

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: P917025

Luminaire Tested: DFN2DIP-PN4F0-100D100US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917025  
REPORT IS A COMBINATION OF REPORTS P901249 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-100D100US930-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

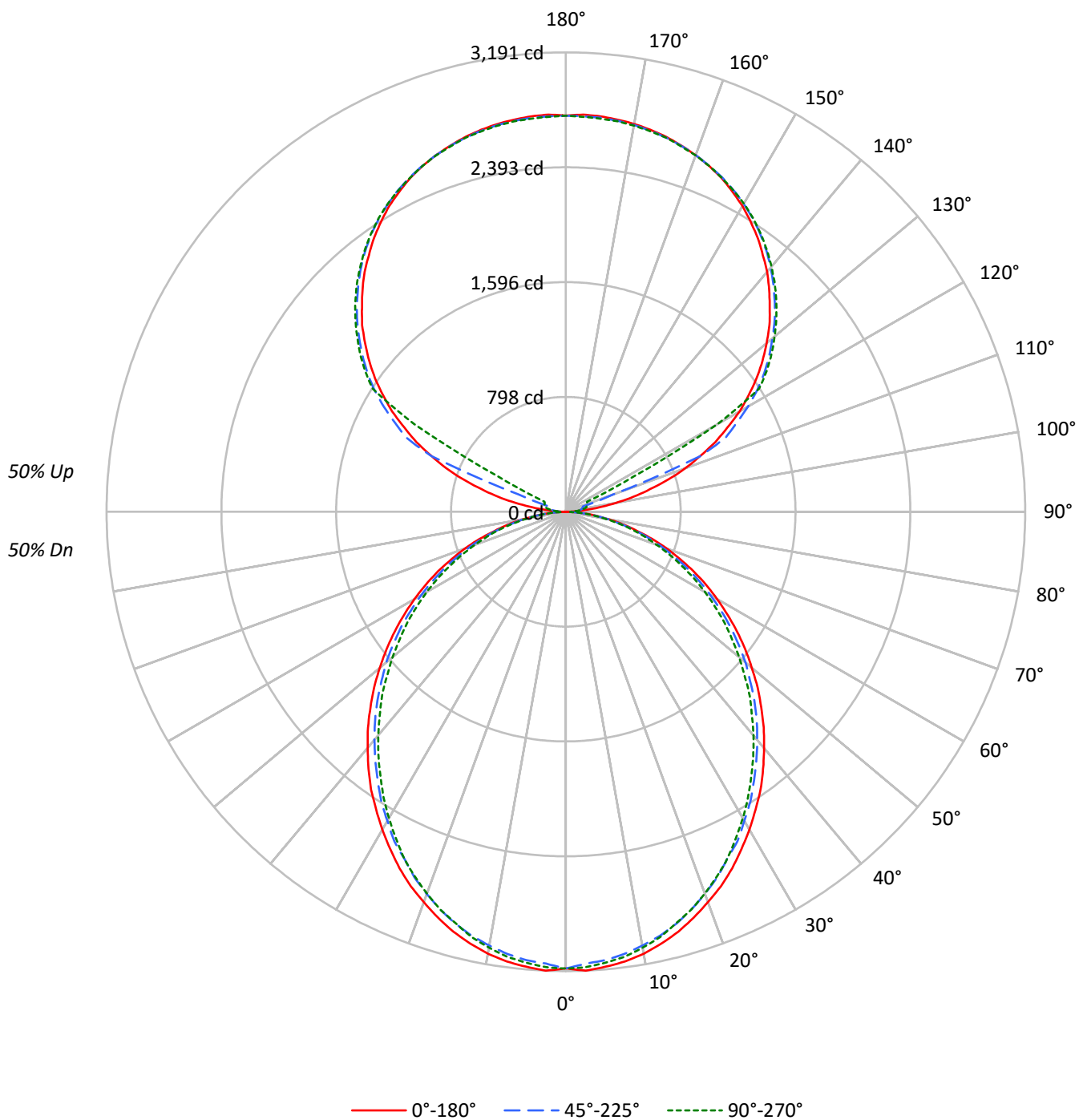
Lumens per Lamp: N/A  
Luminaire Lumens: 16142.9 lumens  
Efficiency: N/A  
Efficacy: 91.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 175.9  
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

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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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 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 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 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: 0°

Vertical Angle: 45°

Luminance: 1932 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 298.6   | 1.8       |
| 10°-20°   | 840.1   | 5.2       |
| 20°-30°   | 1234.6  | 7.6       |
| 30°-40°   | 1433.9  | 8.9       |
| 40°-50°   | 1432.1  | 8.9       |
| 50°-60°   | 1248.8  | 7.7       |
| 60°-70°   | 923.1   | 5.7       |
| 70°-80°   | 522.3   | 3.2       |
| 80°-90°   | 142.7   | 0.9       |
| 90°-100°  | 90.7    | 0.6       |
| 100°-110° | 338.2   | 2.1       |
| 110°-120° | 897.0   | 5.6       |
| 120°-130° | 1487.8  | 9.2       |
| 130°-140° | 1580.4  | 9.8       |
| 140°-150° | 1468.8  | 9.1       |
| 150°-160° | 1180.9  | 7.3       |
| 160°-170° | 760.9   | 4.7       |
| 170°-180° | 261.9   | 1.6       |
| 0°-30°    | 2373.3  | 14.7      |
| 0°-40°    | 3807.2  | 23.6      |
| 0°-60°    | 6488.2  | 40.2      |
| 0°-90°    | 8076.3  | 50.0      |
| 90°-120°  | 1326.0  | 8.2       |
| 90°-150°  | 5862.9  | 36.3      |
| 90°-180°  | 8067.0  | 50.0      |
| 0°-180°   | 16142.9 | 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    | 24    | 40   | 50    | 54   | 15   |
| 95°  | 129  | 64    | 78   | 88    | 86   | 153  |
| 105° | 605  | 665   | 122  | 143   | 151  | 647  |
| 115° | 1145 | 1179  | 1228 | 307   | 163  | 1127 |
| 125° | 1619 | 1645  | 1682 | 1696  | 1702 | 1444 |
| 135° | 2003 | 2035  | 2053 | 2073  | 2069 | 1547 |
| 145° | 2324 | 2322  | 2355 | 2369  | 2359 | 1453 |
| 155° | 2558 | 2541  | 2564 | 2576  | 2560 | 1179 |
| 165° | 2696 | 2684  | 2690 | 2704  | 2690 | 762  |
| 175° | 2757 | 2744  | 2748 | 2762  | 2742 | 262  |
| 180° | 2752 | 2752  | 2752 | 2752  | 2752 |      |

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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°    | 1.9    | 23.9   | 39.7   | 49.9   | 53.6   |
| 92.5°  | 49.9   | 41.8   | 47.8   | 51.8   | 53.6   |
| 95°    | 129.3  | 63.6   | 77.5   | 87.7   | 85.6   |
| 97.5°  | 232.8  | 69.7   | 101.4  | 107.5  | 109.5  |
| 100°   | 352.5  | 79.7   | 113.5  | 129.3  | 133.4  |
| 102.5° | 483.7  | 480.0  | 117.5  | 139.3  | 145.4  |
| 105°   | 605.3  | 665.0  | 121.6  | 143.2  | 151.3  |
| 107.5° | 746.7  | 796.3  | 125.6  | 147.3  | 155.3  |
| 110°   | 882.1  | 923.7  | 348.5  | 149.4  | 157.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1009.5 | 1045.2 | 1011.5 | 153.2  | 159.4  |
| 115°   | 1144.8 | 1178.6 | 1228.5 | 306.6  | 163.4  |
| 117.5° | 1262.2 | 1302.0 | 1336.0 | 1051.2 | 529.6  |
| 120°   | 1393.8 | 1423.5 | 1459.5 | 1483.4 | 1214.5 |
| 122.5° | 1505.1 | 1537.0 | 1576.9 | 1588.8 | 1590.9 |
| 125°   | 1618.6 | 1644.6 | 1682.4 | 1696.4 | 1702.3 |
| 127.5° | 1722.2 | 1750.0 | 1780.0 | 1799.9 | 1801.8 |
| 130°   | 1819.7 | 1851.7 | 1873.5 | 1895.4 | 1893.5 |
| 132.5° | 1919.3 | 1945.3 | 1967.1 | 1985.0 | 1983.1 |
| 135°   | 2003.0 | 2034.9 | 2052.7 | 2072.7 | 2068.7 |
| 137.5° | 2090.5 | 2114.4 | 2134.5 | 2154.3 | 2148.4 |
| 140°   | 2176.0 | 2192.2 | 2213.9 | 2231.9 | 2221.9 |
| 142.5° | 2247.9 | 2261.9 | 2287.6 | 2303.5 | 2293.6 |
| 145°   | 2323.6 | 2321.5 | 2355.3 | 2369.3 | 2359.3 |
| 147.5° | 2389.1 | 2383.2 | 2417.0 | 2426.9 | 2419.2 |
| 150°   | 2452.9 | 2439.0 | 2470.9 | 2482.7 | 2472.8 |
| 152.5° | 2506.6 | 2490.7 | 2520.6 | 2532.6 | 2518.6 |
| 155°   | 2558.4 | 2540.6 | 2564.5 | 2576.3 | 2560.5 |
| 157.5° | 2600.2 | 2584.4 | 2602.4 | 2616.3 | 2600.2 |
| 160°   | 2636.2 | 2624.1 | 2636.2 | 2648.0 | 2634.1 |
| 162.5° | 2667.8 | 2656.0 | 2665.9 | 2679.9 | 2661.9 |
| 165°   | 2695.7 | 2683.9 | 2689.8 | 2703.8 | 2689.8 |
| 167.5° | 2717.7 | 2705.6 | 2711.8 | 2725.8 | 2707.8 |
| 170°   | 2735.7 | 2723.7 | 2727.7 | 2741.6 | 2723.7 |
| 172.5° | 2747.5 | 2735.7 | 2739.7 | 2753.7 | 2735.7 |
| 175°   | 2757.4 | 2743.5 | 2747.5 | 2761.5 | 2741.6 |
| 177.5° | 2761.5 | 2747.5 | 2749.7 | 2763.6 | 2745.6 |
| 180°   | 2751.6 | 2751.6 | 2751.6 | 2751.6 | 2751.6 |

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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 | 10.20            | 11.06 | 11.16 | 12.03 | 13.30 | 9.76           | 10.62 | 10.72 | 11.59 | 12.86 |
|                 | 3H   | 11.86            | 12.64 | 12.83 | 13.62 | 14.91 | 11.38          | 12.15 | 12.35 | 13.13 | 14.43 |
|                 | 4H   | 12.45            | 13.18 | 13.43 | 14.17 | 15.47 | 11.96          | 12.70 | 12.95 | 13.68 | 14.98 |
|                 | 6H   | 12.85            | 13.53 | 13.85 | 14.52 | 15.83 | 12.36          | 13.04 | 13.35 | 14.03 | 15.34 |
|                 | 8H   | 12.96            | 13.60 | 13.96 | 14.61 | 15.92 | 12.47          | 13.11 | 13.47 | 14.12 | 15.43 |
|                 | 12H  | 13.01            | 13.62 | 14.01 | 14.62 | 15.96 | 12.51          | 13.12 | 13.51 | 14.12 | 15.46 |
| 4H              | 2H   | 10.66            | 11.39 | 11.65 | 12.38 | 13.68 | 10.31          | 11.04 | 11.30 | 12.03 | 13.33 |
|                 | 3H   | 12.53            | 13.14 | 13.53 | 14.15 | 15.47 | 12.13          | 12.74 | 13.12 | 13.75 | 15.07 |
|                 | 4H   | 13.25            | 13.81 | 14.25 | 14.81 | 16.15 | 12.83          | 13.39 | 13.83 | 14.39 | 15.73 |
|                 | 6H   | 13.76            | 14.25 | 14.78 | 15.28 | 16.61 | 13.34          | 13.82 | 14.36 | 14.85 | 16.19 |
|                 | 8H   | 13.92            | 14.37 | 14.93 | 15.39 | 16.74 | 13.49          | 13.94 | 14.51 | 14.96 | 16.31 |
|                 | 12H  | 13.99            | 14.40 | 15.03 | 15.44 | 16.79 | 13.55          | 13.96 | 14.59 | 15.00 | 16.35 |
| 8H              | 4H   | 13.44            | 13.89 | 14.46 | 14.92 | 16.27 | 13.07          | 13.52 | 14.09 | 14.55 | 15.90 |
|                 | 6H   | 14.08            | 14.45 | 15.12 | 15.52 | 16.86 | 13.70          | 14.07 | 14.74 | 15.14 | 16.49 |
|                 | 8H   | 14.30            | 14.63 | 15.35 | 15.68 | 17.05 | 13.92          | 14.24 | 14.97 | 15.29 | 16.66 |
|                 | 12H  | 14.43            | 14.72 | 15.49 | 15.77 | 17.18 | 14.03          | 14.32 | 15.09 | 15.37 | 16.78 |
| 12H             | 4H   | 13.43            | 13.84 | 14.47 | 14.87 | 16.23 | 13.07          | 13.47 | 14.10 | 14.51 | 15.87 |
|                 | 6H   | 14.11            | 14.44 | 15.16 | 15.49 | 16.85 | 13.74          | 14.07 | 14.79 | 15.12 | 16.49 |
|                 | 8H   | 14.35            | 14.64 | 15.41 | 15.69 | 17.10 | 13.98          | 14.27 | 15.03 | 15.31 | 16.72 |

END OF REPORT