

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 FEU4C1009040 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 FEU4C1009040 F4LC-CSSQ-MMS
 Description: 4 INCH 10000 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 4000K, 90CRI LEDS AND F4LC-CSSQ TRIM WITH MMS FINISH
 Light Source: -
 Ballast/Driver: -

Summary

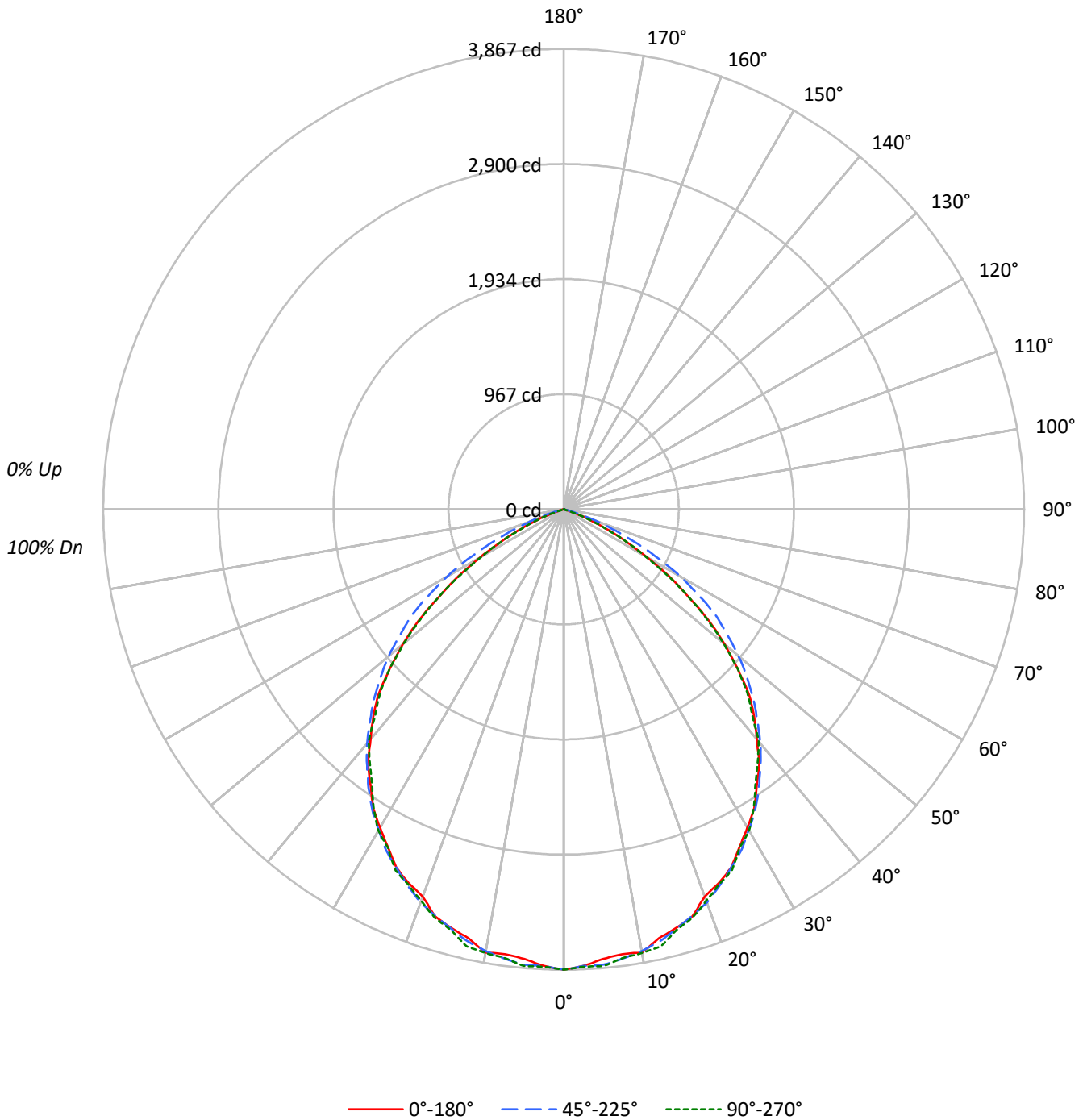
Lumens per Lamp: N/A
 Luminaire Lumens: 8260.0 lumens
 Efficiency: N/A
 Efficacy: 72.2 lumens/watt
 Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.29
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
 CIE Type: Direct

Input Watts (W): 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 |

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Luminous Intensity Polar Plot



TEST NUMBER: P#
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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° | 373103 | 373103 | 373103 |
| 5° | 367080 | 371855 | 372921 |
| 10° | 370247 | 369169 | 370776 |
| 15° | 363759 | 364299 | 365397 |
| 20° | 355308 | 360945 | 359261 |
| 25° | 353768 | 353768 | 356100 |
| 30° | 343907 | 346358 | 346982 |
| 35° | 333172 | 336423 | 330593 |
| 40° | 317551 | 323761 | 320990 |
| 45° | 300530 | 307285 | 297528 |
| 50° | 264674 | 287746 | 263023 |
| 55° | 214350 | 263320 | 215292 |
| 60° | 156852 | 218354 | 153688 |
| 65° | 95320 | 155481 | 92809 |
| 70° | 37183 | 83703 | 35659 |
| 75° | 4101 | 22555 | 4101 |
| 80° | 3112 | 3112 | 3112 |
| 85° | 0 | 0 | 0 |

TEST NUMBER: P#
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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 365.0 | 4.4 |
| 10°-20° | 1032.8 | 12.5 |
| 20°-30° | 1532.5 | 18.6 |
| 30°-40° | 1775.7 | 21.5 |
| 40°-50° | 1702.5 | 20.6 |
| 50°-60° | 1251.8 | 15.2 |
| 60°-70° | 540.7 | 6.5 |
| 70°-80° | 58.4 | 0.7 |
| 80°-90° | 0.8 | 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° | 2930.3 | 35.5 |
| 0°-40° | 4706.0 | 57.0 |
| 0°-60° | 7660.2 | 92.7 |
| 0°-90° | 8260.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 8260.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|------|-------|------|-------|------|------|
| 0° | 3867 | 3867 | 3867 | 3867 | 3867 | |
| 5° | 3790 | 3828 | 3839 | 3845 | 3850 | 362 |
| 15° | 3642 | 3664 | 3647 | 3652 | 3658 | 1026 |
| 25° | 3323 | 3318 | 3323 | 3328 | 3345 | 1521 |
| 35° | 2828 | 2845 | 2856 | 2850 | 2807 | 1769 |
| 45° | 2202 | 2208 | 2252 | 2219 | 2180 | 1674 |
| 55° | 1274 | 1406 | 1565 | 1401 | 1280 | 1147 |
| 65° | 418 | 522 | 681 | 516 | 406 | 429 |
| 75° | 11 | 17 | 60 | 11 | 11 | 34 |
| 85° | 0 | 0 | 0 | 0 | 0 | 1 |
| 90° | 0 | 0 | 0 | 0 | 0 | |

TEST NUMBER: P#
 CATALOG NUMBER: FLDSQ4C100D010 FEU4C1009040 F4LC-CSSQ-MMS

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 22.5° | 25° | 30° | 35° | 40° | 45° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 |
| 2.5° | 3839.2 | 3883.1 | 3888.7 | 3861.2 | 3850.2 | 3833.8 | 3872.1 | 3844.8 | 3855.8 | 3844.8 | 3839.2 |
| 5° | 3789.9 | 3839.2 | 3844.8 | 3844.8 | 3833.8 | 3828.2 | 3844.8 | 3839.2 | 3833.8 | 3822.8 | 3839.2 |
| 7.5° | 3767.9 | 3795.3 | 3822.8 | 3789.9 | 3806.3 | 3800.9 | 3839.2 | 3822.8 | 3817.2 | 3817.2 | 3806.3 |
| 10° | 3778.9 | 3773.3 | 3795.3 | 3762.3 | 3773.3 | 3762.3 | 3795.3 | 3795.3 | 3784.3 | 3773.3 | 3767.9 |
| 12.5° | 3690.9 | 3734.8 | 3734.8 | 3729.4 | 3718.4 | 3701.8 | 3734.8 | 3757.0 | 3723.8 | 3723.8 | 3718.4 |
| 15° | 3641.5 | 3652.5 | 3657.9 | 3657.9 | 3652.5 | 3663.5 | 3679.9 | 3657.9 | 3663.5 | 3635.9 | 3646.9 |
| 17.5° | 3586.6 | 3564.7 | 3581.0 | 3570.1 | 3575.7 | 3586.6 | 3608.6 | 3608.6 | 3575.7 | 3570.1 | 3581.0 |
| 20° | 3460.3 | 3526.1 | 3531.7 | 3498.8 | 3504.2 | 3504.2 | 3542.7 | 3509.8 | 3531.7 | 3504.2 | 3515.2 |
| 22.5° | 3399.8 | 3443.7 | 3449.3 | 3405.4 | 3432.7 | 3399.8 | 3438.3 | 3388.8 | 3443.7 | 3405.4 | 3421.7 |
| 25° | 3322.9 | 3317.5 | 3333.9 | 3311.9 | 3317.5 | 3317.5 | 3344.8 | 3322.9 | 3339.5 | 3317.5 | 3322.9 |
| 27.5° | 3196.7 | 3240.6 | 3235.0 | 3213.1 | 3224.1 | 3218.7 | 3273.6 | 3213.1 | 3246.0 | 3218.7 | 3229.7 |
| 30° | 3086.7 | 3125.2 | 3114.3 | 3092.3 | 3092.3 | 3075.7 | 3136.2 | 3119.6 | 3114.3 | 3114.3 | 3108.7 |
| 32.5° | 2976.9 | 2982.5 | 2971.5 | 2976.9 | 2982.5 | 2960.5 | 3009.8 | 2987.9 | 2982.5 | 2987.9 | 2993.5 |
| 35° | 2828.5 | 2828.5 | 2839.5 | 2823.2 | 2845.1 | 2845.1 | 2889.0 | 2861.5 | 2856.1 | 2839.5 | 2856.1 |
| 37.5° | 2696.8 | 2680.4 | 2685.8 | 2685.8 | 2696.8 | 2707.7 | 2729.7 | 2718.7 | 2718.7 | 2702.4 | 2713.3 |
| 40° | 2521.1 | 2510.1 | 2526.5 | 2526.5 | 2543.0 | 2543.0 | 2565.0 | 2554.0 | 2570.4 | 2570.4 | 2570.4 |
| 42.5° | 2367.3 | 2367.3 | 2356.4 | 2372.7 | 2378.3 | 2372.7 | 2411.3 | 2405.7 | 2411.3 | 2400.3 | 2405.7 |
| 45° | 2202.4 | 2202.4 | 2191.4 | 2186.0 | 2213.4 | 2208.0 | 2251.9 | 2235.4 | 2257.3 | 2246.3 | 2251.9 |
| 47.5° | 1977.2 | 2004.8 | 1988.2 | 2004.8 | 2037.7 | 2043.3 | 2070.6 | 2059.7 | 2081.6 | 2065.3 | 2087.2 |
| 50° | 1763.2 | 1763.2 | 1779.5 | 1801.5 | 1834.4 | 1840.0 | 1873.0 | 1894.9 | 1905.9 | 1911.3 | 1916.9 |
| 52.5° | 1538.0 | 1532.4 | 1548.9 | 1576.3 | 1603.8 | 1625.8 | 1658.8 | 1691.7 | 1713.7 | 1746.6 | 1730.0 |
| 55° | 1274.2 | 1285.2 | 1301.8 | 1334.7 | 1378.6 | 1406.0 | 1433.5 | 1477.5 | 1516.0 | 1532.4 | 1565.3 |
| 57.5° | 1049.0 | 1038.0 | 1049.0 | 1092.9 | 1142.4 | 1164.4 | 1202.9 | 1246.9 | 1301.8 | 1334.7 | 1345.7 |
| 60° | 812.8 | 818.4 | 829.4 | 867.9 | 906.2 | 939.2 | 955.8 | 1027.0 | 1076.6 | 1109.5 | 1131.5 |
| 62.5° | 598.8 | 609.8 | 620.7 | 653.7 | 692.0 | 719.6 | 746.9 | 807.4 | 851.3 | 884.3 | 906.2 |
| 65° | 417.5 | 422.9 | 439.4 | 455.8 | 494.4 | 521.7 | 543.7 | 593.2 | 637.1 | 664.7 | 681.0 |
| 67.5° | 258.2 | 263.5 | 274.5 | 296.7 | 324.0 | 346.0 | 368.0 | 400.9 | 439.4 | 466.8 | 472.4 |
| 70° | 131.8 | 137.4 | 142.8 | 159.3 | 181.3 | 192.3 | 208.6 | 236.2 | 263.5 | 285.5 | 296.7 |
| 72.5° | 43.9 | 43.9 | 49.5 | 60.5 | 71.5 | 82.5 | 87.8 | 115.4 | 137.4 | 148.3 | 153.7 |
| 75° | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 16.6 | 16.6 | 32.9 | 43.9 | 54.9 | 60.5 |
| 77.5° | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 11.0 | 11.0 |
| 80° | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 |
| 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 |

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CANDELA DISTRIBUTION (continued):

| | 50° | 55° | 60° | 65° | 67.5° | 70° | 75° | 80° | 85° | 90° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 | 3866.8 |
| 2.5° | 3866.8 | 3855.8 | 3850.2 | 3855.8 | 3855.8 | 3850.2 | 3866.8 | 3888.7 | 3916.1 | 3844.8 |
| 5° | 3861.2 | 3850.2 | 3861.2 | 3828.2 | 3844.8 | 3833.8 | 3855.8 | 3850.2 | 3872.1 | 3850.2 |
| 7.5° | 3844.8 | 3822.8 | 3828.2 | 3811.9 | 3833.8 | 3806.3 | 3822.8 | 3855.8 | 3833.8 | 3800.9 |
| 10° | 3789.9 | 3778.9 | 3817.2 | 3762.3 | 3751.4 | 3773.3 | 3817.2 | 3784.3 | 3773.3 | 3784.3 |
| 12.5° | 3734.8 | 3734.8 | 3751.4 | 3707.4 | 3712.8 | 3723.8 | 3745.8 | 3723.8 | 3734.8 | 3762.3 |
| 15° | 3674.5 | 3663.5 | 3690.9 | 3657.9 | 3652.5 | 3641.5 | 3663.5 | 3663.5 | 3674.5 | 3657.9 |
| 17.5° | 3603.0 | 3586.6 | 3586.6 | 3575.7 | 3570.1 | 3597.6 | 3608.6 | 3614.0 | 3619.6 | 3597.6 |
| 20° | 3515.2 | 3509.8 | 3526.1 | 3509.8 | 3515.2 | 3520.8 | 3520.8 | 3509.8 | 3559.1 | 3498.8 |
| 22.5° | 3421.7 | 3438.3 | 3416.3 | 3405.4 | 3416.3 | 3427.3 | 3427.3 | 3432.7 | 3421.7 | 3410.7 |
| 25° | 3328.5 | 3339.5 | 3344.8 | 3311.9 | 3328.5 | 3311.9 | 3350.4 | 3355.8 | 3333.9 | 3344.8 |
| 27.5° | 3246.0 | 3229.7 | 3224.1 | 3202.1 | 3213.1 | 3207.7 | 3213.1 | 3213.1 | 3246.0 | 3202.1 |
| 30° | 3119.6 | 3103.3 | 3108.7 | 3092.3 | 3097.7 | 3092.3 | 3097.7 | 3097.7 | 3119.6 | 3114.3 |
| 32.5° | 2998.8 | 2982.5 | 2987.9 | 2971.5 | 2971.5 | 2976.9 | 2965.9 | 2965.9 | 2982.5 | 2971.5 |
| 35° | 2883.4 | 2845.1 | 2850.5 | 2845.1 | 2850.5 | 2828.5 | 2828.5 | 2823.2 | 2834.1 | 2806.6 |
| 37.5° | 2718.7 | 2702.4 | 2696.8 | 2691.4 | 2696.8 | 2685.8 | 2696.8 | 2680.4 | 2696.8 | 2674.8 |
| 40° | 2570.4 | 2559.4 | 2565.0 | 2532.1 | 2532.1 | 2537.4 | 2526.5 | 2521.1 | 2526.5 | 2548.4 |
| 42.5° | 2422.2 | 2400.3 | 2389.3 | 2378.3 | 2383.7 | 2367.3 | 2361.7 | 2350.8 | 2361.7 | 2339.8 |
| 45° | 2246.3 | 2246.3 | 2241.0 | 2213.4 | 2219.0 | 2219.0 | 2197.0 | 2175.1 | 2180.4 | 2180.4 |
| 47.5° | 2087.2 | 2076.2 | 2070.6 | 2043.3 | 2037.7 | 2032.3 | 2010.1 | 1993.8 | 1993.8 | 1977.2 |
| 50° | 1911.3 | 1900.3 | 1884.0 | 1856.4 | 1845.4 | 1812.5 | 1796.1 | 1774.2 | 1752.2 | 1752.2 |
| 52.5° | 1746.6 | 1708.1 | 1686.1 | 1642.2 | 1625.8 | 1609.2 | 1565.3 | 1548.9 | 1532.4 | 1516.0 |
| 55° | 1548.9 | 1516.0 | 1472.1 | 1422.6 | 1400.6 | 1373.0 | 1329.1 | 1296.2 | 1274.2 | 1279.8 |
| 57.5° | 1356.7 | 1301.8 | 1257.8 | 1192.0 | 1164.4 | 1147.8 | 1103.9 | 1060.0 | 1038.0 | 1038.0 |
| 60° | 1120.5 | 1076.6 | 1021.6 | 961.1 | 939.2 | 911.8 | 856.7 | 829.4 | 812.8 | 796.4 |
| 62.5° | 895.3 | 862.3 | 812.8 | 735.9 | 719.6 | 692.0 | 653.7 | 620.7 | 604.2 | 604.2 |
| 65° | 670.0 | 637.1 | 593.2 | 538.3 | 516.3 | 494.4 | 461.4 | 428.5 | 411.9 | 406.5 |
| 67.5° | 472.4 | 433.9 | 395.5 | 351.6 | 335.0 | 324.0 | 291.1 | 269.1 | 258.2 | 252.6 |
| 70° | 285.5 | 263.5 | 236.2 | 203.3 | 186.7 | 175.7 | 153.7 | 137.4 | 131.8 | 126.4 |
| 72.5° | 148.3 | 131.8 | 109.8 | 87.8 | 76.9 | 65.9 | 54.9 | 43.9 | 38.5 | 38.5 |
| 75° | 54.9 | 43.9 | 27.6 | 16.6 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| 77.5° | 11.0 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 |
| 80° | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 |
| 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)