

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: P915765

Luminaire Tested: DFN2DIP-TR4F0-120D090US927-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915765  
REPORT IS A COMBINATION OF REPORTS P901996 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D090US927-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

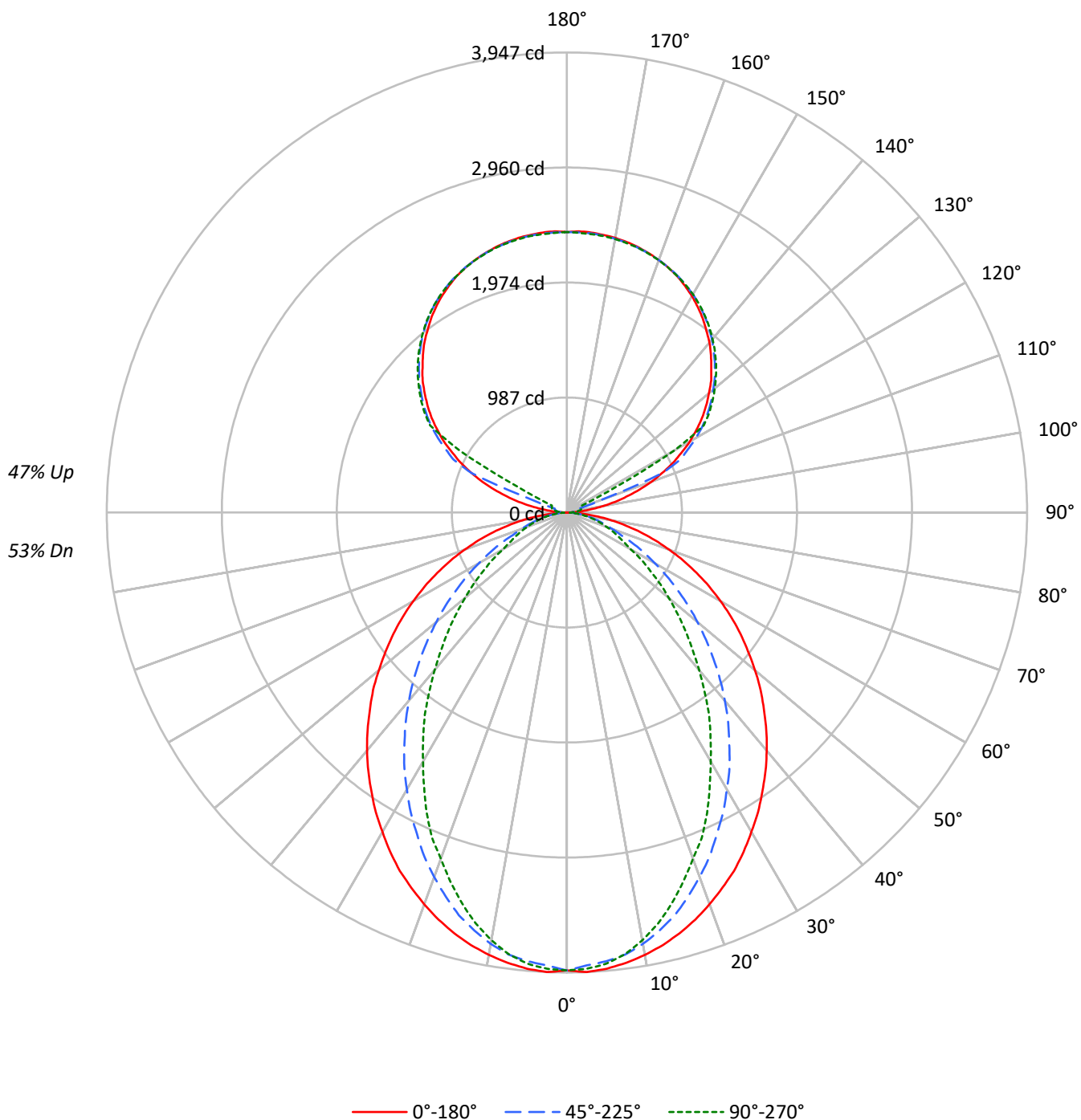
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15138.6 lumens  
Efficiency: N/A  
Efficacy: 78.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 193.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 64 | 62 | 61 | 53 | 52 | 51 |
| 2   | 91  | 83  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 47 | 45 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 55  | 49  | 53 | 48 | 44 | 45 | 42 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 34 | 35 | 32 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 43  | 37  | 43 | 38 | 34 | 37 | 33 | 30 | 32 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 23 | 20 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3121 | 3121 | 3121 |
| 5°  | 3126 | 3072 | 3091 |
| 10° | 3095 | 3011 | 2991 |
| 15° | 3053 | 2912 | 2835 |
| 20° | 2996 | 2775 | 2644 |
| 25° | 2939 | 2621 | 2460 |
| 30° | 2861 | 2463 | 2226 |
| 35° | 2785 | 2293 | 2021 |
| 40° | 2708 | 2118 | 1785 |
| 45° | 2618 | 1923 | 1572 |
| 50° | 2526 | 1727 | 1363 |
| 55° | 2429 | 1517 | 1163 |
| 60° | 2316 | 1297 | 957  |
| 65° | 2188 | 1074 | 862  |
| 70° | 2031 | 866  | 779  |
| 75° | 1835 | 764  | 709  |
| 80° | 1550 | 640  | 614  |
| 85° | 1081 | 427  | 461  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2618 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 368.2   | 2.4       |
| 10°-20°   | 1010.8  | 6.7       |
| 20°-30°   | 1419.2  | 9.4       |
| 30°-40°   | 1547.0  | 10.2      |
| 40°-50°   | 1421.9  | 9.4       |
| 50°-60°   | 1116.7  | 7.4       |
| 60°-70°   | 726.9   | 4.8       |
| 70°-80°   | 374.2   | 2.5       |
| 80°-90°   | 99.7    | 0.7       |
| 90°-100°  | 79.3    | 0.5       |
| 100°-110° | 295.8   | 2.0       |
| 110°-120° | 784.4   | 5.2       |
| 120°-130° | 1301.0  | 8.6       |
| 130°-140° | 1382.0  | 9.1       |
| 140°-150° | 1284.4  | 8.5       |
| 150°-160° | 1032.6  | 6.8       |
| 160°-170° | 665.4   | 4.4       |
| 170°-180° | 229.0   | 1.5       |
| 0°-30°    | 2798.2  | 18.5      |
| 0°-40°    | 4345.2  | 28.7      |
| 0°-60°    | 6883.7  | 45.5      |
| 0°-90°    | 8084.5  | 53.4      |
| 90°-120°  | 1159.5  | 7.7       |
| 90°-150°  | 5127.0  | 33.9      |
| 90°-180°  | 7054.0  | 46.6      |
| 0°-180°   | 15138.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3929 | 3929  | 3929 | 3929  | 3929 |      |
| 5°   | 3929 | 3911  | 3865 | 3897  | 3886 | 373  |
| 15°  | 3737 | 3698  | 3577 | 3509  | 3474 | 1053 |
| 25°  | 3392 | 3278  | 3044 | 2898  | 2844 | 1560 |
| 35°  | 2923 | 2741  | 2429 | 2205  | 2126 | 1829 |
| 45°  | 2389 | 2151  | 1778 | 1525  | 1440 | 1845 |
| 55°  | 1817 | 1540  | 1156 | 942   | 875  | 1623 |
| 65°  | 1227 | 939   | 619  | 498   | 487  | 1216 |
| 75°  | 654  | 405   | 284  | 260   | 256  | 692  |
| 85°  | 153  | 78    | 68   | 68    | 68   | 175  |
| 90°  | 2    | 21    | 35   | 44    | 47   | 14   |
| 95°  | 113  | 56    | 68   | 77    | 75   | 134  |
| 105° | 529  | 582   | 106  | 125   | 132  | 566  |
| 115° | 1001 | 1031  | 1074 | 268   | 143  | 986  |
| 125° | 1415 | 1438  | 1471 | 1483  | 1489 | 1262 |
| 135° | 1752 | 1780  | 1795 | 1813  | 1809 | 1353 |
| 145° | 2032 | 2030  | 2060 | 2072  | 2063 | 1271 |
| 155° | 2237 | 2222  | 2243 | 2253  | 2239 | 1031 |
| 165° | 2357 | 2347  | 2352 | 2364  | 2352 | 666  |
| 175° | 2411 | 2399  | 2403 | 2415  | 2398 | 229  |
| 180° | 2406 | 2406  | 2406 | 2406  | 2406 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3928.9 | 3928.9 | 3928.9 | 3928.9 | 3928.9 |
| 2.5°   | 3946.6 | 3928.9 | 3889.7 | 3925.5 | 3918.3 |
| 5°     | 3928.9 | 3911.2 | 3864.7 | 3896.8 | 3886.3 |
| 7.5°   | 3896.8 | 3875.7 | 3825.9 | 3839.9 | 3822.1 |
| 10°    | 3854.2 | 3829.3 | 3758.3 | 3747.4 | 3726.3 |
| 12.5°  | 3801.0 | 3769.0 | 3672.7 | 3651.6 | 3612.4 |
| 15°    | 3736.9 | 3697.7 | 3576.9 | 3509.4 | 3474.0 |
| 17.5°  | 3662.2 | 3605.2 | 3455.8 | 3377.8 | 3320.8 |
| 20°    | 3576.9 | 3505.6 | 3328.0 | 3239.3 | 3160.8 |
| 22.5°  | 3484.5 | 3402.7 | 3196.3 | 3075.6 | 3022.4 |
| 25°    | 3392.1 | 3278.1 | 3043.5 | 2897.9 | 2844.3 |
| 27.5°  | 3281.9 | 3160.8 | 2901.3 | 2734.2 | 2652.3 |
| 30°    | 3164.6 | 3029.2 | 2744.7 | 2563.7 | 2467.5 |
| 32.5°  | 3050.7 | 2886.9 | 2595.7 | 2382.2 | 2293.2 |
| 35°    | 2922.8 | 2741.3 | 2428.6 | 2204.6 | 2126.1 |
| 37.5°  | 2798.3 | 2602.6 | 2272.1 | 2026.5 | 1937.8 |
| 40°    | 2666.6 | 2453.5 | 2108.4 | 1856.0 | 1763.6 |
| 42.5°  | 2531.6 | 2304.1 | 1945.0 | 1681.7 | 1593.1 |
| 45°    | 2389.4 | 2151.0 | 1777.9 | 1525.2 | 1439.9 |
| 47.5°  | 2254.3 | 2002.0 | 1618.0 | 1365.2 | 1287.1 |
| 50°    | 2105.0 | 1852.6 | 1461.4 | 1215.8 | 1141.5 |
| 52.5°  | 1959.0 | 1692.3 | 1312.0 | 1077.4 | 1009.9 |
| 55°    | 1816.8 | 1539.5 | 1155.5 | 942.3  | 874.8  |
| 57.5°  | 1671.1 | 1386.7 | 1017.0 | 817.8  | 760.9  |
| 60°    | 1521.8 | 1237.3 | 871.0  | 690.0  | 633.0  |
| 62.5°  | 1376.2 | 1091.7 | 746.6  | 576.1  | 547.7  |
| 65°    | 1226.8 | 938.6  | 618.7  | 498.0  | 487.0  |
| 67.5°  | 1084.6 | 796.3  | 498.0  | 437.2  | 426.7  |
| 70°    | 935.2  | 657.9  | 412.3  | 376.8  | 362.5  |
| 72.5°  | 793.0  | 529.7  | 344.8  | 316.5  | 309.3  |
| 75°    | 654.1  | 405.1  | 284.5  | 259.5  | 256.1  |
| 77.5°  | 515.7  | 287.8  | 224.1  | 209.8  | 202.6  |
| 80°    | 387.5  | 206.4  | 170.5  | 156.5  | 156.5  |
| 82.5°  | 270.1  | 138.8  | 117.3  | 110.1  | 110.1  |
| 85°    | 152.8  | 78.1   | 67.5   | 67.5   | 67.5   |
| 87.5°  | 57.0   | 28.3   | 28.3   | 24.9   | 24.9   |
| 90°    | 1.7    | 20.9   | 34.7   | 43.6   | 46.9   |
| 92.5°  | 43.6   | 36.6   | 41.7   | 45.3   | 46.9   |
| 95°    | 113.1  | 55.6   | 67.8   | 76.7   | 74.9   |
| 97.5°  | 203.7  | 61.0   | 88.7   | 94.0   | 95.7   |
| 100°   | 308.2  | 69.7   | 99.3   | 113.1  | 116.6  |
| 102.5° | 423.0  | 419.7  | 102.7  | 121.8  | 127.1  |
| 105°   | 529.3  | 581.6  | 106.2  | 125.3  | 132.3  |
| 107.5° | 652.9  | 696.3  | 109.8  | 128.8  | 135.9  |
| 110°   | 771.3  | 807.8  | 304.8  | 130.6  | 137.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 882.8  | 914.0  | 884.5  | 134.0  | 139.3  |
| 115°   | 1001.1 | 1030.6 | 1074.3 | 268.2  | 142.8  |
| 117.5° | 1103.8 | 1138.6 | 1168.3 | 919.2  | 463.1  |
| 120°   | 1218.8 | 1244.8 | 1276.3 | 1297.1 | 1062.1 |
| 122.5° | 1316.2 | 1344.1 | 1379.0 | 1389.3 | 1391.2 |
| 125°   | 1415.4 | 1438.1 | 1471.2 | 1483.4 | 1488.6 |
| 127.5° | 1505.9 | 1530.3 | 1556.6 | 1574.0 | 1575.6 |
| 130°   | 1591.3 | 1619.3 | 1638.3 | 1657.5 | 1655.9 |
| 132.5° | 1678.4 | 1701.1 | 1720.1 | 1735.9 | 1734.2 |
| 135°   | 1751.6 | 1779.5 | 1795.0 | 1812.6 | 1809.1 |
| 137.5° | 1828.1 | 1849.0 | 1866.5 | 1883.9 | 1878.7 |
| 140°   | 1902.9 | 1917.0 | 1936.0 | 1951.7 | 1943.1 |
| 142.5° | 1965.8 | 1978.0 | 2000.5 | 2014.4 | 2005.7 |
| 145°   | 2031.9 | 2030.0 | 2059.7 | 2071.9 | 2063.2 |
| 147.5° | 2089.2 | 2084.1 | 2113.6 | 2122.3 | 2115.4 |
| 150°   | 2145.1 | 2132.9 | 2160.8 | 2171.1 | 2162.4 |
| 152.5° | 2192.0 | 2178.1 | 2204.2 | 2214.7 | 2202.5 |
| 155°   | 2237.3 | 2221.8 | 2242.6 | 2253.0 | 2239.1 |
| 157.5° | 2273.9 | 2260.0 | 2275.7 | 2287.9 | 2273.9 |
| 160°   | 2305.2 | 2294.7 | 2305.2 | 2315.6 | 2303.4 |
| 162.5° | 2333.0 | 2322.6 | 2331.3 | 2343.5 | 2327.8 |
| 165°   | 2357.4 | 2347.0 | 2352.2 | 2364.4 | 2352.2 |
| 167.5° | 2376.6 | 2366.1 | 2371.4 | 2383.6 | 2367.9 |
| 170°   | 2392.3 | 2381.8 | 2385.3 | 2397.5 | 2381.8 |
| 172.5° | 2402.7 | 2392.3 | 2395.8 | 2408.0 | 2392.3 |
| 175°   | 2411.3 | 2399.1 | 2402.7 | 2414.8 | 2397.5 |
| 177.5° | 2414.8 | 2402.7 | 2404.5 | 2416.7 | 2401.0 |
| 180°   | 2406.2 | 2406.2 | 2406.2 | 2406.2 | 2406.2 |

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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 | 11.41            | 12.27 | 12.34 | 13.21 | 14.44 | 7.38           | 8.24  | 8.32  | 9.19  | 10.41 |
|                 | 3H   | 13.09            | 13.86 | 14.03 | 14.81 | 16.06 | 8.57           | 9.34  | 9.52  | 10.30 | 11.55 |
|                 | 4H   | 13.70            | 14.42 | 14.66 | 15.38 | 16.64 | 9.03           | 9.75  | 9.99  | 10.71 | 11.97 |
|                 | 6H   | 14.12            | 14.79 | 15.09 | 15.76 | 17.02 | 9.35           | 10.02 | 10.32 | 10.98 | 12.25 |
|                 | 8H   | 14.25            | 14.88 | 15.23 | 15.87 | 17.13 | 9.44           | 10.08 | 10.42 | 11.06 | 12.33 |
|                 | 12H  | 14.31            | 14.92 | 15.29 | 15.89 | 17.18 | 9.49           | 10.09 | 10.47 | 11.07 | 12.36 |
| 4H              | 2H   | 11.43            | 12.16 | 12.40 | 13.12 | 14.37 | 7.98           | 8.71  | 8.95  | 9.67  | 10.92 |
|                 | 3H   | 13.26            | 13.87 | 14.24 | 14.86 | 16.13 | 9.34           | 9.94  | 10.31 | 10.93 | 12.20 |
|                 | 4H   | 13.96            | 14.51 | 14.94 | 15.49 | 16.79 | 9.88           | 10.43 | 10.87 | 11.42 | 12.71 |
|                 | 6H   | 14.47            | 14.95 | 15.47 | 15.95 | 17.25 | 10.31          | 10.78 | 11.30 | 11.79 | 13.08 |
|                 | 8H   | 14.65            | 15.09 | 15.65 | 16.09 | 17.40 | 10.44          | 10.88 | 11.43 | 11.88 | 13.19 |
|                 | 12H  | 14.74            | 15.14 | 15.76 | 16.16 | 17.47 | 10.50          | 10.90 | 11.52 | 11.92 | 13.23 |
| 8H              | 4H   | 13.93            | 14.37 | 14.92 | 15.37 | 16.68 | 10.17          | 10.61 | 11.16 | 11.61 | 12.92 |
|                 | 6H   | 14.49            | 14.86 | 15.52 | 15.90 | 17.21 | 10.69          | 11.05 | 11.71 | 12.09 | 13.40 |
|                 | 8H   | 14.71            | 15.03 | 15.74 | 16.06 | 17.38 | 10.88          | 11.20 | 11.91 | 12.23 | 13.55 |
|                 | 12H  | 14.85            | 15.13 | 15.88 | 16.16 | 17.52 | 11.00          | 11.28 | 12.03 | 12.31 | 13.68 |
| 12H             | 4H   | 13.88            | 14.28 | 14.90 | 15.29 | 16.61 | 10.17          | 10.57 | 11.19 | 11.59 | 12.90 |
|                 | 6H   | 14.47            | 14.79 | 15.50 | 15.82 | 17.14 | 10.74          | 11.06 | 11.77 | 12.09 | 13.41 |
|                 | 8H   | 14.69            | 14.97 | 15.72 | 16.00 | 17.37 | 10.95          | 11.23 | 11.98 | 12.26 | 13.62 |

END OF REPORT