

## TEST REPORT

Product: Nano Tube

Product/Item No. FL15WFSSL

Electrical Rating: 15 W; 90-265 V; 240 mA; 0,92

Applicant: FRESHLIGHT

Address: Nagelpoelweg 86, 7333 NZ Apeldoorn, The Netherlands

Manufacturer: Same as applicant

Address: Same as applicant

Testing Laboratory: SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Address: 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Number of Samples received: 1

Date of samples reception: 2017-10-18

Date Test Conducted: 2017-10-18 to 2017-10-27

Test Requested: The Total Luminous Flux, Electrical Power, Luminous Intensity Distribution and Color characteristics

Test Method (standards): 02 IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

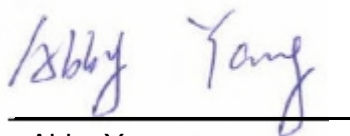
Remark: N/A

Prepared and checked by:



Double Pan

Reviewed by:



Abby Yang

## 1. TEST CONDITIONS

Before measurements are taken, there is no seasoning for the LED luminaires, and LED luminaires in emitting-light surface down position was stabilized for 45 minutes in the ambient temperature  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ .

The AC Power Source DPS-1060 (Everfine) as used to generate 230V/50Hz to the tested samples for the mentioned tests which was measured by Everfine GO-R5000 system.

The Electrical quantities are measured by means of a calibrated Digital Power Meter PF2010 (Everfine).

The sample was mounted at emitting-light surface down position. The geometric centre of the LED luminaires was considered as optical reference centre for photometric test.

Light distribution was measured by calibrated Everfine GO-R5000 Type C goniophotometer with the distance 2.471 m between the detector and the sample's reference center.

The Total Luminous Flux & Color Characteristics of the light emitted by the LED luminaires was measured by calibrated Everfine GO-R5000 Type C goniophotometer with the distance 2.471 m between the detector and the sample's reference center.

The ambient temperature during measurements was  $25^{\circ}\text{C}$

The uncertainty of luminous flux measurement is  $U=2.12\%$  ( $K=2$ ), the uncertainty of the CCT measurement is  $U=2.26\%$  ( $K=2$ ), all measurements results are traceable to NIM.

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product.

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## 2. TEST RESULTS

### 1. The Total Luminous Flux and Electrical Power

|                                          |              |
|------------------------------------------|--------------|
| Test Voltage:                            | 230 V        |
| Tested Working Current:                  | 0,073 A      |
| Power:                                   | 15,78 W      |
| Power Factor:                            | 0,941        |
| Stabilization time                       | 45 mins      |
| Total operating time<br>for measurements | 1,5 hours    |
| Total Luminous Flux:                     | 2516 lm      |
| Self-absorption factor :                 | N/A          |
| Luminous Efficacy:                       | 159,4 lm / W |
| Date Test Conducted :                    | 2017-10-27   |

### ZONE LUMEN SUMMAR:

| γ   | C0                    | C45   | C90    | C135  | C180  | C225  | C270  | C315  | γ       | Φ zone  | Φ total | lum, lamp |
|-----|-----------------------|-------|--------|-------|-------|-------|-------|-------|---------|---------|---------|-----------|
| 10  | 507.5                 | 505.1 | 501.5  | 506.0 | 510.0 | 504.1 | 499.3 | 503.2 | 0-10    | 48.54   | 48.54   | 1.93,1.93 |
| 20  | 494.2                 | 481.2 | 466.5  | 483.3 | 498.6 | 481.4 | 463.8 | 478.9 | 10-20   | 139.6   | 188.2   | 7.48,7.48 |
| 30  | 472.4                 | 443.3 | 411.9  | 447.9 | 481.0 | 445.0 | 407.9 | 441.0 | 20-30   | 213.8   | 402.0   | 16,16     |
| 40  | 442.4                 | 396.0 | 343.5  | 404.4 | 456.0 | 399.7 | 338.2 | 394.5 | 30-40   | 263.7   | 665.7   | 26.5,26.5 |
| 50  | 405.3                 | 344.5 | 267.5  | 355.3 | 424.4 | 349.5 | 262.0 | 343.5 | 40-50   | 286.3   | 952.0   | 37.8,37.8 |
| 60  | 363.6                 | 291.3 | 188.7  | 304.5 | 387.3 | 298.1 | 184.0 | 290.9 | 50-60   | 283.2   | 1235    | 49.1,49.1 |
| 70  | 319.6                 | 241.6 | 111.2  | 255.0 | 346.4 | 249.7 | 106.9 | 241.2 | 60-70   | 259.2   | 1494    | 59.4,59.4 |
| 80  | 274.9                 | 196.2 | 42.63  | 211.0 | 303.5 | 206.0 | 40.24 | 196.5 | 70-80   | 222.0   | 1716    | 68.2,68.2 |
| 90  | 232.6                 | 159.8 | 0.0311 | 173.7 | 261.1 | 170.8 | 0     | 161.1 | 80-90   | 181.8   | 1898    | 75.5,75.5 |
| 100 | 195.2                 | 132.2 | 2.399  | 144.9 | 221.8 | 142.2 | 4.346 | 132.8 | 90-100  | 148.1   | 2046    | 81.3,81.3 |
| 110 | 163.1                 | 111.8 | 7.675  | 123.6 | 186.2 | 121.5 | 9.478 | 112.2 | 100-110 | 121.9   | 2168    | 86.2,86.2 |
| 120 | 136.6                 | 97.09 | 10.90  | 107.6 | 156.0 | 105.0 | 12.02 | 97.97 | 110-120 | 99.66   | 2268    | 90.1,90.1 |
| 130 | 115.5                 | 86.52 | 12.57  | 96.55 | 130.9 | 92.25 | 13.20 | 88.81 | 120-130 | 80.65   | 2349    | 93.4,93.4 |
| 140 | 98.97                 | 78.65 | 14.36  | 89.25 | 110.3 | 82.32 | 14.81 | 82.86 | 130-140 | 63.77   | 2412    | 95.9,95.9 |
| 150 | 86.52                 | 73.05 | 16.51  | 84.58 | 94.02 | 75.87 | 18.46 | 78.45 | 140-150 | 48.28   | 2461    | 97.8,97.8 |
| 160 | 77.44                 | 59.63 | 15.49  | 79.51 | 81.57 | 71.91 | 25.66 | 64.98 | 150-160 | 32.79   | 2493    | 99.1,99.1 |
| 170 | 71.28                 | 53.10 | 19.94  | 77.19 | 73.61 | 67.07 | 31.46 | 62.19 | 160-170 | 17.71   | 2511    | 99.8,99.8 |
| 180 | 0                     | 15.05 | 23.10  | 17.72 | 8.207 | 17.42 | 21.36 | 21.89 | 170-180 | 4.620   | 2516    | 100,100   |
| DEG | LUMINOUS INTENSITY:cd |       |        |       |       |       |       |       |         | UNIT:lm |         |           |

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product.

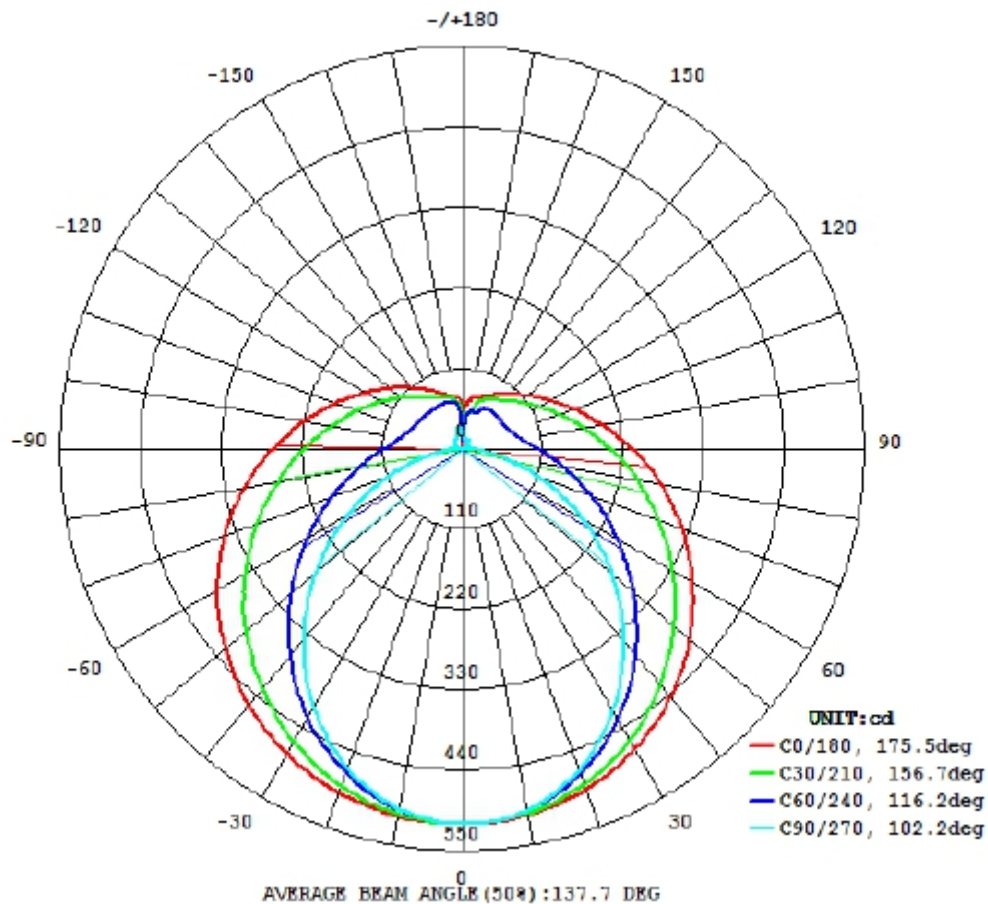
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## 2. Luminous Intensity Distribution of SSL products

Test Voltage: 230 V  
 Stabilization time 45 mins  
 Total operating time 1,5 hours  
 for measurements

Average Beam Angle(50% Imax): 137,7 DEG  
 Date Test Conducted : 2017-10-27

### Light distribution Curve [unit: cd]



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**Luminous Distribution Intensity Data (cd)**

| Gamma/C | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    | 60°    | 70°    | 80°    | 90°    | 100°   | 110°   | 120°   | 130°   | 140°   | 150°   | 160°   | 170°   | 180°   |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.0°    | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 |
| 5.0°    | 511.66 | 510.68 | 511.68 | 510.76 | 511.50 | 510.46 | 510.16 | 510.32 | 509.67 | 510.79 | 510.33 | 510.68 | 511.13 | 511.17 | 511.43 | 511.55 | 512.35 | 511.68 | 511.85 |
| 10.0°   | 507.53 | 507.24 | 507.17 | 505.58 | 506.44 | 503.67 | 501.87 | 501.94 | 501.52 | 501.45 | 502.06 | 502.70 | 504.35 | 505.49 | 506.47 | 507.30 | 509.21 | 509.45 | 509.98 |
| 15.0°   | 501.77 | 501.20 | 500.07 | 497.53 | 497.15 | 492.90 | 489.39 | 487.94 | 486.77 | 487.05 | 487.38 | 489.44 | 492.07 | 494.98 | 497.67 | 501.17 | 503.60 | 505.05 | 504.91 |
| 20.0°   | 494.24 | 492.81 | 491.39 | 487.42 | 484.82 | 477.50 | 471.31 | 468.41 | 466.62 | 466.49 | 467.51 | 471.18 | 475.28 | 480.12 | 486.55 | 491.78 | 496.04 | 498.15 | 498.62 |
| 25.0°   | 484.97 | 482.23 | 479.57 | 473.45 | 468.69 | 458.65 | 450.21 | 444.57 | 441.77 | 441.21 | 443.40 | 448.27 | 453.66 | 461.74 | 472.15 | 480.13 | 486.07 | 489.81 | 490.69 |
| 30.0°   | 472.37 | 470.04 | 466.63 | 457.69 | 449.47 | 437.13 | 425.05 | 417.05 | 412.63 | 411.87 | 414.52 | 421.73 | 429.59 | 441.02 | 454.86 | 466.83 | 472.91 | 479.20 | 481.03 |
| 35.0°   | 457.94 | 455.95 | 451.80 | 440.04 | 428.12 | 412.14 | 397.89 | 387.00 | 380.71 | 379.19 | 382.80 | 391.86 | 402.15 | 418.13 | 436.41 | 449.85 | 459.33 | 466.19 | 469.94 |
| 40.0°   | 442.39 | 439.52 | 434.14 | 420.42 | 405.45 | 386.56 | 368.35 | 354.85 | 345.14 | 343.51 | 348.49 | 359.77 | 373.67 | 393.57 | 415.22 | 431.75 | 443.46 | 451.32 | 456.05 |
| 45.0°   | 424.91 | 422.15 | 415.03 | 399.79 | 380.87 | 360.13 | 337.19 | 321.15 | 308.39 | 306.38 | 311.65 | 326.14 | 343.56 | 367.85 | 392.74 | 412.06 | 425.87 | 434.98 | 441.18 |
| 50.0°   | 405.35 | 402.03 | 394.65 | 377.33 | 356.30 | 332.72 | 305.61 | 285.85 | 270.38 | 267.52 | 273.84 | 291.12 | 313.64 | 341.03 | 369.58 | 391.06 | 406.99 | 417.94 | 424.44 |
| 55.0°   | 385.42 | 381.78 | 372.33 | 355.25 | 331.38 | 304.08 | 274.29 | 250.18 | 231.64 | 228.35 | 235.92 | 256.01 | 282.82 | 315.17 | 344.86 | 368.55 | 386.65 | 399.11 | 406.59 |
| 60.0°   | 363.64 | 360.30 | 350.38 | 332.37 | 306.32 | 276.35 | 243.74 | 215.42 | 193.37 | 188.68 | 198.23 | 222.05 | 252.53 | 288.41 | 320.58 | 346.73 | 366.04 | 378.69 | 387.30 |
| 65.0°   | 341.43 | 338.70 | 328.58 | 309.22 | 282.02 | 249.61 | 215.01 | 182.11 | 156.26 | 149.73 | 161.43 | 189.13 | 223.61 | 262.04 | 296.31 | 324.62 | 344.72 | 355.96 | 367.09 |
| 70.0°   | 319.62 | 315.96 | 305.46 | 285.44 | 258.54 | 224.60 | 187.03 | 150.86 | 121.26 | 111.19 | 125.37 | 157.07 | 196.52 | 236.76 | 273.27 | 302.39 | 322.52 | 333.76 | 346.39 |
| 75.0°   | 296.49 | 293.39 | 284.04 | 263.50 | 235.18 | 200.80 | 161.86 | 122.33 | 88.77  | 75.04  | 92.08  | 128.30 | 170.84 | 213.74 | 250.53 | 280.40 | 301.65 | 311.84 | 325.08 |
| 80.0°   | 274.90 | 271.16 | 261.86 | 242.65 | 213.41 | 179.08 | 139.43 | 97.79  | 59.72  | 42.63  | 62.64  | 103.53 | 148.44 | 192.20 | 229.70 | 259.75 | 278.71 | 290.47 | 303.47 |
| 85.0°   | 253.53 | 249.56 | 240.45 | 221.81 | 194.01 | 159.48 | 119.57 | 77.81  | 38.23  | 17.29  | 40.92  | 83.70  | 129.31 | 172.59 | 209.50 | 238.81 | 257.80 | 269.86 | 282.22 |
| 90.0°   | 232.64 | 229.62 | 220.98 | 203.23 | 176.41 | 143.21 | 104.23 | 63.30  | 24.98  | 0.03   | 27.03  | 68.62  | 113.61 | 155.72 | 191.59 | 220.05 | 238.62 | 248.90 | 261.14 |
| 95.0°   | 213.52 | 210.28 | 201.51 | 185.79 | 160.55 | 129.19 | 92.36  | 54.10  | 19.75  | 0.00   | 20.66  | 58.71  | 101.37 | 141.17 | 175.14 | 202.11 | 219.79 | 229.19 | 241.35 |
| 100.0°  | 195.20 | 191.63 | 183.96 | 169.97 | 146.94 | 117.43 | 83.22  | 48.70  | 19.18  | 2.40   | 20.70  | 53.65  | 92.45  | 128.93 | 160.81 | 186.09 | 201.76 | 210.63 | 221.80 |
| 105.0°  | 178.21 | 175.36 | 168.60 | 155.38 | 134.81 | 107.68 | 76.46  | 46.36  | 21.38  | 6.30   | 22.61  | 51.30  | 85.36  | 118.84 | 148.03 | 171.08 | 185.53 | 192.92 | 203.84 |
| 110.0°  | 163.13 | 159.89 | 153.27 | 141.95 | 124.01 | 99.54  | 72.28  | 45.74  | 25.67  | 7.67   | 26.73  | 50.74  | 80.36  | 110.12 | 137.01 | 157.57 | 170.26 | 177.04 | 186.20 |
| 115.0°  | 149.32 | 146.18 | 140.65 | 130.15 | 114.35 | 93.13  | 69.03  | 46.41  | 30.26  | 9.09   | 31.72  | 50.98  | 76.79  | 102.95 | 127.02 | 145.45 | 156.37 | 161.88 | 170.66 |
| 120.0°  | 136.61 | 133.75 | 128.52 | 119.32 | 105.98 | 88.20  | 67.37  | 48.43  | 35.40  | 10.90  | 37.20  | 52.94  | 74.51  | 97.14  | 118.13 | 134.20 | 144.02 | 148.44 | 155.97 |
| 125.0°  | 125.32 | 122.62 | 118.13 | 109.85 | 98.96  | 83.89  | 66.75  | 51.05  | 40.79  | 12.07  | 42.68  | 55.76  | 73.34  | 92.51  | 110.41 | 124.66 | 133.13 | 136.54 | 142.78 |
| 130.0°  | 115.50 | 112.83 | 109.06 | 101.72 | 92.62  | 80.44  | 66.65  | 54.36  | 45.75  | 12.57  | 48.22  | 58.66  | 72.90  | 89.10  | 103.99 | 115.92 | 122.99 | 125.80 | 130.94 |
| 135.0°  | 106.62 | 104.23 | 100.59 | 94.47  | 87.02  | 77.49  | 66.68  | 56.88  | 49.02  | 13.19  | 53.34  | 61.79  | 72.98  | 86.08  | 98.80  | 108.23 | 113.84 | 116.38 | 119.97 |
| 140.0°  | 98.97  | 96.90  | 93.37  | 88.31  | 82.27  | 75.03  | 67.11  | 58.96  | 53.18  | 14.36  | 58.15  | 64.87  | 73.17  | 84.28  | 94.22  | 101.69 | 106.14 | 107.82 | 110.27 |
| 145.0°  | 92.37  | 90.32  | 87.23  | 83.17  | 78.36  | 73.10  | 66.44  | 61.91  | 57.00  | 16.35  | 62.49  | 67.84  | 73.95  | 82.91  | 90.70  | 96.03  | 99.09  | 100.23 | 101.55 |
| 150.0°  | 86.52  | 84.18  | 81.94  | 78.56  | 74.98  | 71.13  | 64.23  | 62.40  | 55.60  | 16.51  | 65.88  | 70.54  | 74.93  | 81.67  | 87.48  | 91.32  | 93.13  | 93.37  | 94.02  |
| 155.0°  | 81.52  | 79.37  | 77.50  | 75.11  | 72.33  | 65.10  | 59.58  | 56.83  | 50.51  | 16.48  | 65.15  | 72.57  | 75.79  | 80.87  | 84.76  | 87.26  | 88.02  | 87.53  | 87.29  |
| 160.0°  | 77.44  | 75.25  | 73.99  | 71.79  | 63.23  | 56.04  | 54.73  | 53.76  | 41.82  | 15.49  | 49.76  | 72.45  | 75.67  | 78.09  | 80.93  | 84.00  | 83.85  | 82.96  | 81.57  |
| 165.0°  | 74.36  | 72.18  | 70.80  | 68.18  | 64.05  | 53.94  | 53.82  | 51.33  | 28.11  | 16.71  | 36.62  | 72.46  | 75.66  | 77.35  | 78.71  | 78.90  | 80.47  | 79.06  | 76.95  |
| 170.0°  | 71.28  | 66.59  | 61.38  | 51.43  | 52.57  | 53.64  | 51.56  | 40.36  | 25.50  | 19.94  | 33.90  | 54.69  | 73.35  | 77.04  | 77.35  | 76.61  | 74.95  | 76.41  | 73.61  |
| 175.0°  | 62.58  | 43.56  | 41.92  | 45.73  | 46.39  | 37.06  | 28.36  | 25.80  | 22.76  | 21.86  | 29.81  | 35.52  | 40.06  | 50.13  | 63.77  | 69.34  | 69.33  | 69.46  | 70.69  |
| 180.0°  | 0.00   | 13.97  | 16.45  | 14.06  | 15.79  | 14.32  | 12.05  | 15.33  | 20.28  | 23.10  | 23.60  | 18.92  | 14.07  | 16.38  | 19.06  | 22.82  | 20.77  | 15.87  | 8.21   |

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| Gamma/C | 190°   | 200°   | 210°   | 220°   | 230°   | 240°   | 250°   | 260°   | 270°   | 280°   | 290°   | 300°   | 310°   | 320°   | 330°   | 340°   | 350°   |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.0°    | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 | 512.46 |
| 5.0°    | 511.85 | 511.41 | 510.92 | 510.99 | 509.87 | 509.34 | 509.52 | 509.05 | 509.18 | 509.07 | 508.83 | 509.51 | 509.49 | 510.07 | 510.55 | 510.74 | 510.50 |
| 10.0°   | 508.82 | 508.02 | 506.48 | 505.62 | 502.53 | 501.35 | 501.18 | 499.70 | 499.31 | 499.68 | 500.20 | 501.86 | 502.56 | 503.76 | 505.13 | 506.92 | 506.17 |
| 15.0°   | 504.07 | 502.02 | 499.26 | 496.78 | 492.01 | 487.81 | 486.61 | 485.19 | 484.07 | 484.70 | 485.93 | 488.51 | 490.65 | 494.72 | 497.33 | 501.04 | 500.29 |
| 20.0°   | 497.35 | 493.78 | 489.60 | 484.96 | 477.79 | 469.99 | 467.39 | 464.60 | 463.77 | 464.62 | 466.94 | 470.75 | 475.83 | 481.88 | 486.39 | 491.40 | 492.35 |
| 25.0°   | 488.77 | 484.21 | 477.13 | 469.84 | 459.14 | 448.97 | 443.02 | 439.52 | 437.93 | 439.47 | 443.93 | 449.58 | 456.63 | 466.33 | 473.19 | 479.57 | 482.83 |
| 30.0°   | 477.86 | 471.69 | 461.57 | 451.86 | 438.22 | 425.01 | 415.59 | 409.55 | 407.91 | 409.60 | 416.39 | 424.26 | 434.57 | 447.38 | 457.84 | 465.41 | 470.64 |
| 35.0°   | 465.63 | 457.73 | 445.59 | 431.39 | 414.85 | 397.03 | 385.38 | 376.45 | 374.45 | 376.92 | 385.68 | 396.79 | 411.00 | 426.66 | 439.96 | 449.70 | 456.16 |
| 40.0°   | 451.65 | 442.57 | 427.13 | 410.31 | 389.20 | 367.42 | 352.48 | 341.61 | 338.25 | 342.33 | 353.01 | 367.11 | 385.22 | 403.86 | 419.83 | 432.16 | 440.55 |
| 45.0°   | 435.78 | 425.10 | 407.07 | 386.69 | 362.55 | 337.27 | 318.76 | 304.92 | 300.62 | 306.10 | 318.64 | 335.45 | 358.66 | 380.18 | 398.72 | 412.81 | 423.28 |
| 50.0°   | 418.04 | 406.85 | 387.25 | 363.19 | 335.80 | 306.04 | 284.12 | 266.81 | 261.98 | 268.13 | 283.60 | 304.04 | 330.90 | 356.06 | 377.10 | 392.44 | 403.82 |
| 55.0°   | 399.76 | 387.22 | 366.01 | 338.77 | 309.13 | 276.26 | 248.55 | 228.63 | 223.03 | 230.13 | 248.35 | 273.72 | 303.11 | 331.57 | 354.27 | 371.79 | 384.46 |
| 60.0°   | 379.60 | 366.74 | 343.53 | 314.66 | 281.46 | 246.31 | 213.93 | 190.72 | 183.99 | 192.51 | 214.36 | 243.84 | 275.70 | 306.15 | 331.10 | 350.16 | 363.96 |
| 65.0°   | 359.57 | 345.82 | 321.53 | 291.67 | 255.87 | 217.47 | 181.48 | 153.78 | 145.02 | 155.40 | 181.01 | 214.65 | 249.64 | 281.99 | 306.95 | 327.76 | 341.48 |
| 70.0°   | 338.93 | 323.57 | 299.91 | 268.18 | 231.20 | 190.65 | 151.09 | 118.75 | 106.86 | 119.71 | 150.47 | 186.44 | 224.85 | 257.63 | 285.31 | 306.33 | 320.72 |
| 75.0°   | 317.74 | 302.13 | 277.93 | 246.37 | 208.28 | 165.50 | 123.38 | 87.04  | 71.10  | 87.45  | 121.85 | 161.99 | 200.92 | 235.82 | 263.06 | 284.80 | 299.86 |
| 80.0°   | 296.39 | 281.25 | 256.57 | 224.93 | 187.14 | 143.86 | 99.50  | 58.96  | 40.24  | 59.29  | 97.49  | 139.41 | 179.29 | 213.72 | 242.58 | 263.46 | 278.94 |
| 85.0°   | 276.17 | 260.94 | 236.82 | 205.59 | 167.93 | 124.92 | 79.91  | 37.94  | 15.46  | 38.27  | 77.99  | 120.39 | 160.19 | 194.37 | 222.38 | 244.38 | 257.82 |
| 90.0°   | 255.89 | 242.24 | 219.06 | 189.12 | 152.55 | 110.23 | 65.79  | 24.55  | 0.00   | 25.56  | 64.36  | 105.40 | 144.39 | 177.73 | 204.43 | 224.75 | 237.86 |
| 95.0°   | 235.86 | 222.86 | 201.05 | 172.28 | 138.35 | 98.42  | 55.90  | 18.94  | 0.38   | 20.58  | 54.97  | 93.00  | 129.41 | 161.03 | 186.54 | 206.13 | 217.97 |
| 100.0°  | 216.79 | 204.39 | 185.32 | 158.30 | 126.16 | 89.66  | 50.70  | 19.56  | 4.35   | 21.08  | 49.57  | 84.08  | 117.92 | 147.63 | 171.65 | 189.17 | 200.33 |
| 105.0°  | 197.73 | 187.97 | 170.12 | 146.00 | 116.31 | 82.80  | 49.42  | 22.56  | 8.42   | 23.55  | 47.83  | 77.38  | 108.29 | 135.48 | 157.58 | 173.57 | 183.45 |
| 110.0°  | 180.62 | 171.53 | 156.16 | 134.98 | 108.00 | 77.84  | 49.66  | 26.92  | 9.48   | 27.31  | 47.36  | 72.65  | 99.83  | 124.62 | 145.20 | 159.86 | 168.09 |
| 115.0°  | 165.23 | 156.40 | 142.94 | 124.63 | 100.73 | 74.83  | 50.95  | 31.88  | 10.96  | 31.99  | 48.41  | 69.51  | 93.52  | 115.67 | 133.89 | 147.02 | 154.40 |
| 120.0°  | 150.78 | 143.10 | 131.26 | 115.04 | 94.95  | 72.87  | 53.21  | 37.28  | 12.02  | 36.98  | 50.25  | 68.10  | 88.40  | 107.53 | 123.24 | 135.52 | 141.58 |
| 125.0°  | 137.76 | 130.74 | 119.97 | 106.75 | 90.06  | 71.71  | 55.74  | 42.81  | 12.82  | 42.25  | 53.09  | 68.10  | 84.68  | 100.90 | 115.08 | 125.40 | 130.19 |
| 130.0°  | 126.24 | 119.37 | 110.49 | 99.07  | 85.45  | 70.91  | 58.74  | 48.21  | 13.20  | 47.12  | 56.29  | 68.23  | 81.78  | 95.83  | 107.34 | 115.89 | 119.96 |
| 135.0°  | 115.31 | 110.08 | 101.95 | 92.49  | 81.58  | 70.24  | 61.00  | 53.17  | 13.88  | 51.61  | 58.94  | 68.58  | 79.69  | 91.15  | 100.77 | 108.03 | 111.08 |
| 140.0°  | 106.27 | 101.40 | 94.75  | 86.58  | 78.07  | 69.50  | 62.90  | 57.39  | 14.81  | 55.93  | 61.69  | 68.64  | 78.34  | 87.39  | 95.22  | 101.07 | 103.01 |
| 145.0°  | 98.03  | 93.84  | 88.37  | 82.10  | 75.24  | 68.95  | 64.60  | 60.64  | 17.10  | 60.59  | 62.81  | 69.10  | 77.65  | 84.61  | 90.37  | 94.33  | 96.05  |
| 150.0°  | 90.86  | 87.63  | 83.45  | 78.41  | 73.34  | 68.83  | 65.77  | 62.77  | 18.46  | 57.84  | 64.94  | 68.77  | 75.00  | 81.91  | 86.26  | 89.23  | 89.64  |
| 155.0°  | 84.70  | 82.40  | 79.03  | 75.58  | 71.86  | 68.71  | 66.56  | 62.57  | 19.97  | 49.92  | 60.10  | 62.48  | 72.36  | 77.70  | 82.80  | 84.56  | 84.47  |
| 160.0°  | 79.91  | 78.23  | 75.84  | 73.13  | 70.69  | 68.46  | 66.38  | 59.33  | 25.66  | 27.71  | 56.75  | 60.72  | 60.73  | 69.23  | 75.91  | 80.01  | 80.29  |
| 165.0°  | 76.53  | 75.03  | 73.20  | 71.21  | 68.78  | 67.11  | 66.22  | 57.60  | 29.80  | 20.93  | 49.42  | 61.56  | 62.38  | 62.54  | 63.49  | 70.70  | 75.72  |
| 170.0°  | 73.63  | 72.13  | 70.22  | 67.39  | 66.75  | 66.29  | 63.38  | 41.46  | 31.46  | 18.44  | 27.73  | 52.78  | 61.55  | 62.82  | 61.35  | 58.89  | 62.65  |
| 175.0°  | 70.75  | 67.79  | 64.27  | 61.53  | 53.82  | 41.18  | 35.06  | 31.74  | 27.18  | 21.95  | 24.45  | 28.41  | 31.98  | 42.71  | 54.11  | 54.42  | 48.60  |
| 180.0°  | 8.61   | 15.11  | 17.00  | 17.13  | 17.71  | 18.25  | 18.60  | 19.61  | 21.36  | 23.05  | 23.44  | 23.14  | 22.44  | 21.35  | 20.29  | 18.86  | 17.75  |

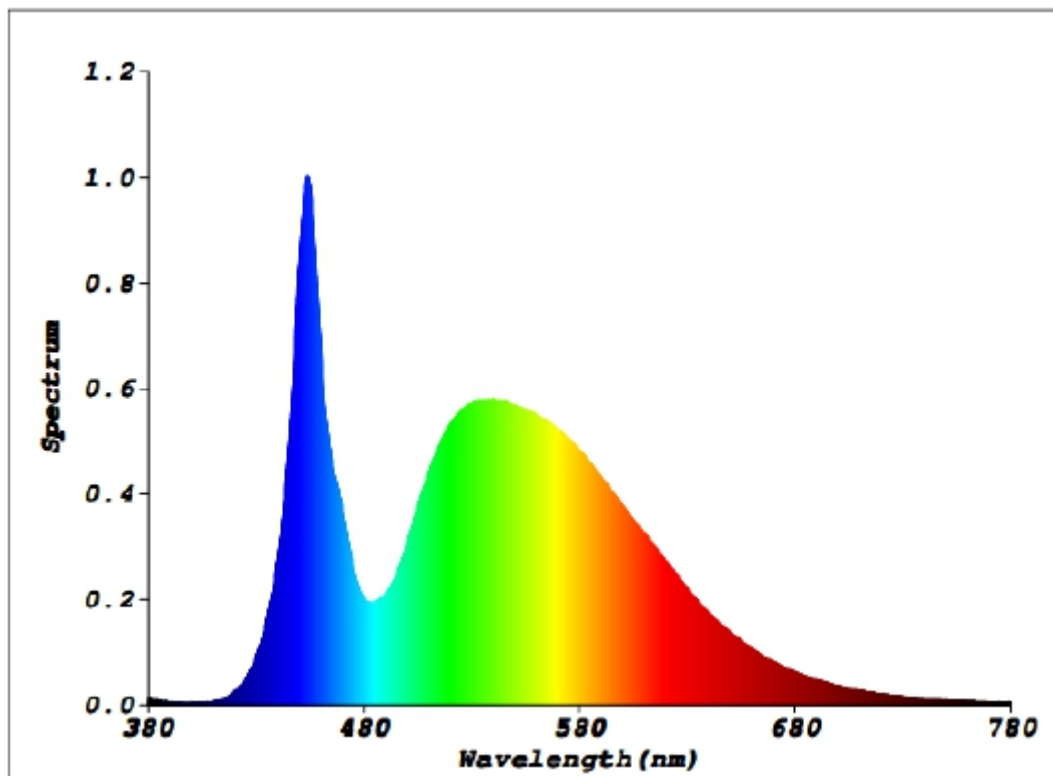
This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product.

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### 3. Color Characteristics of the LED luminaire

|                                          |                                                      |
|------------------------------------------|------------------------------------------------------|
| Test Voltage:                            | 230 V                                                |
| Stabilization time                       | 45 mins                                              |
| Total operating time<br>for measurements | 1,5 hours                                            |
| Chromaticity Coordiante                  | $x=0,3099$ ; $y=0,3689$<br>$u'=0,1821$ ; $v'=0,4878$ |
| Correlated Color Temperature             | --                                                   |
| Color Rendering Index                    | --                                                   |

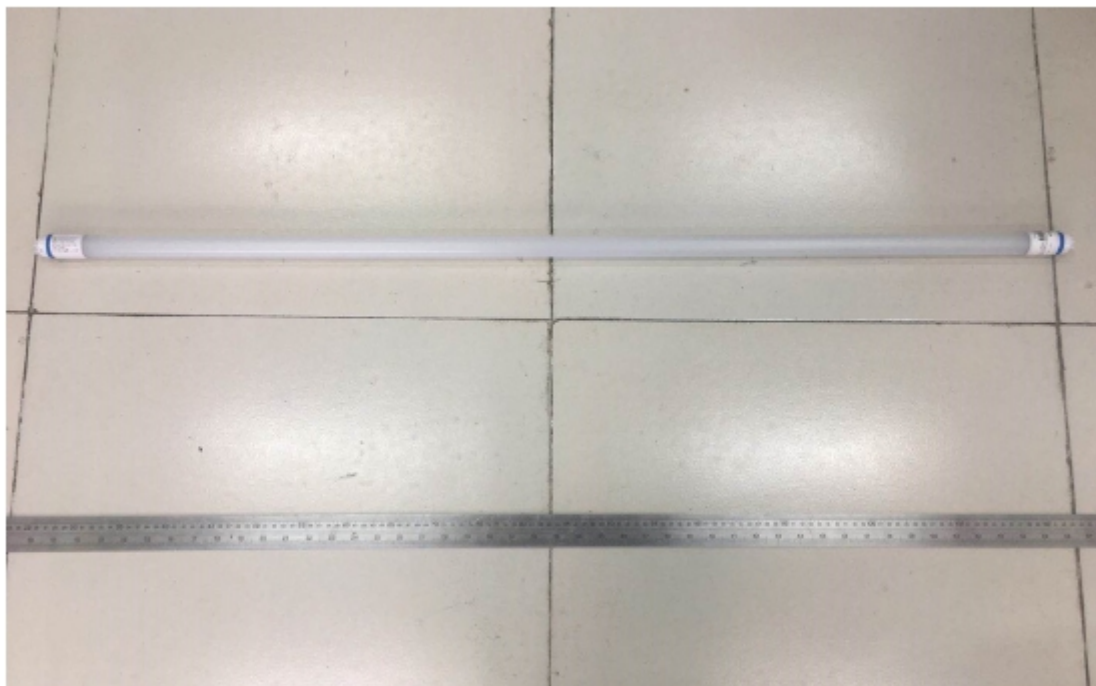
Relative spectrum distribution



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Annex1: Photo documentation



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## ANNEX2: STANDARD BULB USED FOR SYSTEM CALIBRAITON

For Everfine GO-R5000 system

|                                |                       |
|--------------------------------|-----------------------|
| Model                          | D908S                 |
| Intensity Distribution Type    | Omni-Directional Type |
| Calibration current(A)         | 7.2510                |
| Reference voltage (V)          | 91.1                  |
| Calibration CCT (K)            | 2873                  |
| Calibration luminous Flux (lm) | 11599.7               |

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### ANNEX3: LIST OF EQUIPMENT USED

| Registration No | Equipment name                            | Model No | Manufacturer      | Cal. Date<br>(cycle in years) |
|-----------------|-------------------------------------------|----------|-------------------|-------------------------------|
| SHES354-1       | Goniophotometer system                    | GO-R5000 | Hangzhou Everfine | 2017/2/25                     |
| SHES354-1-4     | Standard light source for GO-R5000 system | D908S    | Hangzhou Everfine | 2017/2/25                     |
| SHES354-1-9     | Digital CC&CV DC power supply             | WY12010  | Hangzhou Everfine | 2017/2/25                     |
| SHES354-1-8     | AC Power source                           | DPS-1060 | Hangzhou Everfine | 2017/2/25                     |
| SHES354-1-10    | Digital Power Meter                       | PF2010A  | Hangzhou Everfine | 2017/2/25                     |

— End of report —

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