

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: P906065

Luminaire Tested: DFN2DIP-PN4F0-090D070US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906065  
REPORT IS A COMBINATION OF REPORTS P901193 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D070US835-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

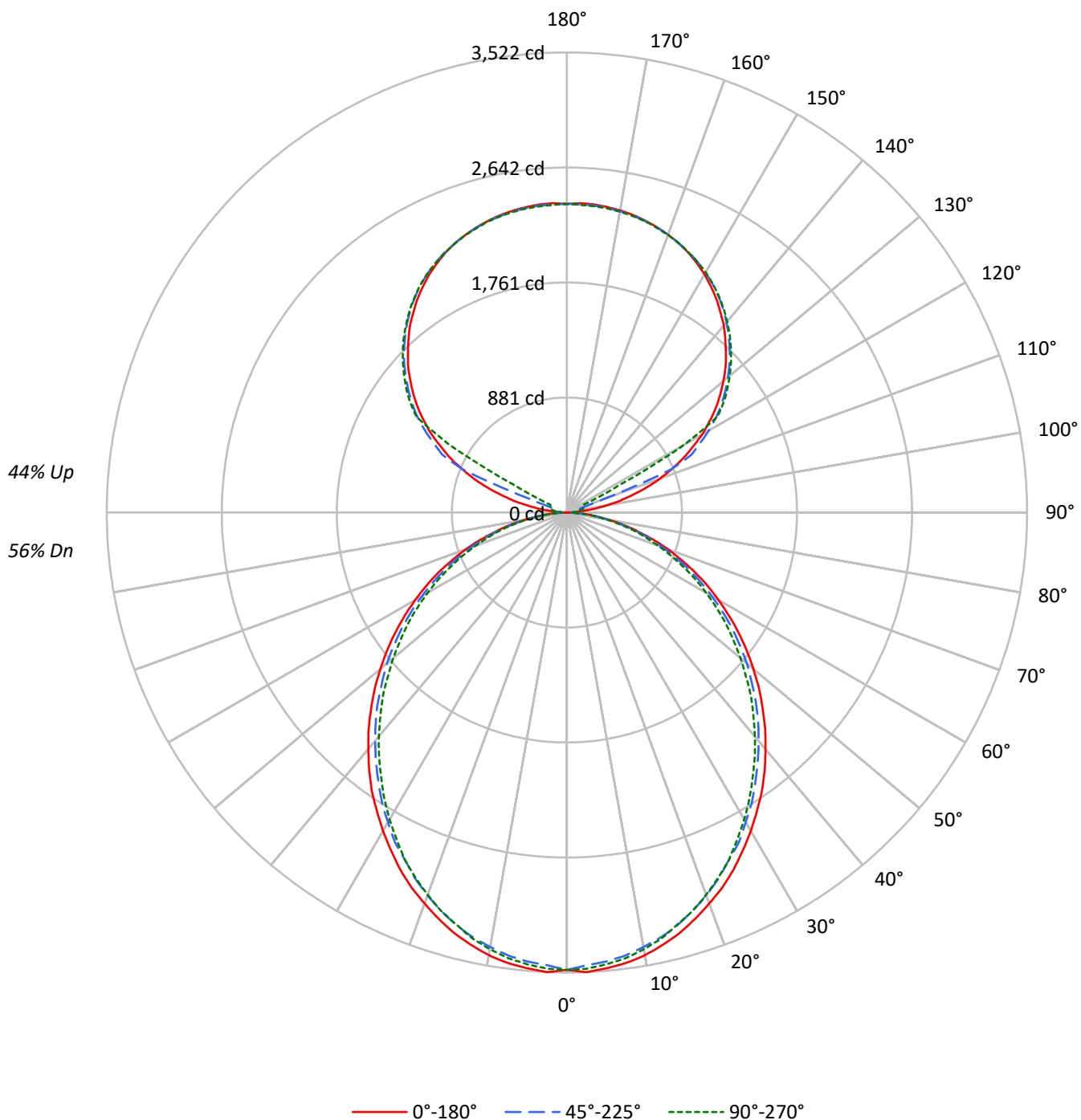
Lumens per Lamp: N/A  
Luminaire Lumens: 15840.0 lumens  
Efficiency: N/A  
Efficacy: 112.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 140.9  
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   | 109 | 109 | 109 | 109 |  | 101 | 101 | 101 | 101 |  | 87 | 87 | 87 |  | 74 | 74 | 74 |  | 62 | 62 | 62 |
| 1   | 99  | 95  | 91  | 87  |  | 92  | 88  | 85  | 82  |  | 76 | 74 | 71 |  | 65 | 63 | 62 |  | 55 | 53 | 52 |
| 2   | 90  | 83  | 77  | 71  |  | 84  | 77  | 72  | 67  |  | 67 | 63 | 59 |  | 57 | 54 | 51 |  | 48 | 46 | 44 |
| 3   | 82  | 73  | 65  | 59  |  | 76  | 68  | 61  | 56  |  | 59 | 54 | 50 |  | 51 | 47 | 44 |  | 43 | 40 | 38 |
| 4   | 75  | 64  | 56  | 50  |  | 70  | 60  | 53  | 48  |  | 52 | 47 | 42 |  | 45 | 41 | 37 |  | 38 | 35 | 32 |
| 5   | 69  | 58  | 49  | 43  |  | 64  | 54  | 46  | 41  |  | 47 | 41 | 37 |  | 40 | 36 | 32 |  | 34 | 31 | 28 |
| 6   | 64  | 52  | 43  | 38  |  | 59  | 48  | 41  | 36  |  | 42 | 36 | 32 |  | 37 | 32 | 28 |  | 31 | 28 | 25 |
| 7   | 59  | 47  | 39  | 33  |  | 55  | 44  | 37  | 31  |  | 38 | 33 | 28 |  | 33 | 29 | 25 |  | 29 | 25 | 22 |
| 8   | 55  | 42  | 35  | 29  |  | 51  | 40  | 33  | 28  |  | 35 | 29 | 25 |  | 30 | 26 | 22 |  | 26 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  |  | 48  | 36  | 30  | 25  |  | 32 | 26 | 23 |  | 28 | 23 | 20 |  | 24 | 21 | 18 |
| 10  | 48  | 36  | 28  | 23  |  | 44  | 34  | 27  | 22  |  | 30 | 24 | 20 |  | 26 | 21 | 18 |  | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2556 | 2556 | 2556 |
| 5°  | 2560 | 2521 | 2538 |
| 10° | 2540 | 2487 | 2504 |
| 15° | 2502 | 2447 | 2451 |
| 20° | 2452 | 2390 | 2396 |
| 25° | 2402 | 2323 | 2333 |
| 30° | 2339 | 2260 | 2253 |
| 35° | 2279 | 2185 | 2168 |
| 40° | 2206 | 2110 | 2087 |
| 45° | 2132 | 2035 | 2005 |
| 50° | 2053 | 1956 | 1909 |
| 55° | 1969 | 1865 | 1821 |
| 60° | 1874 | 1756 | 1720 |
| 65° | 1771 | 1644 | 1601 |
| 70° | 1639 | 1507 | 1473 |
| 75° | 1457 | 1344 | 1356 |
| 80° | 1238 | 1135 | 1131 |
| 85° | 895  | 775  | 757  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2132 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 329.6   | 2.1       |
| 10°-20°   | 927.4   | 5.9       |
| 20°-30°   | 1362.9  | 8.6       |
| 30°-40°   | 1582.9  | 10.0      |
| 40°-50°   | 1580.9  | 10.0      |
| 50°-60°   | 1378.5  | 8.7       |
| 60°-70°   | 1019.0  | 6.4       |
| 70°-80°   | 576.6   | 3.6       |
| 80°-90°   | 156.3   | 1.0       |
| 90°-100°  | 77.9    | 0.5       |
| 100°-110° | 290.4   | 1.8       |
| 110°-120° | 770.2   | 4.9       |
| 120°-130° | 1277.4  | 8.1       |
| 130°-140° | 1356.9  | 8.6       |
| 140°-150° | 1261.1  | 8.0       |
| 150°-160° | 1013.9  | 6.4       |
| 160°-170° | 653.3   | 4.1       |
| 170°-180° | 224.9   | 1.4       |
| 0°-30°    | 2619.9  | 16.5      |
| 0°-40°    | 4202.8  | 26.5      |
| 0°-60°    | 7162.3  | 45.2      |
| 0°-90°    | 8914.2  | 56.3      |
| 90°-120°  | 1138.5  | 7.2       |
| 90°-150°  | 5033.8  | 31.8      |
| 90°-180°  | 6926.0  | 43.7      |
| 0°-180°   | 15840.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3502 | 3502  | 3502 | 3502  | 3502 |      |
| 5°   | 3502 | 3489  | 3452 | 3478  | 3472 | 332  |
| 15°  | 3334 | 3314  | 3270 | 3283  | 3266 | 939  |
| 25°  | 3017 | 2990  | 2933 | 2940  | 2933 | 1388 |
| 35°  | 2603 | 2570  | 2516 | 2495  | 2478 | 1626 |
| 45°  | 2118 | 2095  | 2044 | 2007  | 1994 | 1635 |
| 55°  | 1603 | 1583  | 1542 | 1502  | 1485 | 1433 |
| 65°  | 1081 | 1061  | 1027 | 997   | 980  | 1069 |
| 75°  | 566  | 559   | 542  | 522   | 529  | 604  |
| 85°  | 138  | 135   | 132  | 121   | 118  | 154  |
| 90°  | 2    | 20    | 34   | 43    | 46   | 15   |
| 95°  | 111  | 55    | 67   | 75    | 74   | 131  |
| 105° | 520  | 571   | 104  | 123   | 130  | 555  |
| 115° | 983  | 1012  | 1055 | 263   | 140  | 968  |
| 125° | 1390 | 1412  | 1444 | 1456  | 1462 | 1239 |
| 135° | 1720 | 1747  | 1762 | 1780  | 1776 | 1328 |
| 145° | 1995 | 1993  | 2022 | 2034  | 2026 | 1248 |
| 155° | 2197 | 2181  | 2202 | 2212  | 2198 | 1012 |
| 165° | 2314 | 2304  | 2309 | 2321  | 2309 | 654  |
| 175° | 2368 | 2356  | 2359 | 2371  | 2354 | 225  |
| 180° | 2362 | 2362  | 2362 | 2362  | 2362 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3501.9 | 3501.9 | 3501.9 | 3501.9 | 3501.9 |
| 2.5°   | 3522.3 | 3505.5 | 3468.4 | 3501.9 | 3495.5 |
| 5°     | 3501.9 | 3488.7 | 3451.6 | 3478.4 | 3471.9 |
| 7.5°   | 3478.4 | 3458.4 | 3421.2 | 3448.4 | 3441.6 |
| 10°    | 3441.6 | 3418.0 | 3377.6 | 3404.4 | 3394.4 |
| 12.5°  | 3390.8 | 3370.8 | 3330.5 | 3347.2 | 3340.5 |
| 15°    | 3333.7 | 3313.7 | 3269.7 | 3283.3 | 3266.5 |
| 17.5°  | 3262.9 | 3242.9 | 3199.0 | 3215.8 | 3199.0 |
| 20°    | 3185.4 | 3165.4 | 3118.2 | 3128.2 | 3115.0 |
| 22.5°  | 3108.2 | 3077.9 | 3033.9 | 3033.9 | 3027.1 |
| 25°    | 3017.1 | 2990.3 | 2933.2 | 2939.6 | 2933.2 |
| 27.5°  | 2916.0 | 2892.4 | 2848.9 | 2838.9 | 2822.1 |
| 30°    | 2815.3 | 2788.1 | 2737.7 | 2727.7 | 2714.2 |
| 32.5°  | 2707.4 | 2687.4 | 2633.4 | 2613.1 | 2599.5 |
| 35°    | 2603.1 | 2569.5 | 2515.5 | 2495.2 | 2478.4 |
| 37.5°  | 2485.2 | 2454.8 | 2400.8 | 2377.3 | 2360.5 |
| 40°    | 2364.0 | 2336.9 | 2282.9 | 2252.9 | 2239.4 |
| 42.5°  | 2246.1 | 2219.0 | 2165.4 | 2131.5 | 2111.5 |
| 45°    | 2118.2 | 2094.7 | 2043.9 | 2007.1 | 1993.6 |
| 47.5°  | 1993.6 | 1970.0 | 1916.0 | 1878.9 | 1858.9 |
| 50°    | 1862.1 | 1845.3 | 1798.1 | 1751.0 | 1734.2 |
| 52.5°  | 1734.2 | 1710.6 | 1667.0 | 1629.9 | 1606.3 |
| 55°    | 1603.1 | 1582.7 | 1542.3 | 1502.0 | 1485.2 |
| 57.5°  | 1471.6 | 1454.8 | 1410.9 | 1370.5 | 1356.9 |
| 60°    | 1340.1 | 1326.9 | 1279.7 | 1242.6 | 1232.6 |
| 62.5°  | 1212.2 | 1188.6 | 1155.0 | 1121.5 | 1107.9 |
| 65°    | 1081.1 | 1060.7 | 1027.1 | 996.8  | 980.0  |
| 67.5°  | 946.4  | 929.3  | 899.2  | 875.7  | 862.1  |
| 70°    | 821.7  | 808.1  | 777.8  | 754.2  | 741.0  |
| 72.5°  | 693.8  | 680.2  | 663.4  | 639.9  | 629.9  |
| 75°    | 565.6  | 559.1  | 542.0  | 522.0  | 528.8  |
| 77.5°  | 451.2  | 437.7  | 430.9  | 420.9  | 410.9  |
| 80°    | 336.9  | 333.3  | 326.5  | 316.5  | 309.8  |
| 82.5°  | 229.0  | 229.0  | 225.8  | 212.2  | 212.2  |
| 85°    | 137.9  | 134.7  | 131.5  | 121.1  | 117.9  |
| 87.5°  | 60.7   | 53.9   | 47.2   | 37.2   | 33.6   |
| 90°    | 1.6    | 20.5   | 34.1   | 42.8   | 46.1   |
| 92.5°  | 42.8   | 35.9   | 41.0   | 44.5   | 46.1   |
| 95°    | 111.0  | 54.6   | 66.6   | 75.3   | 73.5   |
| 97.5°  | 199.9  | 59.9   | 87.1   | 92.4   | 94.0   |
| 100°   | 302.7  | 68.4   | 97.4   | 111.0  | 114.5  |
| 102.5° | 415.3  | 412.1  | 100.9  | 119.6  | 124.8  |
| 105°   | 519.7  | 571.0  | 104.3  | 123.0  | 129.9  |
| 107.5° | 641.0  | 683.7  | 107.8  | 126.5  | 133.4  |
| 110°   | 757.4  | 793.1  | 299.2  | 128.3  | 135.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 866.8  | 897.4  | 868.4  | 131.5  | 136.8  |
| 115°   | 982.9  | 1011.9 | 1054.7 | 263.3  | 140.3  |
| 117.5° | 1083.8 | 1117.9 | 1147.1 | 902.5  | 454.7  |
| 120°   | 1196.6 | 1222.2 | 1253.1 | 1273.6 | 1042.8 |
| 122.5° | 1292.2 | 1319.6 | 1354.0 | 1364.1 | 1365.9 |
| 125°   | 1389.7 | 1412.0 | 1444.5 | 1456.5 | 1461.5 |
| 127.5° | 1478.6 | 1502.5 | 1528.3 | 1545.4 | 1547.0 |
| 130°   | 1562.4 | 1589.8 | 1608.5 | 1627.4 | 1625.8 |
| 132.5° | 1647.9 | 1670.2 | 1688.9 | 1704.3 | 1702.7 |
| 135°   | 1719.7 | 1747.1 | 1762.4 | 1779.6 | 1776.2 |
| 137.5° | 1794.8 | 1815.4 | 1832.6 | 1849.7 | 1844.6 |
| 140°   | 1868.3 | 1882.1 | 1900.8 | 1916.2 | 1907.7 |
| 142.5° | 1930.0 | 1942.0 | 1964.1 | 1977.7 | 1969.2 |
| 145°   | 1995.0 | 1993.2 | 2022.2 | 2034.2 | 2025.7 |
| 147.5° | 2051.2 | 2046.2 | 2075.2 | 2083.7 | 2077.0 |
| 150°   | 2106.0 | 2094.1 | 2121.5 | 2131.6 | 2123.1 |
| 152.5° | 2152.1 | 2138.5 | 2164.1 | 2174.4 | 2162.5 |
| 155°   | 2196.6 | 2181.3 | 2201.8 | 2212.0 | 2198.4 |
| 157.5° | 2232.5 | 2218.9 | 2234.3 | 2246.3 | 2232.5 |
| 160°   | 2263.4 | 2253.0 | 2263.4 | 2273.5 | 2261.5 |
| 162.5° | 2290.6 | 2280.4 | 2288.9 | 2300.9 | 2285.5 |
| 165°   | 2314.5 | 2304.4 | 2309.4 | 2321.4 | 2309.4 |
| 167.5° | 2333.4 | 2323.0 | 2328.3 | 2340.3 | 2324.9 |
| 170°   | 2348.8 | 2338.5 | 2341.9 | 2353.9 | 2338.5 |
| 172.5° | 2359.0 | 2348.8 | 2352.3 | 2364.2 | 2348.8 |
| 175°   | 2367.5 | 2355.5 | 2359.0 | 2370.9 | 2353.9 |
| 177.5° | 2370.9 | 2359.0 | 2360.8 | 2372.8 | 2357.3 |
| 180°   | 2362.4 | 2362.4 | 2362.4 | 2362.4 | 2362.4 |

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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 | 11.10            | 12.02 | 12.00 | 12.94 | 14.12 | 10.66          | 11.58 | 11.56 | 12.50 | 13.68 |
|                 | 3H   | 12.77            | 13.59 | 13.68 | 14.52 | 15.73 | 12.28          | 13.11 | 13.20 | 14.04 | 15.24 |
|                 | 4H   | 13.36            | 14.14 | 14.29 | 15.08 | 16.29 | 12.87          | 13.65 | 13.80 | 14.59 | 15.80 |
|                 | 6H   | 13.77            | 14.49 | 14.71 | 15.43 | 16.65 | 13.27          | 13.99 | 14.21 | 14.94 | 16.16 |
|                 | 8H   | 13.87            | 14.56 | 14.82 | 15.52 | 16.74 | 13.38          | 14.07 | 14.33 | 15.03 | 16.25 |
|                 | 12H  | 13.92            | 14.58 | 14.88 | 15.53 | 16.78 | 13.42          | 14.08 | 14.38 | 15.03 | 16.28 |
| 4H              | 2H   | 11.57            | 12.35 | 12.50 | 13.29 | 14.50 | 11.22          | 12.00 | 12.15 | 12.93 | 14.15 |
|                 | 3H   | 13.44            | 14.10 | 14.39 | 15.06 | 16.29 | 13.04          | 13.69 | 13.98 | 14.66 | 15.89 |
|                 | 4H   | 14.16            | 14.76 | 15.12 | 15.72 | 16.97 | 13.74          | 14.34 | 14.70 | 15.30 | 16.55 |
|                 | 6H   | 14.68            | 15.20 | 15.65 | 16.18 | 17.43 | 14.26          | 14.77 | 15.23 | 15.76 | 17.01 |
|                 | 8H   | 14.84            | 15.32 | 15.81 | 16.29 | 17.56 | 14.41          | 14.89 | 15.38 | 15.87 | 17.13 |
|                 | 12H  | 14.91            | 15.35 | 15.90 | 16.34 | 17.61 | 14.47          | 14.91 | 15.46 | 15.90 | 17.17 |
| 8H              | 4H   | 14.36            | 14.84 | 15.33 | 15.82 | 17.09 | 13.99          | 14.47 | 14.96 | 15.45 | 16.72 |
|                 | 6H   | 15.00            | 15.40 | 16.00 | 16.42 | 17.68 | 14.62          | 15.02 | 15.62 | 16.04 | 17.31 |
|                 | 8H   | 15.22            | 15.58 | 16.23 | 16.58 | 17.86 | 14.84          | 15.19 | 15.84 | 16.20 | 17.48 |
|                 | 12H  | 15.36            | 15.67 | 16.37 | 16.67 | 18.00 | 14.96          | 15.27 | 15.97 | 16.27 | 17.60 |
| 12H             | 4H   | 14.35            | 14.79 | 15.34 | 15.78 | 17.05 | 13.99          | 14.42 | 14.98 | 15.42 | 16.69 |
|                 | 6H   | 15.03            | 15.38 | 16.03 | 16.39 | 17.67 | 14.67          | 15.02 | 15.67 | 16.03 | 17.31 |
|                 | 8H   | 15.28            | 15.59 | 16.29 | 16.59 | 17.92 | 14.91          | 15.22 | 15.91 | 16.22 | 17.54 |

END OF REPORT