

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: P905010

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

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905010  
REPORT IS A COMBINATION OF REPORTS P899103 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D050US835-FLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

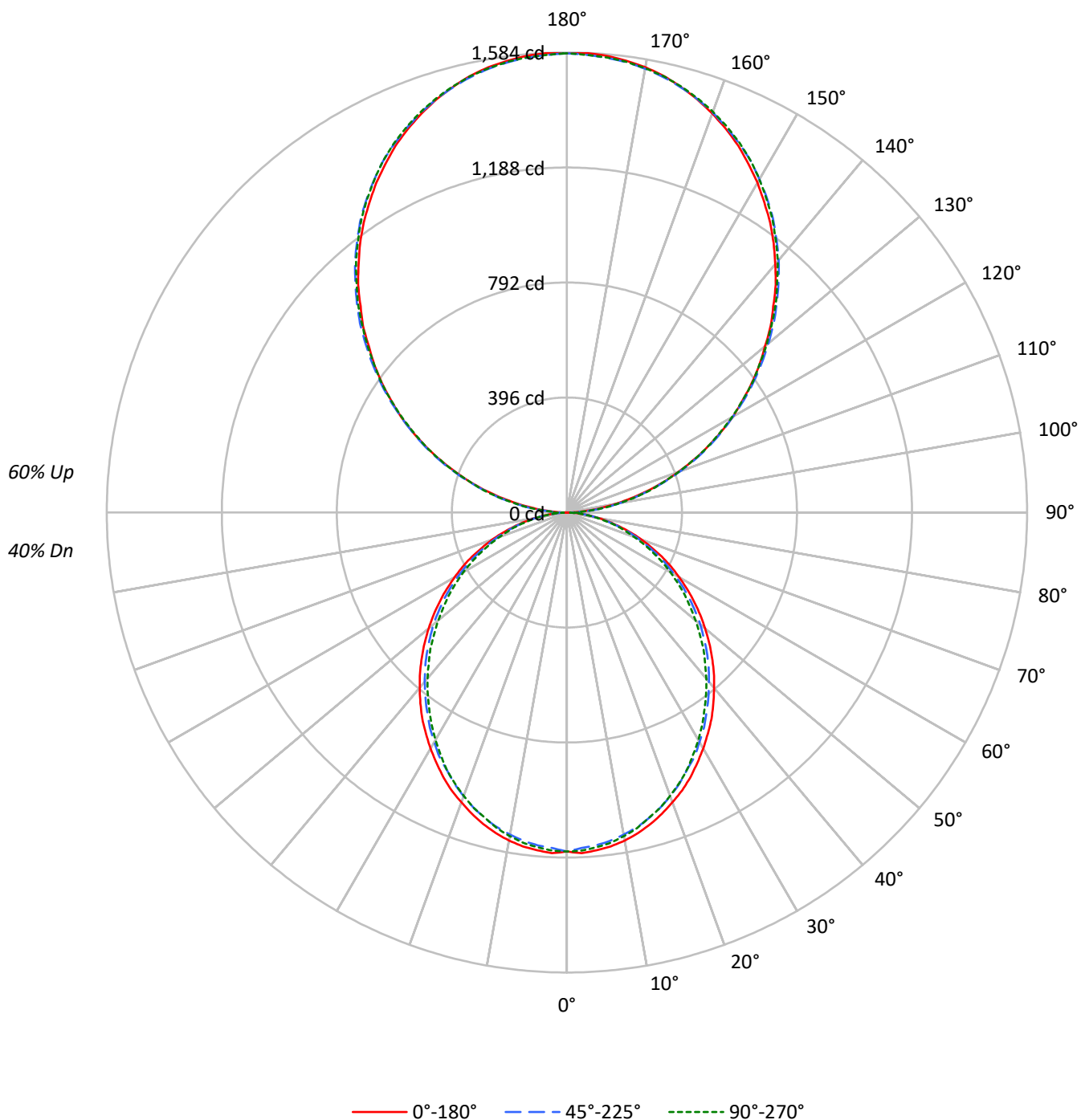
Lumens per Lamp: N/A  
Luminaire Lumens: 7395.0 lumens  
Efficiency: N/A  
Efficacy: 108.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

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

### Luminous Intensity Polar Plot



TEST NUMBER: P905010

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    |    | 20 |    |    |    |    | 20 |    |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    |    | 50 |    |    |    |    | 30 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 | 47 | 47 | 40 |
| 1   | 96  | 91  | 87  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 42 | 41 | 40 | 40 | 40 | 34 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 | 33 | 33 | 28 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 | 28 | 28 | 24 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 34 | 31 | 29 | 27 | 25 | 25 | 25 | 21 |
| 5   | 67  | 55  | 47  | 41  | 60 | 51 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 | 21 | 21 | 18 |
| 6   | 61  | 49  | 41  | 36  | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 27 | 24 | 24 | 21 | 19 | 19 | 19 | 16 |
| 7   | 57  | 45  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 | 17 | 17 | 14 |
| 8   | 52  | 40  | 33  | 28  | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 | 15 | 15 | 13 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 16 | 14 | 14 | 14 | 11 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 | 12 | 12 | 10 |

**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: 1197 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 109.9  | 1.5       |
| 10°-20°   | 309.1  | 4.2       |
| 20°-30°   | 454.3  | 6.1       |
| 30°-40°   | 527.6  | 7.1       |
| 40°-50°   | 527.0  | 7.1       |
| 50°-60°   | 459.5  | 6.2       |
| 60°-70°   | 339.7  | 4.6       |
| 70°-80°   | 192.2  | 2.6       |
| 80°-90°   | 55.2   | 0.7       |
| 90°-100°  | 97.8   | 1.3       |
| 100°-110° | 310.9  | 4.2       |
| 110°-120° | 532.1  | 7.2       |
| 120°-130° | 699.7  | 9.5       |
| 130°-140° | 785.4  | 10.6      |
| 140°-150° | 770.2  | 10.4      |
| 150°-160° | 646.1  | 8.7       |
| 160°-170° | 428.5  | 5.8       |
| 170°-180° | 149.8  | 2.0       |
| 0°-30°    | 873.3  | 11.8      |
| 0°-40°    | 1400.9 | 18.9      |
| 0°-60°    | 2387.4 | 32.3      |
| 0°-90°    | 2974.5 | 40.2      |
| 90°-120°  | 940.8  | 12.7      |
| 90°-150°  | 3196.2 | 43.2      |
| 90°-180°  | 4421.0 | 59.8      |
| 0°-180°   | 7395.0 | 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    | 17    | 47   | 44    | 45   | 7    |
| 95°  | 70   | 83    | 85   | 85    | 83   | 77   |
| 105° | 287  | 291   | 294  | 296   | 296  | 303  |
| 115° | 534  | 542   | 539  | 538   | 534  | 528  |
| 125° | 777  | 788   | 785  | 780   | 779  | 694  |
| 135° | 1004 | 1019  | 1022 | 1021  | 1017 | 776  |
| 145° | 1220 | 1229  | 1237 | 1238  | 1233 | 762  |
| 155° | 1394 | 1398  | 1402 | 1409  | 1405 | 642  |
| 165° | 1517 | 1516  | 1516 | 1525  | 1518 | 428  |
| 175° | 1578 | 1575  | 1572 | 1581  | 1573 | 150  |
| 180° | 1581 | 1581  | 1581 | 1581  | 1581 |      |

TEST NUMBER: P905010

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

**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°    | 1.4    | 17.2   | 46.7   | 43.9   | 45.3   |
| 92.5°  | 29.6   | 40.0   | 41.5   | 42.9   | 42.9   |
| 95°    | 69.6   | 83.0   | 85.3   | 85.3   | 83.0   |
| 97.5°  | 115.8  | 128.2  | 133.5  | 133.5  | 133.5  |
| 100°   | 169.2  | 180.2  | 184.0  | 184.0  | 182.6  |
| 102.5° | 225.5  | 233.6  | 238.8  | 240.3  | 238.8  |
| 105°   | 287.0  | 290.8  | 293.7  | 296.0  | 296.0  |
| 107.5° | 348.0  | 353.7  | 353.7  | 354.7  | 348.0  |
| 110°   | 407.1  | 414.8  | 414.8  | 414.8  | 410.9  |

TEST NUMBER: P905010

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

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 471.0  | 479.1  | 477.7  | 473.9  | 471.0  |
| 115°   | 533.9  | 541.6  | 539.2  | 537.8  | 533.9  |
| 117.5° | 596.4  | 606.9  | 600.2  | 596.4  | 592.6  |
| 120°   | 659.3  | 669.8  | 659.3  | 659.3  | 655.0  |
| 122.5° | 716.5  | 729.9  | 723.2  | 719.4  | 716.5  |
| 125°   | 776.6  | 788.5  | 784.7  | 780.4  | 779.0  |
| 127.5° | 835.2  | 850.0  | 844.8  | 839.0  | 835.2  |
| 130°   | 890.1  | 907.2  | 904.8  | 902.0  | 896.7  |
| 132.5° | 951.6  | 964.9  | 965.9  | 959.2  | 955.4  |
| 135°   | 1004.5 | 1019.2 | 1022.1 | 1020.7 | 1016.9 |
| 137.5° | 1063.6 | 1075.5 | 1077.9 | 1076.9 | 1071.2 |
| 140°   | 1115.5 | 1127.5 | 1134.1 | 1134.1 | 1128.9 |
| 142.5° | 1168.9 | 1180.9 | 1184.7 | 1186.1 | 1180.9 |
| 145°   | 1219.5 | 1229.0 | 1236.6 | 1238.1 | 1232.8 |
| 147.5° | 1264.8 | 1276.7 | 1282.4 | 1284.8 | 1279.5 |
| 150°   | 1311.5 | 1319.6 | 1324.8 | 1329.1 | 1324.8 |
| 152.5° | 1353.0 | 1361.1 | 1367.7 | 1373.0 | 1367.7 |
| 155°   | 1394.4 | 1398.2 | 1402.5 | 1409.2 | 1404.9 |
| 157.5° | 1430.2 | 1433.0 | 1435.4 | 1445.0 | 1438.3 |
| 160°   | 1462.1 | 1465.0 | 1466.4 | 1474.5 | 1468.8 |
| 162.5° | 1491.7 | 1491.7 | 1493.1 | 1502.2 | 1495.5 |
| 165°   | 1517.0 | 1515.5 | 1515.5 | 1525.1 | 1518.4 |
| 167.5° | 1539.8 | 1535.5 | 1535.5 | 1545.1 | 1538.4 |
| 170°   | 1557.0 | 1553.2 | 1551.8 | 1561.3 | 1553.2 |
| 172.5° | 1568.9 | 1565.1 | 1563.7 | 1573.2 | 1565.1 |
| 175°   | 1578.5 | 1574.6 | 1571.8 | 1581.3 | 1573.2 |
| 177.5° | 1583.7 | 1579.9 | 1577.0 | 1585.1 | 1577.0 |
| 180°   | 1581.3 | 1581.3 | 1581.3 | 1581.3 | 1581.3 |

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

**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 | 5.35             | 6.13 | 6.38  | 7.17  | 8.57  | 4.90           | 5.68 | 5.94  | 6.72  | 8.13  |
|                 | 3H   | 7.01             | 7.70 | 8.05  | 8.76  | 10.18 | 6.52           | 7.21 | 7.56  | 8.27  | 9.69  |
|                 | 4H   | 7.59             | 8.26 | 8.65  | 9.31  | 10.74 | 7.10           | 7.76 | 8.16  | 8.82  | 10.25 |
|                 | 6H   | 7.99             | 8.60 | 9.06  | 9.66  | 11.10 | 7.49           | 8.10 | 8.56  | 9.16  | 10.60 |
|                 | 8H   | 8.10             | 8.68 | 9.17  | 9.75  | 11.19 | 7.60           | 8.18 | 8.67  | 9.25  | 10.69 |
|                 | 12H  | 8.15             | 8.70 | 9.22  | 9.77  | 11.23 | 7.64           | 8.19 | 8.71  | 9.26  | 10.72 |
| 4H              | 2H   | 5.80             | 6.46 | 6.86  | 7.51  | 8.94  | 5.44           | 6.11 | 6.51  | 7.16  | 8.59  |
|                 | 3H   | 7.66             | 8.22 | 8.74  | 9.30  | 10.74 | 7.26           | 7.81 | 8.33  | 8.89  | 10.33 |
|                 | 4H   | 8.38             | 8.89 | 9.46  | 9.96  | 11.42 | 7.95           | 8.46 | 9.03  | 9.53  | 11.00 |
|                 | 6H   | 8.89             | 9.33 | 9.98  | 10.43 | 11.88 | 8.46           | 8.90 | 9.55  | 9.99  | 11.45 |
|                 | 8H   | 9.04             | 9.45 | 10.13 | 10.54 | 12.01 | 8.61           | 9.01 | 9.69  | 10.10 | 11.58 |
|                 | 12H  | 9.12             | 9.48 | 10.22 | 10.59 | 12.07 | 8.67           | 9.04 | 9.77  | 10.14 | 11.62 |
| 8H              | 4H   | 8.57             | 8.98 | 9.66  | 10.06 | 11.54 | 8.19           | 8.60 | 9.28  | 9.69  | 11.16 |
|                 | 6H   | 9.20             | 9.54 | 10.31 | 10.67 | 12.14 | 8.82           | 9.16 | 9.93  | 10.29 | 11.76 |
|                 | 8H   | 9.43             | 9.72 | 10.54 | 10.83 | 12.32 | 9.03           | 9.33 | 10.15 | 10.44 | 11.93 |
|                 | 12H  | 9.56             | 9.82 | 10.68 | 10.93 | 12.45 | 9.15           | 9.41 | 10.27 | 10.51 | 12.04 |
| 12H             | 4H   | 8.55             | 8.92 | 9.66  | 10.02 | 11.50 | 8.18           | 8.55 | 9.29  | 9.65  | 11.13 |
|                 | 6H   | 9.23             | 9.53 | 10.35 | 10.64 | 12.13 | 8.86           | 9.16 | 9.98  | 10.27 | 11.76 |
|                 | 8H   | 9.48             | 9.73 | 10.60 | 10.84 | 12.37 | 9.10           | 9.35 | 10.22 | 10.46 | 11.99 |

END OF REPORT