

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: P918655

Luminaire Tested: DFN2DIP-4P4F0-030D060US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918655  
REPORT IS A COMBINATION OF REPORTS P900635 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D060US935-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

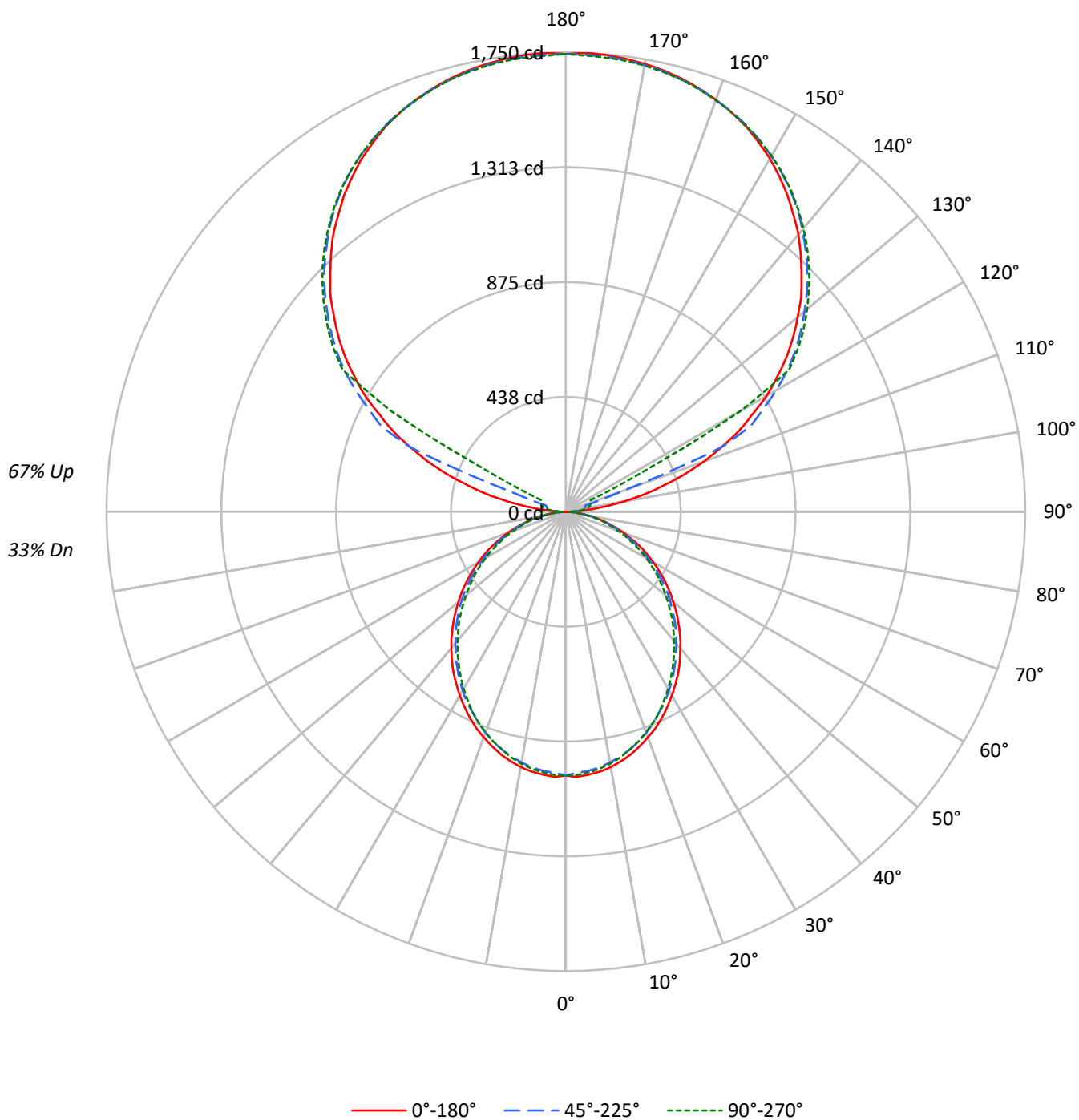
Lumens per Lamp: N/A  
Luminaire Lumens: 7671.5 lumens  
Efficiency: N/A  
Efficacy: 98.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 78  
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

TEST NUMBER: P918655

CATALOG NUMBER: DFN2DIP-4P4F0-030D060US935-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P918655

CATALOG NUMBER: DFN2DIP-4P4F0-030D060US935-FLONL

**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°  | 652 | 652 | 652 |
| 5°  | 653 | 643 | 647 |
| 10° | 648 | 635 | 639 |
| 15° | 638 | 624 | 626 |
| 20° | 626 | 610 | 612 |
| 25° | 613 | 593 | 596 |
| 30° | 597 | 577 | 575 |
| 35° | 582 | 558 | 554 |
| 40° | 563 | 539 | 533 |
| 45° | 544 | 520 | 512 |
| 50° | 524 | 500 | 488 |
| 55° | 503 | 477 | 466 |
| 60° | 479 | 450 | 440 |
| 65° | 453 | 421 | 410 |
| 70° | 419 | 387 | 378 |
| 75° | 373 | 345 | 349 |
| 80° | 317 | 292 | 292 |
| 85° | 230 | 201 | 196 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 898 cd/sqm

TEST NUMBER: P918655

CATALOG NUMBER: DFN2DIP-4P4F0-030D060US935-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 94.6   | 1.2       |
| 10°-20°   | 266.2  | 3.5       |
| 20°-30°   | 391.1  | 5.1       |
| 30°-40°   | 454.3  | 5.9       |
| 40°-50°   | 453.7  | 5.9       |
| 50°-60°   | 395.6  | 5.2       |
| 60°-70°   | 292.5  | 3.8       |
| 70°-80°   | 165.5  | 2.2       |
| 80°-90°   | 46.7   | 0.6       |
| 90°-100°  | 57.5   | 0.7       |
| 100°-110° | 214.3  | 2.8       |
| 110°-120° | 568.4  | 7.4       |
| 120°-130° | 942.7  | 12.3      |
| 130°-140° | 1001.4 | 13.1      |
| 140°-150° | 930.7  | 12.1      |
| 150°-160° | 748.2  | 9.8       |
| 160°-170° | 482.1  | 6.3       |
| 170°-180° | 165.9  | 2.2       |
| 0°-30°    | 751.9  | 9.8       |
| 0°-40°    | 1206.2 | 15.7      |
| 0°-60°    | 2055.6 | 26.8      |
| 0°-90°    | 2560.2 | 33.4      |
| 90°-120°  | 840.2  | 11.0      |
| 90°-150°  | 3714.9 | 48.4      |
| 90°-180°  | 5111.0 | 66.6      |
| 0°-180°   | 7671.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1005 | 1005  | 1005 | 1005  | 1005 |      |
| 5°   | 1005 | 1001  | 991  | 998   | 996  | 95   |
| 15°  | 957  | 951   | 938  | 942   | 938  | 269  |
| 25°  | 866  | 858   | 842  | 844   | 842  | 398  |
| 35°  | 747  | 737   | 722  | 716   | 711  | 467  |
| 45°  | 608  | 601   | 587  | 576   | 572  | 469  |
| 55°  | 460  | 454   | 443  | 431   | 426  | 411  |
| 65°  | 310  | 304   | 295  | 286   | 281  | 307  |
| 75°  | 162  | 160   | 156  | 150   | 152  | 173  |
| 85°  | 40   | 39    | 38   | 35    | 34   | 44   |
| 90°  | 1    | 15    | 25   | 32    | 34   | 7    |
| 95°  | 82   | 40    | 49   | 56    | 54   | 97   |
| 105° | 384  | 421   | 77   | 91    | 96   | 410  |
| 115° | 725  | 747   | 778  | 194   | 104  | 714  |
| 125° | 1026 | 1042  | 1066 | 1075  | 1079 | 915  |
| 135° | 1269 | 1289  | 1301 | 1313  | 1311 | 980  |
| 145° | 1472 | 1471  | 1492 | 1501  | 1495 | 921  |
| 155° | 1621 | 1610  | 1625 | 1632  | 1622 | 747  |
| 165° | 1708 | 1701  | 1704 | 1713  | 1704 | 483  |
| 175° | 1747 | 1738  | 1741 | 1750  | 1737 | 166  |
| 180° | 1743 | 1743  | 1743 | 1743  | 1743 |      |

TEST NUMBER: P918655

CATALOG NUMBER: DFN2DIP-4P4F0-030D060US935-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1005.0 | 1005.0 | 1005.0 | 1005.0 | 1005.0 |
| 2.5°   | 1010.9 | 1006.1 | 995.4  | 1005.0 | 1003.2 |
| 5°     | 1005.0 | 1001.3 | 990.6  | 998.3  | 996.4  |
| 7.5°   | 998.3  | 992.6  | 981.9  | 989.7  | 987.7  |
| 10°    | 987.7  | 980.9  | 969.4  | 977.1  | 974.2  |
| 12.5°  | 973.2  | 967.4  | 955.9  | 960.6  | 958.7  |
| 15°    | 956.7  | 951.1  | 938.4  | 942.3  | 937.5  |
| 17.5°  | 936.4  | 930.7  | 918.1  | 922.9  | 918.1  |
| 20°    | 914.2  | 908.4  | 894.9  | 897.8  | 894.0  |
| 22.5°  | 892.1  | 883.4  | 870.7  | 870.7  | 868.7  |
| 25°    | 865.9  | 858.2  | 841.8  | 843.7  | 841.8  |
| 27.5°  | 836.9  | 830.1  | 817.6  | 814.8  | 809.9  |
| 30°    | 808.0  | 800.2  | 785.7  | 782.8  | 778.9  |
| 32.5°  | 777.1  | 771.3  | 755.8  | 749.9  | 746.1  |
| 35°    | 747.1  | 737.4  | 721.9  | 716.1  | 711.3  |
| 37.5°  | 713.3  | 704.6  | 689.1  | 682.3  | 677.4  |
| 40°    | 678.5  | 670.7  | 655.2  | 646.6  | 642.7  |
| 42.5°  | 644.6  | 636.9  | 621.5  | 611.7  | 606.0  |
| 45°    | 608.0  | 601.1  | 586.6  | 576.0  | 572.1  |
| 47.5°  | 572.1  | 565.4  | 549.9  | 539.2  | 533.5  |
| 50°    | 534.4  | 529.6  | 516.1  | 502.6  | 497.7  |
| 52.5°  | 497.7  | 490.9  | 478.5  | 467.8  | 461.0  |
| 55°    | 460.1  | 454.3  | 442.6  | 431.1  | 426.3  |
| 57.5°  | 422.3  | 417.5  | 404.9  | 393.3  | 389.4  |
| 60°    | 384.6  | 380.8  | 367.3  | 356.6  | 353.8  |
| 62.5°  | 347.9  | 341.1  | 331.5  | 321.8  | 318.0  |
| 65°    | 310.3  | 304.4  | 294.8  | 286.1  | 281.3  |
| 67.5°  | 271.6  | 266.7  | 258.0  | 251.3  | 247.5  |
| 70°    | 235.8  | 232.0  | 223.3  | 216.5  | 212.7  |
| 72.5°  | 199.1  | 195.2  | 190.4  | 183.7  | 180.8  |
| 75°    | 162.3  | 160.5  | 155.6  | 149.8  | 151.8  |
| 77.5°  | 129.5  | 125.6  | 123.6  | 120.8  | 118.0  |
| 80°    | 96.7   | 95.7   | 93.7   | 90.8   | 88.9   |
| 82.5°  | 65.7   | 65.7   | 64.8   | 60.9   | 60.9   |
| 85°    | 39.6   | 38.7   | 37.7   | 34.8   | 33.8   |
| 87.5°  | 17.4   | 15.5   | 13.5   | 10.7   | 9.6    |
| 90°    | 1.2    | 15.2   | 25.1   | 31.6   | 34.0   |
| 92.5°  | 31.6   | 26.5   | 30.2   | 32.8   | 34.0   |
| 95°    | 82.0   | 40.3   | 49.2   | 55.6   | 54.2   |
| 97.5°  | 147.6  | 44.2   | 64.2   | 68.2   | 69.4   |
| 100°   | 223.3  | 50.5   | 71.9   | 82.0   | 84.5   |
| 102.5° | 306.5  | 304.1  | 74.5   | 88.3   | 92.1   |
| 105°   | 383.5  | 421.4  | 77.0   | 90.7   | 95.9   |
| 107.5° | 473.1  | 504.5  | 79.6   | 93.3   | 98.4   |
| 110°   | 559.0  | 585.3  | 220.8  | 94.7   | 99.6   |

TEST NUMBER: P918655

CATALOG NUMBER: DFN2DIP-4P4F0-030D060US935-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 639.6  | 662.3  | 640.8  | 97.0   | 101.0  |
| 115°   | 725.4  | 746.8  | 778.4  | 194.3  | 103.5  |
| 117.5° | 799.8  | 825.0  | 846.5  | 666.1  | 335.5  |
| 120°   | 883.1  | 902.0  | 924.8  | 939.9  | 769.6  |
| 122.5° | 953.6  | 973.9  | 999.2  | 1006.7 | 1008.1 |
| 125°   | 1025.6 | 1042.1 | 1066.0 | 1074.9 | 1078.6 |
| 127.5° | 1091.2 | 1108.9 | 1127.9 | 1140.5 | 1141.7 |
| 130°   | 1153.0 | 1173.3 | 1187.1 | 1201.0 | 1199.8 |
| 132.5° | 1216.2 | 1232.6 | 1246.4 | 1257.7 | 1256.5 |
| 135°   | 1269.2 | 1289.4 | 1300.6 | 1313.4 | 1310.8 |
| 137.5° | 1324.6 | 1339.7 | 1352.5 | 1365.0 | 1361.3 |
| 140°   | 1378.8 | 1389.0 | 1402.8 | 1414.2 | 1407.9 |
| 142.5° | 1424.3 | 1433.2 | 1449.6 | 1459.6 | 1453.3 |
| 145°   | 1472.3 | 1470.9 | 1492.4 | 1501.2 | 1495.0 |
| 147.5° | 1513.8 | 1510.0 | 1531.5 | 1537.7 | 1532.8 |
| 150°   | 1554.3 | 1545.4 | 1565.6 | 1573.1 | 1566.8 |
| 152.5° | 1588.3 | 1578.2 | 1597.1 | 1604.7 | 1595.9 |
| 155°   | 1621.1 | 1609.8 | 1625.0 | 1632.5 | 1622.4 |
| 157.5° | 1647.6 | 1637.5 | 1648.9 | 1657.8 | 1647.6 |
| 160°   | 1670.3 | 1662.7 | 1670.3 | 1677.8 | 1669.0 |
| 162.5° | 1690.4 | 1682.9 | 1689.2 | 1698.1 | 1686.7 |
| 165°   | 1708.1 | 1700.6 | 1704.3 | 1713.2 | 1704.3 |
| 167.5° | 1722.0 | 1714.4 | 1718.3 | 1727.2 | 1715.7 |
| 170°   | 1733.4 | 1725.8 | 1728.4 | 1737.1 | 1725.8 |
| 172.5° | 1740.9 | 1733.4 | 1735.9 | 1744.8 | 1733.4 |
| 175°   | 1747.2 | 1738.4 | 1740.9 | 1749.7 | 1737.1 |
| 177.5° | 1749.7 | 1740.9 | 1742.2 | 1751.1 | 1739.7 |
| 180°   | 1743.4 | 1743.4 | 1743.4 | 1743.4 | 1743.4 |

TEST NUMBER: P918655

CATALOG NUMBER: DFN2DIP-4P4F0-030D060US935-FLONL

**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 | 4.03             | 4.76 | 5.12 | 5.85 | 7.34  | 3.59           | 4.32 | 4.68 | 5.40 | 6.89  |
|                 | 3H   | 5.69             | 6.34 | 6.78 | 7.44 | 8.94  | 5.20           | 5.85 | 6.29 | 6.95 | 8.45  |
|                 | 4H   | 6.27             | 6.89 | 7.38 | 7.99 | 9.50  | 5.78           | 6.40 | 6.89 | 7.50 | 9.01  |
|                 | 6H   | 6.67             | 7.24 | 7.79 | 8.34 | 9.87  | 6.17           | 6.74 | 7.29 | 7.84 | 9.37  |
|                 | 8H   | 6.77             | 7.32 | 7.89 | 8.43 | 9.95  | 6.27           | 6.82 | 7.39 | 7.93 | 9.45  |
|                 | 12H  | 6.82             | 7.34 | 7.94 | 8.44 | 9.99  | 6.31           | 6.83 | 7.43 | 7.94 | 9.48  |
| 4H              | 2H   | 4.48             | 5.10 | 5.59 | 6.19 | 7.71  | 4.12           | 4.74 | 5.24 | 5.84 | 7.35  |
|                 | 3H   | 6.34             | 6.86 | 7.46 | 7.98 | 9.50  | 5.93           | 6.45 | 7.05 | 7.57 | 9.10  |
|                 | 4H   | 7.05             | 7.53 | 8.18 | 8.64 | 10.19 | 6.63           | 7.10 | 7.75 | 8.22 | 9.76  |
|                 | 6H   | 7.56             | 7.97 | 8.70 | 9.11 | 10.65 | 7.13           | 7.54 | 8.26 | 8.68 | 10.21 |
|                 | 8H   | 7.71             | 8.09 | 8.85 | 9.22 | 10.78 | 7.28           | 7.66 | 8.41 | 8.78 | 10.34 |
|                 | 12H  | 7.78             | 8.13 | 8.93 | 9.27 | 10.83 | 7.33           | 7.68 | 8.48 | 8.82 | 10.38 |
| 8H              | 4H   | 7.24             | 7.62 | 8.37 | 8.75 | 10.30 | 6.86           | 7.24 | 7.99 | 8.37 | 9.92  |
|                 | 6H   | 7.87             | 8.18 | 9.02 | 9.35 | 10.91 | 7.49           | 7.80 | 8.64 | 8.97 | 10.52 |
|                 | 8H   | 8.09             | 8.37 | 9.25 | 9.52 | 11.09 | 7.70           | 7.98 | 8.86 | 9.13 | 10.70 |
|                 | 12H  | 8.22             | 8.46 | 9.39 | 9.61 | 11.22 | 7.81           | 8.05 | 8.97 | 9.20 | 10.81 |
| 12H             | 4H   | 7.22             | 7.56 | 8.37 | 8.70 | 10.26 | 6.85           | 7.20 | 8.00 | 8.33 | 9.89  |
|                 | 6H   | 7.90             | 8.17 | 9.06 | 9.32 | 10.90 | 7.53           | 7.80 | 8.69 | 8.95 | 10.52 |
|                 | 8H   | 8.14             | 8.38 | 9.30 | 9.53 | 11.13 | 7.76           | 8.00 | 8.92 | 9.15 | 10.75 |

END OF REPORT