

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: **FLDSQ4C100D010 FEU4C1009030 F4LC-CSSQ-MMS**

Issue Date: 12/13/2022

Tested By:

Approved By:



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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: FLDSQ4C100D010 FEU4C1009030 F4LC-CSSQ-MMS
 Description: 4 INCH 10000 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 3000K, 90CRI LEDS AND F4LC-CSSQ TRIM WITH MMS FINISH
 Light Source: -
 Ballast/Driver: -

Summary

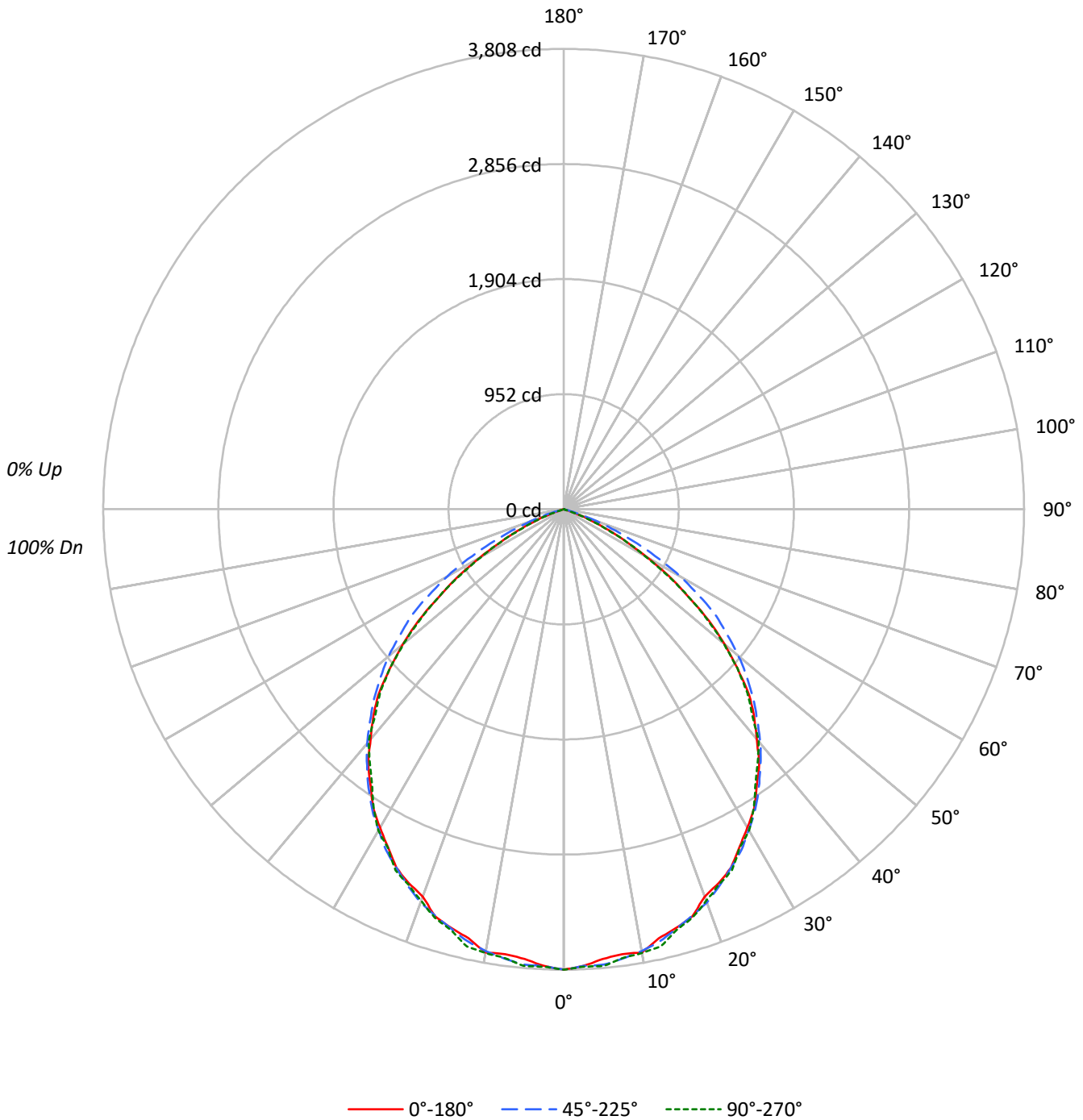
Lumens per Lamp: N/A
 Luminaire Lumens: 8134.0 lumens
 Efficiency: N/A
 Efficacy: 71.1 lumens/watt
 Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.29
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
 CIE Type: Direct

Input Watts (W): 114.4
 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: FLDSQ4C100D010 FEU4C1009030 F4LC-CSSQ-MMS

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° | 367410 | 367410 | 367410 |
| 5° | 361482 | 366179 | 367235 |
| 10° | 364603 | 363545 | 365123 |
| 15° | 358215 | 358744 | 359823 |
| 20° | 349887 | 355431 | 353778 |
| 25° | 348371 | 348371 | 350670 |
| 30° | 338659 | 341066 | 341679 |
| 35° | 328096 | 331288 | 325551 |
| 40° | 312702 | 318823 | 316090 |
| 45° | 295946 | 302605 | 292998 |
| 50° | 260636 | 283363 | 259015 |
| 55° | 211087 | 259299 | 212012 |
| 60° | 154459 | 215016 | 151352 |
| 65° | 93859 | 153106 | 91393 |
| 70° | 36618 | 82434 | 35123 |
| 75° | 4026 | 22219 | 4026 |
| 80° | 3056 | 3056 | 3056 |
| 85° | 0 | 0 | 0 |

TEST NUMBER: P#
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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 359.4 | 4.4 |
| 10°-20° | 1017.1 | 12.5 |
| 20°-30° | 1509.1 | 18.6 |
| 30°-40° | 1748.6 | 21.5 |
| 40°-50° | 1676.5 | 20.6 |
| 50°-60° | 1232.7 | 15.2 |
| 60°-70° | 532.4 | 6.5 |
| 70°-80° | 57.5 | 0.7 |
| 80°-90° | 0.7 | 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° | 2885.6 | 35.5 |
| 0°-40° | 4634.2 | 57.0 |
| 0°-60° | 7543.4 | 92.7 |
| 0°-90° | 8134.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 8134.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|------|-------|------|-------|------|------|
| 0° | 3808 | 3808 | 3808 | 3808 | 3808 | |
| 5° | 3732 | 3770 | 3781 | 3786 | 3792 | 356 |
| 15° | 3586 | 3608 | 3591 | 3597 | 3602 | 1011 |
| 25° | 3272 | 3267 | 3272 | 3278 | 3294 | 1498 |
| 35° | 2785 | 2802 | 2812 | 2807 | 2764 | 1742 |
| 45° | 2169 | 2174 | 2218 | 2185 | 2147 | 1649 |
| 55° | 1255 | 1384 | 1541 | 1379 | 1260 | 1129 |
| 65° | 411 | 514 | 671 | 508 | 400 | 423 |
| 75° | 11 | 16 | 60 | 11 | 11 | 33 |
| 85° | 0 | 0 | 0 | 0 | 0 | 1 |
| 90° | 0 | 0 | 0 | 0 | 0 | |

TEST NUMBER: P#
 CATALOG NUMBER: FLDSQ4C100D010 FEU4C1009030 F4LC-CSSQ-MMS

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 22.5° | 25° | 30° | 35° | 40° | 45° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 |
| 2.5° | 3780.6 | 3823.9 | 3829.4 | 3802.3 | 3791.5 | 3775.3 | 3813.1 | 3786.2 | 3797.0 | 3786.2 | 3780.6 |
| 5° | 3732.1 | 3780.6 | 3786.2 | 3786.2 | 3775.3 | 3769.8 | 3786.2 | 3780.6 | 3775.3 | 3764.5 | 3780.6 |
| 7.5° | 3710.5 | 3737.4 | 3764.5 | 3732.1 | 3748.2 | 3742.9 | 3780.6 | 3764.5 | 3759.0 | 3759.0 | 3748.2 |
| 10° | 3721.3 | 3715.8 | 3737.4 | 3704.9 | 3715.8 | 3704.9 | 3737.4 | 3737.4 | 3726.6 | 3715.8 | 3710.5 |
| 12.5° | 3634.6 | 3677.8 | 3677.8 | 3672.5 | 3661.7 | 3645.4 | 3677.8 | 3699.6 | 3667.0 | 3667.0 | 3661.7 |
| 15° | 3586.0 | 3596.8 | 3602.1 | 3602.1 | 3596.8 | 3607.6 | 3623.7 | 3602.1 | 3607.6 | 3580.5 | 3591.3 |
| 17.5° | 3531.9 | 3510.3 | 3526.4 | 3515.6 | 3521.1 | 3531.9 | 3553.6 | 3553.6 | 3521.1 | 3515.6 | 3526.4 |
| 20° | 3407.5 | 3472.4 | 3477.9 | 3445.4 | 3450.7 | 3450.7 | 3488.7 | 3456.2 | 3477.9 | 3450.7 | 3461.5 |
| 22.5° | 3347.9 | 3391.1 | 3396.7 | 3353.4 | 3380.3 | 3347.9 | 3385.8 | 3337.1 | 3391.1 | 3353.4 | 3369.5 |
| 25° | 3272.2 | 3266.9 | 3283.0 | 3261.4 | 3266.9 | 3266.9 | 3293.8 | 3272.2 | 3288.5 | 3266.9 | 3272.2 |
| 27.5° | 3148.0 | 3191.2 | 3185.7 | 3164.1 | 3174.9 | 3169.6 | 3223.6 | 3164.1 | 3196.5 | 3169.6 | 3180.4 |
| 30° | 3039.6 | 3077.6 | 3066.7 | 3045.1 | 3045.1 | 3028.8 | 3088.4 | 3072.0 | 3066.7 | 3066.7 | 3061.2 |
| 32.5° | 2931.5 | 2937.0 | 2926.2 | 2931.5 | 2937.0 | 2915.4 | 2963.9 | 2942.3 | 2937.0 | 2942.3 | 2947.8 |
| 35° | 2785.4 | 2785.4 | 2796.2 | 2780.1 | 2801.7 | 2801.7 | 2845.0 | 2817.8 | 2812.5 | 2796.2 | 2812.5 |
| 37.5° | 2655.6 | 2639.5 | 2644.8 | 2644.8 | 2655.6 | 2666.4 | 2688.1 | 2677.3 | 2677.3 | 2661.1 | 2672.0 |
| 40° | 2482.6 | 2471.8 | 2487.9 | 2487.9 | 2504.2 | 2504.2 | 2525.9 | 2515.1 | 2531.2 | 2531.2 | 2531.2 |
| 42.5° | 2331.2 | 2331.2 | 2320.4 | 2336.5 | 2342.0 | 2336.5 | 2374.5 | 2369.0 | 2374.5 | 2363.7 | 2369.0 |
| 45° | 2168.8 | 2168.8 | 2158.0 | 2152.7 | 2179.6 | 2174.3 | 2217.6 | 2201.3 | 2222.9 | 2212.1 | 2217.6 |
| 47.5° | 1947.0 | 1974.2 | 1957.8 | 1974.2 | 2006.6 | 2012.1 | 2039.1 | 2028.2 | 2049.9 | 2033.8 | 2055.4 |
| 50° | 1736.3 | 1736.3 | 1752.4 | 1774.0 | 1806.5 | 1812.0 | 1844.4 | 1866.0 | 1876.9 | 1882.2 | 1887.7 |
| 52.5° | 1514.5 | 1509.0 | 1525.3 | 1552.2 | 1579.4 | 1601.0 | 1633.4 | 1665.9 | 1687.5 | 1720.0 | 1703.6 |
| 55° | 1254.8 | 1265.6 | 1281.9 | 1314.3 | 1357.6 | 1384.5 | 1411.7 | 1454.9 | 1492.9 | 1509.0 | 1541.4 |
| 57.5° | 1033.0 | 1022.2 | 1033.0 | 1076.2 | 1125.0 | 1146.6 | 1184.6 | 1227.8 | 1281.9 | 1314.3 | 1325.2 |
| 60° | 800.4 | 805.9 | 816.7 | 854.7 | 892.4 | 924.9 | 941.2 | 1011.4 | 1060.1 | 1092.6 | 1114.2 |
| 62.5° | 589.6 | 600.5 | 611.3 | 643.7 | 681.5 | 708.6 | 735.5 | 795.1 | 838.4 | 870.8 | 892.4 |
| 65° | 411.1 | 416.4 | 432.7 | 448.9 | 486.8 | 513.7 | 535.4 | 584.1 | 627.4 | 654.5 | 670.6 |
| 67.5° | 254.2 | 259.5 | 270.3 | 292.2 | 319.1 | 340.7 | 362.4 | 394.8 | 432.7 | 459.7 | 465.2 |
| 70° | 129.8 | 135.3 | 140.6 | 156.9 | 178.5 | 189.3 | 205.5 | 232.6 | 259.5 | 281.1 | 292.2 |
| 72.5° | 43.3 | 43.3 | 48.8 | 59.6 | 70.4 | 81.2 | 86.5 | 113.6 | 135.3 | 146.1 | 151.4 |
| 75° | 10.8 | 10.8 | 10.8 | 10.8 | 10.8 | 16.3 | 16.3 | 32.4 | 43.3 | 54.1 | 59.6 |
| 77.5° | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 10.8 | 10.8 |
| 80° | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| 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° | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 | 3807.8 |
| 2.5° | 3807.8 | 3797.0 | 3791.5 | 3797.0 | 3797.0 | 3791.5 | 3807.8 | 3829.4 | 3856.3 | 3786.2 |
| 5° | 3802.3 | 3791.5 | 3802.3 | 3769.8 | 3786.2 | 3775.3 | 3797.0 | 3791.5 | 3813.1 | 3791.5 |
| 7.5° | 3786.2 | 3764.5 | 3769.8 | 3753.7 | 3775.3 | 3748.2 | 3764.5 | 3797.0 | 3775.3 | 3742.9 |
| 10° | 3732.1 | 3721.3 | 3759.0 | 3704.9 | 3694.1 | 3715.8 | 3759.0 | 3726.6 | 3715.8 | 3726.6 |
| 12.5° | 3677.8 | 3677.8 | 3694.1 | 3650.9 | 3656.2 | 3667.0 | 3688.6 | 3667.0 | 3677.8 | 3704.9 |
| 15° | 3618.4 | 3607.6 | 3634.6 | 3602.1 | 3596.8 | 3586.0 | 3607.6 | 3607.6 | 3618.4 | 3602.1 |
| 17.5° | 3548.0 | 3531.9 | 3531.9 | 3521.1 | 3515.6 | 3542.7 | 3553.6 | 3558.9 | 3564.4 | 3542.7 |
| 20° | 3461.5 | 3456.2 | 3472.4 | 3456.2 | 3461.5 | 3467.1 | 3467.1 | 3456.2 | 3504.8 | 3445.4 |
| 22.5° | 3369.5 | 3385.8 | 3364.2 | 3353.4 | 3364.2 | 3375.0 | 3375.0 | 3380.3 | 3369.5 | 3358.7 |
| 25° | 3277.7 | 3288.5 | 3293.8 | 3261.4 | 3277.7 | 3261.4 | 3299.3 | 3304.6 | 3283.0 | 3293.8 |
| 27.5° | 3196.5 | 3180.4 | 3174.9 | 3153.3 | 3164.1 | 3158.8 | 3164.1 | 3164.1 | 3196.5 | 3153.3 |
| 30° | 3072.0 | 3055.9 | 3061.2 | 3045.1 | 3050.4 | 3045.1 | 3050.4 | 3050.4 | 3072.0 | 3066.7 |
| 32.5° | 2953.1 | 2937.0 | 2942.3 | 2926.2 | 2926.2 | 2931.5 | 2920.7 | 2920.7 | 2937.0 | 2926.2 |
| 35° | 2839.5 | 2801.7 | 2807.0 | 2801.7 | 2807.0 | 2785.4 | 2785.4 | 2780.1 | 2790.9 | 2763.8 |
| 37.5° | 2677.3 | 2661.1 | 2655.6 | 2650.3 | 2655.6 | 2644.8 | 2655.6 | 2639.5 | 2655.6 | 2634.0 |
| 40° | 2531.2 | 2520.4 | 2525.9 | 2493.4 | 2493.4 | 2498.7 | 2487.9 | 2482.6 | 2487.9 | 2509.5 |
| 42.5° | 2385.3 | 2363.7 | 2352.9 | 2342.0 | 2347.3 | 2331.2 | 2325.7 | 2314.9 | 2325.7 | 2304.1 |
| 45° | 2212.1 | 2212.1 | 2206.8 | 2179.6 | 2185.1 | 2185.1 | 2163.5 | 2141.9 | 2147.2 | 2147.2 |
| 47.5° | 2055.4 | 2044.6 | 2039.1 | 2012.1 | 2006.6 | 2001.3 | 1979.5 | 1963.4 | 1963.4 | 1947.0 |
| 50° | 1882.2 | 1871.3 | 1855.2 | 1828.1 | 1817.3 | 1784.8 | 1768.7 | 1747.1 | 1725.5 | 1725.5 |
| 52.5° | 1720.0 | 1682.0 | 1660.4 | 1617.1 | 1601.0 | 1584.7 | 1541.4 | 1525.3 | 1509.0 | 1492.9 |
| 55° | 1525.3 | 1492.9 | 1449.6 | 1400.9 | 1379.2 | 1352.1 | 1308.8 | 1276.4 | 1254.8 | 1260.3 |
| 57.5° | 1336.0 | 1281.9 | 1238.7 | 1173.8 | 1146.6 | 1130.3 | 1087.1 | 1043.8 | 1022.2 | 1022.2 |
| 60° | 1103.4 | 1060.1 | 1006.1 | 946.5 | 924.9 | 897.9 | 843.7 | 816.7 | 800.4 | 784.3 |
| 62.5° | 881.6 | 849.2 | 800.4 | 724.7 | 708.6 | 681.5 | 643.7 | 611.3 | 594.9 | 594.9 |
| 65° | 659.8 | 627.4 | 584.1 | 530.1 | 508.4 | 486.8 | 454.4 | 421.9 | 405.6 | 400.3 |
| 67.5° | 465.2 | 427.2 | 389.5 | 346.2 | 329.9 | 319.1 | 286.7 | 265.0 | 254.2 | 248.7 |
| 70° | 281.1 | 259.5 | 232.6 | 200.2 | 183.8 | 173.0 | 151.4 | 135.3 | 129.8 | 124.5 |
| 72.5° | 146.1 | 129.8 | 108.1 | 86.5 | 75.7 | 64.9 | 54.1 | 43.3 | 38.0 | 38.0 |
| 75° | 54.1 | 43.3 | 27.1 | 16.3 | 10.8 | 10.8 | 10.8 | 10.8 | 10.8 | 10.8 |
| 77.5° | 10.8 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| 80° | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| 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)