

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P#

Luminaire Tested: **FLDSQ4C15D010 FEU4C159027 F4LC-DFSSQ-MW**

Issue Date: 12/13/2022

Tested By:

Approved By:



Cooper Lighting Solutions laboratories have been accredited by National Voluntary Laboratory Accreditation Program (NVLAP) that it adheres to the requirements of ISO/IEC 17025:2005 and appropriate IESNA test methods. This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government. Results contained in this report are valid for luminaire sample tested, as supplied by requestor. Information related to the luminaire tested has been supplied by requestor and can affect the validity of the test results. Report shall not be reproduced except in full without approval of Cooper Lighting Solutions Lighting Laboratory. Test performed at address noted above.



Test Information

Test Method: LM-79-08
 Report Number: P#
 Test Lab: INNOVATION CENTER
 Issue Date: 12/13/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: FAIL-SAFE
 Catalog Number: FLDSQ4C15D010 FEU4C159027 F4LC-DFSSQ-MW
 Description: 4 INCH 1500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 2700K, 90CRI LEDS AND F4LC-DFSSQ TRIM WITH MW FINISH
 Light Source: -
 Ballast/Driver: -

Summary

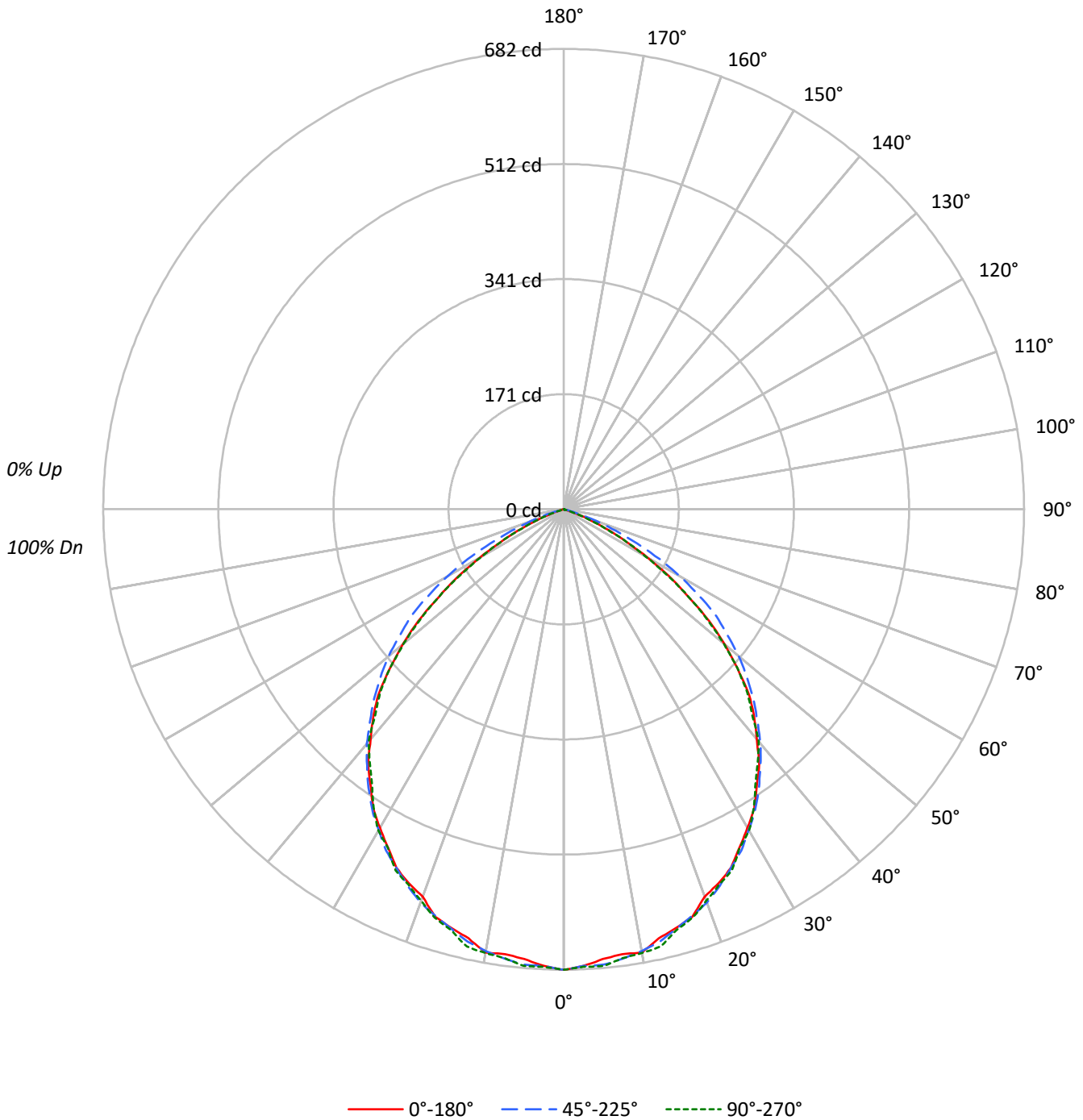
Lumens per Lamp: N/A
 Luminaire Lumens: 1457.0 lumens
 Efficiency: N/A
 Efficacy: 92.2 lumens/watt
 Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.29
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
 CIE Type: Direct

Input Watts (W): 15.8
 Input Voltage (V):
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | GONIO 1 IN0055 | 4/22/2021 | 10/22/2021 |
| Power Meter | XITRON 2801 IN0197 | 12/1/2020 | 12/1/2021 |
| AC Power Source | CHROMA 61505 IN0196 | 12/1/2020 | 12/1/2021 |
| DC Power Supply | AGILENT E3634A IN0198 | 11/30/2020 | 11/30/2021 |
| Room Thermometer | ONSET IN0143 | 12/1/2020 | 12/1/2021 |

TEST NUMBER: P#
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Luminous Intensity Polar Plot



TEST NUMBER: P#

CATALOG NUMBER: FLDSQ4C15D010 FEU4C159027 F4LC-DFSSQ-MW

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|-----|-----|-----|-----|
| RF | 20 | | | | 20 | | | | 20 | | | | 20 | | | | 20 | | | |
| RC | 80 | | | | 70 | | | | 50 | | | | 30 | | | | 10 | 0 | | |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | | 50 | 30 | 10 | | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | | 106 | 106 | 106 | | 102 | 102 | 102 | 100 |
| 1 | 111 | 108 | 104 | 101 | 109 | 105 | 102 | 100 | 101 | 99 | 96 | | 97 | 95 | 94 | | 94 | 92 | 91 | 89 |
| 2 | 103 | 96 | 91 | 86 | 100 | 94 | 89 | 85 | 91 | 87 | 83 | | 88 | 84 | 81 | | 85 | 82 | 79 | 77 |
| 3 | 95 | 86 | 79 | 74 | 93 | 85 | 78 | 73 | 82 | 76 | 72 | | 79 | 74 | 71 | | 77 | 73 | 69 | 67 |
| 4 | 88 | 77 | 70 | 64 | 86 | 76 | 69 | 63 | 74 | 67 | 63 | | 71 | 66 | 62 | | 69 | 65 | 61 | 59 |
| 5 | 81 | 70 | 62 | 56 | 79 | 69 | 61 | 56 | 67 | 60 | 55 | | 65 | 59 | 54 | | 63 | 58 | 54 | 52 |
| 6 | 75 | 63 | 55 | 49 | 73 | 62 | 55 | 49 | 61 | 54 | 49 | | 59 | 53 | 48 | | 57 | 52 | 48 | 46 |
| 7 | 70 | 58 | 50 | 44 | 68 | 57 | 49 | 44 | 55 | 49 | 44 | | 54 | 48 | 43 | | 53 | 47 | 43 | 41 |
| 8 | 65 | 53 | 45 | 40 | 64 | 52 | 45 | 39 | 51 | 44 | 39 | | 50 | 44 | 39 | | 49 | 43 | 39 | 37 |
| 9 | 61 | 49 | 41 | 36 | 60 | 48 | 41 | 36 | 47 | 40 | 36 | | 46 | 40 | 35 | | 45 | 39 | 35 | 33 |
| 10 | 57 | 45 | 38 | 33 | 56 | 44 | 37 | 33 | 44 | 37 | 32 | | 43 | 37 | 32 | | 42 | 36 | 32 | 31 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|-------|-------|-------|
| 0° | 65815 | 65815 | 65815 |
| 5° | 64749 | 65592 | 65776 |
| 10° | 65312 | 65116 | 65400 |
| 15° | 64161 | 64261 | 64451 |
| 20° | 62677 | 63662 | 63375 |
| 25° | 62398 | 62398 | 62814 |
| 30° | 60666 | 61089 | 61201 |
| 35° | 58766 | 59343 | 58318 |
| 40° | 56013 | 57109 | 56618 |
| 45° | 53013 | 54200 | 52481 |
| 50° | 46684 | 50752 | 46399 |
| 55° | 37817 | 46446 | 37968 |
| 60° | 27673 | 38518 | 27113 |
| 65° | 16804 | 27420 | 16370 |
| 70° | 6545 | 14755 | 6291 |
| 75° | 708 | 3989 | 708 |
| 80° | 556 | 556 | 556 |
| 85° | 0 | 0 | 0 |

TEST NUMBER: P#
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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 64.4 | 4.4 |
| 10°-20° | 182.2 | 12.5 |
| 20°-30° | 270.3 | 18.6 |
| 30°-40° | 313.2 | 21.5 |
| 40°-50° | 300.3 | 20.6 |
| 50°-60° | 220.8 | 15.2 |
| 60°-70° | 95.4 | 6.5 |
| 70°-80° | 10.3 | 0.7 |
| 80°-90° | 0.1 | 0.0 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-30° | 516.9 | 35.5 |
| 0°-40° | 830.1 | 57.0 |
| 0°-60° | 1351.2 | 92.7 |
| 0°-90° | 1457.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 1457.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0° | 682 | 682 | 682 | 682 | 682 | |
| 5° | 668 | 675 | 677 | 678 | 679 | 64 |
| 15° | 642 | 646 | 643 | 644 | 645 | 181 |
| 25° | 586 | 585 | 586 | 587 | 590 | 268 |
| 35° | 499 | 502 | 504 | 503 | 495 | 312 |
| 45° | 388 | 390 | 397 | 391 | 385 | 295 |
| 55° | 225 | 248 | 276 | 247 | 226 | 202 |
| 65° | 74 | 92 | 120 | 91 | 72 | 76 |
| 75° | 2 | 3 | 11 | 2 | 2 | 6 |
| 85° | 0 | 0 | 0 | 0 | 0 | 0 |
| 90° | 0 | 0 | 0 | 0 | 0 | |

TEST NUMBER: P#
 CATALOG NUMBER: FLDSQ4C15D010 FEU4C159027 F4LC-DFSSQ-MW

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 22.5° | 25° | 30° | 35° | 40° | 45° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 |
| 2.5° | 677.2 | 685.0 | 685.9 | 681.1 | 679.1 | 676.3 | 683.0 | 678.2 | 680.1 | 678.2 | 677.2 |
| 5° | 668.5 | 677.2 | 678.2 | 678.2 | 676.3 | 675.3 | 678.2 | 677.2 | 676.3 | 674.3 | 677.2 |
| 7.5° | 664.6 | 669.5 | 674.3 | 668.5 | 671.4 | 670.4 | 677.2 | 674.3 | 673.3 | 673.3 | 671.4 |
| 10° | 666.6 | 665.6 | 669.5 | 663.6 | 665.6 | 663.6 | 669.5 | 669.5 | 667.5 | 665.6 | 664.6 |
| 12.5° | 651.0 | 658.8 | 658.8 | 657.8 | 655.9 | 653.0 | 658.8 | 662.7 | 656.8 | 656.8 | 655.9 |
| 15° | 642.3 | 644.3 | 645.2 | 645.2 | 644.3 | 646.2 | 649.1 | 645.2 | 646.2 | 641.4 | 643.3 |
| 17.5° | 632.7 | 628.8 | 631.7 | 629.7 | 630.7 | 632.7 | 636.5 | 636.5 | 630.7 | 629.7 | 631.7 |
| 20° | 610.4 | 622.0 | 623.0 | 617.2 | 618.1 | 618.1 | 624.9 | 619.1 | 623.0 | 618.1 | 620.0 |
| 22.5° | 599.7 | 607.4 | 608.4 | 600.7 | 605.5 | 599.7 | 606.5 | 597.8 | 607.4 | 600.7 | 603.6 |
| 25° | 586.1 | 585.2 | 588.1 | 584.2 | 585.2 | 585.2 | 590.0 | 586.1 | 589.1 | 585.2 | 586.1 |
| 27.5° | 563.9 | 571.6 | 570.6 | 566.8 | 568.7 | 567.7 | 577.4 | 566.8 | 572.6 | 567.7 | 569.7 |
| 30° | 544.5 | 551.3 | 549.3 | 545.5 | 545.5 | 542.5 | 553.2 | 550.3 | 549.3 | 549.3 | 548.3 |
| 32.5° | 525.1 | 526.1 | 524.1 | 525.1 | 526.1 | 522.2 | 530.9 | 527.0 | 526.1 | 527.0 | 528.0 |
| 35° | 498.9 | 498.9 | 500.9 | 498.0 | 501.9 | 501.9 | 509.6 | 504.7 | 503.8 | 500.9 | 503.8 |
| 37.5° | 475.7 | 472.8 | 473.8 | 473.8 | 475.7 | 477.6 | 481.5 | 479.6 | 479.6 | 476.7 | 478.6 |
| 40° | 444.7 | 442.8 | 445.6 | 445.6 | 448.6 | 448.6 | 452.4 | 450.5 | 453.4 | 453.4 | 453.4 |
| 42.5° | 417.6 | 417.6 | 415.6 | 418.5 | 419.5 | 418.5 | 425.3 | 424.3 | 425.3 | 423.4 | 424.3 |
| 45° | 388.5 | 388.5 | 386.6 | 385.6 | 390.4 | 389.5 | 397.2 | 394.3 | 398.2 | 396.2 | 397.2 |
| 47.5° | 348.8 | 353.6 | 350.7 | 353.6 | 359.4 | 360.4 | 365.2 | 363.3 | 367.2 | 364.3 | 368.2 |
| 50° | 311.0 | 311.0 | 313.9 | 317.8 | 323.6 | 324.6 | 330.4 | 334.3 | 336.2 | 337.1 | 338.1 |
| 52.5° | 271.3 | 270.3 | 273.2 | 278.0 | 282.9 | 286.8 | 292.6 | 298.4 | 302.3 | 308.1 | 305.2 |
| 55° | 224.8 | 226.7 | 229.6 | 235.4 | 243.2 | 248.0 | 252.9 | 260.6 | 267.4 | 270.3 | 276.1 |
| 57.5° | 185.0 | 183.1 | 185.0 | 192.8 | 201.5 | 205.4 | 212.2 | 219.9 | 229.6 | 235.4 | 237.4 |
| 60° | 143.4 | 144.4 | 146.3 | 153.1 | 159.9 | 165.7 | 168.6 | 181.2 | 189.9 | 195.7 | 199.6 |
| 62.5° | 105.6 | 107.6 | 109.5 | 115.3 | 122.1 | 126.9 | 131.7 | 142.4 | 150.2 | 156.0 | 159.9 |
| 65° | 73.6 | 74.6 | 77.5 | 80.4 | 87.2 | 92.0 | 95.9 | 104.6 | 112.4 | 117.2 | 120.1 |
| 67.5° | 45.5 | 46.5 | 48.4 | 52.3 | 57.2 | 61.0 | 64.9 | 70.7 | 77.5 | 82.3 | 83.3 |
| 70° | 23.2 | 24.2 | 25.2 | 28.1 | 32.0 | 33.9 | 36.8 | 41.7 | 46.5 | 50.4 | 52.3 |
| 72.5° | 7.7 | 7.7 | 8.7 | 10.7 | 12.6 | 14.5 | 15.5 | 20.4 | 24.2 | 26.2 | 27.1 |
| 75° | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.9 | 2.9 | 5.8 | 7.7 | 9.7 | 10.7 |
| 77.5° | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.9 | 1.9 |
| 80° | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

TEST NUMBER: P#
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CANDELA DISTRIBUTION (continued):

| | 50° | 55° | 60° | 65° | 67.5° | 70° | 75° | 80° | 85° | 90° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 |
| 2.5° | 682.1 | 680.1 | 679.1 | 680.1 | 680.1 | 679.1 | 682.1 | 685.9 | 690.8 | 678.2 |
| 5° | 681.1 | 679.1 | 681.1 | 675.3 | 678.2 | 676.3 | 680.1 | 679.1 | 683.0 | 679.1 |
| 7.5° | 678.2 | 674.3 | 675.3 | 672.4 | 676.3 | 671.4 | 674.3 | 680.1 | 676.3 | 670.4 |
| 10° | 668.5 | 666.6 | 673.3 | 663.6 | 661.7 | 665.6 | 673.3 | 667.5 | 665.6 | 667.5 |
| 12.5° | 658.8 | 658.8 | 661.7 | 654.0 | 654.9 | 656.8 | 660.7 | 656.8 | 658.8 | 663.6 |
| 15° | 648.2 | 646.2 | 651.0 | 645.2 | 644.3 | 642.3 | 646.2 | 646.2 | 648.2 | 645.2 |
| 17.5° | 635.5 | 632.7 | 632.7 | 630.7 | 629.7 | 634.6 | 636.5 | 637.5 | 638.5 | 634.6 |
| 20° | 620.0 | 619.1 | 622.0 | 619.1 | 620.0 | 621.0 | 621.0 | 619.1 | 627.8 | 617.2 |
| 22.5° | 603.6 | 606.5 | 602.6 | 600.7 | 602.6 | 604.6 | 604.6 | 605.5 | 603.6 | 601.6 |
| 25° | 587.1 | 589.1 | 590.0 | 584.2 | 587.1 | 584.2 | 591.0 | 591.9 | 588.1 | 590.0 |
| 27.5° | 572.6 | 569.7 | 568.7 | 564.8 | 566.8 | 565.8 | 566.8 | 566.8 | 572.6 | 564.8 |
| 30° | 550.3 | 547.4 | 548.3 | 545.5 | 546.4 | 545.5 | 546.4 | 546.4 | 550.3 | 549.3 |
| 32.5° | 529.0 | 526.1 | 527.0 | 524.1 | 524.1 | 525.1 | 523.2 | 523.2 | 526.1 | 524.1 |
| 35° | 508.6 | 501.9 | 502.8 | 501.9 | 502.8 | 498.9 | 498.9 | 498.0 | 499.9 | 495.1 |
| 37.5° | 479.6 | 476.7 | 475.7 | 474.7 | 475.7 | 473.8 | 475.7 | 472.8 | 475.7 | 471.8 |
| 40° | 453.4 | 451.5 | 452.4 | 446.6 | 446.6 | 447.6 | 445.6 | 444.7 | 445.6 | 449.5 |
| 42.5° | 427.3 | 423.4 | 421.5 | 419.5 | 420.5 | 417.6 | 416.6 | 414.7 | 416.6 | 412.7 |
| 45° | 396.2 | 396.2 | 395.3 | 390.4 | 391.4 | 391.4 | 387.5 | 383.7 | 384.6 | 384.6 |
| 47.5° | 368.2 | 366.2 | 365.2 | 360.4 | 359.4 | 358.5 | 354.6 | 351.7 | 351.7 | 348.8 |
| 50° | 337.1 | 335.2 | 332.3 | 327.5 | 325.5 | 319.7 | 316.8 | 312.9 | 309.1 | 309.1 |
| 52.5° | 308.1 | 301.3 | 297.4 | 289.7 | 286.8 | 283.9 | 276.1 | 273.2 | 270.3 | 267.4 |
| 55° | 273.2 | 267.4 | 259.7 | 250.9 | 247.1 | 242.2 | 234.4 | 228.6 | 224.8 | 225.7 |
| 57.5° | 239.3 | 229.6 | 221.9 | 210.3 | 205.4 | 202.5 | 194.7 | 187.0 | 183.1 | 183.1 |
| 60° | 197.6 | 189.9 | 180.2 | 169.5 | 165.7 | 160.8 | 151.1 | 146.3 | 143.4 | 140.5 |
| 62.5° | 157.9 | 152.1 | 143.4 | 129.8 | 126.9 | 122.1 | 115.3 | 109.5 | 106.6 | 106.6 |
| 65° | 118.2 | 112.4 | 104.6 | 94.9 | 91.1 | 87.2 | 81.4 | 75.6 | 72.7 | 71.7 |
| 67.5° | 83.3 | 76.5 | 69.8 | 62.0 | 59.1 | 57.2 | 51.3 | 47.5 | 45.5 | 44.5 |
| 70° | 50.4 | 46.5 | 41.7 | 35.9 | 32.9 | 31.0 | 27.1 | 24.2 | 23.2 | 22.3 |
| 72.5° | 26.2 | 23.2 | 19.4 | 15.5 | 13.6 | 11.6 | 9.7 | 7.7 | 6.8 | 6.8 |
| 75° | 9.7 | 7.7 | 4.9 | 2.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| 77.5° | 1.9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 80° | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

(END OF REPORT)