

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: P922422

Luminaire Tested: DFN2DIP-PN4F0-090D040US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922422  
REPORT IS A COMBINATION OF REPORTS P899620 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D040US940-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

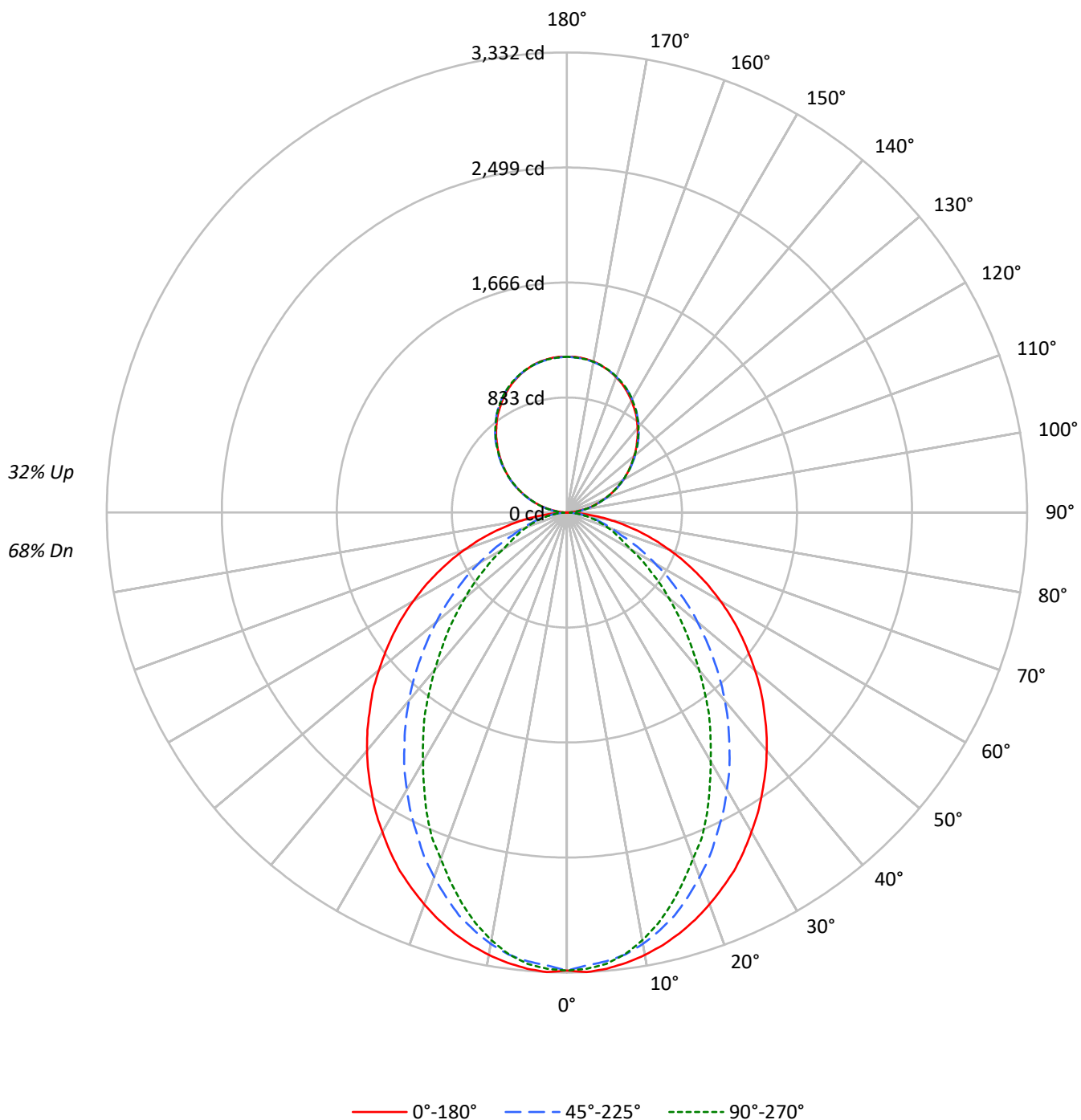
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9978.3 lumens  
Efficiency: N/A  
Efficacy: 84.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 118.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-090D040US940-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P922422

CATALOG NUMBER: DFN2DIP-PN4F0-090D040US940-RLLFLL

**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   | 112 | 112 | 112 | 112 | 105 | 105 | 105 | 105 | 94 | 94 | 94 | 83 | 83 | 83 | 73 | 73 | 73 | 66 | 66 | 66 |
| 1   | 103 | 98  | 95  | 91  | 97  | 93  | 90  | 87  | 83 | 81 | 78 | 74 | 72 | 70 | 66 | 64 | 63 | 59 | 57 | 55 |
| 2   | 94  | 87  | 81  | 76  | 89  | 82  | 77  | 72  | 74 | 70 | 66 | 66 | 63 | 60 | 59 | 56 | 54 | 50 | 48 | 46 |
| 3   | 86  | 77  | 70  | 64  | 81  | 73  | 67  | 61  | 66 | 61 | 56 | 59 | 55 | 51 | 52 | 49 | 47 | 44 | 42 | 40 |
| 4   | 79  | 69  | 61  | 55  | 75  | 65  | 58  | 53  | 59 | 53 | 49 | 53 | 48 | 45 | 47 | 44 | 41 | 38 | 36 | 34 |
| 5   | 73  | 62  | 53  | 48  | 69  | 59  | 51  | 46  | 53 | 47 | 43 | 48 | 43 | 39 | 43 | 39 | 36 | 33 | 31 | 29 |
| 6   | 68  | 56  | 48  | 42  | 64  | 53  | 46  | 40  | 48 | 42 | 38 | 44 | 39 | 35 | 39 | 35 | 32 | 30 | 28 | 26 |
| 7   | 63  | 51  | 43  | 37  | 59  | 48  | 41  | 36  | 44 | 38 | 33 | 40 | 35 | 31 | 36 | 32 | 29 | 27 | 25 | 23 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 30 | 37 | 32 | 28 | 33 | 29 | 26 | 24 | 22 | 20 |
| 9   | 55  | 42  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 27 | 34 | 29 | 25 | 31 | 27 | 24 | 22 | 20 | 18 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 31  | 26  | 34 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 22 | 20 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2421 | 2421 | 2421 |
| 5°  | 2425 | 2383 | 2398 |
| 10° | 2401 | 2337 | 2321 |
| 15° | 2368 | 2260 | 2201 |
| 20° | 2324 | 2154 | 2053 |
| 25° | 2279 | 2035 | 1910 |
| 30° | 2219 | 1912 | 1729 |
| 35° | 2160 | 1781 | 1570 |
| 40° | 2100 | 1645 | 1388 |
| 45° | 2031 | 1494 | 1222 |
| 50° | 1959 | 1342 | 1061 |
| 55° | 1884 | 1179 | 905  |
| 60° | 1797 | 1009 | 746  |
| 65° | 1696 | 836  | 672  |
| 70° | 1575 | 675  | 608  |
| 75° | 1423 | 595  | 554  |
| 80° | 1202 | 500  | 483  |
| 85° | 837  | 336  | 366  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2031 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 310.9  | 3.1       |
| 10°-20°   | 853.4  | 8.6       |
| 20°-30°   | 1198.1 | 12.0      |
| 30°-40°   | 1306.0 | 13.1      |
| 40°-50°   | 1200.4 | 12.0      |
| 50°-60°   | 942.7  | 9.4       |
| 60°-70°   | 613.6  | 6.1       |
| 70°-80°   | 315.9  | 3.2       |
| 80°-90°   | 83.8   | 0.8       |
| 90°-100°  | 69.8   | 0.7       |
| 100°-110° | 221.8  | 2.2       |
| 110°-120° | 379.5  | 3.8       |
| 120°-130° | 499.2  | 5.0       |
| 130°-140° | 560.3  | 5.6       |
| 140°-150° | 549.4  | 5.5       |
| 150°-160° | 460.9  | 4.6       |
| 160°-170° | 305.7  | 3.1       |
| 170°-180° | 106.8  | 1.1       |
| 0°-30°    | 2362.4 | 23.7      |
| 0°-40°    | 3668.4 | 36.8      |
| 0°-60°    | 5811.5 | 58.2      |
| 0°-90°    | 6824.8 | 68.4      |
| 90°-120°  | 671.2  | 6.7       |
| 90°-150°  | 2280.1 | 22.9      |
| 90°-180°  | 3153.0 | 31.6      |
| 0°-180°   | 9978.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3317 | 3317  | 3317 | 3317  | 3317 |      |
| 5°   | 3317 | 3302  | 3263 | 3290  | 3281 | 315  |
| 15°  | 3155 | 3122  | 3020 | 2963  | 2933 | 889  |
| 25°  | 2864 | 2768  | 2570 | 2446  | 2401 | 1317 |
| 35°  | 2468 | 2314  | 2050 | 1861  | 1795 | 1544 |
| 45°  | 2017 | 1816  | 1501 | 1288  | 1216 | 1558 |
| 55°  | 1534 | 1300  | 975  | 796   | 738  | 1371 |
| 65°  | 1036 | 792   | 522  | 420   | 411  | 1027 |
| 75°  | 552  | 342   | 240  | 219   | 216  | 584  |
| 85°  | 129  | 66    | 57   | 57    | 57   | 148  |
| 90°  | 1    | 12    | 33   | 31    | 32   | 10   |
| 95°  | 50   | 59    | 61   | 61    | 59   | 55   |
| 105° | 205  | 207   | 210  | 211   | 211  | 216  |
| 115° | 381  | 386   | 385  | 384   | 381  | 377  |
| 125° | 554  | 562   | 560  | 557   | 556  | 495  |
| 135° | 717  | 727   | 729  | 728   | 725  | 554  |
| 145° | 870  | 877   | 882  | 883   | 880  | 544  |
| 155° | 995  | 998   | 1000 | 1005  | 1002 | 458  |
| 165° | 1082 | 1081  | 1081 | 1088  | 1083 | 305  |
| 175° | 1126 | 1123  | 1121 | 1128  | 1122 | 107  |
| 180° | 1128 | 1128  | 1128 | 1128  | 1128 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3316.9 | 3316.9 | 3316.9 | 3316.9 | 3316.9 |
| 2.5°   | 3331.9 | 3316.9 | 3283.7 | 3314.0 | 3308.0 |
| 5°     | 3316.9 | 3301.9 | 3262.8 | 3289.8 | 3280.9 |
| 7.5°   | 3289.8 | 3272.0 | 3230.0 | 3241.7 | 3226.7 |
| 10°    | 3253.9 | 3232.8 | 3173.0 | 3163.7 | 3145.9 |
| 12.5°  | 3208.9 | 3181.9 | 3100.7 | 3082.8 | 3049.6 |
| 15°    | 3154.8 | 3121.7 | 3019.8 | 2962.7 | 2932.8 |
| 17.5°  | 3091.7 | 3043.7 | 2917.5 | 2851.6 | 2803.5 |
| 20°    | 3019.8 | 2959.6 | 2809.5 | 2734.7 | 2668.4 |
| 22.5°  | 2941.8 | 2872.6 | 2698.4 | 2596.5 | 2551.6 |
| 25°    | 2863.7 | 2767.5 | 2569.5 | 2446.5 | 2401.3 |
| 27.5°  | 2770.7 | 2668.4 | 2449.4 | 2308.3 | 2239.2 |
| 30°    | 2671.7 | 2557.3 | 2317.2 | 2164.4 | 2083.1 |
| 32.5°  | 2575.4 | 2437.2 | 2191.4 | 2011.2 | 1936.0 |
| 35°    | 2467.5 | 2314.3 | 2050.3 | 1861.2 | 1794.9 |
| 37.5°  | 2362.4 | 2197.2 | 1918.2 | 1710.8 | 1636.0 |
| 40°    | 2251.3 | 2071.4 | 1779.9 | 1566.9 | 1488.9 |
| 42.5°  | 2137.3 | 1945.3 | 1642.0 | 1419.8 | 1344.9 |
| 45°    | 2017.2 | 1816.0 | 1500.9 | 1287.5 | 1215.6 |
| 47.5°  | 1903.2 | 1690.1 | 1365.9 | 1152.5 | 1086.6 |
| 50°    | 1777.1 | 1564.0 | 1233.8 | 1026.4 | 963.7  |
| 52.5°  | 1653.9 | 1428.7 | 1107.7 | 909.5  | 852.6  |
| 55°    | 1533.7 | 1299.7 | 975.4  | 795.6  | 738.5  |
| 57.5°  | 1410.9 | 1170.7 | 858.6  | 690.5  | 642.4  |
| 60°    | 1284.7 | 1044.5 | 735.4  | 582.5  | 534.4  |
| 62.5°  | 1161.8 | 921.7  | 630.3  | 486.3  | 462.4  |
| 65°    | 1035.6 | 792.4  | 522.3  | 420.4  | 411.2  |
| 67.5°  | 915.6  | 672.3  | 420.4  | 369.1  | 360.2  |
| 70°    | 789.5  | 555.4  | 348.1  | 318.2  | 306.0  |
| 72.5°  | 669.4  | 447.1  | 291.1  | 267.2  | 261.2  |
| 75°    | 552.2  | 342.1  | 240.1  | 219.1  | 216.2  |
| 77.5°  | 435.3  | 243.0  | 189.1  | 177.1  | 171.0  |
| 80°    | 327.1  | 174.2  | 143.9  | 132.2  | 132.2  |
| 82.5°  | 228.0  | 117.2  | 99.1   | 93.0   | 93.0   |
| 85°    | 128.9  | 65.9   | 57.0   | 57.0   | 57.0   |
| 87.5°  | 48.1   | 23.9   | 23.9   | 21.0   | 21.0   |
| 90°    | 1.0    | 12.2   | 33.3   | 31.3   | 32.3   |
| 92.5°  | 21.0   | 28.5   | 29.6   | 30.6   | 30.6   |
| 95°    | 49.7   | 59.2   | 60.9   | 60.9   | 59.2   |
| 97.5°  | 82.7   | 91.5   | 95.2   | 95.2   | 95.2   |
| 100°   | 120.7  | 128.6  | 131.3  | 131.3  | 130.3  |
| 102.5° | 160.9  | 166.7  | 170.4  | 171.4  | 170.4  |
| 105°   | 204.7  | 207.4  | 209.5  | 211.2  | 211.2  |
| 107.5° | 248.3  | 252.4  | 252.4  | 253.0  | 248.3  |
| 110°   | 290.4  | 295.9  | 295.9  | 295.9  | 293.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 336.0  | 341.8  | 340.7  | 338.0  | 336.0  |
| 115°   | 380.8  | 386.4  | 384.6  | 383.6  | 380.8  |
| 117.5° | 425.4  | 432.9  | 428.2  | 425.4  | 422.8  |
| 120°   | 470.4  | 477.8  | 470.4  | 470.4  | 467.3  |
| 122.5° | 511.1  | 520.7  | 515.9  | 513.2  | 511.1  |
| 125°   | 554.0  | 562.5  | 559.8  | 556.7  | 555.7  |
| 127.5° | 595.8  | 606.4  | 602.6  | 598.5  | 595.8  |
| 130°   | 634.9  | 647.2  | 645.5  | 643.5  | 639.7  |
| 132.5° | 678.8  | 688.3  | 689.0  | 684.2  | 681.5  |
| 135°   | 716.6  | 727.1  | 729.2  | 728.1  | 725.4  |
| 137.5° | 758.8  | 767.2  | 768.9  | 768.2  | 764.2  |
| 140°   | 795.8  | 804.3  | 809.0  | 809.0  | 805.3  |
| 142.5° | 833.9  | 842.4  | 845.1  | 846.1  | 842.4  |
| 145°   | 870.0  | 876.7  | 882.2  | 883.2  | 879.5  |
| 147.5° | 902.2  | 910.7  | 914.8  | 916.5  | 912.8  |
| 150°   | 935.6  | 941.4  | 945.1  | 948.2  | 945.1  |
| 152.5° | 965.2  | 970.9  | 975.7  | 979.5  | 975.7  |
| 155°   | 994.7  | 997.5  | 1000.5 | 1005.3 | 1002.2 |
| 157.5° | 1020.3 | 1022.3 | 1024.0 | 1030.8 | 1026.0 |
| 160°   | 1043.0 | 1045.1 | 1046.1 | 1051.9 | 1047.8 |
| 162.5° | 1064.1 | 1064.1 | 1065.1 | 1071.6 | 1066.8 |
| 165°   | 1082.2 | 1081.1 | 1081.1 | 1087.9 | 1083.2 |
| 167.5° | 1098.5 | 1095.4 | 1095.4 | 1102.2 | 1097.4 |
| 170°   | 1110.7 | 1108.0 | 1107.0 | 1113.7 | 1108.0 |
| 172.5° | 1119.2 | 1116.5 | 1115.4 | 1122.3 | 1116.5 |
| 175°   | 1126.1 | 1123.3 | 1121.2 | 1128.0 | 1122.3 |
| 177.5° | 1129.8 | 1127.0 | 1125.0 | 1130.8 | 1125.0 |
| 180°   | 1128.0 | 1128.0 | 1128.0 | 1128.0 | 1128.0 |

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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 | 11.79            | 12.80 | 12.58 | 13.61 | 14.59 | 7.76           | 8.77  | 8.55  | 9.57  | 10.56 |
|                 | 3H   | 13.49            | 14.39 | 14.29 | 15.20 | 16.22 | 8.96           | 9.86  | 9.76  | 10.68 | 11.69 |
|                 | 4H   | 14.11            | 14.95 | 14.92 | 15.78 | 16.80 | 9.42           | 10.27 | 10.24 | 11.09 | 12.12 |
|                 | 6H   | 14.54            | 15.32 | 15.37 | 16.15 | 17.19 | 9.75           | 10.53 | 10.58 | 11.36 | 12.40 |
|                 | 8H   | 14.67            | 15.41 | 15.51 | 16.26 | 17.30 | 9.85           | 10.59 | 10.69 | 11.44 | 12.48 |
|                 | 12H  | 14.74            | 15.45 | 15.59 | 16.29 | 17.36 | 9.90           | 10.60 | 10.74 | 11.45 | 12.51 |
| 4H              | 2H   | 11.83            | 12.68 | 12.66 | 13.51 | 14.53 | 8.38           | 9.23  | 9.20  | 10.05 | 11.08 |
|                 | 3H   | 13.68            | 14.39 | 14.52 | 15.24 | 16.28 | 9.74           | 10.45 | 10.58 | 11.31 | 12.35 |
|                 | 4H   | 14.38            | 15.02 | 15.23 | 15.88 | 16.95 | 10.30          | 10.94 | 11.15 | 11.80 | 12.86 |
|                 | 6H   | 14.91            | 15.46 | 15.77 | 16.34 | 17.41 | 10.73          | 11.28 | 11.59 | 12.16 | 13.23 |
|                 | 8H   | 15.09            | 15.61 | 15.96 | 16.48 | 17.57 | 10.86          | 11.38 | 11.73 | 12.25 | 13.34 |
|                 | 12H  | 15.19            | 15.66 | 16.08 | 16.55 | 17.64 | 10.94          | 11.40 | 11.82 | 12.29 | 13.38 |
| 8H              | 4H   | 14.36            | 14.88 | 15.23 | 15.75 | 16.84 | 10.59          | 11.11 | 11.46 | 11.98 | 13.07 |
|                 | 6H   | 14.94            | 15.36 | 15.83 | 16.28 | 17.37 | 11.12          | 11.55 | 12.01 | 12.46 | 13.55 |
|                 | 8H   | 15.16            | 15.54 | 16.06 | 16.45 | 17.55 | 11.31          | 11.69 | 12.22 | 12.60 | 13.70 |
|                 | 12H  | 15.31            | 15.64 | 16.21 | 16.54 | 17.70 | 11.44          | 11.77 | 12.35 | 12.67 | 13.83 |
| 12H             | 4H   | 14.32            | 14.79 | 15.21 | 15.68 | 16.77 | 10.61          | 11.07 | 11.49 | 11.97 | 13.06 |
|                 | 6H   | 14.91            | 15.29 | 15.82 | 16.20 | 17.31 | 11.17          | 11.55 | 12.08 | 12.46 | 13.56 |
|                 | 8H   | 15.14            | 15.48 | 16.05 | 16.38 | 17.54 | 11.39          | 11.72 | 12.30 | 12.62 | 13.78 |

END OF REPORT