

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: P917028

Luminaire Tested: DFN2DIP-PN4F0-100D110US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917028  
REPORT IS A COMBINATION OF REPORTS P899747 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-100D110US930-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

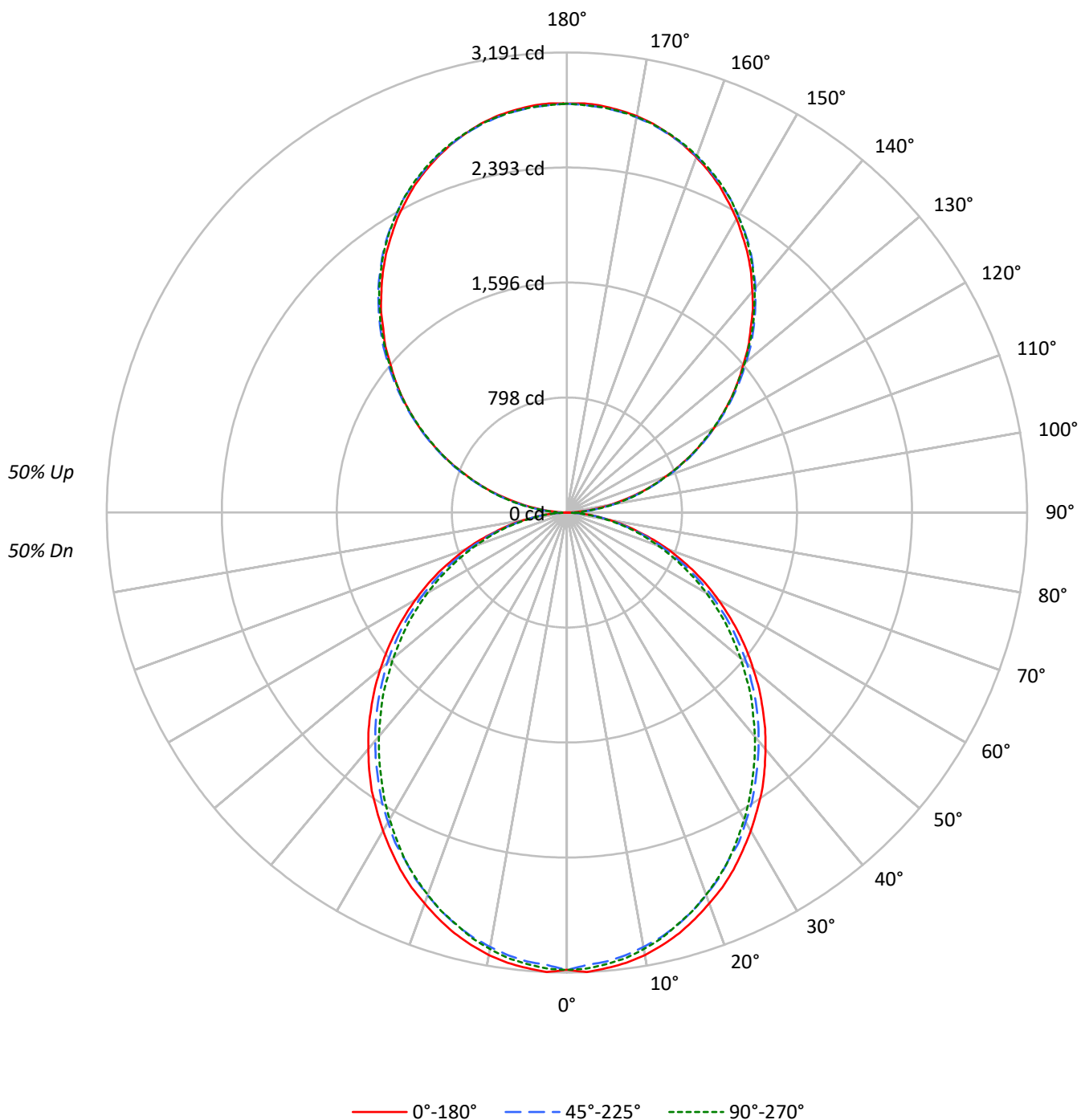
Lumens per Lamp: N/A  
Luminaire Lumens: 16008.4 lumens  
Efficiency: N/A  
Efficacy: 83.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 192.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P917028

CATALOG NUMBER: DFN2DIP-PN4F0-100D110US930-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P917028

CATALOG NUMBER: DFN2DIP-PN4F0-100D110US930-FLLFL

**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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 69 | 69 | 69 | 57 | 57 | 57 |
| 1   | 98  | 94  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 89  | 82  | 76  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 54 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 67 | 60 | 55 | 57 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 30 |
| 5   | 68  | 57  | 49  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 41 | 35 | 31 | 34 | 30 | 27 | 29 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 54 | 43 | 36 | 31 | 37 | 31 | 27 | 31 | 27 | 24 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 34 | 28 | 24 | 29 | 24 | 21 | 24 | 21 | 18 |
| 9   | 50  | 38  | 31  | 25  | 46 | 36 | 29 | 24 | 31 | 25 | 22 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2316 | 2316 | 2316 |
| 5°  | 2319 | 2284 | 2299 |
| 10° | 2301 | 2253 | 2269 |
| 15° | 2267 | 2217 | 2220 |
| 20° | 2221 | 2165 | 2171 |
| 25° | 2176 | 2104 | 2114 |
| 30° | 2119 | 2047 | 2041 |
| 35° | 2065 | 1980 | 1964 |
| 40° | 1998 | 1912 | 1891 |
| 45° | 1932 | 1843 | 1816 |
| 50° | 1859 | 1772 | 1729 |
| 55° | 1783 | 1689 | 1649 |
| 60° | 1698 | 1591 | 1558 |
| 65° | 1604 | 1490 | 1450 |
| 70° | 1485 | 1366 | 1335 |
| 75° | 1320 | 1217 | 1229 |
| 80° | 1121 | 1029 | 1024 |
| 85° | 811  | 702  | 685  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2220 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 298.6   | 1.9       |
| 10°-20°   | 840.1   | 5.2       |
| 20°-30°   | 1234.6  | 7.7       |
| 30°-40°   | 1433.9  | 9.0       |
| 40°-50°   | 1432.1  | 8.9       |
| 50°-60°   | 1248.8  | 7.8       |
| 60°-70°   | 923.1   | 5.8       |
| 70°-80°   | 522.3   | 3.3       |
| 80°-90°   | 145.9   | 0.9       |
| 90°-100°  | 175.5   | 1.1       |
| 100°-110° | 557.7   | 3.5       |
| 110°-120° | 954.3   | 6.0       |
| 120°-130° | 1255.1  | 7.8       |
| 130°-140° | 1408.8  | 8.8       |
| 140°-150° | 1381.5  | 8.6       |
| 150°-160° | 1158.9  | 7.2       |
| 160°-170° | 768.5   | 4.8       |
| 170°-180° | 268.6   | 1.7       |
| 0°-30°    | 2373.3  | 14.8      |
| 0°-40°    | 3807.2  | 23.8      |
| 0°-60°    | 6488.2  | 40.5      |
| 0°-90°    | 8079.5  | 50.5      |
| 90°-120°  | 1687.5  | 10.5      |
| 90°-150°  | 5732.8  | 35.8      |
| 90°-180°  | 7929.0  | 49.5      |
| 0°-180°   | 16008.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3172 | 3172  | 3172 | 3172  | 3172 |      |
| 5°   | 3172 | 3160  | 3127 | 3151  | 3145 | 301  |
| 15°  | 3020 | 3002  | 2962 | 2974  | 2959 | 851  |
| 25°  | 2733 | 2709  | 2657 | 2663  | 2657 | 1258 |
| 35°  | 2358 | 2328  | 2279 | 2260  | 2245 | 1473 |
| 45°  | 1919 | 1898  | 1852 | 1818  | 1806 | 1481 |
| 55°  | 1452 | 1434  | 1397 | 1361  | 1345 | 1298 |
| 65°  | 979  | 961   | 930  | 903   | 888  | 968  |
| 75°  | 512  | 506   | 491  | 473   | 479  | 547  |
| 85°  | 125  | 122   | 119  | 110   | 107  | 139  |
| 90°  | 2    | 31    | 84   | 79    | 81   | 15   |
| 95°  | 125  | 149   | 153  | 153   | 149  | 139  |
| 105° | 515  | 522   | 527  | 531   | 531  | 543  |
| 115° | 958  | 971   | 967  | 965   | 958  | 947  |
| 125° | 1393 | 1414  | 1407 | 1400  | 1397 | 1245 |
| 135° | 1802 | 1828  | 1833 | 1831  | 1824 | 1393 |
| 145° | 2187 | 2204  | 2218 | 2221  | 2211 | 1367 |
| 155° | 2501 | 2508  | 2516 | 2528  | 2520 | 1151 |
| 165° | 2721 | 2718  | 2718 | 2735  | 2723 | 768  |
| 175° | 2831 | 2824  | 2819 | 2836  | 2822 | 269  |
| 180° | 2836 | 2836  | 2836 | 2836  | 2836 |      |

TEST NUMBER: P917028

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3172.4 | 3172.4 | 3172.4 | 3172.4 | 3172.4 |
| 2.5°   | 3190.8 | 3175.6 | 3141.9 | 3172.4 | 3166.5 |
| 5°     | 3172.4 | 3160.4 | 3126.8 | 3151.0 | 3145.2 |
| 7.5°   | 3151.0 | 3132.9 | 3099.2 | 3123.8 | 3117.7 |
| 10°    | 3117.7 | 3096.3 | 3059.7 | 3084.0 | 3075.0 |
| 12.5°  | 3071.7 | 3053.6 | 3017.0 | 3032.3 | 3026.1 |
| 15°    | 3019.9 | 3001.8 | 2962.0 | 2974.3 | 2959.1 |
| 17.5°  | 2955.9 | 2937.8 | 2897.9 | 2913.1 | 2897.9 |
| 20°    | 2885.6 | 2867.5 | 2824.8 | 2833.8 | 2821.8 |
| 22.5°  | 2815.7 | 2788.2 | 2748.4 | 2748.4 | 2742.3 |
| 25°    | 2733.2 | 2708.9 | 2657.1 | 2662.9 | 2657.1 |
| 27.5°  | 2641.6 | 2620.2 | 2580.7 | 2571.7 | 2556.4 |
| 30°    | 2550.3 | 2525.7 | 2480.1 | 2471.0 | 2458.7 |
| 32.5°  | 2452.6 | 2434.5 | 2385.6 | 2367.1 | 2354.8 |
| 35°    | 2358.1 | 2327.7 | 2278.8 | 2260.3 | 2245.1 |
| 37.5°  | 2251.3 | 2223.7 | 2174.9 | 2153.5 | 2138.3 |
| 40°    | 2141.5 | 2116.9 | 2068.1 | 2040.9 | 2028.6 |
| 42.5°  | 2034.7 | 2010.1 | 1961.6 | 1930.9 | 1912.8 |
| 45°    | 1918.9 | 1897.5 | 1851.5 | 1818.2 | 1806.0 |
| 47.5°  | 1806.0 | 1784.6 | 1735.7 | 1702.0 | 1683.9 |
| 50°    | 1686.9 | 1671.6 | 1628.9 | 1586.2 | 1571.0 |
| 52.5°  | 1571.0 | 1549.6 | 1510.1 | 1476.5 | 1455.1 |
| 55°    | 1452.2 | 1433.8 | 1397.2 | 1360.6 | 1345.4 |
| 57.5°  | 1333.1 | 1317.8 | 1278.1 | 1241.5 | 1229.2 |
| 60°    | 1214.0 | 1202.0 | 1159.3 | 1125.6 | 1116.6 |
| 62.5°  | 1098.1 | 1076.8 | 1046.4 | 1015.9 | 1003.6 |
| 65°    | 979.3  | 960.9  | 930.5  | 902.9  | 887.8  |
| 67.5°  | 857.4  | 841.8  | 814.6  | 793.3  | 781.0  |
| 70°    | 744.4  | 732.1  | 704.6  | 683.2  | 671.2  |
| 72.5°  | 628.5  | 616.2  | 601.0  | 579.7  | 570.5  |
| 75°    | 512.3  | 506.5  | 491.0  | 472.9  | 479.0  |
| 77.5°  | 408.8  | 396.5  | 390.3  | 381.2  | 372.2  |
| 80°    | 305.2  | 302.0  | 295.8  | 286.7  | 280.6  |
| 82.5°  | 207.5  | 207.5  | 204.6  | 192.2  | 192.2  |
| 85°    | 124.9  | 122.1  | 119.1  | 109.7  | 106.8  |
| 87.5°  | 55.0   | 48.8   | 42.7   | 33.7   | 30.4   |
| 90°    | 2.5    | 30.8   | 83.8   | 78.7   | 81.2   |
| 92.5°  | 53.0   | 71.8   | 74.4   | 77.0   | 77.0   |
| 95°    | 124.8  | 148.8  | 153.0  | 153.0  | 148.8  |
| 97.5°  | 207.8  | 230.0  | 239.5  | 239.5  | 239.5  |
| 100°   | 303.5  | 323.2  | 330.0  | 330.0  | 327.5  |
| 102.5° | 404.5  | 419.0  | 428.4  | 431.0  | 428.4  |
| 105°   | 514.8  | 521.6  | 526.8  | 531.0  | 531.0  |
| 107.5° | 624.2  | 634.5  | 634.5  | 636.2  | 624.2  |
| 110°   | 730.3  | 744.0  | 744.0  | 744.0  | 737.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 844.8  | 859.3  | 856.8  | 849.9  | 844.8  |
| 115°   | 957.7  | 971.3  | 967.1  | 964.6  | 957.7  |
| 117.5° | 1069.8 | 1088.5 | 1076.5 | 1069.8 | 1062.9 |
| 120°   | 1182.6 | 1201.4 | 1182.6 | 1182.6 | 1174.9 |
| 122.5° | 1285.2 | 1309.1 | 1297.1 | 1290.3 | 1285.2 |
| 125°   | 1392.9 | 1414.3 | 1407.4 | 1399.8 | 1397.2 |
| 127.5° | 1498.1 | 1524.6 | 1515.2 | 1505.0 | 1498.1 |
| 130°   | 1596.4 | 1627.3 | 1622.9 | 1617.8 | 1608.4 |
| 132.5° | 1706.7 | 1730.7 | 1732.4 | 1720.4 | 1713.6 |
| 135°   | 1801.6 | 1828.1 | 1833.3 | 1830.8 | 1823.9 |
| 137.5° | 1907.7 | 1929.1 | 1933.3 | 1931.6 | 1921.4 |
| 140°   | 2000.9 | 2022.3 | 2034.3 | 2034.3 | 2024.9 |
| 142.5° | 2096.7 | 2118.1 | 2124.9 | 2127.4 | 2118.1 |
| 145°   | 2187.3 | 2204.4 | 2218.1 | 2220.6 | 2211.3 |
| 147.5° | 2268.6 | 2289.9 | 2300.2 | 2304.4 | 2295.1 |
| 150°   | 2352.4 | 2366.9 | 2376.3 | 2384.0 | 2376.3 |
| 152.5° | 2426.7 | 2441.2 | 2453.2 | 2462.7 | 2453.2 |
| 155°   | 2501.2 | 2507.9 | 2515.7 | 2527.7 | 2519.9 |
| 157.5° | 2565.3 | 2570.4 | 2574.6 | 2591.8 | 2579.8 |
| 160°   | 2622.6 | 2627.7 | 2630.2 | 2644.8 | 2634.6 |
| 162.5° | 2675.6 | 2675.6 | 2678.2 | 2694.4 | 2682.4 |
| 165°   | 2720.9 | 2718.3 | 2718.3 | 2735.4 | 2723.4 |
| 167.5° | 2761.9 | 2754.2 | 2754.2 | 2771.4 | 2759.4 |
| 170°   | 2792.7 | 2785.9 | 2783.3 | 2800.4 | 2785.9 |
| 172.5° | 2814.1 | 2807.2 | 2804.7 | 2821.8 | 2807.2 |
| 175°   | 2831.2 | 2824.4 | 2819.2 | 2836.3 | 2821.8 |
| 177.5° | 2840.6 | 2833.7 | 2828.6 | 2843.2 | 2828.6 |
| 180°   | 2836.3 | 2836.3 | 2836.3 | 2836.3 | 2836.3 |

TEST NUMBER: P917028

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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 | 10.24            | 11.10 | 11.19 | 12.07 | 13.34 | 9.80           | 10.66 | 10.75 | 11.63 | 12.90 |
|                 | 3H   | 11.90            | 12.68 | 12.87 | 13.66 | 14.94 | 11.42          | 12.19 | 12.38 | 13.17 | 14.46 |
|                 | 4H   | 12.49            | 13.23 | 13.47 | 14.21 | 15.50 | 12.00          | 12.74 | 12.98 | 13.72 | 15.02 |
|                 | 6H   | 12.89            | 13.57 | 13.88 | 14.56 | 15.87 | 12.40          | 13.08 | 13.39 | 14.07 | 15.37 |
|                 | 8H   | 13.00            | 13.65 | 14.00 | 14.65 | 15.95 | 12.51          | 13.15 | 13.50 | 14.16 | 15.46 |
|                 | 12H  | 13.05            | 13.66 | 14.05 | 14.66 | 15.99 | 12.55          | 13.16 | 13.55 | 14.16 | 15.49 |
| 4H              | 2H   | 10.70            | 11.44 | 11.68 | 12.42 | 13.71 | 10.35          | 11.08 | 11.33 | 12.07 | 13.36 |
|                 | 3H   | 12.57            | 13.18 | 13.56 | 14.19 | 15.50 | 12.17          | 12.78 | 13.16 | 13.79 | 15.10 |
|                 | 4H   | 13.29            | 13.85 | 14.29 | 14.85 | 16.18 | 12.87          | 13.43 | 13.87 | 14.43 | 15.77 |
|                 | 6H   | 13.81            | 14.29 | 14.82 | 15.32 | 16.65 | 13.38          | 13.86 | 14.39 | 14.89 | 16.22 |
|                 | 8H   | 13.96            | 14.41 | 14.97 | 15.43 | 16.77 | 13.53          | 13.98 | 14.54 | 15.00 | 16.34 |
|                 | 12H  | 14.03            | 14.44 | 15.06 | 15.48 | 16.83 | 13.59          | 14.00 | 14.62 | 15.03 | 16.39 |
| 8H              | 4H   | 13.48            | 13.94 | 14.50 | 14.96 | 16.30 | 13.11          | 13.56 | 14.13 | 14.59 | 15.93 |
|                 | 6H   | 14.12            | 14.49 | 15.16 | 15.55 | 16.90 | 13.74          | 14.12 | 14.78 | 15.18 | 16.52 |
|                 | 8H   | 14.34            | 14.67 | 15.39 | 15.72 | 17.08 | 13.96          | 14.29 | 15.00 | 15.33 | 16.70 |
|                 | 12H  | 14.48            | 14.76 | 15.53 | 15.81 | 17.21 | 14.07          | 14.36 | 15.12 | 15.41 | 16.81 |
| 12H             | 4H   | 13.47            | 13.88 | 14.50 | 14.91 | 16.26 | 13.11          | 13.52 | 14.14 | 14.55 | 15.90 |
|                 | 6H   | 14.15            | 14.48 | 15.20 | 15.53 | 16.89 | 13.78          | 14.11 | 14.83 | 15.16 | 16.52 |
|                 | 8H   | 14.39            | 14.68 | 15.44 | 15.73 | 17.13 | 14.02          | 14.31 | 15.07 | 15.35 | 16.76 |

END OF REPORT