

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: P926522

Luminaire Tested: DFN2DIP-TR4F0-080D070US950-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926522  
REPORT IS A COMBINATION OF REPORTS P900431 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-080D070US950-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

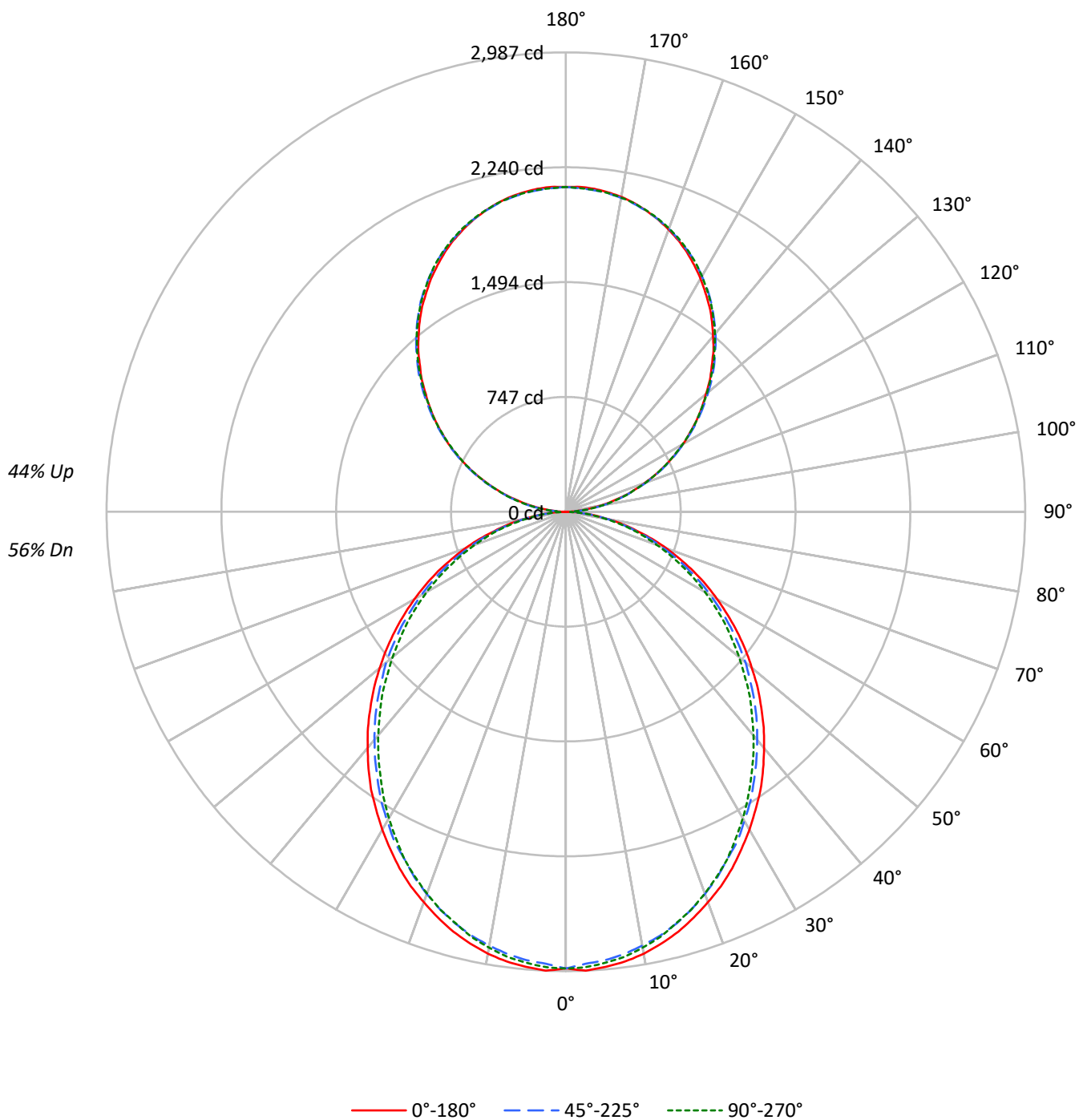
Lumens per Lamp: N/A  
Luminaire Lumens: 13465.7 lumens  
Efficiency: N/A  
Efficacy: 105.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 127.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P926522

CATALOG NUMBER: DFN2DIP-TR4F0-080D070US950-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P926522

CATALOG NUMBER: DFN2DIP-TR4F0-080D070US950-FLLFLL

**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 | 61 | 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 | 50 | 47 | 43 | 43 | 40 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 48  | 52 | 47 | 42 | 45 | 41 | 37 | 38 | 35 | 32 |
| 5   | 69  | 57  | 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 | 32 | 28 | 33 | 29 | 25 | 28 | 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  | 47  | 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°  | 2359 | 2359 | 2359 |
| 5°  | 2363 | 2326 | 2342 |
| 10° | 2344 | 2295 | 2310 |
| 15° | 2309 | 2257 | 2261 |
| 20° | 2263 | 2205 | 2210 |
| 25° | 2217 | 2142 | 2151 |
| 30° | 2159 | 2083 | 2076 |
| 35° | 2104 | 2014 | 1997 |
| 40° | 2036 | 1945 | 1922 |
| 45° | 1968 | 1875 | 1846 |
| 50° | 1895 | 1802 | 1756 |
| 55° | 1817 | 1717 | 1675 |
| 60° | 1730 | 1616 | 1581 |
| 65° | 1635 | 1512 | 1470 |
| 70° | 1513 | 1385 | 1351 |
| 75° | 1345 | 1233 | 1241 |
| 80° | 1143 | 1040 | 1031 |
| 85° | 827  | 706  | 683  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1968 cd/sqm

TEST NUMBER: P926522

CATALOG NUMBER: DFN2DIP-TR4F0-080D070US950-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 279.5   | 2.1       |
| 10°-20°   | 786.4   | 5.8       |
| 20°-30°   | 1155.7  | 8.6       |
| 30°-40°   | 1342.3  | 10.0      |
| 40°-50°   | 1340.6  | 10.0      |
| 50°-60°   | 1169.0  | 8.7       |
| 60°-70°   | 864.1   | 6.4       |
| 70°-80°   | 488.9   | 3.6       |
| 80°-90°   | 135.0   | 1.0       |
| 90°-100°  | 130.7   | 1.0       |
| 100°-110° | 415.3   | 3.1       |
| 110°-120° | 710.6   | 5.3       |
| 120°-130° | 934.6   | 6.9       |
| 130°-140° | 1049.0  | 7.8       |
| 140°-150° | 1028.7  | 7.6       |
| 150°-160° | 862.9   | 6.4       |
| 160°-170° | 572.3   | 4.2       |
| 170°-180° | 200.0   | 1.5       |
| 0°-30°    | 2221.6  | 16.5      |
| 0°-40°    | 3563.9  | 26.5      |
| 0°-60°    | 6073.6  | 45.1      |
| 0°-90°    | 7561.7  | 56.2      |
| 90°-120°  | 1256.6  | 9.3       |
| 90°-150°  | 4268.9  | 31.7      |
| 90°-180°  | 5904.0  | 43.8      |
| 0°-180°   | 13465.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2970 | 2970  | 2970 | 2970  | 2970 |      |
| 5°   | 2970 | 2958  | 2927 | 2950  | 2944 | 282  |
| 15°  | 2827 | 2810  | 2773 | 2784  | 2770 | 796  |
| 25°  | 2558 | 2536  | 2487 | 2493  | 2487 | 1177 |
| 35°  | 2207 | 2179  | 2133 | 2116  | 2102 | 1378 |
| 45°  | 1796 | 1776  | 1733 | 1702  | 1691 | 1386 |
| 55°  | 1359 | 1342  | 1308 | 1274  | 1259 | 1215 |
| 65°  | 917  | 900   | 871  | 845   | 831  | 906  |
| 75°  | 480  | 474   | 460  | 443   | 448  | 512  |
| 85°  | 117  | 114   | 112  | 103   | 100  | 130  |
| 90°  | 2    | 23    | 62   | 59    | 60   | 13   |
| 95°  | 93   | 111   | 114  | 114   | 111  | 103  |
| 105° | 383  | 388   | 392  | 395   | 395  | 405  |
| 115° | 713  | 723   | 720  | 718   | 713  | 705  |
| 125° | 1037 | 1053  | 1048 | 1042  | 1040 | 927  |
| 135° | 1342 | 1361  | 1365 | 1363  | 1358 | 1037 |
| 145° | 1629 | 1642  | 1652 | 1654  | 1647 | 1018 |
| 155° | 1862 | 1868  | 1873 | 1882  | 1876 | 857  |
| 165° | 2026 | 2024  | 2024 | 2037  | 2028 | 572  |
| 175° | 2108 | 2103  | 2099 | 2112  | 2101 | 200  |
| 180° | 2112 | 2112  | 2112 | 2112  | 2112 |      |

TEST NUMBER: P926522

CATALOG NUMBER: DFN2DIP-TR4F0-080D070US950-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2969.6 | 2969.6 | 2969.6 | 2969.6 | 2969.6 |
| 2.5°   | 2986.9 | 2972.7 | 2941.2 | 2969.6 | 2964.2 |
| 5°     | 2969.6 | 2958.4 | 2927.0 | 2949.7 | 2944.2 |
| 7.5°   | 2949.7 | 2932.7 | 2901.2 | 2924.2 | 2918.5 |
| 10°    | 2918.5 | 2898.4 | 2864.2 | 2886.9 | 2878.5 |
| 12.5°  | 2875.5 | 2858.5 | 2824.2 | 2838.4 | 2832.7 |
| 15°    | 2827.0 | 2810.0 | 2772.7 | 2784.2 | 2770.0 |
| 17.5°  | 2767.0 | 2750.0 | 2712.7 | 2727.0 | 2712.7 |
| 20°    | 2701.3 | 2684.3 | 2644.3 | 2652.8 | 2641.5 |
| 22.5°  | 2635.8 | 2610.0 | 2572.7 | 2572.7 | 2567.0 |
| 25°    | 2558.5 | 2535.8 | 2487.4 | 2492.8 | 2487.4 |
| 27.5°  | 2472.8 | 2452.8 | 2415.8 | 2407.3 | 2393.1 |
| 30°    | 2387.4 | 2364.3 | 2321.7 | 2313.2 | 2301.6 |
| 32.5°  | 2295.9 | 2278.9 | 2233.1 | 2215.9 | 2204.4 |
| 35°    | 2207.4 | 2178.9 | 2133.1 | 2115.9 | 2101.7 |
| 37.5°  | 2107.4 | 2081.6 | 2035.9 | 2015.9 | 2001.7 |
| 40°    | 2004.7 | 1981.6 | 1936.0 | 1910.5 | 1898.9 |
| 42.5°  | 1904.8 | 1881.7 | 1836.3 | 1807.4 | 1790.6 |
| 45°    | 1796.3 | 1776.3 | 1733.2 | 1702.0 | 1690.6 |
| 47.5°  | 1690.6 | 1670.5 | 1624.8 | 1593.3 | 1576.3 |
| 50°    | 1579.1 | 1564.8 | 1524.8 | 1484.8 | 1470.6 |
| 52.5°  | 1470.6 | 1450.6 | 1413.6 | 1382.2 | 1362.1 |
| 55°    | 1359.4 | 1342.1 | 1307.9 | 1273.7 | 1259.4 |
| 57.5°  | 1247.9 | 1233.7 | 1196.4 | 1162.2 | 1150.6 |
| 60°    | 1136.4 | 1125.2 | 1085.2 | 1053.7 | 1045.2 |
| 62.5°  | 1027.9 | 1008.0 | 979.5  | 951.0  | 939.5  |
| 65°    | 916.8  | 899.5  | 871.0  | 845.2  | 831.0  |
| 67.5°  | 802.5  | 788.0  | 762.5  | 742.6  | 731.1  |
| 70°    | 696.8  | 685.3  | 659.6  | 639.6  | 628.3  |
| 72.5°  | 588.3  | 576.9  | 562.6  | 542.6  | 534.1  |
| 75°    | 479.6  | 474.1  | 459.6  | 442.7  | 448.4  |
| 77.5°  | 382.6  | 371.1  | 365.4  | 356.9  | 348.4  |
| 80°    | 285.7  | 282.7  | 276.9  | 268.5  | 262.6  |
| 82.5°  | 194.2  | 194.2  | 191.5  | 179.9  | 179.9  |
| 85°    | 117.0  | 114.2  | 111.5  | 102.7  | 100.0  |
| 87.5°  | 51.5   | 45.8   | 40.0   | 31.5   | 28.5   |
| 90°    | 1.9    | 22.9   | 62.4   | 58.6   | 60.5   |
| 92.5°  | 39.5   | 53.5   | 55.4   | 57.3   | 57.3   |
| 95°    | 92.9   | 110.8  | 114.0  | 114.0  | 110.8  |
| 97.5°  | 154.7  | 171.2  | 178.3  | 178.3  | 178.3  |
| 100°   | 226.0  | 240.7  | 245.8  | 245.8  | 243.8  |
| 102.5° | 301.2  | 312.0  | 319.0  | 320.9  | 319.0  |
| 105°   | 383.3  | 388.4  | 392.2  | 395.4  | 395.4  |
| 107.5° | 464.8  | 472.4  | 472.4  | 473.8  | 464.8  |
| 110°   | 543.8  | 554.0  | 554.0  | 554.0  | 548.8  |

TEST NUMBER: P926522

CATALOG NUMBER: DFN2DIP-TR4F0-080D070US950-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 629.1  | 639.9  | 638.0  | 632.9  | 629.1  |
| 115°   | 713.1  | 723.3  | 720.2  | 718.3  | 713.1  |
| 117.5° | 796.5  | 810.5  | 801.6  | 796.5  | 791.4  |
| 120°   | 880.5  | 894.6  | 880.5  | 880.5  | 874.8  |
| 122.5° | 957.0  | 974.8  | 965.9  | 960.8  | 957.0  |
| 125°   | 1037.2 | 1053.1 | 1048.1 | 1042.3 | 1040.4 |
| 127.5° | 1115.5 | 1135.3 | 1128.3 | 1120.7 | 1115.5 |
| 130°   | 1188.8 | 1211.7 | 1208.5 | 1204.7 | 1197.7 |
| 132.5° | 1270.9 | 1288.8 | 1290.0 | 1281.1 | 1276.0 |
| 135°   | 1341.6 | 1361.3 | 1365.2 | 1363.2 | 1358.1 |
| 137.5° | 1420.5 | 1436.4 | 1439.6 | 1438.3 | 1430.7 |
| 140°   | 1490.0 | 1505.9 | 1514.8 | 1514.8 | 1507.8 |
| 142.5° | 1561.2 | 1577.2 | 1582.2 | 1584.1 | 1577.2 |
| 145°   | 1628.8 | 1641.5 | 1651.7 | 1653.6 | 1646.6 |
| 147.5° | 1689.2 | 1705.2 | 1712.8 | 1716.0 | 1709.0 |
| 150°   | 1751.6 | 1762.4 | 1769.5 | 1775.2 | 1769.5 |
| 152.5° | 1807.0 | 1817.8 | 1826.7 | 1833.8 | 1826.7 |
| 155°   | 1862.4 | 1867.5 | 1873.3 | 1882.1 | 1876.4 |
| 157.5° | 1910.2 | 1914.0 | 1917.2 | 1929.9 | 1921.0 |
| 160°   | 1952.8 | 1956.7 | 1958.6 | 1969.3 | 1961.7 |
| 162.5° | 1992.3 | 1992.3 | 1994.2 | 2006.3 | 1997.4 |
| 165°   | 2026.0 | 2024.1 | 2024.1 | 2036.9 | 2027.9 |
| 167.5° | 2056.6 | 2050.9 | 2050.9 | 2063.6 | 2054.7 |
| 170°   | 2079.5 | 2074.5 | 2072.6 | 2085.3 | 2074.5 |
| 172.5° | 2095.5 | 2090.3 | 2088.4 | 2101.2 | 2090.3 |
| 175°   | 2108.1 | 2103.1 | 2099.3 | 2112.0 | 2101.2 |
| 177.5° | 2115.2 | 2110.1 | 2106.2 | 2117.1 | 2106.2 |
| 180°   | 2112.0 | 2112.0 | 2112.0 | 2112.0 | 2112.0 |

TEST NUMBER: P926522

CATALOG NUMBER: DFN2DIP-TR4F0-080D070US950-FLLFLL

**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 | 10.80            | 11.72 | 11.70 | 12.64 | 13.82 | 10.37          | 11.29 | 11.27 | 12.21 | 13.39 |
|                 | 3H   | 12.46            | 13.29 | 13.38 | 14.22 | 15.42 | 11.99          | 12.81 | 12.90 | 13.75 | 14.95 |
|                 | 4H   | 13.05            | 13.83 | 13.98 | 14.77 | 15.98 | 12.58          | 13.36 | 13.51 | 14.30 | 15.51 |
|                 | 6H   | 13.45            | 14.17 | 14.40 | 15.12 | 16.34 | 12.98          | 13.70 | 13.92 | 14.64 | 15.87 |
|                 | 8H   | 13.56            | 14.25 | 14.51 | 15.21 | 16.43 | 13.09          | 13.77 | 14.03 | 14.73 | 15.96 |
|                 | 12H  | 13.61            | 14.26 | 14.56 | 15.22 | 16.47 | 13.13          | 13.78 | 14.08 | 14.74 | 15.99 |
| 4H              | 2H   | 11.27            | 12.05 | 12.20 | 12.98 | 14.20 | 10.92          | 11.70 | 11.86 | 12.64 | 13.85 |
|                 | 3H   | 13.14            | 13.79 | 14.08 | 14.76 | 15.98 | 12.74          | 13.40 | 13.69 | 14.36 | 15.59 |
|                 | 4H   | 13.85            | 14.45 | 14.81 | 15.41 | 16.66 | 13.45          | 14.04 | 14.40 | 15.01 | 16.26 |
|                 | 6H   | 14.37            | 14.89 | 15.34 | 15.87 | 17.12 | 13.96          | 14.48 | 14.93 | 15.46 | 16.71 |
|                 | 8H   | 14.52            | 15.00 | 15.49 | 15.98 | 17.25 | 14.11          | 14.59 | 15.08 | 15.57 | 16.84 |
|                 | 12H  | 14.60            | 15.03 | 15.59 | 16.03 | 17.30 | 14.18          | 14.61 | 15.17 | 15.61 | 16.88 |
| 8H              | 4H   | 14.06            | 14.53 | 15.03 | 15.51 | 16.78 | 13.70          | 14.17 | 14.67 | 15.15 | 16.42 |
|                 | 6H   | 14.69            | 15.09 | 15.68 | 16.11 | 17.37 | 14.33          | 14.72 | 15.32 | 15.74 | 17.01 |
|                 | 8H   | 14.91            | 15.26 | 15.91 | 16.27 | 17.55 | 14.54          | 14.89 | 15.55 | 15.90 | 17.18 |
|                 | 12H  | 15.04            | 15.35 | 16.05 | 16.35 | 17.68 | 14.66          | 14.97 | 15.67 | 15.97 | 17.30 |
| 12H             | 4H   | 14.04            | 14.48 | 15.03 | 15.47 | 16.74 | 13.69          | 14.12 | 14.68 | 15.12 | 16.39 |
|                 | 6H   | 14.72            | 15.07 | 15.72 | 16.08 | 17.36 | 14.37          | 14.72 | 15.37 | 15.73 | 17.01 |
|                 | 8H   | 14.96            | 15.27 | 15.97 | 16.27 | 17.60 | 14.61          | 14.92 | 15.61 | 15.92 | 17.25 |

END OF REPORT