

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-2017

Prepared For

RAB Lighting Inc.

Prepared By

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Prepare by:

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Date: 2023-11-15

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Technical Lead: Vincent Yuan
Issue Date: 2023-11-15
Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

| Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires | | | | |
|--|--------------------------------|----------------------|----------|------------|
| Requirement Category | Test Method | Requirements | | Test Value |
| Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-180° zones) | IES LM-79-2008 | N/A | | 3764 |
| Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-180° zones) | IES LM-79-2008 | N/A | | 141.5 |
| Luminaire Output (lm) (Goniophotometer – Section 4.2) (0°-90° zones) | IES LM-79-2008 | 300 | | 3702 |
| Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2) (0°-90° zones) | IES LM-79-2008 | Standard | Premium | 139.2 |
| | | 105 | 120 | |
| Power (Input Wattage) (W) (Goniophotometer – Section 4.2) | IES LM-79-2008 | Worst Case | | 26.6 |
| Total Harmonic Distortion (A%) (THD & PF – Section 4.3) | ANSI C82.77:2014 | 20.00% | 120V | 2.98 |
| | | | 277V | 11.77 |
| Power Factor (THD & PF – Section 4.3) | ANSI C82.77:2014 | 0.9 | 120V | 0.996 |
| | | | 277V | 0.909 |
| Allowable CCTs* (K) (Integrating Sphere – Section 4.1) | IES LM-79-2008 | 7 steps | 5029±283 | 5230 |
| | | 4 steps | 5029±220 | |
| Minimum CRI (Integrating Sphere – Section 4.1) | IES LM-79-2008 CIE13.3-1995 | ≥70 | | 82.4 |
| Minimum R9 (Integrating Sphere – Section 4.1) | IES LM-79-2008 CIE13.3-1995 | N/A | | 6 |
| Minimum Rf (Integrating Sphere – Section 4.1) | ANSI/IES TM-30-18 | ≥70 | | 83 |
| Minimum Rg (Integrating Sphere – Section 4.1) | ANSI/IES TM-30-18 | ≥89 | | 97 |
| IES Rcs,h1 (Integrating Sphere – Section 4.1) | ANSI/IES TM-30-18 | -18%≤IES Rcs,h1≤+23% | | -13% |
| Zonal Lumen Requirement (80°-90°) (Goniophotometer – Section 4.2) | IES LM-79-2008 | ≤10% | | 2.2% |
| Input Voltage (V) | | | | |
| (Goniophotometer – Section 4.2) | IES LM-79-2008 | Worst Cast | | 277.0 |
| (Goniophotometer – Section 4.2) | | Non-Worst Case | | 120.0 |
| Input Current (A) | | | | |
| (Goniophotometer – Section 4.2) | IES LM-79-2008 | Worst Case | | 0.106 |
| (Goniophotometer – Section 4.2) | | Non-Worst Case | | 0.216 |
| Power (Input Wattage – W) | | | | |
| (Goniophotometer – Section 4.2) | IES LM-79-2008 | Worst Case | | 26.6 |
| (Goniophotometer – Section 4.2) | | Non-Worst Case | | 25.8 |

2.0 Test List

| Test Item | Test | Test Date | Model Number | Sample No. |
|-----------|-------------------------|------------|--------------------|--------------|
| 1 | Integrating Sphere Test | 2023-11-02 | WPX1 @ 20W / 5000K | 231101002-S1 |
| 2 | Goniophotometer Test | 2023-11-02 | WPX1 @ 20W / 5000K | 231101002-S1 |
| 3 | THD and PF Test | 2023-11-02 | WPX1 @ 20W / 5000K | 231101002-S1 |

Remark (If any)

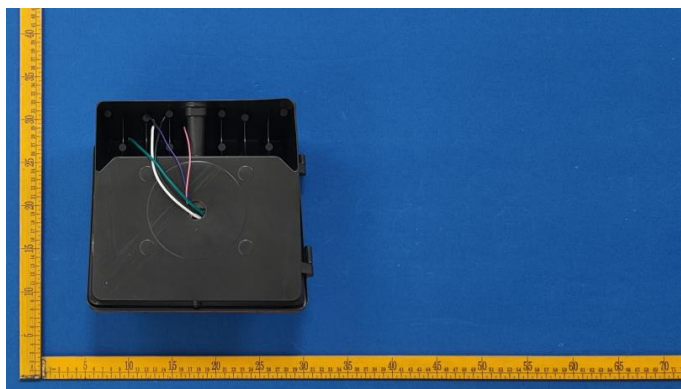
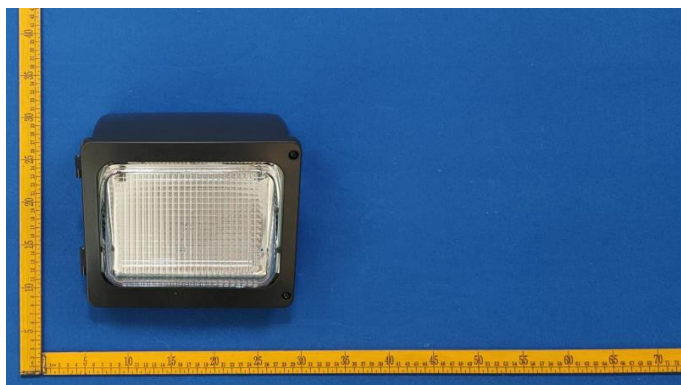
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency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

3.0 Product Description

Luminaire Description: Model No. WPX1 @ 20W / 5000K, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 120-277Vac, 50/60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

| | | | |
|----------------------------|--------------------|----------------------------------|--------------|
| Model No. | WPX1 @ 20W / 5000K | Sample ID | 231101002-S1 |
| Operate time (Min.) | 10 | Stabilization time (Min.) | 60 |
| Temperature (°C) | 25.4 | Humidity (%RH) | 41.0 |

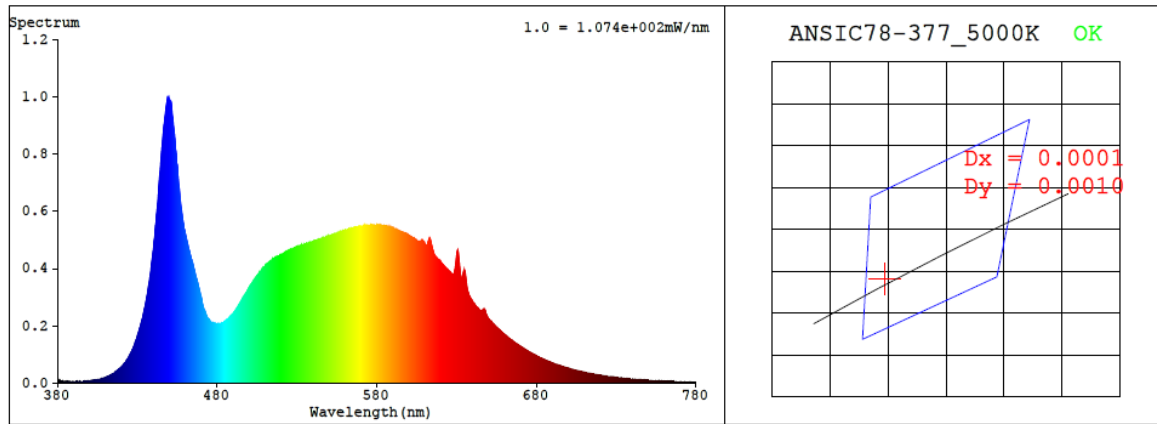
| |
|--|
| Test Method |
| <p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</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 sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement.</p> <p>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.</p> |

Test Result

| Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|---------------|----------------|-------------|-----------|--------------|
| 120.0 | 60 | 0.216 | 25.8 | 0.996 |
| 277.0 | 60 | 0.106 | 26.6 | 0.909 |

| CCT (K) | CRI | R9 | Duv | Rf | Rg | IES Rcs,h1 |
|---------|------|----|--------|----|----|------------|
| 5230 | 82.4 | 6 | 0.0005 | 83 | 97 | -13% |

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3390$ $y = 0.3477$ / $u' = 0.2088$ $v' = 0.4818$ ($duv=5.00e-04$)

CCT= 5230K Prcp WL: $L_d=567.7nm$ Purity=6.0%

Peak WL: $L_p=450nm$ FWHM: $=20.4nm$ Ratio:R=15.3% G=80.2% B=4.5%

Render Index: $R_a = 82.4$ AvgR = 75.5 TM30:Rf=82 Rg=96

EEL: 0.09808 A++ Highest

R1 =81 R2 =87 R3 =91 R4 =83 R5 =82 R6 =82 R7 =86

R8 =67 R9 =6 R10=69 R11=83 R12=62 R13=82 R14=95 R15=76

4.1 Integrating Sphere Test

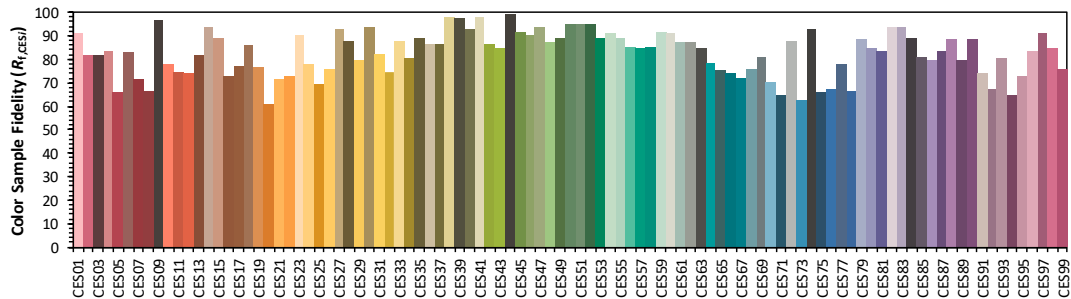
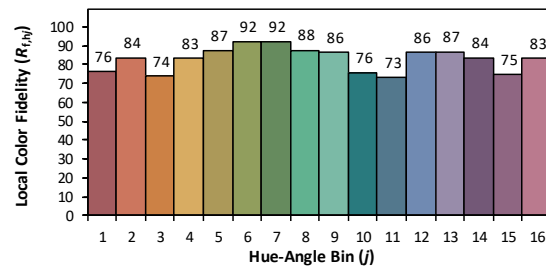
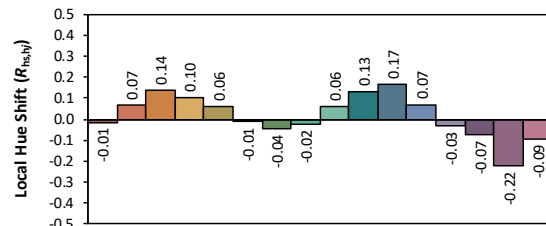
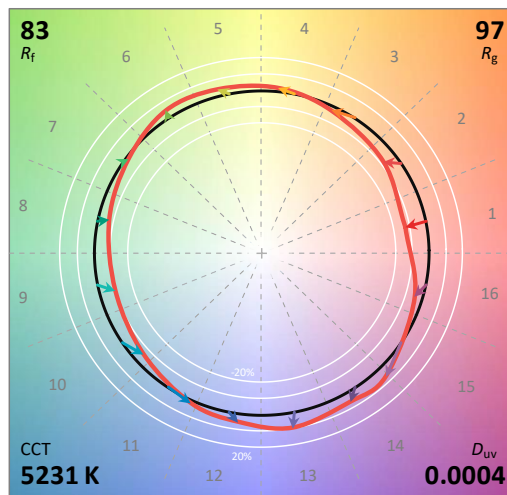
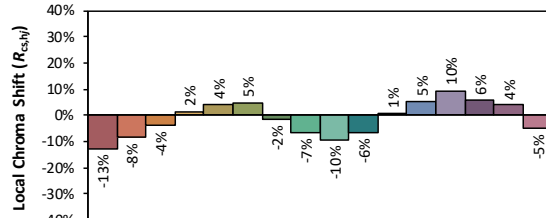
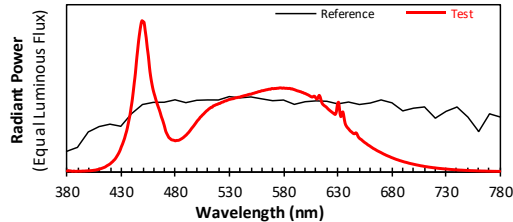
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2023/11/15

Model: WPX1 @ 20W / 5000K



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

x 0.3390
 y 0.3475
 u' 0.2089
 v' 0.4817

CIE 13.3-1995
(CRI)

R_a 82
 R_g 6

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 | 6.90E-06 | 447 | 9.17E-04 | 514 | 4.26E-04 | 581 | 5.51E-04 | 648 | 2.50E-04 | 715 | 3.20E-05 |
| 381 | 9.60E-06 | 448 | 9.64E-04 | 515 | 4.34E-04 | 582 | 5.50E-04 | 649 | 2.34E-04 | 716 | 3.10E-05 |
| 382 | 7.50E-06 | 449 | 9.93E-04 | 516 | 4.37E-04 | 583 | 5.50E-04 | 650 | 2.24E-04 | 717 | 3.02E-05 |
| 383 | 7.60E-06 | 450 | 9.87E-04 | 517 | 4.40E-04 | 584 | 5.49E-04 | 651 | 2.18E-04 | 718 | 2.90E-05 |
| 384 | 5.80E-06 | 451 | 9.83E-04 | 518 | 4.43E-04 | 585 | 5.49E-04 | 652 | 2.13E-04 | 719 | 2.82E-05 |
| 385 | 4.80E-06 | 452 | 9.32E-04 | 519 | 4.45E-04 | 586 | 5.49E-04 | 653 | 2.07E-04 | 720 | 2.76E-05 |
| 386 | 6.50E-06 | 453 | 8.81E-04 | 520 | 4.49E-04 | 587 | 5.45E-04 | 654 | 2.01E-04 | 721 | 2.65E-05 |
| 387 | 5.10E-06 | 454 | 8.15E-04 | 521 | 4.50E-04 | 588 | 5.47E-04 | 655 | 1.95E-04 | 722 | 2.56E-05 |
| 388 | 4.50E-06 | 455 | 7.62E-04 | 522 | 4.55E-04 | 589 | 5.43E-04 | 656 | 1.90E-04 | 723 | 2.48E-05 |
| 389 | 5.10E-06 | 456 | 6.89E-04 | 523 | 4.58E-04 | 590 | 5.41E-04 | 657 | 1.85E-04 | 724 | 2.40E-05 |
| 390 | 6.00E-06 | 457 | 6.33E-04 | 524 | 4.60E-04 | 591 | 5.39E-04 | 658 | 1.79E-04 | 725 | 2.33E-05 |
| 391 | 5.50E-06 | 458 | 5.90E-04 | 525 | 4.64E-04 | 592 | 5.36E-04 | 659 | 1.75E-04 | 726 | 2.27E-05 |
| 392 | 5.30E-06 | 459 | 5.53E-04 | 526 | 4.67E-04 | 593 | 5.33E-04 | 660 | 1.70E-04 | 727 | 2.18E-05 |
| 393 | 5.50E-06 | 460 | 5.23E-04 | 527 | 4.68E-04 | 594 | 5.32E-04 | 661 | 1.65E-04 | 728 | 2.14E-05 |
| 394 | 6.50E-06 | 461 | 4.99E-04 | 528 | 4.72E-04 | 595 | 5.29E-04 | 662 | 1.60E-04 | 729 | 2.04E-05 |
| 395 | 6.40E-06 | 462 | 4.74E-04 | 529 | 4.74E-04 | 596 | 5.28E-04 | 663 | 1.55E-04 | 730 | 1.98E-05 |
| 396 | 6.40E-06 | 463 | 4.51E-04 | 530 | 4.77E-04 | 597 | 5.24E-04 | 664 | 1.52E-04 | 731 | 1.94E-05 |
| 397 | 7.20E-06 | 464 | 4.31E-04 | 531 | 4.78E-04 | 598 | 5.22E-04 | 665 | 1.48E-04 | 732 | 1.88E-05 |
| 398 | 7.50E-06 | 465 | 4.11E-04 | 532 | 4.80E-04 | 599 | 5.18E-04 | 666 | 1.43E-04 | 733 | 1.82E-05 |
| 399 | 8.10E-06 | 466 | 3.89E-04 | 533 | 4.81E-04 | 600 | 5.16E-04 | 667 | 1.39E-04 | 734 | 1.75E-05 |
| 400 | 8.40E-06 | 467 | 3.64E-04 | 534 | 4.83E-04 | 601 | 5.13E-04 | 668 | 1.36E-04 | 735 | 1.69E-05 |
| 401 | 8.60E-06 | 468 | 3.45E-04 | 535 | 4.86E-04 | 602 | 5.09E-04 | 669 | 1.32E-04 | 736 | 1.65E-05 |
| 402 | 9.40E-06 | 469 | 3.22E-04 | 536 | 4.88E-04 | 603 | 5.06E-04 | 670 | 1.29E-04 | 737 | 1.59E-05 |
| 403 | 1.00E-05 | 470 | 2.98E-04 | 537 | 4.88E-04 | 604 | 5.02E-04 | 671 | 1.25E-04 | 738 | 1.54E-05 |
| 404 | 1.10E-05 | 471 | 2.70E-04 | 538 | 4.91E-04 | 605 | 4.97E-04 | 672 | 1.21E-04 | 739 | 1.47E-05 |
| 405 | 1.21E-05 | 472 | 2.53E-04 | 539 | 4.91E-04 | 606 | 4.94E-04 | 673 | 1.17E-04 | 740 | 1.45E-05 |
| 406 | 1.27E-05 | 473 | 2.40E-04 | 540 | 4.93E-04 | 607 | 4.93E-04 | 674 | 1.14E-04 | 741 | 1.39E-05 |
| 407 | 1.47E-05 | 474 | 2.26E-04 | 541 | 4.96E-04 | 608 | 4.98E-04 | 675 | 1.10E-04 | 742 | 1.34E-05 |
| 408 | 1.62E-05 | 475 | 2.21E-04 | 542 | 4.98E-04 | 609 | 4.96E-04 | 676 | 1.07E-04 | 743 | 1.30E-05 |
| 409 | 1.77E-05 | 476 | 2.14E-04 | 543 | 5.00E-04 | 610 | 4.86E-04 | 677 | 1.04E-04 | 744 | 1.26E-05 |
| 410 | 1.98E-05 | 477 | 2.11E-04 | 544 | 5.02E-04 | 611 | 4.79E-04 | 678 | 1.02E-04 | 745 | 1.24E-05 |
| 411 | 2.23E-05 | 478 | 2.10E-04 | 545 | 5.03E-04 | 612 | 4.88E-04 | 679 | 9.84E-05 | 746 | 1.19E-05 |
| 412 | 2.46E-05 | 479 | 2.08E-04 | 546 | 5.05E-04 | 613 | 5.04E-04 | 680 | 9.50E-05 | 747 | 1.15E-05 |
| 413 | 2.74E-05 | 480 | 2.05E-04 | 547 | 5.08E-04 | 614 | 4.92E-04 | 681 | 9.26E-05 | 748 | 1.12E-05 |
| 414 | 3.01E-05 | 481 | 2.08E-04 | 548 | 5.10E-04 | 615 | 4.66E-04 | 682 | 8.95E-05 | 749 | 1.08E-05 |
| 415 | 3.31E-05 | 482 | 2.08E-04 | 549 | 5.11E-04 | 616 | 4.49E-04 | 683 | 8.69E-05 | 750 | 1.05E-05 |
| 416 | 3.78E-05 | 483 | 2.09E-04 | 550 | 5.11E-04 | 617 | 4.41E-04 | 684 | 8.40E-05 | 751 | 1.02E-05 |
| 417 | 4.26E-05 | 484 | 2.12E-04 | 551 | 5.15E-04 | 618 | 4.35E-04 | 685 | 8.16E-05 | 752 | 9.70E-06 |
| 418 | 4.64E-05 | 485 | 2.16E-04 | 552 | 5.17E-04 | 619 | 4.30E-04 | 686 | 7.95E-05 | 753 | 9.40E-06 |
| 419 | 5.08E-05 | 486 | 2.20E-04 | 553 | 5.18E-04 | 620 | 4.24E-04 | 687 | 7.69E-05 | 754 | 9.10E-06 |
| 420 | 5.61E-05 | 487 | 2.25E-04 | 554 | 5.21E-04 | 621 | 4.16E-04 | 688 | 7.45E-05 | 755 | 9.00E-06 |
| 421 | 6.29E-05 | 488 | 2.30E-04 | 555 | 5.23E-04 | 622 | 4.10E-04 | 689 | 7.25E-05 | 756 | 8.70E-06 |
| 422 | 6.88E-05 | 489 | 2.37E-04 | 556 | 5.25E-04 | 623 | 4.03E-04 | 690 | 7.01E-05 | 757 | 8.60E-06 |
| 423 | 7.66E-05 | 490 | 2.43E-04 | 557 | 5.28E-04 | 624 | 3.98E-04 | 691 | 6.81E-05 | 758 | 8.10E-06 |
| 424 | 8.35E-05 | 491 | 2.51E-04 | 558 | 5.29E-04 | 625 | 3.92E-04 | 692 | 6.57E-05 | 759 | 7.90E-06 |
| 425 | 9.36E-05 | 492 | 2.58E-04 | 559 | 5.31E-04 | 626 | 3.87E-04 | 693 | 6.43E-05 | 760 | 7.80E-06 |
| 426 | 1.05E-04 | 493 | 2.67E-04 | 560 | 5.34E-04 | 627 | 3.82E-04 | 694 | 6.25E-05 | 761 | 7.30E-06 |
| 427 | 1.17E-04 | 494 | 2.76E-04 | 561 | 5.34E-04 | 628 | 3.79E-04 | 695 | 6.05E-05 | 762 | 7.20E-06 |
| 428 | 1.30E-04 | 495 | 2.86E-04 | 562 | 5.36E-04 | 629 | 3.99E-04 | 696 | 5.82E-05 | 763 | 6.80E-06 |
| 429 | 1.46E-04 | 496 | 2.95E-04 | 563 | 5.38E-04 | 630 | 4.48E-04 | 697 | 5.67E-05 | 764 | 6.70E-06 |
| 430 | 1.66E-04 | 497 | 3.04E-04 | 564 | 5.40E-04 | 631 | 4.57E-04 | 698 | 5.49E-05 | 765 | 6.60E-06 |
| 431 | 1.82E-04 | 498 | 3.14E-04 | 565 | 5.41E-04 | 632 | 4.03E-04 | 699 | 5.34E-05 | 766 | 6.60E-06 |
| 432 | 2.02E-04 | 499 | 3.23E-04 | 566 | 5.43E-04 | 633 | 3.64E-04 | 700 | 5.18E-05 | 767 | 6.20E-06 |
| 433 | 2.22E-04 | 500 | 3.34E-04 | 567 | 5.44E-04 | 634 | 3.80E-04 | 701 | 5.02E-05 | 768 | 5.90E-06 |
| 434 | 2.49E-04 | 501 | 3.42E-04 | 568 | 5.44E-04 | 635 | 3.95E-04 | 702 | 4.86E-05 | 769 | 5.80E-06 |
| 435 | 2.73E-04 | 502 | 3.50E-04 | 569 | 5.48E-04 | 636 | 3.59E-04 | 703 | 4.70E-05 | 770 | 5.70E-06 |
| 436 | 3.06E-04 | 503 | 3.60E-04 | 570 | 5.48E-04 | 637 | 3.21E-04 | 704 | 4.56E-05 | 771 | 5.40E-06 |
| 437 | 3.41E-04 | 504 | 3.66E-04 | 571 | 5.47E-04 | 638 | 3.04E-04 | 705 | 4.42E-05 | 772 | 5.20E-06 |
| 438 | 3.76E-04 | 505 | 3.74E-04 | 572 | 5.49E-04 | 639 | 2.93E-04 | 706 | 4.28E-05 | 773 | 5.00E-06 |
| 439 | 4.23E-04 | 506 | 3.81E-04 | 573 | 5.48E-04 | 640 | 2.86E-04 | 707 | 4.11E-05 | 774 | 4.90E-06 |
| 440 | 4.69E-04 | 507 | 3.88E-04 | 574 | 5.50E-04 | 641 | 2.77E-04 | 708 | 4.02E-05 | 775 | 4.70E-06 |
| 441 | 5.27E-04 | 508 | 3.96E-04 | 575 | 5.50E-04 | 642 | 2.69E-04 | 709 | 3.90E-05 | 776 | 4.80E-06 |
| 442 | 5.89E-04 | 509 | 4.03E-04 | 576 | 5.52E-04 | 643 | 2.63E-04 | 710 | 3.74E-05 | 777 | 4.50E-06 |
| 443 | 6.49E-04 | 510 | 4.08E-04 | 577 | 5.53E-04 | 644 | 2.57E-04 | 711 | 3.62E-05 | 778 | 4.40E-06 |
| 444 | 7.28E-04 | 511 | 4.15E-04 | 578 | 5.52E-04 | 645 | 2.52E-04 | 712 | 3.52E-05 | 779 | 4.50E-06 |
| 445 | 7.96E-04 | 512 | 4.19E-04 | 579 | 5.50E-04 | 646 | 2.52E-04 | 713 | 3.42E-05 | 780 | 4.50E-06 |
| 446 | 8.63E-04 | 513 | 4.25E-04 | 580 | 5.52E-04 | 647 | 2.58E-04 | 714 | 3.29E-05 | N/A | N/A |

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

| | | | |
|----------------------------|--------------------|----------------------------------|--------------|
| Model No. | WPX1 @ 20W / 5000K | Sample ID | 231101002-S1 |
| Operate time (Min.) | 30 | Stabilization time (Min.) | 60 |
| Temperature (°C) | 24.8 | Humidity (%RH) | 42.9 |

| |
|---|
| Test Method |
| <p>The Samples were tested according to the IES LM-79-2008.</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 | 277.0 | 60 | 0.106 | 26.6 | 0.909 |
| NON-WORST CASE | 120.0 | 60 | 0.216 | 25.8 | 0.996 |

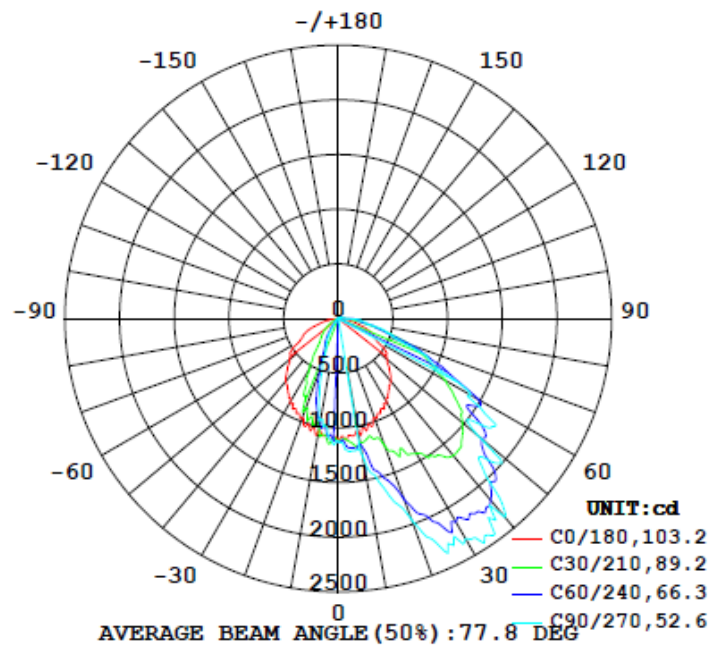
Test Result

| Result Type | Flux (lm) | Field Angle (10%) | | Beam Angle (50%) | | Luminous Efficacy (lm/W) | Zonal Lumen Requirement (80°-90°) | BUG |
|----------------------|-----------|-------------------|---------|------------------|---------|--------------------------|-----------------------------------|----------|
| | | C0-180 | C90-270 | C0-180 | C90-270 | | | |
| 0°-180° zones | 3764 | 109.3 | 146.8 | 52.1 | 95.8 | 141.5 | 2.2% | B1-U2-G1 |
| 0°-90° zones | 3702 | 109.3 | 146.8 | 52.1 | 95.8 | 139.2 | 2.2% | B1-U2-G1 |

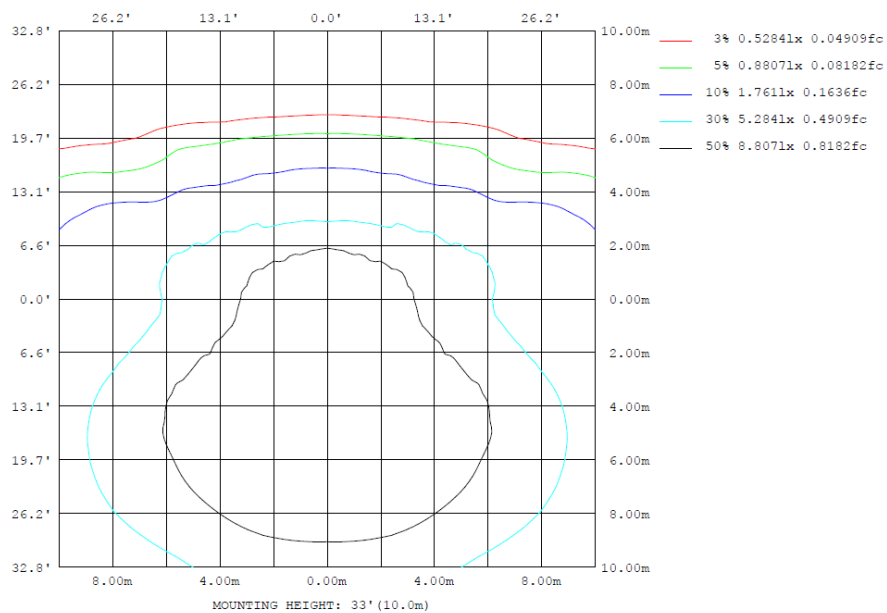
4.2 Goniophotometer Test

Lighting Distribution Curve

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

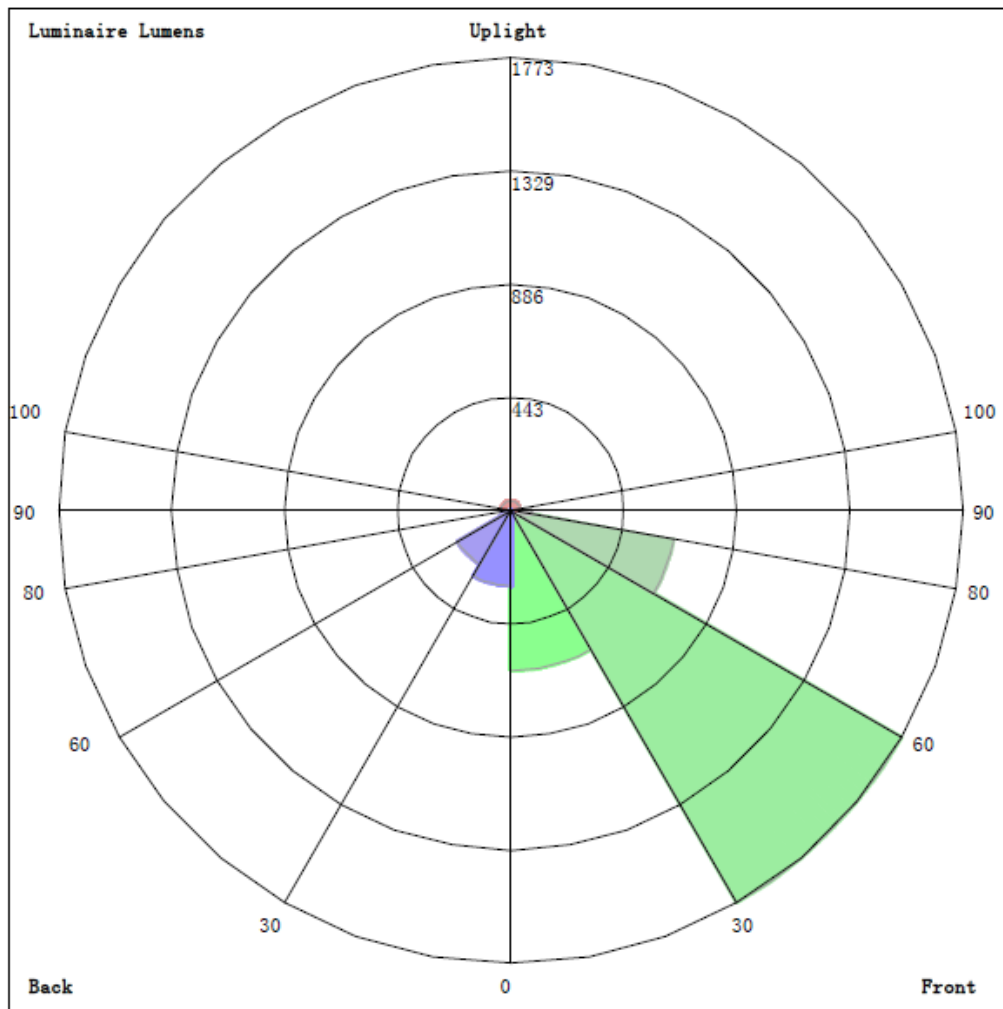
ZONAL FLUX DIAGRAM:

| γ | C0 | C45 | C90 | C135 | C180 | C225 | C270 | C315 | γ | ± zone | ± total | %lum, lamp |
|-----|-----------------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|------------|
| 10 | 1048 | 1196 | 1272 | 1196 | 1048 | 956.9 | 945.9 | 956.9 | 0- 10 | 105.1 | 105.1 | 2.79,2.79 |
| 20 | 965.0 | 1554 | 1953 | 1554 | 965.0 | 667.4 | 361.8 | 667.4 | 10- 20 | 308.6 | 413.7 | 11,11 |
| 30 | 886.9 | 1885 | 2324 | 1885 | 886.9 | 290.6 | 176.8 | 290.6 | 20- 30 | 507.0 | 920.7 | 24.5,24.5 |
| 40 | 747.5 | 1899 | 2371 | 1899 | 747.5 | 155.1 | 51.45 | 155.1 | 30- 40 | 662.4 | 1583 | 42.1,42.1 |
| 50 | 586.3 | 1713 | 1669 | 1713 | 586.3 | 52.78 | 23.68 | 52.78 | 40- 50 | 709.4 | 2293 | 60.9,60.9 |
| 60 | 406.1 | 1269 | 1399 | 1269 | 406.1 | 20.20 | 0.4945 | 20.20 | 50- 60 | 642.1 | 2935 | 78,78 |
| 70 | 275.1 | 690.2 | 589.4 | 690.2 | 275.1 | 3.576 | 0.7144 | 3.576 | 60- 70 | 467.2 | 3402 | 90.4,90.4 |
| 80 | 97.96 | 237.9 | 259.0 | 237.9 | 97.96 | 1.618 | 0.7239 | 1.618 | 70- 80 | 218.9 | 3621 | 96.2,96.2 |
| 90 | 13.12 | 92.87 | 86.62 | 92.87 | 13.12 | 1.087 | 0.8654 | 1.087 | 80- 90 | 81.67 | 3702 | 98.4,98.4 |
| 100 | 8.885 | 29.56 | 46.44 | 29.56 | 8.885 | 1.193 | 1.185 | 1.193 | 90-100 | 24.52 | 3727 | 99,99 |
| 110 | 8.343 | 11.16 | 33.44 | 11.16 | 8.343 | 1.094 | 1.233 | 1.094 | 100-110 | 11.38 | 3738 | 99.3,99.3 |
| 120 | 6.652 | 22.36 | 12.52 | 22.36 | 6.652 | 1.042 | 1.292 | 1.042 | 110-120 | 8.061 | 3746 | 99.5,99.5 |
| 130 | 2.642 | 17.56 | 20.17 | 17.56 | 2.642 | 1.114 | 1.539 | 1.114 | 120-130 | 8.247 | 3755 | 99.7,99.7 |
| 140 | 0.7037 | 10.77 | 16.10 | 10.77 | 0.7037 | 1.226 | 1.587 | 1.226 | 130-140 | 5.535 | 3760 | 99.9,99.9 |
| 150 | 0.6507 | 5.361 | 7.625 | 5.361 | 0.6507 | 1.357 | 1.541 | 1.357 | 140-150 | 2.822 | 3763 | 100,100 |
| 160 | 0.7614 | 0.6030 | 2.618 | 0.6030 | 0.7614 | 1.431 | 1.367 | 1.431 | 150-160 | 0.9594 | 3764 | 100,100 |
| 170 | 0.9137 | 0.8859 | 0.7192 | 0.8859 | 0.9137 | 1.200 | 1.046 | 1.200 | 160-170 | 0.3163 | 3764 | 100,100 |
| 180 | 1.052 | 1.014 | 0.8514 | 1.014 | 1.052 | 0.9713 | 0.9120 | 0.9713 | 170-180 | 0.0972 | 3764 | 100,100 |
| DEG | LUMINOUS INTENSITY:cd | | | | | | | | | UNIT:lm | | |

| | Zonal (lm) | | Total (lm) | Percent |
|---------|------------|-------|------------|---------|
| 0-10 | 105.08 | 0-10 | 105.08 | 2.79% |
| 10-20 | 308.60 | 0-20 | 413.68 | 10.99% |
| 20-30 | 507.03 | 0-30 | 920.71 | 24.46% |
| 30-40 | 662.40 | 0-40 | 1583.11 | 42.06% |
| 40-50 | 709.42 | 0-50 | 2292.53 | 60.90% |
| 50-60 | 642.14 | 0-60 | 2934.67 | 77.96% |
| 60-70 | 467.20 | 0-70 | 3401.87 | 90.37% |
| 70-80 | 218.87 | 0-80 | 3620.74 | 96.19% |
| 80-90 | 81.67 | 0-90 | 3702.41 | 98.36% |
| 90-100 | 24.52 | 0-100 | 3726.93 | 99.01% |
| 100-110 | 11.38 | 0-110 | 3738.31 | 99.31% |
| 110-120 | 8.06 | 0-120 | 3746.37 | 99.52% |
| 120-130 | 8.25 | 0-130 | 3754.62 | 99.74% |
| 130-140 | 5.54 | 0-140 | 3760.16 | 99.89% |
| 140-150 | 2.82 | 0-150 | 3762.98 | 99.97% |
| 150-160 | 0.96 | 0-160 | 3763.94 | 99.99% |
| 160-170 | 0.32 | 0-170 | 3764.26 | 100.00% |
| 170-180 | 0.10 | 0-180 | 3764.36 | 100.00% |

4.2 Goniophotometer Test

LCS/BUG

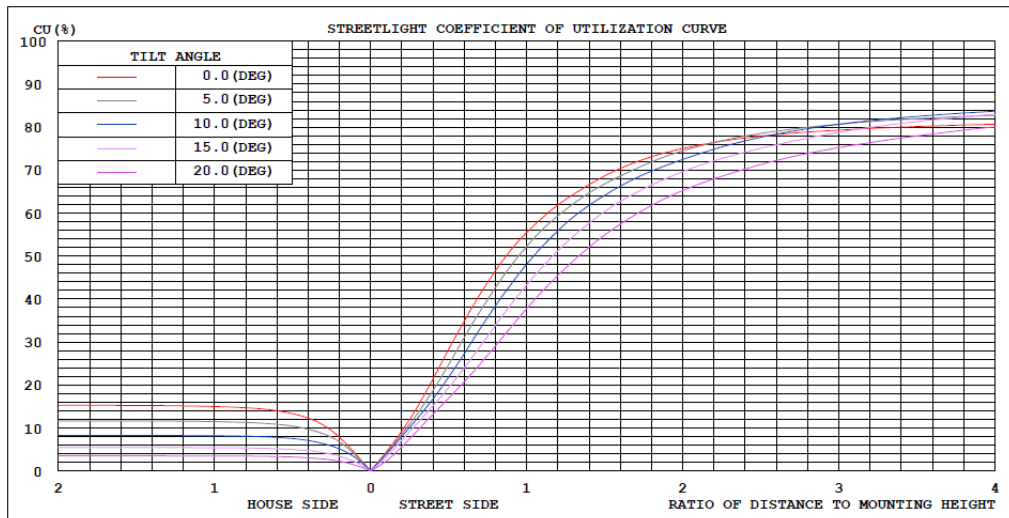


LUMINAIRE CLASSIFICATION SYSTEM (LCS)

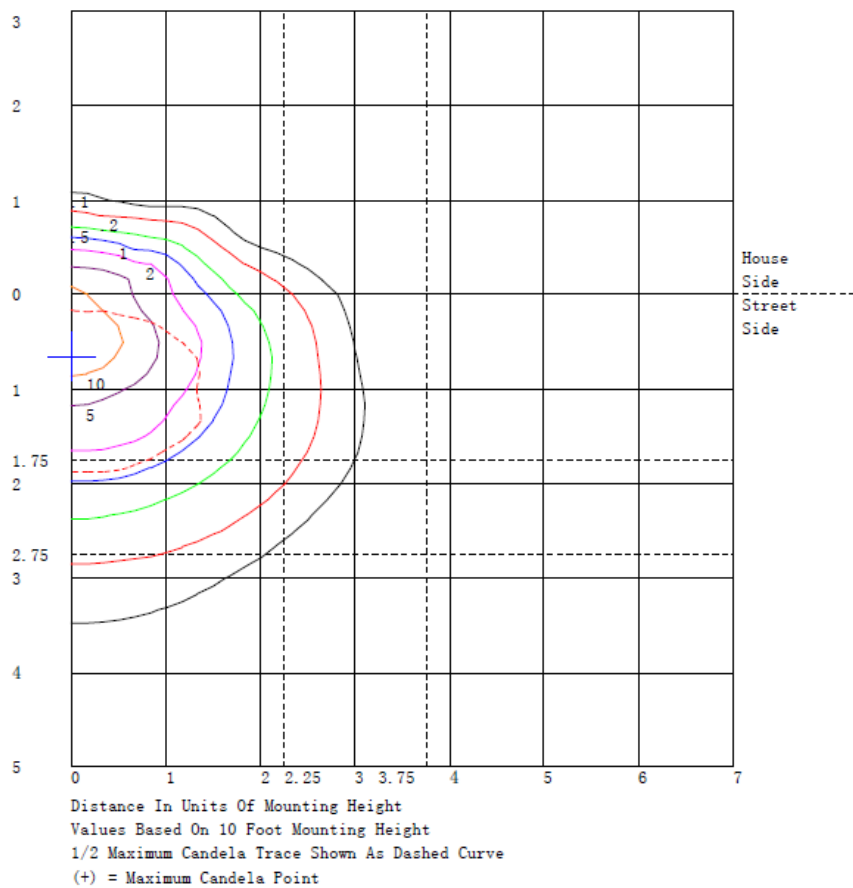
| | Lumens | % Lamp | % Luminaire |
|-------------------------------|----------|--------|-------------|
| FL - Front-Low (0-30) | 626.8 | N.A. | 16.7 |
| FM - Front-Medium (30-60) | 1772.6 | N.A. | 47.1 |
| FH - Front-High (60-80) | 647.5 | N.A. | 17.2 |
| FVH - Front-Very High (80-90) | 77.9 | N.A. | 2.1 |
| BL - Back-Low (0-30) | 293.9 | N.A. | 7.8 |
| BM - Back-Medium (30-60) | 241.4 | N.A. | 6.4 |
| BH - Back-High (60-80) | 38.6 | N.A. | 1.0 |
| BVH - Back-Very High (80-90) | 3.8 | N.A. | 0.1 |
| UL - Uplight-Low (90-100) | 24.5 | N.A. | 0.7 |
| UH - Uplight-High (100-180) | 37.4 | N.A. | 1.0 |
| Total | 3764.4 | N.A. | 100.0 |
| BUG Rating | B1-U2-G1 | | |

4.2 Goniophotometer Test

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

| C (DEG) y (DEG) | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0 | 1124 | 1124 | 1124 | 1125 | 1125 | 1125 | 1126 | 1126 | 1127 | 1127 | 1127 | 1127 | 1128 | 1128 | 1128 | 1128 | 1128 | 1128 | 1128 |
| 5 | 1072 | 1079 | 1088 | 1097 | 1105 | 1115 | 1127 | 1146 | 1166 | 1182 | 1187 | 1188 | 1187 | 1185 | 1185 | 1188 | 1200 | 1213 | 1223 |
| 10 | 1048 | 1061 | 1075 | 1090 | 1109 | 1128 | 1146 | 1167 | 1184 | 1196 | 1188 | 1178 | 1170 | 1185 | 1205 | 1227 | 1246 | 1262 | 1272 |
| 15 | 1029 | 1070 | 1100 | 1119 | 1112 | 1105 | 1109 | 1163 | 1231 | 1304 | 1362 | 1415 | 1465 | 1513 | 1555 | 1587 | 1600 | 1604 | 1600 |
| 20 | 965 | 987 | 1018 | 1059 | 1107 | 1167 | 1239 | 1341 | 1449 | 1554 | 1633 | 1702 | 1759 | 1807 | 1846 | 1879 | 1915 | 1942 | 1953 |
| 25 | 916 | 940 | 982 | 1042 | 1121 | 1218 | 1329 | 1463 | 1601 | 1738 | 1850 | 1953 | 2046 | 2135 | 2213 | 2278 | 2327 | 2358 | 2369 |
| 30 | 887 | 892 | 931 | 1004 | 1124 | 1269 | 1428 | 1588 | 1743 | 1885 | 1992 | 2080 | 2151 | 2209 | 2254 | 2286 | 2307 | 2319 | 2324 |
| 35 | 801 | 852 | 932 | 1041 | 1198 | 1370 | 1544 | 1694 | 1830 | 1950 | 2038 | 2112 | 2177 | 2253 | 2321 | 2377 | 2406 | 2419 | 2419 |
| 40 | 747 | 810 | 906 | 1037 | 1233 | 1441 | 1634 | 1743 | 1827 | 1899 | 2001 | 2093 | 2166 | 2177 | 2175 | 2177 | 2249 | 2320 | 2371 |
| 45 | 657 | 762 | 888 | 1033 | 1222 | 1415 | 1593 | 1710 | 1801 | 1874 | 1953 | 2010 | 2038 | 1992 | 1925 | 1857 | 1830 | 1817 | 1816 |
| 50 | 586 | 685 | 804 | 943 | 1126 | 1312 | 1482 | 1589 | 1665 | 1713 | 1720 | 1715 | 1715 | 1776 | 1836 | 1875 | 1809 | 1731 | 1669 |
| 55 | 536 | 695 | 844 | 981 | 1114 | 1232 | 1328 | 1384 | 1420 | 1440 | 1443 | 1445 | 1455 | 1508 | 1570 | 1632 | 1673 | 1704 | 1720 |
| 60 | 406 | 560 | 700 | 827 | 943 | 1044 | 1128 | 1182 | 1226 | 1269 | 1352 | 1427 | 1479 | 1449 | 1401 | 1353 | 1362 | 1380 | 1399 |
| 65 | 354 | 486 | 602 | 701 | 777 | 841 | 897 | 965 | 1024 | 1068 | 1077 | 1068 | 1048 | 1018 | 985 | 955 | 942 | 935 | 935 |
| 70 | 275 | 329 | 389 | 456 | 543 | 626 | 693 | 706 | 703 | 690 | 695 | 697 | 694 | 673 | 648 | 622 | 607 | 596 | 589 |
| 75 | 175 | 220 | 263 | 305 | 351 | 391 | 420 | 419 | 409 | 396 | 395 | 397 | 403 | 414 | 427 | 438 | 445 | 448 | 448 |
| 80 | 98.0 | 128 | 154 | 177 | 195 | 210 | 222 | 229 | 234 | 238 | 242 | 246 | 249 | 250 | 250 | 251 | 254 | 257 | 259 |
| 85 | 36.1 | 49.5 | 63.2 | 77.4 | 92.8 | 108 | 122 | 133 | 143 | 153 | 165 | 177 | 188 | 195 | 200 | 204 | 207 | 208 | 208 |
| 90 | 13.1 | 20.1 | 28.0 | 37.0 | 47.9 | 59.2 | 70.6 | 79.6 | 87.4 | 92.9 | 93.5 | 92.1 | 89.4 | 86.7 | 84.1 | 82.3 | 83.4 | 85.1 | 86.6 |
| 95 | 9.58 | 14.6 | 19.9 | 25.3 | 32.1 | 38.3 | 43.2 | 43.7 | 42.9 | 41.6 | 42.0 | 42.7 | 43.8 | 45.6 | 47.6 | 49.7 | 52.0 | 54.0 | 55.3 |
| 100 | 8.88 | 9.49 | 10.1 | 10.9 | 11.0 | 11.6 | 13.3 | 18.4 | 24.1 | 29.6 | 31.9 | 33.5 | 34.7 | 36.7 | 38.8 | 40.9 | 43.2 | 45.2 | 46.4 |
| 105 | 1.54 | 3.63 | 5.64 | 7.55 | 9.47 | 11.2 | 12.7 | 13.4 | 14.1 | 14.9 | 16.7 | 18.8 | 21.0 | 22.9 | 24.8 | 26.6 | 28.7 | 30.4 | 31.6 |
| 110 | 8.34 | 7.21 | 7.25 | 8.47 | 12.3 | 16.2 | 19.1 | 16.6 | 13.4 | 11.2 | 14.5 | 19.2 | 24.2 | 27.0 | 29.3 | 31.0 | 32.3 | 33.1 | 33.4 |
| 115 | 7.48 | 5.94 | 5.66 | 6.64 | 9.85 | 13.6 | 17.2 | 19.2 | 20.1 | 19.6 | 15.5 | 10.9 | 7.19 | 8.22 | 10.4 | 12.7 | 12.8 | 12.5 | 12.0 |
| 120 | 6.65 | 5.07 | 4.65 | 5.39 | 7.86 | 11.1 | 14.5 | 17.4 | 20.0 | 22.4 | 24.6 | 26.2 | 26.6 | 24.5 | 21.5 | 18.3 | 15.3 | 13.2 | 12.5 |
| 125 | 4.82 | 3.68 | 3.46 | 4.17 | 6.18 | 8.84 | 11.9 | 14.8 | 17.6 | 20.4 | 22.7 | 24.8 | 26.5 | 27.9 | 28.7 | 28.6 | 25.8 | 22.9 | 21.0 |
| 130 | 2.64 | 2.02 | 2.11 | 2.91 | 4.67 | 6.96 | 9.58 | 12.2 | 14.9 | 17.6 | 20.3 | 22.8 | 24.8 | 25.9 | 26.2 | 25.8 | 23.7 | 21.5 | 20.2 |
| 135 | 0.89 | 0.00 | 0.00 | 0.48 | 2.48 | 5.02 | 7.80 | 10.0 | 12.2 | 14.5 | 17.4 | 20.1 | 22.2 | 23.0 | 23.0 | 22.5 | 21.1 | 19.8 | 19.0 |
| 140 | 0.70 | 1.74 | 2.74 | 3.69 | 4.47 | 5.29 | 6.25 | 7.52 | 9.02 | 10.8 | 13.2 | 15.6 | 17.7 | 18.4 | 18.5 | 18.2 | 17.4 | 16.6 | 16.1 |
| 145 | 0.66 | 1.20 | 1.78 | 2.40 | 3.02 | 3.72 | 4.50 | 5.43 | 6.48 | 7.68 | 9.33 | 10.9 | 12.2 | 12.7 | 12.7 | 12.5 | 12.1 | 11.7 | 11.5 |
| 150 | 0.65 | 1.01 | 1.22 | 1.27 | 0.81 | 0.46 | 0.48 | 1.90 | 3.63 | 5.36 | 6.31 | 6.98 | 7.44 | 7.72 | 7.87 | 7.89 | 7.80 | 7.69 | 7.63 |
| 155 | 0.69 | 0.68 | 0.69 | 0.72 | 0.67 | 0.71 | 0.90 | 1.53 | 2.28 | 3.02 | 3.49 | 3.85 | 4.13 | 4.31 | 4.43 | 4.50 | 4.56 | 4.60 | 4.62 |
| 160 | 0.76 | 0.76 | 0.75 | 0.74 | 0.72 | 0.70 | 0.68 | 0.59 | 0.55 | 0.60 | 0.97 | 1.41 | 1.85 | 2.12 | 2.34 | 2.49 | 2.56 | 2.60 | 2.62 |
| 165 | 0.83 | 0.84 | 0.84 | 0.84 | 0.82 | 0.80 | 0.78 | 0.75 | 0.74 | 0.73 | 0.78 | 0.84 | 0.88 | 0.83 | 0.76 | 0.69 | 0.66 | 0.64 | 0.64 |
| 170 | 0.91 | 0.93 | 0.94 | 0.94 | 0.94 | 0.94 | 0.93 | 0.92 | 0.90 | 0.89 | 0.87 | 0.86 | 0.85 | 0.84 | 0.83 | 0.81 | 0.77 | 0.74 | 0.72 |
| 175 | 0.98 | 0.99 | 0.99 | 0.99 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 | 0.98 | 0.98 | 0.97 | 0.95 | 0.91 | 0.86 | 0.82 | 0.80 | 0.79 | 0.79 |
| 180 | 1.05 | 1.06 | 1.06 | 1.06 | 1.06 | 1.05 | 1.04 | 1.03 | 1.02 | 1.01 | 1.00 | 0.98 | 0.96 | 0.95 | 0.94 | 0.93 | 0.90 | 0.87 | 0.85 |

| C (DEG) | | UNIT: cd | | | | | | | | | | | | | | | | | |
|---------|------|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| y (DEG) | 95 | 100 | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 |
| 0 | 1128 | 1128 | 1128 | 1128 | 1128 | 1128 | 1127 | 1127 | 1127 | 1127 | 1126 | 1126 | 1125 | 1125 | 1125 | 1124 | 1124 | 1124 | 1124 |
| 5 | 1213 | 1220 | 1188 | 1185 | 1185 | 1187 | 1188 | 1187 | 1182 | 1166 | 1146 | 1127 | 1115 | 1105 | 1097 | 1088 | 1079 | 1072 | 1085 |
| 10 | 1262 | 1246 | 1227 | 1205 | 1185 | 1170 | 1178 | 1188 | 1196 | 1184 | 1167 | 1146 | 1128 | 1109 | 1090 | 1075 | 1061 | 1048 | 1056 |
| 15 | 1604 | 1600 | 1587 | 1555 | 1513 | 1465 | 1415 | 1362 | 1304 | 1231 | 1163 | 1109 | 1105 | 1112 | 1119 | 1100 | 1070 | 1029 | 1054 |
| 20 | 1942 | 1915 | 1879 | 1846 | 1807 | 1759 | 1702 | 1633 | 1554 | 1449 | 1341 | 1239 | 1167 | 1107 | 1059 | 1018 | 987 | 965 | 948 |
| 25 | 2358 | 2327 | 2278 | 2213 | 2135 | 2046 | 1953 | 1850 | 1738 | 1601 | 1463 | 1329 | 1218 | 1121 | 1042 | 982 | 940 | 916 | 937 |
| 30 | 2319 | 2307 | 2286 | 2254 | 2209 | 2151 | 2080 | 1992 | 1885 | 1743 | 1588 | 1428 | 1269 | 1124 | 1004 | 931 | 892 | 887 | 910 |
| 35 | 2419 | 2406 | 2377 | 2321 | 2253 | 2177 | 2112 | 2038 | 1950 | 1830 | 1694 | 1544 | 1370 | 1198 | 1041 | 932 | 852 | 801 | 837 |
| 40 | 2320 | 2249 | 2177 | 2175 | 2177 | 2166 | 2093 | 2001 | 1899 | 1827 | 1743 | 1634 | 1441 | 1233 | 1037 | 906 | 810 | 747 | 779 |
| 45 | 1817 | 1830 | 1857 | 1925 | 1992 | 2038 | 2010 | 1953 | 1874 | 1801 | 1710 | 1593 | 1415 | 1222 | 1033 | 888 | 762 | 657 | 647 |
| 50 | 1731 | 1809 | 1875 | 1836 | 1776 | 1715 | 1715 | 1720 | 1713 | 1665 | 1589 | 1482 | 1312 | 1126 | 943 | 804 | 685 | 586 | 523 |
| 55 | 1704 | 1673 | 1632 | 1570 | 1508 | 1455 | 1445 | 1443 | 1440 | 1420 | 1384 | 1328 | 1232 | 1114 | 981 | 844 | 695 | 536 | 426 |
| 60 | 1380 | 1362 | 1353 | 1401 | 1449 | 1479 | 1427 | 1352 | 1269 | 1226 | 1182 | 1128 | 1044 | 943 | 827 | 700 | 560 | 406 | 301 |
| 65 | 935 | 942 | 955 | 985 | 1018 | 1048 | 1068 | 1077 | 1068 | 1024 | 965 | 897 | 841 | 777 | 701 | 602 | 486 | 354 | 250 |
| 70 | 596 | 607 | 622 | 648 | 673 | 694 | 697 | 695 | 690 | 703 | 706 | 693 | 626 | 543 | 456 | 389 | 329 | 275 | 194 |
| 75 | 448 | 445 | 438 | 427 | 414 | 403 | 397 | 395 | 396 | 409 | 419 | 420 | 391 | 351 | 305 | 263 | 220 | 175 | 123 |
| 80 | 257 | 254 | 251 | 250 | 250 | 249 | 246 | 242 | 238 | 234 | 229 | 222 | 210 | 195 | 177 | 154 | 128 | 98.0 | 67.9 |
| 85 | 208 | 207 | 204 | 200 | 195 | 188 | 177 | 165 | 153 | 143 | 133 | 122 | 108 | 92.8 | 77.4 | 63.2 | 49.5 | 36.1 | 26.9 |
| 90 | 85.1 | 83.4 | 82.3 | 84.1 | 86.7 | 89.4 | 92.1 | 93.5 | 92.9 | 87.4 | 79.6 | 70.0 | 59.2 | 47.9 | 37.0 | 28.0 | 20.1 | 13.1 | 10.8 |
| 95 | 54.0 | 52.0 | 49.7 | 47.6 | 45.6 | 43.8 | 42.7 | 42.0 | 41.6 | 42.9 | 43.7 | 43.2 | 38.3 | 32.1 | 25.3 | 19.9 | 14.6 | 9.58 | 7.98 |
| 100 | 45.2 | 43.2 | 40.9 | 38.8 | 36.7 | 34.7 | 33.5 | 31.9 | 29.6 | 24.1 | 18.4 | 13.3 | 11.6 | 11.0 | 10.9 | 10.1 | 9.49 | 8.88 | 6.96 |
| 105 | 30.4 | 28.7 | 26.6 | 24.8 | 22.9 | 21.0 | 18.8 | 16.7 | 14.9 | 14.1 | 13.4 | 12.7 | 11.2 | 9.47 | 7.55 | 5.64 | 3.63 | 1.54 | 1.27 |
| 110 | 33.1 | 32.3 | 31.0 | 29.3 | 27.0 | 24.2 | 19.2 | 14.5 | 11.2 | 13.4 | 16.6 | 19.1 | 16.2 | 12.3 | 8.47 | 7.25 | 7.21 | 8.34 | 5.29 |
| 115 | 12.5 | 12.8 | 12.7 | 10.4 | 8.22 | 7.19 | 10.9 | 15.5 | 19.6 | 20.1 | 19.2 | 17.2 | 13.6 | 9.85 | 6.64 | 5.66 | 5.94 | 7.48 | 4.78 |
| 120 | 13.2 | 15.3 | 18.3 | 21.5 | 24.5 | 26.6 | 26.2 | 24.6 | 22.4 | 20.0 | 17.4 | 14.5 | 11.1 | 7.86 | 5.39 | 4.65 | 5.07 | 6.65 | 4.33 |
| 125 | 22.9 | 25.8 | 28.6 | 28.7 | 27.9 | 26.5 | 24.8 | 22.7 | 20.4 | 17.6 | 14.8 | 11.9 | 8.84 | 6.18 | 4.17 | 3.46 | 3.68 | 4.82 | 3.36 |
| 130 | 21.5 | 23.7 | 25.8 | 26.2 | 25.9 | 24.8 | 22.8 | 20.3 | 17.6 | 14.9 | 12.2 | 9.58 | 6.96 | 4.67 | 2.91 | 2.11 | 2.02 | 2.64 | 2.05 |
| 135 | 19.8 | 21.1 | 22.5 | 23.0 | 23.0 | 22.2 | 20.1 | 17.4 | 14.5 | 12.2 | 10.0 | 7.80 | 5.02 | 2.48 | 0.48 | 0.00 | 0.00 | 0.89 | 1.06 |
| 140 | 16.6 | 17.4 | 18.2 | 18.5 | 18.4 | 17.7 | 15.6 | 13.2 | 10.8 | 9.02 | 7.52 | 6.25 | 5.29 | 4.47 | 3.69 | 2.74 | 1.74 | 0.70 | 0.60 |
| 145 | 11.7 | 12.1 | 12.5 | 12.7 | 12.7 | 12.2 | 10.9 | 9.33 | 7.68 | 6.48 | 5.43 | 4.50 | 3.72 | 3.02 | 2.40 | 1.78 | 1.20 | 0.66 | 0.87 |
| 150 | 7.69 | 7.80 | 7.89 | 7.87 | 7.72 | 7.44 | 6.98 | 6.31 | 5.36 | 3.63 | 2.60 | 1.90 | 0.48 | 0.46 | 0.81 | 1.27 | 1.22 | 1.01 | 0.65 |
| 155 | 4.60 | 4.56 | 4.50 | 4.43 | 4.31 | 4.13 | 3.98 | 3.49 | 3.02 | 2.28 | 1.53 | 0.90 | 0.71 | 0.67 | 1.02 | 1.62 | 1.69 | 1.68 | 0.98 |
| 160 | 2.60 | 2.56 | 2.49 | 2.34 | 2.12 | 1.85 | 1.41 | 0.97 | 0.60 | 0.55 | 0.59 | 0.68 | 0.70 | 0.72 | 0.74 | 0.75 | 0.76 | 0.76 | 1.09 |
| 165 | 0.64 | 0.66 | 0.69 | 0.76 | 0.83 | 0.88 | 0.84 | 0.78 | 0.73 | 0.74 | 0.75 | 0.78 | 0.80 | 0.82 | 0.84 | 0.84 | 0.84 | 0.83 | 1.16 |
| 170 | 0.74 | 0.77 | 0.81 | 0.83 | 0.84 | 0.85 | 0.86 | 0.87 | 0.89 | 0.90 | 0.92 | 0.93 | 0.94 | 0.94 | 0.94 | 0.94 | 0.93 | 0.91 | 1.16 |
| 175 | 0.79 | 0.80 | 0.82 | 0.86 | 0.91 | 0.95 | 0.97 | 0.98 | 0.98 | 0.99 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 | 0.99 | 1.13 |
| 180 | 0.87 | 0.90 | 0.93 | 0.94 | 0.95 | 0.96 | 0.98 | 1.00 | 1.01 | 1.02 | 1.03 | 1.04 | 1.05 | 1.06 | 1.06 | 1.06 | 1.06 | 1.05 | 1.04 |

Table---3

UNIT: °C

| C (DEG) | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | 245 | 250 | 255 | 260 | 265 | 270 | 275 | 280 |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| y (DEG) | 0 | 1124 | 1124 | 1125 | 1126 | 1127 | 1127 | 1128 | 1128 | 1128 | 1128 | 1128 | 1128 | 1129 | 1128 | 1128 | 1128 | 1128 | 1128 |
| 5 | 1098 | 1110 | 1122 | 1132 | 1137 | 1128 | 1115 | 1101 | 1096 | 1092 | 1087 | 1076 | 1065 | 1058 | 1066 | 1076 | 1085 | 1076 | 1066 |
| 10 | 1059 | 1057 | 1049 | 1038 | 1022 | 999 | 976 | 957 | 953 | 952 | 951 | 940 | 929 | 921 | 929 | 938 | 946 | 938 | 929 |
| 15 | 1062 | 1053 | 1015 | 970 | 929 | 926 | 927 | 923 | 883 | 836 | 787 | 751 | 720 | 695 | 677 | 665 | 659 | 665 | 677 |
| 20 | 933 | 918 | 914 | 903 | 880 | 818 | 745 | 667 | 600 | 540 | 489 | 460 | 439 | 423 | 396 | 374 | 362 | 374 | 396 |
| 25 | 938 | 919 | 876 | 816 | 742 | 651 | 556 | 465 | 396 | 339 | 297 | 277 | 267 | 265 | 260 | 258 | 257 | 258 | 260 |
| 30 | 901 | 858 | 763 | 650 | 532 | 437 | 355 | 291 | 259 | 242 | 233 | 218 | 205 | 194 | 185 | 179 | 177 | 179 | 185 |
| 35 | 829 | 778 | 650 | 504 | 363 | 297 | 254 | 226 | 194 | 168 | 146 | 126 | 110 | 97.5 | 90.9 | 88.0 | 88.0 | 88.0 | 90.9 |
| 40 | 766 | 707 | 565 | 405 | 257 | 200 | 171 | 155 | 124 | 95.8 | 73.1 | 61.1 | 54.4 | 51.5 | 50.1 | 50.3 | 51.4 | 50.3 | 50.1 |
| 45 | 611 | 549 | 439 | 320 | 210 | 153 | 115 | 90.7 | 68.3 | 52.8 | 43.0 | 38.7 | 37.6 | 38.4 | 37.5 | 37.0 | 36.8 | 37.0 | 37.5 |
| 50 | 457 | 388 | 309 | 232 | 163 | 115 | 78.6 | 52.8 | 38.0 | 30.4 | 27.4 | 24.6 | 23.5 | 23.6 | 23.4 | 23.5 | 23.7 | 23.5 | 23.4 |
| 55 | 332 | 254 | 195 | 149 | 113 | 79.3 | 52.7 | 33.0 | 22.6 | 17.4 | 15.6 | 13.8 | 13.2 | 13.3 | 13.2 | 13.2 | 13.3 | 13.2 | 13.2 |
| 60 | 215 | 150 | 112 | 89.1 | 74.1 | 52.8 | 34.7 | 20.2 | 12.5 | 8.06 | 5.84 | 3.53 | 2.09 | 1.29 | 0.74 | 0.51 | 0.49 | 0.51 | 0.74 |
| 65 | 166 | 103 | 69.5 | 50.8 | 41.4 | 27.6 | 16.8 | 8.91 | 4.23 | 1.65 | 0.59 | 0.14 | 0.31 | 0.76 | 0.73 | 0.66 | 0.58 | 0.66 | 0.73 |
| 70 | 128 | 78.8 | 50.8 | 34.4 | 25.7 | 15.5 | 8.24 | 3.58 | 1.26 | 0.47 | 0.63 | 0.51 | 0.61 | 0.81 | 0.80 | 0.77 | 0.71 | 0.77 | 0.80 |
| 75 | 81.3 | 49.5 | 31.4 | 21.0 | 15.5 | 9.21 | 4.94 | 2.30 | 0.96 | 0.53 | 0.67 | 0.63 | 0.70 | 0.83 | 0.81 | 0.77 | 0.72 | 0.77 | 0.81 |
| 80 | 44.0 | 26.0 | 16.4 | 11.1 | 8.62 | 5.34 | 3.06 | 1.62 | 0.89 | 0.66 | 0.72 | 0.69 | 0.72 | 0.79 | 0.78 | 0.76 | 0.72 | 0.76 | 0.78 |
| 85 | 19.4 | 13.4 | 9.48 | 6.81 | 5.02 | 3.30 | 2.05 | 1.20 | 0.81 | 0.69 | 0.72 | 0.71 | 0.73 | 0.76 | 0.77 | 0.77 | 0.76 | 0.77 | 0.77 |
| 90 | 8.82 | 7.08 | 5.66 | 4.46 | 3.45 | 2.48 | 1.68 | 1.09 | 0.86 | 0.79 | 0.82 | 0.81 | 0.81 | 0.82 | 0.84 | 0.85 | 0.87 | 0.85 | 0.84 |
| 95 | 6.25 | 4.98 | 4.06 | 3.34 | 2.75 | 2.11 | 1.56 | 1.14 | 0.98 | 0.93 | 0.95 | 0.92 | 0.91 | 0.92 | 0.93 | 0.96 | 0.99 | 0.96 | 0.93 |
| 100 | 5.37 | 4.11 | 3.28 | 2.70 | 2.28 | 1.82 | 1.46 | 1.19 | 1.09 | 1.07 | 1.09 | 1.08 | 1.08 | 1.09 | 1.11 | 1.14 | 1.19 | 1.14 | 1.11 |
| 105 | 1.07 | 0.94 | 0.92 | 0.95 | 1.01 | 1.06 | 1.11 | 1.16 | 1.16 | 1.16 | 1.15 | 1.16 | 1.17 | 1.19 | 1.22 | 1.25 | 1.27 | 1.25 | 1.22 |
| 110 | 3.00 | 1.48 | 1.09 | 1.19 | 1.51 | 1.38 | 1.22 | 1.09 | 1.09 | 1.13 | 1.18 | 1.20 | 1.21 | 1.22 | 1.23 | 1.23 | 1.23 | 1.23 | 1.23 |
| 115 | 2.74 | 1.36 | 0.94 | 0.96 | 1.20 | 1.13 | 1.08 | 1.05 | 1.07 | 1.11 | 1.16 | 1.18 | 1.19 | 1.21 | 1.22 | 1.24 | 1.25 | 1.24 | 1.22 |
| 120 | 2.57 | 1.35 | 0.91 | 0.85 | 1.01 | 0.99 | 1.00 | 1.04 | 1.08 | 1.13 | 1.18 | 1.20 | 1.23 | 1.24 | 1.27 | 1.29 | 1.29 | 1.29 | 1.27 |
| 125 | 2.22 | 1.41 | 1.04 | 0.92 | 0.95 | 0.95 | 0.99 | 1.06 | 1.13 | 1.20 | 1.26 | 1.29 | 1.32 | 1.34 | 1.37 | 1.39 | 1.41 | 1.39 | 1.37 |
| 130 | 1.59 | 1.25 | 1.07 | 0.99 | 0.98 | 1.00 | 1.05 | 1.11 | 1.17 | 1.23 | 1.30 | 1.36 | 1.42 | 1.47 | 1.51 | 1.53 | 1.54 | 1.53 | 1.51 |
| 135 | 1.18 | 1.23 | 1.18 | 1.10 | 1.03 | 1.05 | 1.10 | 1.16 | 1.23 | 1.29 | 1.36 | 1.42 | 1.47 | 1.51 | 1.54 | 1.56 | 1.57 | 1.56 | 1.54 |
| 140 | 1.04 | 1.14 | 1.15 | 1.13 | 1.11 | 1.14 | 1.18 | 1.23 | 1.27 | 1.31 | 1.36 | 1.42 | 1.47 | 1.52 | 1.55 | 1.58 | 1.59 | 1.58 | 1.55 |
| 145 | 1.03 | 1.15 | 1.18 | 1.19 | 1.18 | 1.21 | 1.25 | 1.29 | 1.34 | 1.39 | 1.44 | 1.48 | 1.51 | 1.54 | 1.56 | 1.58 | 1.59 | 1.58 | 1.56 |
| 150 | 1.08 | 1.20 | 1.25 | 1.26 | 1.26 | 1.29 | 1.32 | 1.36 | 1.39 | 1.41 | 1.44 | 1.46 | 1.48 | 1.50 | 1.52 | 1.53 | 1.54 | 1.53 | 1.52 |
| 155 | 1.20 | 1.36 | 1.41 | 1.42 | 1.40 | 1.38 | 1.36 | 1.34 | 1.36 | 1.39 | 1.42 | 1.44 | 1.46 | 1.47 | 1.46 | 1.45 | 1.44 | 1.45 | 1.46 |
| 160 | 1.34 | 1.50 | 1.56 | 1.56 | 1.52 | 1.50 | 1.46 | 1.43 | 1.42 | 1.41 | 1.40 | 1.37 | 1.34 | 1.31 | 1.33 | 1.35 | 1.37 | 1.35 | 1.33 |
| 165 | 1.41 | 1.56 | 1.60 | 1.57 | 1.51 | 1.49 | 1.47 | 1.44 | 1.42 | 1.40 | 1.36 | 1.29 | 1.22 | 1.17 | 1.17 | 1.20 | 1.22 | 1.20 | 1.17 |
| 170 | 1.33 | 1.44 | 1.47 | 1.44 | 1.38 | 1.32 | 1.26 | 1.20 | 1.18 | 1.16 | 1.15 | 1.10 | 1.05 | 1.02 | 1.02 | 1.03 | 1.05 | 1.03 | 1.02 |
| 175 | 1.24 | 1.31 | 1.33 | 1.31 | 1.26 | 1.20 | 1.13 | 1.07 | 1.03 | 1.01 | 0.99 | 0.96 | 0.93 | 0.92 | 0.93 | 0.96 | 0.99 | 0.96 | 0.93 |
| 180 | 1.04 | 1.03 | 1.03 | 1.03 | 1.02 | 1.01 | 0.99 | 0.97 | 0.95 | 0.93 | 0.91 | 0.89 | 0.88 | 0.87 | 0.88 | 0.89 | 0.91 | 0.89 | 0.88 |

| | | | | | | | | | | | | | | | | UNIT: °C | | | |
|-----|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|--|--|--|
| y | C (DEG) | | | | | | | | | | | | | | | | | | |
| | 285 | 290 | 295 | 300 | 305 | 310 | 315 | 320 | 325 | 330 | 335 | 340 | 345 | 350 | 355 | | | | |
| 0 | 1129 | 1128 | 1128 | 1128 | 1128 | 1128 | 1128 | 1128 | 1127 | 1127 | 1126 | 1125 | 1124 | 1124 | 1124 | | | | |
| 5 | 1058 | 1065 | 1076 | 1087 | 1092 | 1096 | 1101 | 1115 | 1128 | 1137 | 1132 | 1122 | 1110 | 1098 | 1085 | | | | |
| 10 | 921 | 929 | 940 | 951 | 952 | 953 | 957 | 976 | 999 | 1022 | 1038 | 1049 | 1057 | 1059 | 1056 | | | | |
| 15 | 695 | 720 | 751 | 787 | 836 | 883 | 923 | 927 | 926 | 929 | 970 | 1015 | 1053 | 1062 | 1054 | | | | |
| 20 | 423 | 439 | 460 | 489 | 540 | 600 | 667 | 745 | 818 | 880 | 903 | 914 | 918 | 933 | 948 | | | | |
| 25 | 265 | 267 | 277 | 297 | 339 | 396 | 465 | 556 | 651 | 742 | 816 | 876 | 919 | 938 | 937 | | | | |
| 30 | 194 | 205 | 218 | 233 | 242 | 259 | 291 | 355 | 437 | 532 | 650 | 763 | 858 | 901 | 910 | | | | |
| 35 | 97.5 | 110 | 126 | 146 | 168 | 194 | 226 | 254 | 297 | 363 | 504 | 650 | 778 | 829 | 837 | | | | |
| 40 | 51.5 | 54.4 | 61.1 | 73.1 | 95.8 | 124 | 155 | 171 | 200 | 257 | 405 | 565 | 707 | 766 | 779 | | | | |
| 45 | 38.4 | 37.6 | 38.7 | 43.0 | 52.8 | 68.3 | 90.7 | 115 | 153 | 210 | 320 | 439 | 549 | 611 | 647 | | | | |
| 50 | 23.6 | 23.5 | 24.6 | 27.4 | 30.4 | 38.0 | 52.8 | 78.6 | 115 | 163 | 232 | 309 | 388 | 457 | 523 | | | | |
| 55 | 13.3 | 13.2 | 13.8 | 15.6 | 17.4 | 22.6 | 33.0 | 52.7 | 79.3 | 113 | 149 | 195 | 254 | 332 | 426 | | | | |
| 60 | 1.29 | 2.09 | 3.53 | 5.84 | 8.06 | 12.5 | 20.2 | 34.7 | 52.8 | 74.1 | 89.1 | 112 | 150 | 215 | 301 | | | | |
| 65 | 0.76 | 0.31 | 0.14 | 0.59 | 1.65 | 4.23 | 8.91 | 16.8 | 27.6 | 41.4 | 50.8 | 69.5 | 103 | 166 | 250 | | | | |
| 70 | 0.81 | 0.61 | 0.51 | 0.63 | 0.47 | 1.26 | 3.58 | 8.24 | 15.5 | 25.7 | 34.4 | 50.8 | 78.8 | 128 | 194 | | | | |
| 75 | 0.83 | 0.70 | 0.63 | 0.67 | 0.53 | 0.96 | 2.30 | 4.94 | 9.21 | 15.5 | 21.0 | 31.4 | 49.5 | 81.3 | 123 | | | | |
| 80 | 0.79 | 0.72 | 0.69 | 0.72 | 0.66 | 0.89 | 1.62 | 3.06 | 5.34 | 8.62 | 11.1 | 16.4 | 26.0 | 44.0 | 67.9 | | | | |
| 85 | 0.76 | 0.73 | 0.71 | 0.72 | 0.69 | 0.81 | 1.20 | 2.05 | 3.30 | 5.02 | 6.81 | 9.48 | 13.4 | 19.4 | 26.9 | | | | |
| 90 | 0.82 | 0.81 | 0.81 | 0.82 | 0.79 | 0.86 | 1.09 | 1.68 | 2.48 | 3.45 | 4.46 | 5.66 | 7.08 | 8.82 | 10.8 | | | | |
| 95 | 0.92 | 0.91 | 0.92 | 0.95 | 0.93 | 0.98 | 1.14 | 1.56 | 2.11 | 2.75 | 3.34 | 4.06 | 4.98 | 6.25 | 7.78 | | | | |
| 100 | 1.09 | 1.08 | 1.08 | 1.09 | 1.07 | 1.09 | 1.19 | 1.46 | 1.82 | 2.28 | 2.70 | 3.28 | 4.11 | 5.37 | 6.96 | | | | |
| 105 | 1.19 | 1.17 | 1.16 | 1.15 | 1.16 | 1.16 | 1.16 | 1.11 | 1.06 | 1.01 | 0.95 | 0.92 | 0.94 | 1.07 | 1.27 | | | | |
| 110 | 1.22 | 1.21 | 1.20 | 1.18 | 1.13 | 1.09 | 1.09 | 1.22 | 1.38 | 1.51 | 1.19 | 1.09 | 1.48 | 3.00 | 5.29 | | | | |
| 115 | 1.21 | 1.19 | 1.18 | 1.16 | 1.11 | 1.07 | 1.05 | 1.08 | 1.13 | 1.20 | 0.96 | 0.94 | 1.36 | 2.74 | 4.78 | | | | |
| 120 | 1.24 | 1.23 | 1.20 | 1.18 | 1.13 | 1.08 | 1.04 | 1.00 | 0.99 | 1.01 | 0.85 | 0.91 | 1.35 | 2.57 | 4.33 | | | | |
| 125 | 1.34 | 1.32 | 1.29 | 1.26 | 1.20 | 1.13 | 1.06 | 0.99 | 0.95 | 0.95 | 0.92 | 1.04 | 1.41 | 2.22 | 3.36 | | | | |
| 130 | 1.47 | 1.42 | 1.36 | 1.30 | 1.23 | 1.17 | 1.11 | 1.05 | 1.00 | 0.98 | 0.99 | 1.07 | 1.25 | 1.59 | 2.05 | | | | |
| 135 | 1.51 | 1.47 | 1.42 | 1.36 | 1.29 | 1.23 | 1.16 | 1.10 | 1.05 | 1.03 | 1.10 | 1.18 | 1.23 | 1.18 | 1.06 | | | | |
| 140 | 1.52 | 1.47 | 1.42 | 1.36 | 1.31 | 1.27 | 1.23 | 1.18 | 1.14 | 1.11 | 1.13 | 1.15 | 1.14 | 1.04 | 0.90 | | | | |
| 145 | 1.54 | 1.51 | 1.48 | 1.44 | 1.39 | 1.34 | 1.29 | 1.25 | 1.21 | 1.18 | 1.19 | 1.18 | 1.15 | 1.03 | 0.87 | | | | |
| 150 | 1.50 | 1.48 | 1.46 | 1.44 | 1.41 | 1.39 | 1.36 | 1.32 | 1.29 | 1.26 | 1.26 | 1.25 | 1.20 | 1.08 | 0.89 | | | | |
| 155 | 1.47 | 1.46 | 1.44 | 1.42 | 1.39 | 1.36 | 1.34 | 1.36 | 1.38 | 1.40 | 1.42 | 1.41 | 1.36 | 1.20 | 0.98 | | | | |
| 160 | 1.31 | 1.34 | 1.37 | 1.40 | 1.41 | 1.42 | 1.43 | 1.46 | 1.50 | 1.52 | 1.56 | 1.56 | 1.50 | 1.34 | 1.09 | | | | |
| 165 | 1.17 | 1.22 | 1.29 | 1.36 | 1.40 | 1.42 | 1.44 | 1.47 | 1.49 | 1.51 | 1.57 | 1.60 | 1.56 | 1.41 | 1.16 | | | | |
| 170 | 1.02 | 1.05 | 1.10 | 1.15 | 1.16 | 1.18 | 1.20 | 1.26 | 1.32 | 1.38 | 1.44 | 1.47 | 1.44 | 1.33 | 1.16 | | | | |
| 175 | 0.92 | 0.93 | 0.96 | 0.99 | 1.01 | 1.03 | 1.07 | 1.13 | 1.20 | 1.26 | 1.31 | 1.33 | 1.31 | 1.24 | 1.13 | | | | |
| 180 | 0.87 | 0.88 | 0.89 | 0.91 | 0.93 | 0.95 | 0.97 | 0.99 | 1.01 | 1.02 | 1.03 | 1.03 | 1.03 | 1.04 | 1.04 | | | | |

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

| | | | |
|-------------------------|--------------------|-----------------------|--------------|
| Model No. | WPX1 @ 20W / 5000K | Sample ID | 231101002-S1 |
| Temperature (°C) | 25.4 | Humidity (%RH) | 41.0 |

| |
|---|
| Test Method |
| <p>The samples were tested according to the ANSI C82.77:2014</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^{\circ}\text{C}$. 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 | 0.216 | 25.8 | 0.996 | 2.98 |
| 277.0 | 60 | 0.106 | 26.6 | 0.909 | 11.77 |

5.0 Equipment List:

| Equipment ID | Equipment Name | Last Cal. | Due Cal. |
|--------------|------------------------------|------------|------------|
| NTC-F01-001 | Goniophotometer System | 2022-11-09 | 2023-11-08 |
| NTC-F01-006 | 2.0 meter Integrating Sphere | 2022-11-09 | 2023-11-08 |
| NTC-F01-012 | Standard Lamp | 2022-11-09 | 2023-11-08 |
| NTC-F01-013 | Standard Lamp | 2022-11-09 | 2023-11-08 |
| NTC-F01-031 | Digital Power Meter | 2023-08-25 | 2024-08-24 |
| NTC-F01-019 | Temperature & Humidity Meter | 2022-11-12 | 2023-11-11 |

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