

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: P918724

Luminaire Tested: DFN2DIP-4P4F0-060D050US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918724  
REPORT IS A COMBINATION OF REPORTS P899110 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-060D050US935-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

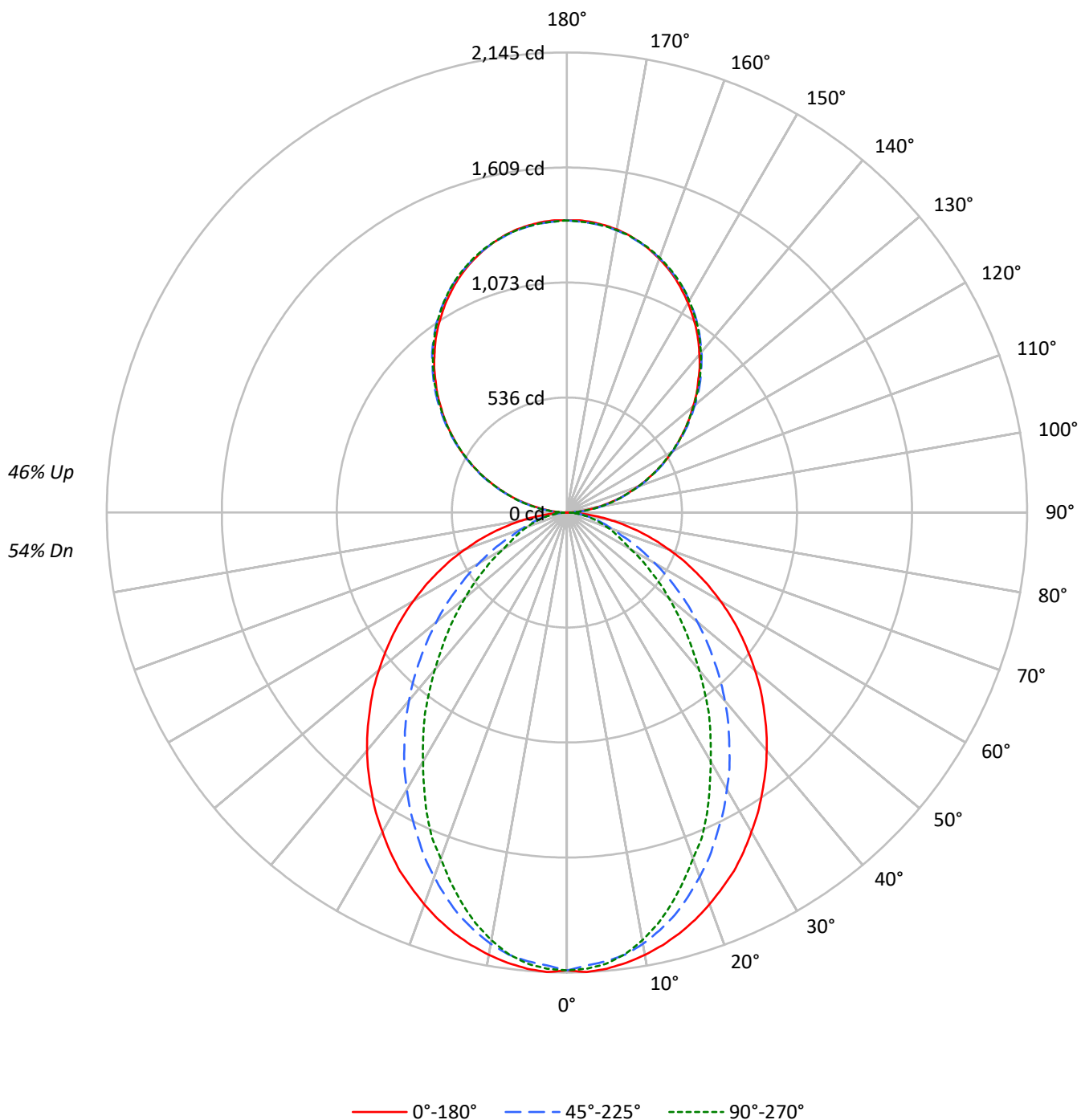
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8201.0 lumens  
Efficiency: N/A  
Efficacy: 80.6 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): 101.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P918724

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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  | 84  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 48 | 46 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 43 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 71  | 61  | 55  | 49  | 53 | 48 | 44 | 46 | 42 | 38 | 38 | 36 | 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 | 29 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 27 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 30  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 27  | 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 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1385 | 1385 | 1385 |
| 5°  | 1387 | 1364 | 1372 |
| 10° | 1374 | 1337 | 1328 |
| 15° | 1355 | 1293 | 1260 |
| 20° | 1330 | 1233 | 1175 |
| 25° | 1305 | 1165 | 1094 |
| 30° | 1270 | 1095 | 990  |
| 35° | 1237 | 1020 | 900  |
| 40° | 1202 | 943  | 795  |
| 45° | 1163 | 857  | 701  |
| 50° | 1122 | 770  | 608  |
| 55° | 1079 | 677  | 519  |
| 60° | 1029 | 579  | 428  |
| 65° | 972  | 480  | 386  |
| 70° | 903  | 388  | 350  |
| 75° | 816  | 343  | 320  |
| 80° | 690  | 289  | 279  |
| 85° | 482  | 196  | 213  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1163 cd/sqm

TEST NUMBER: P918724

CATALOG NUMBER: DFN2DIP-4P4F0-060D050US935-RLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 200.1  | 2.4       |
| 10°-20°   | 549.3  | 6.7       |
| 20°-30°   | 771.2  | 9.4       |
| 30°-40°   | 840.7  | 10.3      |
| 40°-50°   | 772.7  | 9.4       |
| 50°-60°   | 606.8  | 7.4       |
| 60°-70°   | 395.0  | 4.8       |
| 70°-80°   | 203.3  | 2.5       |
| 80°-90°   | 55.8   | 0.7       |
| 90°-100°  | 84.2   | 1.0       |
| 100°-110° | 267.7  | 3.3       |
| 110°-120° | 458.1  | 5.6       |
| 120°-130° | 602.5  | 7.3       |
| 130°-140° | 676.3  | 8.2       |
| 140°-150° | 663.1  | 8.1       |
| 150°-160° | 556.3  | 6.8       |
| 160°-170° | 368.9  | 4.5       |
| 170°-180° | 128.9  | 1.6       |
| 0°-30°    | 1520.7 | 18.5      |
| 0°-40°    | 2361.4 | 28.8      |
| 0°-60°    | 3740.9 | 45.6      |
| 0°-90°    | 4394.9 | 53.6      |
| 90°-120°  | 810.0  | 9.9       |
| 90°-150°  | 2751.9 | 33.6      |
| 90°-180°  | 3806.0 | 46.4      |
| 0°-180°   | 8201.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2135 | 2135  | 2135 | 2135  | 2135 |      |
| 5°   | 2135 | 2126  | 2100 | 2118  | 2112 | 202  |
| 15°  | 2031 | 2009  | 1944 | 1907  | 1888 | 572  |
| 25°  | 1843 | 1782  | 1654 | 1575  | 1546 | 848  |
| 35°  | 1588 | 1490  | 1320 | 1198  | 1155 | 994  |
| 45°  | 1298 | 1169  | 966  | 829   | 782  | 1003 |
| 55°  | 987  | 837   | 628  | 512   | 475  | 882  |
| 65°  | 667  | 510   | 336  | 271   | 265  | 661  |
| 75°  | 356  | 220   | 154  | 141   | 139  | 376  |
| 85°  | 83   | 42    | 37   | 37    | 37   | 95   |
| 90°  | 1    | 15    | 40   | 38    | 39   | 8    |
| 95°  | 60   | 72    | 73   | 73    | 72   | 67   |
| 105° | 247  | 250   | 253  | 255   | 255  | 261  |
| 115° | 460  | 466   | 464  | 463   | 460  | 455  |
| 125° | 669  | 679   | 676  | 672   | 671  | 598  |
| 135° | 865  | 878   | 880  | 879   | 876  | 669  |
| 145° | 1050 | 1058  | 1065 | 1066  | 1061 | 656  |
| 155° | 1201 | 1204  | 1208 | 1213  | 1210 | 553  |
| 165° | 1306 | 1305  | 1305 | 1313  | 1307 | 368  |
| 175° | 1359 | 1356  | 1353 | 1362  | 1354 | 129  |
| 180° | 1362 | 1362  | 1362 | 1362  | 1362 |      |

TEST NUMBER: P918724

CATALOG NUMBER: DFN2DIP-4P4F0-060D050US935-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2135.1 | 2135.1 | 2135.1 | 2135.1 | 2135.1 |
| 2.5°   | 2144.7 | 2135.1 | 2113.7 | 2133.2 | 2129.3 |
| 5°     | 2135.1 | 2125.5 | 2100.2 | 2117.7 | 2111.9 |
| 7.5°   | 2117.7 | 2106.2 | 2079.1 | 2086.7 | 2077.1 |
| 10°    | 2094.5 | 2080.9 | 2042.5 | 2036.5 | 2025.0 |
| 12.5°  | 2065.6 | 2048.1 | 1995.9 | 1984.4 | 1963.1 |
| 15°    | 2030.7 | 2009.4 | 1943.8 | 1907.1 | 1887.8 |
| 17.5°  | 1990.2 | 1959.2 | 1878.0 | 1835.6 | 1804.7 |
| 20°    | 1943.8 | 1905.0 | 1808.5 | 1760.3 | 1717.7 |
| 22.5°  | 1893.6 | 1849.1 | 1737.0 | 1671.4 | 1642.4 |
| 25°    | 1843.4 | 1781.5 | 1654.0 | 1574.9 | 1545.7 |
| 27.5°  | 1783.6 | 1717.7 | 1576.7 | 1485.8 | 1441.4 |
| 30°    | 1719.8 | 1646.1 | 1491.6 | 1393.2 | 1340.9 |
| 32.5°  | 1657.9 | 1568.9 | 1410.7 | 1294.6 | 1246.2 |
| 35°    | 1588.4 | 1489.8 | 1319.8 | 1198.0 | 1155.4 |
| 37.5°  | 1520.7 | 1414.3 | 1234.8 | 1101.3 | 1053.1 |
| 40°    | 1449.1 | 1333.3 | 1145.7 | 1008.6 | 958.4  |
| 42.5°  | 1375.8 | 1252.1 | 1057.0 | 913.9  | 865.7  |
| 45°    | 1298.5 | 1168.9 | 966.2  | 828.8  | 782.5  |
| 47.5°  | 1225.1 | 1088.0 | 879.3  | 741.9  | 699.5  |
| 50°    | 1143.9 | 1006.8 | 794.2  | 660.7  | 620.3  |
| 52.5°  | 1064.5 | 919.6  | 713.0  | 585.5  | 548.8  |
| 55°    | 987.3  | 836.6  | 627.9  | 512.1  | 475.4  |
| 57.5°  | 908.2  | 753.5  | 552.7  | 444.4  | 413.5  |
| 60°    | 827.0  | 672.4  | 473.4  | 375.0  | 344.0  |
| 62.5°  | 747.9  | 593.3  | 405.7  | 313.1  | 297.6  |
| 65°    | 666.7  | 510.1  | 336.2  | 270.6  | 264.7  |
| 67.5°  | 589.4  | 432.7  | 270.6  | 237.6  | 231.9  |
| 70°    | 508.2  | 357.5  | 224.0  | 204.8  | 197.0  |
| 72.5°  | 430.9  | 287.8  | 187.4  | 172.0  | 168.1  |
| 75°    | 355.5  | 220.2  | 154.5  | 141.0  | 139.2  |
| 77.5°  | 280.3  | 156.4  | 121.7  | 114.0  | 110.1  |
| 80°    | 210.5  | 112.1  | 92.6   | 85.1   | 85.1   |
| 82.5°  | 146.8  | 75.4   | 63.7   | 59.8   | 59.8   |
| 85°    | 83.0   | 42.4   | 36.7   | 36.7   | 36.7   |
| 87.5°  | 31.0   | 15.4   | 15.4   | 13.5   | 13.5   |
| 90°    | 1.2    | 14.8   | 40.2   | 37.8   | 39.0   |
| 92.5°  | 25.5   | 34.4   | 35.7   | 36.9   | 36.9   |
| 95°    | 59.9   | 71.5   | 73.4   | 73.4   | 71.5   |
| 97.5°  | 99.7   | 110.4  | 114.9  | 114.9  | 114.9  |
| 100°   | 145.7  | 155.2  | 158.4  | 158.4  | 157.2  |
| 102.5° | 194.2  | 201.1  | 205.6  | 206.9  | 205.6  |
| 105°   | 247.1  | 250.4  | 252.9  | 254.9  | 254.9  |
| 107.5° | 299.6  | 304.5  | 304.5  | 305.4  | 299.6  |
| 110°   | 350.5  | 357.1  | 357.1  | 357.1  | 353.8  |

TEST NUMBER: P918724

CATALOG NUMBER: DFN2DIP-4P4F0-060D050US935-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 405.5  | 412.5  | 411.3  | 408.0  | 405.5  |
| 115°   | 459.7  | 466.3  | 464.3  | 463.0  | 459.7  |
| 117.5° | 513.5  | 522.5  | 516.8  | 513.5  | 510.2  |
| 120°   | 567.7  | 576.7  | 567.7  | 567.7  | 564.0  |
| 122.5° | 616.9  | 628.4  | 622.7  | 619.4  | 616.9  |
| 125°   | 668.7  | 678.9  | 675.6  | 671.9  | 670.7  |
| 127.5° | 719.1  | 731.8  | 727.4  | 722.4  | 719.1  |
| 130°   | 766.4  | 781.1  | 779.0  | 776.6  | 772.1  |
| 132.5° | 819.3  | 830.8  | 831.6  | 825.9  | 822.6  |
| 135°   | 864.9  | 877.5  | 880.0  | 878.8  | 875.5  |
| 137.5° | 915.8  | 926.0  | 928.1  | 927.2  | 922.3  |
| 140°   | 960.4  | 970.8  | 976.5  | 976.5  | 972.0  |
| 142.5° | 1006.4 | 1016.8 | 1020.0 | 1021.2 | 1016.8 |
| 145°   | 1050.0 | 1058.2 | 1064.7 | 1066.0 | 1061.4 |
| 147.5° | 1089.0 | 1099.2 | 1104.1 | 1106.2 | 1101.6 |
| 150°   | 1129.2 | 1136.2 | 1140.6 | 1144.4 | 1140.6 |
| 152.5° | 1164.9 | 1171.9 | 1177.6 | 1182.2 | 1177.6 |
| 155°   | 1200.6 | 1203.8 | 1207.5 | 1213.3 | 1209.6 |
| 157.5° | 1231.4 | 1233.8 | 1235.9 | 1244.1 | 1238.4 |
| 160°   | 1258.9 | 1261.4 | 1262.6 | 1269.5 | 1264.6 |
| 162.5° | 1284.4 | 1284.4 | 1285.6 | 1293.4 | 1287.6 |
| 165°   | 1306.1 | 1304.8 | 1304.8 | 1313.1 | 1307.3 |
| 167.5° | 1325.8 | 1322.1 | 1322.1 | 1330.3 | 1324.6 |
| 170°   | 1340.6 | 1337.3 | 1336.1 | 1344.3 | 1337.3 |
| 172.5° | 1350.8 | 1347.5 | 1346.3 | 1354.5 | 1347.5 |
| 175°   | 1359.1 | 1355.7 | 1353.3 | 1361.5 | 1354.5 |
| 177.5° | 1363.6 | 1360.3 | 1357.8 | 1364.8 | 1357.8 |
| 180°   | 1361.5 | 1361.5 | 1361.5 | 1361.5 | 1361.5 |

TEST NUMBER: P918724

CATALOG NUMBER: DFN2DIP-4P4F0-060D050US935-RLLFLL

**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 | 8.63             | 9.49  | 9.56  | 10.43 | 11.65 | 4.59           | 5.45 | 5.52 | 6.39 | 7.61  |
|                 | 3H   | 10.31            | 11.08 | 11.26 | 12.04 | 13.28 | 5.78           | 6.55 | 6.72 | 7.50 | 8.75  |
|                 | 4H   | 10.93            | 11.65 | 11.88 | 12.61 | 13.87 | 6.23           | 6.96 | 7.19 | 7.92 | 9.17  |
|                 | 6H   | 11.35            | 12.02 | 12.32 | 12.99 | 14.25 | 6.56           | 7.23 | 7.53 | 8.19 | 9.46  |
|                 | 8H   | 11.48            | 12.12 | 12.46 | 13.10 | 14.37 | 6.65           | 7.28 | 7.62 | 8.27 | 9.53  |
|                 | 12H  | 11.55            | 12.15 | 12.53 | 13.13 | 14.42 | 6.69           | 7.30 | 7.67 | 8.27 | 9.56  |
| 4H              | 2H   | 8.65             | 9.37  | 9.61  | 10.33 | 11.59 | 5.19           | 5.92 | 6.15 | 6.87 | 8.13  |
|                 | 3H   | 10.49            | 11.09 | 11.46 | 12.08 | 13.35 | 6.54           | 7.15 | 7.52 | 8.14 | 9.41  |
|                 | 4H   | 11.18            | 11.74 | 12.17 | 12.72 | 14.01 | 7.09           | 7.65 | 8.08 | 8.63 | 9.92  |
|                 | 6H   | 11.71            | 12.18 | 12.70 | 13.19 | 14.48 | 7.52           | 7.99 | 8.51 | 9.00 | 10.29 |
|                 | 8H   | 11.89            | 12.33 | 12.88 | 13.33 | 14.63 | 7.65           | 8.09 | 8.64 | 9.09 | 10.40 |
|                 | 12H  | 11.99            | 12.38 | 13.00 | 13.40 | 14.71 | 7.72           | 8.11 | 8.73 | 9.13 | 10.44 |
| 8H              | 4H   | 11.15            | 11.60 | 12.15 | 12.60 | 13.90 | 7.38           | 7.82 | 8.38 | 8.82 | 10.13 |
|                 | 6H   | 11.73            | 12.09 | 12.75 | 13.13 | 14.44 | 7.90           | 8.27 | 8.92 | 9.31 | 10.61 |
|                 | 8H   | 11.95            | 12.27 | 12.98 | 13.30 | 14.62 | 8.10           | 8.42 | 9.12 | 9.45 | 10.77 |
|                 | 12H  | 12.09            | 12.38 | 13.12 | 13.40 | 14.76 | 8.22           | 8.50 | 9.25 | 9.52 | 10.89 |
| 12H             | 4H   | 11.11            | 11.51 | 12.12 | 12.52 | 13.83 | 7.39           | 7.79 | 8.40 | 8.80 | 10.11 |
|                 | 6H   | 11.70            | 12.03 | 12.73 | 13.05 | 14.38 | 7.95           | 8.28 | 8.98 | 9.30 | 10.63 |
|                 | 8H   | 11.93            | 12.21 | 12.96 | 13.23 | 14.60 | 8.17           | 8.45 | 9.20 | 9.47 | 10.84 |

END OF REPORT