

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: P917811

Luminaire Tested: DFN2DIP-SQ4F0-120D100US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917811  
REPORT IS A COMBINATION OF REPORTS P901664 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D100US930-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

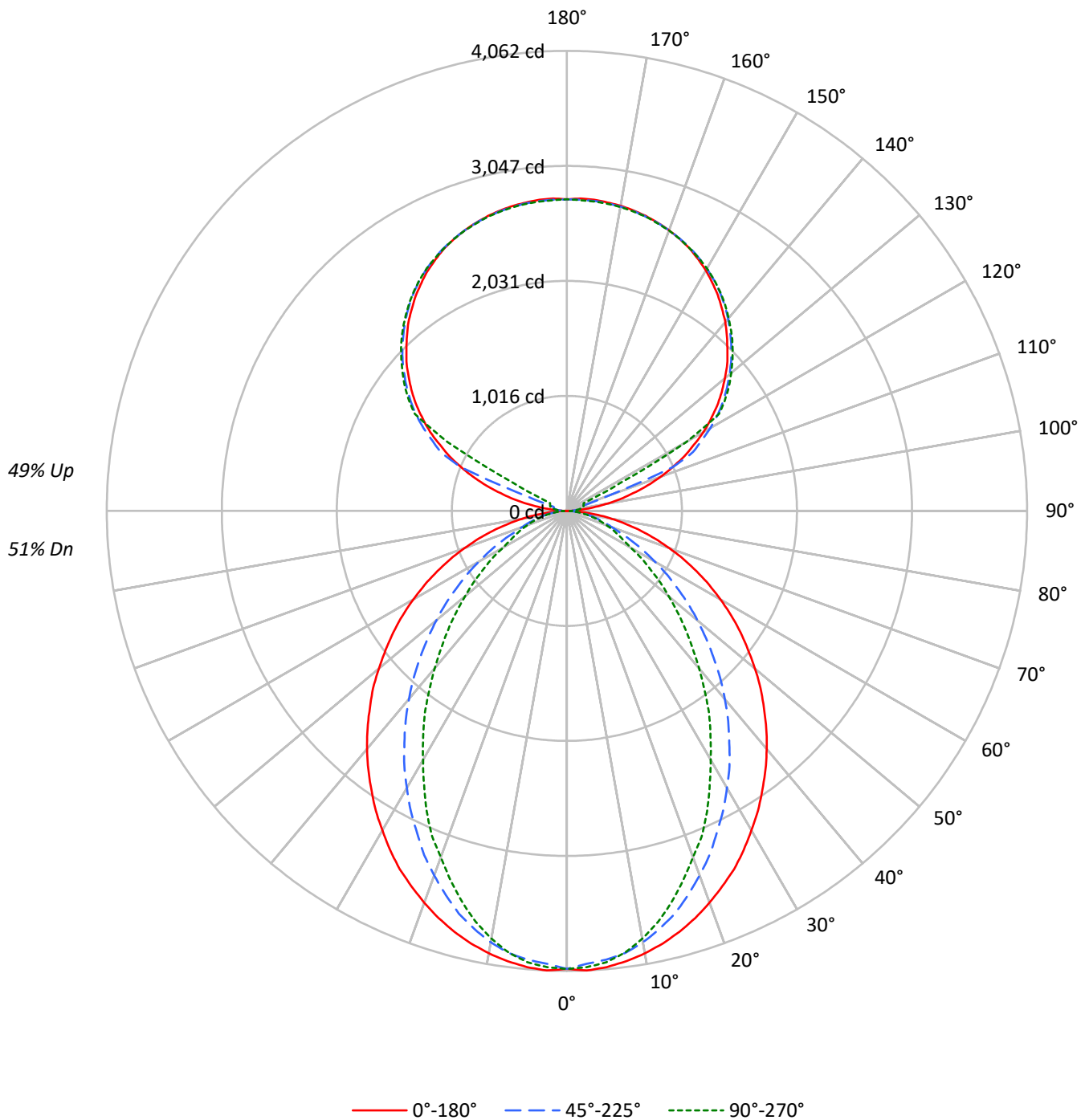
Lumens per Lamp: N/A  
Luminaire Lumens: 16387.5 lumens  
Efficiency: N/A  
Efficacy: 85.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 192.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### 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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 98  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 | 62 | 61 | 59 | 51 | 50 | 49 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 67 | 66 | 62 | 59 | 55 | 52 | 50 | 45 | 44 | 42 |
| 3   | 82  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 58 | 54 | 50 | 49 | 46 | 43 | 41 | 38 | 36 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 44 | 40 | 37 | 37 | 34 | 32 |
| 5   | 70  | 58  | 50  | 45  | 64 | 54 | 47 | 42 | 47 | 41 | 37 | 40 | 36 | 33 | 33 | 30 | 28 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 42 | 37 | 33 | 36 | 32 | 29 | 30 | 27 | 25 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 22 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 35 | 30 | 26 | 30 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 32 | 27 | 23 | 28 | 24 | 21 | 24 | 21 | 18 |
| 10  | 48  | 36  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2837 | 2837 | 2837 |
| 5°  | 2842 | 2793 | 2811 |
| 10° | 2814 | 2739 | 2720 |
| 15° | 2775 | 2649 | 2580 |
| 20° | 2724 | 2524 | 2407 |
| 25° | 2671 | 2385 | 2240 |
| 30° | 2601 | 2242 | 2028 |
| 35° | 2531 | 2088 | 1841 |
| 40° | 2461 | 1929 | 1628 |
| 45° | 2379 | 1752 | 1434 |
| 50° | 2295 | 1574 | 1245 |
| 55° | 2207 | 1383 | 1063 |
| 60° | 2105 | 1184 | 876  |
| 65° | 1987 | 981  | 789  |
| 70° | 1845 | 792  | 715  |
| 75° | 1666 | 700  | 652  |
| 80° | 1408 | 589  | 569  |
| 85° | 980  | 396  | 433  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2379 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 379.0   | 2.3       |
| 10°-20°   | 1040.3  | 6.3       |
| 20°-30°   | 1460.6  | 8.9       |
| 30°-40°   | 1592.1  | 9.7       |
| 40°-50°   | 1463.4  | 8.9       |
| 50°-60°   | 1149.2  | 7.0       |
| 60°-70°   | 748.0   | 4.6       |
| 70°-80°   | 385.1   | 2.3       |
| 80°-90°   | 103.1   | 0.6       |
| 90°-100°  | 90.7    | 0.6       |
| 100°-110° | 338.2   | 2.1       |
| 110°-120° | 897.0   | 5.5       |
| 120°-130° | 1487.8  | 9.1       |
| 130°-140° | 1580.4  | 9.6       |
| 140°-150° | 1468.8  | 9.0       |
| 150°-160° | 1180.9  | 7.2       |
| 160°-170° | 760.9   | 4.6       |
| 170°-180° | 261.9   | 1.6       |
| 0°-30°    | 2879.9  | 17.6      |
| 0°-40°    | 4472.0  | 27.3      |
| 0°-60°    | 7084.6  | 43.2      |
| 0°-90°    | 8320.9  | 50.8      |
| 90°-120°  | 1326.0  | 8.1       |
| 90°-150°  | 5862.9  | 35.8      |
| 90°-180°  | 8067.0  | 49.2      |
| 0°-180°   | 16387.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4044 | 4044  | 4044 | 4044  | 4044 |      |
| 5°   | 4044 | 4025  | 3978 | 4010  | 4000 | 383  |
| 15°  | 3846 | 3806  | 3681 | 3612  | 3575 | 1084 |
| 25°  | 3491 | 3374  | 3132 | 2982  | 2927 | 1606 |
| 35°  | 3008 | 2821  | 2500 | 2269  | 2188 | 1883 |
| 45°  | 2459 | 2214  | 1830 | 1570  | 1482 | 1899 |
| 55°  | 1870 | 1584  | 1189 | 970   | 900  | 1671 |
| 65°  | 1263 | 966   | 637  | 512   | 501  | 1252 |
| 75°  | 673  | 417   | 293  | 267   | 264  | 712  |
| 85°  | 157  | 80    | 70   | 70    | 70   | 181  |
| 90°  | 2    | 24    | 40   | 50    | 54   | 15   |
| 95°  | 129  | 64    | 78   | 88    | 86   | 153  |
| 105° | 605  | 665   | 122  | 143   | 151  | 647  |
| 115° | 1145 | 1179  | 1228 | 307   | 163  | 1127 |
| 125° | 1619 | 1645  | 1682 | 1696  | 1702 | 1444 |
| 135° | 2003 | 2035  | 2053 | 2073  | 2069 | 1547 |
| 145° | 2324 | 2322  | 2355 | 2369  | 2359 | 1453 |
| 155° | 2558 | 2541  | 2564 | 2576  | 2560 | 1179 |
| 165° | 2696 | 2684  | 2690 | 2704  | 2690 | 762  |
| 175° | 2757 | 2744  | 2748 | 2762  | 2742 | 262  |
| 180° | 2752 | 2752  | 2752 | 2752  | 2752 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4043.6 | 4043.6 | 4043.6 | 4043.6 | 4043.6 |
| 2.5°   | 4061.8 | 4043.6 | 4003.2 | 4040.0 | 4032.6 |
| 5°     | 4043.6 | 4025.3 | 3977.5 | 4010.5 | 3999.7 |
| 7.5°   | 4010.5 | 3988.8 | 3937.6 | 3951.9 | 3933.7 |
| 10°    | 3966.7 | 3941.1 | 3868.0 | 3856.8 | 3835.1 |
| 12.5°  | 3911.9 | 3878.9 | 3779.9 | 3758.2 | 3717.8 |
| 15°    | 3845.9 | 3805.6 | 3681.3 | 3611.8 | 3575.3 |
| 17.5°  | 3769.0 | 3710.4 | 3556.7 | 3476.4 | 3417.7 |
| 20°    | 3681.3 | 3607.9 | 3425.1 | 3333.8 | 3253.0 |
| 22.5°  | 3586.2 | 3502.0 | 3289.6 | 3165.3 | 3110.6 |
| 25°    | 3491.1 | 3373.8 | 3132.3 | 2982.4 | 2927.3 |
| 27.5°  | 3377.7 | 3253.0 | 2985.9 | 2814.0 | 2729.7 |
| 30°    | 3257.0 | 3117.6 | 2824.8 | 2638.5 | 2539.5 |
| 32.5°  | 3139.7 | 2971.2 | 2671.5 | 2451.8 | 2360.1 |
| 35°    | 3008.1 | 2821.3 | 2499.5 | 2268.9 | 2188.1 |
| 37.5°  | 2880.0 | 2678.5 | 2338.4 | 2085.6 | 1994.4 |
| 40°    | 2744.5 | 2525.1 | 2169.9 | 1910.2 | 1815.0 |
| 42.5°  | 2605.4 | 2371.4 | 2001.8 | 1730.8 | 1639.6 |
| 45°    | 2459.1 | 2213.8 | 1829.8 | 1569.7 | 1481.9 |
| 47.5°  | 2320.1 | 2060.4 | 1665.2 | 1405.1 | 1324.7 |
| 50°    | 2166.4 | 1906.7 | 1504.1 | 1251.3 | 1174.8 |
| 52.5°  | 2016.2 | 1741.6 | 1350.3 | 1108.8 | 1039.3 |
| 55°    | 1869.8 | 1584.5 | 1189.2 | 969.8  | 900.3  |
| 57.5°  | 1719.9 | 1427.2 | 1046.7 | 841.7  | 783.1  |
| 60°    | 1566.2 | 1273.4 | 896.4  | 710.1  | 651.5  |
| 62.5°  | 1416.3 | 1123.6 | 768.3  | 592.9  | 563.7  |
| 65°    | 1262.6 | 966.0  | 636.7  | 512.5  | 501.2  |
| 67.5°  | 1116.2 | 819.5  | 512.5  | 450.0  | 439.1  |
| 70°    | 962.5  | 677.1  | 424.4  | 387.8  | 373.1  |
| 72.5°  | 816.1  | 545.1  | 354.8  | 325.7  | 318.4  |
| 75°    | 673.2  | 416.9  | 292.8  | 267.1  | 263.6  |
| 77.5°  | 530.8  | 296.2  | 230.6  | 215.9  | 208.5  |
| 80°    | 398.8  | 212.4  | 175.5  | 161.1  | 161.1  |
| 82.5°  | 278.0  | 142.8  | 120.7  | 113.3  | 113.3  |
| 85°    | 157.3  | 80.4   | 69.5   | 69.5   | 69.5   |
| 87.5°  | 58.6   | 29.1   | 29.1   | 25.6   | 25.6   |
| 90°    | 1.9    | 23.9   | 39.7   | 49.9   | 53.6   |
| 92.5°  | 49.9   | 41.8   | 47.8   | 51.8   | 53.6   |
| 95°    | 129.3  | 63.6   | 77.5   | 87.7   | 85.6   |
| 97.5°  | 232.8  | 69.7   | 101.4  | 107.5  | 109.5  |
| 100°   | 352.5  | 79.7   | 113.5  | 129.3  | 133.4  |
| 102.5° | 483.7  | 480.0  | 117.5  | 139.3  | 145.4  |
| 105°   | 605.3  | 665.0  | 121.6  | 143.2  | 151.3  |
| 107.5° | 746.7  | 796.3  | 125.6  | 147.3  | 155.3  |
| 110°   | 882.1  | 923.7  | 348.5  | 149.4  | 157.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1009.5 | 1045.2 | 1011.5 | 153.2  | 159.4  |
| 115°   | 1144.8 | 1178.6 | 1228.5 | 306.6  | 163.4  |
| 117.5° | 1262.2 | 1302.0 | 1336.0 | 1051.2 | 529.6  |
| 120°   | 1393.8 | 1423.5 | 1459.5 | 1483.4 | 1214.5 |
| 122.5° | 1505.1 | 1537.0 | 1576.9 | 1588.8 | 1590.9 |
| 125°   | 1618.6 | 1644.6 | 1682.4 | 1696.4 | 1702.3 |
| 127.5° | 1722.2 | 1750.0 | 1780.0 | 1799.9 | 1801.8 |
| 130°   | 1819.7 | 1851.7 | 1873.5 | 1895.4 | 1893.5 |
| 132.5° | 1919.3 | 1945.3 | 1967.1 | 1985.0 | 1983.1 |
| 135°   | 2003.0 | 2034.9 | 2052.7 | 2072.7 | 2068.7 |
| 137.5° | 2090.5 | 2114.4 | 2134.5 | 2154.3 | 2148.4 |
| 140°   | 2176.0 | 2192.2 | 2213.9 | 2231.9 | 2221.9 |
| 142.5° | 2247.9 | 2261.9 | 2287.6 | 2303.5 | 2293.6 |
| 145°   | 2323.6 | 2321.5 | 2355.3 | 2369.3 | 2359.3 |
| 147.5° | 2389.1 | 2383.2 | 2417.0 | 2426.9 | 2419.2 |
| 150°   | 2452.9 | 2439.0 | 2470.9 | 2482.7 | 2472.8 |
| 152.5° | 2506.6 | 2490.7 | 2520.6 | 2532.6 | 2518.6 |
| 155°   | 2558.4 | 2540.6 | 2564.5 | 2576.3 | 2560.5 |
| 157.5° | 2600.2 | 2584.4 | 2602.4 | 2616.3 | 2600.2 |
| 160°   | 2636.2 | 2624.1 | 2636.2 | 2648.0 | 2634.1 |
| 162.5° | 2667.8 | 2656.0 | 2665.9 | 2679.9 | 2661.9 |
| 165°   | 2695.7 | 2683.9 | 2689.8 | 2703.8 | 2689.8 |
| 167.5° | 2717.7 | 2705.6 | 2711.8 | 2725.8 | 2707.8 |
| 170°   | 2735.7 | 2723.7 | 2727.7 | 2741.6 | 2723.7 |
| 172.5° | 2747.5 | 2735.7 | 2739.7 | 2753.7 | 2735.7 |
| 175°   | 2757.4 | 2743.5 | 2747.5 | 2761.5 | 2741.6 |
| 177.5° | 2761.5 | 2747.5 | 2749.7 | 2763.6 | 2745.6 |
| 180°   | 2751.6 | 2751.6 | 2751.6 | 2751.6 | 2751.6 |



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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 | 10.86            | 11.69 | 11.81 | 12.66 | 13.92 | 6.82           | 7.65  | 7.77  | 8.62  | 9.88  |
|                 | 3H   | 12.54            | 13.29 | 13.51 | 14.26 | 15.55 | 8.01           | 8.75  | 8.97  | 9.73  | 11.02 |
|                 | 4H   | 13.15            | 13.86 | 14.13 | 14.84 | 16.13 | 8.46           | 9.16  | 9.44  | 10.14 | 11.44 |
|                 | 6H   | 13.58            | 14.23 | 14.57 | 15.21 | 16.52 | 8.78           | 9.43  | 9.77  | 10.42 | 11.72 |
|                 | 8H   | 13.70            | 14.32 | 14.70 | 15.33 | 16.63 | 8.87           | 9.49  | 9.87  | 10.49 | 11.79 |
|                 | 12H  | 13.77            | 14.36 | 14.77 | 15.35 | 16.68 | 8.91           | 9.50  | 9.92  | 10.50 | 11.83 |
| 4H              | 2H   | 10.87            | 11.58 | 11.86 | 12.56 | 13.86 | 7.41           | 8.12  | 8.40  | 9.10  | 10.40 |
|                 | 3H   | 12.71            | 13.30 | 13.71 | 14.31 | 15.61 | 8.77           | 9.35  | 9.76  | 10.36 | 11.67 |
|                 | 4H   | 13.40            | 13.94 | 14.41 | 14.94 | 16.28 | 9.32           | 9.85  | 10.32 | 10.86 | 12.19 |
|                 | 6H   | 13.92            | 14.39 | 14.94 | 15.41 | 16.74 | 9.74           | 10.20 | 10.75 | 11.22 | 12.55 |
|                 | 8H   | 14.10            | 14.53 | 15.12 | 15.55 | 16.90 | 9.87           | 10.30 | 10.88 | 11.32 | 12.66 |
|                 | 12H  | 14.20            | 14.59 | 15.24 | 15.62 | 16.97 | 9.93           | 10.32 | 10.97 | 11.35 | 12.70 |
| 8H              | 4H   | 13.37            | 13.80 | 14.39 | 14.82 | 16.17 | 9.60           | 10.03 | 10.62 | 11.05 | 12.39 |
|                 | 6H   | 13.94            | 14.30 | 14.99 | 15.36 | 16.70 | 10.12          | 10.47 | 11.16 | 11.54 | 12.88 |
|                 | 8H   | 14.16            | 14.48 | 15.21 | 15.52 | 16.88 | 10.31          | 10.62 | 11.36 | 11.67 | 13.03 |
|                 | 12H  | 14.31            | 14.58 | 15.36 | 15.62 | 17.03 | 10.43          | 10.71 | 11.48 | 11.75 | 13.15 |
| 12H             | 4H   | 13.33            | 13.71 | 14.36 | 14.75 | 16.10 | 9.60           | 9.99  | 10.64 | 11.03 | 12.38 |
|                 | 6H   | 13.92            | 14.23 | 14.97 | 15.28 | 16.64 | 10.17          | 10.48 | 11.22 | 11.53 | 12.89 |
|                 | 8H   | 14.14            | 14.42 | 15.20 | 15.46 | 16.86 | 10.38          | 10.66 | 11.43 | 11.70 | 13.10 |

END OF REPORT