

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: P916032

Luminaire Tested: DFN2DIP-4P4F0-070D080US930-RLFL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916032  
REPORT IS A COMBINATION OF REPORTS P899148 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-070D080US930-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

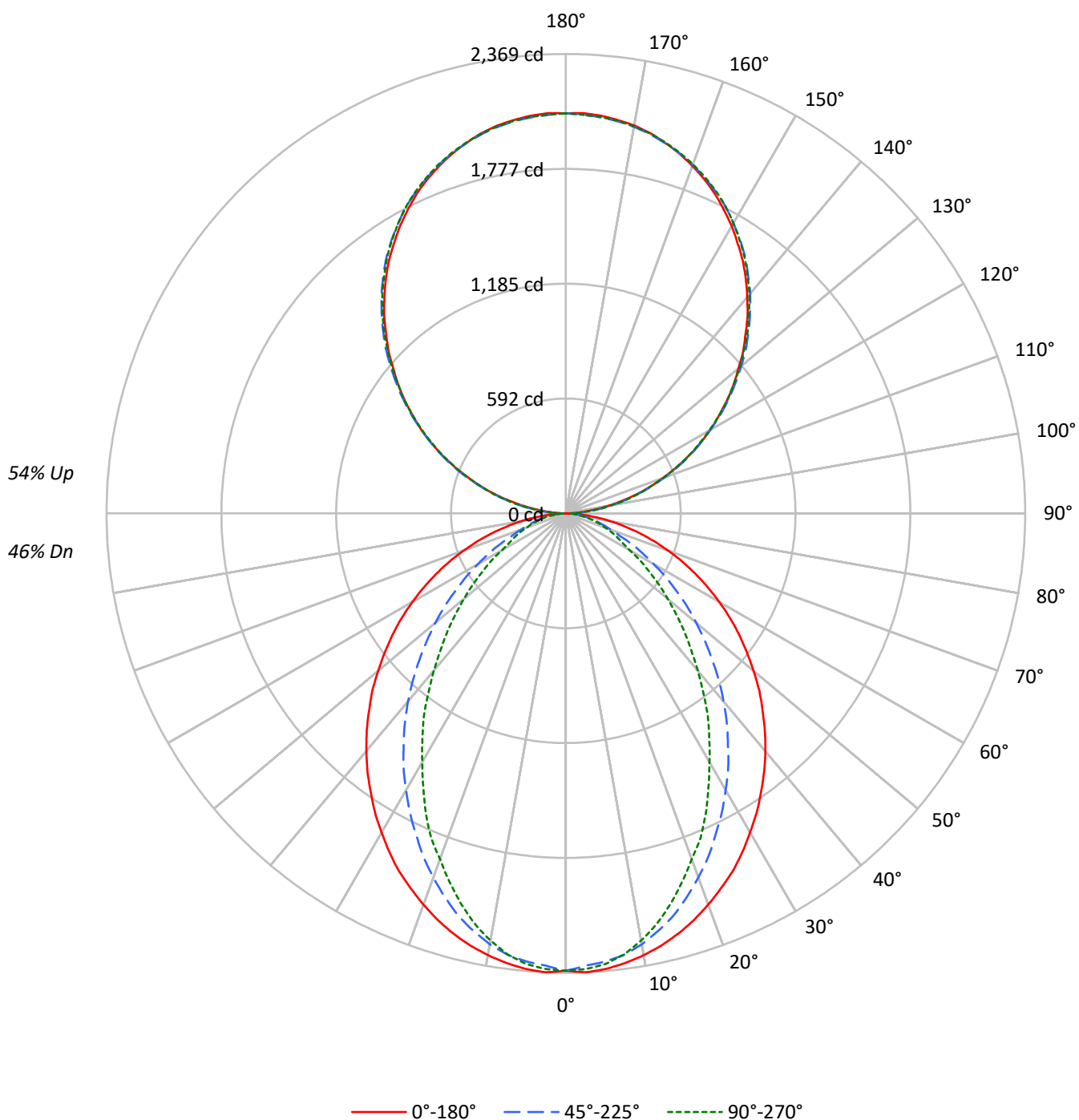
Lumens per Lamp: N/A  
Luminaire Lumens: 10623.3 lumens  
Efficiency: N/A  
Efficacy: 71.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 147.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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



TEST NUMBER: P916032

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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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 66 | 66 | 66 | 52 | 52 | 52 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 80 | 72 | 69 | 67 | 59 | 57 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 81 | 75 | 70 | 66 | 63 | 60 | 56 | 52 | 49 | 47 | 42 | 40 | 38 |
| 3   | 81  | 72  | 65  | 60  | 74 | 67 | 61 | 56 | 56 | 52 | 48 | 46 | 43 | 40 | 37 | 35 | 33 |
| 4   | 75  | 64  | 57  | 51  | 68 | 59 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 57  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 43 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 20 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 18 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 26 | 22 | 20 | 22 | 19 | 17 |
| 10  | 47  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 24 | 20 | 18 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1530 | 1530 | 1530 |
| 5°  | 1533 | 1506 | 1516 |
| 10° | 1518 | 1477 | 1467 |
| 15° | 1497 | 1429 | 1392 |
| 20° | 1469 | 1362 | 1298 |
| 25° | 1441 | 1287 | 1208 |
| 30° | 1403 | 1210 | 1094 |
| 35° | 1366 | 1127 | 994  |
| 40° | 1328 | 1042 | 878  |
| 45° | 1285 | 946  | 774  |
| 50° | 1239 | 850  | 672  |
| 55° | 1192 | 748  | 574  |
| 60° | 1137 | 640  | 473  |
| 65° | 1074 | 531  | 426  |
| 70° | 998  | 429  | 387  |
| 75° | 902  | 379  | 353  |
| 80° | 763  | 320  | 308  |
| 85° | 533  | 216  | 235  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1562 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.1   | 2.1       |
| 10°-20°   | 606.9   | 5.7       |
| 20°-30°   | 852.0   | 8.0       |
| 30°-40°   | 928.8   | 8.7       |
| 40°-50°   | 853.6   | 8.0       |
| 50°-60°   | 670.4   | 6.3       |
| 60°-70°   | 436.4   | 4.1       |
| 70°-80°   | 224.6   | 2.1       |
| 80°-90°   | 63.2    | 0.6       |
| 90°-100°  | 127.6   | 1.2       |
| 100°-110° | 405.6   | 3.8       |
| 110°-120° | 694.1   | 6.5       |
| 120°-130° | 912.8   | 8.6       |
| 130°-140° | 1024.6  | 9.6       |
| 140°-150° | 1004.7  | 9.5       |
| 150°-160° | 842.8   | 7.9       |
| 160°-170° | 558.9   | 5.3       |
| 170°-180° | 195.4   | 1.8       |
| 0°-30°    | 1679.9  | 15.8      |
| 0°-40°    | 2608.7  | 24.6      |
| 0°-60°    | 4132.7  | 38.9      |
| 0°-90°    | 4856.9  | 45.7      |
| 90°-120°  | 1227.3  | 11.6      |
| 90°-150°  | 4169.4  | 39.2      |
| 90°-180°  | 5766.0  | 54.3      |
| 0°-180°   | 10623.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2359 | 2359  | 2359 | 2359  | 2359 |      |
| 5°   | 2359 | 2348  | 2320 | 2340  | 2333 | 224  |
| 15°  | 2244 | 2220  | 2147 | 2107  | 2086 | 632  |
| 25°  | 2036 | 1968  | 1827 | 1740  | 1708 | 937  |
| 35°  | 1755 | 1646  | 1458 | 1324  | 1276 | 1098 |
| 45°  | 1434 | 1291  | 1067 | 916   | 864  | 1108 |
| 55°  | 1091 | 924   | 694  | 566   | 525  | 975  |
| 65°  | 736  | 564   | 371  | 299   | 292  | 730  |
| 75°  | 393  | 243   | 171  | 156   | 154  | 415  |
| 85°  | 92   | 47    | 40   | 40    | 40   | 105  |
| 90°  | 2    | 22    | 61   | 57    | 59   | 10   |
| 95°  | 91   | 108   | 111  | 111   | 108  | 101  |
| 105° | 374  | 379   | 383  | 386   | 386  | 395  |
| 115° | 696  | 706   | 703  | 702   | 696  | 689  |
| 125° | 1013 | 1029  | 1024 | 1018  | 1016 | 905  |
| 135° | 1310 | 1330  | 1333 | 1332  | 1326 | 1013 |
| 145° | 1591 | 1603  | 1613 | 1615  | 1608 | 994  |
| 155° | 1819 | 1824  | 1830 | 1838  | 1833 | 837  |
| 165° | 1979 | 1977  | 1977 | 1989  | 1981 | 558  |
| 175° | 2059 | 2054  | 2050 | 2063  | 2052 | 196  |
| 180° | 2063 | 2063  | 2063 | 2063  | 2063 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2358.7 | 2358.7 | 2358.7 | 2358.7 | 2358.7 |
| 2.5°   | 2369.3 | 2358.7 | 2335.2 | 2356.7 | 2352.4 |
| 5°     | 2358.7 | 2348.1 | 2320.3 | 2339.5 | 2333.1 |
| 7.5°   | 2339.5 | 2326.8 | 2296.9 | 2305.3 | 2294.7 |
| 10°    | 2313.9 | 2299.0 | 2256.3 | 2249.8 | 2237.1 |
| 12.5°  | 2281.9 | 2262.7 | 2205.0 | 2192.3 | 2168.7 |
| 15°    | 2243.5 | 2219.9 | 2147.4 | 2106.9 | 2085.6 |
| 17.5°  | 2198.6 | 2164.5 | 2074.8 | 2027.8 | 1993.6 |
| 20°    | 2147.4 | 2104.6 | 1998.0 | 1944.7 | 1897.6 |
| 22.5°  | 2092.0 | 2042.8 | 1918.9 | 1846.4 | 1814.5 |
| 25°    | 2036.5 | 1968.0 | 1827.2 | 1739.8 | 1707.6 |
| 27.5°  | 1970.3 | 1897.6 | 1741.8 | 1641.5 | 1592.4 |
| 30°    | 1899.9 | 1818.6 | 1647.8 | 1539.1 | 1481.4 |
| 32.5°  | 1831.5 | 1733.2 | 1558.4 | 1430.2 | 1376.7 |
| 35°    | 1754.7 | 1645.8 | 1458.1 | 1323.6 | 1276.4 |
| 37.5°  | 1680.0 | 1562.4 | 1364.1 | 1216.6 | 1163.4 |
| 40°    | 1600.9 | 1473.0 | 1265.8 | 1114.3 | 1058.7 |
| 42.5°  | 1519.9 | 1383.3 | 1167.7 | 1009.6 | 956.4  |
| 45°    | 1434.5 | 1291.4 | 1067.4 | 915.7  | 864.5  |
| 47.5°  | 1353.4 | 1201.9 | 971.3  | 819.6  | 772.7  |
| 50°    | 1263.7 | 1112.2 | 877.3  | 729.9  | 685.3  |
| 52.5°  | 1176.1 | 1015.9 | 787.7  | 646.8  | 606.3  |
| 55°    | 1090.7 | 924.2  | 693.7  | 565.7  | 525.2  |
| 57.5°  | 1003.3 | 832.5  | 610.6  | 491.0  | 456.8  |
| 60°    | 913.6  | 742.8  | 522.9  | 414.3  | 380.0  |
| 62.5°  | 826.1  | 655.4  | 448.2  | 345.8  | 328.8  |
| 65°    | 736.5  | 563.5  | 371.4  | 299.0  | 292.4  |
| 67.5°  | 651.1  | 478.1  | 299.0  | 262.4  | 256.2  |
| 70°    | 561.4  | 394.9  | 247.5  | 226.2  | 217.6  |
| 72.5°  | 476.1  | 318.0  | 207.0  | 190.0  | 185.7  |
| 75°    | 392.7  | 243.2  | 170.7  | 155.8  | 153.8  |
| 77.5°  | 309.6  | 172.8  | 134.5  | 125.9  | 121.6  |
| 80°    | 232.6  | 123.8  | 102.4  | 94.0   | 94.0   |
| 82.5°  | 162.2  | 83.3   | 70.4   | 66.1   | 66.1   |
| 85°    | 91.7   | 46.9   | 40.5   | 40.5   | 40.5   |
| 87.5°  | 34.2   | 17.0   | 17.0   | 14.9   | 14.9   |
| 90°    | 1.9    | 22.4   | 61.0   | 57.2   | 59.1   |
| 92.5°  | 38.6   | 52.3   | 54.1   | 55.9   | 55.9   |
| 95°    | 90.8   | 108.2  | 111.3  | 111.3  | 108.2  |
| 97.5°  | 151.2  | 167.3  | 174.1  | 174.1  | 174.1  |
| 100°   | 220.8  | 235.1  | 240.0  | 240.0  | 238.1  |
| 102.5° | 294.2  | 304.8  | 311.5  | 313.4  | 311.5  |
| 105°   | 374.4  | 379.4  | 383.1  | 386.2  | 386.2  |
| 107.5° | 454.0  | 461.5  | 461.5  | 462.7  | 454.0  |
| 110°   | 531.1  | 541.0  | 541.0  | 541.0  | 536.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 614.4  | 625.0  | 623.1  | 618.2  | 614.4  |
| 115°   | 696.5  | 706.5  | 703.4  | 701.5  | 696.5  |
| 117.5° | 778.0  | 791.7  | 782.9  | 778.0  | 773.0  |
| 120°   | 860.1  | 873.8  | 860.1  | 860.1  | 854.4  |
| 122.5° | 934.7  | 952.1  | 943.4  | 938.4  | 934.7  |
| 125°   | 1013.0 | 1028.6 | 1023.6 | 1018.0 | 1016.2 |
| 127.5° | 1089.6 | 1108.8 | 1102.0 | 1094.5 | 1089.6 |
| 130°   | 1161.1 | 1183.4 | 1180.3 | 1176.6 | 1169.8 |
| 132.5° | 1241.3 | 1258.7 | 1260.0 | 1251.2 | 1246.3 |
| 135°   | 1310.3 | 1329.6 | 1333.3 | 1331.5 | 1326.5 |
| 137.5° | 1387.4 | 1403.0 | 1406.1 | 1404.8 | 1397.3 |
| 140°   | 1455.2 | 1470.7 | 1479.4 | 1479.4 | 1472.6 |
| 142.5° | 1524.9 | 1540.4 | 1545.4 | 1547.3 | 1540.4 |
| 145°   | 1590.8 | 1603.2 | 1613.1 | 1615.0 | 1608.2 |
| 147.5° | 1649.8 | 1665.4 | 1672.8 | 1676.0 | 1669.2 |
| 150°   | 1710.8 | 1721.3 | 1728.2 | 1733.8 | 1728.2 |
| 152.5° | 1764.9 | 1775.5 | 1784.2 | 1791.0 | 1784.2 |
| 155°   | 1819.0 | 1824.0 | 1829.6 | 1838.3 | 1832.7 |
| 157.5° | 1865.6 | 1869.4 | 1872.5 | 1884.9 | 1876.2 |
| 160°   | 1907.3 | 1911.1 | 1912.9 | 1923.5 | 1916.0 |
| 162.5° | 1945.9 | 1945.9 | 1947.7 | 1959.6 | 1950.8 |
| 165°   | 1978.8 | 1976.9 | 1976.9 | 1989.4 | 1980.7 |
| 167.5° | 2008.7 | 2003.1 | 2003.1 | 2015.5 | 2006.8 |
| 170°   | 2031.1 | 2026.1 | 2024.2 | 2036.7 | 2026.1 |
| 172.5° | 2046.6 | 2041.7 | 2039.8 | 2052.2 | 2041.7 |
| 175°   | 2059.0 | 2054.1 | 2050.3 | 2062.8 | 2052.2 |
| 177.5° | 2065.9 | 2060.9 | 2057.2 | 2067.8 | 2057.2 |
| 180°   | 2062.8 | 2062.8 | 2062.8 | 2062.8 | 2062.8 |

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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 | 8.23             | 9.03  | 9.23  | 10.03 | 11.36 | 4.19           | 4.99 | 5.19 | 5.99 | 7.33  |
|                 | 3H   | 9.91             | 10.62 | 10.92 | 11.64 | 12.99 | 5.38           | 6.09 | 6.39 | 7.10 | 8.46  |
|                 | 4H   | 10.52            | 11.19 | 11.54 | 12.21 | 13.57 | 5.83           | 6.50 | 6.85 | 7.52 | 8.88  |
|                 | 6H   | 10.94            | 11.56 | 11.98 | 12.59 | 13.96 | 6.15           | 6.77 | 7.18 | 7.79 | 9.16  |
|                 | 8H   | 11.07            | 11.66 | 12.11 | 12.70 | 14.07 | 6.24           | 6.83 | 7.28 | 7.87 | 9.24  |
|                 | 12H  | 11.14            | 11.70 | 12.18 | 12.73 | 14.12 | 6.28           | 6.84 | 7.32 | 7.87 | 9.27  |
| 4H              | 2H   | 8.24             | 8.92  | 9.27  | 9.93  | 11.30 | 4.78           | 5.46 | 5.81 | 6.48 | 7.84  |
|                 | 3H   | 10.08            | 10.64 | 11.11 | 11.68 | 13.06 | 6.13           | 6.69 | 7.17 | 7.74 | 9.11  |
|                 | 4H   | 10.77            | 11.28 | 11.81 | 12.32 | 13.72 | 6.68           | 7.19 | 7.72 | 8.23 | 9.63  |
|                 | 6H   | 11.29            | 11.73 | 12.34 | 12.79 | 14.18 | 7.10           | 7.54 | 8.15 | 8.60 | 10.00 |
|                 | 8H   | 11.47            | 11.88 | 12.52 | 12.93 | 14.34 | 7.23           | 7.64 | 8.28 | 8.69 | 10.10 |
|                 | 12H  | 11.56            | 11.93 | 12.64 | 13.00 | 14.42 | 7.29           | 7.66 | 8.37 | 8.73 | 10.15 |
| 8H              | 4H   | 10.74            | 11.15 | 11.79 | 12.20 | 13.61 | 6.96           | 7.37 | 8.02 | 8.43 | 9.84  |
|                 | 6H   | 11.31            | 11.65 | 12.38 | 12.74 | 14.15 | 7.48           | 7.82 | 8.56 | 8.92 | 10.32 |
|                 | 8H   | 11.53            | 11.82 | 12.61 | 12.90 | 14.33 | 7.67           | 7.97 | 8.76 | 9.05 | 10.48 |
|                 | 12H  | 11.67            | 11.93 | 12.76 | 13.01 | 14.47 | 7.79           | 8.06 | 8.88 | 9.13 | 10.60 |
| 12H             | 4H   | 10.69            | 11.06 | 11.76 | 12.13 | 13.54 | 6.97           | 7.34 | 8.04 | 8.41 | 9.82  |
|                 | 6H   | 11.28            | 11.58 | 12.37 | 12.66 | 14.09 | 7.53           | 7.83 | 8.62 | 8.91 | 10.34 |
|                 | 8H   | 11.51            | 11.77 | 12.59 | 12.84 | 14.31 | 7.74           | 8.01 | 8.83 | 9.08 | 10.55 |

END OF REPORT