

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: P929258

Luminaire Tested: DFN2DIP-HX4F0-070D060US940-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P929258  
REPORT IS A COMBINATION OF REPORTS P900862 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D060US940-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

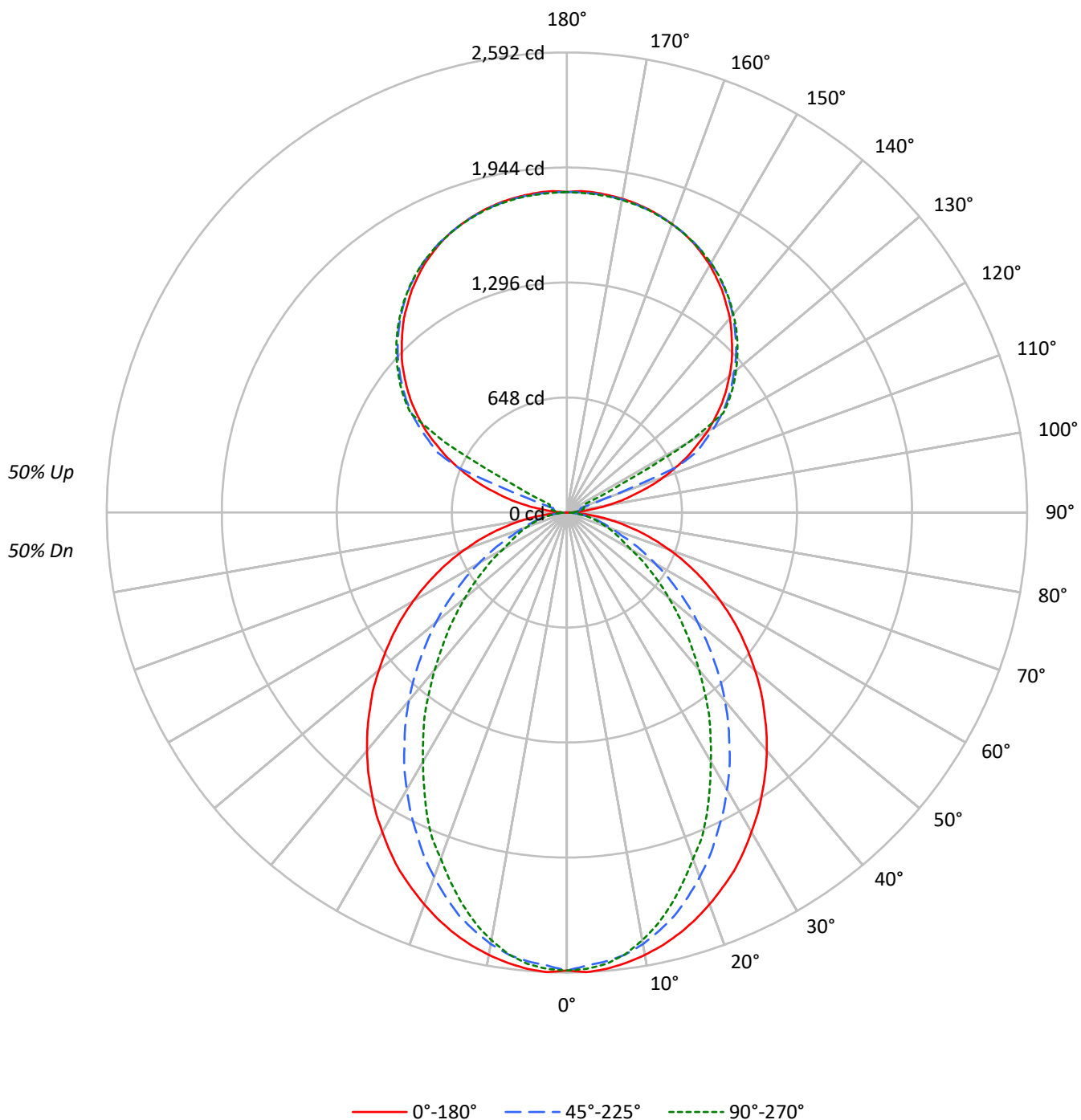
Lumens per Lamp: N/A  
Luminaire Lumens: 10605.8 lumens  
Efficiency: N/A  
Efficacy: 96.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 110.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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  | 94  | 90  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 69 | 62 | 60 | 59 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 67 | 65 | 62 | 58 | 55 | 52 | 50 | 45 | 43 | 41 |
| 3   | 82  | 73  | 66  | 60  | 76 | 68 | 62 | 57 | 58 | 53 | 50 | 49 | 45 | 43 | 40 | 38 | 36 |
| 4   | 76  | 65  | 57  | 52  | 70 | 60 | 54 | 49 | 52 | 47 | 43 | 44 | 40 | 37 | 36 | 34 | 31 |
| 5   | 70  | 58  | 50  | 45  | 64 | 54 | 47 | 42 | 47 | 41 | 37 | 40 | 35 | 32 | 33 | 30 | 28 |
| 6   | 64  | 52  | 45  | 39  | 59 | 49 | 42 | 37 | 42 | 37 | 33 | 36 | 32 | 29 | 30 | 27 | 25 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 33 | 29 | 25 | 28 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 34 | 29 | 35 | 30 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 30 | 26 | 32 | 27 | 23 | 28 | 24 | 21 | 24 | 20 | 18 |
| 10  | 48  | 36  | 29  | 25  | 45 | 34 | 28 | 23 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1919 | 1919 | 1919 |
| 5°  | 1922 | 1889 | 1901 |
| 10° | 1903 | 1852 | 1839 |
| 15° | 1877 | 1791 | 1743 |
| 20° | 1843 | 1707 | 1626 |
| 25° | 1807 | 1612 | 1513 |
| 30° | 1760 | 1515 | 1369 |
| 35° | 1713 | 1411 | 1243 |
| 40° | 1666 | 1303 | 1098 |
| 45° | 1611 | 1184 | 967  |
| 50° | 1554 | 1063 | 839  |
| 55° | 1495 | 934  | 716  |
| 60° | 1426 | 799  | 590  |
| 65° | 1347 | 662  | 531  |
| 70° | 1251 | 534  | 480  |
| 75° | 1131 | 471  | 437  |
| 80° | 957  | 396  | 379  |
| 85° | 669  | 265  | 286  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1611 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 241.9   | 2.3       |
| 10°-20°   | 664.0   | 6.3       |
| 20°-30°   | 932.2   | 8.8       |
| 30°-40°   | 1016.1  | 9.6       |
| 40°-50°   | 933.9   | 8.8       |
| 50°-60°   | 733.5   | 6.9       |
| 60°-70°   | 477.4   | 4.5       |
| 70°-80°   | 245.7   | 2.3       |
| 80°-90°   | 65.9    | 0.6       |
| 90°-100°  | 59.5    | 0.6       |
| 100°-110° | 222.0   | 2.1       |
| 110°-120° | 588.9   | 5.6       |
| 120°-130° | 976.7   | 9.2       |
| 130°-140° | 1037.4  | 9.8       |
| 140°-150° | 964.2   | 9.1       |
| 150°-160° | 775.2   | 7.3       |
| 160°-170° | 499.5   | 4.7       |
| 170°-180° | 171.9   | 1.6       |
| 0°-30°    | 1838.0  | 17.3      |
| 0°-40°    | 2854.1  | 26.9      |
| 0°-60°    | 4521.5  | 42.6      |
| 0°-90°    | 5310.5  | 50.1      |
| 90°-120°  | 870.4   | 8.2       |
| 90°-150°  | 3848.7  | 36.3      |
| 90°-180°  | 5295.0  | 49.9      |
| 0°-180°   | 10605.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2581 | 2581  | 2581 | 2581  | 2581 |      |
| 5°   | 2581 | 2569  | 2538 | 2560  | 2553 | 245  |
| 15°  | 2454 | 2429  | 2349 | 2305  | 2282 | 692  |
| 25°  | 2228 | 2153  | 1999 | 1903  | 1868 | 1025 |
| 35°  | 1920 | 1801  | 1595 | 1448  | 1396 | 1202 |
| 45°  | 1570 | 1413  | 1168 | 1002  | 946  | 1212 |
| 55°  | 1193 | 1011  | 759  | 619   | 575  | 1066 |
| 65°  | 806  | 616   | 406  | 327   | 320  | 799  |
| 75°  | 430  | 266   | 187  | 170   | 168  | 454  |
| 85°  | 100  | 51    | 44   | 44    | 44   | 115  |
| 90°  | 1    | 16    | 26   | 33    | 35   | 10   |
| 95°  | 85   | 42    | 51   | 58    | 56   | 101  |
| 105° | 397  | 436   | 80   | 94    | 99   | 425  |
| 115° | 752  | 774   | 806  | 201   | 107  | 740  |
| 125° | 1063 | 1080  | 1104 | 1114  | 1117 | 948  |
| 135° | 1315 | 1336  | 1348 | 1361  | 1358 | 1016 |
| 145° | 1525 | 1524  | 1546 | 1555  | 1549 | 954  |
| 155° | 1680 | 1668  | 1684 | 1691  | 1681 | 774  |
| 165° | 1770 | 1762  | 1766 | 1775  | 1766 | 500  |
| 175° | 1810 | 1801  | 1804 | 1813  | 1800 | 172  |
| 180° | 1806 | 1806  | 1806 | 1806  | 1806 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2580.6 | 2580.6 | 2580.6 | 2580.6 | 2580.6 |
| 2.5°   | 2592.2 | 2580.6 | 2554.9 | 2578.4 | 2573.7 |
| 5°     | 2580.6 | 2569.0 | 2538.5 | 2559.6 | 2552.6 |
| 7.5°   | 2559.6 | 2545.7 | 2513.0 | 2522.1 | 2510.5 |
| 10°    | 2531.6 | 2515.3 | 2468.6 | 2461.5 | 2447.6 |
| 12.5°  | 2496.6 | 2475.6 | 2412.4 | 2398.5 | 2372.7 |
| 15°    | 2454.5 | 2428.7 | 2349.4 | 2305.1 | 2281.8 |
| 17.5°  | 2405.5 | 2368.1 | 2270.0 | 2218.6 | 2181.2 |
| 20°    | 2349.4 | 2302.6 | 2185.9 | 2127.7 | 2076.1 |
| 22.5°  | 2288.8 | 2235.0 | 2099.4 | 2020.1 | 1985.2 |
| 25°    | 2228.0 | 2153.2 | 1999.1 | 1903.4 | 1868.3 |
| 27.5°  | 2155.7 | 2076.1 | 1905.7 | 1796.0 | 1742.2 |
| 30°    | 2078.6 | 1989.7 | 1802.8 | 1683.9 | 1620.8 |
| 32.5°  | 2003.8 | 1896.3 | 1705.0 | 1564.7 | 1506.2 |
| 35°    | 1919.8 | 1800.6 | 1595.3 | 1448.1 | 1396.5 |
| 37.5°  | 1838.1 | 1709.4 | 1492.4 | 1331.0 | 1272.9 |
| 40°    | 1751.5 | 1611.6 | 1384.8 | 1219.1 | 1158.4 |
| 42.5°  | 1662.9 | 1513.5 | 1277.5 | 1104.6 | 1046.4 |
| 45°    | 1569.5 | 1412.8 | 1167.8 | 1001.8 | 945.8  |
| 47.5°  | 1480.7 | 1315.0 | 1062.7 | 896.7  | 845.4  |
| 50°    | 1382.6 | 1216.9 | 959.9  | 798.6  | 749.8  |
| 52.5°  | 1286.7 | 1111.5 | 861.8  | 707.6  | 663.3  |
| 55°    | 1193.3 | 1011.2 | 758.9  | 619.0  | 574.6  |
| 57.5°  | 1097.7 | 910.8  | 668.0  | 537.2  | 499.8  |
| 60°    | 999.6  | 812.7  | 572.1  | 453.2  | 415.8  |
| 62.5°  | 903.9  | 717.1  | 490.3  | 378.4  | 359.7  |
| 65°    | 805.7  | 616.5  | 406.4  | 327.1  | 319.9  |
| 67.5°  | 712.4  | 523.1  | 327.1  | 287.1  | 280.3  |
| 70°    | 614.2  | 432.1  | 270.8  | 247.5  | 238.1  |
| 72.5°  | 520.8  | 347.9  | 226.5  | 207.9  | 203.2  |
| 75°    | 429.7  | 266.1  | 186.8  | 170.5  | 168.2  |
| 77.5°  | 338.7  | 189.0  | 147.2  | 137.7  | 133.1  |
| 80°    | 254.5  | 135.5  | 112.0  | 102.8  | 102.8  |
| 82.5°  | 177.4  | 91.2   | 77.1   | 72.3   | 72.3   |
| 85°    | 100.4  | 51.3   | 44.3   | 44.3   | 44.3   |
| 87.5°  | 37.4   | 18.6   | 18.6   | 16.3   | 16.3   |
| 90°    | 1.2    | 15.7   | 26.0   | 32.7   | 35.2   |
| 92.5°  | 32.7   | 27.5   | 31.3   | 34.0   | 35.2   |
| 95°    | 84.9   | 41.7   | 50.9   | 57.6   | 56.2   |
| 97.5°  | 152.9  | 45.8   | 66.5   | 70.6   | 71.9   |
| 100°   | 231.4  | 52.3   | 74.5   | 84.9   | 87.5   |
| 102.5° | 317.6  | 315.1  | 77.2   | 91.4   | 95.4   |
| 105°   | 397.3  | 436.5  | 79.7   | 94.0   | 99.4   |
| 107.5° | 490.2  | 522.7  | 82.4   | 96.7   | 102.0  |
| 110°   | 579.1  | 606.4  | 228.8  | 98.1   | 103.2  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 662.7  | 686.1  | 663.9  | 100.5  | 104.6  |
| 115°   | 751.5  | 773.7  | 806.5  | 201.3  | 107.2  |
| 117.5° | 828.6  | 854.7  | 877.0  | 690.1  | 347.6  |
| 120°   | 914.9  | 934.5  | 958.1  | 973.7  | 797.3  |
| 122.5° | 988.0  | 1008.9 | 1035.2 | 1042.9 | 1044.4 |
| 125°   | 1062.6 | 1079.6 | 1104.4 | 1113.6 | 1117.4 |
| 127.5° | 1130.5 | 1148.8 | 1168.5 | 1181.5 | 1182.8 |
| 130°   | 1194.6 | 1215.5 | 1229.8 | 1244.3 | 1243.0 |
| 132.5° | 1260.0 | 1277.0 | 1291.3 | 1303.0 | 1301.8 |
| 135°   | 1314.9 | 1335.9 | 1347.5 | 1360.7 | 1358.0 |
| 137.5° | 1372.3 | 1388.0 | 1401.2 | 1414.2 | 1410.3 |
| 140°   | 1428.4 | 1439.1 | 1453.3 | 1465.1 | 1458.6 |
| 142.5° | 1475.6 | 1484.8 | 1501.8 | 1512.1 | 1505.6 |
| 145°   | 1525.3 | 1523.9 | 1546.1 | 1555.3 | 1548.8 |
| 147.5° | 1568.3 | 1564.4 | 1586.6 | 1593.1 | 1588.0 |
| 150°   | 1610.2 | 1601.1 | 1622.0 | 1629.8 | 1623.3 |
| 152.5° | 1645.5 | 1635.0 | 1654.6 | 1662.5 | 1653.3 |
| 155°   | 1679.5 | 1667.8 | 1683.5 | 1691.2 | 1680.8 |
| 157.5° | 1706.9 | 1696.5 | 1708.3 | 1717.5 | 1706.9 |
| 160°   | 1730.5 | 1722.5 | 1730.5 | 1738.2 | 1729.1 |
| 162.5° | 1751.3 | 1743.5 | 1750.0 | 1759.2 | 1747.4 |
| 165°   | 1769.6 | 1761.9 | 1765.7 | 1774.9 | 1765.7 |
| 167.5° | 1784.0 | 1776.2 | 1780.2 | 1789.4 | 1777.5 |
| 170°   | 1795.9 | 1787.9 | 1790.6 | 1799.7 | 1787.9 |
| 172.5° | 1803.6 | 1795.9 | 1798.5 | 1807.6 | 1795.9 |
| 175°   | 1810.1 | 1800.9 | 1803.6 | 1812.7 | 1799.7 |
| 177.5° | 1812.7 | 1803.6 | 1805.0 | 1814.1 | 1802.4 |
| 180°   | 1806.2 | 1806.2 | 1806.2 | 1806.2 | 1806.2 |

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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 | 9.42             | 10.25 | 10.38 | 11.22 | 12.50 | 5.39           | 6.22 | 6.36  | 7.20  | 8.47  |
|                 | 3H   | 11.10            | 11.84 | 12.07 | 12.82 | 14.12 | 6.58           | 7.33 | 7.56  | 8.31  | 9.60  |
|                 | 4H   | 11.71            | 12.41 | 12.70 | 13.40 | 14.70 | 7.03           | 7.74 | 8.02  | 8.72  | 10.03 |
|                 | 6H   | 12.13            | 12.78 | 13.13 | 13.77 | 15.08 | 7.36           | 8.00 | 8.36  | 8.99  | 10.31 |
|                 | 8H   | 12.26            | 12.87 | 13.26 | 13.88 | 15.19 | 7.45           | 8.06 | 8.45  | 9.07  | 10.38 |
|                 | 12H  | 12.32            | 12.90 | 13.33 | 13.90 | 15.24 | 7.49           | 8.08 | 8.50  | 9.08  | 10.42 |
| 4H              | 2H   | 9.44             | 10.14 | 10.43 | 11.13 | 12.43 | 5.99           | 6.69 | 6.98  | 7.68  | 8.98  |
|                 | 3H   | 11.27            | 11.85 | 12.27 | 12.87 | 14.18 | 7.34           | 7.92 | 8.34  | 8.94  | 10.26 |
|                 | 4H   | 11.96            | 12.49 | 12.97 | 13.50 | 14.84 | 7.89           | 8.42 | 8.90  | 9.43  | 10.77 |
|                 | 6H   | 12.48            | 12.94 | 13.50 | 13.97 | 15.31 | 8.31           | 8.77 | 9.33  | 9.80  | 11.14 |
|                 | 8H   | 12.65            | 13.08 | 13.68 | 14.11 | 15.46 | 8.44           | 8.87 | 9.46  | 9.89  | 11.25 |
|                 | 12H  | 12.75            | 13.13 | 13.79 | 14.17 | 15.53 | 8.51           | 8.89 | 9.55  | 9.93  | 11.29 |
| 8H              | 4H   | 11.93            | 12.36 | 12.95 | 13.38 | 14.73 | 8.17           | 8.60 | 9.19  | 9.62  | 10.98 |
|                 | 6H   | 12.50            | 12.85 | 13.54 | 13.92 | 15.27 | 8.69           | 9.04 | 9.74  | 10.11 | 11.46 |
|                 | 8H   | 12.71            | 13.02 | 13.77 | 14.08 | 15.45 | 8.88           | 9.19 | 9.94  | 10.25 | 11.62 |
|                 | 12H  | 12.85            | 13.13 | 13.91 | 14.17 | 15.59 | 9.00           | 9.28 | 10.06 | 10.32 | 11.74 |
| 12H             | 4H   | 11.88            | 12.27 | 12.92 | 13.31 | 14.66 | 8.18           | 8.56 | 9.22  | 9.60  | 10.96 |
|                 | 6H   | 12.47            | 12.78 | 13.53 | 13.84 | 15.20 | 8.74           | 9.05 | 9.80  | 10.10 | 11.47 |
|                 | 8H   | 12.69            | 12.97 | 13.75 | 14.01 | 15.43 | 8.95           | 9.23 | 10.01 | 10.27 | 11.68 |

END OF REPORT