

Photometric Test Report

Relevant Standards

- ☒ ANSI/IES LM-79-2019
- ☒ ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

Address: 408 W 14th St New York, NY 10014

Prepared By

Dongguan New Testing Centre Co., Ltd.

Address: 3F No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China

Prepare by:

Alan Wang

Engineer: Alan Wang

Date: 2025-09-17

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

Issue Date: 2025-09-17

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V6.0

| Surface Mount Luminaires | | | | | |
|--|--|---|----------------------|----------|------------|
| Requirement Category | | Test Method | Requirements | | Test Value |
| Luminaire Output (lm) (Goniophotometer – Section 4.2) | | ANSI/IES LM-79:2019 | 250 | | 1066 |
| Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) | | ANSI/IES LM-79:2019 | Standard | Premium | 88.1 |
| | | | 95 | 110 | |
| Power (Input Wattage) (W) (Goniophotometer – Section 4.2) | | ANSI/IES LM-79:2019 | Worst Case | | 12.1 |
| Total Harmonic Distortion (A%) (THD & PF – Section 4.3) | | ANSI C82.77:2002 ANSI C82-77-10:2020 | 20.00% | 120V | 10.95 |
| Power Factor (THD & PF – Section 4.3) | | ANSI C82.77:2002 ANSI C82-77-10:2020 | 0.9 | 120V | 0.986 |
| Allowable CCTs* (K) (Integrating Sphere – Section 4.1) | | ANSI/IES LM-79:2019 | 7 steps | 3045±175 | 3020 |
| | | | 4 steps | 3045±100 | |
| Minimum CRI (Integrating Sphere – Section 4.1) | | ANSI/IES LM-79:2019 CIE13.3-1995 | ≥80 | | 92.9 |
| Minimum R9 (Integrating Sphere – Section 4.1) | | ANSI/IES LM-79-2019 CIE13.3-1995 | ≥0 | | 58 |
| Minimum Rf (Integrating Sphere – Section 4.1) | | ANSI/IES TM-30-18 | ≥70 | | 90 |
| Minimum Rg (Integrating Sphere – Section 4.1) | | ANSI/IES TM-30-18 | ≥89 | | 96 |
| IES Rcs,h1 (Integrating Sphere – Section 4.1) | | ANSI/IES TM-30-18 | -12%≤IES Rcs,h1≤+23% | | -5% |
| Zonal Lumen Requirement (0°-90°) (Goniophotometer – Section 4.2) | | ANSI/IES LM-79:2019 | ≥85% | | 100.0% |
| Input Voltage (V) | | | | | |
| (Goniophotometer – Section 4.2) | | ANSI/IES LM-79:2019 | Worst Cast | | 120.0 |
| (Goniophotometer – Section 4.2) | | | Non-Worst Case | | N/A |
| Input Current (A) | | | | | |
| (Goniophotometer – Section 4.2) | | ANSI/IES LM-79:2019 | Worst Case | | 0.102 |
| (Goniophotometer – Section 4.2) | | | Non-Worst Case | | N/A |
| Power (Input Wattage – W) | | | | | |
| (Goniophotometer – Section 4.2) | | ANSI/IES LM-79:2019 | Worst Case | | 12.1 |
| (Goniophotometer – Section 4.2) | | | Non-Worst Case | | N/A |

2.0 Test List

| Test Item | Test | Test Date | Model Number | Build Level | Sample No. |
|-----------|-------------------------|------------|----------------------------|-------------|--------------|
| 1 | Integrating Sphere Test | 2025-09-15 | COL12SM2 @3000K Black trim | - | 250903017-S1 |
| 2 | Goniophotometer Test | 2025-09-15 | COL12SM2 @3000K Black trim | - | 250903017-S1 |
| 3 | THD and PF Test | 2025-09-15 | COL12SM2 @3000K Black trim | - | 250903017-S1 |

Remark (If any):

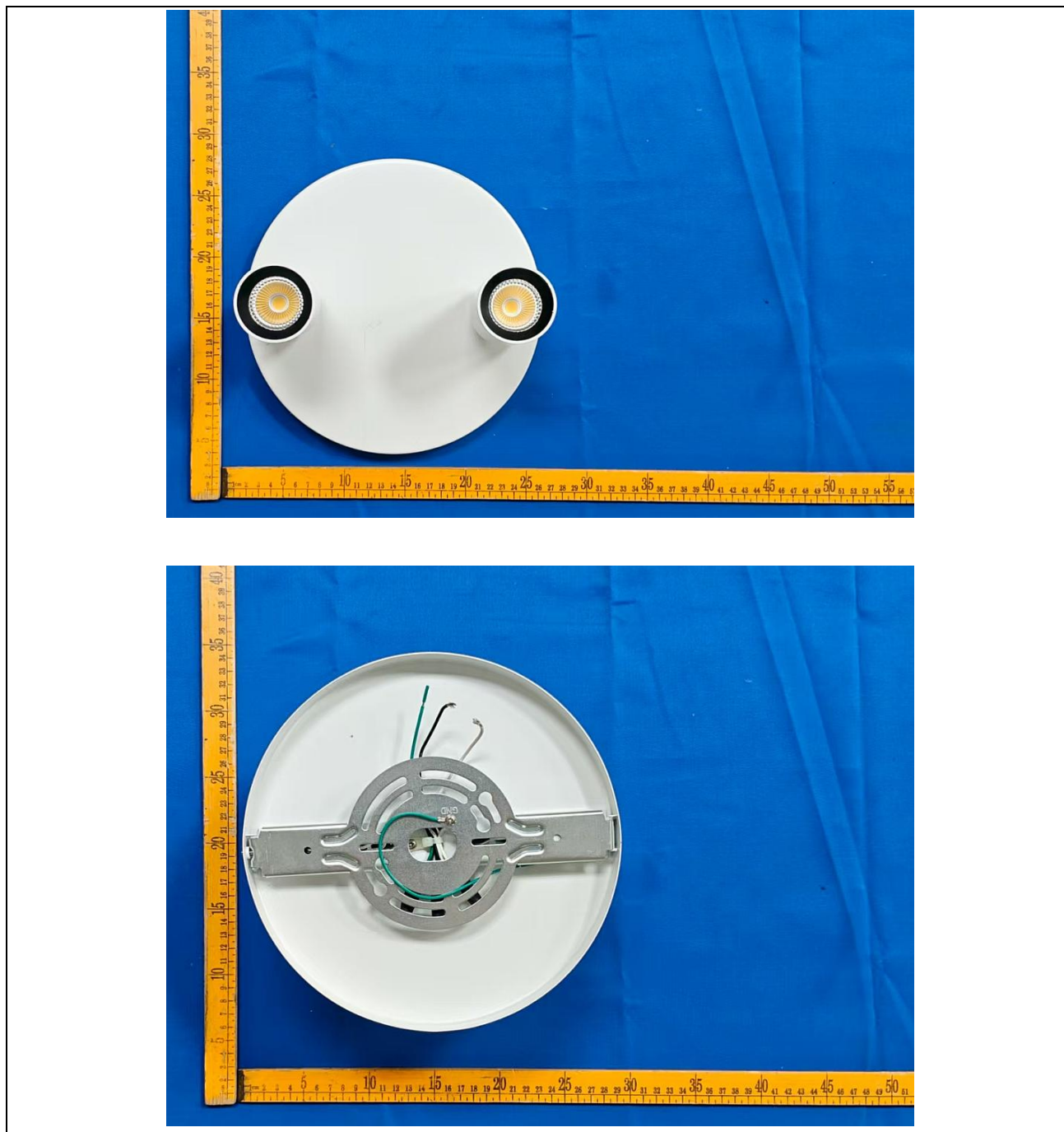
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

3.0 Product Description

Luminaire Description: Model No. COL12SM2 @3000K Black trim, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 120Vac, 60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

| | | | |
|----------------------------|-------------------------------|----------------------------------|--------------|
| Model No. | COL12SM2 @3000K Black trim | Sample ID | 250903017-S1 |
| Operate time (Min.) | 10 | Stabilization time (Min.) | 60 |
| Temperature (°C) | 25.4 | Humidity (%RH) | 41.0 |

Test Method

The Samples were tested according to the ANSI/IES LM-79:2019.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.

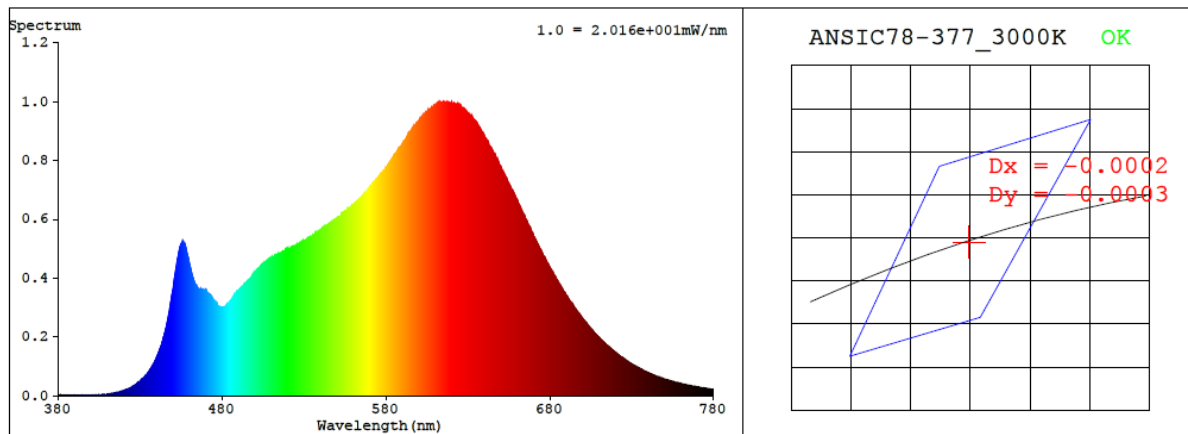
The sample was measured using 4 π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780nm.

Test Result

| Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|---------------|----------------|-------------|-----------|--------------|
| 120.0 | 60 | 0.102 | 12.1 | 0.986 |

| CCT (K) | CRI | R9 | Duv | SDCM | Rf | Rg | IES Rcs,h1 |
|---------|------|----|---------|------|----|----|------------|
| 3020 | 92.9 | 58 | -0.0001 | 0.9 | 90 | 96 | -5% |

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4354$ $y = 0.4033$ / $u' = 0.2499$ $v' = 0.5208$ ($duv = -1.05e-04$)

CCT= 3020K Prcp WL: $L_d = 582.8\text{nm}$ Purity=51.7%

Peak WL: $L_p = 615\text{nm}$ FWHM: $= 153.7\text{nm}$ Ratio: R=24.5% G=72.1% B=3.4%

Render Index: $R_a = 92.9$ AvgR = 91.1 TM30: Rf=91 Rg=97

EEL: 0.15855 A+

R1=95 R2=100 R3=95 R4=93 R5=95 R6=96 R7=89

R8=80 R9=58 R10=99 R11=96 R12=84 R13=97 R14=98 R15=90

4.1 Integrating Sphere Test

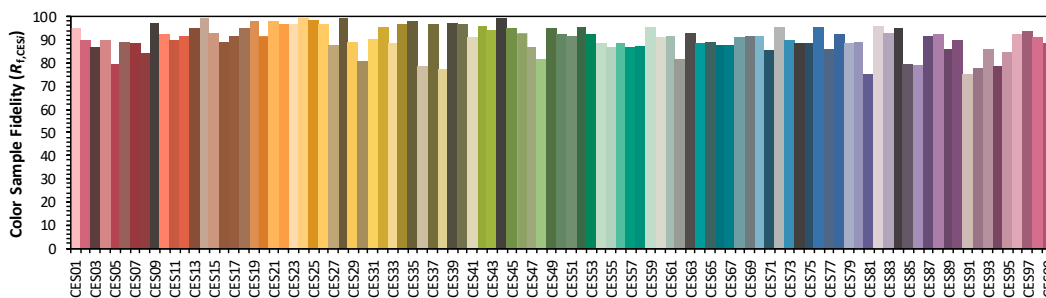
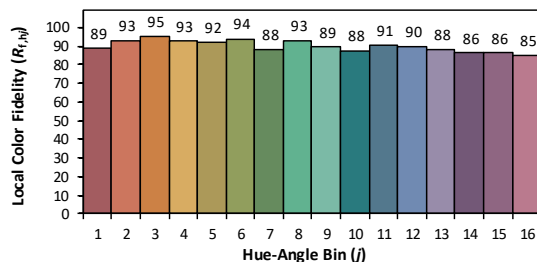
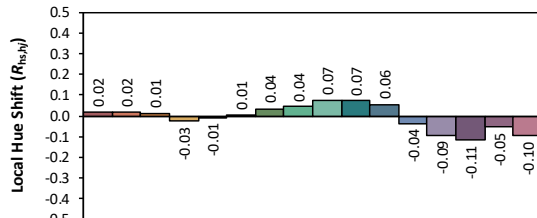
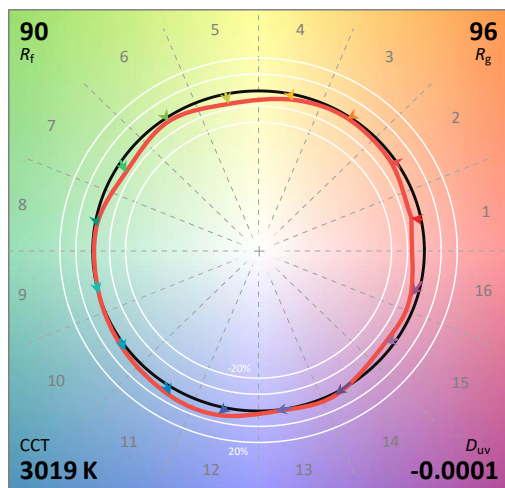
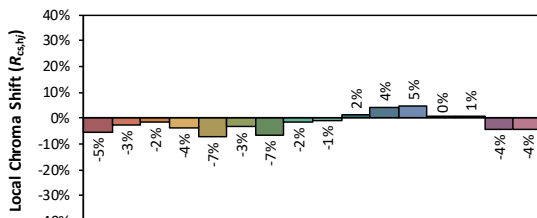
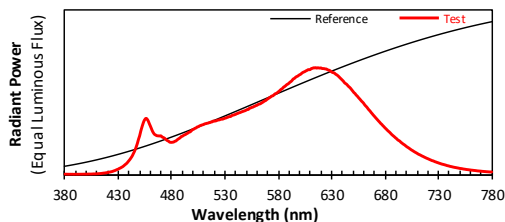
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2025/9/17

Model: COL12SM2 @3000K Black trim



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4354
 y 0.4032
 u' 0.2500
 v' 0.5208

CIE 13.3-1995
(CRI)

R_a 93
 R_g 58

4.1 Integrating Sphere Test

| Spectral Distribution over Visible Wavelength | | | | | | | | | | | |
|---|----------------|---------|----------------|---------|----------------|---------|----------------|---------|----------------|---------|----------------|
| WL (nm) | Radiant (W/nm) | WL (nm) | Radiant (W/nm) | WL (nm) | Radiant (W/nm) | WL (nm) | Radiant (W/nm) | WL (nm) | Radiant (W/nm) | WL (nm) | Radiant (W/nm) |
| 380 | 2.40E-06 | 447 | 2.64E-04 | 514 | 4.80E-04 | 581 | 7.81E-04 | 648 | 8.04E-04 | 715 | 1.72E-04 |
| 381 | 2.20E-06 | 448 | 2.95E-04 | 515 | 4.85E-04 | 582 | 7.91E-04 | 649 | 7.91E-04 | 716 | 1.67E-04 |
| 382 | 1.70E-06 | 449 | 3.31E-04 | 516 | 4.86E-04 | 583 | 7.99E-04 | 650 | 7.79E-04 | 717 | 1.62E-04 |
| 383 | 1.60E-06 | 450 | 3.62E-04 | 517 | 4.91E-04 | 584 | 8.06E-04 | 651 | 7.66E-04 | 718 | 1.57E-04 |
| 384 | 1.20E-06 | 451 | 4.03E-04 | 518 | 4.92E-04 | 585 | 8.18E-04 | 652 | 7.57E-04 | 719 | 1.52E-04 |
| 385 | 1.70E-06 | 452 | 4.38E-04 | 519 | 5.00E-04 | 586 | 8.24E-04 | 653 | 7.44E-04 | 720 | 1.48E-04 |
| 386 | 1.20E-06 | 453 | 4.70E-04 | 520 | 4.99E-04 | 587 | 8.32E-04 | 654 | 7.35E-04 | 721 | 1.44E-04 |
| 387 | 1.80E-06 | 454 | 4.98E-04 | 521 | 5.01E-04 | 588 | 8.41E-04 | 655 | 7.22E-04 | 722 | 1.39E-04 |
| 388 | 7.00E-07 | 455 | 5.16E-04 | 522 | 5.03E-04 | 589 | 8.47E-04 | 656 | 7.11E-04 | 723 | 1.35E-04 |
| 389 | 1.40E-06 | 456 | 5.25E-04 | 523 | 5.08E-04 | 590 | 8.54E-04 | 657 | 7.00E-04 | 724 | 1.30E-04 |
| 390 | 1.90E-06 | 457 | 5.18E-04 | 524 | 5.10E-04 | 591 | 8.64E-04 | 658 | 6.87E-04 | 725 | 1.28E-04 |
| 391 | 9.00E-07 | 458 | 5.02E-04 | 525 | 5.12E-04 | 592 | 8.71E-04 | 659 | 6.78E-04 | 726 | 1.24E-04 |
| 392 | 1.70E-06 | 459 | 4.77E-04 | 526 | 5.16E-04 | 593 | 8.81E-04 | 660 | 6.67E-04 | 727 | 1.19E-04 |
| 393 | 1.30E-06 | 460 | 4.55E-04 | 527 | 5.18E-04 | 594 | 8.94E-04 | 661 | 6.52E-04 | 728 | 1.16E-04 |
| 394 | 1.70E-06 | 461 | 4.30E-04 | 528 | 5.19E-04 | 595 | 8.99E-04 | 662 | 6.41E-04 | 729 | 1.12E-04 |
| 395 | 1.70E-06 | 462 | 4.06E-04 | 529 | 5.23E-04 | 596 | 9.08E-04 | 663 | 6.31E-04 | 730 | 1.09E-04 |
| 396 | 1.90E-06 | 463 | 3.88E-04 | 530 | 5.27E-04 | 597 | 9.15E-04 | 664 | 6.17E-04 | 731 | 1.05E-04 |
| 397 | 2.00E-06 | 464 | 3.75E-04 | 531 | 5.29E-04 | 598 | 9.20E-04 | 665 | 6.05E-04 | 732 | 1.02E-04 |
| 398 | 2.40E-06 | 465 | 3.69E-04 | 532 | 5.34E-04 | 599 | 9.27E-04 | 666 | 5.95E-04 | 733 | 9.80E-05 |
| 399 | 2.50E-06 | 466 | 3.63E-04 | 533 | 5.37E-04 | 600 | 9.34E-04 | 667 | 5.81E-04 | 734 | 9.53E-05 |
| 400 | 2.00E-06 | 467 | 3.62E-04 | 534 | 5.42E-04 | 601 | 9.39E-04 | 668 | 5.69E-04 | 735 | 9.29E-05 |
| 401 | 2.90E-06 | 468 | 3.61E-04 | 535 | 5.42E-04 | 602 | 9.48E-04 | 669 | 5.57E-04 | 736 | 9.00E-05 |
| 402 | 3.20E-06 | 469 | 3.60E-04 | 536 | 5.47E-04 | 603 | 9.55E-04 | 670 | 5.46E-04 | 737 | 8.73E-05 |
| 403 | 3.30E-06 | 470 | 3.61E-04 | 537 | 5.55E-04 | 604 | 9.60E-04 | 671 | 5.34E-04 | 738 | 8.36E-05 |
| 404 | 3.00E-06 | 471 | 3.51E-04 | 538 | 5.56E-04 | 605 | 9.64E-04 | 672 | 5.23E-04 | 739 | 8.13E-05 |
| 405 | 3.50E-06 | 472 | 3.47E-04 | 539 | 5.60E-04 | 606 | 9.70E-04 | 673 | 5.12E-04 | 740 | 7.89E-05 |
| 406 | 4.00E-06 | 473 | 3.42E-04 | 540 | 5.63E-04 | 607 | 9.75E-04 | 674 | 5.00E-04 | 741 | 7.57E-05 |
| 407 | 5.00E-06 | 474 | 3.34E-04 | 541 | 5.69E-04 | 608 | 9.81E-04 | 675 | 4.90E-04 | 742 | 7.37E-05 |
| 408 | 4.40E-06 | 475 | 3.24E-04 | 542 | 5.72E-04 | 609 | 9.81E-04 | 676 | 4.78E-04 | 743 | 7.14E-05 |
| 409 | 5.50E-06 | 476 | 3.17E-04 | 543 | 5.77E-04 | 610 | 9.83E-04 | 677 | 4.69E-04 | 744 | 6.89E-05 |
| 410 | 5.70E-06 | 477 | 3.12E-04 | 544 | 5.79E-04 | 611 | 9.92E-04 | 678 | 4.58E-04 | 745 | 6.67E-05 |
| 411 | 6.70E-06 | 478 | 3.04E-04 | 545 | 5.83E-04 | 612 | 9.94E-04 | 679 | 4.48E-04 | 746 | 6.48E-05 |
| 412 | 7.20E-06 | 479 | 3.01E-04 | 546 | 5.88E-04 | 613 | 9.98E-04 | 680 | 4.37E-04 | 747 | 6.31E-05 |
| 413 | 8.10E-06 | 480 | 3.01E-04 | 547 | 5.91E-04 | 614 | 9.98E-04 | 681 | 4.27E-04 | 748 | 6.10E-05 |
| 414 | 9.20E-06 | 481 | 3.02E-04 | 548 | 5.95E-04 | 615 | 1.00E-03 | 682 | 4.17E-04 | 749 | 5.92E-05 |
| 415 | 1.04E-05 | 482 | 3.04E-04 | 549 | 5.98E-04 | 616 | 9.96E-04 | 683 | 4.07E-04 | 750 | 5.67E-05 |
| 416 | 1.22E-05 | 483 | 3.11E-04 | 550 | 6.03E-04 | 617 | 9.99E-04 | 684 | 3.99E-04 | 751 | 5.53E-05 |
| 417 | 1.30E-05 | 484 | 3.13E-04 | 551 | 6.08E-04 | 618 | 9.97E-04 | 685 | 3.89E-04 | 752 | 5.41E-05 |
| 418 | 1.46E-05 | 485 | 3.23E-04 | 552 | 6.09E-04 | 619 | 9.96E-04 | 686 | 3.78E-04 | 753 | 5.19E-05 |
| 419 | 1.63E-05 | 486 | 3.30E-04 | 553 | 6.21E-04 | 620 | 9.98E-04 | 687 | 3.68E-04 | 754 | 5.01E-05 |
| 420 | 1.80E-05 | 487 | 3.37E-04 | 554 | 6.22E-04 | 621 | 9.92E-04 | 688 | 3.60E-04 | 755 | 4.88E-05 |
| 421 | 2.02E-05 | 488 | 3.43E-04 | 555 | 6.28E-04 | 622 | 9.92E-04 | 689 | 3.52E-04 | 756 | 4.69E-05 |
| 422 | 2.24E-05 | 489 | 3.55E-04 | 556 | 6.30E-04 | 623 | 9.91E-04 | 690 | 3.42E-04 | 757 | 4.55E-05 |
| 423 | 2.43E-05 | 490 | 3.57E-04 | 557 | 6.36E-04 | 624 | 9.88E-04 | 691 | 3.34E-04 | 758 | 4.44E-05 |
| 424 | 2.67E-05 | 491 | 3.65E-04 | 558 | 6.39E-04 | 625 | 9.88E-04 | 692 | 3.24E-04 | 759 | 4.30E-05 |
| 425 | 2.99E-05 | 492 | 3.70E-04 | 559 | 6.45E-04 | 626 | 9.82E-04 | 693 | 3.18E-04 | 760 | 4.17E-05 |
| 426 | 3.37E-05 | 493 | 3.74E-04 | 560 | 6.48E-04 | 627 | 9.77E-04 | 694 | 3.11E-04 | 761 | 4.03E-05 |
| 427 | 3.71E-05 | 494 | 3.81E-04 | 561 | 6.55E-04 | 628 | 9.75E-04 | 695 | 3.01E-04 | 762 | 3.93E-05 |
| 428 | 4.18E-05 | 495 | 3.86E-04 | 562 | 6.59E-04 | 629 | 9.67E-04 | 696 | 2.94E-04 | 763 | 3.81E-05 |
| 429 | 4.63E-05 | 496 | 3.94E-04 | 563 | 6.61E-04 | 630 | 9.61E-04 | 697 | 2.85E-04 | 764 | 3.69E-05 |
| 430 | 4.99E-05 | 497 | 3.97E-04 | 564 | 6.67E-04 | 631 | 9.55E-04 | 698 | 2.79E-04 | 765 | 3.59E-05 |
| 431 | 5.64E-05 | 498 | 4.04E-04 | 565 | 6.74E-04 | 632 | 9.53E-04 | 699 | 2.72E-04 | 766 | 3.43E-05 |
| 432 | 6.04E-05 | 499 | 4.15E-04 | 566 | 6.79E-04 | 633 | 9.46E-04 | 700 | 2.63E-04 | 767 | 3.30E-05 |
| 433 | 6.64E-05 | 500 | 4.21E-04 | 567 | 6.88E-04 | 634 | 9.38E-04 | 701 | 2.56E-04 | 768 | 3.22E-05 |
| 434 | 7.20E-05 | 501 | 4.26E-04 | 568 | 6.91E-04 | 635 | 9.32E-04 | 702 | 2.50E-04 | 769 | 3.13E-05 |
| 435 | 7.94E-05 | 502 | 4.32E-04 | 569 | 6.99E-04 | 636 | 9.23E-04 | 703 | 2.43E-04 | 770 | 3.06E-05 |
| 436 | 8.84E-05 | 503 | 4.36E-04 | 570 | 7.07E-04 | 637 | 9.14E-04 | 704 | 2.36E-04 | 771 | 2.91E-05 |
| 437 | 9.66E-05 | 504 | 4.45E-04 | 571 | 7.14E-04 | 638 | 9.03E-04 | 705 | 2.29E-04 | 772 | 2.85E-05 |
| 438 | 1.05E-04 | 505 | 4.47E-04 | 572 | 7.20E-04 | 639 | 8.94E-04 | 706 | 2.23E-04 | 773 | 2.73E-05 |
| 439 | 1.17E-04 | 506 | 4.53E-04 | 573 | 7.27E-04 | 640 | 8.84E-04 | 707 | 2.16E-04 | 774 | 2.67E-05 |
| 440 | 1.29E-04 | 507 | 4.58E-04 | 574 | 7.34E-04 | 641 | 8.74E-04 | 708 | 2.10E-04 | 775 | 2.56E-05 |
| 441 | 1.42E-04 | 508 | 4.62E-04 | 575 | 7.37E-04 | 642 | 8.60E-04 | 709 | 2.04E-04 | 776 | 2.49E-05 |
| 442 | 1.57E-04 | 509 | 4.65E-04 | 576 | 7.46E-04 | 643 | 8.52E-04 | 710 | 1.99E-04 | 777 | 2.42E-05 |
| 443 | 1.72E-04 | 510 | 4.68E-04 | 577 | 7.55E-04 | 644 | 8.45E-04 | 711 | 1.92E-04 | 778 | 2.33E-05 |
| 444 | 1.92E-04 | 511 | 4.73E-04 | 578 | 7.58E-04 | 645 | 8.34E-04 | 712 | 1.87E-04 | 779 | 2.31E-05 |
| 445 | 2.13E-04 | 512 | 4.76E-04 | 579 | 7.65E-04 | 646 | 8.23E-04 | 713 | 1.83E-04 | 780 | 2.32E-05 |
| 446 | 2.36E-04 | 513 | 4.79E-04 | 580 | 7.74E-04 | 647 | 8.15E-04 | 714 | 1.77E-04 | N/A | N/A |

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

| | | | |
|----------------------------|-------------------------------|----------------------------------|--------------|
| Model No. | COL12SM2 @3000K Black trim | Sample ID | 250903017-S1 |
| Operate time (Min.) | 30 | Stabilization time (Min.) | 60 |
| Temperature (°C) | 25.0 | Humidity (%RH) | 41.1 |

| |
|--|
| Test Method |
| <p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^\circ\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.</p> <p>The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1.0° vertical intervals and 15° horizontal intervals.</p> |

Test Conditions

| Condition | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|-----------------------|---------------|----------------|-------------|-----------|--------------|
| WORST CASE | 120.0 | 60 | 0.102 | 12.1 | 0.986 |
| NON-WORST CASE | N/A | N/A | N/A | N/A | N/A |

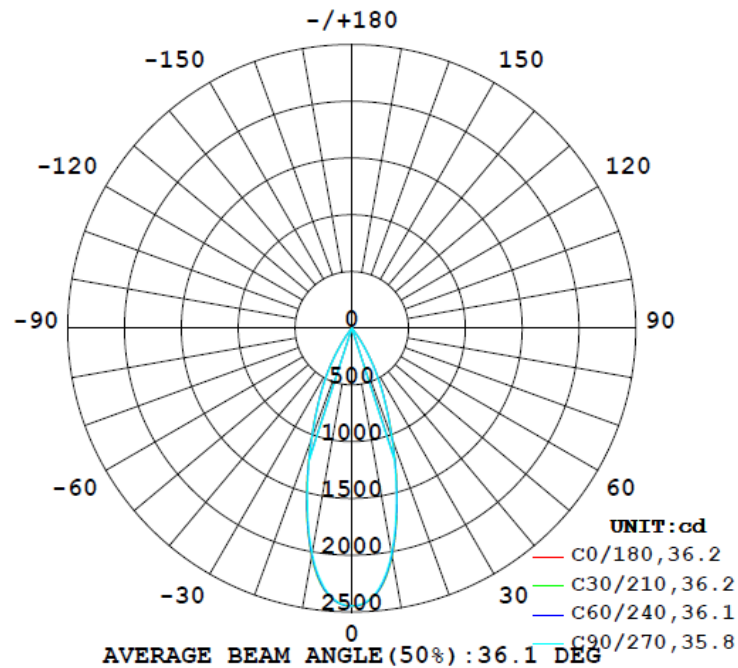
Test Result

| Flux (lm) | Field Angle (10%) | | Beam Angle (50%) | | Luminous Efficacy (lm/W) | Zonal Lumen Requirement |
|-----------|-------------------|---------|------------------|---------|--------------------------|-------------------------|
| | C0-180 | C90-270 | C0-180 | C90-270 | | (0°-90°) |
| 1066 | 65.4 | 64.9 | 36.3 | 35.9 | 88.1 | 100.0% |

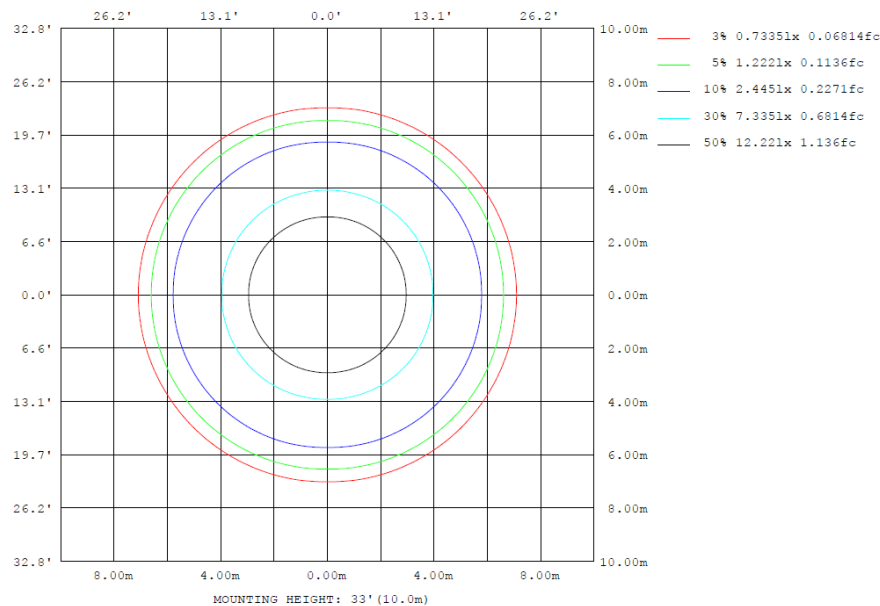
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

| γ | C0 | C45 | C90 | C135 | C180 | C225 | C270 | C315 | γ | ϕ zone | ϕ total | ϕ lum, lamp |
|----------|-----------------------|--------|--------|--------|--------|--------|--------|--------|----------|-------------|--------------|------------------|
| 10 | 2039 | 2036 | 2011 | 2036 | 2039 | 2036 | 2011 | 2036 | 0- 10 | 214.8 | 214.8 | 20.2,20.2 |
| 20 | 1045 | 1045 | 1030 | 1045 | 1045 | 1045 | 1030 | 1045 | 10- 20 | 419.7 | 634.5 | 59.5,59.5 |
| 30 | 378.9 | 383.1 | 363.5 | 383.1 | 378.9 | 383.1 | 363.5 | 383.1 | 20- 30 | 306.1 | 940.6 | 88.3,88.3 |
| 40 | 25.07 | 22.32 | 24.65 | 22.32 | 25.07 | 22.32 | 24.65 | 22.32 | 30- 40 | 98.33 | 1039 | 97.5,97.5 |
| 50 | 10.40 | 9.726 | 9.526 | 9.726 | 10.40 | 9.726 | 9.526 | 9.726 | 40- 50 | 10.06 | 1049 | 98.5,98.5 |
| 60 | 7.834 | 7.359 | 7.121 | 7.359 | 7.834 | 7.359 | 7.121 | 7.359 | 50- 60 | 7.685 | 1057 | 99.2,99.2 |
| 70 | 4.881 | 4.421 | 4.088 | 4.421 | 4.881 | 4.421 | 4.088 | 4.421 | 60- 70 | 6.137 | 1063 | 99.7,99.7 |
| 80 | 0.3099 | 0.3881 | 0.3371 | 0.3881 | 0.3099 | 0.3881 | 0.3371 | 0.3881 | 70- 80 | 2.577 | 1065 | 100,100 |
| 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80- 90 | 0.0892 | 1066 | 100,100 |
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 90-100 | 0 | 1066 | 100,100 |
| 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100-110 | 0 | 1066 | 100,100 |
| 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 110-120 | 0 | 1066 | 100,100 |
| 130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120-130 | 0 | 1066 | 100,100 |
| 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 130-140 | 0 | 1066 | 100,100 |
| 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 140-150 | 0 | 1066 | 100,100 |
| 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150-160 | 0 | 1066 | 100,100 |
| 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160-170 | 0 | 1066 | 100,100 |
| 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 170-180 | 0 | 1066 | 100,100 |
| DEG | LUMINOUS INTENSITY:cd | | | | | | | | | UNIT:lm | | |

| Zonal (lm) | | Total (lm) | | Percent |
|------------|--------|------------|---------|---------|
| 0-10 | 214.77 | 0-10 | 214.77 | 20.16% |
| 10-20 | 419.72 | 0-20 | 634.49 | 59.55% |
| 20-30 | 306.14 | 0-30 | 940.63 | 88.28% |
| 30-40 | 98.33 | 0-40 | 1038.96 | 97.51% |
| 40-50 | 10.06 | 0-50 | 1049.02 | 98.45% |
| 50-60 | 7.68 | 0-60 | 1056.70 | 99.17% |
| 60-70 | 6.14 | 0-70 | 1062.84 | 99.75% |
| 70-80 | 2.58 | 0-80 | 1065.42 | 99.99% |
| 80-90 | 0.09 | 0-90 | 1065.51 | 100.00% |
| 90-100 | 0.00 | 0-100 | 1065.51 | 100.00% |
| 100-110 | 0.00 | 0-110 | 1065.51 | 100.00% |
| 110-120 | 0.00 | 0-120 | 1065.51 | 100.00% |
| 120-130 | 0.00 | 0-130 | 1065.51 | 100.00% |
| 130-140 | 0.00 | 0-140 | 1065.51 | 100.00% |
| 140-150 | 0.00 | 0-150 | 1065.51 | 100.00% |
| 150-160 | 0.00 | 0-160 | 1065.51 | 100.00% |
| 160-170 | 0.00 | 0-170 | 1065.51 | 100.00% |
| 170-180 | 0.00 | 0-180 | 1065.51 | 100.00% |

4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

| C (DEG) y (DEG) | 0 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0 | 2445 | 2445 | 2447 | 2447 | 2447 | 2447 | 2446 | 2447 | 2447 | 2447 | 2447 | 2445 | 2445 | 2445 | 2447 | 2447 | 2447 | 2447 | 2446 |
| 5 | 2360 | 2362 | 2361 | 2360 | 2356 | 2352 | 2346 | 2352 | 2356 | 2360 | 2361 | 2362 | 2360 | 2362 | 2361 | 2360 | 2356 | 2352 | 2346 |
| 10 | 2039 | 2041 | 2040 | 2036 | 2028 | 2019 | 2011 | 2019 | 2028 | 2036 | 2040 | 2041 | 2039 | 2041 | 2040 | 2036 | 2028 | 2019 | 2011 |
| 15 | 1539 | 1541 | 1542 | 1537 | 1532 | 1523 | 1513 | 1523 | 1532 | 1537 | 1542 | 1541 | 1539 | 1541 | 1542 | 1537 | 1532 | 1523 | 1513 |
| 20 | 1045 | 1048 | 1048 | 1045 | 1042 | 1037 | 1030 | 1037 | 1042 | 1045 | 1048 | 1048 | 1045 | 1048 | 1048 | 1045 | 1042 | 1037 | 1030 |
| 25 | 665 | 669 | 668 | 667 | 665 | 661 | 654 | 661 | 665 | 667 | 668 | 669 | 665 | 669 | 668 | 667 | 665 | 661 | 654 |
| 30 | 379 | 383 | 384 | 383 | 379 | 373 | 364 | 373 | 379 | 383 | 384 | 383 | 379 | 383 | 384 | 383 | 379 | 373 | 364 |
| 35 | 147 | 146 | 146 | 145 | 142 | 139 | 136 | 139 | 142 | 145 | 146 | 146 | 147 | 146 | 146 | 145 | 142 | 139 | 136 |
| 40 | 25.1 | 23.7 | 22.5 | 22.3 | 23.1 | 23.8 | 24.6 | 23.8 | 23.1 | 22.3 | 22.5 | 23.7 | 25.1 | 23.7 | 22.5 | 22.3 | 23.1 | 23.8 | 24.6 |
| 45 | 12.5 | 12.2 | 12.0 | 11.8 | 11.7 | 11.6 | 11.6 | 11.6 | 11.7 | 11.8 | 12.0 | 12.2 | 12.5 | 12.2 | 12.0 | 11.8 | 11.7 | 11.6 | 11.6 |
| 50 | 10.4 | 10.2 | 9.95 | 9.73 | 9.65 | 9.58 | 9.53 | 9.58 | 9.65 | 9.73 | 9.95 | 10.2 | 10.4 | 10.2 | 9.95 | 9.73 | 9.65 | 9.58 | 9.53 |
| 55 | 9.11 | 8.94 | 8.72 | 8.57 | 8.51 | 8.40 | 8.36 | 8.40 | 8.51 | 8.57 | 8.72 | 8.94 | 9.11 | 8.94 | 8.72 | 8.57 | 8.51 | 8.40 | 8.36 |
| 60 | 7.83 | 7.67 | 7.52 | 7.36 | 7.25 | 7.17 | 7.12 | 7.17 | 7.25 | 7.36 | 7.52 | 7.67 | 7.83 | 7.67 | 7.52 | 7.36 | 7.25 | 7.17 | 7.12 |
| 65 | 6.88 | 6.73 | 6.60 | 6.42 | 6.28 | 6.18 | 6.12 | 6.18 | 6.28 | 6.42 | 6.60 | 6.73 | 6.88 | 6.73 | 6.60 | 6.42 | 6.28 | 6.18 | 6.12 |
| 70 | 4.88 | 4.74 | 4.60 | 4.42 | 4.26 | 4.18 | 4.09 | 4.18 | 4.26 | 4.42 | 4.60 | 4.74 | 4.88 | 4.74 | 4.60 | 4.42 | 4.26 | 4.18 | 4.09 |
| 75 | 3.07 | 2.86 | 2.65 | 2.49 | 2.36 | 2.24 | 2.20 | 2.24 | 2.36 | 2.49 | 2.65 | 2.86 | 3.07 | 2.86 | 2.65 | 2.49 | 2.36 | 2.24 | 2.20 |
| 80 | 0.31 | 0.35 | 0.37 | 0.39 | 0.39 | 0.37 | 0.34 | 0.37 | 0.39 | 0.39 | 0.37 | 0.35 | 0.31 | 0.35 | 0.37 | 0.39 | 0.39 | 0.37 | 0.34 |
| 85 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 |
| 90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 110 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 115 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 120 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 125 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 130 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 135 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 145 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 155 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 160 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 165 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 170 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 175 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 180 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Table--2

UNIT: cd

| C (DEG) y (DEG) | 285 | 300 | 315 | 330 | 345 | | | | | | | | | | | | | | |
|--------------------|------|------|------|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 0 | 2447 | 2447 | 2447 | 2447 | 2445 | | | | | | | | | | | | | | |
| 5 | 2352 | 2356 | 2360 | 2361 | 2362 | | | | | | | | | | | | | | |
| 10 | 2019 | 2028 | 2036 | 2040 | 2041 | | | | | | | | | | | | | | |
| 15 | 1523 | 1532 | 1537 | 1542 | 1541 | | | | | | | | | | | | | | |
| 20 | 1037 | 1042 | 1045 | 1048 | 1048 | | | | | | | | | | | | | | |
| 25 | 661 | 665 | 667 | 668 | 669 | | | | | | | | | | | | | | |
| 30 | 373 | 379 | 383 | 384 | 383 | | | | | | | | | | | | | | |
| 35 | 139 | 142 | 145 | 146 | 146 | | | | | | | | | | | | | | |
| 40 | 23.8 | 23.1 | 22.3 | 22.5 | 23.7 | | | | | | | | | | | | | | |
| 45 | 11.6 | 11.7 | 11.8 | 12.0 | 12.2 | | | | | | | | | | | | | | |
| 50 | 9.58 | 9.65 | 9.73 | 9.95 | 10.2 | | | | | | | | | | | | | | |
| 55 | 8.40 | 8.51 | 8.57 | 8.72 | 8.94 | | | | | | | | | | | | | | |
| 60 | 7.17 | 7.25 | 7.36 | 7.52 | 7.67 | | | | | | | | | | | | | | |
| 65 | 6.18 | 6.28 | 6.42 | 6.60 | 6.73 | | | | | | | | | | | | | | |
| 70 | 4.18 | 4.26 | 4.42 | 4.60 | 4.74 | | | | | | | | | | | | | | |
| 75 | 2.24 | 2.36 | 2.49 | 2.65 | 2.86 | | | | | | | | | | | | | | |
| 80 | 0.37 | 0.39 | 0.39 | 0.37 | 0.35 | | | | | | | | | | | | | | |
| 85 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | | | | | | | | | | | | | | |
| 90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 105 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 110 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 115 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 120 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 125 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 130 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 135 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 145 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 155 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 160 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 165 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 170 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 175 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 180 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

| | | | |
|-----------------------------|-------------------------------|---------------------------|--------------|
| Model No. | COL12SM2 @3000K Black trim | Sample ID | 250903017-S1 |
| Temperature (°C) | 25.4 | Humidity (%RH) | 41.0 |

| |
|---|
| Test Method |
| <p>The samples were tested according to the and ANSI C82.77: 2002 and ANSI C82.77-10:2020</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at 25±1°C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.</p> |

Test Results

| Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | iTHD(%) |
|---------------|----------------|-------------|-----------|--------------|---------|
| 120.0 | 60 | 0.102 | 12.1 | 0.986 | 10.95 |

5.0 Equipment List:

| Equipment ID | Equipment Name | Last Cal. | Due Cal. |
|--------------|------------------------------|------------|------------|
| NTC-F01-001 | Goniophotometer System | 2024-11-07 | 2025-11-06 |
| NTC-F01-006 | 2.0 meter Integrating Sphere | 2024-11-07 | 2025-11-06 |
| NTC-F01-012 | Standard Lamp | 2024-10-28 | 2025-10-27 |
| NTC-F01-013 | Standard Lamp | 2024-10-28 | 2025-10-27 |
| NTC-F01-031 | Digital Power Meter | 2025-08-04 | 2026-08-03 |
| NTC-F01-019 | Temperature & Humidity Meter | 2024-10-29 | 2025-10-28 |

*****End of Report*****