



## IESNA LM-79 TEST REPORT

Applicant's name ..... : Espen Technology Inc.

Address ..... : 12257 Florence Ave., Santa Fe Springs, CA 90670, USA

Brand Name ..... : ESPEN

Report No. .... : BTR66.181.15.0030.31

Product Name ..... : LED T8 TUBE

Model Number ..... : L48T8-850-15G-XT N

Tested by  
(printed name and signature) ..... : David Zhang

Title ..... : Test Engineer

Approved by  
(printed name and signature) ..... : Steven Su

Title ..... : Approved Signatory

Date of issue ..... : Jan 20, 2016

Testing Laboratory Name ..... : BEST Test Service Shenzhen Co., Ltd.

Address ..... : 1<sup>st</sup> Floor, 1<sup>st</sup> Building, Weitai Industrial Park, Yingrenshi, Shiyao, Baoan,  
Shenzhen, China

Accreditation ..... : DLC/Lighting Facts/UL/ETL/ELI/NVLAP/EPA/DOE

### Test specification

Standard ..... : IESNA LM-79

Test procedure ..... : IESNA LM-79 Test Procedure

Non-standard test method ..... : No

Test Report Form No. .... : BEST\_ LM-79

TRF originator..... : BEST Test Service Shenzhen Co., Ltd. Mr Tseng

Master TRF ..... : BEST\_ LM-79.doc

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|                                                                              |                                                              |
|------------------------------------------------------------------------------|--------------------------------------------------------------|
| <b>Product description:</b>                                                  |                                                              |
| Test date .....                                                              | Jan 15, 2016 to Jan 20, 2016                                 |
| Sample Quantity .....                                                        | 1 unit                                                       |
| SKU.....                                                                     | N/A                                                          |
| Rating(s) (V; Hz) .....                                                      | AC 100-277V/60Hz                                             |
| Nominal Power .....                                                          | 15W                                                          |
| Nominal Power Factor .....                                                   | >0.9                                                         |
| Nominal Lumen Output.....                                                    | 1800 lm                                                      |
| Nominal CCT .....                                                            | 5000K                                                        |
| Nominal CRI(Ra) .....                                                        | 80                                                           |
| Number of hours operated prior to measurement                                | 0H                                                           |
| Total operating time of the product for measurements including stabilization | 3.5H                                                         |
| Ambient temperature                                                          | 25°C                                                         |
| Orientation (burning position) of SSL product during test                    | Lighting Surface Down                                        |
| Stabilization time                                                           | 1.5 H                                                        |
| Photometric method                                                           | Sphere-spectroradiometer+Goniophotometer                     |
| reference standard used                                                      | DC 24V 100W Omni-Directional Halogen Calibrated by NIM China |
| Correction factors applied                                                   | Self absorbing applied                                       |
| Photometric measurement conditions                                           | See test method description below                            |
| Bandwidth of spectroradiometer                                               | 2nm                                                          |
| Statement of uncertainties                                                   | 1.12%                                                        |
| Deviation from standard operating procedures,                                | None                                                         |

## Photometric and Electrical Measurement

Total light output (luminous flux) for the  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$  ambient temperature conditions is measured using a EVERFINE 2.0 m  $4\pi$  geometry integrating sphere. Temperature is measured at a position inside the sphere. Spectral radiant flux measurements are made using Integral Sphere to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation by a CHROMA 61602 AC SOURCE. Each lamp should be stable before measurements are made as below:

Step 1 Take 3 measurements of the lamp light output at 15 minute interval (total time=30minutes.) This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable.

Luminous flux, chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 2 nm intervals over the range 380 to 780 nm by EVERFINE HASS-2000. The calibration of the sphere photometer-spectrometer system is traceable to the NIM China by a calibrated halogen incandescent lamp. Lamp efficacy (lumens per watts) for each lamp model is computed based on the revised luminous flux result. Electrical measurements including voltage, current, power and power factor are measured using the YOKOGAWA WT310 digital power Meter.

The total uncertainty of the light output measurements is estimated, at the 95% confidence level, not to exceed  $\pm 1.12\%$  over the wavelength range 380-780 nm.

## Luminous Intensity

A Everfine GOR-5000 Goniophotometer was used to measure the intensity at each angle of distribution, Luminous intensity (cd) is measured within each vertical plane at a  $5^{\circ}$  vertical angle increment (maximum) from  $0^{\circ}$  to  $180^{\circ}$  Luminous intensity (cd), measurements repeated in vertical planes about the lamp (polar) axis in maximum increments of  $22.5^{\circ}$  from  $0^{\circ}$  to  $180^{\circ}$ , and export the intensity (cd) with excel format. The test distance is 25meters from the Goniophotometer to the detector

### Photometric and Electrical Test Data

| Input Voltage (V) | Frequency (Hz) | Input Current (A) | ITHD         | Input Power (W) | Power Factor  | Lumen Output (Lumens) | Efficiency Lumen/w |
|-------------------|----------------|-------------------|--------------|-----------------|---------------|-----------------------|--------------------|
| 120.0             | 60.0           | 0.123             | /            | 14.72           | 0.997         | 1811.80               | 123.08             |
| CCT (K)           | CRI (Ra)       | R9                | x<br>CIE1931 | y<br>CIE1931    | u'<br>CIE1976 | v'<br>CIE1976         | Duv<br>CIE1976     |
| 4981              | 84.7           | 17                | 0.3462       | 0.3583          | 0.2096        | 0.4880                | 0.0029             |

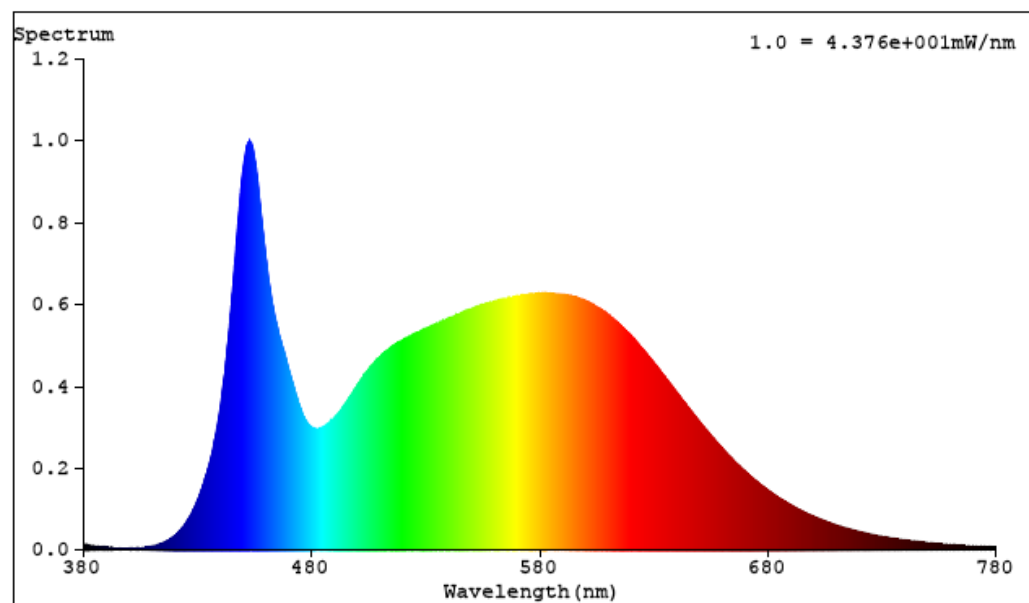
## Luminous Intensity

2 lamps together with driver, were installed in a LITHONIA 2GT8 Troffer lensed 2\*4, and mounted in the centre of Goniophotometer, Everfine GOR-5000 Goniophotometer was used to measure the intensity at each angle of distribution, Luminous intensity (cd) is measured within each vertical plane at a  $5^{\circ}$  vertical angle increment (maximum) from  $0^{\circ}$  to  $180^{\circ}$  Luminous intensity (cd), measurements repeated in vertical planes about the lamp (polar) axis in maximum increments of  $22.5^{\circ}$  from  $0^{\circ}$  to  $180^{\circ}$ , and export the intensity (cd) with excel format. The test distance is 25 meters from the Goniophotometer to the detector

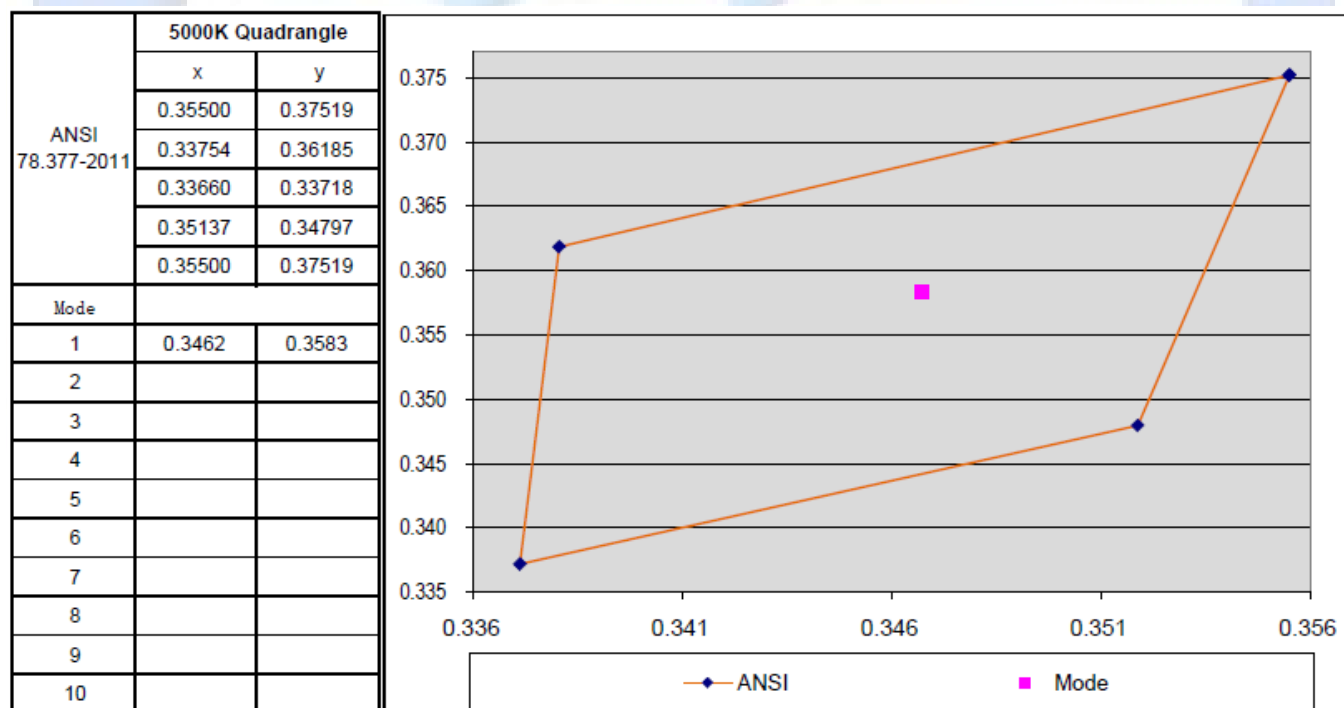
### Photometric and Electrical Test Data

| Input Voltage (V) | Frequency (Hz) | Input Current (A) | ITHD | Input Power (W) | Power Factor | Lumen Output (Lumens) | Efficiency Lumen/w | Spacing Criteria 0-180° | Spacing Criteria 90-270° |
|-------------------|----------------|-------------------|------|-----------------|--------------|-----------------------|--------------------|-------------------------|--------------------------|
| 120.0             | 60.0           | 0.252             | 5.4% | 30.14           | 0.997        | 2911.34               | 96.59              | 1.34                    | 1.28                     |

## Spectral Plots



## 7 Step Quadrangle



## EUT Photo



**Luminous Intensity Distribution Test Plots (CIE Chromaticity)**

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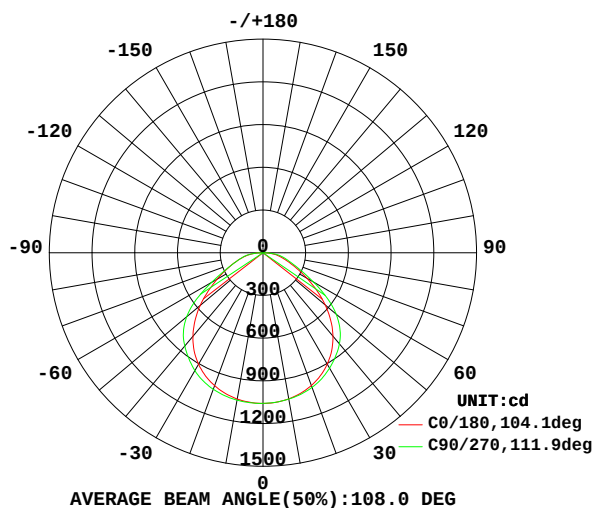


## LUMINAIRE PHOTOMETRIC TEST REPORT

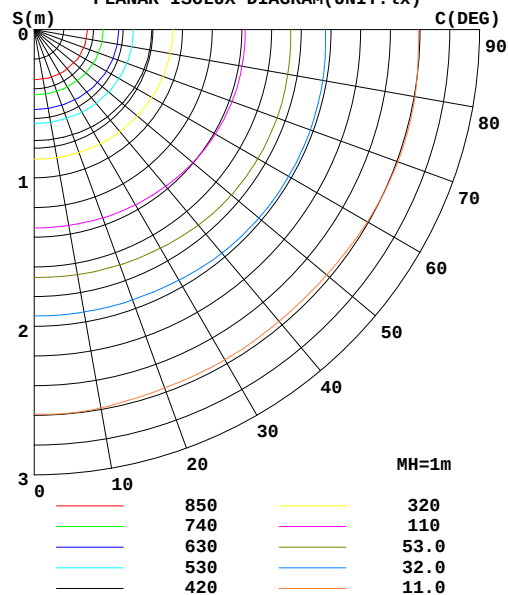
|                                                                   |                         |                   |
|-------------------------------------------------------------------|-------------------------|-------------------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |                         |                   |
| NAME:                                                             | TYPE:L48T8/850/15G-XT N | WEIGHT:           |
| SPEC.:                                                            | DIM.:                   | SERIAL No.:       |
| MFR.: ESPEN                                                       | SUR.:1.2*0.6            | PROTECTION ANGLE: |

| DATA OF LAMP     |                    | PHOTOMETRIC DATA Eff: 96.59 lm/W |        |                    |           |
|------------------|--------------------|----------------------------------|--------|--------------------|-----------|
| MODEL            | L48T8/850/15G-XT N | I <sub>max</sub> (cd)            | 1058   | S/MH(C0/180)       | 1.26      |
| NOMINAL POWER(W) | 15                 | LOR(%)                           | 100.0  | S/MH(C90/270)      | 1.31      |
| RATED VOLTAGE(V) | 120.0              | TOTAL FLUX(lm)                   | 2911.3 | η UP, DN(C0-180)   | 0.1, 50.3 |
| NOMINAL FLUX(lm) | 1455.67            | CIE CLASS                        | DIRECT | η UP, DN(C180-360) | 0.0, 49.6 |
| LAMPS INSIDE     | 2                  | η up(%)                          | 0.1    | CIBSE SHR NOM      | 1.25      |
| TEST VOLTAGE(V)  | 120.0              | η down(%)                        | 99.9   | CIBSE SHR MAX      | 1.35      |

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



PLANAR ISOLUX DIAGRAM(UNIT: lx)



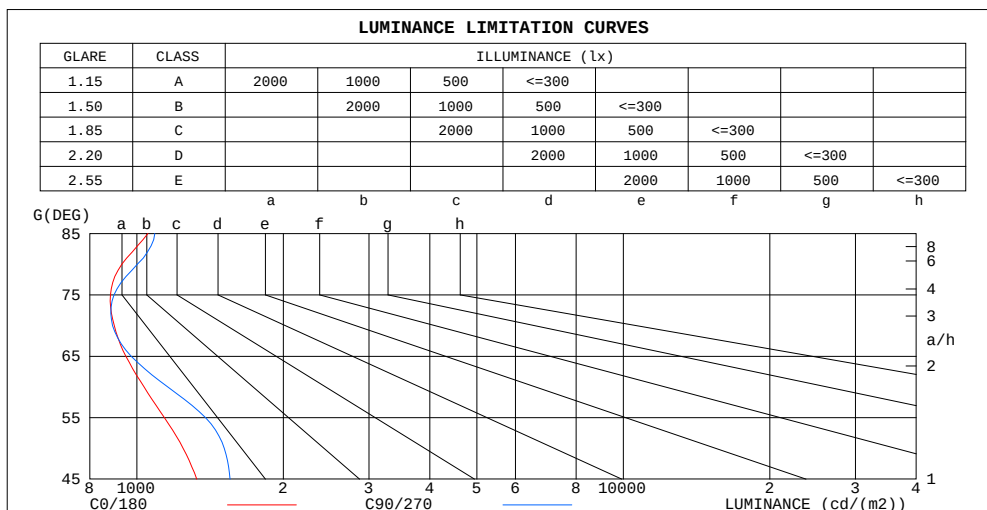
C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature: 25.6DEG  
 Operators: David  
 Test Date: 2016-01-16

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System: EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity: 67.1%  
 Test Distance: 2.455m [K=1.0000]  
 Remarks:

## ZONAL FLUX DIAGRAM AND LUMINANCE LIMITATION CURVES

### ZONAL FLUX DIAGRAM:

| $\gamma$ | C0                    | C45    | C90    | C135   | C180   | C225   | C270   | C315   | $\gamma$ | $\Phi$ zone | $\Phi$ total | %lum, lamp |
|----------|-----------------------|--------|--------|--------|--------|--------|--------|--------|----------|-------------|--------------|------------|
| 10       | 1043                  | 1047   | 1051   | 1047   | 1042   | 1041   | 1044   | 1043   | 0- 10    | 100.4       | 100.4        | 3.45,3.45  |
| 20       | 993.6                 | 1008   | 1020   | 1008   | 992.4  | 996.4  | 1007   | 1002   | 10- 20   | 290.4       | 390.7        | 13.4,13.4  |
| 30       | 905.0                 | 934.1  | 956.3  | 933.8  | 902.9  | 917.3  | 935.5  | 925.7  | 20- 30   | 447.0       | 837.8        | 28.8,28.8  |
| 40       | 765.3                 | 812.4  | 854.6  | 815.8  | 764.7  | 796.0  | 835.3  | 799.9  | 30- 40   | 544.8       | 1383         | 47.5,47.5  |
| 50       | 576.1                 | 638.1  | 699.8  | 640.6  | 570.7  | 620.2  | 670.5  | 623.3  | 40- 50   | 558.4       | 1941         | 66.7,66.7  |
| 60       | 372.4                 | 418.8  | 416.8  | 392.4  | 354.7  | 383.7  | 406.9  | 410.0  | 50- 60   | 459.6       | 2401         | 82.5,82.5  |
| 70       | 221.3                 | 208.8  | 219.5  | 172.1  | 192.9  | 175.7  | 216.1  | 206.1  | 60- 70   | 285.4       | 2686         | 92.3,92.3  |
| 80       | 116.4                 | 103.2  | 125.3  | 93.05  | 100.6  | 91.50  | 122.5  | 104.7  | 70- 80   | 158.6       | 2845         | 97.7,97.7  |
| 90       | 5.426                 | 6.042  | 8.370  | 2.596  | 0.1968 | 0.6489 | 0.9276 | 2.336  | 80- 90   | 63.82       | 2908         | 99.9,99.9  |
| 100      | 0.2530                | 0.4569 | 0.2129 | 0.3782 | 0.2681 | 0.3390 | 0.1823 | 0.3131 | 90-100   | 0.6483      | 2909         | 99.9,99.9  |
| 110      | 0.3546                | 0.4736 | 0.5273 | 0.4277 | 0.2611 | 0.3531 | 0.3913 | 0.3189 | 100-110  | 0.3824      | 2910         | 99.9,99.9  |
| 120      | 0.3816                | 0.4280 | 0.5756 | 0.3965 | 0.3511 | 0.3615 | 0.4025 | 0.3370 | 110-120  | 0.3886      | 2910         | 100,100    |
| 130      | 0.3879                | 0.4451 | 0.5149 | 0.4686 | 0.4123 | 0.4299 | 0.4289 | 0.3743 | 120-130  | 0.3665      | 2910         | 100,100    |
| 140      | 0.4201                | 0.5044 | 0.5927 | 0.4925 | 0.4452 | 0.4592 | 0.4809 | 0.4401 | 130-140  | 0.3488      | 2911         | 100,100    |
| 150      | 0.4882                | 0.5453 | 0.5666 | 0.5036 | 0.4544 | 0.4432 | 0.4340 | 0.4130 | 140-150  | 0.3033      | 2911         | 100,100    |
| 160      | 0.4997                | 0.5646 | 0.5170 | 0.5481 | 0.4441 | 0.4453 | 0.3761 | 0.4443 | 150-160  | 0.2199      | 2911         | 100,100    |
| 170      | 0.4721                | 0.5289 | 0.4731 | 0.5486 | 0.4521 | 0.4664 | 0.4077 | 0.4666 | 160-170  | 0.1357      | 2911         | 100,100    |
| 180      | 0.5876                | 0.5518 | 0.5399 | 0.5522 | 0.5878 | 0.5643 | 0.4972 | 0.5413 | 170-180  | 0.0521      | 2911         | 100,100    |
| DEG      | LUMINOUS INTENSITY:cd |        |        |        |        |        |        |        |          | UNIT: lm    |              |            |



| LUMINANCE cd/(m <sup>2</sup> ) |        |         |
|--------------------------------|--------|---------|
| G(°)                           | C0/180 | C90/270 |
| 85                             | 1054   | 1089    |
| 80                             | 931    | 1002    |
| 75                             | 882    | 897     |
| 70                             | 899    | 891     |
| 65                             | 949    | 973     |
| 60                             | 1034   | 1158    |
| 55                             | 1139   | 1384    |
| 50                             | 1245   | 1512    |
| 45                             | 1328   | 1554    |

C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature: 25.6DEG  
Operators: David  
Test Date: 2016-01-16

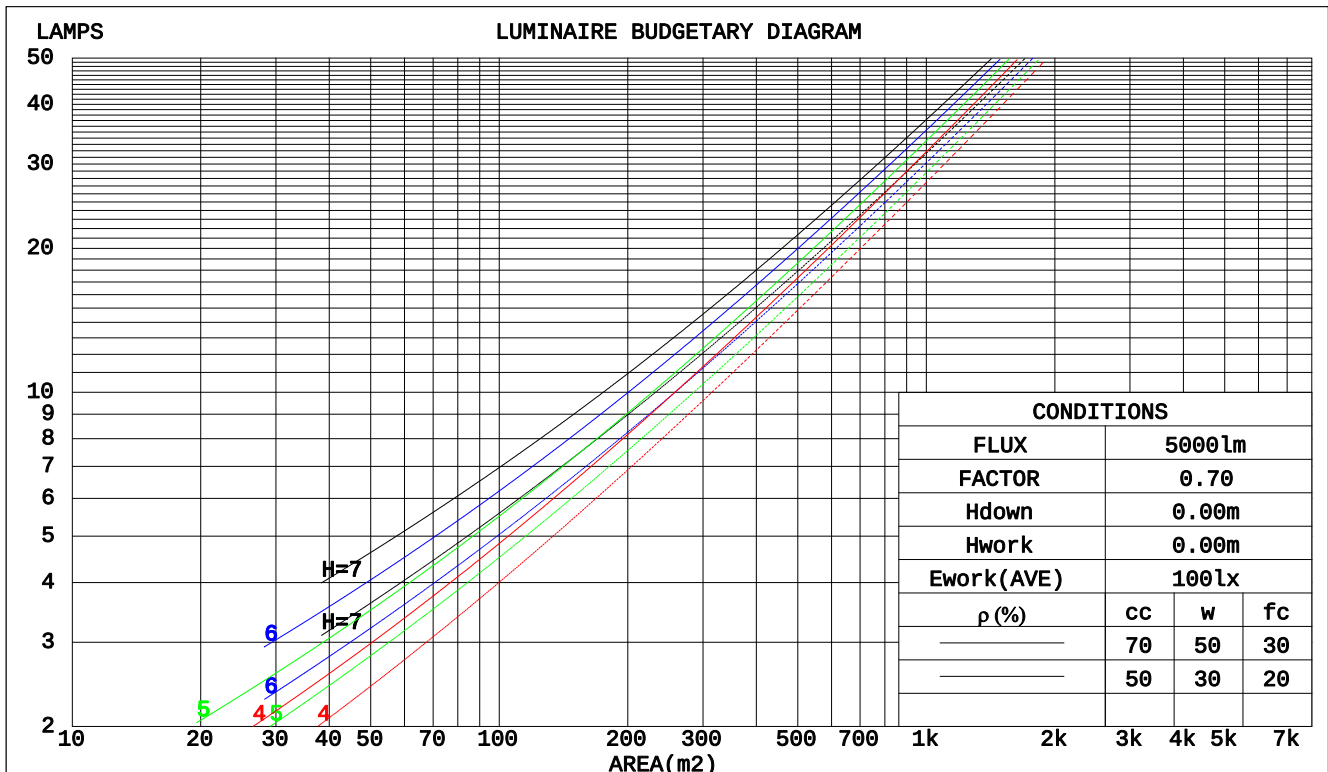
$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
Humidity: 67.1%  
Test Distance: 2.455m [K=1.0000]  
Remarks:



## CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

|                                                                   |                         |                   |
|-------------------------------------------------------------------|-------------------------|-------------------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |                         |                   |
| NAME:                                                             | TYPE:L48T8/850/15G-XT N | WEIGHT:           |
| SPEC.:                                                            | DIM.:                   | SERIAL No.:       |
| MFR.: ESPEN                                                       | SUR.:1.2*0.6            | PROTECTION ANGLE: |

| $\rho_{CC}$ | 80%                   |      |      | 70%  |      |      | 50%                             |      |      | 30%  |      |      | 10%  |      |      | 0   |
|-------------|-----------------------|------|------|------|------|------|---------------------------------|------|------|------|------|------|------|------|------|-----|
| $\rho_W$    | 50%                   | 30%  | 10%  | 50%  | 30%  | 10%  | 50%                             | 30%  | 10%  | 50%  | 30%  | 10%  | 50%  | 30%  | 10%  | 0   |
| $\rho_{fc}$ | 20%                   |      |      | 20%  |      |      | 20%                             |      |      | 20%  |      |      | 20%  |      |      | 0   |
| RCR         | RCR:Room Cavity Ratio |      |      |      |      |      | Coefficients of Utilization(CU) |      |      |      |      |      |      |      |      |     |
| 0.0         | 1.19                  | 1.19 | 1.19 | 1.16 | 1.16 | 1.16 | 1.11                            | 1.11 | 1.11 | 1.06 | 1.06 | 1.06 | 1.02 | 1.02 | 1.02 | .00 |
| 1.0         | 1.04                  | 1.00 | .97  | 1.02 | .98  | .95  | .98                             | .95  | .92  | .94  | .91  | .89  | .90  | .88  | .86  | .84 |
| 2.0         | .92                   | .85  | .79  | .90  | .84  | .78  | .86                             | .81  | .77  | .83  | .79  | .75  | .80  | .76  | .73  | .71 |
| 3.0         | .81                   | .73  | .67  | .79  | .72  | .66  | .76                             | .70  | .65  | .74  | .68  | .64  | .71  | .66  | .63  | .60 |
| 4.0         | .72                   | .63  | .57  | .71  | .63  | .56  | .68                             | .61  | .56  | .66  | .60  | .55  | .64  | .58  | .54  | .52 |
| 5.0         | .64                   | .56  | .49  | .63  | .55  | .49  | .61                             | .54  | .48  | .59  | .53  | .48  | .57  | .52  | .47  | .45 |
| 6.0         | .58                   | .49  | .43  | .57  | .49  | .43  | .55                             | .48  | .42  | .54  | .47  | .42  | .52  | .46  | .42  | .40 |
| 7.0         | .53                   | .44  | .38  | .52  | .44  | .38  | .50                             | .43  | .38  | .49  | .42  | .37  | .47  | .42  | .37  | .35 |
| 8.0         | .48                   | .40  | .34  | .47  | .39  | .34  | .46                             | .39  | .34  | .45  | .38  | .33  | .44  | .38  | .33  | .31 |
| 9.0         | .44                   | .36  | .30  | .44  | .36  | .30  | .42                             | .35  | .30  | .41  | .35  | .30  | .40  | .34  | .30  | .28 |
| 10.0        | .41                   | .33  | .28  | .40  | .33  | .28  | .39                             | .32  | .27  | .38  | .32  | .27  | .37  | .31  | .27  | .25 |



C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:2016-01-16

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity:67.1%  
 Test Distance:2.455m [K=1.0000]  
 Remarks:

## WEC AND CCEC

|                                                                   |  |  |                         |  |                   |
|-------------------------------------------------------------------|--|--|-------------------------|--|-------------------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |  |  |                         |  |                   |
| NAME:                                                             |  |  | TYPE:L48T8/850/15G-XT N |  | WEIGHT:           |
| SPEC.:                                                            |  |  | DIM.:                   |  | SERIAL No.:       |
| MFR.: ESPEN                                                       |  |  | SUR.:1.2*0.6            |  | PROTECTION ANGLE: |

| $\rho_{CC}$ | 80%                   |      |      | 70%  |      |      | 50%                             |      |      | 30%  |      |      | 10%  |      |      | 0 |
|-------------|-----------------------|------|------|------|------|------|---------------------------------|------|------|------|------|------|------|------|------|---|
| $\rho_W$    | 50%                   | 30%  | 10%  | 50%  | 30%  | 10%  | 50%                             | 30%  | 10%  | 50%  | 30%  | 10%  | 50%  | 30%  | 10%  | 0 |
| $\rho_{fc}$ | 20%                   |      |      | 20%  |      |      | 20%                             |      |      | 20%  |      |      | 20%  |      |      | 0 |
| RCR         | RCR:Room Cavity Ratio |      |      |      |      |      | Wall Exitance Coefficients(WEC) |      |      |      |      |      |      |      |      |   |
| 0.0         |                       |      |      |      |      |      |                                 |      |      |      |      |      |      |      |      |   |
| 1.0         | .299                  | .170 | .054 | .292 | .166 | .053 | .278                            | .160 | .051 | .266 | .153 | .049 | .255 | .148 | .048 |   |
| 2.0         | .280                  | .154 | .047 | .274 | .151 | .047 | .263                            | .146 | .045 | .252 | .141 | .044 | .242 | .137 | .043 |   |
| 3.0         | .260                  | .139 | .042 | .255 | .137 | .041 | .245                            | .133 | .040 | .235 | .129 | .040 | .226 | .125 | .039 |   |
| 4.0         | .241                  | .125 | .037 | .237 | .124 | .037 | .227                            | .121 | .036 | .219 | .118 | .035 | .211 | .115 | .035 |   |
| 5.0         | .224                  | .114 | .033 | .220 | .113 | .033 | .212                            | .110 | .032 | .204 | .108 | .032 | .197 | .105 | .032 |   |
| 6.0         | .209                  | .105 | .030 | .205 | .103 | .030 | .198                            | .101 | .029 | .191 | .099 | .029 | .185 | .097 | .029 |   |
| 7.0         | .195                  | .096 | .027 | .191 | .095 | .027 | .185                            | .093 | .027 | .179 | .092 | .027 | .173 | .090 | .026 |   |
| 8.0         | .182                  | .089 | .025 | .179 | .088 | .025 | .174                            | .087 | .025 | .168 | .085 | .025 | .163 | .084 | .024 |   |
| 9.0         | .171                  | .083 | .023 | .169 | .082 | .023 | .163                            | .081 | .023 | .158 | .079 | .023 | .154 | .078 | .023 |   |
| 10.0        | .161                  | .077 | .021 | .159 | .077 | .021 | .154                            | .076 | .021 | .150 | .074 | .021 | .146 | .073 | .021 |   |

| ρ <sub>CC</sub> | 80%                   |      |      | 70%  |      |      | 50%                                        |      |      | 30%  |      |      | 10%  |      |      | 0 |
|-----------------|-----------------------|------|------|------|------|------|--------------------------------------------|------|------|------|------|------|------|------|------|---|
| ρ <sub>W</sub>  | 50%                   | 30%  | 10%  | 50%  | 30%  | 10%  | 50%                                        | 30%  | 10%  | 50%  | 30%  | 10%  | 50%  | 30%  | 10%  | 0 |
| ρ <sub>fc</sub> | 20%                   |      |      | 20%  |      |      | 20%                                        |      |      | 20%  |      |      | 20%  |      |      | 0 |
| RCR             | RCR:Room Cavity Ratio |      |      |      |      |      | Ceiling Cavity Exitance Coefficients(CCEC) |      |      |      |      |      |      |      |      |   |
| 0.0             | .191                  | .191 | .191 | .163 | .163 | .163 | .112                                       | .112 | .112 | .064 | .064 | .064 | .020 | .020 | .020 |   |
| 1.0             | .180                  | .157 | .136 | .154 | .135 | .117 | .106                                       | .093 | .081 | .061 | .054 | .047 | .019 | .017 | .015 |   |
| 2.0             | .171                  | .133 | .100 | .147 | .114 | .087 | .101                                       | .079 | .060 | .058 | .046 | .035 | .019 | .015 | .012 |   |
| 3.0             | .163                  | .115 | .076 | .140 | .099 | .066 | .096                                       | .069 | .046 | .056 | .040 | .027 | .018 | .013 | .009 |   |
| 4.0             | .156                  | .102 | .060 | .134 | .088 | .052 | .092                                       | .061 | .037 | .053 | .036 | .022 | .017 | .012 | .007 |   |
| 5.0             | .148                  | .091 | .049 | .127 | .079 | .043 | .088                                       | .055 | .030 | .051 | .032 | .018 | .016 | .011 | .006 |   |
| 6.0             | .141                  | .083 | .041 | .121 | .072 | .035 | .084                                       | .050 | .025 | .049 | .029 | .015 | .016 | .010 | .005 |   |
| 7.0             | .135                  | .076 | .035 | .116 | .066 | .030 | .080                                       | .046 | .021 | .046 | .027 | .013 | .015 | .009 | .004 |   |
| 8.0             | .128                  | .070 | .030 | .110 | .061 | .026 | .076                                       | .043 | .018 | .044 | .025 | .011 | .014 | .008 | .004 |   |
| 9.0             | .122                  | .065 | .026 | .105 | .056 | .023 | .073                                       | .040 | .016 | .043 | .023 | .010 | .014 | .008 | .003 |   |
| 10.0            | .117                  | .061 | .023 | .101 | .053 | .020 | .070                                       | .037 | .015 | .041 | .022 | .009 | .013 | .007 | .003 |   |

C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:2016-01-16

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity:67.1%  
 Test Distance:2.455m [K=1.0000]  
 Remarks:

## UGR(Unified Glare Rating) Table

|                                                                   |     |                  |      |      |                         |      |                |                   |      |      |      |
|-------------------------------------------------------------------|-----|------------------|------|------|-------------------------|------|----------------|-------------------|------|------|------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |     |                  |      |      |                         |      |                |                   |      |      |      |
| NAME:                                                             |     |                  |      |      | TYPE:L48T8/850/15G-XT N |      |                | WEIGHT:           |      |      |      |
| SPEC.:                                                            |     |                  |      |      | DIM.:                   |      |                | SERIAL No.:       |      |      |      |
| MFR.: ESPEN                                                       |     |                  |      |      | SUR.:1.2*0.6            |      |                | PROTECTION ANGLE: |      |      |      |
| ceiling/cavity                                                    | 0.7 | 0.7              | 0.5  | 0.5  | 0.3                     | 0.7  | 0.7            | 0.5               | 0.5  | 0.3  |      |
| walls                                                             | 0.5 | 0.3              | 0.5  | 0.3  | 0.3                     | 0.5  | 0.3            | 0.5               | 0.3  | 0.3  |      |
| working 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                                                     |     | 13.2             | 14.6 | 13.4 | 14.8                    | 15.1 | 13.9           | 15.4              | 14.2 | 15.6 | 15.8 |
|                                                                   | 3H  | 14.3             | 15.7 | 14.6 | 15.9                    | 16.1 | 14.9           | 16.2              | 15.2 | 16.5 | 16.7 |
|                                                                   | 4H  | 14.8             | 16.1 | 15.1 | 16.4                    | 16.6 | 15.3           | 16.6              | 15.7 | 16.9 | 17.2 |
|                                                                   | 6H  | 15.3             | 16.6 | 15.7 | 16.8                    | 17.1 | 15.8           | 17.1              | 16.2 | 17.3 | 17.6 |
|                                                                   | 8H  | 15.6             | 16.8 | 15.9 | 17.0                    | 17.3 | 16.1           | 17.3              | 16.4 | 17.5 | 17.8 |
|                                                                   | 12H | 15.8             | 16.9 | 16.1 | 17.2                    | 17.5 | 16.3           | 17.4              | 16.6 | 17.7 | 18.0 |
| 4H                                                                | 2H  | 13.7             | 15.0 | 14.0 | 15.2                    | 15.5 | 14.3           | 15.6              | 14.6 | 15.8 | 16.1 |
|                                                                   | 3H  | 15.0             | 16.1 | 15.3 | 16.4                    | 16.7 | 15.4           | 16.6              | 15.8 | 16.9 | 17.2 |
|                                                                   | 4H  | 15.6             | 16.7 | 16.0 | 17.0                    | 17.3 | 16.1           | 17.1              | 16.4 | 17.4 | 17.7 |
|                                                                   | 6H  | 16.3             | 17.2 | 16.7 | 17.6                    | 17.9 | 16.7           | 17.7              | 17.1 | 18.0 | 18.4 |
|                                                                   | 8H  | 16.6             | 17.5 | 17.0 | 17.8                    | 18.2 | 17.1           | 17.9              | 17.5 | 18.3 | 18.7 |
|                                                                   | 12H | 16.9             | 17.7 | 17.3 | 18.1                    | 18.5 | 17.4           | 18.1              | 17.8 | 18.5 | 18.9 |
| 8H                                                                | 4H  | 15.8             | 16.7 | 16.2 | 17.0                    | 17.4 | 16.2           | 17.1              | 16.6 | 17.4 | 17.8 |
|                                                                   | 6H  | 16.7             | 17.4 | 17.1 | 17.8                    | 18.2 | 17.1           | 17.8              | 17.5 | 18.2 | 18.6 |
|                                                                   | 8H  | 17.1             | 17.7 | 17.6 | 18.2                    | 18.6 | 17.6           | 18.2              | 18.0 | 18.6 | 19.1 |
|                                                                   | 12H | 17.5             | 18.1 | 18.0 | 18.5                    | 19.0 | 18.0           | 18.5              | 18.5 | 19.0 | 19.5 |
| 12H                                                               | 4H  | 15.9             | 16.6 | 16.3 | 17.0                    | 17.4 | 16.2           | 17.0              | 16.7 | 17.4 | 17.8 |
|                                                                   | 6H  | 16.8             | 17.4 | 17.2 | 17.8                    | 18.3 | 17.2           | 17.8              | 17.6 | 18.2 | 18.7 |
|                                                                   | 8H  | 17.3             | 17.8 | 17.7 | 18.2                    | 18.7 | 17.7           | 18.2              | 18.2 | 18.7 | 19.1 |
| Variations with the observer position at spacings:                |     |                  |      |      |                         |      |                |                   |      |      |      |
| S = 1.0H                                                          |     | + 0.2 / - 0.3    |      |      |                         |      | + 0.2 / - 0.2  |                   |      |      |      |
| 1.5H                                                              |     | + 0.2 / - 0.4    |      |      |                         |      | + 0.3 / - 0.5  |                   |      |      |      |
| 2.0H                                                              |     | + 0.2 / - 0.4    |      |      |                         |      | + 0.4 / - 0.4  |                   |      |      |      |

CIE Pub.117 Corrected 2911 lm Total Lamp Luminous Flux.(8log(F/F0) = 3.7)

C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:2016-01-16

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity:67.1%  
 Test Distance:2.455m [K=1.0000]  
 Remarks:

## UTILIZATION FACTORS TABLE

|                                                                   |                         |                   |
|-------------------------------------------------------------------|-------------------------|-------------------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |                         |                   |
| NAME:                                                             | TYPE:L48T8/850/15G-XT N | WEIGHT:           |
| SPEC.:                                                            | DIM.:                   | SERIAL No.:       |
| MFR.: ESPEN                                                       | SUR.:1.2*0.6            | PROTECTION ANGLE: |

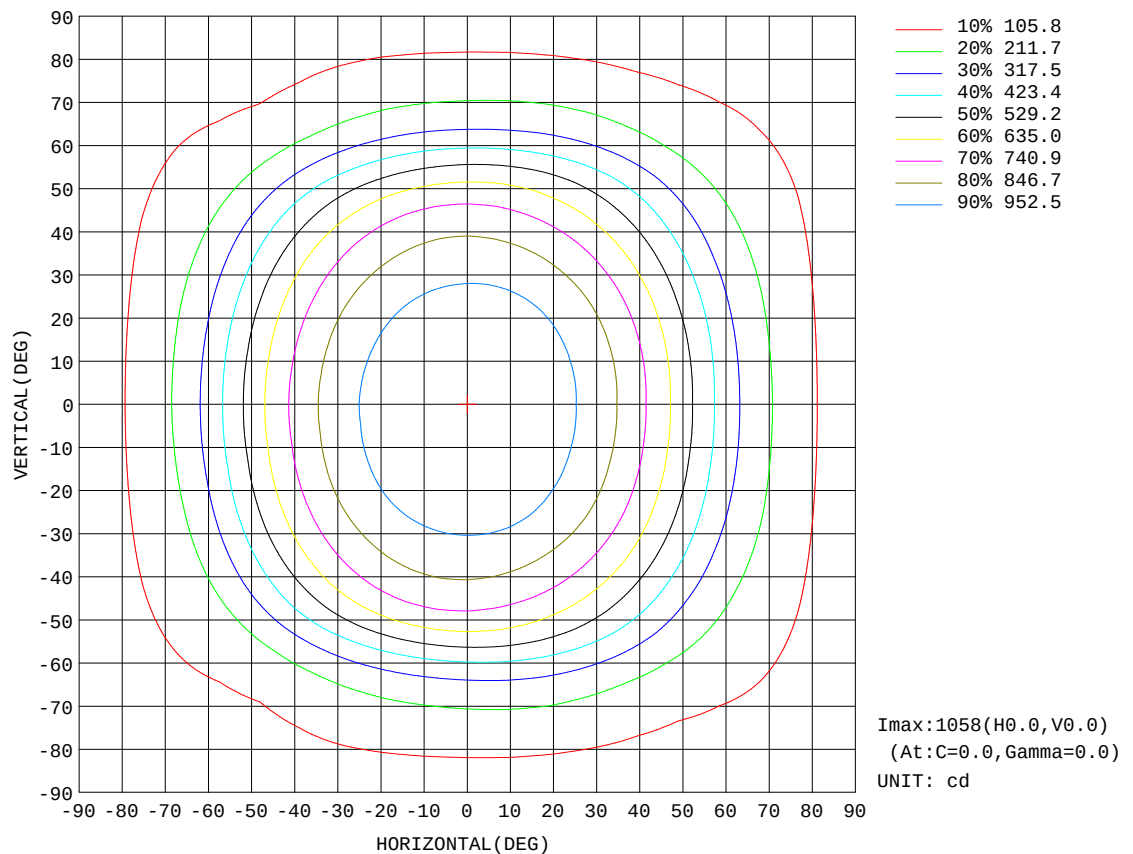
| REFLECTANCE                      |                                                     |     |           |     |     |     |     |               |     |        |
|----------------------------------|-----------------------------------------------------|-----|-----------|-----|-----|-----|-----|---------------|-----|--------|
| Ceiling                          | 0.8                                                 | 0.8 | 0.8       | 0.7 | 0.7 | 0.7 | 0.5 | 0.5           | 0.5 | 0      |
| Walls                            | 0.7                                                 | 0.5 | 0.3       | 0.7 | 0.5 | 0.3 | 0.7 | 0.5           | 0.3 | 0      |
| Working plane                    | 0.2                                                 | 0.2 | 0.2       | 0.2 | 0.2 | 0.2 | 0.2 | 0.2           | 0.2 | 0      |
| ROOM INDEX                       | UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$ |     |           |     |     |     |     |               |     |        |
| $k = 0.60$                       | 59                                                  | 47  | 41        | 58  | 47  | 41  | 57  | 47            | 40  | 34     |
| 0.80                             | 69                                                  | 58  | 51        | 68  | 57  | 51  | 66  | 57            | 50  | 43     |
| 1.00                             | 78                                                  | 67  | 60        | 77  | 66  | 60  | 74  | 68            | 59  | 52     |
| 1.25                             | 85                                                  | 75  | 68        | 83  | 74  | 67  | 81  | 73            | 67  | 60     |
| 1.50                             | 90                                                  | 80  | 74        | 88  | 79  | 73  | 85  | 78            | 72  | 65     |
| 2.00                             | 96                                                  | 88  | 82        | 94  | 87  | 81  | 91  | 85            | 80  | 72     |
| 2.50                             | 100                                                 | 92  | 87        | 98  | 91  | 86  | 94  | 88            | 84  | 76     |
| 3.00                             | 103                                                 | 96  | 91        | 101 | 95  | 90  | 97  | 92            | 88  | 80     |
| 4.00                             | 107                                                 | 101 | 97        | 104 | 99  | 95  | 100 | 96            | 93  | 84     |
| 5.00                             | 109                                                 | 104 | 100       | 107 | 102 | 99  | 102 | 99            | 96  | 87     |
| ROOM INDEX                       | UF(total)                                           |     |           |     |     |     |     |               |     | Direct |
| According to DIN EN 13032-2 2004 |                                                     |     | Suspended |     |     |     |     | SHRNOM = 1.25 |     |        |

C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:2016-01-16

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity:67.1%  
 Test Distance:2.455m [K=1.0000]  
 Remarks:

## ISOCANDELA DIAGRAM

|                                                                   |                         |                   |
|-------------------------------------------------------------------|-------------------------|-------------------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |                         |                   |
| NAME:                                                             | TYPE:L48T8/850/15G-XT N | WEIGHT:           |
| SPEC.:                                                            | DIM.:                   | SERIAL No.:       |
| MFR.: ESPEN                                                       | SUR.:1.2*0.6            | PROTECTION ANGLE: |



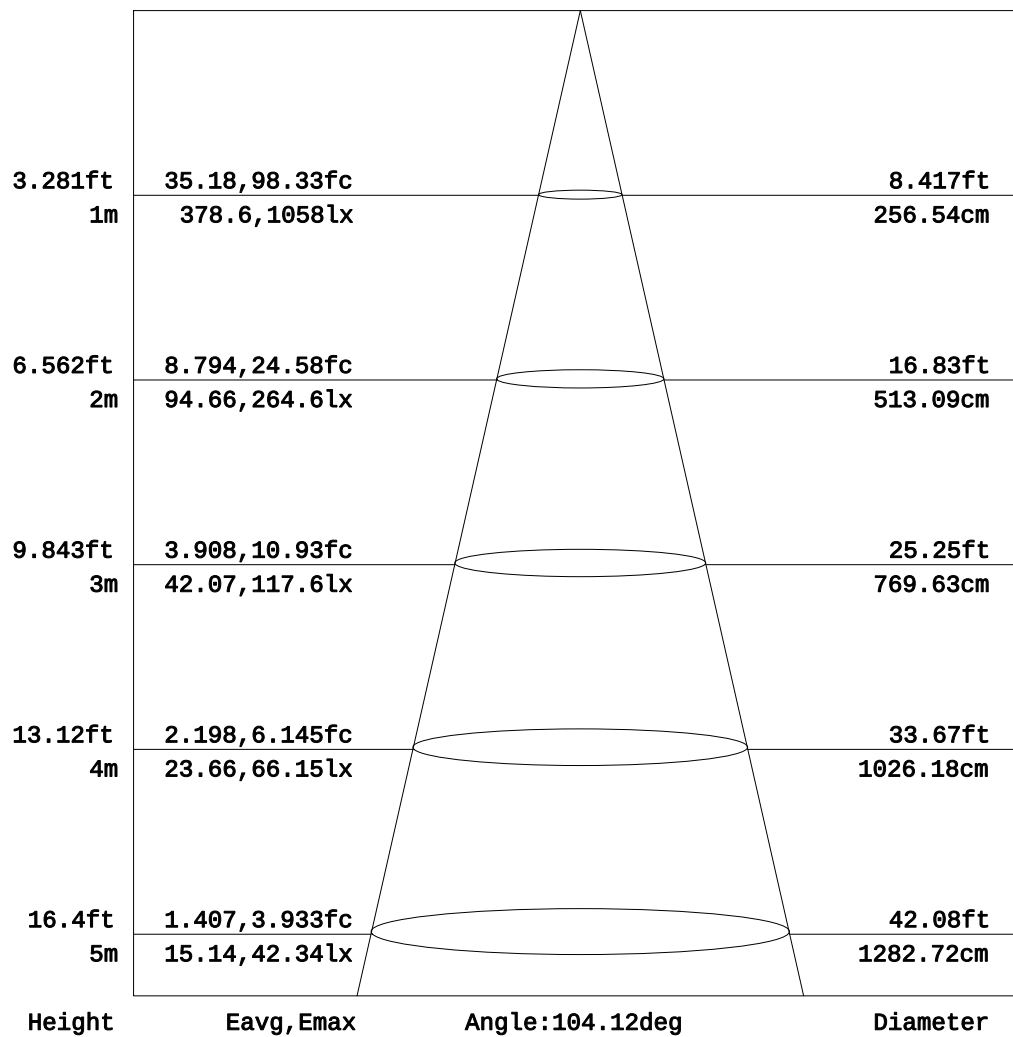
C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature:25.6DEG  
Operators:David  
Test Date:2016-01-16

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
Humidity:67.1%  
Test Distance:2.455m [K=1.0000]  
Remarks:

## AAI Figure

|                                                                   |                         |                   |
|-------------------------------------------------------------------|-------------------------|-------------------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |                         |                   |
| NAME:                                                             | TYPE:L48T8/850/15G-XT N | WEIGHT:           |
| SPEC.:                                                            | DIM.:                   | SERIAL No.:       |
| MFR.: ESPEN                                                       | SUR.:1.2*0.6            | PROTECTION ANGLE: |

Flux out:2095 lm



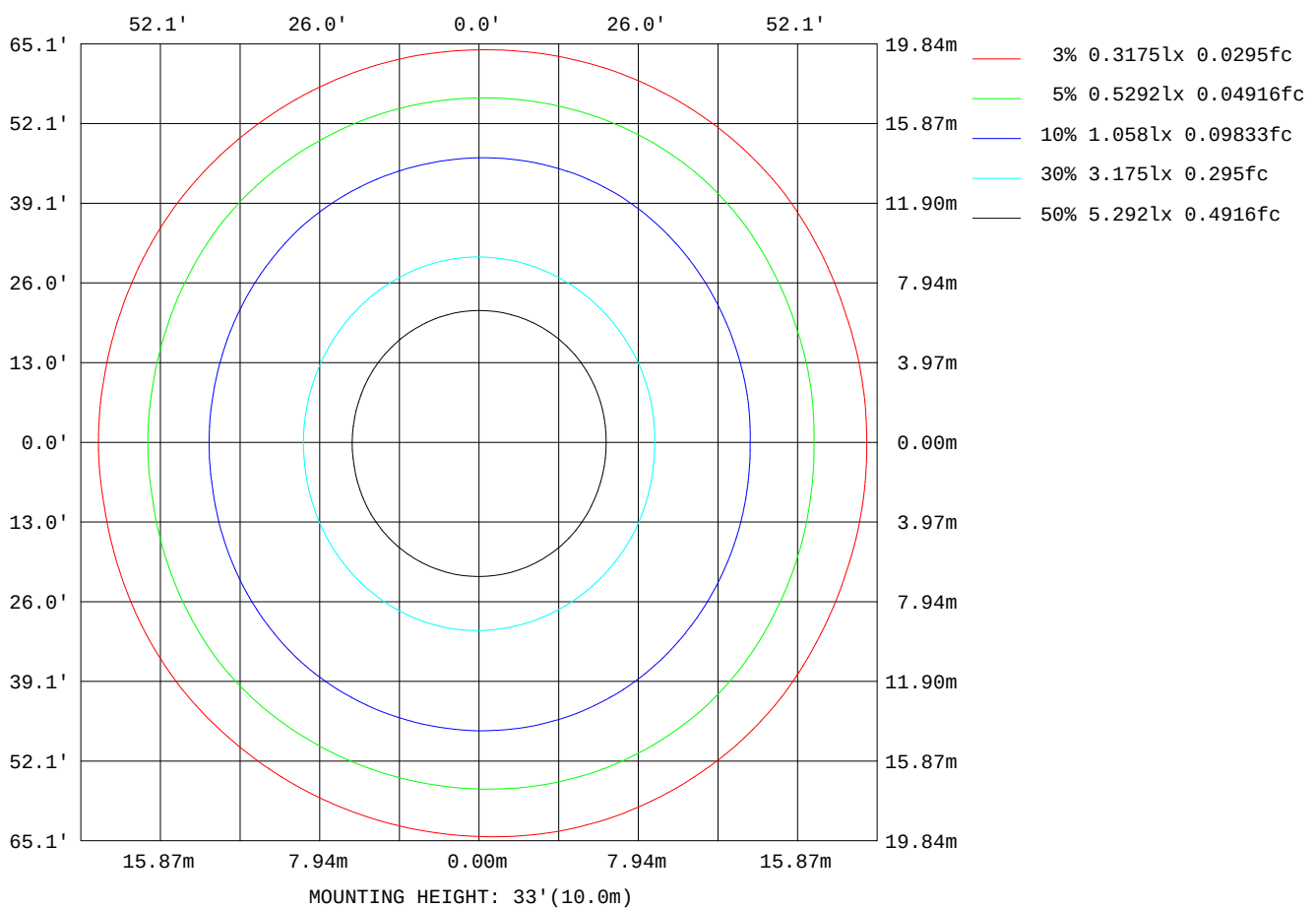
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature: 25.6DEG  
Operators: David  
Test Date: 2016-01-16

γ Range: 0 - 180DEG  
γ Interval: 1.0DEG  
Test System: EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
Humidity: 67.1%  
Test Distance: 2.455m [K=1.0000]  
Remarks:

## ISOLUX DIAGRAM

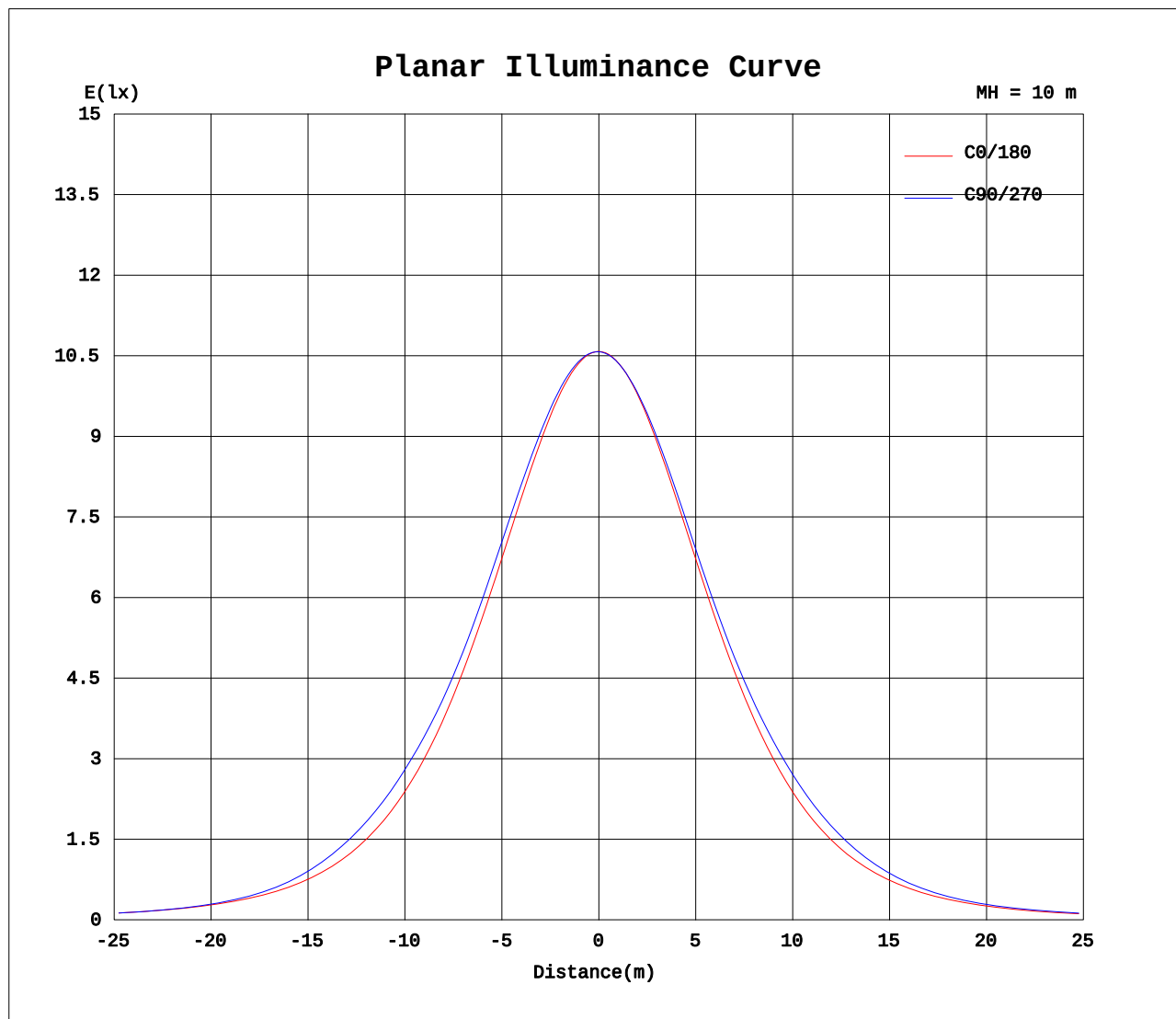
|                                                                   |                         |                   |
|-------------------------------------------------------------------|-------------------------|-------------------|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |                         |                   |
| NAME:                                                             | TYPE:L48T8/850/15G-XT N | WEIGHT:           |
| SPEC.:                                                            | DIM.:                   | SERIAL No.:       |
| MFR.: ESPEN                                                       | SUR.:1.2*0.6            | PROTECTION ANGLE: |



C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:2016-01-16

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity:67.1%  
 Test Distance:2.455m [K=1.0000]  
 Remarks:

## Planar Illuminance Curve



C Range: 0 - 360DEG  
C Interval: 10.0DEG  
Test Speed: HIGH  
Temperature: 25.6DEG  
Operators: David  
Test Date: 2016-01-16

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
Test System: EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
Humidity: 67.1%  
Test Distance: 2.455m [K=1.0000]  
Remarks:



## LUMINOUS DISTRIBUTION INTENSITY DATA

|                                                                   |  |  |  |  |  |  |  |  |                         |  |  |  |  |                   |  |  |  |  |
|-------------------------------------------------------------------|--|--|--|--|--|--|--|--|-------------------------|--|--|--|--|-------------------|--|--|--|--|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |  |  |  |  |  |  |  |  |                         |  |  |  |  |                   |  |  |  |  |
| NAME:                                                             |  |  |  |  |  |  |  |  | TYPE:L48T8/850/15G-XT N |  |  |  |  | WEIGHT:           |  |  |  |  |
| SPEC.:                                                            |  |  |  |  |  |  |  |  | DIM.:                   |  |  |  |  | SERIAL No.:       |  |  |  |  |
| MFR.: ESPEN                                                       |  |  |  |  |  |  |  |  | SUR.:1.2*0.6            |  |  |  |  | PROTECTION ANGLE: |  |  |  |  |

Table--1

UNIT: cd

| C(DEG)<br>γ (DEG) | 0    | 10   | 20   | 30   | 40   | 50   | 60   | 70   | 80   | 90   | 100  | 110  | 120  | 130  | 140  | 150  | 160  | 170  | 180  |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0                 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 |
| 5                 | 1054 | 1055 | 1055 | 1055 | 1056 | 1056 | 1057 | 1057 | 1057 | 1057 | 1057 | 1057 | 1056 | 1056 | 1056 | 1055 | 1054 | 1054 | 1054 |
| 10                | 1043 | 1044 | 1044 | 1045 | 1047 | 1048 | 1049 | 1051 | 1051 | 1051 | 1051 | 1050 | 1049 | 1048 | 1046 | 1044 | 1043 | 1041 | 1042 |
| 15                | 1023 | 1024 | 1025 | 1028 | 1031 | 1033 | 1035 | 1038 | 1039 | 1039 | 1039 | 1037 | 1035 | 1033 | 1030 | 1027 | 1024 | 1022 | 1022 |
| 20                | 994  | 995  | 998  | 1002 | 1006 | 1010 | 1015 | 1018 | 1020 | 1020 | 1020 | 1018 | 1014 | 1010 | 1005 | 1001 | 996  | 993  | 992  |
| 25                | 955  | 957  | 960  | 966  | 973  | 979  | 985  | 990  | 993  | 994  | 993  | 990  | 985  | 979  | 973  | 965  | 959  | 954  | 953  |
| 30                | 905  | 907  | 912  | 920  | 929  | 939  | 947  | 953  | 956  | 956  | 955  | 951  | 946  | 939  | 929  | 920  | 911  | 904  | 903  |
| 35                | 842  | 845  | 852  | 863  | 875  | 886  | 895  | 902  | 906  | 908  | 907  | 903  | 896  | 886  | 875  | 863  | 851  | 842  | 841  |
| 40                | 765  | 770  | 779  | 793  | 806  | 819  | 831  | 842  | 850  | 855  | 855  | 849  | 838  | 824  | 808  | 792  | 778  | 766  | 765  |
| 45                | 676  | 681  | 692  | 708  | 724  | 741  | 758  | 773  | 784  | 791  | 792  | 783  | 768  | 748  | 727  | 708  | 690  | 676  | 674  |
| 50                | 576  | 581  | 594  | 611  | 629  | 647  | 665  | 681  | 693  | 700  | 697  | 688  | 673  | 652  | 629  | 608  | 589  | 573  | 571  |
| 55                | 471  | 475  | 488  | 503  | 522  | 542  | 558  | 569  | 574  | 572  | 565  | 557  | 547  | 533  | 514  | 494  | 477  | 463  | 461  |
| 60                | 372  | 377  | 385  | 397  | 413  | 425  | 430  | 431  | 425  | 417  | 409  | 403  | 399  | 395  | 389  | 375  | 364  | 355  | 355  |
| 65                | 289  | 290  | 288  | 294  | 302  | 305  | 308  | 309  | 304  | 296  | 289  | 282  | 275  | 267  | 262  | 261  | 259  | 259  | 264  |
| 70                | 221  | 220  | 214  | 211  | 208  | 210  | 219  | 225  | 225  | 220  | 213  | 206  | 193  | 177  | 167  | 170  | 177  | 185  | 193  |
| 75                | 164  | 163  | 158  | 148  | 140  | 146  | 159  | 168  | 170  | 167  | 164  | 157  | 144  | 125  | 113  | 116  | 128  | 137  | 142  |
| 80                | 116  | 117  | 111  | 103  | 101  | 106  | 114  | 121  | 125  | 125  | 123  | 117  | 109  | 97.3 | 88.8 | 86.6 | 92.0 | 98.3 | 101  |
| 85                | 66.1 | 65.7 | 63.2 | 63.4 | 64.8 | 65.0 | 66.7 | 69.2 | 70.2 | 68.3 | 67.0 | 65.5 | 62.8 | 56.7 | 52.9 | 50.0 | 49.2 | 50.8 | 54.3 |
| 90                | 5.43 | 7.30 | 7.34 | 7.07 | 6.18 | 5.90 | 5.69 | 5.25 | 9.55 | 8.37 | 6.93 | 5.79 | 3.58 | 2.92 | 2.27 | 1.98 | 2.00 | 2.47 | 0.20 |
| 95                | 0.16 | 0.36 | 0.44 | 0.45 | 0.43 | 0.32 | 0.31 | 0.33 | 0.35 | 0.34 | 0.34 | 0.33 | 0.33 | 0.30 | 0.34 | 0.37 | 0.34 | 0.28 | 0.14 |
| 100               | 0.25 | 0.32 | 0.41 | 0.54 | 0.56 | 0.36 | 0.23 | 0.21 | 0.20 | 0.21 | 0.22 | 0.21 | 0.23 | 0.33 | 0.43 | 0.42 | 0.33 | 0.26 | 0.27 |
| 105               | 0.35 | 0.40 | 0.40 | 0.47 | 0.47 | 0.44 | 0.48 | 0.47 | 0.46 | 0.48 | 0.46 | 0.43 | 0.40 | 0.39 | 0.40 | 0.37 | 0.34 | 0.29 | 0.33 |
| 110               | 0.35 | 0.41 | 0.41 | 0.45 | 0.49 | 0.46 | 0.46 | 0.47 | 0.50 | 0.53 | 0.52 | 0.48 | 0.44 | 0.43 | 0.43 | 0.37 | 0.36 | 0.30 | 0.26 |
| 115               | 0.31 | 0.35 | 0.38 | 0.43 | 0.44 | 0.49 | 0.50 | 0.49 | 0.52 | 0.53 | 0.53 | 0.50 | 0.45 | 0.44 | 0.40 | 0.37 | 0.34 | 0.29 | 0.29 |
| 120               | 0.38 | 0.38 | 0.41 | 0.42 | 0.42 | 0.43 | 0.47 | 0.53 | 0.57 | 0.58 | 0.56 | 0.52 | 0.45 | 0.40 | 0.39 | 0.36 | 0.43 | 0.39 | 0.35 |
| 125               | 0.37 | 0.39 | 0.37 | 0.47 | 0.42 | 0.45 | 0.45 | 0.47 | 0.51 | 0.53 | 0.52 | 0.49 | 0.43 | 0.42 | 0.42 | 0.37 | 0.39 | 0.35 | 0.38 |
| 130               | 0.39 | 0.41 | 0.40 | 0.43 | 0.45 | 0.44 | 0.48 | 0.49 | 0.51 | 0.51 | 0.51 | 0.51 | 0.48 | 0.46 | 0.48 | 0.46 | 0.37 | 0.36 | 0.41 |
| 135               | 0.34 | 0.39 | 0.41 | 0.41 | 0.49 | 0.52 | 0.54 | 0.52 | 0.54 | 0.54 | 0.54 | 0.53 | 0.51 | 0.52 | 0.47 | 0.37 | 0.38 | 0.41 | 0.42 |
| 140               | 0.42 | 0.44 | 0.42 | 0.44 | 0.45 | 0.56 | 0.56 | 0.57 | 0.57 | 0.59 | 0.57 | 0.59 | 0.57 | 0.54 | 0.44 | 0.40 | 0.42 | 0.39 | 0.45 |
| 145               | 0.43 | 0.47 | 0.47 | 0.50 | 0.52 | 0.48 | 0.55 | 0.59 | 0.60 | 0.61 | 0.60 | 0.59 | 0.58 | 0.47 | 0.43 | 0.49 | 0.47 | 0.48 | 0.46 |
| 150               | 0.49 | 0.54 | 0.49 | 0.53 | 0.55 | 0.54 | 0.51 | 0.52 | 0.55 | 0.57 | 0.55 | 0.51 | 0.48 | 0.48 | 0.53 | 0.52 | 0.48 | 0.53 | 0.45 |
| 155               | 0.52 | 0.54 | 0.51 | 0.55 | 0.56 | 0.56 | 0.57 | 0.53 | 0.52 | 0.51 | 0.50 | 0.52 | 0.53 | 0.54 | 0.51 | 0.53 | 0.52 | 0.52 | 0.43 |
| 160               | 0.50 | 0.55 | 0.56 | 0.54 | 0.57 | 0.56 | 0.55 | 0.56 | 0.55 | 0.52 | 0.53 | 0.54 | 0.53 | 0.54 | 0.55 | 0.52 | 0.50 | 0.54 | 0.44 |
| 165               | 0.52 | 0.53 | 0.56 | 0.56 | 0.53 | 0.53 | 0.53 | 0.54 | 0.50 | 0.50 | 0.48 | 0.53 | 0.55 | 0.55 | 0.50 | 0.48 | 0.51 | 0.52 | 0.44 |
| 170               | 0.47 | 0.49 | 0.51 | 0.53 | 0.54 | 0.52 | 0.50 | 0.51 | 0.50 | 0.47 | 0.48 | 0.54 | 0.56 | 0.55 | 0.54 | 0.53 | 0.52 | 0.51 | 0.45 |
| 175               | 0.61 | 0.61 | 0.61 | 0.63 | 0.63 | 0.61 | 0.58 | 0.58 | 0.57 | 0.52 | 0.53 | 0.57 | 0.57 | 0.59 | 0.63 | 0.65 | 0.64 | 0.63 | 0.59 |
| 180               | 0.59 | 0.58 | 0.57 | 0.56 | 0.55 | 0.55 | 0.53 | 0.47 | 0.50 | 0.54 | 0.49 | 0.46 | 0.49 | 0.55 | 0.56 | 0.55 | 0.55 | 0.58 | 0.59 |

C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:2016-01-16

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity:67.1%  
 Test Distance:2.455m [K=1.0000]  
 Remarks:

## LUMINOUS DISTRIBUTION INTENSITY DATA

|                                                                   |  |  |  |  |  |  |  |  |                         |  |  |  |  |                   |  |  |  |  |
|-------------------------------------------------------------------|--|--|--|--|--|--|--|--|-------------------------|--|--|--|--|-------------------|--|--|--|--|
| Test:U:120.0V I:0.2519A P:30.14W PF:0.9971 Lamp Flux:1455.67x2 lm |  |  |  |  |  |  |  |  |                         |  |  |  |  |                   |  |  |  |  |
| NAME:                                                             |  |  |  |  |  |  |  |  | TYPE:L48T8/850/15G-XT N |  |  |  |  | WEIGHT:           |  |  |  |  |
| SPEC.:                                                            |  |  |  |  |  |  |  |  | DIM.:                   |  |  |  |  | SERIAL No.:       |  |  |  |  |
| MFR.: ESPEN                                                       |  |  |  |  |  |  |  |  | SUR.:1.2*0.6            |  |  |  |  | PROTECTION ANGLE: |  |  |  |  |

Table--2

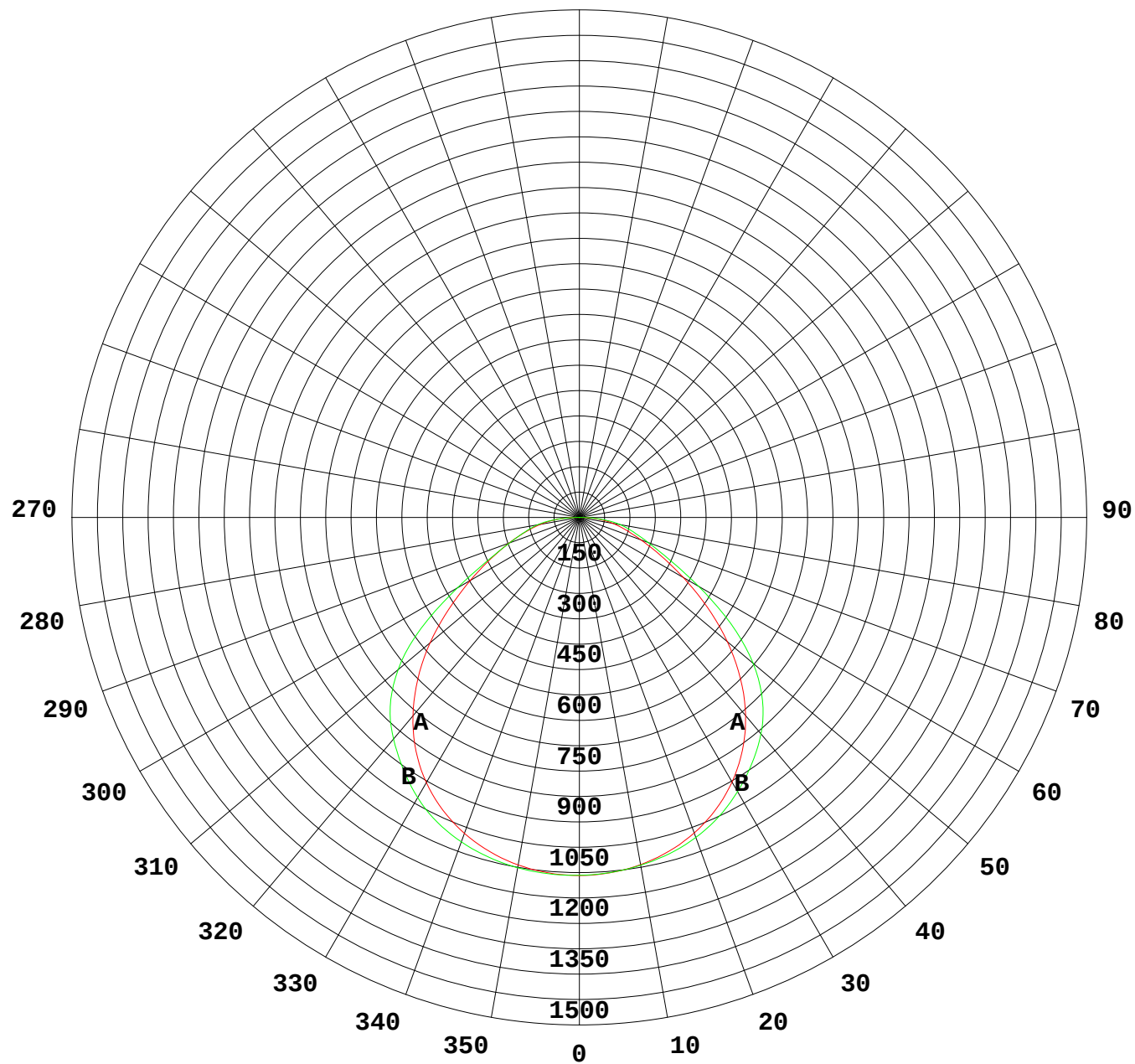
UNIT: cd

| C( DEG)<br>γ (DEG) |      | 190  | 200  | 210  | 220  | 230  | 240  | 250  | 260  | 270  | 280  | 290  | 300  | 310  | 320  | 330  | 340  | 350  |  |  |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| 0                  | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 | 1058 |  |  |
| 5                  | 1054 | 1054 | 1053 | 1053 | 1053 | 1053 | 1053 | 1053 | 1053 | 1054 | 1053 | 1054 | 1054 | 1054 | 1054 | 1054 | 1054 | 1054 |  |  |
| 10                 | 1041 | 1041 | 1041 | 1041 | 1042 | 1042 | 1043 | 1043 | 1043 | 1044 | 1044 | 1044 | 1044 | 1043 | 1043 | 1043 | 1042 | 1043 |  |  |
| 15                 | 1021 | 1021 | 1021 | 1022 | 1024 | 1025 | 1027 | 1028 | 1029 | 1029 | 1029 | 1029 | 1028 | 1027 | 1025 | 1024 | 1023 | 1023 |  |  |
| 20                 | 991  | 992  | 993  | 995  | 998  | 1000 | 1003 | 1005 | 1007 | 1007 | 1007 | 1007 | 1005 | 1003 | 1000 | 998  | 996  | 995  |  |  |
| 25                 | 952  | 953  | 955  | 959  | 964  | 968  | 971  | 974  | 976  | 977  | 976  | 976  | 974  | 971  | 967  | 962  | 959  | 957  |  |  |
| 30                 | 902  | 903  | 908  | 914  | 920  | 926  | 931  | 934  | 936  | 936  | 936  | 935  | 932  | 928  | 923  | 917  | 911  | 908  |  |  |
| 35                 | 840  | 844  | 850  | 858  | 867  | 875  | 882  | 887  | 889  | 888  | 885  | 880  | 873  | 866  | 859  | 852  | 847  |      |  |  |
| 40                 | 764  | 770  | 779  | 789  | 803  | 815  | 826  | 833  | 835  | 832  | 825  | 815  | 805  | 795  | 786  | 778  | 771  |      |  |  |
| 45                 | 674  | 681  | 693  | 709  | 726  | 741  | 755  | 763  | 766  | 761  | 751  | 739  | 725  | 712  | 699  | 689  | 682  |      |  |  |
| 50                 | 572  | 580  | 594  | 612  | 629  | 645  | 658  | 666  | 670  | 669  | 661  | 647  | 631  | 615  | 601  | 589  | 582  |      |  |  |
| 55                 | 462  | 469  | 482  | 497  | 513  | 524  | 532  | 539  | 546  | 550  | 550  | 543  | 529  | 512  | 496  | 483  | 477  |      |  |  |
| 60                 | 354  | 359  | 369  | 380  | 387  | 392  | 398  | 403  | 407  | 411  | 415  | 417  | 415  | 405  | 391  | 381  | 377  |      |  |  |
| 65                 | 263  | 261  | 262  | 264  | 268  | 275  | 283  | 289  | 292  | 296  | 300  | 300  | 299  | 297  | 292  | 286  | 287  |      |  |  |
| 70                 | 191  | 183  | 176  | 172  | 179  | 194  | 207  | 213  | 216  | 219  | 220  | 217  | 209  | 204  | 206  | 212  | 217  |      |  |  |
| 75                 | 142  | 133  | 122  | 117  | 125  | 143  | 155  | 162  | 165  | 167  | 166  | 159  | 148  | 141  | 144  | 155  | 162  |      |  |  |
| 80                 | 101  | 95.9 | 88.8 | 88.0 | 95.0 | 106  | 115  | 120  | 122  | 123  | 119  | 113  | 106  | 103  | 104  | 109  | 117  |      |  |  |
| 85                 | 53.6 | 52.4 | 52.0 | 53.2 | 57.1 | 60.9 | 63.7 | 65.8 | 65.6 | 67.0 | 66.6 | 64.5 | 62.8 | 62.8 | 63.4 | 62.4 | 65.9 |      |  |  |
| 90                 | 0.32 | 0.47 | 0.57 | 0.59 | 0.71 | 0.75 | 0.78 | 0.88 | 0.93 | 1.19 | 1.51 | 1.87 | 2.17 | 2.50 | 3.50 | 10.2 | 10.8 |      |  |  |
| 95                 | 0.29 | 0.33 | 0.39 | 0.33 | 0.26 | 0.28 | 0.28 | 0.30 | 0.30 | 0.30 | 0.29 | 0.30 | 0.28 | 0.35 | 0.38 | 0.35 | 0.30 |      |  |  |
| 100                | 0.26 | 0.28 | 0.45 | 0.40 | 0.28 | 0.26 | 0.21 | 0.18 | 0.18 | 0.20 | 0.19 | 0.21 | 0.25 | 0.38 | 0.47 | 0.35 | 0.25 |      |  |  |
| 105                | 0.30 | 0.30 | 0.35 | 0.39 | 0.34 | 0.32 | 0.30 | 0.29 | 0.32 | 0.31 | 0.31 | 0.32 | 0.34 | 0.40 | 0.34 | 0.30 | 0.25 |      |  |  |
| 110                | 0.29 | 0.30 | 0.33 | 0.34 | 0.36 | 0.36 | 0.35 | 0.38 | 0.39 | 0.37 | 0.36 | 0.36 | 0.34 | 0.30 | 0.31 | 0.30 | 0.32 |      |  |  |
| 115                | 0.30 | 0.32 | 0.33 | 0.33 | 0.34 | 0.36 | 0.37 | 0.40 | 0.42 | 0.41 | 0.38 | 0.34 | 0.31 | 0.30 | 0.33 | 0.28 | 0.26 |      |  |  |
| 120                | 0.36 | 0.40 | 0.34 | 0.37 | 0.35 | 0.34 | 0.36 | 0.39 | 0.40 | 0.39 | 0.37 | 0.34 | 0.33 | 0.35 | 0.30 | 0.31 | 0.33 |      |  |  |
| 125                | 0.36 | 0.35 | 0.38 | 0.39 | 0.39 | 0.40 | 0.37 | 0.38 | 0.39 | 0.38 | 0.37 | 0.37 | 0.37 | 0.34 | 0.40 | 0.36 | 0.35 |      |  |  |
| 130                | 0.39 | 0.38 | 0.41 | 0.46 | 0.40 | 0.41 | 0.43 | 0.43 | 0.43 | 0.42 | 0.42 | 0.40 | 0.38 | 0.37 | 0.41 | 0.32 | 0.39 |      |  |  |
| 135                | 0.45 | 0.43 | 0.38 | 0.45 | 0.50 | 0.48 | 0.44 | 0.44 | 0.44 | 0.43 | 0.41 | 0.41 | 0.44 | 0.45 | 0.35 | 0.39 | 0.40 |      |  |  |
| 140                | 0.43 | 0.44 | 0.43 | 0.41 | 0.51 | 0.50 | 0.50 | 0.47 | 0.48 | 0.44 | 0.47 | 0.47 | 0.46 | 0.42 | 0.39 | 0.38 | 0.42 |      |  |  |
| 145                | 0.48 | 0.48 | 0.46 | 0.44 | 0.40 | 0.49 | 0.50 | 0.49 | 0.49 | 0.47 | 0.47 | 0.47 | 0.38 | 0.37 | 0.45 | 0.45 | 0.48 |      |  |  |
| 150                | 0.48 | 0.46 | 0.44 | 0.46 | 0.43 | 0.38 | 0.38 | 0.43 | 0.43 | 0.41 | 0.36 | 0.35 | 0.39 | 0.44 | 0.43 | 0.44 | 0.50 |      |  |  |
| 155                | 0.44 | 0.44 | 0.47 | 0.42 | 0.43 | 0.43 | 0.39 | 0.37 | 0.36 | 0.35 | 0.37 | 0.40 | 0.42 | 0.43 | 0.45 | 0.45 | 0.49 |      |  |  |
| 160                | 0.43 | 0.45 | 0.42 | 0.45 | 0.44 | 0.42 | 0.40 | 0.41 | 0.38 | 0.37 | 0.40 | 0.40 | 0.41 | 0.47 | 0.44 | 0.46 | 0.47 |      |  |  |
| 165                | 0.46 | 0.47 | 0.44 | 0.40 | 0.41 | 0.43 | 0.44 | 0.41 | 0.37 | 0.37 | 0.40 | 0.45 | 0.43 | 0.44 | 0.41 | 0.51 | 0.49 |      |  |  |
| 170                | 0.45 | 0.47 | 0.48 | 0.47 | 0.47 | 0.48 | 0.46 | 0.46 | 0.41 | 0.40 | 0.43 | 0.45 | 0.44 | 0.49 | 0.47 | 0.48 | 0.46 |      |  |  |
| 175                | 0.59 | 0.59 | 0.59 | 0.61 | 0.61 | 0.57 | 0.52 | 0.54 | 0.51 | 0.46 | 0.48 | 0.52 | 0.53 | 0.55 | 0.59 | 0.60 | 0.59 |      |  |  |
| 180                | 0.59 | 0.58 | 0.57 | 0.57 | 0.56 | 0.56 | 0.54 | 0.50 | 0.50 | 0.52 | 0.52 | 0.49 | 0.53 | 0.56 | 0.57 | 0.58 | 0.60 |      |  |  |

C Range: 0 - 360DEG  
 C Interval: 10.0DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:2016-01-16

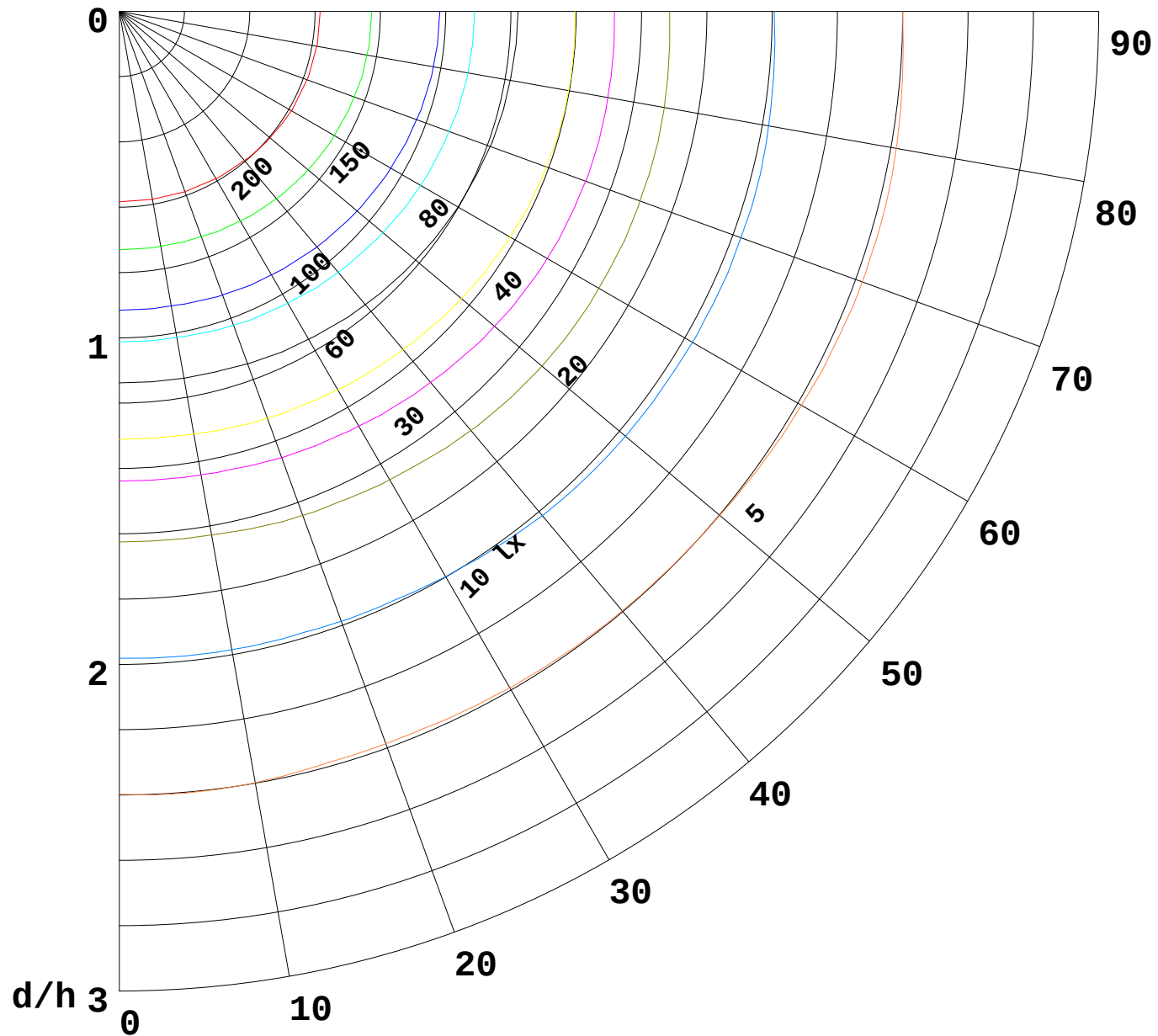
γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE G0-R5000\_V2 SYSTEM V2.0.287  
 Humidity:67.1%  
 Test Distance:2.455m [K=1.0000]  
 Remarks:

**I(cd)**



1000  $\lambda_m$

$K = 1$



F = 5000 lm  
 K = 0.7  
 Hcc = 0.0 m  
 Hfc = 0.0 m  
 Eave = 100 lx

|       | Pcc | Pw | Pfc |
|-------|-----|----|-----|
| ————— | 70  | 50 | 30  |
| ————— | 50  | 30 | 20  |

