

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: P912099

Luminaire Tested: DFN2DIP-SQ3F0-120D070US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912099  
REPORT IS A COMBINATION OF REPORTS P901452 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-120D070US850-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

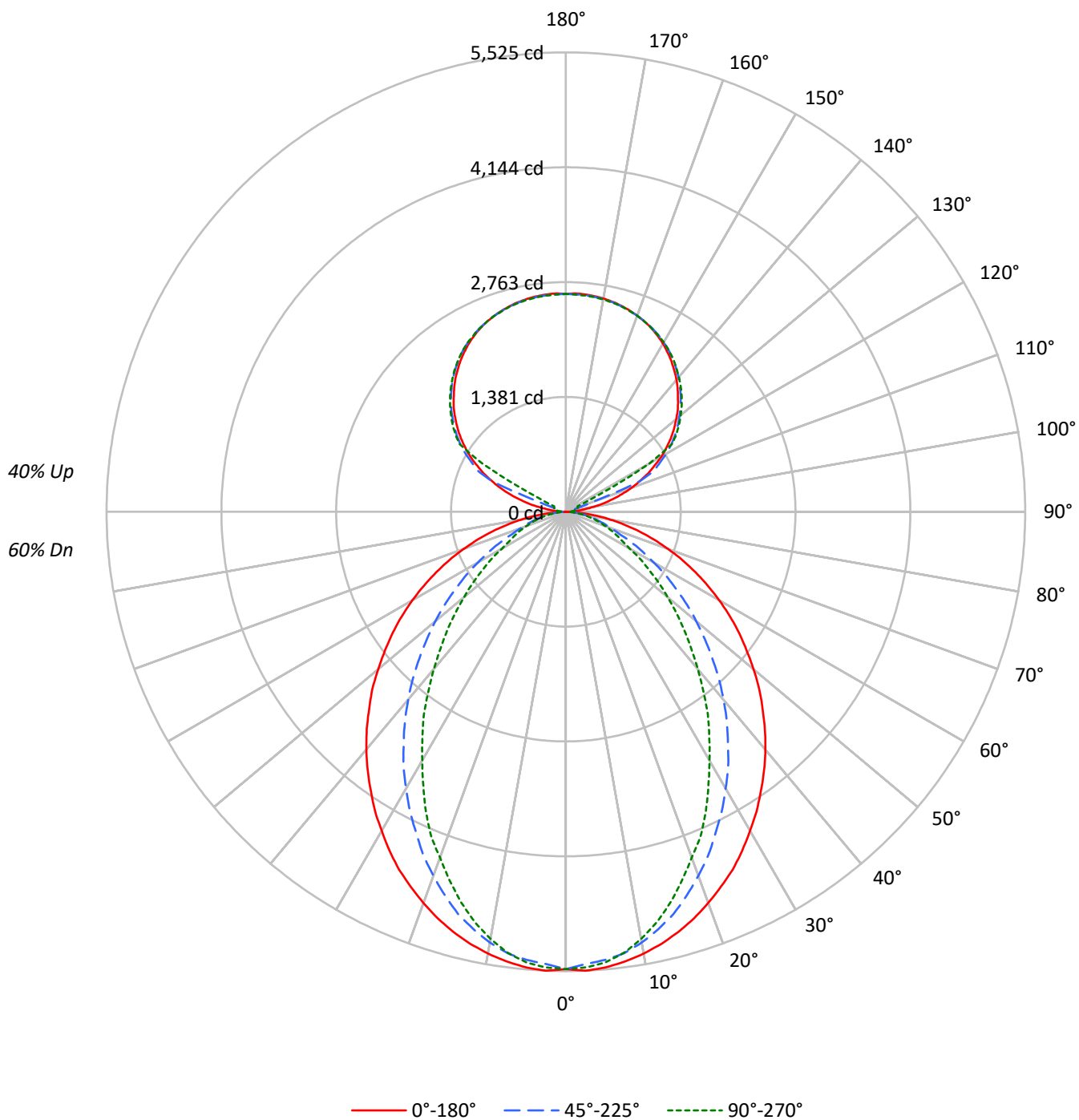
Lumens per Lamp: N/A  
Luminaire Lumens: 18997.2 lumens  
Efficiency: N/A  
Efficacy: 106.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 178.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |  |    |    |    |  |    |
| 0   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 89 | 89 | 89 |  | 76 | 76 | 76 |  | 65 |
| 1   | 101 | 96  | 93  | 89  | 94  | 90  | 87  | 84  | 79 | 76 | 74 |  | 68 | 66 | 65 |  | 58 |
| 2   | 92  | 85  | 79  | 74  | 86  | 80  | 74  | 70  | 70 | 66 | 62 |  | 60 | 58 | 55 |  | 52 |
| 3   | 84  | 75  | 68  | 62  | 79  | 71  | 64  | 59  | 62 | 57 | 53 |  | 54 | 50 | 47 |  | 47 |
| 4   | 77  | 67  | 59  | 53  | 72  | 63  | 56  | 51  | 55 | 50 | 46 |  | 48 | 44 | 41 |  | 42 |
| 5   | 71  | 60  | 52  | 46  | 67  | 56  | 49  | 44  | 50 | 44 | 40 |  | 44 | 39 | 36 |  | 38 |
| 6   | 66  | 54  | 46  | 40  | 62  | 51  | 44  | 39  | 45 | 39 | 35 |  | 40 | 35 | 32 |  | 35 |
| 7   | 61  | 49  | 41  | 36  | 57  | 46  | 39  | 34  | 41 | 35 | 31 |  | 36 | 32 | 28 |  | 32 |
| 8   | 57  | 45  | 37  | 32  | 53  | 42  | 35  | 31  | 38 | 32 | 28 |  | 34 | 29 | 26 |  | 30 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 27  | 35 | 29 | 25 |  | 31 | 26 | 23 |  | 27 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 27 | 23 |  | 29 | 24 | 21 |  | 25 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 6302 | 6302 | 6302 |
| 5°  | 6308 | 6198 | 6240 |
| 10° | 6242 | 6072 | 6035 |
| 15° | 6152 | 5867 | 5719 |
| 20° | 6034 | 5587 | 5332 |
| 25° | 5914 | 5273 | 4959 |
| 30° | 5753 | 4952 | 4486 |
| 35° | 5596 | 4607 | 4070 |
| 40° | 5435 | 4250 | 3594 |
| 45° | 5249 | 3855 | 3163 |
| 50° | 5056 | 3457 | 2742 |
| 55° | 4855 | 3032 | 2338 |
| 60° | 4621 | 2587 | 1922 |
| 65° | 4352 | 2137 | 1728 |
| 70° | 4025 | 1716 | 1560 |
| 75° | 3614 | 1504 | 1415 |
| 80° | 3020 | 1248 | 1220 |
| 85° | 2048 | 813  | 905  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 5249 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 515.5   | 2.7       |
| 10°-20°   | 1415.1  | 7.4       |
| 20°-30°   | 1986.8  | 10.5      |
| 30°-40°   | 2165.7  | 11.4      |
| 40°-50°   | 1990.5  | 10.5      |
| 50°-60°   | 1563.2  | 8.2       |
| 60°-70°   | 1017.5  | 5.4       |
| 70°-80°   | 523.8   | 2.8       |
| 80°-90°   | 138.3   | 0.7       |
| 90°-100°  | 86.4    | 0.5       |
| 100°-110° | 322.1   | 1.7       |
| 110°-120° | 854.1   | 4.5       |
| 120°-130° | 1416.6  | 7.5       |
| 130°-140° | 1504.8  | 7.9       |
| 140°-150° | 1398.5  | 7.4       |
| 150°-160° | 1124.4  | 5.9       |
| 160°-170° | 724.5   | 3.8       |
| 170°-180° | 249.4   | 1.3       |
| 0°-30°    | 3917.3  | 20.6      |
| 0°-40°    | 6083.0  | 32.0      |
| 0°-60°    | 9636.8  | 50.7      |
| 0°-90°    | 11316.4 | 59.6      |
| 90°-120°  | 1262.6  | 6.6       |
| 90°-150°  | 5582.5  | 29.4      |
| 90°-180°  | 7681.0  | 40.4      |
| 0°-180°   | 18997.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5500 | 5500  | 5500 | 5500  | 5500 |      |
| 5°   | 5500 | 5475  | 5410 | 5455  | 5440 | 522  |
| 15°  | 5231 | 5176  | 5008 | 4913  | 4863 | 1474 |
| 25°  | 4749 | 4589  | 4261 | 4057  | 3982 | 2184 |
| 35°  | 4092 | 3838  | 3400 | 3086  | 2976 | 2561 |
| 45°  | 3345 | 3011  | 2489 | 2135  | 2016 | 2583 |
| 55°  | 2543 | 2155  | 1618 | 1319  | 1225 | 2273 |
| 65°  | 1717 | 1314  | 866  | 697   | 682  | 1703 |
| 75°  | 916  | 567   | 398  | 363   | 358  | 969  |
| 85°  | 214  | 109   | 94   | 94    | 94   | 246  |
| 90°  | 2    | 23    | 38   | 48    | 51   | 18   |
| 95°  | 123  | 61    | 74   | 84    | 82   | 146  |
| 105° | 576  | 633   | 116  | 136   | 144  | 616  |
| 115° | 1090 | 1122  | 1170 | 292   | 156  | 1073 |
| 125° | 1541 | 1566  | 1602 | 1615  | 1621 | 1375 |
| 135° | 1907 | 1938  | 1954 | 1974  | 1970 | 1473 |
| 145° | 2212 | 2210  | 2243 | 2256  | 2246 | 1384 |
| 155° | 2436 | 2419  | 2442 | 2453  | 2438 | 1123 |
| 165° | 2567 | 2556  | 2561 | 2574  | 2561 | 725  |
| 175° | 2626 | 2612  | 2616 | 2629  | 2610 | 250  |
| 180° | 2620 | 2620  | 2620 | 2620  | 2620 |      |

TEST NUMBER: P912099

CATALOG NUMBER: DFN2DIP-SQ3F0-120D070US850-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5500.2 | 5500.2 | 5500.2 | 5500.2 | 5500.2 |
| 2.5°   | 5525.0 | 5500.2 | 5445.3 | 5495.4 | 5485.3 |
| 5°     | 5500.2 | 5475.4 | 5410.4 | 5455.3 | 5440.5 |
| 7.5°   | 5455.3 | 5425.7 | 5356.0 | 5375.5 | 5350.7 |
| 10°    | 5395.6 | 5360.8 | 5261.4 | 5246.1 | 5216.6 |
| 12.5°  | 5321.1 | 5276.3 | 5141.5 | 5112.0 | 5057.2 |
| 15°    | 5231.4 | 5176.5 | 5007.5 | 4912.9 | 4863.3 |
| 17.5°  | 5126.8 | 5047.1 | 4837.9 | 4728.7 | 4648.9 |
| 20°    | 5007.5 | 4907.7 | 4658.9 | 4534.8 | 4424.9 |
| 22.5°  | 4878.0 | 4763.5 | 4474.6 | 4305.6 | 4231.2 |
| 25°    | 4748.7 | 4589.2 | 4260.7 | 4056.8 | 3981.9 |
| 27.5°  | 4594.5 | 4424.9 | 4061.6 | 3827.7 | 3713.0 |
| 30°    | 4430.2 | 4240.7 | 3842.5 | 3588.9 | 3454.3 |
| 32.5°  | 4270.8 | 4041.5 | 3633.9 | 3335.0 | 3210.3 |
| 35°    | 4091.8 | 3837.7 | 3399.9 | 3086.2 | 2976.3 |
| 37.5°  | 3917.4 | 3643.4 | 3180.7 | 2836.9 | 2712.8 |
| 40°    | 3733.1 | 3434.8 | 2951.6 | 2598.3 | 2468.9 |
| 42.5°  | 3544.0 | 3225.6 | 2722.9 | 2354.3 | 2230.2 |
| 45°    | 3345.0 | 3011.3 | 2488.9 | 2135.2 | 2015.7 |
| 47.5°  | 3155.9 | 2802.7 | 2265.0 | 1911.3 | 1801.9 |
| 50°    | 2946.8 | 2593.5 | 2045.9 | 1702.1 | 1598.1 |
| 52.5°  | 2742.4 | 2369.0 | 1836.7 | 1508.2 | 1413.8 |
| 55°    | 2543.4 | 2155.2 | 1617.6 | 1319.2 | 1224.7 |
| 57.5°  | 2339.4 | 1941.3 | 1423.7 | 1144.9 | 1065.2 |
| 60°    | 2130.4 | 1732.1 | 1219.3 | 965.9  | 886.2  |
| 62.5°  | 1926.6 | 1528.3 | 1045.1 | 806.5  | 766.8  |
| 65°    | 1717.4 | 1313.9 | 866.1  | 697.1  | 681.8  |
| 67.5°  | 1518.3 | 1114.8 | 697.1  | 612.1  | 597.3  |
| 70°    | 1309.2 | 921.0  | 577.2  | 527.6  | 507.5  |
| 72.5°  | 1110.1 | 741.5  | 482.6  | 443.0  | 433.1  |
| 75°    | 915.7  | 567.1  | 398.2  | 363.3  | 358.5  |
| 77.5°  | 722.0  | 402.9  | 313.7  | 293.7  | 283.6  |
| 80°    | 542.4  | 288.9  | 238.7  | 219.1  | 219.1  |
| 82.5°  | 378.2  | 194.3  | 164.2  | 154.2  | 154.2  |
| 85°    | 213.9  | 109.3  | 94.5   | 94.5   | 94.5   |
| 87.5°  | 79.7   | 39.6   | 39.6   | 34.8   | 34.8   |
| 90°    | 1.8    | 22.7   | 37.8   | 47.5   | 51.1   |
| 92.5°  | 47.5   | 39.8   | 45.5   | 49.4   | 51.1   |
| 95°    | 123.1  | 60.6   | 73.9   | 83.5   | 81.5   |
| 97.5°  | 221.7  | 66.4   | 96.6   | 102.5  | 104.2  |
| 100°   | 335.7  | 75.9   | 108.0  | 123.1  | 127.0  |
| 102.5° | 460.6  | 457.0  | 111.9  | 132.6  | 138.4  |
| 105°   | 576.3  | 633.2  | 115.7  | 136.4  | 144.1  |
| 107.5° | 710.9  | 758.2  | 119.6  | 140.3  | 147.9  |
| 110°   | 840.0  | 879.5  | 331.8  | 142.3  | 149.7  |

TEST NUMBER: P912099

CATALOG NUMBER: DFN2DIP-SQ3F0-120D070US850-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 961.3  | 995.2  | 963.1  | 145.8  | 151.7  |
| 115°   | 1090.0 | 1122.2 | 1169.7 | 292.0  | 155.6  |
| 117.5° | 1201.9 | 1239.8 | 1272.1 | 1000.9 | 504.3  |
| 120°   | 1327.0 | 1355.4 | 1389.7 | 1412.4 | 1156.5 |
| 122.5° | 1433.0 | 1463.4 | 1501.6 | 1512.8 | 1514.8 |
| 125°   | 1541.2 | 1565.9 | 1602.0 | 1615.3 | 1620.8 |
| 127.5° | 1639.8 | 1666.3 | 1694.9 | 1713.8 | 1715.6 |
| 130°   | 1732.7 | 1763.1 | 1783.8 | 1804.8 | 1803.0 |
| 132.5° | 1827.5 | 1852.3 | 1873.0 | 1890.1 | 1888.3 |
| 135°   | 1907.1 | 1937.5 | 1954.5 | 1973.6 | 1969.8 |
| 137.5° | 1990.4 | 2013.3 | 2032.4 | 2051.3 | 2045.7 |
| 140°   | 2071.9 | 2087.2 | 2108.0 | 2125.1 | 2115.6 |
| 142.5° | 2140.4 | 2153.7 | 2178.2 | 2193.3 | 2183.8 |
| 145°   | 2212.5 | 2210.5 | 2242.6 | 2255.9 | 2246.5 |
| 147.5° | 2274.8 | 2269.2 | 2301.4 | 2310.8 | 2303.4 |
| 150°   | 2335.6 | 2322.4 | 2352.7 | 2363.9 | 2354.5 |
| 152.5° | 2386.7 | 2371.6 | 2400.0 | 2411.4 | 2398.2 |
| 155°   | 2436.0 | 2419.1 | 2441.8 | 2453.1 | 2438.0 |
| 157.5° | 2475.8 | 2460.8 | 2477.8 | 2491.1 | 2475.8 |
| 160°   | 2510.1 | 2498.6 | 2510.1 | 2521.3 | 2508.0 |
| 162.5° | 2540.3 | 2529.0 | 2538.4 | 2551.7 | 2534.6 |
| 165°   | 2566.8 | 2555.6 | 2561.1 | 2574.4 | 2561.1 |
| 167.5° | 2587.7 | 2576.2 | 2582.1 | 2595.4 | 2578.3 |
| 170°   | 2604.8 | 2593.4 | 2597.2 | 2610.5 | 2593.4 |
| 172.5° | 2616.1 | 2604.8 | 2608.7 | 2621.9 | 2604.8 |
| 175°   | 2625.6 | 2612.2 | 2616.1 | 2629.3 | 2610.5 |
| 177.5° | 2629.3 | 2616.1 | 2618.1 | 2631.4 | 2614.2 |
| 180°   | 2619.9 | 2619.9 | 2619.9 | 2619.9 | 2619.9 |

TEST NUMBER: P912099

CATALOG NUMBER: DFN2DIP-SQ3F0-120D070US850-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 | 14.36            | 15.27 | 15.24 | 16.17 | 17.30 | 10.32          | 11.23 | 11.20 | 12.13 | 13.26 |
|                 | 3H   | 16.04            | 16.86 | 16.93 | 17.76 | 18.92 | 11.51          | 12.33 | 12.40 | 13.23 | 14.39 |
|                 | 4H   | 16.65            | 17.42 | 17.55 | 18.33 | 19.49 | 11.96          | 12.73 | 12.86 | 13.64 | 14.80 |
|                 | 6H   | 17.07            | 17.78 | 17.99 | 18.70 | 19.87 | 12.28          | 12.99 | 13.19 | 13.90 | 15.08 |
|                 | 8H   | 17.20            | 17.87 | 18.12 | 18.81 | 19.98 | 12.37          | 13.04 | 13.29 | 13.98 | 15.15 |
|                 | 12H  | 17.26            | 17.90 | 18.19 | 18.83 | 20.03 | 12.41          | 13.05 | 13.34 | 13.98 | 15.18 |
| 4H              | 2H   | 14.39            | 15.16 | 15.30 | 16.07 | 17.23 | 10.92          | 11.69 | 11.83 | 12.60 | 13.77 |
|                 | 3H   | 16.22            | 16.86 | 17.14 | 17.80 | 18.98 | 12.27          | 12.91 | 13.19 | 13.85 | 15.04 |
|                 | 4H   | 16.91            | 17.49 | 17.84 | 18.43 | 19.63 | 12.82          | 13.40 | 13.75 | 14.34 | 15.54 |
|                 | 6H   | 17.42            | 17.93 | 18.37 | 18.89 | 20.09 | 13.24          | 13.74 | 14.18 | 14.70 | 15.91 |
|                 | 8H   | 17.60            | 18.07 | 18.55 | 19.02 | 20.24 | 13.36          | 13.83 | 14.31 | 14.78 | 16.01 |
|                 | 12H  | 17.69            | 18.12 | 18.66 | 19.09 | 20.31 | 13.43          | 13.85 | 14.39 | 14.82 | 16.05 |
| 8H              | 4H   | 16.88            | 17.35 | 17.83 | 18.30 | 19.52 | 13.10          | 13.57 | 14.05 | 14.52 | 15.75 |
|                 | 6H   | 17.44            | 17.83 | 18.42 | 18.83 | 20.05 | 13.62          | 14.00 | 14.59 | 15.00 | 16.22 |
|                 | 8H   | 17.66            | 18.00 | 18.64 | 18.99 | 20.22 | 13.80          | 14.14 | 14.78 | 15.13 | 16.37 |
|                 | 12H  | 17.80            | 18.10 | 18.78 | 19.08 | 20.36 | 13.92          | 14.22 | 14.90 | 15.20 | 16.48 |
| 12H             | 4H   | 16.84            | 17.26 | 17.80 | 18.23 | 19.46 | 13.11          | 13.53 | 14.08 | 14.50 | 15.73 |
|                 | 6H   | 17.42            | 17.76 | 18.40 | 18.75 | 19.98 | 13.66          | 14.01 | 14.65 | 14.99 | 16.23 |
|                 | 8H   | 17.64            | 17.94 | 18.63 | 18.92 | 20.20 | 13.87          | 14.17 | 14.86 | 15.15 | 16.44 |

END OF REPORT