

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: P915737

Luminaire Tested: DFN2DIP-TR4F0-110D110US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915737  
REPORT IS A COMBINATION OF REPORTS P902030 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-110D110US927-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

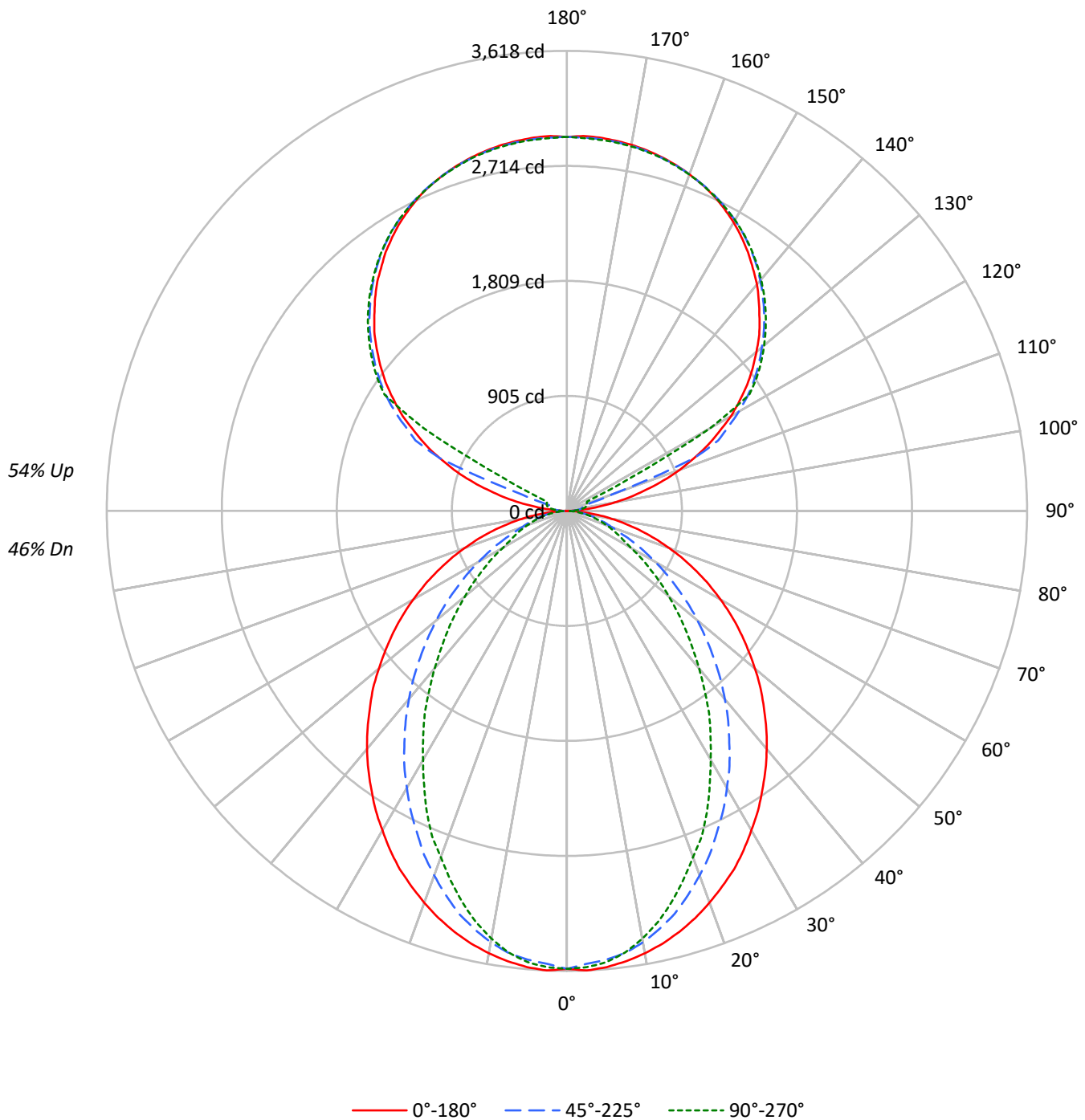
Lumens per Lamp: N/A  
Luminaire Lumens: 16033.7 lumens  
Efficiency: N/A  
Efficacy: 81.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 197.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
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



TEST NUMBER: P915737

CATALOG NUMBER: DFN2DIP-TR4F0-110D110US927-RLONL

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

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    |    | 20 |    |    |    |    | 20 |    |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    |    | 50 |    |    |    |    | 30 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 | 46 |    |    |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 | 40 |    |    |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 | 34 |    |    |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 | 29 |    |    |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 | 26 |    |    |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | 23 |    |    |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 | 20 |    |    |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 | 18 |    |    |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 | 16 |    |    |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 | 15 |    |    |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 | 13 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2861 | 2861 | 2861 |
| 5°  | 2866 | 2816 | 2834 |
| 10° | 2837 | 2760 | 2741 |
| 15° | 2798 | 2669 | 2599 |
| 20° | 2747 | 2543 | 2424 |
| 25° | 2694 | 2402 | 2255 |
| 30° | 2623 | 2258 | 2040 |
| 35° | 2553 | 2102 | 1852 |
| 40° | 2482 | 1942 | 1636 |
| 45° | 2400 | 1763 | 1441 |
| 50° | 2315 | 1583 | 1250 |
| 55° | 2226 | 1390 | 1066 |
| 60° | 2123 | 1189 | 878  |
| 65° | 2005 | 985  | 790  |
| 70° | 1862 | 794  | 715  |
| 75° | 1682 | 700  | 650  |
| 80° | 1421 | 587  | 563  |
| 85° | 991  | 392  | 423  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2400 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 337.5   | 2.1       |
| 10°-20°   | 926.6   | 5.8       |
| 20°-30°   | 1300.9  | 8.1       |
| 30°-40°   | 1418.1  | 8.8       |
| 40°-50°   | 1303.4  | 8.1       |
| 50°-60°   | 1023.6  | 6.4       |
| 60°-70°   | 666.3   | 4.2       |
| 70°-80°   | 343.0   | 2.1       |
| 80°-90°   | 92.7    | 0.6       |
| 90°-100°  | 97.0    | 0.6       |
| 100°-110° | 361.5   | 2.3       |
| 110°-120° | 958.7   | 6.0       |
| 120°-130° | 1590.2  | 9.9       |
| 130°-140° | 1689.1  | 10.5      |
| 140°-150° | 1569.9  | 9.8       |
| 150°-160° | 1262.1  | 7.9       |
| 160°-170° | 813.3   | 5.1       |
| 170°-180° | 279.9   | 1.7       |
| 0°-30°    | 2565.1  | 16.0      |
| 0°-40°    | 3983.1  | 24.8      |
| 0°-60°    | 6310.1  | 39.4      |
| 0°-90°    | 7412.1  | 46.2      |
| 90°-120°  | 1417.2  | 8.8       |
| 90°-150°  | 6266.3  | 39.1      |
| 90°-180°  | 8622.0  | 53.8      |
| 0°-180°   | 16033.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3602 | 3602  | 3602 | 3602  | 3602 |      |
| 5°   | 3602 | 3585  | 3543 | 3572  | 3562 | 341  |
| 15°  | 3426 | 3390  | 3279 | 3217  | 3184 | 965  |
| 25°  | 3109 | 3005  | 2790 | 2656  | 2607 | 1430 |
| 35°  | 2679 | 2513  | 2226 | 2021  | 1949 | 1677 |
| 45°  | 2190 | 1972  | 1630 | 1398  | 1320 | 1691 |
| 55°  | 1665 | 1411  | 1059 | 864   | 802  | 1488 |
| 65°  | 1124 | 860   | 567  | 456   | 446  | 1115 |
| 75°  | 600  | 371   | 261  | 238   | 235  | 634  |
| 85°  | 140  | 72    | 62   | 62    | 62   | 161  |
| 90°  | 2    | 26    | 42   | 53    | 57   | 15   |
| 95°  | 138  | 68    | 83   | 94    | 92   | 164  |
| 105° | 647  | 711   | 130  | 153   | 162  | 691  |
| 115° | 1224 | 1260  | 1313 | 328   | 175  | 1205 |
| 125° | 1730 | 1758  | 1798 | 1813  | 1819 | 1543 |
| 135° | 2141 | 2175  | 2194 | 2215  | 2211 | 1654 |
| 145° | 2484 | 2481  | 2517 | 2532  | 2522 | 1553 |
| 155° | 2734 | 2715  | 2741 | 2754  | 2737 | 1260 |
| 165° | 2881 | 2869  | 2875 | 2890  | 2875 | 814  |
| 175° | 2947 | 2932  | 2936 | 2952  | 2930 | 280  |
| 180° | 2941 | 2941  | 2941 | 2941  | 2941 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3601.5 | 3601.5 | 3601.5 | 3601.5 | 3601.5 |
| 2.5°   | 3617.7 | 3601.5 | 3565.5 | 3598.4 | 3591.8 |
| 5°     | 3601.5 | 3585.3 | 3542.7 | 3572.1 | 3562.4 |
| 7.5°   | 3572.1 | 3552.7 | 3507.1 | 3519.9 | 3503.6 |
| 10°    | 3533.0 | 3510.2 | 3445.2 | 3435.1 | 3415.8 |
| 12.5°  | 3484.3 | 3454.9 | 3366.7 | 3347.3 | 3311.3 |
| 15°    | 3425.5 | 3389.5 | 3278.8 | 3217.0 | 3184.4 |
| 17.5°  | 3357.0 | 3304.8 | 3167.9 | 3096.2 | 3044.0 |
| 20°    | 3278.8 | 3213.5 | 3050.6 | 2969.3 | 2897.4 |
| 22.5°  | 3194.2 | 3119.1 | 2930.0 | 2819.3 | 2770.5 |
| 25°    | 3109.4 | 3005.0 | 2789.9 | 2656.4 | 2607.3 |
| 27.5°  | 3008.5 | 2897.4 | 2659.5 | 2506.3 | 2431.3 |
| 30°    | 2900.9 | 2776.8 | 2516.0 | 2350.0 | 2261.8 |
| 32.5°  | 2796.5 | 2646.4 | 2379.4 | 2183.7 | 2102.1 |
| 35°    | 2679.2 | 2512.9 | 2226.3 | 2020.9 | 1948.9 |
| 37.5°  | 2565.2 | 2385.7 | 2082.7 | 1857.6 | 1776.4 |
| 40°    | 2444.4 | 2249.1 | 1932.7 | 1701.3 | 1616.6 |
| 42.5°  | 2320.6 | 2112.1 | 1783.0 | 1541.6 | 1460.3 |
| 45°    | 2190.3 | 1971.7 | 1629.8 | 1398.0 | 1319.9 |
| 47.5°  | 2066.5 | 1835.2 | 1483.1 | 1251.4 | 1179.9 |
| 50°    | 1929.5 | 1698.2 | 1339.7 | 1114.5 | 1046.4 |
| 52.5°  | 1795.7 | 1551.2 | 1202.7 | 987.6  | 925.7  |
| 55°    | 1665.3 | 1411.2 | 1059.1 | 863.8  | 801.9  |
| 57.5°  | 1531.9 | 1271.1 | 932.2  | 749.7  | 697.4  |
| 60°    | 1395.0 | 1134.2 | 798.4  | 632.5  | 580.3  |
| 62.5°  | 1261.5 | 1000.8 | 684.4  | 528.1  | 502.1  |
| 65°    | 1124.5 | 860.3  | 567.1  | 456.5  | 446.4  |
| 67.5°  | 994.2  | 730.0  | 456.5  | 400.8  | 391.1  |
| 70°    | 857.2  | 603.1  | 377.9  | 345.5  | 332.3  |
| 72.5°  | 726.8  | 485.5  | 316.1  | 290.1  | 283.5  |
| 75°    | 599.6  | 371.4  | 260.7  | 237.9  | 234.8  |
| 77.5°  | 472.7  | 263.9  | 205.4  | 192.3  | 185.7  |
| 80°    | 355.1  | 189.2  | 156.3  | 143.5  | 143.5  |
| 82.5°  | 247.6  | 127.2  | 107.6  | 101.0  | 101.0  |
| 85°    | 140.1  | 71.6   | 61.9   | 61.9   | 61.9   |
| 87.5°  | 52.2   | 25.9   | 25.9   | 22.8   | 22.8   |
| 90°    | 2.1    | 25.5   | 42.5   | 53.3   | 57.4   |
| 92.5°  | 53.3   | 44.8   | 51.0   | 55.4   | 57.4   |
| 95°    | 138.2  | 68.0   | 82.9   | 93.7   | 91.5   |
| 97.5°  | 248.9  | 74.5   | 108.4  | 114.9  | 117.0  |
| 100°   | 376.8  | 85.2   | 121.3  | 138.2  | 142.5  |
| 102.5° | 517.0  | 512.9  | 125.6  | 148.9  | 155.4  |
| 105°   | 646.9  | 710.8  | 129.9  | 153.1  | 161.8  |
| 107.5° | 798.0  | 851.0  | 134.2  | 157.4  | 166.0  |
| 110°   | 942.8  | 987.3  | 372.5  | 159.7  | 168.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1079.0 | 1117.1 | 1081.0 | 163.7  | 170.3  |
| 115°   | 1223.5 | 1259.6 | 1313.0 | 327.7  | 174.6  |
| 117.5° | 1349.2 | 1391.6 | 1428.0 | 1123.5 | 566.0  |
| 120°   | 1489.6 | 1521.5 | 1559.9 | 1585.4 | 1298.1 |
| 122.5° | 1608.7 | 1642.7 | 1685.4 | 1698.1 | 1700.4 |
| 125°   | 1730.0 | 1757.8 | 1798.2 | 1813.1 | 1819.4 |
| 127.5° | 1840.6 | 1870.4 | 1902.5 | 1923.7 | 1925.8 |
| 130°   | 1945.0 | 1979.1 | 2002.3 | 2025.8 | 2023.9 |
| 132.5° | 2051.4 | 2079.2 | 2102.4 | 2121.6 | 2119.6 |
| 135°   | 2140.9 | 2174.9 | 2193.9 | 2215.4 | 2211.1 |
| 137.5° | 2234.3 | 2259.9 | 2281.3 | 2302.6 | 2296.2 |
| 140°   | 2325.8 | 2343.0 | 2366.2 | 2385.4 | 2374.8 |
| 142.5° | 2402.6 | 2417.5 | 2445.1 | 2462.0 | 2451.4 |
| 145°   | 2483.5 | 2481.2 | 2517.3 | 2532.3 | 2521.7 |
| 147.5° | 2553.5 | 2547.2 | 2583.3 | 2593.9 | 2585.6 |
| 150°   | 2621.7 | 2606.8 | 2640.9 | 2653.6 | 2643.0 |
| 152.5° | 2679.1 | 2662.1 | 2694.0 | 2706.9 | 2692.0 |
| 155°   | 2734.5 | 2715.4 | 2740.9 | 2753.6 | 2736.7 |
| 157.5° | 2779.1 | 2762.2 | 2781.4 | 2796.3 | 2779.1 |
| 160°   | 2817.6 | 2804.6 | 2817.6 | 2830.1 | 2815.3 |
| 162.5° | 2851.4 | 2838.8 | 2849.4 | 2864.3 | 2845.1 |
| 165°   | 2881.2 | 2868.6 | 2874.9 | 2889.8 | 2874.9 |
| 167.5° | 2904.7 | 2891.9 | 2898.4 | 2913.3 | 2894.2 |
| 170°   | 2923.9 | 2911.0 | 2915.3 | 2930.3 | 2911.0 |
| 172.5° | 2936.5 | 2923.9 | 2928.2 | 2943.1 | 2923.9 |
| 175°   | 2947.2 | 2932.3 | 2936.5 | 2951.5 | 2930.3 |
| 177.5° | 2951.5 | 2936.5 | 2938.8 | 2953.7 | 2934.6 |
| 180°   | 2940.9 | 2940.9 | 2940.9 | 2940.9 | 2940.9 |

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**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 | 10.43            | 11.23 | 11.43 | 12.23 | 13.56 | 6.40           | 7.20  | 7.40  | 8.21  | 9.53  |
|                 | 3H   | 12.11            | 12.82 | 13.11 | 13.83 | 15.18 | 7.59           | 8.31  | 8.60  | 9.32  | 10.67 |
|                 | 4H   | 12.71            | 13.39 | 13.73 | 14.40 | 15.76 | 8.04           | 8.72  | 9.06  | 9.73  | 11.09 |
|                 | 6H   | 13.13            | 13.76 | 14.16 | 14.77 | 16.14 | 8.36           | 8.98  | 9.39  | 10.00 | 11.37 |
|                 | 8H   | 13.26            | 13.85 | 14.29 | 14.89 | 16.25 | 8.45           | 9.04  | 9.49  | 10.08 | 11.44 |
|                 | 12H  | 13.32            | 13.88 | 14.36 | 14.91 | 16.30 | 8.50           | 9.06  | 9.53  | 10.09 | 11.47 |
| 4H              | 2H   | 10.45            | 11.12 | 11.47 | 12.14 | 13.49 | 7.00           | 7.67  | 8.02  | 8.69  | 10.04 |
|                 | 3H   | 12.27            | 12.83 | 13.31 | 13.88 | 15.25 | 8.34           | 8.91  | 9.38  | 9.95  | 11.32 |
|                 | 4H   | 12.96            | 13.48 | 14.00 | 14.51 | 15.90 | 8.89           | 9.41  | 9.93  | 10.44 | 11.83 |
|                 | 6H   | 13.48            | 13.92 | 14.53 | 14.98 | 16.36 | 9.31           | 9.75  | 10.36 | 10.81 | 12.20 |
|                 | 8H   | 13.65            | 14.06 | 14.70 | 15.11 | 16.52 | 9.44           | 9.85  | 10.49 | 10.90 | 12.31 |
|                 | 12H  | 13.74            | 14.12 | 14.81 | 15.18 | 16.59 | 9.50           | 9.88  | 10.57 | 10.94 | 12.35 |
| 8H              | 4H   | 12.93            | 13.34 | 13.98 | 14.39 | 15.79 | 9.17           | 9.58  | 10.22 | 10.63 | 12.04 |
|                 | 6H   | 13.49            | 13.83 | 14.57 | 14.93 | 16.33 | 9.69           | 10.03 | 10.76 | 11.12 | 12.52 |
|                 | 8H   | 13.71            | 14.01 | 14.79 | 15.09 | 16.50 | 9.88           | 10.18 | 10.96 | 11.26 | 12.68 |
|                 | 12H  | 13.85            | 14.11 | 14.93 | 15.18 | 16.64 | 10.00          | 10.26 | 11.08 | 11.33 | 12.79 |
| 12H             | 4H   | 12.88            | 13.25 | 13.95 | 14.32 | 15.72 | 9.17           | 9.55  | 10.24 | 10.61 | 12.02 |
|                 | 6H   | 13.47            | 13.77 | 14.55 | 14.85 | 16.26 | 9.74           | 10.04 | 10.82 | 11.11 | 12.53 |
|                 | 8H   | 13.69            | 13.95 | 14.77 | 15.02 | 16.48 | 9.95           | 10.21 | 11.03 | 11.28 | 12.74 |

END OF REPORT