

IES LM-79-08

MEASUREMENT AND TEST REPORT

For

Overdrive Electronics Pvt. Ltd.

C-121 Hosiery Complex Phase-II Extension, Noida 201305 UP India.

#**Test Model: L9WNA19/27K**

| | |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Report Type: | Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution |
| Test Engineer: | Hexy He <i>Hexy He</i> |
| Report Number: | RSZ201022508-10 |
| Test Date: | 2017-12-26 to 2017-12-27 |
| Report Date: | 2020-10-23 |
| Reviewed By: | Blake Zhang / EE Engineer |
| Prepared By: | Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588 |
| Accreditation: | The IAS Accreditation Number TL-460. |

1. Product Description

General Information:

One sample was received on 2017-12-21 and used for testing.

| | |
|----------------------------|---------------------------------|
| #Model Tested: | L9WNA19/27K |
| #Manufacturer: | Overdrive Electronics Pvt. Ltd. |
| #Product Code: | 792G |
| #Brand Name: | Overdrive |
| #Product Designation: | LED Lamp |
| #Burning Time Before Test: | 0hour(For New Products) |

Rated Values:

| | |
|---------------------------|---------------|
| #Rated Voltage/Frequency: | 120 V AC 60Hz |
| #Rated Power: | 9.5 W |
| #Nominal CCT: | 2700 K |
| #Nominal Lumen Output: | 980lm |

Note:

1. The applicant Overdrive Electronics Pvt. Ltd. declare that their products with model L9WNA19/27K are the same to the products in report#RSZ171221512-10 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ171221512-10) is shared in this report.

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting
- IES TM-30-15: IES Method for Evaluating Light Source Color Rendition (This method is not in IAS accreditation scope)

3. Description of Test Equipment

| Device | Manufacture | Model No | Serial No | Calibration date | Calibration due date |
|-----------------------------------------------|-------------|-----------|---------------------------|------------------|----------------------|
| 1.5m temperature integrating sphere | SENSING | SPR-600 | S09008 | 2017-07-11 | 2018-07-11 |
| High-precision rapid spectral analysis system | EVERFINE | HAAS-2000 | M112048CA1361125 | 2017-07-11 | 2018-07-11 |
| Digital power meter | YOKOGAWA | WT310 | 13398 | 2017-12-05 | 2018-12-05 |
| Programmable Precision DC Power Supply | ITECH | IT6154 | 0061 0417 6471 0010 19 | 2017-03-03 | 2018-03-03 |
| thermometer | SENSING | NA | NA | 2017-03-09 | 2018-03-09 |
| Standard Light Source | SENSING | NA | LSD090808 | 2017-12-05 | 2018-12-05 |
| Precision frequency power supply | ALL Power | APW-105N | 970613 | 2017-03-03 | 2018-03-03 |

| Device | Manufacture | Model No | Serial No | Calibration date | Calibration due date |
|----------------------------------|-------------|-------------|-------------------|------------------|----------------------|
| AC POWER SUPPLY | EVERFINE | VPS1030 PWM | 1012017 | 2017-03-03 | 2018-03-03 |
| Digital CC&CV DC Power Supply | EVERFINE | WY12010 | 1009009 | 2017-03-03 | 2018-03-03 |
| Digital power meter | YOKOGAWA | WT-210 | 91j926132 | 2017-03-03 | 2018-03-03 |
| full-field speed goniophotometer | EVERFINE | GO-R5000 | YG108492N10120001 | 2017-03-09 | 2018-03-09 |
| Wireless Remote Sensor | N/A | 433MHz | N/A | 2017-03-20 | 2018-03-20 |
| Standard Light Source | EVERFINE | D908 | 1012003 | 2017-12-17 | 2018-12-17 |

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is $U=2.1\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=25\text{K}$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.1(K=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.17\%$ of rdg, Power $U=0.48\%$ ($K=2$), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The vertical angle (γ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

The uncertainty of the luminous intensity is $U=2.82\%$ ($K=2$), at the 95% confidence level.

Additional Test

The Additional Test item may not be covered by IESNA LM-79-2008. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$. Test voltage for THD and power factor test would be equal to rated voltage or, in case of a voltage range, maximum value of that range.

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.46\%$ ($K=2$), at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_i , R_g was calculated according to IES TM-30-15 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Baseup**

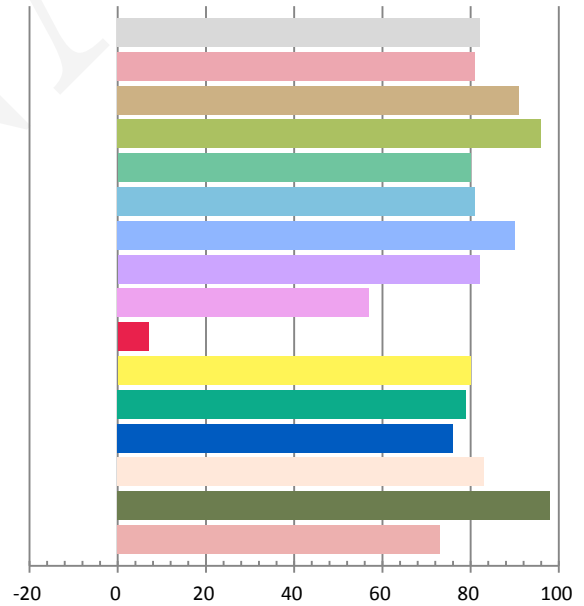
Photometric and Electrical Measurement Result

| Voltage (V) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Luminous Flux(lm) | Efficacy (lm/W) |
|-------------|----------------|-------------|-----------|--------------|-------------------|-----------------|
| 120.0 | 60 | 0.09223 | 9.378 | 0.8476 | 989.14 | 105.47 |

| Radiant Flux (W) | CCT (K) | Duv | x | y | u' | v' |
|------------------|---------|---------|--------|--------|--------|--------|
| 3.075 | 2699 | 0.00016 | 0.4602 | 0.4111 | 0.2625 | 0.5276 |

Color Rendering Index

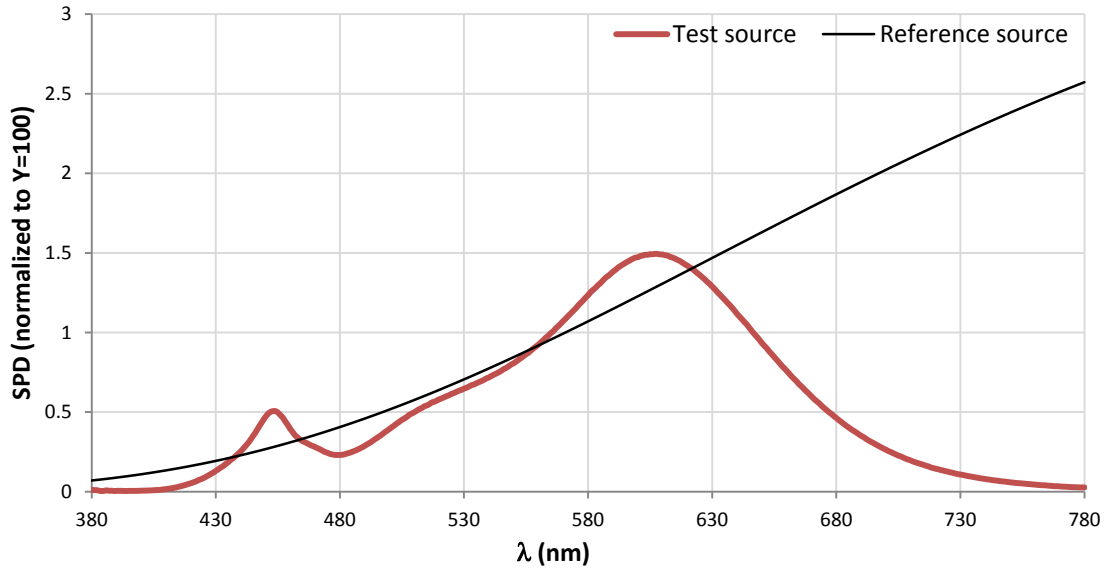
| Ra | | | |
|------|-----|-----|-----|
| 82.1 | | | |
| R1 | R2 | R3 | R4 |
| 81 | 91 | 96 | 80 |
| R5 | R6 | R7 | R8 |
| 81 | 90 | 82 | 57 |
| R9 | R10 | R11 | R12 |
| 7 | 80 | 79 | 76 |
| R13 | R14 | R15 | |
| 83 | 98 | 73 | |



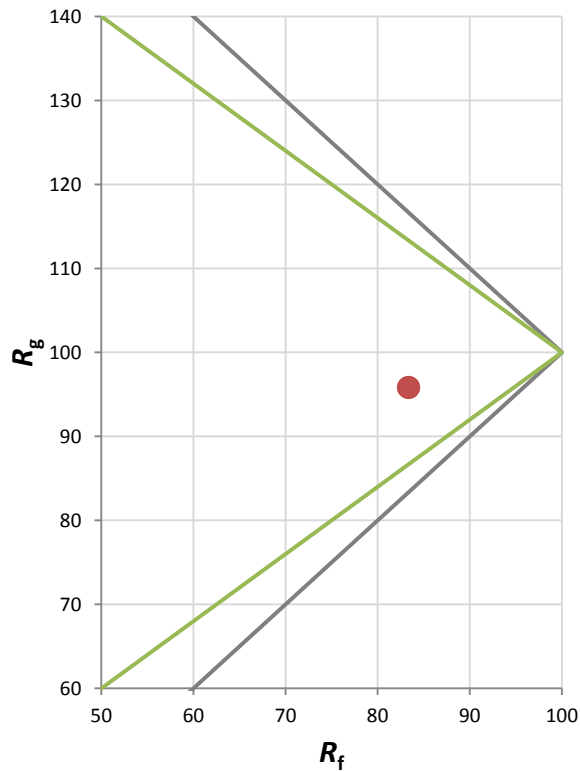
Fidelity Index and Gamut Index

| | |
|----------------------|----|
| Fidelity Index R_f | 83 |
| Gamut Index R_g | 96 |

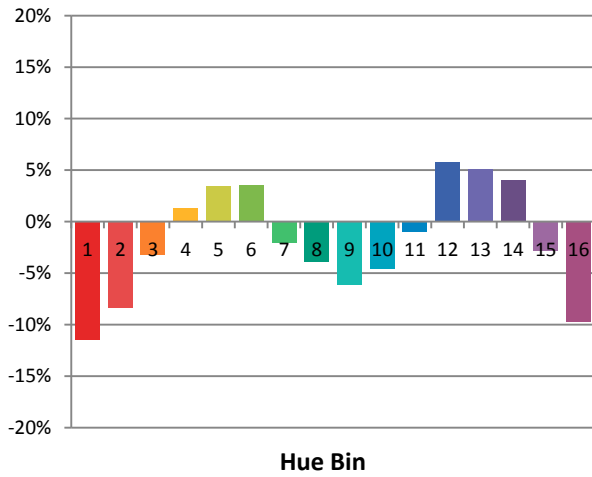
Spectral Power Distribution Comparison



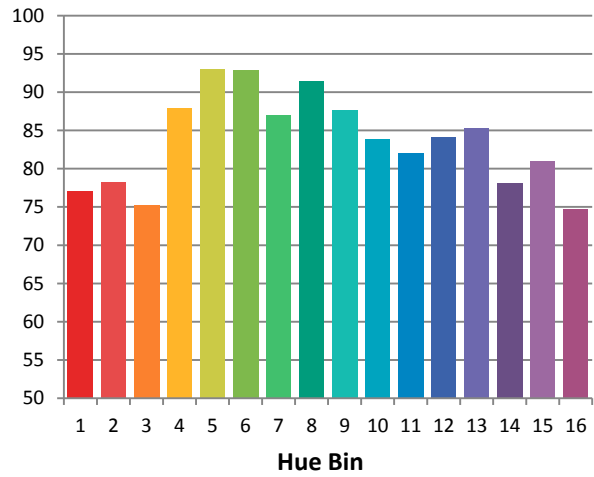
Plot of R_g versus R_f



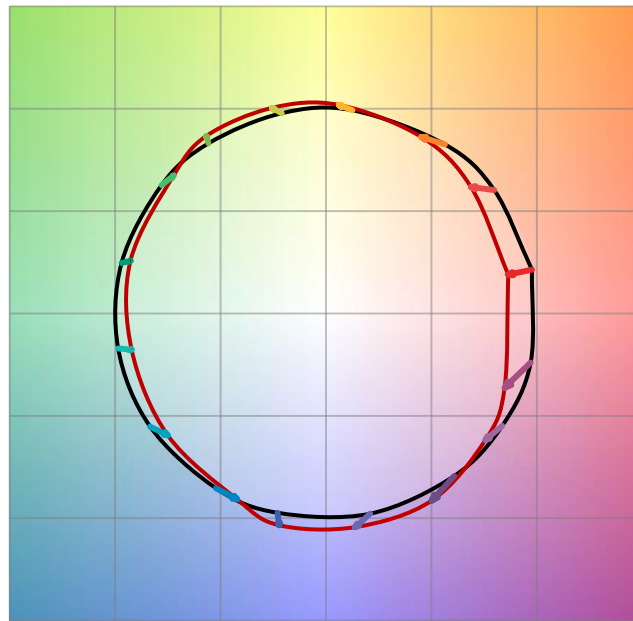
Chroma Shift by Hue



R_f by Hue

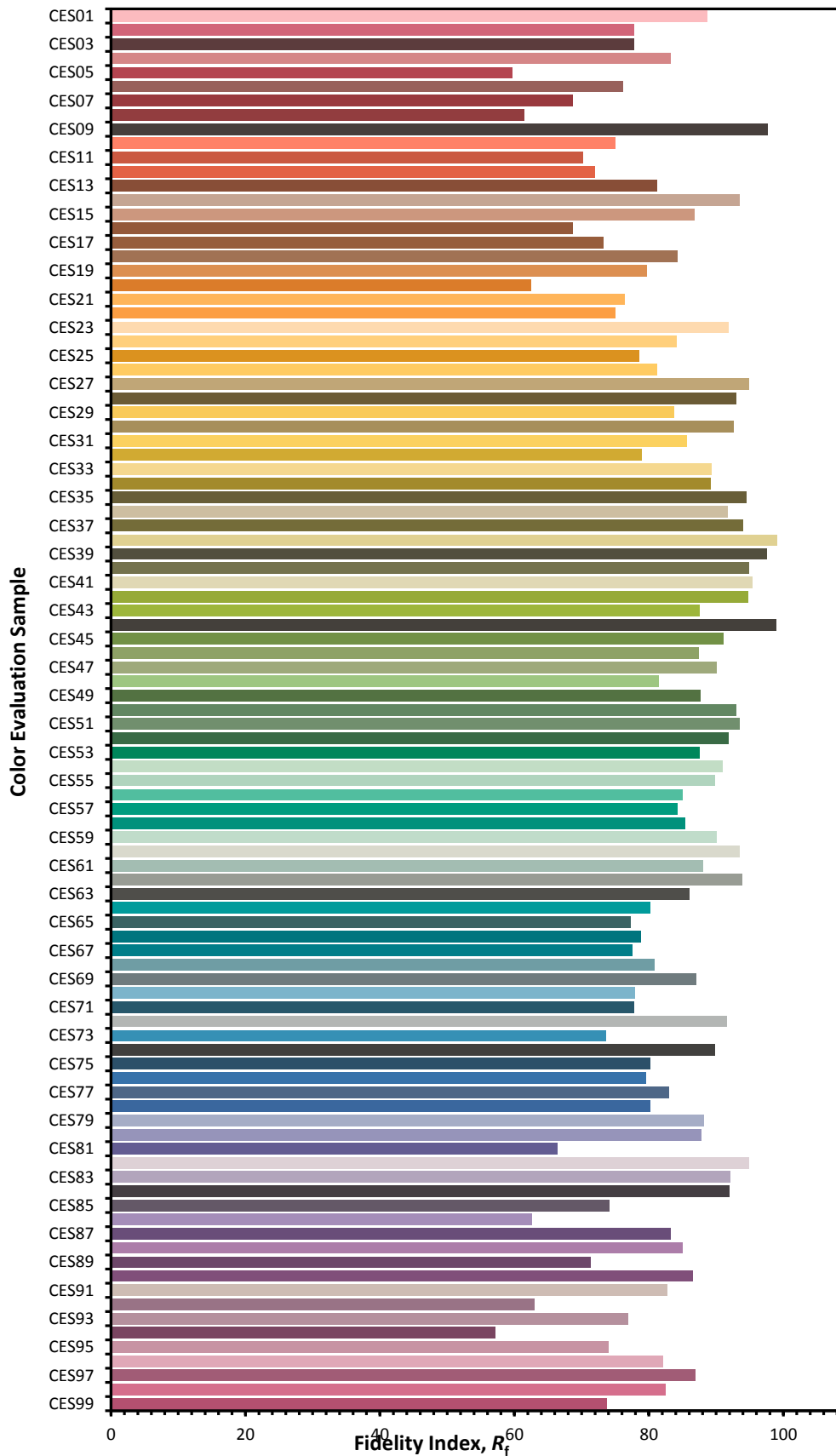


Color Vector Graphic

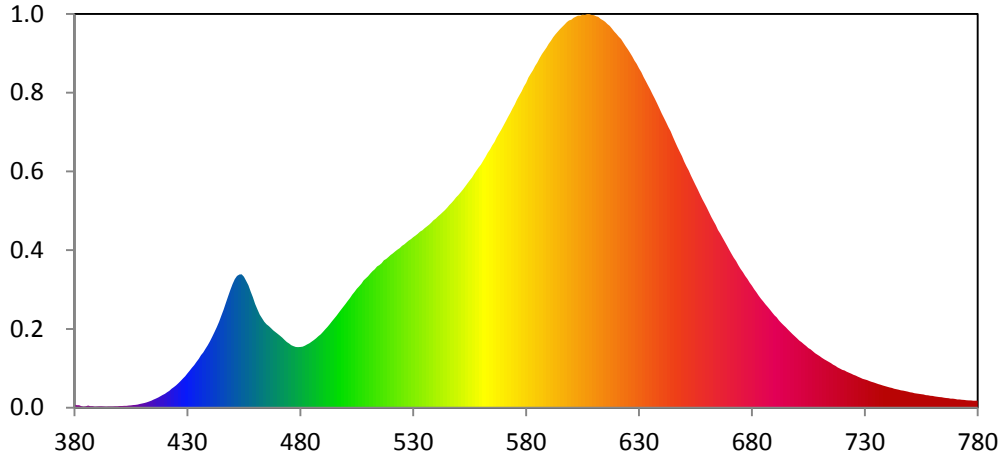


— Reference Illuminat — Test Source

Color Fidelity by CES Sample



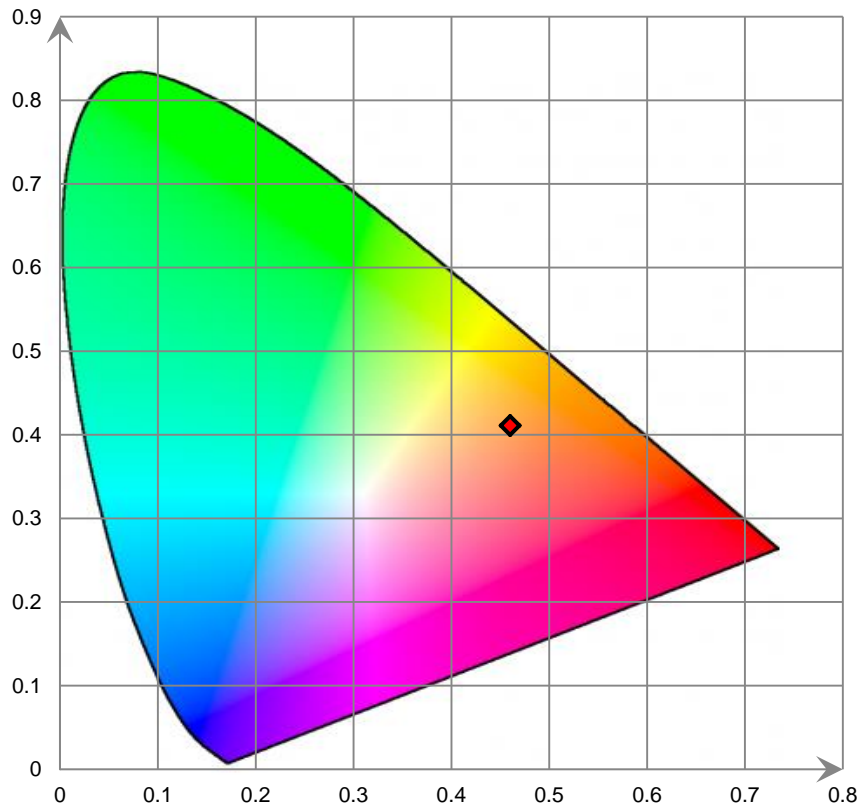
Relative Spectral Power Distribution



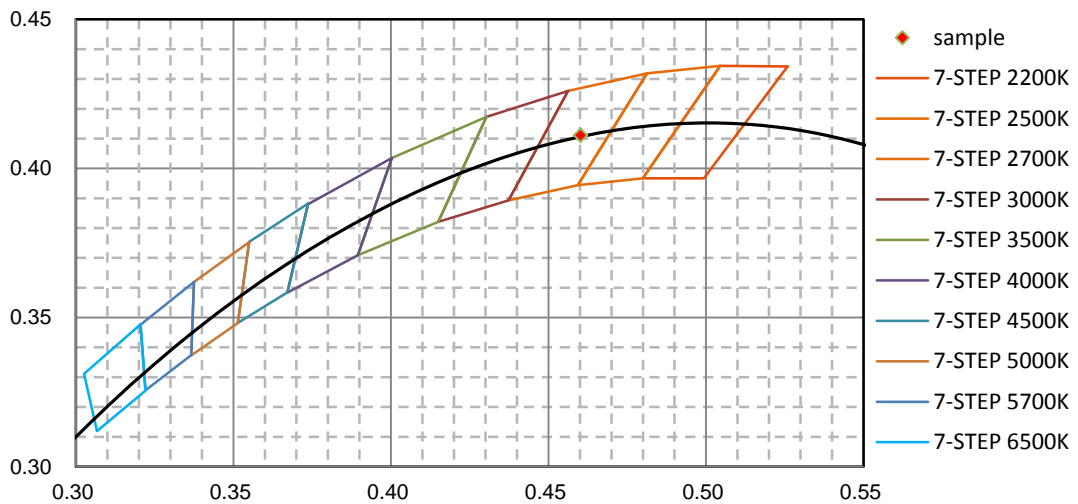
| nm | mW | nm | mW | nm | mW | nm | mW | nm | mW |
|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|
| 380 | 1.732E-01 | 421 | 8.525E-01 | 462 | 5.113E+00 | 503 | 6.214E+00 | 544 | 1.086E+01 |
| 381 | 1.392E-01 | 422 | 9.311E-01 | 463 | 4.923E+00 | 504 | 6.369E+00 | 545 | 1.100E+01 |
| 382 | 1.373E-01 | 423 | 1.045E+00 | 464 | 4.736E+00 | 505 | 6.529E+00 | 546 | 1.115E+01 |
| 383 | 8.741E-02 | 424 | 1.133E+00 | 465 | 4.593E+00 | 506 | 6.664E+00 | 547 | 1.126E+01 |
| 384 | 5.569E-02 | 425 | 1.230E+00 | 466 | 4.491E+00 | 507 | 6.812E+00 | 548 | 1.141E+01 |
| 385 | 7.824E-02 | 426 | 1.351E+00 | 467 | 4.375E+00 | 508 | 7.000E+00 | 549 | 1.157E+01 |
| 386 | 1.164E-01 | 427 | 1.474E+00 | 468 | 4.255E+00 | 509 | 7.113E+00 | 550 | 1.168E+01 |
| 387 | 8.341E-02 | 428 | 1.611E+00 | 469 | 4.158E+00 | 510 | 7.230E+00 | 551 | 1.184E+01 |
| 388 | 8.602E-02 | 429 | 1.734E+00 | 470 | 4.062E+00 | 511 | 7.373E+00 | 552 | 1.200E+01 |
| 389 | 5.800E-02 | 430 | 1.893E+00 | 471 | 3.954E+00 | 512 | 7.512E+00 | 553 | 1.217E+01 |
| 390 | 7.212E-02 | 431 | 2.041E+00 | 472 | 3.851E+00 | 513 | 7.617E+00 | 554 | 1.233E+01 |
| 391 | 7.564E-02 | 432 | 2.194E+00 | 473 | 3.728E+00 | 514 | 7.762E+00 | 555 | 1.250E+01 |
| 392 | 7.264E-02 | 433 | 2.333E+00 | 474 | 3.609E+00 | 515 | 7.843E+00 | 556 | 1.265E+01 |
| 393 | 6.529E-02 | 434 | 2.513E+00 | 475 | 3.534E+00 | 516 | 7.954E+00 | 557 | 1.285E+01 |
| 394 | 5.679E-02 | 435 | 2.689E+00 | 476 | 3.436E+00 | 517 | 8.113E+00 | 558 | 1.304E+01 |
| 395 | 7.056E-02 | 436 | 2.893E+00 | 477 | 3.387E+00 | 518 | 8.176E+00 | 559 | 1.321E+01 |
| 396 | 6.947E-02 | 437 | 3.041E+00 | 478 | 3.340E+00 | 519 | 8.286E+00 | 560 | 1.338E+01 |
| 397 | 7.022E-02 | 438 | 3.243E+00 | 479 | 3.336E+00 | 520 | 8.401E+00 | 561 | 1.359E+01 |
| 398 | 7.489E-02 | 439 | 3.438E+00 | 480 | 3.344E+00 | 521 | 8.485E+00 | 562 | 1.379E+01 |
| 399 | 7.617E-02 | 440 | 3.656E+00 | 481 | 3.359E+00 | 522 | 8.593E+00 | 563 | 1.402E+01 |
| 400 | 9.016E-02 | 441 | 3.901E+00 | 482 | 3.407E+00 | 523 | 8.689E+00 | 564 | 1.420E+01 |
| 401 | 9.250E-02 | 442 | 4.160E+00 | 483 | 3.483E+00 | 524 | 8.778E+00 | 565 | 1.443E+01 |
| 402 | 1.000E-01 | 443 | 4.420E+00 | 484 | 3.546E+00 | 525 | 8.895E+00 | 566 | 1.461E+01 |
| 403 | 1.052E-01 | 444 | 4.728E+00 | 485 | 3.628E+00 | 526 | 8.978E+00 | 567 | 1.486E+01 |
| 404 | 1.168E-01 | 445 | 5.066E+00 | 486 | 3.718E+00 | 527 | 9.088E+00 | 568 | 1.507E+01 |
| 405 | 1.274E-01 | 446 | 5.387E+00 | 487 | 3.814E+00 | 528 | 9.189E+00 | 569 | 1.529E+01 |
| 406 | 1.469E-01 | 447 | 5.761E+00 | 488 | 3.926E+00 | 529 | 9.265E+00 | 570 | 1.553E+01 |
| 407 | 1.546E-01 | 448 | 6.119E+00 | 489 | 4.039E+00 | 530 | 9.374E+00 | 571 | 1.575E+01 |
| 408 | 1.784E-01 | 449 | 6.473E+00 | 490 | 4.169E+00 | 531 | 9.461E+00 | 572 | 1.599E+01 |
| 409 | 2.108E-01 | 450 | 6.796E+00 | 491 | 4.310E+00 | 532 | 9.563E+00 | 573 | 1.621E+01 |
| 410 | 2.372E-01 | 451 | 7.072E+00 | 492 | 4.441E+00 | 533 | 9.685E+00 | 574 | 1.645E+01 |
| 411 | 2.667E-01 | 452 | 7.247E+00 | 493 | 4.587E+00 | 534 | 9.750E+00 | 575 | 1.667E+01 |
| 412 | 3.015E-01 | 453 | 7.323E+00 | 494 | 4.748E+00 | 535 | 9.864E+00 | 576 | 1.694E+01 |
| 413 | 3.433E-01 | 454 | 7.331E+00 | 495 | 4.901E+00 | 536 | 9.966E+00 | 577 | 1.717E+01 |
| 414 | 3.869E-01 | 455 | 7.203E+00 | 496 | 5.049E+00 | 537 | 1.006E+01 | 578 | 1.740E+01 |
| 415 | 4.444E-01 | 456 | 6.972E+00 | 497 | 5.213E+00 | 538 | 1.017E+01 | 579 | 1.766E+01 |
| 416 | 4.995E-01 | 457 | 6.735E+00 | 498 | 5.389E+00 | 539 | 1.030E+01 | 580 | 1.787E+01 |
| 417 | 5.613E-01 | 458 | 6.391E+00 | 499 | 5.546E+00 | 540 | 1.039E+01 | 581 | 1.815E+01 |
| 418 | 6.267E-01 | 459 | 6.072E+00 | 500 | 5.707E+00 | 541 | 1.052E+01 | 582 | 1.836E+01 |
| 419 | 7.048E-01 | 460 | 5.712E+00 | 501 | 5.878E+00 | 542 | 1.064E+01 | 583 | 1.855E+01 |
| 420 | 7.663E-01 | 461 | 5.417E+00 | 502 | 6.035E+00 | 543 | 1.075E+01 | 584 | 1.879E+01 |

| nm | mW | nm | mW | nm | mW | nm | mW | nm | mW |
|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|
| 585 | 1.898E+01 | 626 | 1.951E+01 | 667 | 9.334E+00 | 708 | 2.995E+00 | 749 | 8.825E-01 |
| 586 | 1.922E+01 | 627 | 1.932E+01 | 668 | 9.117E+00 | 709 | 2.920E+00 | 750 | 8.507E-01 |
| 587 | 1.945E+01 | 628 | 1.909E+01 | 669 | 8.902E+00 | 710 | 2.836E+00 | 751 | 8.305E-01 |
| 588 | 1.962E+01 | 629 | 1.890E+01 | 670 | 8.669E+00 | 711 | 2.739E+00 | 752 | 7.983E-01 |
| 589 | 1.980E+01 | 630 | 1.866E+01 | 671 | 8.450E+00 | 712 | 2.663E+00 | 753 | 7.786E-01 |
| 590 | 2.001E+01 | 631 | 1.844E+01 | 672 | 8.244E+00 | 713 | 2.589E+00 | 754 | 7.664E-01 |
| 591 | 2.018E+01 | 632 | 1.818E+01 | 673 | 8.064E+00 | 714 | 2.520E+00 | 755 | 7.422E-01 |
| 592 | 2.037E+01 | 633 | 1.795E+01 | 674 | 7.834E+00 | 715 | 2.453E+00 | 756 | 7.275E-01 |
| 593 | 2.053E+01 | 634 | 1.771E+01 | 675 | 7.630E+00 | 716 | 2.369E+00 | 757 | 6.935E-01 |
| 594 | 2.067E+01 | 635 | 1.748E+01 | 676 | 7.448E+00 | 717 | 2.307E+00 | 758 | 6.874E-01 |
| 595 | 2.081E+01 | 636 | 1.723E+01 | 677 | 7.241E+00 | 718 | 2.216E+00 | 759 | 6.596E-01 |
| 596 | 2.094E+01 | 637 | 1.699E+01 | 678 | 7.082E+00 | 719 | 2.152E+00 | 760 | 6.451E-01 |
| 597 | 2.107E+01 | 638 | 1.674E+01 | 679 | 6.881E+00 | 720 | 2.088E+00 | 761 | 6.196E-01 |
| 598 | 2.119E+01 | 639 | 1.647E+01 | 680 | 6.707E+00 | 721 | 2.046E+00 | 762 | 6.010E-01 |
| 599 | 2.129E+01 | 640 | 1.618E+01 | 681 | 6.514E+00 | 722 | 1.975E+00 | 763 | 5.862E-01 |
| 600 | 2.133E+01 | 641 | 1.593E+01 | 682 | 6.349E+00 | 723 | 1.928E+00 | 764 | 5.762E-01 |
| 601 | 2.143E+01 | 642 | 1.569E+01 | 683 | 6.167E+00 | 724 | 1.867E+00 | 765 | 5.546E-01 |
| 602 | 2.149E+01 | 643 | 1.543E+01 | 684 | 5.995E+00 | 725 | 1.814E+00 | 766 | 5.350E-01 |
| 603 | 2.156E+01 | 644 | 1.520E+01 | 685 | 5.841E+00 | 726 | 1.762E+00 | 767 | 5.210E-01 |
| 604 | 2.155E+01 | 645 | 1.490E+01 | 686 | 5.676E+00 | 727 | 1.708E+00 | 768 | 4.977E-01 |
| 605 | 2.161E+01 | 646 | 1.462E+01 | 687 | 5.537E+00 | 728 | 1.648E+00 | 769 | 5.008E-01 |
| 606 | 2.160E+01 | 647 | 1.434E+01 | 688 | 5.393E+00 | 729 | 1.593E+00 | 770 | 4.812E-01 |
| 607 | 2.164E+01 | 648 | 1.409E+01 | 689 | 5.234E+00 | 730 | 1.558E+00 | 771 | 4.584E-01 |
| 608 | 2.163E+01 | 649 | 1.383E+01 | 690 | 5.084E+00 | 731 | 1.518E+00 | 772 | 4.542E-01 |
| 609 | 2.159E+01 | 650 | 1.353E+01 | 691 | 4.964E+00 | 732 | 1.469E+00 | 773 | 4.405E-01 |
| 610 | 2.158E+01 | 651 | 1.328E+01 | 692 | 4.802E+00 | 733 | 1.421E+00 | 774 | 4.269E-01 |
| 611 | 2.152E+01 | 652 | 1.304E+01 | 693 | 4.664E+00 | 734 | 1.386E+00 | 775 | 4.092E-01 |
| 612 | 2.148E+01 | 653 | 1.276E+01 | 694 | 4.535E+00 | 735 | 1.343E+00 | 776 | 4.062E-01 |
| 613 | 2.137E+01 | 654 | 1.251E+01 | 695 | 4.423E+00 | 736 | 1.299E+00 | 777 | 3.993E-01 |
| 614 | 2.130E+01 | 655 | 1.225E+01 | 696 | 4.288E+00 | 737 | 1.264E+00 | 778 | 3.873E-01 |
| 615 | 2.121E+01 | 656 | 1.200E+01 | 697 | 4.170E+00 | 738 | 1.216E+00 | 779 | 3.879E-01 |
| 616 | 2.109E+01 | 657 | 1.174E+01 | 698 | 4.043E+00 | 739 | 1.186E+00 | 780 | 3.886E-01 |
| 617 | 2.099E+01 | 658 | 1.147E+01 | 699 | 3.927E+00 | 740 | 1.151E+00 | | |
| 618 | 2.084E+01 | 659 | 1.124E+01 | 700 | 3.815E+00 | 741 | 1.116E+00 | | |
| 619 | 2.069E+01 | 660 | 1.100E+01 | 701 | 3.696E+00 | 742 | 1.086E+00 | | |
| 620 | 2.056E+01 | 661 | 1.075E+01 | 702 | 3.600E+00 | 743 | 1.046E+00 | | |
| 621 | 2.041E+01 | 662 | 1.049E+01 | 703 | 3.493E+00 | 744 | 1.022E+00 | | |
| 622 | 2.027E+01 | 663 | 1.026E+01 | 704 | 3.392E+00 | 745 | 9.928E-01 | | |
| 623 | 2.008E+01 | 664 | 1.004E+01 | 705 | 3.281E+00 | 746 | 9.609E-01 | | |
| 624 | 1.989E+01 | 665 | 9.773E+00 | 706 | 3.206E+00 | 747 | 9.343E-01 | | |
| 625 | 1.971E+01 | 666 | 9.575E+00 | 707 | 3.101E+00 | 748 | 9.140E-01 | | |

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **1.0 hour**

Test orientation: **Baseup**

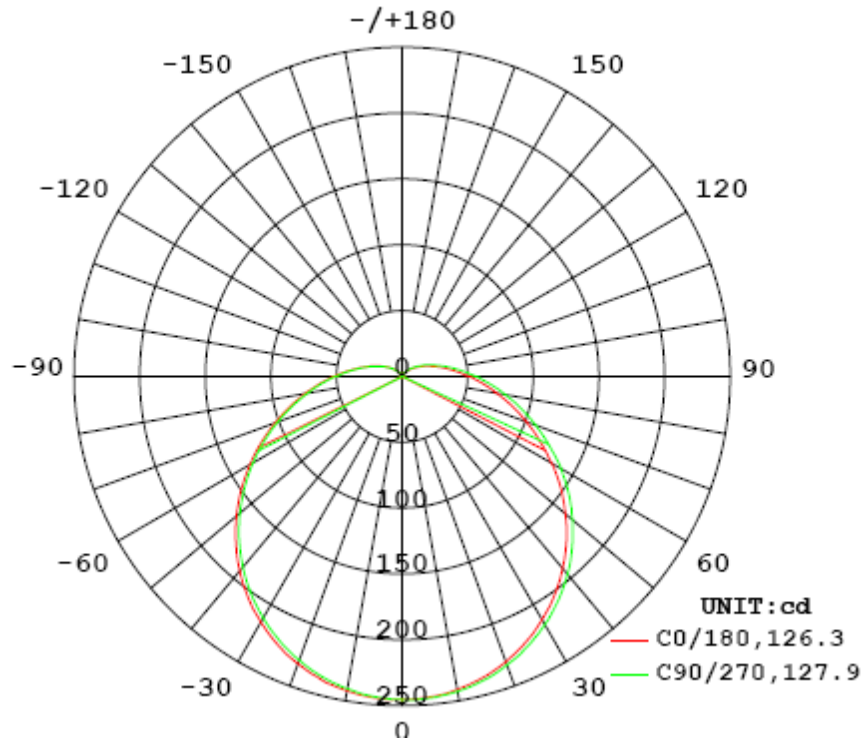
Electrical Measurement

| Input Voltage (V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|-------------------|----------------|-------------------|-----------|--------------|
| 120.0 | 60 | 0.0920 | 9.4 | 0.8517 |

Photometric Measurement

| Luminous Flux (lm) | Efficacy (lm/W) | I _{max} (cd) | S/MH (C0/180) | S/MH (C90/270) |
|--------------------|-----------------|-----------------------|---------------|----------------|
| 991.579 | 105.49 | 245.7 | 1.30 | 1.32 |

Luminous Intensity Distribution



| | C0/180 | C45/225 | C90/270 | C135/315 | AVG. |
|--------------------------------------|--------|---------|---------|----------|-------|
| Beam Angle (50% I _{max}): | 126.3 | 125.9 | 127.9 | 128.3 | 127.1 |
| Field Angle (10% I _{max}): | 217.4 | 216.7 | 219.3 | 219.6 | 218.3 |

Luminous Intensity (cd) Distribution Data

| C γ | 0° | 22.5° | 45° | 67.5° | 90° | 112.5° | 135° | 157.5° |
|--------|-----|-------|-----|-------|-----|--------|------|--------|
| 0.0° | 245 | 245 | 245 | 245 | 245 | 245 | 245 | 245 |
| 5.0° | 245 | 244 | 245 | 244 | 244 | 244 | 244 | 244 |
| 10.0° | 242 | 242 | 242 | 241 | 241 | 241 | 241 | 241 |
| 15.0° | 238 | 238 | 237 | 236 | 236 | 236 | 236 | 236 |
| 20.0° | 232 | 232 | 231 | 230 | 229 | 229 | 229 | 229 |
| 25.0° | 225 | 224 | 223 | 222 | 221 | 221 | 221 | 221 |
| 30.0° | 216 | 214 | 213 | 212 | 212 | 212 | 211 | 212 |
| 35.0° | 205 | 203 | 203 | 202 | 201 | 201 | 201 | 201 |
| 40.0° | 193 | 191 | 190 | 189 | 189 | 189 | 189 | 189 |
| 45.0° | 179 | 177 | 177 | 176 | 176 | 175 | 175 | 176 |
| 50.0° | 165 | 163 | 162 | 162 | 161 | 162 | 161 | 161 |
| 55.0° | 150 | 147 | 146 | 146 | 147 | 147 | 147 | 146 |
| 60.0° | 134 | 131 | 131 | 131 | 131 | 131 | 131 | 131 |
| 65.0° | 118 | 115 | 115 | 115 | 116 | 116 | 116 | 116 |
| 70.0° | 103 | 100 | 100 | 100 | 101 | 101 | 101 | 101 |
| 75.0° | 89 | 85 | 85 | 86 | 87 | 87 | 87 | 86 |
| 80.0° | 75 | 72 | 72 | 73 | 73 | 74 | 74 | 73 |
| 85.0° | 63 | 60 | 60 | 61 | 62 | 62 | 62 | 62 |
| 90.0° | 52 | 50 | 50 | 51 | 51 | 51 | 51 | 51 |
| 95.0° | 43 | 41 | 41 | 42 | 42 | 42 | 42 | 42 |
| 100.0° | 35 | 34 | 34 | 34 | 34 | 35 | 35 | 35 |
| 105.0° | 29 | 27 | 27 | 28 | 28 | 28 | 28 | 28 |
| 110.0° | 23 | 22 | 22 | 23 | 23 | 23 | 23 | 23 |
| 115.0° | 19 | 18 | 18 | 18 | 18 | 19 | 19 | 19 |
| 120.0° | 15 | 14 | 14 | 14 | 15 | 15 | 15 | 15 |
| 125.0° | 12 | 11 | 11 | 11 | 12 | 12 | 12 | 12 |
| 130.0° | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| 135.0° | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 140.0° | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 145.0° | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 150.0° | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| 155.0° | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 160.0° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 165.0° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 170.0° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 175.0° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180.0° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Luminous Intensity (cd) Distribution Data (cont.)

| C y | 180° | 202.5° | 225° | 247.5° | 270° | 292.5° | 315° | 337.5° |
|--------|------|--------|------|--------|------|--------|------|--------|
| 0.0° | 245 | 245 | 245 | 245 | 245 | 245 | 245 | 245 |
| 5.0° | 244 | 244 | 245 | 245 | 245 | 245 | 245 | 245 |
| 10.0° | 241 | 242 | 242 | 243 | 243 | 243 | 243 | 243 |
| 15.0° | 237 | 237 | 238 | 238 | 239 | 239 | 239 | 239 |
| 20.0° | 231 | 231 | 232 | 233 | 233 | 234 | 234 | 233 |
| 25.0° | 223 | 224 | 225 | 225 | 226 | 226 | 226 | 226 |
| 30.0° | 213 | 214 | 215 | 216 | 217 | 218 | 218 | 217 |
| 35.0° | 202 | 203 | 205 | 206 | 208 | 208 | 208 | 207 |
| 40.0° | 190 | 191 | 193 | 195 | 196 | 197 | 196 | 195 |
| 45.0° | 177 | 178 | 180 | 181 | 183 | 184 | 184 | 183 |
| 50.0° | 162 | 163 | 165 | 167 | 169 | 170 | 170 | 169 |
| 55.0° | 147 | 148 | 150 | 153 | 155 | 156 | 155 | 154 |
| 60.0° | 131 | 132 | 134 | 137 | 140 | 141 | 140 | 138 |
| 65.0° | 116 | 116 | 118 | 121 | 123 | 125 | 124 | 122 |
| 70.0° | 101 | 100 | 103 | 106 | 108 | 109 | 109 | 107 |
| 75.0° | 86 | 86 | 88 | 91 | 94 | 95 | 94 | 92 |
| 80.0° | 73 | 73 | 75 | 78 | 80 | 81 | 80 | 79 |
| 85.0° | 62 | 61 | 63 | 66 | 67 | 68 | 68 | 66 |
| 90.0° | 51 | 51 | 52 | 55 | 56 | 57 | 56 | 55 |
| 95.0° | 42 | 42 | 43 | 45 | 47 | 47 | 47 | 46 |
| 100.0° | 35 | 34 | 36 | 37 | 38 | 39 | 38 | 38 |
| 105.0° | 28 | 28 | 29 | 31 | 31 | 32 | 32 | 31 |
| 110.0° | 23 | 23 | 24 | 25 | 26 | 26 | 26 | 25 |
| 115.0° | 19 | 19 | 19 | 20 | 21 | 21 | 21 | 20 |
| 120.0° | 15 | 15 | 15 | 16 | 17 | 17 | 17 | 16 |
| 125.0° | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 |
| 130.0° | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 |
| 135.0° | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 |
| 140.0° | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| 145.0° | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 150.0° | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 155.0° | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 160.0° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 165.0° | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 170.0° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 175.0° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180.0° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Zonal Lumen Density Measurement

| Deg | Flux (lm) | % | Deg | Flux (lm) | % |
|---------|-----------|------|-------|-----------|--------|
| 0-5 | 5.9 | 0.59 | 0-5 | 5.9 | 0.59 |
| 5-10 | 17.4 | 1.76 | 0-10 | 23.3 | 2.35 |
| 10-15 | 28.4 | 2.86 | 0-15 | 51.7 | 5.21 |
| 15-20 | 38.6 | 3.90 | 0-20 | 90.3 | 9.11 |
| 20-25 | 47.7 | 4.81 | 0-25 | 138.1 | 13.92 |
| 25-30 | 55.5 | 5.60 | 0-30 | 193.5 | 19.52 |
| 30-35 | 61.6 | 6.21 | 0-35 | 255.2 | 25.73 |
| 35-40 | 66.1 | 6.66 | 0-40 | 321.2 | 32.39 |
| 40-45 | 68.6 | 6.93 | 0-45 | 389.9 | 39.32 |
| 45-50 | 69.4 | 6.99 | 0-50 | 459.2 | 46.31 |
| 50-55 | 68.3 | 6.89 | 0-55 | 527.5 | 53.20 |
| 55-60 | 65.6 | 6.61 | 0-60 | 593.1 | 59.81 |
| 60-65 | 61.3 | 6.18 | 0-65 | 654.4 | 65.99 |
| 65-70 | 56.0 | 5.65 | 0-70 | 710.4 | 71.64 |
| 70-75 | 50.1 | 5.05 | 0-75 | 760.5 | 76.69 |
| 75-80 | 43.8 | 4.42 | 0-80 | 804.3 | 81.11 |
| 80-85 | 37.6 | 3.79 | 0-85 | 841.8 | 84.90 |
| 85-90 | 31.6 | 3.18 | 0-90 | 873.4 | 88.08 |
| 90-95 | 26.2 | 2.65 | 0-95 | 899.6 | 90.73 |
| 95-100 | 21.4 | 2.16 | 0-100 | 921.1 | 92.89 |
| 100-105 | 17.3 | 1.74 | 0-105 | 938.4 | 94.63 |
| 105-110 | 13.8 | 1.39 | 0-110 | 952.1 | 96.02 |
| 110-115 | 10.8 | 1.09 | 0-115 | 963.0 | 97.11 |
| 115-120 | 8.4 | 0.85 | 0-120 | 971.3 | 97.96 |
| 120-125 | 6.3 | 0.63 | 0-125 | 977.6 | 98.59 |
| 125-130 | 4.7 | 0.48 | 0-130 | 982.3 | 99.07 |
| 130-135 | 3.4 | 0.33 | 0-135 | 985.7 | 99.40 |
| 135-140 | 2.3 | 0.24 | 0-140 | 988.0 | 99.64 |
| 140-145 | 1.5 | 0.15 | 0-145 | 989.5 | 99.79 |
| 145-150 | 1.0 | 0.10 | 0-150 | 990.5 | 99.89 |
| 150-155 | 0.6 | 0.06 | 0-155 | 991.1 | 99.95 |
| 155-160 | 0.3 | 0.03 | 0-160 | 991.4 | 99.98 |
| 160-165 | 0.1 | 0.01 | 0-165 | 991.5 | 99.99 |
| 165-170 | 0.1 | 0.01 | 0-170 | 991.5 | 100.00 |
| 170-175 | 0.0 | 0.00 | 0-175 | 991.6 | 100.00 |
| 175-180 | 0.0 | 0.00 | 0-180 | 991.6 | 100.00 |

6. Product Photo



Directions

1. The information marked "superscript #" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
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*****END OF REPORT*****