

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: P917815

Luminaire Tested: DFN2DIP-SQ4F0-120D110US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917815  
REPORT IS A COMBINATION OF REPORTS P901682 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D110US930-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

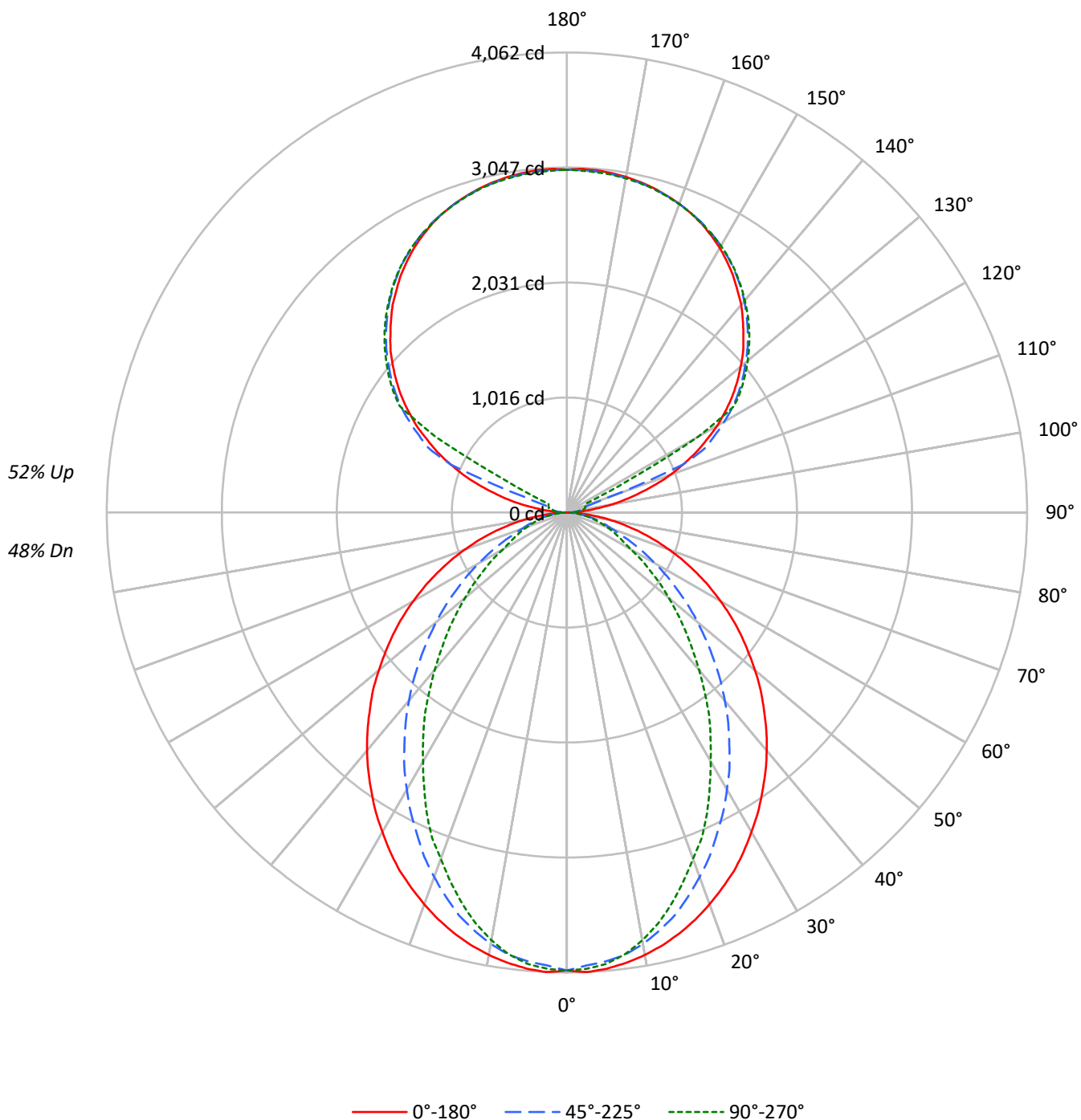
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17194.6 lumens  
Efficiency: N/A  
Efficacy: 85.8 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): 200.4  
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

TEST NUMBER: P917815

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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 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 83 | 80 | 73 | 71 | 69 | 60 | 59 | 58 | 49 | 48 | 47 |
| 2   | 90  | 82  | 77  | 72  | 82 | 76 | 71 | 67 | 64 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 40 |
| 3   | 82  | 73  | 66  | 60  | 75 | 67 | 61 | 56 | 57 | 53 | 49 | 48 | 45 | 42 | 39 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 53 | 48 | 51 | 46 | 42 | 43 | 39 | 36 | 35 | 33 | 30 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 36 | 42 | 36 | 32 | 35 | 31 | 28 | 29 | 26 | 24 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 38 | 32 | 29 | 32 | 28 | 25 | 27 | 24 | 21 |
| 8   | 55  | 43  | 35  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 | 21 | 18 | 16 |

**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

TEST NUMBER: P917815

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US930-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 379.0   | 2.2       |
| 10°-20°   | 1040.3  | 6.1       |
| 20°-30°   | 1460.6  | 8.5       |
| 30°-40°   | 1592.1  | 9.3       |
| 40°-50°   | 1463.4  | 8.5       |
| 50°-60°   | 1149.2  | 6.7       |
| 60°-70°   | 748.0   | 4.4       |
| 70°-80°   | 385.1   | 2.2       |
| 80°-90°   | 103.6   | 0.6       |
| 90°-100°  | 99.8    | 0.6       |
| 100°-110° | 372.1   | 2.2       |
| 110°-120° | 986.7   | 5.7       |
| 120°-130° | 1636.6  | 9.5       |
| 130°-140° | 1738.4  | 10.1      |
| 140°-150° | 1615.7  | 9.4       |
| 150°-160° | 1298.9  | 7.6       |
| 160°-170° | 837.0   | 4.9       |
| 170°-180° | 288.1   | 1.7       |
| 0°-30°    | 2879.9  | 16.7      |
| 0°-40°    | 4472.0  | 26.0      |
| 0°-60°    | 7084.6  | 41.2      |
| 0°-90°    | 8321.4  | 48.4      |
| 90°-120°  | 1458.6  | 8.5       |
| 90°-150°  | 6449.2  | 37.5      |
| 90°-180°  | 8873.0  | 51.6      |
| 0°-180°   | 17194.6 | 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    | 26    | 44   | 55    | 59   | 16   |
| 95°  | 142  | 70    | 85   | 96    | 94   | 169  |
| 105° | 666  | 732   | 134  | 158   | 166  | 711  |
| 115° | 1259 | 1296  | 1351 | 337   | 180  | 1240 |
| 125° | 1780 | 1809  | 1851 | 1866  | 1872 | 1588 |
| 135° | 2203 | 2238  | 2258 | 2280  | 2276 | 1702 |
| 145° | 2556 | 2554  | 2591 | 2606  | 2595 | 1599 |
| 155° | 2814 | 2795  | 2821 | 2834  | 2816 | 1297 |
| 165° | 2965 | 2952  | 2959 | 2974  | 2959 | 838  |
| 175° | 3033 | 3018  | 3022 | 3038  | 3016 | 289  |
| 180° | 3027 | 3027  | 3027 | 3027  | 3027 |      |

TEST NUMBER: P917815

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US930-RLLONL

**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°    | 2.1    | 26.3   | 43.7   | 54.9   | 59.0   |
| 92.5°  | 54.9   | 46.1   | 52.5   | 57.0   | 59.0   |
| 95°    | 142.3  | 70.0   | 85.3   | 96.4   | 94.2   |
| 97.5°  | 256.2  | 76.7   | 111.5  | 118.3  | 120.4  |
| 100°   | 387.8  | 87.6   | 124.8  | 142.3  | 146.7  |
| 102.5° | 532.1  | 527.9  | 129.2  | 153.2  | 160.0  |
| 105°   | 665.8  | 731.6  | 133.7  | 157.6  | 166.5  |
| 107.5° | 821.3  | 875.9  | 138.1  | 162.0  | 170.9  |
| 110°   | 970.3  | 1016.1 | 383.4  | 164.4  | 172.9  |

TEST NUMBER: P917815

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US930-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1110.5 | 1149.7 | 1112.6 | 168.5  | 175.3  |
| 115°   | 1259.2 | 1296.4 | 1351.4 | 337.3  | 179.7  |
| 117.5° | 1388.5 | 1432.2 | 1469.7 | 1156.3 | 582.5  |
| 120°   | 1533.1 | 1565.9 | 1605.4 | 1631.7 | 1335.9 |
| 122.5° | 1655.6 | 1690.7 | 1734.6 | 1747.7 | 1750.0 |
| 125°   | 1780.4 | 1809.1 | 1850.6 | 1866.0 | 1872.5 |
| 127.5° | 1894.3 | 1925.0 | 1958.0 | 1979.9 | 1982.0 |
| 130°   | 2001.7 | 2036.9 | 2060.7 | 2085.0 | 2082.9 |
| 132.5° | 2111.2 | 2139.8 | 2163.8 | 2183.5 | 2181.5 |
| 135°   | 2203.3 | 2238.4 | 2257.9 | 2280.1 | 2275.6 |
| 137.5° | 2299.5 | 2325.8 | 2347.9 | 2369.7 | 2363.2 |
| 140°   | 2393.7 | 2411.3 | 2435.3 | 2455.0 | 2444.1 |
| 142.5° | 2472.7 | 2488.0 | 2516.4 | 2533.9 | 2522.9 |
| 145°   | 2556.0 | 2553.6 | 2590.8 | 2606.2 | 2595.3 |
| 147.5° | 2628.0 | 2621.5 | 2658.7 | 2669.6 | 2661.1 |
| 150°   | 2698.2 | 2682.9 | 2718.0 | 2731.0 | 2720.1 |
| 152.5° | 2757.3 | 2739.8 | 2772.6 | 2785.9 | 2770.5 |
| 155°   | 2814.2 | 2794.7 | 2820.9 | 2834.0 | 2816.5 |
| 157.5° | 2860.2 | 2842.8 | 2862.6 | 2877.9 | 2860.2 |
| 160°   | 2899.8 | 2886.5 | 2899.8 | 2912.7 | 2897.4 |
| 162.5° | 2934.6 | 2921.6 | 2932.5 | 2947.9 | 2928.1 |
| 165°   | 2965.3 | 2952.3 | 2958.8 | 2974.1 | 2958.8 |
| 167.5° | 2989.5 | 2976.2 | 2983.0 | 2998.3 | 2978.6 |
| 170°   | 3009.3 | 2996.0 | 3000.4 | 3015.8 | 2996.0 |
| 172.5° | 3022.2 | 3009.3 | 3013.7 | 3029.0 | 3009.3 |
| 175°   | 3033.2 | 3017.8 | 3022.2 | 3037.6 | 3015.8 |
| 177.5° | 3037.6 | 3022.2 | 3024.6 | 3039.9 | 3020.2 |
| 180°   | 3026.7 | 3026.7 | 3026.7 | 3026.7 | 3026.7 |

TEST NUMBER: P917815

CATALOG NUMBER: DFN2DIP-SQ4F0-120D110US930-RLONL

**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 | 10.63            | 11.45 | 11.61 | 12.43 | 13.73 | 6.59           | 7.41  | 7.57  | 8.39  | 9.69  |
|                 | 3H   | 12.31            | 13.04 | 13.30 | 14.04 | 15.36 | 7.78           | 8.51  | 8.77  | 9.51  | 10.82 |
|                 | 4H   | 12.92            | 13.61 | 13.92 | 14.61 | 15.94 | 8.23           | 8.92  | 9.23  | 9.92  | 11.25 |
|                 | 6H   | 13.35            | 13.98 | 14.36 | 14.99 | 16.33 | 8.55           | 9.19  | 9.56  | 10.19 | 11.53 |
|                 | 8H   | 13.48            | 14.08 | 14.49 | 15.10 | 16.44 | 8.64           | 9.25  | 9.66  | 10.27 | 11.60 |
|                 | 12H  | 13.54            | 14.11 | 14.56 | 15.13 | 16.49 | 8.68           | 9.26  | 9.71  | 10.27 | 11.63 |
| 4H              | 2H   | 10.65            | 11.34 | 11.66 | 12.34 | 13.66 | 7.19           | 7.88  | 8.20  | 8.88  | 10.20 |
|                 | 3H   | 12.48            | 13.05 | 13.50 | 14.08 | 15.42 | 8.54           | 9.11  | 9.55  | 10.14 | 11.48 |
|                 | 4H   | 13.18            | 13.70 | 14.20 | 14.72 | 16.08 | 9.09           | 9.61  | 10.11 | 10.63 | 11.99 |
|                 | 6H   | 13.69            | 14.14 | 14.73 | 15.19 | 16.55 | 9.51           | 9.96  | 10.54 | 11.00 | 12.36 |
|                 | 8H   | 13.87            | 14.29 | 14.91 | 15.33 | 16.70 | 9.63           | 10.06 | 10.67 | 11.09 | 12.47 |
|                 | 12H  | 13.97            | 14.35 | 15.02 | 15.40 | 16.78 | 9.70           | 10.08 | 10.75 | 11.13 | 12.51 |
| 8H              | 4H   | 13.14            | 13.56 | 14.18 | 14.60 | 15.97 | 9.37           | 9.79  | 10.40 | 10.82 | 12.20 |
|                 | 6H   | 13.71            | 14.06 | 14.77 | 15.14 | 16.51 | 9.89           | 10.23 | 10.95 | 11.31 | 12.68 |
|                 | 8H   | 13.93            | 14.24 | 15.00 | 15.30 | 16.69 | 10.08          | 10.38 | 11.14 | 11.45 | 12.84 |
|                 | 12H  | 14.07            | 14.34 | 15.14 | 15.40 | 16.83 | 10.20          | 10.47 | 11.27 | 11.52 | 12.96 |
| 12H             | 4H   | 13.09            | 13.47 | 14.15 | 14.52 | 15.90 | 9.37           | 9.75  | 10.43 | 10.80 | 12.18 |
|                 | 6H   | 13.69            | 13.99 | 14.75 | 15.06 | 16.45 | 9.94           | 10.24 | 11.00 | 11.31 | 12.70 |
|                 | 8H   | 13.91            | 14.18 | 14.98 | 15.24 | 16.67 | 10.15          | 10.42 | 11.22 | 11.47 | 12.91 |

END OF REPORT