

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: P915158

Luminaire Tested: DFN2DIP-SQ4F0-160D110US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915158  
REPORT IS A COMBINATION OF REPORTS P900166 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-160D110US927-RLLFLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

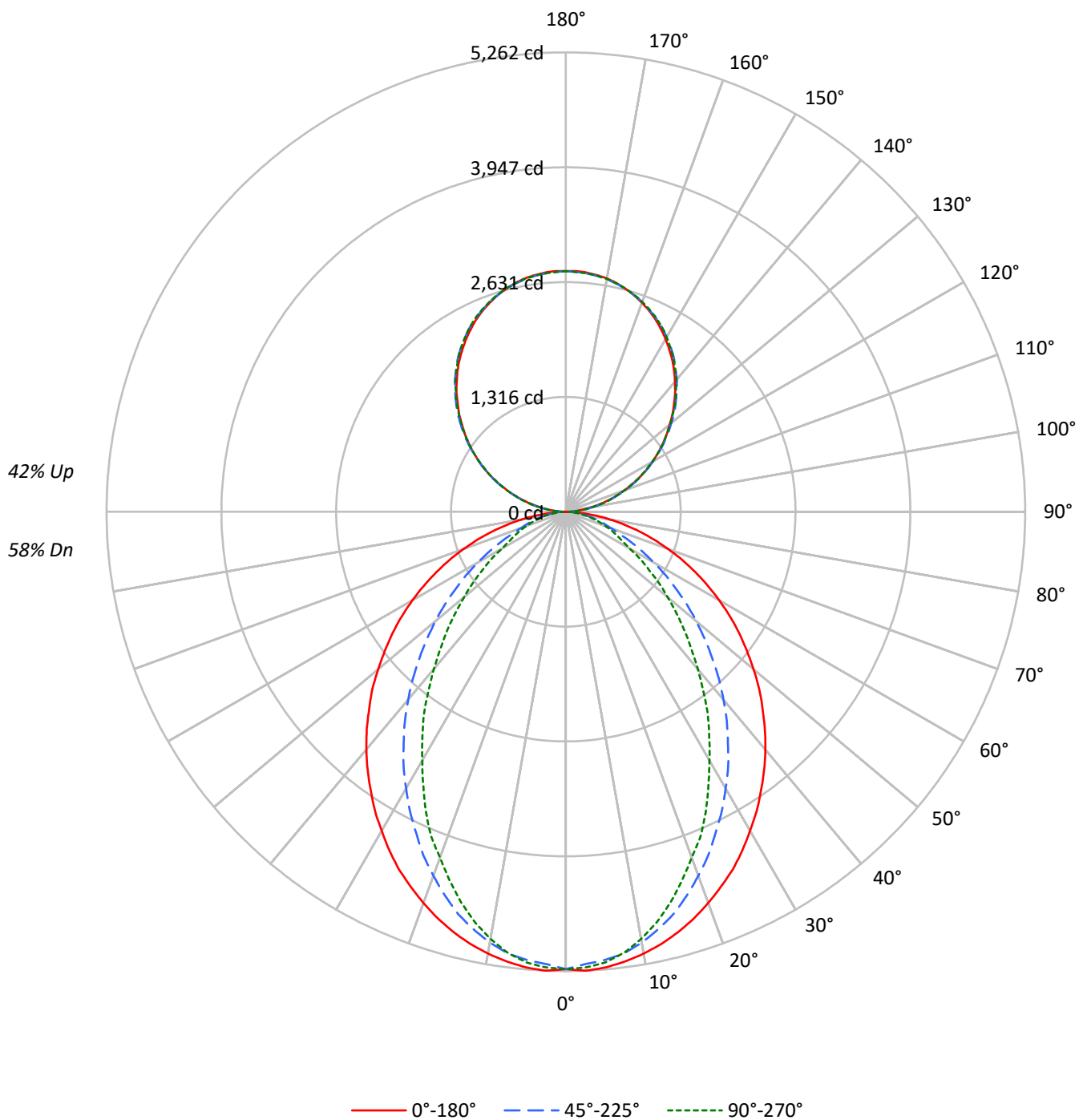
Lumens per Lamp: N/A  
Luminaire Lumens: 18485.6 lumens  
Efficiency: N/A  
Efficacy: 74.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 249.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P915158

CATALOG NUMBER: DFN2DIP-SQ4F0-160D110US927-RLFL

### 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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 75 | 75 | 75 | 64 | 64 | 64 |
| 1   | 100 | 96  | 92  | 89  | 93  | 90  | 87  | 84  | 78 | 76 | 73 | 67 | 65 | 64 | 57 | 56 | 55 |
| 2   | 92  | 85  | 79  | 74  | 85  | 79  | 74  | 70  | 69 | 65 | 62 | 60 | 57 | 54 | 51 | 49 | 47 |
| 3   | 84  | 75  | 68  | 62  | 78  | 70  | 64  | 59  | 61 | 57 | 53 | 53 | 50 | 47 | 46 | 43 | 41 |
| 4   | 77  | 67  | 59  | 53  | 72  | 63  | 56  | 50  | 55 | 50 | 45 | 48 | 44 | 40 | 41 | 38 | 36 |
| 5   | 71  | 60  | 52  | 46  | 66  | 56  | 49  | 44  | 50 | 44 | 40 | 43 | 39 | 35 | 37 | 34 | 31 |
| 6   | 66  | 54  | 46  | 40  | 61  | 51  | 44  | 38  | 45 | 39 | 35 | 39 | 35 | 31 | 34 | 31 | 28 |
| 7   | 61  | 49  | 41  | 36  | 57  | 46  | 39  | 34  | 41 | 35 | 31 | 36 | 31 | 28 | 31 | 28 | 25 |
| 8   | 57  | 45  | 37  | 32  | 53  | 42  | 35  | 30  | 37 | 32 | 28 | 33 | 29 | 25 | 29 | 25 | 23 |
| 9   | 53  | 41  | 33  | 28  | 49  | 39  | 32  | 27  | 34 | 29 | 25 | 31 | 26 | 23 | 27 | 23 | 21 |
| 10  | 50  | 38  | 30  | 26  | 46  | 36  | 29  | 25  | 32 | 26 | 23 | 28 | 24 | 21 | 25 | 21 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3676 | 3676 | 3676 |
| 5°  | 3682 | 3618 | 3642 |
| 10° | 3645 | 3548 | 3524 |
| 15° | 3595 | 3431 | 3342 |
| 20° | 3528 | 3270 | 3118 |
| 25° | 3460 | 3090 | 2902 |
| 30° | 3369 | 2905 | 2627 |
| 35° | 3280 | 2705 | 2386 |
| 40° | 3188 | 2499 | 2109 |
| 45° | 3083 | 2270 | 1858 |
| 50° | 2973 | 2039 | 1612 |
| 55° | 2859 | 1792 | 1377 |
| 60° | 2727 | 1534 | 1134 |
| 65° | 2575 | 1271 | 1022 |
| 70° | 2390 | 1026 | 927  |
| 75° | 2159 | 906  | 845  |
| 80° | 1823 | 763  | 737  |
| 85° | 1269 | 513  | 562  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3083 cd/sqm

TEST NUMBER: P915158

CATALOG NUMBER: DFN2DIP-SQ4F0-160D110US927-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 491.0   | 2.7       |
| 10°-20°   | 1347.8  | 7.3       |
| 20°-30°   | 1892.2  | 10.2      |
| 30°-40°   | 2062.7  | 11.2      |
| 40°-50°   | 1895.8  | 10.3      |
| 50°-60°   | 1488.9  | 8.1       |
| 60°-70°   | 969.1   | 5.2       |
| 70°-80°   | 498.8   | 2.7       |
| 80°-90°   | 135.2   | 0.7       |
| 90°-100°  | 170.5   | 0.9       |
| 100°-110° | 541.8   | 2.9       |
| 110°-120° | 927.3   | 5.0       |
| 120°-130° | 1219.5  | 6.6       |
| 130°-140° | 1368.8  | 7.4       |
| 140°-150° | 1342.3  | 7.3       |
| 150°-160° | 1126.0  | 6.1       |
| 160°-170° | 746.7   | 4.0       |
| 170°-180° | 261.0   | 1.4       |
| 0°-30°    | 3731.0  | 20.2      |
| 0°-40°    | 5793.7  | 31.3      |
| 0°-60°    | 9178.3  | 49.7      |
| 0°-90°    | 10781.5 | 58.3      |
| 90°-120°  | 1639.7  | 8.9       |
| 90°-150°  | 5570.3  | 30.1      |
| 90°-180°  | 7704.0  | 41.7      |
| 0°-180°   | 18485.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5238 | 5238  | 5238 | 5238  | 5238 |      |
| 5°   | 5238 | 5215  | 5153 | 5196  | 5182 | 497  |
| 15°  | 4982 | 4930  | 4769 | 4679  | 4632 | 1404 |
| 25°  | 4523 | 4371  | 4058 | 3864  | 3792 | 2080 |
| 35°  | 3897 | 3655  | 3238 | 2939  | 2835 | 2439 |
| 45°  | 3186 | 2868  | 2370 | 2034  | 1920 | 2460 |
| 55°  | 2422 | 2053  | 1541 | 1256  | 1166 | 2165 |
| 65°  | 1636 | 1251  | 825  | 664   | 649  | 1622 |
| 75°  | 872  | 540   | 379  | 346   | 342  | 922  |
| 85°  | 204  | 104   | 90   | 90    | 90   | 234  |
| 90°  | 2    | 30    | 81   | 76    | 79   | 18   |
| 95°  | 121  | 145   | 149  | 149   | 145  | 135  |
| 105° | 500  | 507   | 512  | 516   | 516  | 528  |
| 115° | 931  | 944   | 940  | 937   | 931  | 920  |
| 125° | 1353 | 1374  | 1368 | 1360  | 1358 | 1209 |
| 135° | 1751 | 1776  | 1781 | 1779  | 1772 | 1353 |
| 145° | 2125 | 2142  | 2155 | 2158  | 2149 | 1328 |
| 155° | 2430 | 2437  | 2444 | 2456  | 2448 | 1119 |
| 165° | 2644 | 2641  | 2641 | 2658  | 2646 | 746  |
| 175° | 2751 | 2744  | 2739 | 2756  | 2742 | 261  |
| 180° | 2756 | 2756  | 2756 | 2756  | 2756 |      |

TEST NUMBER: P915158

CATALOG NUMBER: DFN2DIP-SQ4F0-160D110US927-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5238.5 | 5238.5 | 5238.5 | 5238.5 | 5238.5 |
| 2.5°   | 5262.1 | 5238.5 | 5186.2 | 5234.0 | 5224.4 |
| 5°     | 5238.5 | 5214.8 | 5153.0 | 5195.8 | 5181.7 |
| 7.5°   | 5195.8 | 5167.6 | 5101.2 | 5119.8 | 5096.2 |
| 10°    | 5139.0 | 5105.8 | 5011.2 | 4996.6 | 4968.4 |
| 12.5°  | 5068.0 | 5025.3 | 4897.0 | 4868.8 | 4816.5 |
| 15°    | 4982.5 | 4930.2 | 4769.2 | 4679.2 | 4631.9 |
| 17.5°  | 4882.9 | 4807.0 | 4607.8 | 4503.6 | 4427.7 |
| 20°    | 4769.2 | 4674.2 | 4437.2 | 4319.1 | 4214.5 |
| 22.5°  | 4646.0 | 4536.8 | 4261.7 | 4100.8 | 4029.8 |
| 25°    | 4522.8 | 4370.9 | 4058.0 | 3863.9 | 3792.5 |
| 27.5°  | 4375.9 | 4214.5 | 3868.4 | 3645.6 | 3536.5 |
| 30°    | 4219.5 | 4038.9 | 3659.6 | 3418.3 | 3290.0 |
| 32.5°  | 4067.6 | 3849.3 | 3461.0 | 3176.3 | 3057.6 |
| 35°    | 3897.1 | 3655.1 | 3238.2 | 2939.4 | 2834.8 |
| 37.5°  | 3731.1 | 3470.1 | 3029.5 | 2702.0 | 2583.8 |
| 40°    | 3555.5 | 3271.4 | 2811.1 | 2474.6 | 2351.4 |
| 42.5°  | 3375.5 | 3072.2 | 2593.4 | 2242.3 | 2124.1 |
| 45°    | 3185.8 | 2868.0 | 2370.5 | 2033.5 | 1919.9 |
| 47.5°  | 3005.8 | 2669.3 | 2157.3 | 1820.3 | 1716.2 |
| 50°    | 2806.6 | 2470.1 | 1948.5 | 1621.1 | 1522.0 |
| 52.5°  | 2612.0 | 2256.4 | 1749.4 | 1436.5 | 1346.5 |
| 55°    | 2422.3 | 2052.6 | 1540.6 | 1256.4 | 1166.4 |
| 57.5°  | 2228.2 | 1849.0 | 1356.1 | 1090.4 | 1014.5 |
| 60°    | 2029.0 | 1649.8 | 1161.3 | 920.0  | 844.0  |
| 62.5°  | 1834.8 | 1455.6 | 995.4  | 768.0  | 730.3  |
| 65°    | 1635.7 | 1251.4 | 824.9  | 663.9  | 649.4  |
| 67.5°  | 1446.0 | 1061.8 | 663.9  | 583.0  | 568.9  |
| 70°    | 1246.9 | 877.2  | 549.8  | 502.5  | 483.4  |
| 72.5°  | 1057.2 | 706.2  | 459.7  | 422.0  | 412.4  |
| 75°    | 872.2  | 540.2  | 379.2  | 346.0  | 341.5  |
| 77.5°  | 687.5  | 383.7  | 298.7  | 279.6  | 270.1  |
| 80°    | 516.6  | 275.1  | 227.4  | 208.7  | 208.7  |
| 82.5°  | 360.1  | 185.1  | 156.5  | 146.9  | 146.9  |
| 85°    | 203.7  | 104.1  | 90.1   | 90.1   | 90.1   |
| 87.5°  | 76.0   | 37.7   | 37.7   | 33.2   | 33.2   |
| 90°    | 2.5    | 29.9   | 81.4   | 76.4   | 78.9   |
| 92.5°  | 51.5   | 69.8   | 72.2   | 74.8   | 74.8   |
| 95°    | 121.3  | 144.6  | 148.7  | 148.7  | 144.6  |
| 97.5°  | 201.9  | 223.5  | 232.7  | 232.7  | 232.7  |
| 100°   | 294.9  | 314.0  | 320.7  | 320.7  | 318.2  |
| 102.5° | 393.0  | 407.1  | 416.3  | 418.7  | 416.3  |
| 105°   | 500.2  | 506.8  | 511.8  | 515.9  | 515.9  |
| 107.5° | 606.5  | 616.5  | 616.5  | 618.1  | 606.5  |
| 110°   | 709.6  | 722.9  | 722.9  | 722.9  | 716.2  |

TEST NUMBER: P915158

CATALOG NUMBER: DFN2DIP-SQ4F0-160D110US927-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 820.9  | 835.0  | 832.5  | 825.8  | 820.9  |
| 115°   | 930.6  | 943.8  | 939.7  | 937.2  | 930.6  |
| 117.5° | 1039.4 | 1057.6 | 1046.0 | 1039.4 | 1032.8 |
| 120°   | 1149.1 | 1167.4 | 1149.1 | 1149.1 | 1141.6 |
| 122.5° | 1248.8 | 1272.0 | 1260.4 | 1253.7 | 1248.8 |
| 125°   | 1353.4 | 1374.2 | 1367.5 | 1360.1 | 1357.6 |
| 127.5° | 1455.6 | 1481.4 | 1472.3 | 1462.3 | 1455.6 |
| 130°   | 1551.2 | 1581.1 | 1576.9 | 1571.9 | 1562.8 |
| 132.5° | 1658.4 | 1681.6 | 1683.3 | 1671.7 | 1665.0 |
| 135°   | 1750.6 | 1776.3 | 1781.3 | 1778.8 | 1772.2 |
| 137.5° | 1853.6 | 1874.4 | 1878.5 | 1876.8 | 1866.9 |
| 140°   | 1944.2 | 1964.9 | 1976.6 | 1976.6 | 1967.5 |
| 142.5° | 2037.3 | 2058.0 | 2064.7 | 2067.1 | 2058.0 |
| 145°   | 2125.3 | 2141.9 | 2155.2 | 2157.7 | 2148.6 |
| 147.5° | 2204.2 | 2225.0 | 2235.0 | 2239.1 | 2230.0 |
| 150°   | 2285.7 | 2299.8 | 2308.9 | 2316.4 | 2308.9 |
| 152.5° | 2357.9 | 2372.0 | 2383.7 | 2392.9 | 2383.7 |
| 155°   | 2430.3 | 2436.8 | 2444.4 | 2456.0 | 2448.5 |
| 157.5° | 2492.5 | 2497.5 | 2501.6 | 2518.3 | 2506.6 |
| 160°   | 2548.2 | 2553.2 | 2555.7 | 2569.8 | 2559.9 |
| 162.5° | 2599.7 | 2599.7 | 2602.2 | 2618.0 | 2606.4 |
| 165°   | 2643.7 | 2641.2 | 2641.2 | 2657.8 | 2646.2 |
| 167.5° | 2683.6 | 2676.1 | 2676.1 | 2692.8 | 2681.1 |
| 170°   | 2713.5 | 2706.9 | 2704.4 | 2721.0 | 2706.9 |
| 172.5° | 2734.3 | 2727.6 | 2725.2 | 2741.8 | 2727.6 |
| 175°   | 2750.9 | 2744.3 | 2739.3 | 2755.9 | 2741.8 |
| 177.5° | 2760.0 | 2753.4 | 2748.4 | 2762.6 | 2748.4 |
| 180°   | 2755.9 | 2755.9 | 2755.9 | 2755.9 | 2755.9 |

TEST NUMBER: P915158

CATALOG NUMBER: DFN2DIP-SQ4F0-160D110US927-RLLFLL

**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 | 12.42            | 13.33 | 13.31 | 14.23 | 15.38 | 8.39           | 9.29  | 9.27  | 10.19 | 11.34 |
|                 | 3H   | 14.11            | 14.92 | 15.01 | 15.83 | 17.01 | 9.58           | 10.39 | 10.48 | 11.30 | 12.48 |
|                 | 4H   | 14.73            | 15.49 | 15.64 | 16.41 | 17.59 | 10.03          | 10.80 | 10.95 | 11.72 | 12.90 |
|                 | 6H   | 15.16            | 15.86 | 16.08 | 16.78 | 17.98 | 10.36          | 11.06 | 11.29 | 11.99 | 13.19 |
|                 | 8H   | 15.29            | 15.95 | 16.22 | 16.90 | 18.09 | 10.45          | 11.12 | 11.39 | 12.06 | 13.26 |
|                 | 12H  | 15.35            | 15.99 | 16.29 | 16.92 | 18.15 | 10.50          | 11.13 | 11.44 | 12.07 | 13.29 |
| 4H              | 2H   | 12.45            | 13.21 | 13.37 | 14.13 | 15.32 | 8.99           | 9.75  | 9.91  | 10.67 | 11.86 |
|                 | 3H   | 14.29            | 14.93 | 15.23 | 15.88 | 17.08 | 10.35          | 10.98 | 11.28 | 11.93 | 13.13 |
|                 | 4H   | 14.99            | 15.57 | 15.93 | 16.51 | 17.74 | 10.90          | 11.48 | 11.84 | 12.42 | 13.65 |
|                 | 6H   | 15.51            | 16.01 | 16.47 | 16.98 | 18.21 | 11.33          | 11.82 | 12.28 | 12.79 | 14.02 |
|                 | 8H   | 15.69            | 16.16 | 16.65 | 17.12 | 18.36 | 11.46          | 11.92 | 12.41 | 12.88 | 14.12 |
|                 | 12H  | 15.79            | 16.21 | 16.77 | 17.19 | 18.44 | 11.53          | 11.94 | 12.50 | 12.92 | 14.17 |
| 8H              | 4H   | 14.96            | 15.43 | 15.92 | 16.39 | 17.63 | 11.19          | 11.65 | 12.15 | 12.62 | 13.85 |
|                 | 6H   | 15.54            | 15.92 | 16.52 | 16.93 | 18.16 | 11.71          | 12.09 | 12.70 | 13.10 | 14.34 |
|                 | 8H   | 15.76            | 16.10 | 16.75 | 17.09 | 18.34 | 11.90          | 12.24 | 12.90 | 13.24 | 14.49 |
|                 | 12H  | 15.90            | 16.20 | 16.90 | 17.19 | 18.49 | 12.03          | 12.33 | 13.02 | 13.31 | 14.61 |
| 12H             | 4H   | 14.92            | 15.34 | 15.90 | 16.32 | 17.56 | 11.20          | 11.62 | 12.17 | 12.60 | 13.84 |
|                 | 6H   | 15.51            | 15.85 | 16.51 | 16.85 | 18.10 | 11.76          | 12.10 | 12.75 | 13.09 | 14.35 |
|                 | 8H   | 15.74            | 16.04 | 16.74 | 17.02 | 18.33 | 11.98          | 12.28 | 12.97 | 13.26 | 14.56 |

END OF REPORT