

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: P920508

Luminaire Tested: DFN2DIP-SQ4F0-110D120US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920508  
REPORT IS A COMBINATION OF REPORTS P900177 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-110D120US935-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

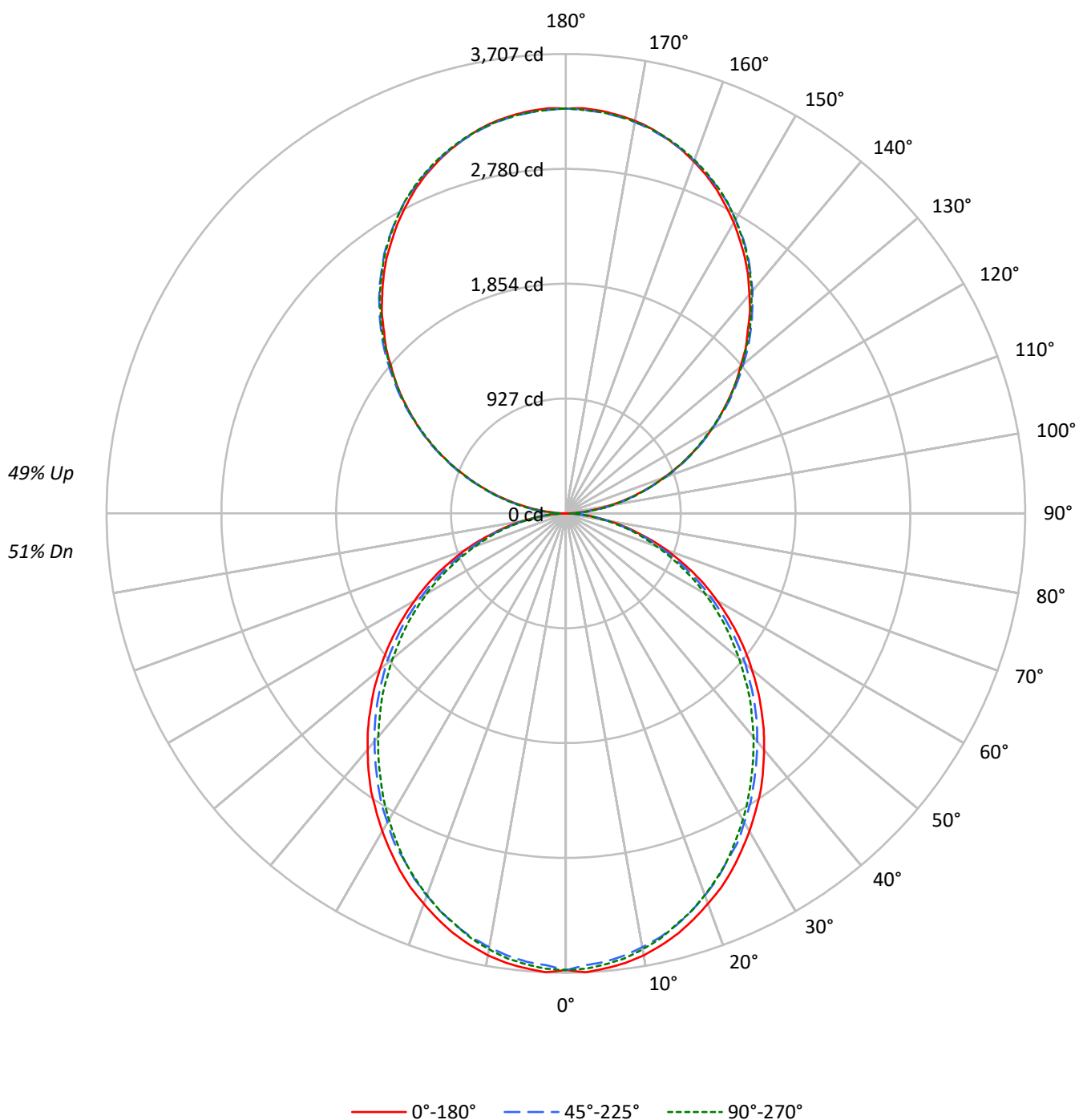
Lumens per Lamp: N/A  
Luminaire Lumens: 18520.0 lumens  
Efficiency: N/A  
Efficacy: 94.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 195.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P920508

CATALOG NUMBER: DFN2DIP-SQ4F0-110D120US935-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P920508

CATALOG NUMBER: DFN2DIP-SQ4F0-110D120US935-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 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 98  | 94  | 90  | 86  | 90 | 87 | 83 | 80 | 73 | 71 | 69 | 61 | 60 | 58 | 50 | 49 | 48 |
| 2   | 89  | 82  | 76  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 54 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 65  | 59  | 75 | 67 | 60 | 55 | 57 | 52 | 48 | 48 | 44 | 41 | 39 | 37 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 30 |
| 5   | 68  | 57  | 49  | 43  | 63 | 53 | 45 | 40 | 45 | 40 | 35 | 38 | 34 | 30 | 32 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 41 | 35 | 31 | 34 | 30 | 27 | 29 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 54 | 43 | 36 | 31 | 37 | 31 | 27 | 31 | 27 | 24 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 34 | 28 | 24 | 29 | 24 | 21 | 24 | 21 | 18 |
| 9   | 50  | 38  | 31  | 25  | 46 | 36 | 29 | 24 | 31 | 25 | 22 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 21 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2586 | 2586 | 2586 |
| 5°  | 2590 | 2550 | 2568 |
| 10° | 2569 | 2516 | 2534 |
| 15° | 2531 | 2476 | 2480 |
| 20° | 2480 | 2418 | 2425 |
| 25° | 2429 | 2350 | 2362 |
| 30° | 2366 | 2287 | 2281 |
| 35° | 2305 | 2212 | 2195 |
| 40° | 2231 | 2136 | 2113 |
| 45° | 2157 | 2060 | 2030 |
| 50° | 2076 | 1980 | 1933 |
| 55° | 1991 | 1888 | 1845 |
| 60° | 1895 | 1779 | 1743 |
| 65° | 1791 | 1666 | 1623 |
| 70° | 1658 | 1528 | 1495 |
| 75° | 1473 | 1363 | 1377 |
| 80° | 1252 | 1152 | 1151 |
| 85° | 905  | 789  | 773  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2572 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 346.9   | 1.9       |
| 10°-20°   | 975.9   | 5.3       |
| 20°-30°   | 1434.2  | 7.7       |
| 30°-40°   | 1665.7  | 9.0       |
| 40°-50°   | 1663.7  | 9.0       |
| 50°-60°   | 1450.7  | 7.8       |
| 60°-70°   | 1072.4  | 5.8       |
| 70°-80°   | 606.7   | 3.3       |
| 80°-90°   | 169.4   | 0.9       |
| 90°-100°  | 202.2   | 1.1       |
| 100°-110° | 642.4   | 3.5       |
| 110°-120° | 1099.4  | 5.9       |
| 120°-130° | 1445.9  | 7.8       |
| 130°-140° | 1623.0  | 8.8       |
| 140°-150° | 1591.6  | 8.6       |
| 150°-160° | 1335.1  | 7.2       |
| 160°-170° | 885.4   | 4.8       |
| 170°-180° | 309.5   | 1.7       |
| 0°-30°    | 2757.0  | 14.9      |
| 0°-40°    | 4422.7  | 23.9      |
| 0°-60°    | 7537.0  | 40.7      |
| 0°-90°    | 9385.5  | 50.7      |
| 90°-120°  | 1944.1  | 10.5      |
| 90°-150°  | 6604.6  | 35.7      |
| 90°-180°  | 9134.0  | 49.3      |
| 0°-180°   | 18520.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3685 | 3685  | 3685 | 3685  | 3685 |      |
| 5°   | 3685 | 3671  | 3632 | 3660  | 3654 | 350  |
| 15°  | 3508 | 3487  | 3441 | 3455  | 3437 | 988  |
| 25°  | 3175 | 3147  | 3087 | 3094  | 3087 | 1461 |
| 35°  | 2739 | 2704  | 2647 | 2626  | 2608 | 1711 |
| 45°  | 2229 | 2204  | 2151 | 2112  | 2098 | 1720 |
| 55°  | 1687 | 1666  | 1623 | 1580  | 1563 | 1508 |
| 65°  | 1138 | 1116  | 1081 | 1049  | 1031 | 1125 |
| 75°  | 595  | 588   | 570  | 549   | 556  | 635  |
| 85°  | 145  | 142   | 138  | 127   | 124  | 162  |
| 90°  | 3    | 36    | 96   | 91    | 94   | 18   |
| 95°  | 144  | 171   | 176  | 176   | 171  | 160  |
| 105° | 593  | 601   | 607  | 612   | 612  | 626  |
| 115° | 1103 | 1119  | 1114 | 1111  | 1103 | 1091 |
| 125° | 1605 | 1629  | 1622 | 1613  | 1610 | 1434 |
| 135° | 2076 | 2106  | 2112 | 2109  | 2101 | 1604 |
| 145° | 2520 | 2540  | 2555 | 2558  | 2548 | 1574 |
| 155° | 2881 | 2889  | 2898 | 2912  | 2903 | 1326 |
| 165° | 3135 | 3132  | 3132 | 3151  | 3138 | 884  |
| 175° | 3262 | 3254  | 3248 | 3268  | 3251 | 310  |
| 180° | 3268 | 3268  | 3268 | 3268  | 3268 |      |

TEST NUMBER: P920508

CATALOG NUMBER: DFN2DIP-SQ4F0-110D120US935-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3685.2 | 3685.2 | 3685.2 | 3685.2 | 3685.2 |
| 2.5°   | 3706.6 | 3688.9 | 3649.9 | 3685.2 | 3678.4 |
| 5°     | 3685.2 | 3671.3 | 3632.2 | 3660.4 | 3653.6 |
| 7.5°   | 3660.4 | 3639.4 | 3600.3 | 3628.8 | 3621.7 |
| 10°    | 3621.7 | 3596.8 | 3554.4 | 3582.5 | 3572.0 |
| 12.5°  | 3568.3 | 3547.2 | 3504.8 | 3522.4 | 3515.3 |
| 15°    | 3508.1 | 3487.0 | 3440.8 | 3455.1 | 3437.4 |
| 17.5°  | 3433.7 | 3412.7 | 3366.4 | 3384.1 | 3366.4 |
| 20°    | 3352.1 | 3331.0 | 3281.4 | 3291.9 | 3278.1 |
| 22.5°  | 3270.9 | 3238.9 | 3192.7 | 3192.7 | 3185.5 |
| 25°    | 3175.0 | 3146.9 | 3086.7 | 3093.5 | 3086.7 |
| 27.5°  | 3068.6 | 3043.8 | 2997.9 | 2987.4 | 2969.8 |
| 30°    | 2962.6 | 2934.0 | 2881.0 | 2870.5 | 2856.2 |
| 32.5°  | 2849.0 | 2828.0 | 2771.2 | 2749.8 | 2735.5 |
| 35°    | 2739.3 | 2704.0 | 2647.1 | 2625.7 | 2608.0 |
| 37.5°  | 2615.2 | 2583.3 | 2526.5 | 2501.6 | 2484.0 |
| 40°    | 2487.8 | 2459.2 | 2402.4 | 2370.8 | 2356.6 |
| 42.5°  | 2363.7 | 2335.1 | 2278.7 | 2243.0 | 2222.0 |
| 45°    | 2229.1 | 2204.2 | 2150.9 | 2112.2 | 2097.9 |
| 47.5°  | 2097.9 | 2073.1 | 2016.3 | 1977.2 | 1956.1 |
| 50°    | 1959.5 | 1941.9 | 1892.2 | 1842.6 | 1825.0 |
| 52.5°  | 1825.0 | 1800.1 | 1754.3 | 1715.1 | 1690.3 |
| 55°    | 1687.0 | 1665.5 | 1623.1 | 1580.5 | 1562.9 |
| 57.5°  | 1548.6 | 1530.9 | 1484.7 | 1442.2 | 1427.9 |
| 60°    | 1410.2 | 1396.4 | 1346.7 | 1307.6 | 1297.1 |
| 62.5°  | 1275.7 | 1250.9 | 1215.5 | 1180.2 | 1165.9 |
| 65°    | 1137.6 | 1116.2 | 1080.9 | 1049.0 | 1031.3 |
| 67.5°  | 995.9  | 977.9  | 946.3  | 921.5  | 907.2  |
| 70°    | 864.7  | 850.4  | 818.5  | 793.7  | 779.7  |
| 72.5°  | 730.1  | 715.8  | 698.2  | 673.4  | 662.8  |
| 75°    | 595.1  | 588.4  | 570.3  | 549.3  | 556.5  |
| 77.5°  | 474.8  | 460.5  | 453.4  | 442.9  | 432.4  |
| 80°    | 354.6  | 350.8  | 343.6  | 333.1  | 326.0  |
| 82.5°  | 241.0  | 241.0  | 237.6  | 223.3  | 223.3  |
| 85°    | 145.2  | 141.7  | 138.4  | 127.4  | 124.1  |
| 87.5°  | 63.9   | 56.7   | 49.6   | 39.1   | 35.3   |
| 90°    | 2.9    | 35.5   | 96.5   | 90.7   | 93.6   |
| 92.5°  | 61.0   | 82.7   | 85.7   | 88.7   | 88.7   |
| 95°    | 143.8  | 171.4  | 176.3  | 176.3  | 171.4  |
| 97.5°  | 239.4  | 265.0  | 275.9  | 275.9  | 275.9  |
| 100°   | 349.7  | 372.4  | 380.2  | 380.2  | 377.3  |
| 102.5° | 466.0  | 482.7  | 493.5  | 496.5  | 493.5  |
| 105°   | 593.1  | 600.9  | 606.8  | 611.7  | 611.7  |
| 107.5° | 719.1  | 731.0  | 731.0  | 732.9  | 719.1  |
| 110°   | 841.3  | 857.0  | 857.0  | 857.0  | 849.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 973.3  | 990.1  | 987.0  | 979.2  | 973.3  |
| 115°   | 1103.3 | 1119.1 | 1114.1 | 1111.2 | 1103.3 |
| 117.5° | 1232.3 | 1254.0 | 1240.3 | 1232.3 | 1224.5 |
| 120°   | 1362.4 | 1384.1 | 1362.4 | 1362.4 | 1353.6 |
| 122.5° | 1480.7 | 1508.2 | 1494.4 | 1486.5 | 1480.7 |
| 125°   | 1604.7 | 1629.4 | 1621.5 | 1612.6 | 1609.6 |
| 127.5° | 1726.0 | 1756.4 | 1745.6 | 1733.8 | 1726.0 |
| 130°   | 1839.2 | 1874.7 | 1869.7 | 1863.8 | 1853.0 |
| 132.5° | 1966.3 | 1993.9 | 1995.8 | 1982.0 | 1974.2 |
| 135°   | 2075.6 | 2106.2 | 2112.1 | 2109.1 | 2101.3 |
| 137.5° | 2197.8 | 2222.4 | 2227.3 | 2225.3 | 2213.5 |
| 140°   | 2305.1 | 2329.8 | 2343.6 | 2343.6 | 2332.7 |
| 142.5° | 2415.5 | 2440.2 | 2448.0 | 2450.9 | 2440.2 |
| 145°   | 2519.9 | 2539.6 | 2555.4 | 2558.4 | 2547.5 |
| 147.5° | 2613.5 | 2638.1 | 2650.0 | 2654.9 | 2644.0 |
| 150°   | 2710.1 | 2726.8 | 2737.6 | 2746.5 | 2737.6 |
| 152.5° | 2795.7 | 2812.4 | 2826.3 | 2837.2 | 2826.3 |
| 155°   | 2881.4 | 2889.3 | 2898.2 | 2912.0 | 2903.1 |
| 157.5° | 2955.4 | 2961.2 | 2966.1 | 2985.9 | 2972.1 |
| 160°   | 3021.3 | 3027.3 | 3030.2 | 3047.0 | 3035.1 |
| 162.5° | 3082.4 | 3082.4 | 3085.4 | 3104.1 | 3090.3 |
| 165°   | 3134.6 | 3131.7 | 3131.7 | 3151.3 | 3137.6 |
| 167.5° | 3181.9 | 3173.0 | 3173.0 | 3192.8 | 3179.0 |
| 170°   | 3217.4 | 3209.5 | 3206.5 | 3226.2 | 3209.5 |
| 172.5° | 3242.0 | 3234.1 | 3231.2 | 3250.9 | 3234.1 |
| 175°   | 3261.7 | 3253.8 | 3247.9 | 3267.6 | 3250.9 |
| 177.5° | 3272.6 | 3264.6 | 3258.7 | 3275.5 | 3258.7 |
| 180°   | 3267.6 | 3267.6 | 3267.6 | 3267.6 | 3267.6 |

TEST NUMBER: P920508

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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 | 10.65            | 11.51 | 11.60 | 12.48 | 13.74 | 10.20          | 11.07 | 11.15 | 12.04 | 13.30 |
|                 | 3H   | 12.31            | 13.09 | 13.27 | 14.07 | 15.35 | 11.82          | 12.60 | 12.78 | 13.58 | 14.86 |
|                 | 4H   | 12.90            | 13.64 | 13.88 | 14.62 | 15.91 | 12.41          | 13.14 | 13.38 | 14.13 | 15.42 |
|                 | 6H   | 13.31            | 13.98 | 14.29 | 14.97 | 16.28 | 12.81          | 13.48 | 13.79 | 14.47 | 15.78 |
|                 | 8H   | 13.41            | 14.06 | 14.41 | 15.06 | 16.36 | 12.91          | 13.56 | 13.90 | 14.56 | 15.86 |
|                 | 12H  | 13.46            | 14.08 | 14.46 | 15.07 | 16.40 | 12.95          | 13.57 | 13.95 | 14.56 | 15.89 |
| 4H              | 2H   | 11.11            | 11.85 | 12.09 | 12.83 | 14.12 | 10.75          | 11.49 | 11.74 | 12.47 | 13.76 |
|                 | 3H   | 12.98            | 13.59 | 13.97 | 14.60 | 15.91 | 12.57          | 13.19 | 13.56 | 14.20 | 15.50 |
|                 | 4H   | 13.70            | 14.26 | 14.70 | 15.26 | 16.59 | 13.27          | 13.84 | 14.27 | 14.84 | 16.17 |
|                 | 6H   | 14.22            | 14.70 | 15.23 | 15.73 | 17.06 | 13.79          | 14.27 | 14.80 | 15.30 | 16.62 |
|                 | 8H   | 14.37            | 14.82 | 15.38 | 15.84 | 17.18 | 13.93          | 14.38 | 14.95 | 15.40 | 16.75 |
|                 | 12H  | 14.45            | 14.85 | 15.48 | 15.89 | 17.24 | 14.00          | 14.40 | 15.03 | 15.44 | 16.79 |
| 8H              | 4H   | 13.90            | 14.35 | 14.91 | 15.37 | 16.71 | 13.52          | 13.97 | 14.53 | 14.99 | 16.33 |
|                 | 6H   | 14.53            | 14.91 | 15.57 | 15.97 | 17.31 | 14.15          | 14.52 | 15.19 | 15.58 | 16.92 |
|                 | 8H   | 14.76            | 15.09 | 15.80 | 16.13 | 17.49 | 14.36          | 14.69 | 15.41 | 15.74 | 17.10 |
|                 | 12H  | 14.89            | 15.18 | 15.94 | 16.22 | 17.62 | 14.48          | 14.77 | 15.53 | 15.81 | 17.21 |
| 12H             | 4H   | 13.88            | 14.29 | 14.91 | 15.32 | 16.67 | 13.51          | 13.92 | 14.55 | 14.96 | 16.30 |
|                 | 6H   | 14.56            | 14.89 | 15.61 | 15.94 | 17.30 | 14.19          | 14.52 | 15.24 | 15.57 | 16.93 |
|                 | 8H   | 14.81            | 15.10 | 15.86 | 16.14 | 17.54 | 14.43          | 14.72 | 15.48 | 15.76 | 17.16 |

END OF REPORT