

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P925575

Luminaire Tested: DFN2DIP-SQ3F0-070D110US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925575  
REPORT IS A COMBINATION OF REPORTS P901514 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-070D110US950-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

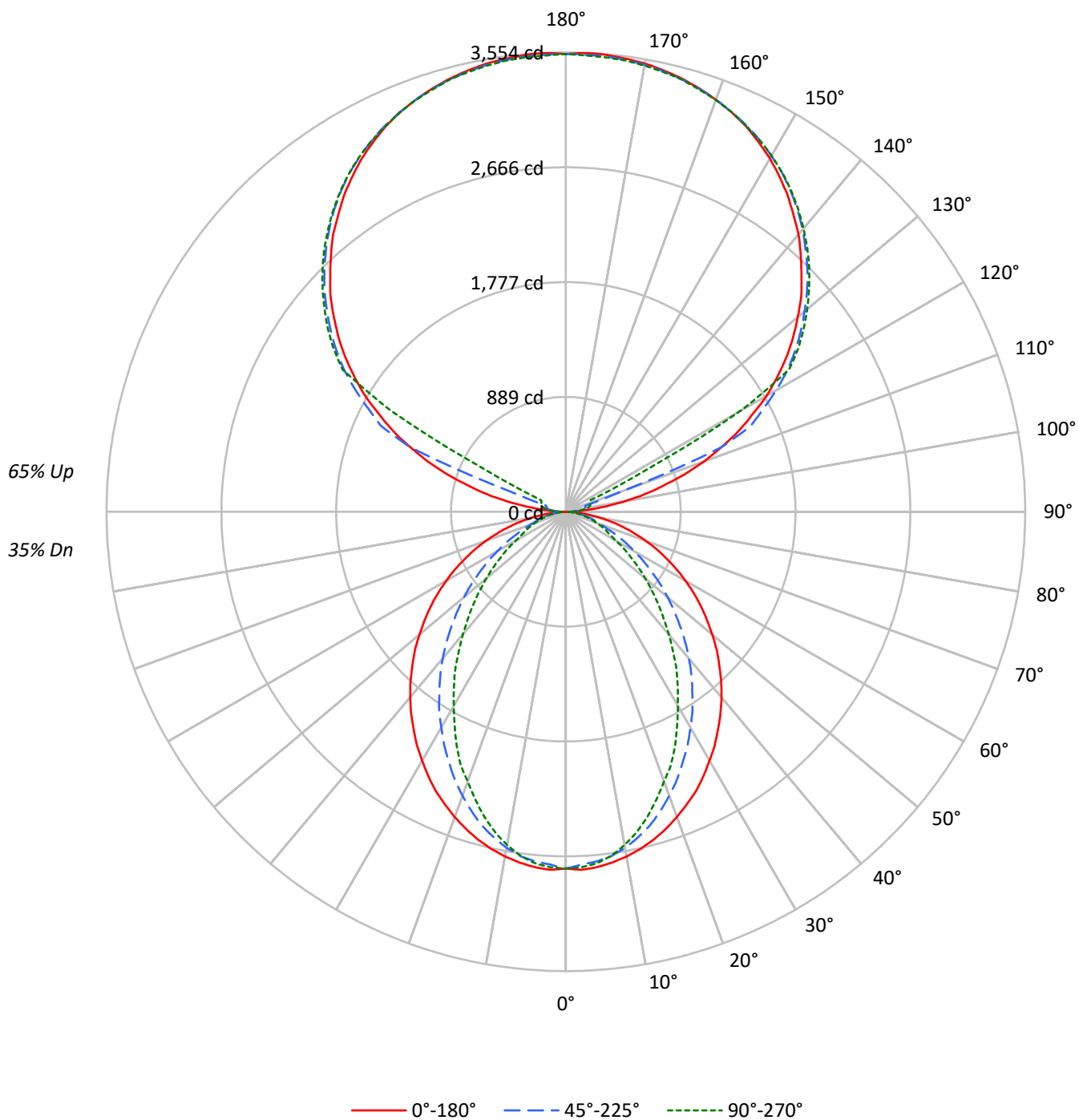
Lumens per Lamp: N/A  
Luminaire Lumens: 16065.3 lumens  
Efficiency: N/A  
Efficacy: 106.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 151.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 |
| 1   | 95  | 91  | 87  | 84  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 37 |
| 2   | 87  | 80  | 74  | 69  | 78 | 72 | 67 | 63 | 58 | 55 | 52 | 46 | 44 | 41 | 34 | 33 | 31 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 48 | 44 | 41 | 38 | 35 | 30 | 29 | 27 |
| 4   | 73  | 62  | 55  | 49  | 65 | 57 | 50 | 45 | 46 | 42 | 38 | 36 | 33 | 31 | 27 | 25 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 41 | 37 | 33 | 33 | 29 | 27 | 25 | 23 | 21 |
| 6   | 61  | 50  | 42  | 37  | 55 | 46 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 24 | 23 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 35 | 30 | 34 | 29 | 25 | 27 | 24 | 21 | 21 | 18 | 16 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 23 | 25 | 21 | 19 | 19 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 24 | 28 | 24 | 20 | 23 | 19 | 17 | 18 | 15 | 13 |
| 10  | 46  | 34  | 27  | 23  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 16 | 14 | 12 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3162 | 3162 | 3162 |
| 5°  | 3165 | 3110 | 3131 |
| 10° | 3132 | 3047 | 3028 |
| 15° | 3087 | 2944 | 2870 |
| 20° | 3028 | 2804 | 2676 |
| 25° | 2967 | 2646 | 2488 |
| 30° | 2887 | 2485 | 2251 |
| 35° | 2808 | 2312 | 2043 |
| 40° | 2727 | 2133 | 1804 |
| 45° | 2634 | 1935 | 1587 |
| 50° | 2537 | 1735 | 1376 |
| 55° | 2436 | 1521 | 1173 |
| 60° | 2319 | 1298 | 965  |
| 65° | 2183 | 1072 | 867  |
| 70° | 2020 | 861  | 783  |
| 75° | 1813 | 755  | 710  |
| 80° | 1516 | 627  | 612  |
| 85° | 1027 | 408  | 454  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2634 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 258.7   | 1.6       |
| 10°-20°   | 710.1   | 4.4       |
| 20°-30°   | 997.0   | 6.2       |
| 30°-40°   | 1086.8  | 6.8       |
| 40°-50°   | 998.8   | 6.2       |
| 50°-60°   | 784.4   | 4.9       |
| 60°-70°   | 510.6   | 3.2       |
| 70°-80°   | 262.8   | 1.6       |
| 80°-90°   | 73.3    | 0.5       |
| 90°-100°  | 116.8   | 0.7       |
| 100°-110° | 435.4   | 2.7       |
| 110°-120° | 1154.6  | 7.2       |
| 120°-130° | 1915.0  | 11.9      |
| 130°-140° | 2034.2  | 12.7      |
| 140°-150° | 1890.5  | 11.8      |
| 150°-160° | 1519.9  | 9.5       |
| 160°-170° | 979.4   | 6.1       |
| 170°-180° | 337.1   | 2.1       |
| 0°-30°    | 1965.7  | 12.2      |
| 0°-40°    | 3052.5  | 19.0      |
| 0°-60°    | 4835.8  | 30.1      |
| 0°-90°    | 5682.5  | 35.4      |
| 90°-120°  | 1706.7  | 10.6      |
| 90°-150°  | 7546.4  | 47.0      |
| 90°-180°  | 10383.0 | 64.6      |
| 0°-180°   | 16065.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2760 | 2760  | 2760 | 2760  | 2760 |      |
| 5°   | 2760 | 2748  | 2715 | 2738  | 2730 | 262  |
| 15°  | 2625 | 2598  | 2513 | 2465  | 2440 | 740  |
| 25°  | 2383 | 2303  | 2138 | 2036  | 1998 | 1096 |
| 35°  | 2053 | 1926  | 1706 | 1549  | 1494 | 1285 |
| 45°  | 1679 | 1511  | 1249 | 1071  | 1012 | 1296 |
| 55°  | 1276 | 1082  | 812  | 662   | 615  | 1140 |
| 65°  | 862  | 659   | 435  | 350   | 342  | 854  |
| 75°  | 460  | 285   | 200  | 182   | 180  | 486  |
| 85°  | 107  | 55    | 47   | 47    | 47   | 123  |
| 90°  | 2    | 31    | 51   | 64    | 69   | 15   |
| 95°  | 166  | 82    | 100  | 113   | 110  | 197  |
| 105° | 779  | 856   | 156  | 184   | 195  | 832  |
| 115° | 1474 | 1517  | 1581 | 395   | 210  | 1451 |
| 125° | 2083 | 2117  | 2166 | 2183  | 2191 | 1858 |
| 135° | 2578 | 2619  | 2642 | 2668  | 2663 | 1992 |
| 145° | 2991 | 2988  | 3032 | 3050  | 3037 | 1871 |
| 155° | 3293 | 3270  | 3301 | 3316  | 3296 | 1517 |
| 165° | 3470 | 3454  | 3462 | 3480  | 3462 | 980  |
| 175° | 3549 | 3531  | 3536 | 3554  | 3529 | 338  |
| 180° | 3542 | 3542  | 3542 | 3542  | 3542 |      |

TEST NUMBER: P925575

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US950-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2760.0 | 2760.0 | 2760.0 | 2760.0 | 2760.0 |
| 2.5°   | 2772.4 | 2760.0 | 2732.4 | 2757.6 | 2752.6 |
| 5°     | 2760.0 | 2747.5 | 2715.0 | 2737.5 | 2730.1 |
| 7.5°   | 2737.5 | 2722.6 | 2687.7 | 2697.4 | 2685.0 |
| 10°    | 2707.5 | 2690.1 | 2640.2 | 2632.6 | 2617.7 |
| 12.5°  | 2670.2 | 2647.6 | 2580.1 | 2565.2 | 2537.6 |
| 15°    | 2625.1 | 2597.6 | 2512.7 | 2465.3 | 2440.4 |
| 17.5°  | 2572.7 | 2532.7 | 2427.7 | 2372.8 | 2332.8 |
| 20°    | 2512.7 | 2462.7 | 2337.9 | 2275.6 | 2220.4 |
| 22.5°  | 2447.9 | 2390.3 | 2245.3 | 2160.5 | 2123.2 |
| 25°    | 2382.9 | 2302.9 | 2138.0 | 2035.7 | 1998.2 |
| 27.5°  | 2305.5 | 2220.4 | 2038.1 | 1920.8 | 1863.3 |
| 30°    | 2223.1 | 2128.0 | 1928.1 | 1801.0 | 1733.4 |
| 32.5°  | 2143.1 | 2028.1 | 1823.5 | 1673.5 | 1610.9 |
| 35°    | 2053.2 | 1925.7 | 1706.1 | 1548.7 | 1493.6 |
| 37.5°  | 1965.8 | 1828.2 | 1596.1 | 1423.6 | 1361.4 |
| 40°    | 1873.3 | 1723.6 | 1481.1 | 1303.8 | 1238.9 |
| 42.5°  | 1778.4 | 1618.7 | 1366.3 | 1181.3 | 1119.1 |
| 45°    | 1678.6 | 1511.0 | 1249.0 | 1071.4 | 1011.5 |
| 47.5°  | 1583.6 | 1406.4 | 1136.6 | 959.1  | 904.2  |
| 50°    | 1478.7 | 1301.4 | 1026.6 | 854.1  | 801.9  |
| 52.5°  | 1376.1 | 1188.8 | 921.7  | 756.8  | 709.4  |
| 55°    | 1276.3 | 1081.5 | 811.7  | 662.0  | 614.6  |
| 57.5°  | 1174.0 | 974.1  | 714.5  | 574.5  | 534.5  |
| 60°    | 1069.1 | 869.2  | 611.9  | 484.7  | 444.7  |
| 62.5°  | 966.7  | 766.9  | 524.4  | 404.7  | 384.7  |
| 65°    | 861.7  | 659.3  | 434.6  | 349.8  | 342.1  |
| 67.5°  | 761.9  | 559.4  | 349.8  | 307.1  | 299.7  |
| 70°    | 656.9  | 462.1  | 289.6  | 264.7  | 254.6  |
| 72.5°  | 557.0  | 372.1  | 242.2  | 222.4  | 217.3  |
| 75°    | 459.5  | 284.6  | 199.8  | 182.3  | 179.9  |
| 77.5°  | 362.2  | 202.2  | 157.4  | 147.3  | 142.3  |
| 80°    | 272.2  | 144.9  | 119.8  | 110.0  | 110.0  |
| 82.5°  | 189.8  | 97.5   | 82.4   | 77.4   | 77.4   |
| 85°    | 107.3  | 54.9   | 47.4   | 47.4   | 47.4   |
| 87.5°  | 40.0   | 19.8   | 19.8   | 17.5   | 17.5   |
| 90°    | 2.5    | 30.7   | 51.1   | 64.2   | 69.1   |
| 92.5°  | 64.2   | 53.9   | 61.4   | 66.7   | 69.1   |
| 95°    | 166.5  | 81.9   | 99.8   | 112.9  | 110.2  |
| 97.5°  | 299.7  | 89.8   | 130.5  | 138.4  | 140.9  |
| 100°   | 453.7  | 102.6  | 146.1  | 166.5  | 171.6  |
| 102.5° | 622.6  | 617.7  | 151.2  | 179.3  | 187.2  |
| 105°   | 779.0  | 856.0  | 156.5  | 184.4  | 194.8  |
| 107.5° | 961.1  | 1024.9 | 161.6  | 189.6  | 200.0  |
| 110°   | 1135.4 | 1189.0 | 448.6  | 192.3  | 202.3  |

TEST NUMBER: P925575

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US950-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1299.4 | 1345.3 | 1301.8 | 197.2  | 205.1  |
| 115°   | 1473.5 | 1517.0 | 1581.3 | 394.7  | 210.3  |
| 117.5° | 1624.8 | 1675.9 | 1719.7 | 1353.0 | 681.6  |
| 120°   | 1793.9 | 1832.3 | 1878.5 | 1909.2 | 1563.2 |
| 122.5° | 1937.3 | 1978.3 | 2029.7 | 2045.0 | 2047.8 |
| 125°   | 2083.3 | 2116.8 | 2165.5 | 2183.4 | 2191.1 |
| 127.5° | 2216.6 | 2252.5 | 2291.1 | 2316.7 | 2319.2 |
| 130°   | 2342.3 | 2383.4 | 2411.3 | 2439.7 | 2437.3 |
| 132.5° | 2470.4 | 2503.9 | 2531.9 | 2555.0 | 2552.6 |
| 135°   | 2578.2 | 2619.2 | 2642.0 | 2668.0 | 2662.7 |
| 137.5° | 2690.8 | 2721.5 | 2747.3 | 2772.9 | 2765.3 |
| 140°   | 2800.9 | 2821.6 | 2849.6 | 2872.7 | 2859.9 |
| 142.5° | 2893.4 | 2911.3 | 2944.5 | 2964.9 | 2952.2 |
| 145°   | 2990.8 | 2988.0 | 3031.5 | 3049.6 | 3036.8 |
| 147.5° | 3075.1 | 3067.5 | 3111.0 | 3123.8 | 3113.8 |
| 150°   | 3157.3 | 3139.3 | 3180.3 | 3195.6 | 3182.8 |
| 152.5° | 3226.3 | 3205.9 | 3244.3 | 3259.8 | 3241.9 |
| 155°   | 3293.0 | 3270.1 | 3300.8 | 3316.1 | 3295.7 |
| 157.5° | 3346.8 | 3326.4 | 3349.6 | 3367.5 | 3346.8 |
| 160°   | 3393.1 | 3377.5 | 3393.1 | 3408.3 | 3390.3 |
| 162.5° | 3433.8 | 3418.7 | 3431.4 | 3449.4 | 3426.3 |
| 165°   | 3469.8 | 3454.5 | 3462.2 | 3480.1 | 3462.2 |
| 167.5° | 3498.0 | 3482.6 | 3490.5 | 3508.4 | 3485.3 |
| 170°   | 3521.2 | 3505.7 | 3510.8 | 3528.8 | 3505.7 |
| 172.5° | 3536.4 | 3521.2 | 3526.4 | 3544.3 | 3521.2 |
| 175°   | 3549.2 | 3531.2 | 3536.4 | 3554.4 | 3528.8 |
| 177.5° | 3554.4 | 3536.4 | 3539.1 | 3557.1 | 3534.0 |
| 180°   | 3541.6 | 3541.6 | 3541.6 | 3541.6 | 3541.6 |

TEST NUMBER: P925575

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US950-RLONL

**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |      |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7  | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3  | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2  | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |      |       |       |       |
| X=2H            | Y=2H | 9.57             | 10.29 | 10.65 | 11.37 | 12.84 | 5.53           | 6.26 | 6.61  | 7.33  | 8.80  |
|                 | 3H   | 11.24            | 11.88 | 12.32 | 12.97 | 14.45 | 6.71           | 7.35 | 7.79  | 8.44  | 9.92  |
|                 | 4H   | 11.84            | 12.45 | 12.93 | 13.53 | 15.03 | 7.15           | 7.76 | 8.24  | 8.84  | 10.34 |
|                 | 6H   | 12.25            | 12.81 | 13.36 | 13.90 | 15.40 | 7.46           | 8.02 | 8.56  | 9.11  | 10.61 |
|                 | 8H   | 12.37            | 12.91 | 13.48 | 14.01 | 15.51 | 7.54           | 8.08 | 8.65  | 9.18  | 10.68 |
|                 | 12H  | 12.43            | 12.94 | 13.54 | 14.03 | 15.55 | 7.58           | 8.09 | 8.69  | 9.18  | 10.70 |
| 4H              | 2H   | 9.57             | 10.19 | 10.68 | 11.27 | 12.76 | 6.11           | 6.72 | 7.22  | 7.81  | 9.30  |
|                 | 3H   | 11.39            | 11.90 | 12.50 | 13.01 | 14.51 | 7.44           | 7.95 | 8.56  | 9.07  | 10.57 |
|                 | 4H   | 12.07            | 12.54 | 13.19 | 13.64 | 15.17 | 7.98           | 8.45 | 9.10  | 9.55  | 11.08 |
|                 | 6H   | 12.58            | 12.98 | 13.70 | 14.10 | 15.62 | 8.39           | 8.79 | 9.51  | 9.92  | 11.43 |
|                 | 8H   | 12.75            | 13.12 | 13.87 | 14.24 | 15.77 | 8.51           | 8.89 | 9.63  | 10.00 | 11.54 |
|                 | 12H  | 12.83            | 13.17 | 13.97 | 14.30 | 15.84 | 8.57           | 8.91 | 9.71  | 10.04 | 11.57 |
| 8H              | 4H   | 12.03            | 12.40 | 13.15 | 13.52 | 15.06 | 8.25           | 8.63 | 9.37  | 9.74  | 11.28 |
|                 | 6H   | 12.59            | 12.90 | 13.73 | 14.06 | 15.59 | 8.76           | 9.07 | 9.90  | 10.23 | 11.76 |
|                 | 8H   | 12.80            | 13.07 | 13.95 | 14.21 | 15.76 | 8.94           | 9.21 | 10.09 | 10.35 | 11.90 |
|                 | 12H  | 12.93            | 13.17 | 14.08 | 14.30 | 15.89 | 9.05           | 9.29 | 10.21 | 10.43 | 12.01 |
| 12H             | 4H   | 11.98            | 12.32 | 13.12 | 13.45 | 14.98 | 8.25           | 8.59 | 9.39  | 9.72  | 11.26 |
|                 | 6H   | 12.56            | 12.83 | 13.71 | 13.97 | 15.52 | 8.81           | 9.08 | 9.96  | 10.21 | 11.77 |
|                 | 8H   | 12.77            | 13.01 | 13.93 | 14.15 | 15.73 | 9.01           | 9.24 | 10.16 | 10.38 | 11.96 |

END OF REPORT