

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: P923200

Luminaire Tested: DFN2DIP-SQ4F0-100D120US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923200  
REPORT IS A COMBINATION OF REPORTS P900175 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-100D120US940-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

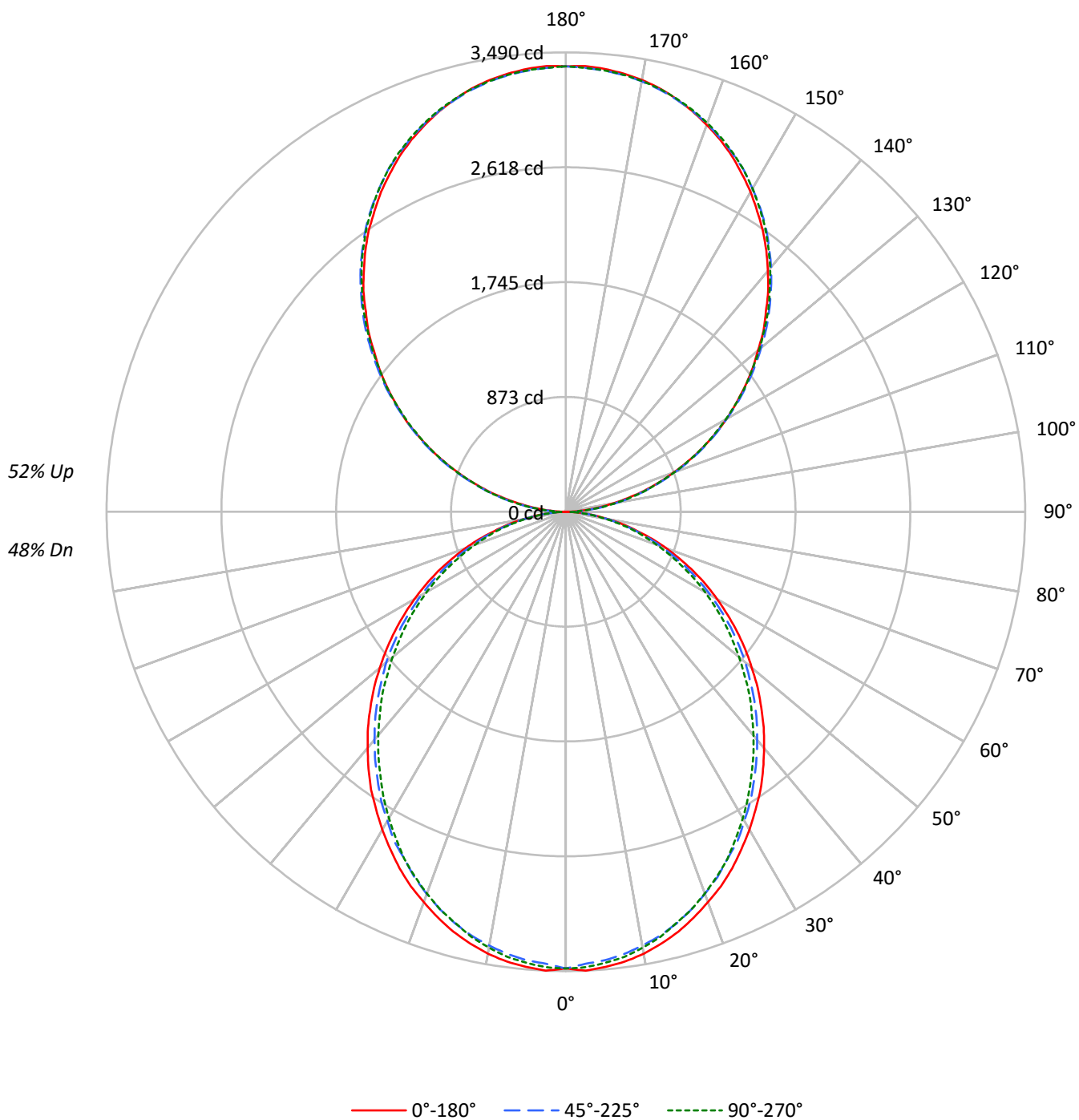
Lumens per Lamp: N/A  
Luminaire Lumens: 18297.9 lumens  
Efficiency: N/A  
Efficacy: 100.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 182.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P923200

CATALOG NUMBER: DFN2DIP-SQ4F0-100D120US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P923200

CATALOG NUMBER: DFN2DIP-SQ4F0-100D120US940-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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 79 | 72 | 70 | 68 | 60 | 58 | 57 | 48 | 47 | 46 |
| 2   | 89  | 81  | 75  | 70  | 81 | 75 | 70 | 65 | 63 | 59 | 56 | 52 | 50 | 47 | 42 | 41 | 39 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 60 | 54 | 56 | 51 | 47 | 46 | 43 | 40 | 38 | 35 | 33 |
| 4   | 74  | 63  | 55  | 49  | 68 | 59 | 52 | 46 | 50 | 44 | 40 | 41 | 37 | 34 | 34 | 31 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 37 | 33 | 30 | 30 | 27 | 25 |
| 6   | 63  | 51  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 34 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 31 | 27 | 30 | 26 | 23 | 25 | 22 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 20 | 23 | 20 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 16 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2435 | 2435 | 2435 |
| 5°  | 2438 | 2401 | 2418 |
| 10° | 2419 | 2369 | 2386 |
| 15° | 2383 | 2331 | 2335 |
| 20° | 2335 | 2277 | 2283 |
| 25° | 2287 | 2213 | 2224 |
| 30° | 2227 | 2153 | 2147 |
| 35° | 2170 | 2082 | 2066 |
| 40° | 2100 | 2011 | 1990 |
| 45° | 2031 | 1940 | 1911 |
| 50° | 1954 | 1864 | 1820 |
| 55° | 1875 | 1778 | 1737 |
| 60° | 1784 | 1675 | 1641 |
| 65° | 1686 | 1568 | 1528 |
| 70° | 1561 | 1438 | 1407 |
| 75° | 1387 | 1283 | 1297 |
| 80° | 1178 | 1085 | 1083 |
| 85° | 851  | 743  | 728  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2663 cd/sqm

TEST NUMBER: P923200

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 326.6   | 1.8       |
| 10°-20°   | 918.8   | 5.0       |
| 20°-30°   | 1350.3  | 7.4       |
| 30°-40°   | 1568.3  | 8.6       |
| 40°-50°   | 1566.4  | 8.6       |
| 50°-60°   | 1365.8  | 7.5       |
| 60°-70°   | 1009.7  | 5.5       |
| 70°-80°   | 571.3   | 3.1       |
| 80°-90°   | 160.4   | 0.9       |
| 90°-100°  | 209.4   | 1.1       |
| 100°-110° | 665.4   | 3.6       |
| 110°-120° | 1138.7  | 6.2       |
| 120°-130° | 1497.5  | 8.2       |
| 130°-140° | 1680.9  | 9.2       |
| 140°-150° | 1648.3  | 9.0       |
| 150°-160° | 1382.7  | 7.6       |
| 160°-170° | 917.0   | 5.0       |
| 170°-180° | 320.5   | 1.8       |
| 0°-30°    | 2595.7  | 14.2      |
| 0°-40°    | 4164.0  | 22.8      |
| 0°-60°    | 7096.2  | 38.8      |
| 0°-90°    | 8837.5  | 48.3      |
| 90°-120°  | 2013.4  | 11.0      |
| 90°-150°  | 6840.1  | 37.4      |
| 90°-180°  | 9460.0  | 51.7      |
| 0°-180°   | 18297.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3470 | 3470  | 3470 | 3470  | 3470 |      |
| 5°   | 3470 | 3457  | 3420 | 3446  | 3440 | 329  |
| 15°  | 3303 | 3283  | 3240 | 3253  | 3236 | 930  |
| 25°  | 2989 | 2963  | 2906 | 2912  | 2906 | 1376 |
| 35°  | 2579 | 2546  | 2492 | 2472  | 2456 | 1611 |
| 45°  | 2099 | 2075  | 2025 | 1989  | 1975 | 1620 |
| 55°  | 1588 | 1568  | 1528 | 1488  | 1472 | 1420 |
| 65°  | 1071 | 1051  | 1018 | 988   | 971  | 1059 |
| 75°  | 560  | 554   | 537  | 517   | 524  | 598  |
| 85°  | 137  | 134   | 130  | 120   | 117  | 152  |
| 90°  | 3    | 37    | 100  | 94    | 97   | 18   |
| 95°  | 149  | 178   | 183  | 183   | 178  | 166  |
| 105° | 614  | 622   | 628  | 634   | 634  | 648  |
| 115° | 1143 | 1159  | 1154 | 1151  | 1143 | 1130 |
| 125° | 1662 | 1688  | 1679 | 1670  | 1667 | 1485 |
| 135° | 2150 | 2181  | 2188 | 2184  | 2176 | 1662 |
| 145° | 2610 | 2630  | 2646 | 2650  | 2638 | 1631 |
| 155° | 2984 | 2992  | 3002 | 3016  | 3007 | 1374 |
| 165° | 3246 | 3243  | 3243 | 3264  | 3250 | 916  |
| 175° | 3378 | 3370  | 3364 | 3384  | 3367 | 321  |
| 180° | 3384 | 3384  | 3384 | 3384  | 3384 |      |

TEST NUMBER: P923200

CATALOG NUMBER: DFN2DIP-SQ4F0-100D120US940-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3469.7 | 3469.7 | 3469.7 | 3469.7 | 3469.7 |
| 2.5°   | 3489.9 | 3473.2 | 3436.4 | 3469.7 | 3463.3 |
| 5°     | 3469.7 | 3456.6 | 3419.8 | 3446.4 | 3440.0 |
| 7.5°   | 3446.4 | 3426.5 | 3389.7 | 3416.6 | 3409.9 |
| 10°    | 3409.9 | 3386.5 | 3346.5 | 3373.1 | 3363.2 |
| 12.5°  | 3359.6 | 3339.8 | 3299.8 | 3316.4 | 3309.7 |
| 15°    | 3303.0 | 3283.2 | 3239.6 | 3253.0 | 3236.5 |
| 17.5°  | 3232.9 | 3213.1 | 3169.5 | 3186.2 | 3169.5 |
| 20°    | 3156.0 | 3136.2 | 3089.5 | 3099.4 | 3086.3 |
| 22.5°  | 3079.6 | 3049.6 | 3006.0 | 3006.0 | 2999.3 |
| 25°    | 2989.4 | 2962.8 | 2906.2 | 2912.5 | 2906.2 |
| 27.5°  | 2889.1 | 2865.8 | 2822.6 | 2812.7 | 2796.0 |
| 30°    | 2789.4 | 2762.4 | 2712.5 | 2702.6 | 2689.1 |
| 32.5°  | 2682.4 | 2662.6 | 2609.1 | 2589.0 | 2575.5 |
| 35°    | 2579.1 | 2545.8 | 2492.3 | 2472.2 | 2455.5 |
| 37.5°  | 2462.3 | 2432.1 | 2378.7 | 2355.4 | 2338.7 |
| 40°    | 2342.3 | 2315.3 | 2261.9 | 2232.2 | 2218.8 |
| 42.5°  | 2225.4 | 2198.5 | 2145.5 | 2111.8 | 2092.0 |
| 45°    | 2098.7 | 2075.4 | 2025.1 | 1988.6 | 1975.2 |
| 47.5°  | 1975.2 | 1951.9 | 1898.4 | 1861.5 | 1841.7 |
| 50°    | 1844.9 | 1828.3 | 1781.5 | 1734.8 | 1718.2 |
| 52.5°  | 1718.2 | 1694.9 | 1651.6 | 1614.9 | 1591.5 |
| 55°    | 1588.3 | 1568.2 | 1528.1 | 1488.1 | 1471.5 |
| 57.5°  | 1458.0 | 1441.4 | 1397.8 | 1357.9 | 1344.4 |
| 60°    | 1327.8 | 1314.6 | 1267.9 | 1231.1 | 1221.2 |
| 62.5°  | 1201.0 | 1177.7 | 1144.4 | 1111.2 | 1097.7 |
| 65°    | 1071.1 | 1051.0 | 1017.7 | 987.6  | 971.0  |
| 67.5°  | 937.7  | 920.7  | 891.0  | 867.6  | 854.2  |
| 70°    | 814.1  | 800.7  | 770.6  | 747.3  | 734.1  |
| 72.5°  | 687.4  | 674.0  | 657.4  | 634.0  | 624.0  |
| 75°    | 560.4  | 554.0  | 537.0  | 517.2  | 523.9  |
| 77.5°  | 447.1  | 433.6  | 426.9  | 417.0  | 407.1  |
| 80°    | 333.8  | 330.3  | 323.5  | 313.6  | 306.9  |
| 82.5°  | 226.9  | 226.9  | 223.7  | 210.3  | 210.3  |
| 85°    | 136.6  | 133.5  | 130.3  | 120.0  | 116.8  |
| 87.5°  | 60.2   | 53.4   | 46.7   | 36.8   | 33.3   |
| 90°    | 3.0    | 36.7   | 100.0  | 93.9   | 96.9   |
| 92.5°  | 63.2   | 85.7   | 88.7   | 91.8   | 91.8   |
| 95°    | 148.9  | 177.5  | 182.6  | 182.6  | 177.5  |
| 97.5°  | 247.9  | 274.5  | 285.7  | 285.7  | 285.7  |
| 100°   | 362.2  | 385.7  | 393.8  | 393.8  | 390.7  |
| 102.5° | 482.6  | 499.9  | 511.1  | 514.2  | 511.1  |
| 105°   | 614.2  | 622.3  | 628.5  | 633.6  | 633.6  |
| 107.5° | 744.8  | 757.1  | 757.1  | 759.0  | 744.8  |
| 110°   | 871.3  | 887.6  | 887.6  | 887.6  | 879.5  |

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CATALOG NUMBER: DFN2DIP-SQ4F0-100D120US940-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1008.0 | 1025.4 | 1022.3 | 1014.1 | 1008.0 |
| 115°   | 1142.6 | 1159.0 | 1153.9 | 1150.8 | 1142.6 |
| 117.5° | 1276.3 | 1298.8 | 1284.5 | 1276.3 | 1268.2 |
| 120°   | 1411.0 | 1433.4 | 1411.0 | 1411.0 | 1401.9 |
| 122.5° | 1533.5 | 1562.0 | 1547.7 | 1539.5 | 1533.5 |
| 125°   | 1662.0 | 1687.5 | 1679.4 | 1670.2 | 1667.1 |
| 127.5° | 1787.5 | 1819.1 | 1807.9 | 1795.6 | 1787.5 |
| 130°   | 1904.8 | 1941.5 | 1936.4 | 1930.3 | 1919.0 |
| 132.5° | 2036.4 | 2065.0 | 2067.0 | 2052.7 | 2044.6 |
| 135°   | 2149.6 | 2181.3 | 2187.5 | 2184.3 | 2176.2 |
| 137.5° | 2276.2 | 2301.7 | 2306.8 | 2304.7 | 2292.5 |
| 140°   | 2387.4 | 2412.9 | 2427.1 | 2427.1 | 2415.9 |
| 142.5° | 2501.7 | 2527.2 | 2535.3 | 2538.3 | 2527.2 |
| 145°   | 2609.8 | 2630.2 | 2646.5 | 2649.6 | 2638.4 |
| 147.5° | 2706.7 | 2732.2 | 2744.5 | 2749.6 | 2738.4 |
| 150°   | 2806.7 | 2824.0 | 2835.3 | 2844.5 | 2835.3 |
| 152.5° | 2895.5 | 2912.8 | 2927.1 | 2938.4 | 2927.1 |
| 155°   | 2984.2 | 2992.4 | 3001.6 | 3015.9 | 3006.7 |
| 157.5° | 3060.8 | 3066.9 | 3071.9 | 3092.4 | 3078.1 |
| 160°   | 3129.1 | 3135.3 | 3138.3 | 3155.7 | 3143.4 |
| 162.5° | 3192.3 | 3192.3 | 3195.4 | 3214.8 | 3200.5 |
| 165°   | 3246.4 | 3243.4 | 3243.4 | 3263.7 | 3249.5 |
| 167.5° | 3295.4 | 3286.2 | 3286.2 | 3306.6 | 3292.4 |
| 170°   | 3332.1 | 3323.9 | 3320.9 | 3341.3 | 3323.9 |
| 172.5° | 3357.6 | 3349.4 | 3346.4 | 3366.8 | 3349.4 |
| 175°   | 3378.1 | 3369.9 | 3363.8 | 3384.1 | 3366.8 |
| 177.5° | 3389.3 | 3381.1 | 3374.9 | 3392.3 | 3374.9 |
| 180°   | 3384.1 | 3384.1 | 3384.1 | 3384.1 | 3384.1 |

TEST NUMBER: P923200

CATALOG NUMBER: DFN2DIP-SQ4F0-100D120US940-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 | 10.21            | 11.06 | 11.19 | 12.05 | 13.34 | 9.77           | 10.62 | 10.74 | 11.60 | 12.90 |
|                 | 3H   | 11.88            | 12.64 | 12.86 | 13.63 | 14.95 | 11.39          | 12.15 | 12.37 | 13.14 | 14.46 |
|                 | 4H   | 12.47            | 13.19 | 13.46 | 14.18 | 15.51 | 11.97          | 12.69 | 12.97 | 13.69 | 15.02 |
|                 | 6H   | 12.87            | 13.53 | 13.88 | 14.54 | 15.87 | 12.37          | 13.03 | 13.38 | 14.04 | 15.37 |
|                 | 8H   | 12.98            | 13.61 | 13.99 | 14.63 | 15.96 | 12.47          | 13.11 | 13.49 | 14.13 | 15.46 |
|                 | 12H  | 13.03            | 13.63 | 14.04 | 14.64 | 16.00 | 12.52          | 13.12 | 13.53 | 14.13 | 15.49 |
| 4H              | 2H   | 10.67            | 11.39 | 11.68 | 12.39 | 13.72 | 10.32          | 11.04 | 11.32 | 12.04 | 13.36 |
|                 | 3H   | 12.54            | 13.14 | 13.55 | 14.17 | 15.51 | 12.14          | 12.74 | 13.15 | 13.76 | 15.10 |
|                 | 4H   | 13.26            | 13.81 | 14.28 | 14.83 | 16.19 | 12.84          | 13.39 | 13.86 | 14.41 | 15.77 |
|                 | 6H   | 13.78            | 14.25 | 14.81 | 15.29 | 16.65 | 13.35          | 13.82 | 14.38 | 14.86 | 16.22 |
|                 | 8H   | 13.93            | 14.37 | 14.96 | 15.41 | 16.78 | 13.49          | 13.93 | 14.52 | 14.97 | 16.34 |
|                 | 12H  | 14.01            | 14.40 | 15.05 | 15.46 | 16.83 | 13.56          | 13.95 | 14.61 | 15.01 | 16.38 |
| 8H              | 4H   | 13.46            | 13.90 | 14.49 | 14.93 | 16.31 | 13.08          | 13.52 | 14.11 | 14.56 | 15.93 |
|                 | 6H   | 14.09            | 14.46 | 15.15 | 15.53 | 16.91 | 13.71          | 14.07 | 14.76 | 15.15 | 16.52 |
|                 | 8H   | 14.32            | 14.64 | 15.38 | 15.70 | 17.09 | 13.92          | 14.24 | 14.99 | 15.31 | 16.70 |
|                 | 12H  | 14.45            | 14.73 | 15.52 | 15.79 | 17.22 | 14.04          | 14.32 | 15.10 | 15.38 | 16.81 |
| 12H             | 4H   | 13.44            | 13.84 | 14.49 | 14.89 | 16.27 | 13.07          | 13.47 | 14.12 | 14.52 | 15.90 |
|                 | 6H   | 14.12            | 14.44 | 15.18 | 15.51 | 16.90 | 13.75          | 14.07 | 14.81 | 15.13 | 16.52 |
|                 | 8H   | 14.37            | 14.65 | 15.43 | 15.71 | 17.14 | 13.99          | 14.27 | 15.05 | 15.33 | 16.76 |

END OF REPORT