

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: P905011

Luminaire Tested: DFN2DIP-4P4F0-030D050US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905011  
REPORT IS A COMBINATION OF REPORTS P900623 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D050US835-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

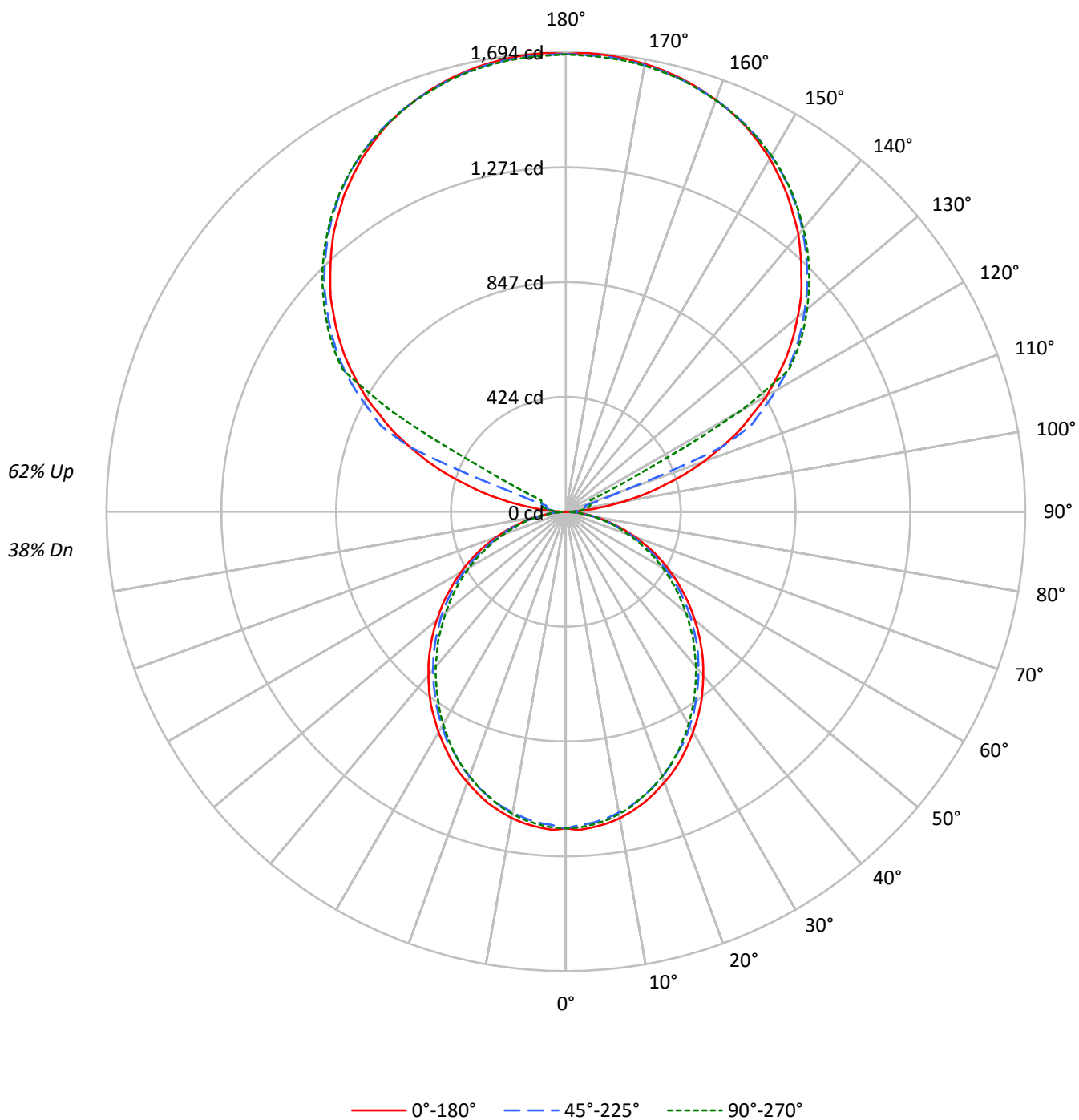
Lumens per Lamp: N/A  
Luminaire Lumens: 7920.0 lumens  
Efficiency: N/A  
Efficacy: 116.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 67.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 83  | 86 | 82 | 79 | 76 | 67 | 65 | 63 | 53 | 51 | 50 | 39 | 39 | 38 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 62  | 57  | 71 | 63 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 49 | 44 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 34 | 29 | 33 | 28 | 24 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 28 | 23 | 19 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 14 | 16 | 13 | 12 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 757 | 757 | 757 |
| 5°  | 759 | 747 | 752 |
| 10° | 752 | 737 | 742 |
| 15° | 741 | 725 | 726 |
| 20° | 727 | 709 | 710 |
| 25° | 712 | 689 | 692 |
| 30° | 693 | 670 | 668 |
| 35° | 676 | 648 | 643 |
| 40° | 654 | 626 | 619 |
| 45° | 632 | 604 | 595 |
| 50° | 609 | 581 | 567 |
| 55° | 584 | 554 | 541 |
| 60° | 556 | 522 | 511 |
| 65° | 526 | 489 | 476 |
| 70° | 487 | 449 | 439 |
| 75° | 433 | 401 | 405 |
| 80° | 368 | 340 | 339 |
| 85° | 267 | 233 | 228 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 869 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 109.9  | 1.4       |
| 10°-20°   | 309.1  | 3.9       |
| 20°-30°   | 454.3  | 5.7       |
| 30°-40°   | 527.6  | 6.7       |
| 40°-50°   | 527.0  | 6.7       |
| 50°-60°   | 459.5  | 5.8       |
| 60°-70°   | 339.7  | 4.3       |
| 70°-80°   | 192.2  | 2.4       |
| 80°-90°   | 53.7   | 0.7       |
| 90°-100°  | 55.7   | 0.7       |
| 100°-110° | 207.4  | 2.6       |
| 110°-120° | 550.1  | 6.9       |
| 120°-130° | 912.4  | 11.5      |
| 130°-140° | 969.2  | 12.2      |
| 140°-150° | 900.8  | 11.4      |
| 150°-160° | 724.2  | 9.1       |
| 160°-170° | 466.6  | 5.9       |
| 170°-180° | 160.6  | 2.0       |
| 0°-30°    | 873.3  | 11.0      |
| 0°-40°    | 1400.9 | 17.7      |
| 0°-60°    | 2387.4 | 30.1      |
| 0°-90°    | 2973.0 | 37.5      |
| 90°-120°  | 813.2  | 10.3      |
| 90°-150°  | 3595.6 | 45.4      |
| 90°-180°  | 4947.0 | 62.5      |
| 0°-180°   | 7920.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1167 | 1167  | 1167 | 1167  | 1167 |      |
| 5°   | 1167 | 1163  | 1150 | 1160  | 1157 | 111  |
| 15°  | 1111 | 1105  | 1090 | 1094  | 1089 | 313  |
| 25°  | 1006 | 997   | 978  | 980   | 978  | 463  |
| 35°  | 868  | 856   | 838  | 832   | 826  | 542  |
| 45°  | 706  | 698   | 681  | 669   | 664  | 545  |
| 55°  | 534  | 528   | 514  | 501   | 495  | 478  |
| 65°  | 360  | 354   | 342  | 332   | 327  | 356  |
| 75°  | 188  | 186   | 181  | 174   | 176  | 201  |
| 85°  | 46   | 45    | 44   | 40    | 39   | 51   |
| 90°  | 1    | 15    | 24   | 31    | 33   | 7    |
| 95°  | 79   | 39    | 48   | 54    | 52   | 94   |
| 105° | 371  | 408   | 74   | 88    | 93   | 397  |
| 115° | 702  | 723   | 753  | 188   | 100  | 691  |
| 125° | 993  | 1009  | 1032 | 1040  | 1044 | 885  |
| 135° | 1228 | 1248  | 1259 | 1271  | 1269 | 949  |
| 145° | 1425 | 1424  | 1444 | 1453  | 1447 | 891  |
| 155° | 1569 | 1558  | 1573 | 1580  | 1570 | 723  |
| 165° | 1653 | 1646  | 1650 | 1658  | 1650 | 467  |
| 175° | 1691 | 1682  | 1685 | 1694  | 1681 | 161  |
| 180° | 1687 | 1687  | 1687 | 1687  | 1687 |      |

TEST NUMBER: P905011

CATALOG NUMBER: DFN2DIP-4P4F0-030D050US835-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1167.3 | 1167.3 | 1167.3 | 1167.3 | 1167.3 |
| 2.5°   | 1174.1 | 1168.5 | 1156.1 | 1167.3 | 1165.2 |
| 5°     | 1167.3 | 1162.9 | 1150.5 | 1159.5 | 1157.3 |
| 7.5°   | 1159.5 | 1152.8 | 1140.4 | 1149.5 | 1147.2 |
| 10°    | 1147.2 | 1139.3 | 1125.9 | 1134.8 | 1131.5 |
| 12.5°  | 1130.3 | 1123.6 | 1110.2 | 1115.7 | 1113.5 |
| 15°    | 1111.2 | 1104.6 | 1089.9 | 1094.4 | 1088.8 |
| 17.5°  | 1087.6 | 1081.0 | 1066.3 | 1071.9 | 1066.3 |
| 20°    | 1061.8 | 1055.1 | 1039.4 | 1042.7 | 1038.3 |
| 22.5°  | 1036.1 | 1026.0 | 1011.3 | 1011.3 | 1009.0 |
| 25°    | 1005.7 | 996.8  | 977.7  | 979.9  | 977.7  |
| 27.5°  | 972.0  | 964.1  | 949.6  | 946.3  | 940.7  |
| 30°    | 938.4  | 929.4  | 912.6  | 909.2  | 904.7  |
| 32.5°  | 902.5  | 895.8  | 877.8  | 871.0  | 866.5  |
| 35°    | 867.7  | 856.5  | 838.5  | 831.7  | 826.1  |
| 37.5°  | 828.4  | 818.3  | 800.3  | 792.4  | 786.8  |
| 40°    | 788.0  | 779.0  | 761.0  | 751.0  | 746.5  |
| 42.5°  | 748.7  | 739.7  | 721.8  | 710.5  | 703.8  |
| 45°    | 706.1  | 698.2  | 681.3  | 669.0  | 664.5  |
| 47.5°  | 664.5  | 656.7  | 638.7  | 626.3  | 619.6  |
| 50°    | 620.7  | 615.1  | 599.4  | 583.7  | 578.1  |
| 52.5°  | 578.1  | 570.2  | 555.7  | 543.3  | 535.4  |
| 55°    | 534.4  | 527.6  | 514.1  | 500.7  | 495.1  |
| 57.5°  | 490.5  | 484.9  | 470.3  | 456.8  | 452.3  |
| 60°    | 446.7  | 442.3  | 426.6  | 414.2  | 410.9  |
| 62.5°  | 404.1  | 396.2  | 385.0  | 373.8  | 369.3  |
| 65°    | 360.4  | 353.6  | 342.4  | 332.3  | 326.7  |
| 67.5°  | 315.5  | 309.8  | 299.7  | 291.9  | 287.4  |
| 70°    | 273.9  | 269.4  | 259.3  | 251.4  | 247.0  |
| 72.5°  | 231.3  | 226.7  | 221.1  | 213.3  | 210.0  |
| 75°    | 188.5  | 186.4  | 180.7  | 174.0  | 176.3  |
| 77.5°  | 150.4  | 145.9  | 143.6  | 140.3  | 137.0  |
| 80°    | 112.3  | 111.1  | 108.8  | 105.5  | 103.3  |
| 82.5°  | 76.3   | 76.3   | 75.3   | 70.7   | 70.7   |
| 85°    | 46.0   | 44.9   | 43.8   | 40.4   | 39.3   |
| 87.5°  | 20.2   | 18.0   | 15.7   | 12.4   | 11.2   |
| 90°    | 1.2    | 14.6   | 24.4   | 30.6   | 32.9   |
| 92.5°  | 30.6   | 25.7   | 29.3   | 31.8   | 32.9   |
| 95°    | 79.3   | 39.0   | 47.6   | 53.8   | 52.5   |
| 97.5°  | 142.8  | 42.8   | 62.2   | 66.0   | 67.1   |
| 100°   | 216.2  | 48.9   | 69.6   | 79.3   | 81.8   |
| 102.5° | 296.7  | 294.3  | 72.1   | 85.4   | 89.2   |
| 105°   | 371.2  | 407.9  | 74.5   | 87.9   | 92.8   |
| 107.5° | 457.9  | 488.3  | 77.0   | 90.3   | 95.3   |
| 110°   | 541.0  | 566.5  | 213.7  | 91.6   | 96.4   |

TEST NUMBER: P905011

CATALOG NUMBER: DFN2DIP-4P4F0-030D050US835-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 619.1  | 641.0  | 620.3  | 94.0   | 97.7   |
| 115°   | 702.1  | 722.8  | 753.4  | 188.1  | 100.2  |
| 117.5° | 774.1  | 798.5  | 819.4  | 644.6  | 324.8  |
| 120°   | 854.7  | 873.0  | 895.0  | 909.7  | 744.8  |
| 122.5° | 923.0  | 942.6  | 967.1  | 974.4  | 975.7  |
| 125°   | 992.6  | 1008.6 | 1031.8 | 1040.3 | 1044.0 |
| 127.5° | 1056.1 | 1073.2 | 1091.7 | 1103.8 | 1105.0 |
| 130°   | 1116.0 | 1135.6 | 1148.9 | 1162.4 | 1161.3 |
| 132.5° | 1177.1 | 1193.0 | 1206.3 | 1217.4 | 1216.2 |
| 135°   | 1228.4 | 1248.0 | 1258.8 | 1271.2 | 1268.7 |
| 137.5° | 1282.0 | 1296.7 | 1309.0 | 1321.2 | 1317.6 |
| 140°   | 1334.5 | 1344.4 | 1357.7 | 1368.7 | 1362.7 |
| 142.5° | 1378.6 | 1387.2 | 1403.0 | 1412.7 | 1406.6 |
| 145°   | 1425.0 | 1423.7 | 1444.4 | 1453.0 | 1446.9 |
| 147.5° | 1465.2 | 1461.5 | 1482.3 | 1488.4 | 1483.6 |
| 150°   | 1504.3 | 1495.8 | 1515.3 | 1522.6 | 1516.5 |
| 152.5° | 1537.2 | 1527.5 | 1545.8 | 1553.2 | 1544.6 |
| 155°   | 1569.0 | 1558.1 | 1572.7 | 1580.0 | 1570.3 |
| 157.5° | 1594.6 | 1584.9 | 1595.9 | 1604.5 | 1594.6 |
| 160°   | 1616.7 | 1609.3 | 1616.7 | 1623.9 | 1615.4 |
| 162.5° | 1636.1 | 1628.9 | 1634.9 | 1643.5 | 1632.5 |
| 165°   | 1653.2 | 1646.0 | 1649.6 | 1658.1 | 1649.6 |
| 167.5° | 1666.7 | 1659.3 | 1663.1 | 1671.6 | 1660.6 |
| 170°   | 1677.7 | 1670.3 | 1672.8 | 1681.3 | 1670.3 |
| 172.5° | 1685.0 | 1677.7 | 1680.2 | 1688.7 | 1677.7 |
| 175°   | 1691.1 | 1682.5 | 1685.0 | 1693.5 | 1681.3 |
| 177.5° | 1693.5 | 1685.0 | 1686.3 | 1694.8 | 1683.8 |
| 180°   | 1687.4 | 1687.4 | 1687.4 | 1687.4 | 1687.4 |

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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 | 5.05             | 5.81 | 6.11  | 6.87  | 8.31  | 4.60           | 5.36 | 5.66 | 6.42  | 7.86  |
|                 | 3H   | 6.71             | 7.39 | 7.77  | 8.46  | 9.91  | 6.22           | 6.90 | 7.28 | 7.97  | 9.42  |
|                 | 4H   | 7.29             | 7.94 | 8.37  | 9.01  | 10.47 | 6.80           | 7.45 | 7.88 | 8.52  | 9.98  |
|                 | 6H   | 7.69             | 8.29 | 8.78  | 9.36  | 10.84 | 7.19           | 7.79 | 8.28 | 8.86  | 10.34 |
|                 | 8H   | 7.80             | 8.36 | 8.89  | 9.45  | 10.92 | 7.30           | 7.86 | 8.39 | 8.95  | 10.42 |
|                 | 12H  | 7.84             | 8.38 | 8.94  | 9.47  | 10.96 | 7.34           | 7.87 | 8.43 | 8.96  | 10.45 |
| 4H              | 2H   | 5.50             | 6.14 | 6.58  | 7.22  | 8.68  | 5.14           | 5.79 | 6.23 | 6.86  | 8.32  |
|                 | 3H   | 7.36             | 7.90 | 8.45  | 9.00  | 10.48 | 6.95           | 7.49 | 8.05 | 8.59  | 10.07 |
|                 | 4H   | 8.08             | 8.57 | 9.17  | 9.66  | 11.16 | 7.65           | 8.15 | 8.75 | 9.24  | 10.73 |
|                 | 6H   | 8.59             | 9.02 | 9.70  | 10.13 | 11.62 | 8.16           | 8.58 | 9.26 | 9.70  | 11.19 |
|                 | 8H   | 8.74             | 9.14 | 9.85  | 10.24 | 11.75 | 8.30           | 8.70 | 9.41 | 9.80  | 11.31 |
|                 | 12H  | 8.81             | 9.17 | 9.93  | 10.29 | 11.80 | 8.36           | 8.72 | 9.49 | 9.84  | 11.35 |
| 8H              | 4H   | 8.27             | 8.66 | 9.37  | 9.77  | 11.27 | 7.89           | 8.29 | 8.99 | 9.39  | 10.90 |
|                 | 6H   | 8.90             | 9.23 | 10.03 | 10.37 | 11.88 | 8.52           | 8.84 | 9.64 | 9.99  | 11.49 |
|                 | 8H   | 9.12             | 9.41 | 10.26 | 10.54 | 12.06 | 8.73           | 9.02 | 9.86 | 10.14 | 11.67 |
|                 | 12H  | 9.25             | 9.51 | 10.39 | 10.63 | 12.19 | 8.84           | 9.09 | 9.98 | 10.22 | 11.78 |
| 12H             | 4H   | 8.25             | 8.61 | 9.37  | 9.72  | 11.23 | 7.88           | 8.24 | 9.00 | 9.35  | 10.87 |
|                 | 6H   | 8.93             | 9.22 | 10.06 | 10.34 | 11.87 | 8.56           | 8.84 | 9.69 | 9.97  | 11.49 |
|                 | 8H   | 9.17             | 9.42 | 10.31 | 10.55 | 12.11 | 8.79           | 9.04 | 9.93 | 10.17 | 11.73 |

END OF REPORT