

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: P923300

Luminaire Tested: DFN2DIP-SQ4F0-140D100US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923300  
REPORT IS A COMBINATION OF REPORTS P900145 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D100US940-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

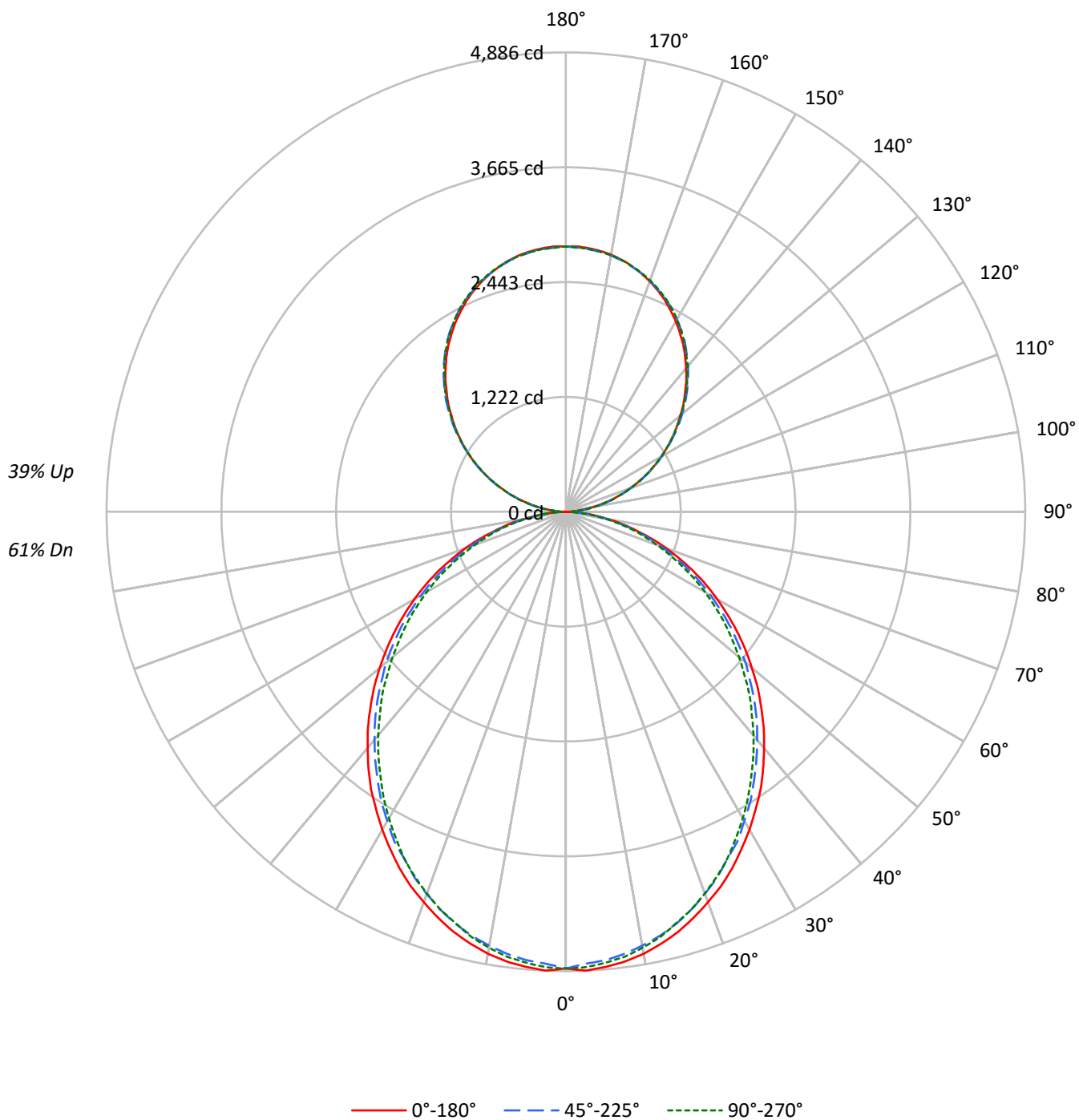
Lumens per Lamp: N/A  
Luminaire Lumens: 20250.8 lumens  
Efficiency: N/A  
Efficacy: 92.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 218.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P923300

CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P923300

CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US940-FLLFL

**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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 89 | 89 | 89 | 77 | 77 | 77 | 66 | 66 | 66 |
| 1   | 100 | 96  | 92  | 88  | 94  | 90  | 86  | 83  | 79 | 76 | 74 | 68 | 66 | 65 | 59 | 57 | 56 |
| 2   | 91  | 84  | 77  | 72  | 85  | 79  | 73  | 68  | 69 | 65 | 61 | 60 | 57 | 54 | 52 | 49 | 47 |
| 3   | 83  | 74  | 66  | 60  | 78  | 69  | 63  | 57  | 61 | 56 | 51 | 53 | 49 | 46 | 46 | 43 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 49  | 54 | 48 | 44 | 47 | 43 | 39 | 41 | 37 | 35 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 | 42 | 38 | 34 | 37 | 33 | 30 |
| 6   | 65  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 44 | 38 | 33 | 38 | 34 | 30 | 33 | 30 | 27 |
| 7   | 60  | 47  | 39  | 33  | 56  | 45  | 37  | 32  | 40 | 34 | 29 | 35 | 30 | 26 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 27  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 30 | 25 | 21 | 26 | 22 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 28  | 23  | 31 | 25 | 21 | 27 | 23 | 19 | 24 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3408 | 3408 | 3408 |
| 5°  | 3414 | 3362 | 3385 |
| 10° | 3386 | 3317 | 3340 |
| 15° | 3336 | 3263 | 3269 |
| 20° | 3269 | 3188 | 3197 |
| 25° | 3202 | 3098 | 3113 |
| 30° | 3118 | 3014 | 3006 |
| 35° | 3039 | 2915 | 2893 |
| 40° | 2941 | 2815 | 2786 |
| 45° | 2843 | 2715 | 2676 |
| 50° | 2736 | 2610 | 2548 |
| 55° | 2625 | 2489 | 2432 |
| 60° | 2498 | 2344 | 2298 |
| 65° | 2361 | 2196 | 2140 |
| 70° | 2185 | 2014 | 1970 |
| 75° | 1942 | 1796 | 1815 |
| 80° | 1649 | 1519 | 1516 |
| 85° | 1192 | 1039 | 1019 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2843 cd/sqm

TEST NUMBER: P923300

CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US940-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 457.2   | 2.3       |
| 10°-20°   | 1286.4  | 6.4       |
| 20°-30°   | 1890.5  | 9.3       |
| 30°-40°   | 2195.7  | 10.8      |
| 40°-50°   | 2192.9  | 10.8      |
| 50°-60°   | 1912.2  | 9.4       |
| 60°-70°   | 1413.5  | 7.0       |
| 70°-80°   | 799.7   | 3.9       |
| 80°-90°   | 219.1   | 1.1       |
| 90°-100°  | 174.5   | 0.9       |
| 100°-110° | 554.5   | 2.7       |
| 110°-120° | 948.9   | 4.7       |
| 120°-130° | 1247.9  | 6.2       |
| 130°-140° | 1400.8  | 6.9       |
| 140°-150° | 1373.6  | 6.8       |
| 150°-160° | 1152.3  | 5.7       |
| 160°-170° | 764.1   | 3.8       |
| 170°-180° | 267.1   | 1.3       |
| 0°-30°    | 3634.0  | 17.9      |
| 0°-40°    | 5829.7  | 28.8      |
| 0°-60°    | 9934.8  | 49.1      |
| 0°-90°    | 12367.1 | 61.1      |
| 90°-120°  | 1677.9  | 8.3       |
| 90°-150°  | 5700.1  | 28.1      |
| 90°-180°  | 7884.0  | 38.9      |
| 0°-180°   | 20250.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4858 | 4858  | 4858 | 4858  | 4858 |      |
| 5°   | 4858 | 4839  | 4788 | 4825  | 4816 | 461  |
| 15°  | 4624 | 4596  | 4535 | 4554  | 4531 | 1302 |
| 25°  | 4185 | 4148  | 4069 | 4078  | 4069 | 1926 |
| 35°  | 3611 | 3564  | 3489 | 3461  | 3438 | 2255 |
| 45°  | 2938 | 2906  | 2835 | 2784  | 2765 | 2268 |
| 55°  | 2224 | 2195  | 2139 | 2083  | 2060 | 1988 |
| 65°  | 1500 | 1471  | 1425 | 1383  | 1359 | 1483 |
| 75°  | 784  | 776   | 752  | 724   | 733  | 837  |
| 85°  | 191  | 187   | 182  | 168   | 164  | 213  |
| 90°  | 3    | 31    | 83   | 78    | 81   | 19   |
| 95°  | 124  | 148   | 152  | 152   | 148  | 138  |
| 105° | 512  | 519   | 524  | 528   | 528  | 540  |
| 115° | 952  | 966   | 962  | 959   | 952  | 942  |
| 125° | 1385 | 1406  | 1400 | 1392  | 1389 | 1238 |
| 135° | 1791 | 1818  | 1823 | 1820  | 1814 | 1385 |
| 145° | 2175 | 2192  | 2206 | 2208  | 2199 | 1359 |
| 155° | 2487 | 2494  | 2501 | 2513  | 2506 | 1145 |
| 165° | 2705 | 2703  | 2703 | 2720  | 2708 | 763  |
| 175° | 2815 | 2808  | 2803 | 2820  | 2806 | 267  |
| 180° | 2820 | 2820  | 2820 | 2820  | 2820 |      |

TEST NUMBER: P923300

CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US940-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4857.6 | 4857.6 | 4857.6 | 4857.6 | 4857.6 |
| 2.5°   | 4885.8 | 4862.5 | 4811.0 | 4857.6 | 4848.7 |
| 5°     | 4857.6 | 4839.2 | 4787.7 | 4824.9 | 4815.9 |
| 7.5°   | 4824.9 | 4797.1 | 4745.6 | 4783.2 | 4773.8 |
| 10°    | 4773.8 | 4741.1 | 4685.1 | 4722.3 | 4708.4 |
| 12.5°  | 4703.4 | 4675.7 | 4619.7 | 4643.0 | 4633.6 |
| 15°    | 4624.1 | 4596.4 | 4535.4 | 4554.3 | 4531.0 |
| 17.5°  | 4526.1 | 4498.3 | 4437.3 | 4460.6 | 4437.3 |
| 20°    | 4418.5 | 4390.8 | 4325.3 | 4339.2 | 4320.9 |
| 22.5°  | 4311.4 | 4269.3 | 4208.3 | 4208.3 | 4199.0 |
| 25°    | 4185.1 | 4147.9 | 4068.6 | 4077.5 | 4068.6 |
| 27.5°  | 4044.8 | 4012.2 | 3951.7 | 3937.8 | 3914.5 |
| 30°    | 3905.1 | 3867.4 | 3797.5 | 3783.7 | 3764.8 |
| 32.5°  | 3755.4 | 3727.7 | 3652.8 | 3624.6 | 3605.7 |
| 35°    | 3610.7 | 3564.2 | 3489.3 | 3461.1 | 3437.7 |
| 37.5°  | 3447.2 | 3405.1 | 3330.2 | 3297.5 | 3274.2 |
| 40°    | 3279.2 | 3241.5 | 3166.6 | 3125.1 | 3106.2 |
| 42.5°  | 3115.6 | 3078.0 | 3003.6 | 2956.6 | 2928.8 |
| 45°    | 2938.2 | 2905.5 | 2835.2 | 2784.1 | 2765.3 |
| 47.5°  | 2765.3 | 2732.6 | 2657.7 | 2606.2 | 2578.5 |
| 50°    | 2582.9 | 2559.7 | 2494.2 | 2428.8 | 2405.5 |
| 52.5°  | 2405.5 | 2372.8 | 2312.3 | 2260.8 | 2228.1 |
| 55°    | 2223.7 | 2195.4 | 2139.4 | 2083.4 | 2060.1 |
| 57.5°  | 2041.2 | 2017.9 | 1957.0 | 1901.0 | 1882.1 |
| 60°    | 1858.9 | 1840.6 | 1775.1 | 1723.6 | 1709.7 |
| 62.5°  | 1681.5 | 1648.8 | 1602.1 | 1555.6 | 1536.8 |
| 65°    | 1499.6 | 1471.3 | 1424.8 | 1382.6 | 1359.3 |
| 67.5°  | 1312.8 | 1289.0 | 1247.3 | 1214.6 | 1195.8 |
| 70°    | 1139.8 | 1121.0 | 1078.9 | 1046.2 | 1027.8 |
| 72.5°  | 962.4  | 943.5  | 920.2  | 887.6  | 873.7  |
| 75°    | 784.5  | 775.6  | 751.8  | 724.1  | 733.4  |
| 77.5°  | 625.9  | 607.1  | 597.6  | 583.8  | 569.9  |
| 80°    | 467.3  | 462.4  | 453.0  | 439.1  | 429.6  |
| 82.5°  | 317.6  | 317.6  | 313.2  | 294.4  | 294.4  |
| 85°    | 191.3  | 186.8  | 182.4  | 168.0  | 163.5  |
| 87.5°  | 84.3   | 74.8   | 65.5   | 51.5   | 46.5   |
| 90°    | 2.6    | 30.6   | 83.3   | 78.2   | 80.8   |
| 92.5°  | 52.7   | 71.4   | 74.0   | 76.5   | 76.5   |
| 95°    | 124.1  | 147.9  | 152.2  | 152.2  | 147.9  |
| 97.5°  | 206.6  | 228.7  | 238.1  | 238.1  | 238.1  |
| 100°   | 301.8  | 321.4  | 328.1  | 328.1  | 325.7  |
| 102.5° | 402.2  | 416.6  | 426.0  | 428.5  | 426.0  |
| 105°   | 511.8  | 518.6  | 523.7  | 528.0  | 528.0  |
| 107.5° | 620.6  | 630.9  | 630.9  | 632.6  | 620.6  |
| 110°   | 726.1  | 739.7  | 739.7  | 739.7  | 732.9  |



TEST NUMBER: P923300

CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US940-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 840.0  | 854.4  | 851.9  | 845.1  | 840.0  |
| 115°   | 952.3  | 965.8  | 961.6  | 959.0  | 952.3  |
| 117.5° | 1063.6 | 1082.4 | 1070.4 | 1063.6 | 1056.8 |
| 120°   | 1175.8 | 1194.5 | 1175.8 | 1175.8 | 1168.2 |
| 122.5° | 1277.8 | 1301.6 | 1289.8 | 1283.0 | 1277.8 |
| 125°   | 1385.0 | 1406.2 | 1399.5 | 1391.8 | 1389.3 |
| 127.5° | 1489.6 | 1515.9 | 1506.5 | 1496.4 | 1489.6 |
| 130°   | 1587.3 | 1617.9 | 1613.7 | 1608.6 | 1599.3 |
| 132.5° | 1697.0 | 1720.8 | 1722.5 | 1710.7 | 1703.8 |
| 135°   | 1791.4 | 1817.8 | 1822.8 | 1820.3 | 1813.5 |
| 137.5° | 1896.8 | 1918.1 | 1922.3 | 1920.7 | 1910.4 |
| 140°   | 1989.5 | 2010.7 | 2022.7 | 2022.7 | 2013.3 |
| 142.5° | 2084.7 | 2106.0 | 2112.7 | 2115.3 | 2106.0 |
| 145°   | 2174.8 | 2191.8 | 2205.5 | 2208.0 | 2198.6 |
| 147.5° | 2255.6 | 2276.9 | 2287.1 | 2291.3 | 2282.0 |
| 150°   | 2339.0 | 2353.4 | 2362.8 | 2370.3 | 2362.8 |
| 152.5° | 2412.9 | 2427.3 | 2439.3 | 2448.6 | 2439.3 |
| 155°   | 2486.9 | 2493.7 | 2501.3 | 2513.2 | 2505.5 |
| 157.5° | 2550.6 | 2555.7 | 2560.0 | 2577.0 | 2565.1 |
| 160°   | 2607.6 | 2612.7 | 2615.2 | 2629.7 | 2619.5 |
| 162.5° | 2660.3 | 2660.3 | 2662.8 | 2679.0 | 2667.1 |
| 165°   | 2705.4 | 2702.8 | 2702.8 | 2719.8 | 2707.9 |
| 167.5° | 2746.2 | 2738.5 | 2738.5 | 2755.6 | 2743.6 |
| 170°   | 2776.8 | 2770.0 | 2767.4 | 2784.5 | 2770.0 |
| 172.5° | 2798.0 | 2791.2 | 2788.6 | 2805.7 | 2791.2 |
| 175°   | 2815.0 | 2808.3 | 2803.2 | 2820.1 | 2805.7 |
| 177.5° | 2824.4 | 2817.6 | 2812.5 | 2826.9 | 2812.5 |
| 180°   | 2820.1 | 2820.1 | 2820.1 | 2820.1 | 2820.1 |

TEST NUMBER: P923300

CATALOG NUMBER: DFN2DIP-SQ4F0-140D100US940-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 | 12.51            | 13.48 | 13.36 | 14.36 | 15.46 | 12.06          | 13.03 | 12.92 | 13.91 | 15.01 |
|                 | 3H   | 14.18            | 15.05 | 15.05 | 15.94 | 17.07 | 13.69          | 14.56 | 14.56 | 15.45 | 16.58 |
|                 | 4H   | 14.78            | 15.60 | 15.66 | 16.49 | 17.63 | 14.28          | 15.10 | 15.17 | 16.00 | 17.14 |
|                 | 6H   | 15.18            | 15.94 | 16.08 | 16.84 | 18.00 | 14.68          | 15.44 | 15.58 | 16.34 | 17.50 |
|                 | 8H   | 15.29            | 16.02 | 16.20 | 16.94 | 18.09 | 14.79          | 15.52 | 15.70 | 16.43 | 17.59 |
|                 | 12H  | 15.35            | 16.04 | 16.26 | 16.95 | 18.13 | 14.84          | 15.53 | 15.75 | 16.44 | 17.62 |
| 4H              | 2H   | 12.98            | 13.80 | 13.87 | 14.70 | 15.84 | 12.63          | 13.45 | 13.52 | 14.34 | 15.48 |
|                 | 3H   | 14.86            | 15.55 | 15.76 | 16.47 | 17.63 | 14.45          | 15.14 | 15.35 | 16.07 | 17.22 |
|                 | 4H   | 15.58            | 16.21 | 16.50 | 17.13 | 18.31 | 15.16          | 15.79 | 16.07 | 16.71 | 17.89 |
|                 | 6H   | 16.11            | 16.65 | 17.04 | 17.60 | 18.78 | 15.68          | 16.22 | 16.60 | 17.16 | 18.35 |
|                 | 8H   | 16.26            | 16.77 | 17.19 | 17.71 | 18.91 | 15.83          | 16.33 | 16.76 | 17.27 | 18.47 |
|                 | 12H  | 16.34            | 16.80 | 17.29 | 17.76 | 18.96 | 15.90          | 16.35 | 16.84 | 17.31 | 18.51 |
| 8H              | 4H   | 15.79            | 16.30 | 16.72 | 17.23 | 18.43 | 15.41          | 15.92 | 16.34 | 16.86 | 18.05 |
|                 | 6H   | 16.43            | 16.85 | 17.39 | 17.83 | 19.03 | 16.05          | 16.47 | 17.00 | 17.45 | 18.64 |
|                 | 8H   | 16.66            | 17.03 | 17.62 | 18.00 | 19.21 | 16.26          | 16.63 | 17.23 | 17.60 | 18.82 |
|                 | 12H  | 16.79            | 17.12 | 17.76 | 18.09 | 19.35 | 16.38          | 16.71 | 17.35 | 17.67 | 18.94 |
| 12H             | 4H   | 15.78            | 16.24 | 16.73 | 17.19 | 18.40 | 15.41          | 15.87 | 16.36 | 16.83 | 18.03 |
|                 | 6H   | 16.46            | 16.83 | 17.43 | 17.80 | 19.02 | 16.09          | 16.46 | 17.05 | 17.43 | 18.64 |
|                 | 8H   | 16.71            | 17.04 | 17.68 | 18.00 | 19.26 | 16.33          | 16.66 | 17.30 | 17.62 | 18.88 |

END OF REPORT