

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: P911425

Luminaire Tested: DFN2DIP-PN4F0-060D100US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911425  
REPORT IS A COMBINATION OF REPORTS P901241 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-060D100US850-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

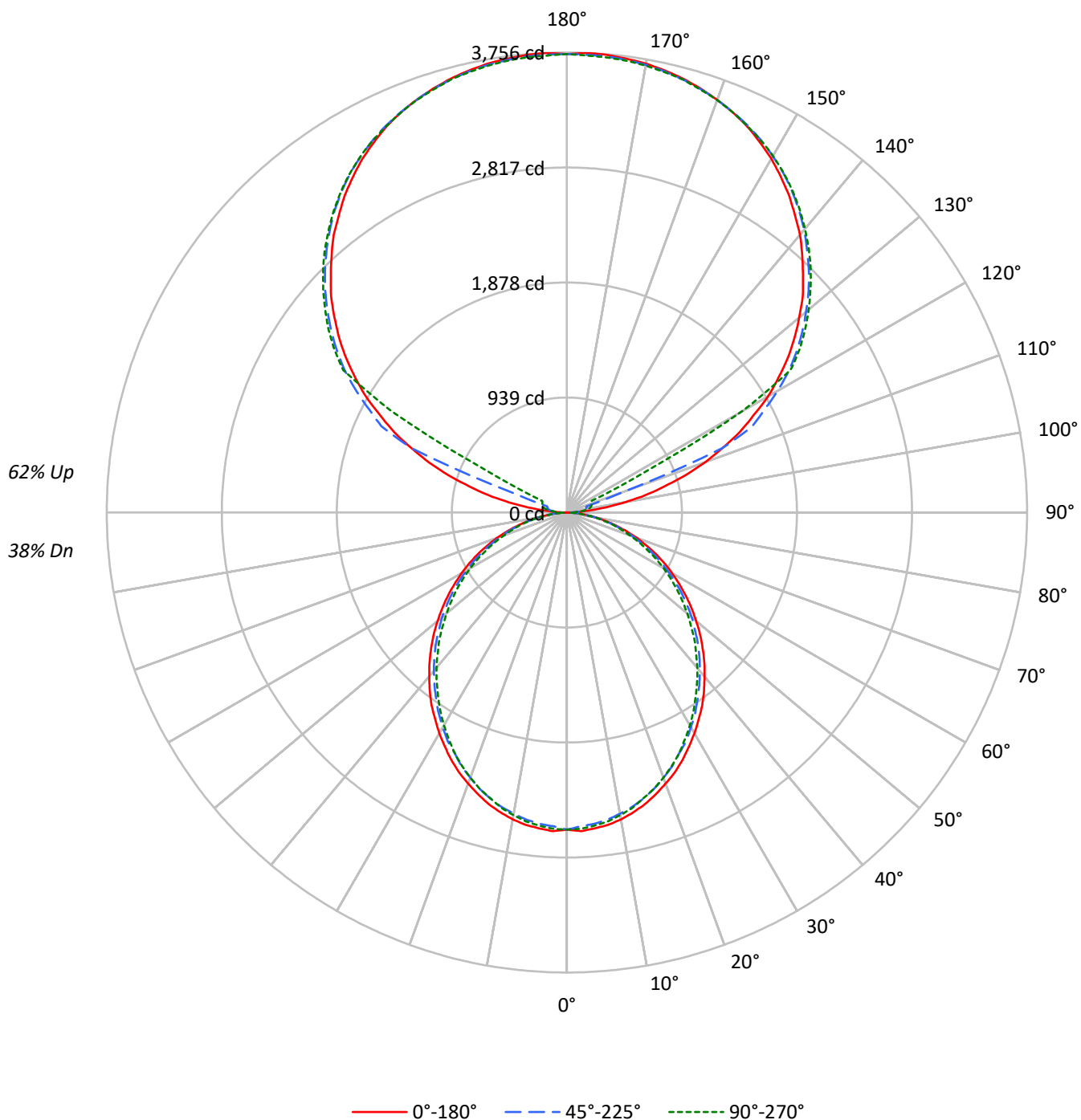
Lumens per Lamp: N/A  
Luminaire Lumens: 17566.5 lumens  
Efficiency: N/A  
Efficacy: 135.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 129.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 83  | 86 | 82 | 79 | 76 | 67 | 65 | 63 | 53 | 51 | 50 | 39 | 39 | 38 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 62  | 57  | 71 | 63 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 49 | 44 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 34 | 29 | 33 | 28 | 24 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 28 | 23 | 19 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 14 | 16 | 13 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1890 | 1890 | 1890 |
| 5°  | 1893 | 1864 | 1877 |
| 10° | 1878 | 1839 | 1851 |
| 15° | 1850 | 1809 | 1812 |
| 20° | 1813 | 1767 | 1772 |
| 25° | 1776 | 1717 | 1725 |
| 30° | 1729 | 1671 | 1666 |
| 35° | 1685 | 1616 | 1603 |
| 40° | 1631 | 1560 | 1543 |
| 45° | 1577 | 1505 | 1482 |
| 50° | 1517 | 1446 | 1411 |
| 55° | 1456 | 1379 | 1346 |
| 60° | 1386 | 1299 | 1272 |
| 65° | 1309 | 1216 | 1184 |
| 70° | 1212 | 1114 | 1089 |
| 75° | 1077 | 994  | 1003 |
| 80° | 915  | 839  | 836  |
| 85° | 661  | 572  | 560  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1996 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 243.7   | 1.4       |
| 10°-20°   | 685.6   | 3.9       |
| 20°-30°   | 1007.6  | 5.7       |
| 30°-40°   | 1170.3  | 6.7       |
| 40°-50°   | 1168.8  | 6.7       |
| 50°-60°   | 1019.2  | 5.8       |
| 60°-70°   | 753.4   | 4.3       |
| 70°-80°   | 426.3   | 2.4       |
| 80°-90°   | 119.1   | 0.7       |
| 90°-100°  | 123.4   | 0.7       |
| 100°-110° | 460.1   | 2.6       |
| 110°-120° | 1220.2  | 6.9       |
| 120°-130° | 2023.8  | 11.5      |
| 130°-140° | 2149.7  | 12.2      |
| 140°-150° | 1997.9  | 11.4      |
| 150°-160° | 1606.3  | 9.1       |
| 160°-170° | 1035.0  | 5.9       |
| 170°-180° | 356.2   | 2.0       |
| 0°-30°    | 1937.0  | 11.0      |
| 0°-40°    | 3107.2  | 17.7      |
| 0°-60°    | 5295.3  | 30.1      |
| 0°-90°    | 6594.0  | 37.5      |
| 90°-120°  | 1803.7  | 10.3      |
| 90°-150°  | 7975.0  | 45.4      |
| 90°-180°  | 10973.0 | 62.5      |
| 0°-180°   | 17566.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2589 | 2589  | 2589 | 2589  | 2589 |      |
| 5°   | 2589 | 2579  | 2552 | 2572  | 2567 | 246  |
| 15°  | 2465 | 2450  | 2417 | 2428  | 2415 | 694  |
| 25°  | 2231 | 2211  | 2168 | 2173  | 2168 | 1026 |
| 35°  | 1925 | 1900  | 1860 | 1845  | 1832 | 1202 |
| 45°  | 1566 | 1549  | 1511 | 1484  | 1474 | 1209 |
| 55°  | 1185 | 1170  | 1140 | 1110  | 1098 | 1060 |
| 65°  | 799  | 784   | 759  | 737   | 724  | 790  |
| 75°  | 418  | 413   | 401  | 386   | 391  | 446  |
| 85°  | 102  | 100   | 97   | 90    | 87   | 114  |
| 90°  | 3    | 32    | 54   | 68    | 73   | 16   |
| 95°  | 176  | 86    | 106  | 119   | 116  | 208  |
| 105° | 823  | 905   | 165  | 195   | 206  | 880  |
| 115° | 1557 | 1603  | 1671 | 417   | 222  | 1533 |
| 125° | 2202 | 2237  | 2288 | 2308  | 2316 | 1964 |
| 135° | 2725 | 2768  | 2792 | 2819  | 2814 | 2105 |
| 145° | 3161 | 3158  | 3204 | 3223  | 3209 | 1977 |
| 155° | 3480 | 3456  | 3488 | 3504  | 3483 | 1604 |
| 165° | 3667 | 3651  | 3659 | 3678  | 3659 | 1036 |
| 175° | 3751 | 3732  | 3737 | 3756  | 3729 | 357  |
| 180° | 3743 | 3743  | 3743 | 3743  | 3743 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2589.1 | 2589.1 | 2589.1 | 2589.1 | 2589.1 |
| 2.5°   | 2604.2 | 2591.7 | 2564.2 | 2589.1 | 2584.3 |
| 5°     | 2589.1 | 2579.3 | 2551.8 | 2571.7 | 2566.9 |
| 7.5°   | 2571.7 | 2556.9 | 2529.4 | 2549.5 | 2544.5 |
| 10°    | 2544.5 | 2527.1 | 2497.1 | 2517.0 | 2509.6 |
| 12.5°  | 2507.0 | 2492.1 | 2462.3 | 2474.7 | 2469.7 |
| 15°    | 2464.6 | 2449.9 | 2417.4 | 2427.5 | 2415.1 |
| 17.5°  | 2412.4 | 2397.7 | 2365.2 | 2377.5 | 2365.2 |
| 20°    | 2355.1 | 2340.3 | 2305.4 | 2312.8 | 2303.1 |
| 22.5°  | 2298.1 | 2275.6 | 2243.1 | 2243.1 | 2238.1 |
| 25°    | 2230.6 | 2210.9 | 2168.5 | 2173.3 | 2168.5 |
| 27.5°  | 2155.9 | 2138.5 | 2106.2 | 2098.9 | 2086.5 |
| 30°    | 2081.5 | 2061.3 | 2024.1 | 2016.7 | 2006.6 |
| 32.5°  | 2001.6 | 1986.9 | 1947.0 | 1931.9 | 1921.9 |
| 35°    | 1924.6 | 1899.7 | 1859.8 | 1844.7 | 1832.3 |
| 37.5°  | 1837.4 | 1814.9 | 1775.1 | 1757.5 | 1745.1 |
| 40°    | 1747.8 | 1727.7 | 1687.9 | 1665.7 | 1655.6 |
| 42.5°  | 1660.6 | 1640.5 | 1601.0 | 1575.9 | 1561.0 |
| 45°    | 1566.1 | 1548.6 | 1511.1 | 1484.0 | 1473.9 |
| 47.5°  | 1473.9 | 1456.4 | 1416.6 | 1389.1 | 1374.3 |
| 50°    | 1376.7 | 1364.3 | 1329.5 | 1294.5 | 1282.1 |
| 52.5°  | 1282.1 | 1264.7 | 1232.4 | 1205.0 | 1187.6 |
| 55°    | 1185.2 | 1170.1 | 1140.3 | 1110.4 | 1098.0 |
| 57.5°  | 1088.0 | 1075.6 | 1043.1 | 1013.3 | 1003.2 |
| 60°    | 990.8  | 981.0  | 946.2  | 918.7  | 911.3  |
| 62.5°  | 896.2  | 878.8  | 853.9  | 829.1  | 819.1  |
| 65°    | 799.3  | 784.3  | 759.4  | 736.9  | 724.5  |
| 67.5°  | 699.7  | 687.0  | 664.8  | 647.4  | 637.3  |
| 70°    | 607.5  | 597.5  | 575.0  | 557.6  | 547.8  |
| 72.5°  | 512.9  | 502.9  | 490.5  | 473.1  | 465.7  |
| 75°    | 418.1  | 413.4  | 400.7  | 385.9  | 390.9  |
| 77.5°  | 333.6  | 323.6  | 318.5  | 311.2  | 303.8  |
| 80°    | 249.1  | 246.4  | 241.4  | 234.0  | 229.0  |
| 82.5°  | 169.3  | 169.3  | 166.9  | 156.9  | 156.9  |
| 85°    | 101.9  | 99.6   | 97.1   | 89.5   | 87.2   |
| 87.5°  | 44.9   | 39.9   | 34.8   | 27.5   | 24.8   |
| 90°    | 2.6    | 32.5   | 54.0   | 67.9   | 73.0   |
| 92.5°  | 67.9   | 56.9   | 65.0   | 70.4   | 73.0   |
| 95°    | 175.9  | 86.5   | 105.5  | 119.3  | 116.4  |
| 97.5°  | 316.7  | 94.8   | 138.0  | 146.3  | 148.9  |
| 100°   | 479.5  | 108.3  | 154.4  | 175.9  | 181.4  |
| 102.5° | 658.0  | 652.9  | 159.8  | 189.4  | 197.7  |
| 105°   | 823.3  | 904.6  | 165.4  | 194.9  | 205.8  |
| 107.5° | 1015.6 | 1083.2 | 170.8  | 200.4  | 211.3  |
| 110°   | 1199.8 | 1256.5 | 474.0  | 203.3  | 213.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1373.2 | 1421.7 | 1375.8 | 208.4  | 216.8  |
| 115°   | 1557.1 | 1603.2 | 1671.0 | 417.1  | 222.2  |
| 117.5° | 1717.0 | 1771.1 | 1817.3 | 1429.8 | 720.4  |
| 120°   | 1895.8 | 1936.3 | 1985.2 | 2017.7 | 1652.1 |
| 122.5° | 2047.3 | 2090.7 | 2145.0 | 2161.1 | 2164.0 |
| 125°   | 2201.7 | 2237.1 | 2288.5 | 2307.5 | 2315.5 |
| 127.5° | 2342.5 | 2380.5 | 2421.3 | 2448.3 | 2450.9 |
| 130°   | 2475.3 | 2518.8 | 2548.4 | 2578.2 | 2575.7 |
| 132.5° | 2610.7 | 2646.1 | 2675.7 | 2700.1 | 2697.5 |
| 135°   | 2724.6 | 2768.0 | 2792.1 | 2819.4 | 2814.0 |
| 137.5° | 2843.6 | 2876.1 | 2903.4 | 2930.4 | 2922.3 |
| 140°   | 2959.9 | 2981.9 | 3011.4 | 3035.9 | 3022.4 |
| 142.5° | 3057.7 | 3076.7 | 3111.7 | 3133.3 | 3119.8 |
| 145°   | 3160.6 | 3157.8 | 3203.8 | 3222.8 | 3209.2 |
| 147.5° | 3249.7 | 3241.7 | 3287.6 | 3301.2 | 3290.6 |
| 150°   | 3336.5 | 3317.6 | 3361.0 | 3377.1 | 3363.6 |
| 152.5° | 3409.5 | 3388.0 | 3428.6 | 3444.9 | 3425.9 |
| 155°   | 3480.0 | 3455.9 | 3488.4 | 3504.4 | 3482.9 |
| 157.5° | 3536.9 | 3515.4 | 3539.8 | 3558.8 | 3536.9 |
| 160°   | 3585.8 | 3569.4 | 3585.8 | 3601.9 | 3583.0 |
| 162.5° | 3628.9 | 3612.8 | 3626.3 | 3645.3 | 3620.9 |
| 165°   | 3666.8 | 3650.7 | 3658.8 | 3677.8 | 3658.8 |
| 167.5° | 3696.7 | 3680.3 | 3688.8 | 3707.7 | 3683.2 |
| 170°   | 3721.1 | 3704.8 | 3710.3 | 3729.2 | 3704.8 |
| 172.5° | 3737.2 | 3721.1 | 3726.7 | 3745.6 | 3721.1 |
| 175°   | 3750.7 | 3731.8 | 3737.2 | 3756.3 | 3729.2 |
| 177.5° | 3756.3 | 3737.2 | 3740.2 | 3759.2 | 3734.7 |
| 180°   | 3742.8 | 3742.8 | 3742.8 | 3742.8 | 3742.8 |

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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 | 8.22             | 8.97  | 9.27  | 10.04 | 11.47 | 7.78           | 8.53  | 8.83  | 9.60  | 11.03 |
|                 | 3H   | 9.87             | 10.55 | 10.94 | 11.62 | 13.08 | 9.39           | 10.07 | 10.45 | 11.14 | 12.59 |
|                 | 4H   | 10.46            | 11.10 | 11.53 | 12.17 | 13.64 | 9.97           | 10.61 | 11.05 | 11.68 | 13.15 |
|                 | 6H   | 10.85            | 11.45 | 11.94 | 12.52 | 14.00 | 10.36          | 10.95 | 11.45 | 12.03 | 13.51 |
|                 | 8H   | 10.96            | 11.52 | 12.05 | 12.61 | 14.08 | 10.46          | 11.03 | 11.55 | 12.12 | 13.59 |
|                 | 12H  | 11.00            | 11.54 | 12.10 | 12.62 | 14.12 | 10.50          | 11.04 | 11.60 | 12.12 | 13.62 |
| 4H              | 2H   | 8.66             | 9.31  | 9.75  | 10.38 | 11.84 | 8.31           | 8.96  | 9.40  | 10.03 | 11.49 |
|                 | 3H   | 10.52            | 11.06 | 11.62 | 12.16 | 13.64 | 10.12          | 10.66 | 11.21 | 11.76 | 13.23 |
|                 | 4H   | 11.24            | 11.73 | 12.33 | 12.82 | 14.32 | 10.82          | 11.31 | 11.92 | 12.40 | 13.90 |
|                 | 6H   | 11.75            | 12.17 | 12.85 | 13.28 | 14.77 | 11.32          | 11.75 | 12.43 | 12.86 | 14.35 |
|                 | 8H   | 11.90            | 12.29 | 13.00 | 13.40 | 14.90 | 11.47          | 11.86 | 12.57 | 12.97 | 14.48 |
|                 | 12H  | 11.97            | 12.33 | 13.09 | 13.44 | 14.95 | 11.53          | 11.89 | 12.65 | 13.00 | 14.51 |
| 8H              | 4H   | 11.42            | 11.82 | 12.53 | 12.92 | 14.43 | 11.05          | 11.45 | 12.16 | 12.55 | 14.06 |
|                 | 6H   | 12.06            | 12.38 | 13.18 | 13.53 | 15.03 | 11.68          | 12.01 | 12.81 | 13.15 | 14.66 |
|                 | 8H   | 12.28            | 12.56 | 13.41 | 13.69 | 15.21 | 11.89          | 12.18 | 13.03 | 13.31 | 14.83 |
|                 | 12H  | 12.41            | 12.66 | 13.54 | 13.78 | 15.34 | 12.00          | 12.26 | 13.14 | 13.38 | 14.94 |
| 12H             | 4H   | 11.41            | 11.76 | 12.53 | 12.88 | 14.39 | 11.04          | 11.40 | 12.17 | 12.52 | 14.03 |
|                 | 6H   | 12.08            | 12.37 | 13.22 | 13.50 | 15.02 | 11.72          | 12.01 | 12.85 | 13.13 | 14.66 |
|                 | 8H   | 12.32            | 12.58 | 13.46 | 13.70 | 15.26 | 11.95          | 12.20 | 13.09 | 13.33 | 14.89 |

END OF REPORT