

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: P911041

Luminaire Tested: DFN2DIP-PN2F0-020D040US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911041  
REPORT IS A COMBINATION OF REPORTS P901001 AND P897905  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-020D040US850-FLLONL  
Description: 2 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

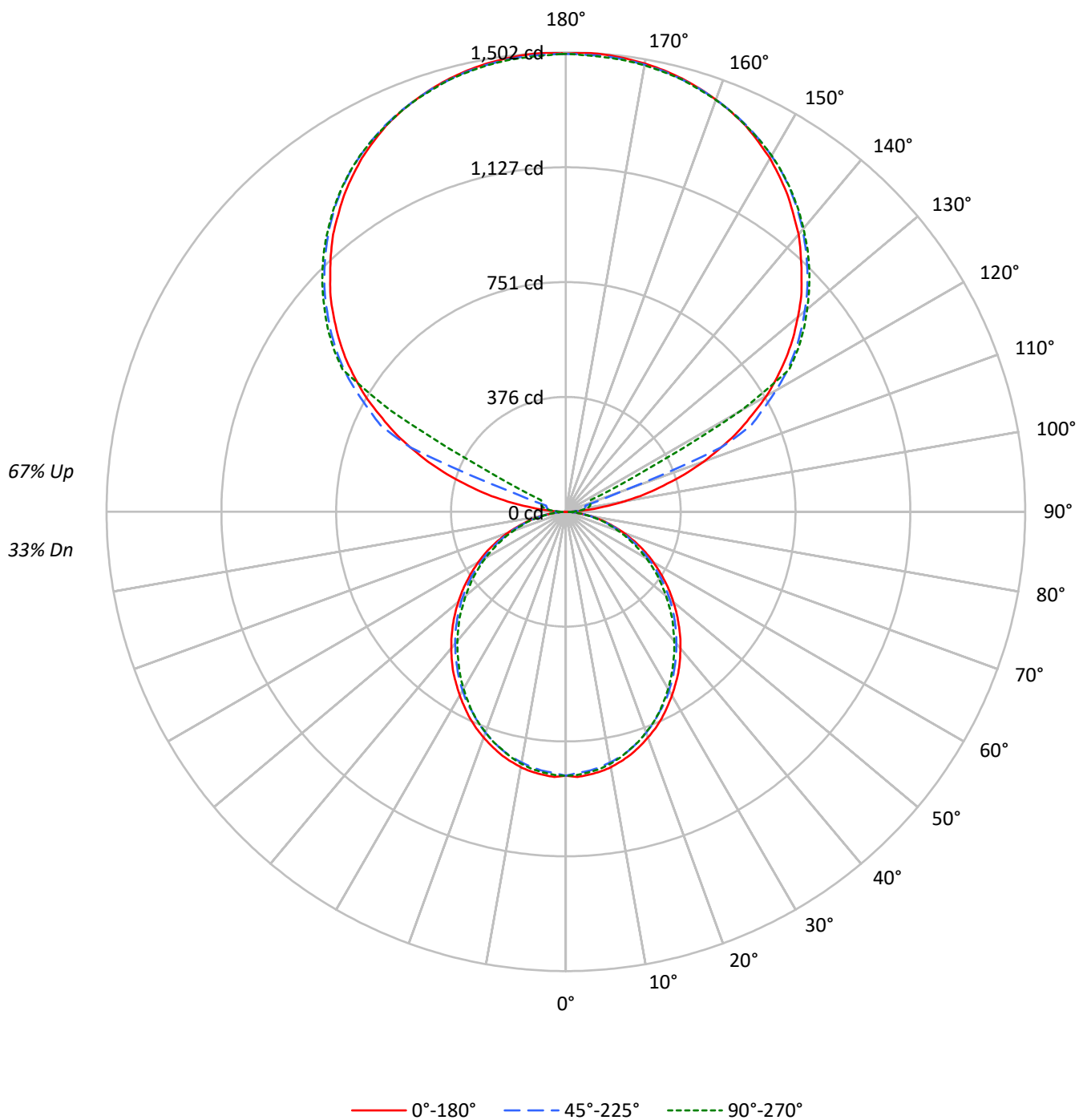
Lumens per Lamp: N/A  
Luminaire Lumens: 6587.5 lumens  
Efficiency: N/A  
Efficacy: 139.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 47.3  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P911041

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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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 78  | 72  | 67  | 77 | 71 | 66 | 62 | 57 | 53 | 50 | 44 | 41 | 39 | 32 | 30 | 29 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 46 | 42 | 39 | 36 | 33 | 28 | 26 | 25 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 49 | 43 | 44 | 40 | 36 | 34 | 31 | 28 | 25 | 23 | 21 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 40 | 35 | 31 | 31 | 27 | 25 | 23 | 20 | 18 |
| 6   | 60  | 48  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 28 | 24 | 21 | 20 | 18 | 16 |
| 7   | 56  | 44  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 25 | 22 | 19 | 19 | 16 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 15 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1869 | 1869 | 1869 |
| 5°  | 1869 | 1839 | 1853 |
| 10° | 1851 | 1810 | 1825 |
| 15° | 1821 | 1777 | 1783 |
| 20° | 1781 | 1731 | 1740 |
| 25° | 1742 | 1678 | 1691 |
| 30° | 1692 | 1628 | 1629 |
| 35° | 1646 | 1569 | 1564 |
| 40° | 1589 | 1510 | 1502 |
| 45° | 1532 | 1451 | 1439 |
| 50° | 1470 | 1388 | 1365 |
| 55° | 1404 | 1316 | 1297 |
| 60° | 1330 | 1231 | 1219 |
| 65° | 1248 | 1142 | 1127 |
| 70° | 1145 | 1033 | 1027 |
| 75° | 1003 | 903  | 931  |
| 80° | 830  | 738  | 755  |
| 85° | 562  | 467  | 474  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1532 cd/sqm

TEST NUMBER: P911041

CATALOG NUMBER: DFN2DIP-PN2F0-020D040US850-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 81.2   | 1.2       |
| 10°-20°   | 228.6  | 3.5       |
| 20°-30°   | 335.9  | 5.1       |
| 30°-40°   | 390.1  | 5.9       |
| 40°-50°   | 389.6  | 5.9       |
| 50°-60°   | 339.7  | 5.2       |
| 60°-70°   | 251.1  | 3.8       |
| 70°-80°   | 142.1  | 2.2       |
| 80°-90°   | 40.1   | 0.6       |
| 90°-100°  | 49.4   | 0.7       |
| 100°-110° | 184.0  | 2.8       |
| 110°-120° | 488.1  | 7.4       |
| 120°-130° | 809.5  | 12.3      |
| 130°-140° | 859.9  | 13.1      |
| 140°-150° | 799.2  | 12.1      |
| 150°-160° | 642.5  | 9.8       |
| 160°-170° | 414.0  | 6.3       |
| 170°-180° | 142.5  | 2.2       |
| 0°-30°    | 645.7  | 9.8       |
| 0°-40°    | 1035.8 | 15.7      |
| 0°-60°    | 1765.1 | 26.8      |
| 0°-90°    | 2198.5 | 33.4      |
| 90°-120°  | 721.5  | 11.0      |
| 90°-150°  | 3190.0 | 48.4      |
| 90°-180°  | 4389.0 | 66.6      |
| 0°-180°   | 6587.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 863  | 863   | 863  | 863   | 863  |      |
| 5°   | 863  | 860   | 851  | 857   | 856  | 82   |
| 15°  | 822  | 817   | 806  | 809   | 805  | 231  |
| 25°  | 744  | 737   | 723  | 724   | 723  | 342  |
| 35°  | 642  | 633   | 620  | 615   | 611  | 401  |
| 45°  | 522  | 516   | 504  | 495   | 491  | 403  |
| 55°  | 395  | 390   | 380  | 370   | 366  | 353  |
| 65°  | 266  | 261   | 253  | 246   | 242  | 263  |
| 75°  | 139  | 138   | 134  | 129   | 130  | 149  |
| 85°  | 34   | 33    | 32   | 30    | 29   | 38   |
| 90°  | 1    | 13    | 22   | 27    | 29   | 6    |
| 95°  | 70   | 35    | 42   | 48    | 47   | 83   |
| 105° | 329  | 362   | 66   | 78    | 82   | 352  |
| 115° | 623  | 641   | 668  | 167   | 89   | 613  |
| 125° | 881  | 895   | 915  | 923   | 926  | 785  |
| 135° | 1090 | 1107  | 1117 | 1128  | 1126 | 842  |
| 145° | 1264 | 1263  | 1281 | 1289  | 1284 | 791  |
| 155° | 1392 | 1382  | 1395 | 1402  | 1393 | 641  |
| 165° | 1467 | 1460  | 1464 | 1471  | 1464 | 414  |
| 175° | 1500 | 1493  | 1495 | 1502  | 1492 | 143  |
| 180° | 1497 | 1497  | 1497 | 1497  | 1497 |      |

TEST NUMBER: P911041

CATALOG NUMBER: DFN2DIP-PN2F0-020D040US850-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 863.0 | 863.0 | 863.0 | 863.0 | 863.0 |
| 2.5°   | 868.0 | 863.9 | 854.7 | 863.0 | 861.5 |
| 5°     | 863.0 | 859.8 | 850.6 | 857.3 | 855.6 |
| 7.5°   | 857.3 | 852.3 | 843.2 | 849.8 | 848.2 |
| 10°    | 848.2 | 842.4 | 832.4 | 839.0 | 836.5 |
| 12.5°  | 835.6 | 830.8 | 820.8 | 824.9 | 823.2 |
| 15°    | 821.5 | 816.7 | 805.8 | 809.1 | 805.0 |
| 17.5°  | 804.1 | 799.3 | 788.4 | 792.5 | 788.4 |
| 20°    | 785.1 | 780.1 | 768.4 | 771.0 | 767.6 |
| 22.5°  | 766.0 | 758.6 | 747.7 | 747.7 | 746.0 |
| 25°    | 743.6 | 736.9 | 722.8 | 724.4 | 722.8 |
| 27.5°  | 718.6 | 712.9 | 702.1 | 699.7 | 695.5 |
| 30°    | 693.8 | 687.1 | 674.7 | 672.3 | 668.8 |
| 32.5°  | 667.2 | 662.3 | 649.0 | 644.0 | 640.7 |
| 35°    | 641.6 | 633.2 | 619.9 | 614.9 | 610.7 |
| 37.5°  | 612.5 | 605.0 | 591.7 | 585.9 | 581.7 |
| 40°    | 582.6 | 575.9 | 562.6 | 555.3 | 551.8 |
| 42.5°  | 553.5 | 546.8 | 533.7 | 525.3 | 520.3 |
| 45°    | 522.0 | 516.2 | 503.7 | 494.6 | 491.3 |
| 47.5°  | 491.3 | 485.5 | 472.2 | 463.0 | 458.1 |
| 50°    | 458.9 | 454.8 | 443.2 | 431.5 | 427.4 |
| 52.5°  | 427.4 | 421.5 | 410.8 | 401.7 | 395.9 |
| 55°    | 395.0 | 390.0 | 380.1 | 370.2 | 366.0 |
| 57.5°  | 362.6 | 358.5 | 347.7 | 337.8 | 334.4 |
| 60°    | 330.3 | 327.0 | 315.4 | 306.2 | 303.8 |
| 62.5°  | 298.8 | 292.9 | 284.7 | 276.4 | 273.0 |
| 65°    | 266.4 | 261.4 | 253.2 | 245.6 | 241.5 |
| 67.5°  | 233.2 | 229.0 | 221.6 | 215.8 | 212.5 |
| 70°    | 202.5 | 199.2 | 191.6 | 185.9 | 182.7 |
| 72.5°  | 171.0 | 167.7 | 163.5 | 157.7 | 155.3 |
| 75°    | 139.4 | 137.8 | 133.5 | 128.6 | 130.3 |
| 77.5°  | 111.2 | 107.9 | 106.1 | 103.7 | 101.3 |
| 80°    | 83.1  | 82.2  | 80.5  | 78.0  | 76.3  |
| 82.5°  | 56.4  | 56.4  | 55.7  | 52.3  | 52.3  |
| 85°    | 33.9  | 33.2  | 32.4  | 29.8  | 29.1  |
| 87.5°  | 15.0  | 13.3  | 11.6  | 9.2   | 8.3   |
| 90°    | 1.0   | 13.0  | 21.6  | 27.2  | 29.2  |
| 92.5°  | 27.2  | 22.7  | 26.0  | 28.2  | 29.2  |
| 95°    | 70.3  | 34.6  | 42.1  | 47.7  | 46.6  |
| 97.5°  | 126.8 | 37.9  | 55.2  | 58.6  | 59.6  |
| 100°   | 191.7 | 43.4  | 61.8  | 70.3  | 72.5  |
| 102.5° | 263.2 | 261.2 | 63.9  | 75.7  | 79.1  |
| 105°   | 329.3 | 361.9 | 66.1  | 78.0  | 82.3  |
| 107.5° | 406.2 | 433.3 | 68.3  | 80.2  | 84.5  |
| 110°   | 480.0 | 502.6 | 189.6 | 81.3  | 85.5  |

TEST NUMBER: P911041

CATALOG NUMBER: DFN2DIP-PN2F0-020D040US850-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 549.3  | 568.7  | 550.3  | 83.4   | 86.7   |
| 115°   | 622.8  | 641.2  | 668.4  | 166.8  | 88.9   |
| 117.5° | 686.8  | 708.4  | 726.9  | 571.9  | 288.1  |
| 120°   | 758.3  | 774.5  | 794.0  | 807.1  | 660.9  |
| 122.5° | 818.9  | 836.3  | 858.0  | 864.5  | 865.6  |
| 125°   | 880.7  | 894.9  | 915.4  | 923.0  | 926.2  |
| 127.5° | 937.0  | 952.2  | 968.5  | 979.4  | 980.4  |
| 130°   | 990.1  | 1007.5 | 1019.3 | 1031.3 | 1030.3 |
| 132.5° | 1044.2 | 1058.4 | 1070.3 | 1080.1 | 1079.1 |
| 135°   | 1089.8 | 1107.2 | 1116.9 | 1127.7 | 1125.6 |
| 137.5° | 1137.4 | 1150.4 | 1161.3 | 1172.1 | 1168.9 |
| 140°   | 1184.0 | 1192.7 | 1204.6 | 1214.4 | 1208.9 |
| 142.5° | 1223.1 | 1230.7 | 1244.7 | 1253.3 | 1248.0 |
| 145°   | 1264.3 | 1263.2 | 1281.4 | 1289.1 | 1283.7 |
| 147.5° | 1299.9 | 1296.6 | 1315.1 | 1320.5 | 1316.3 |
| 150°   | 1334.6 | 1327.0 | 1344.4 | 1350.9 | 1345.4 |
| 152.5° | 1363.8 | 1355.2 | 1371.4 | 1377.9 | 1370.4 |
| 155°   | 1392.0 | 1382.4 | 1395.3 | 1401.8 | 1393.1 |
| 157.5° | 1414.8 | 1406.1 | 1416.0 | 1423.5 | 1414.8 |
| 160°   | 1434.3 | 1427.7 | 1434.3 | 1440.7 | 1433.2 |
| 162.5° | 1451.6 | 1445.1 | 1450.6 | 1458.1 | 1448.4 |
| 165°   | 1466.8 | 1460.3 | 1463.5 | 1471.1 | 1463.5 |
| 167.5° | 1478.7 | 1472.1 | 1475.5 | 1483.1 | 1473.3 |
| 170°   | 1488.5 | 1482.0 | 1484.1 | 1491.7 | 1482.0 |
| 172.5° | 1494.9 | 1488.5 | 1490.7 | 1498.3 | 1488.5 |
| 175°   | 1500.3 | 1492.7 | 1494.9 | 1502.5 | 1491.7 |
| 177.5° | 1502.5 | 1494.9 | 1496.0 | 1503.7 | 1493.9 |
| 180°   | 1497.2 | 1497.2 | 1497.2 | 1497.2 | 1497.2 |

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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 | 7.56             | 8.28  | 8.64  | 9.37  | 10.86 | 7.12           | 7.85  | 8.21  | 8.94  | 10.43 |
|                 | 3H   | 9.19             | 9.84  | 10.28 | 10.93 | 12.44 | 8.71           | 9.36  | 9.80  | 10.46 | 11.96 |
|                 | 4H   | 9.75             | 10.37 | 10.86 | 11.47 | 12.98 | 9.27           | 9.89  | 10.38 | 10.99 | 12.50 |
|                 | 6H   | 10.13            | 10.70 | 11.25 | 11.80 | 13.33 | 9.65           | 10.22 | 10.76 | 11.32 | 12.84 |
|                 | 8H   | 10.22            | 10.77 | 11.34 | 11.88 | 13.40 | 9.74           | 10.28 | 10.86 | 11.40 | 12.92 |
|                 | 12H  | 10.26            | 10.78 | 11.38 | 11.88 | 13.43 | 9.77           | 10.28 | 10.89 | 11.39 | 12.94 |
| 4H              | 2H   | 7.99             | 8.61  | 9.11  | 9.71  | 11.22 | 7.64           | 8.26  | 8.76  | 9.36  | 10.87 |
|                 | 3H   | 9.82             | 10.34 | 10.94 | 11.46 | 12.99 | 9.42           | 9.94  | 10.54 | 11.06 | 12.59 |
|                 | 4H   | 10.51            | 10.99 | 11.64 | 12.10 | 13.65 | 10.10          | 10.58 | 11.22 | 11.69 | 13.23 |
|                 | 6H   | 11.00            | 11.41 | 12.13 | 12.55 | 14.08 | 10.58          | 10.99 | 11.71 | 12.13 | 13.66 |
|                 | 8H   | 11.14            | 11.52 | 12.27 | 12.65 | 14.20 | 10.72          | 11.10 | 11.85 | 12.22 | 13.78 |
|                 | 12H  | 11.20            | 11.54 | 12.34 | 12.68 | 14.24 | 10.76          | 11.11 | 11.91 | 12.25 | 13.81 |
| 8H              | 4H   | 10.69            | 11.07 | 11.82 | 12.20 | 13.75 | 10.32          | 10.70 | 11.45 | 11.83 | 13.38 |
|                 | 6H   | 11.29            | 11.60 | 12.44 | 12.77 | 14.32 | 10.92          | 11.23 | 12.07 | 12.40 | 13.95 |
|                 | 8H   | 11.50            | 11.77 | 12.65 | 12.92 | 14.49 | 11.11          | 11.39 | 12.27 | 12.54 | 14.11 |
|                 | 12H  | 11.61            | 11.85 | 12.77 | 12.99 | 14.60 | 11.21          | 11.45 | 12.37 | 12.60 | 14.20 |
| 12H             | 4H   | 10.66            | 11.01 | 11.81 | 12.15 | 13.71 | 10.30          | 10.65 | 11.45 | 11.79 | 13.35 |
|                 | 6H   | 11.31            | 11.59 | 12.47 | 12.74 | 14.31 | 10.95          | 11.23 | 12.11 | 12.38 | 13.95 |
|                 | 8H   | 11.53            | 11.78 | 12.70 | 12.92 | 14.53 | 11.16          | 11.41 | 12.33 | 12.55 | 14.16 |

END OF REPORT