | 0.43 | 0.38 | 0.34 | 0.28 | 0.24 |  |
| 0.30                                                                                                                                                                              | 0.50 | 0.20  | 0.91           | 0.78 | 0.67 | 0.60 | 0.49 | 0.42 | 0.36 | 0.29 | 0.24 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.78           | 0.69 | 0.60 | 0.54 | 0.45 | 0.39 | 0.34 | 0.28 | 0.23 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.68           | 0.61 | 0.54 | 0.49 | 0.42 | 0.36 | 0.32 | 0.27 | 0.23 |  |
| 0.00                                                                                                                                                                              | 0.00 | 0.00  | 0.57           | 0.51 | 0.45 | 0.41 | 0.34 | 0.30 | 0.26 | 0.22 | 0.18 |  |
| Rating:40W Photometrically tested without ceiling board.<br>Multiply UF values by service correction factors<br>Calculate in accordance with CIBSE Technical Memorandum NO.5 1980 |      |       |                |      |      |      |      |      |      |      |      |  |

## Utilisation Factor Table(Ceiling cavity)

| Utilisation Factors UF(C)                                                                                                                                                         |      |       | SHR NOM = 1.50 |      |      |      |      |      |      |      |      |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|----------------|------|------|------|------|------|------|------|------|--|
| Room Reflectance                                                                                                                                                                  |      |       | Room Index(RI) |      |      |      |      |      |      |      |      |  |
| Ceiling                                                                                                                                                                           | Wall | Floor | 0.75           | 1.00 | 1.25 | 1.50 | 2.00 | 2.50 | 3.00 | 4.00 | 5.00 |  |
| 0.70                                                                                                                                                                              | 0.50 | 0.20  | 0.24           | 0.25 | 0.26 | 0.27 | 0.28 | 0.28 | 0.28 | 0.29 | 0.29 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.17           | 0.18 | 0.20 | 0.20 | 0.22 | 0.23 | 0.24 | 0.25 | 0.26 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.12           | 0.13 | 0.14 | 0.16 | 0.18 | 0.19 | 0.20 | 0.22 | 0.23 |  |
| 0.50                                                                                                                                                                              | 0.50 | 0.20  | 0.23           | 0.24 | 0.25 | 0.26 | 0.26 | 0.27 | 0.27 | 0.28 | 0.28 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.16           | 0.18 | 0.19 | 0.20 | 0.21 | 0.22 | 0.23 | 0.24 | 0.25 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.12           | 0.13 | 0.14 | 0.15 | 0.17 | 0.19 | 0.20 | 0.21 | 0.22 |  |
| 0.30                                                                                                                                                                              | 0.50 | 0.20  | 0.22           | 0.23 | 0.24 | 0.25 | 0.25 | 0.26 | 0.26 | 0.27 | 0.27 |  |
|                                                                                                                                                                                   | 0.30 |       | 0.16           | 0.17 | 0.19 | 0.19 | 0.21 | 0.22 | 0.22 | 0.23 | 0.24 |  |
|                                                                                                                                                                                   | 0.20 |       | 0.11           | 0.13 | 0.14 | 0.15 | 0.17 | 0.18 | 0.19 | 0.21 | 0.22 |  |
| 0.00                                                                                                                                                                              | 0.00 | 0.00  | 0.07           | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |  |
| Rating:40W Photometrically tested without ceiling board.<br>Multiply UF values by service correction factors<br>Calculate in accordance with CIBSE Technical Memorandum NO.5 1980 |      |       |                |      |      |      |      |      |      |      |      |  |