

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: P912011

Luminaire Tested: DFN2DIP-SQ3F0-090D120US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912011  
REPORT IS A COMBINATION OF REPORTS P901536 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D120US850-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

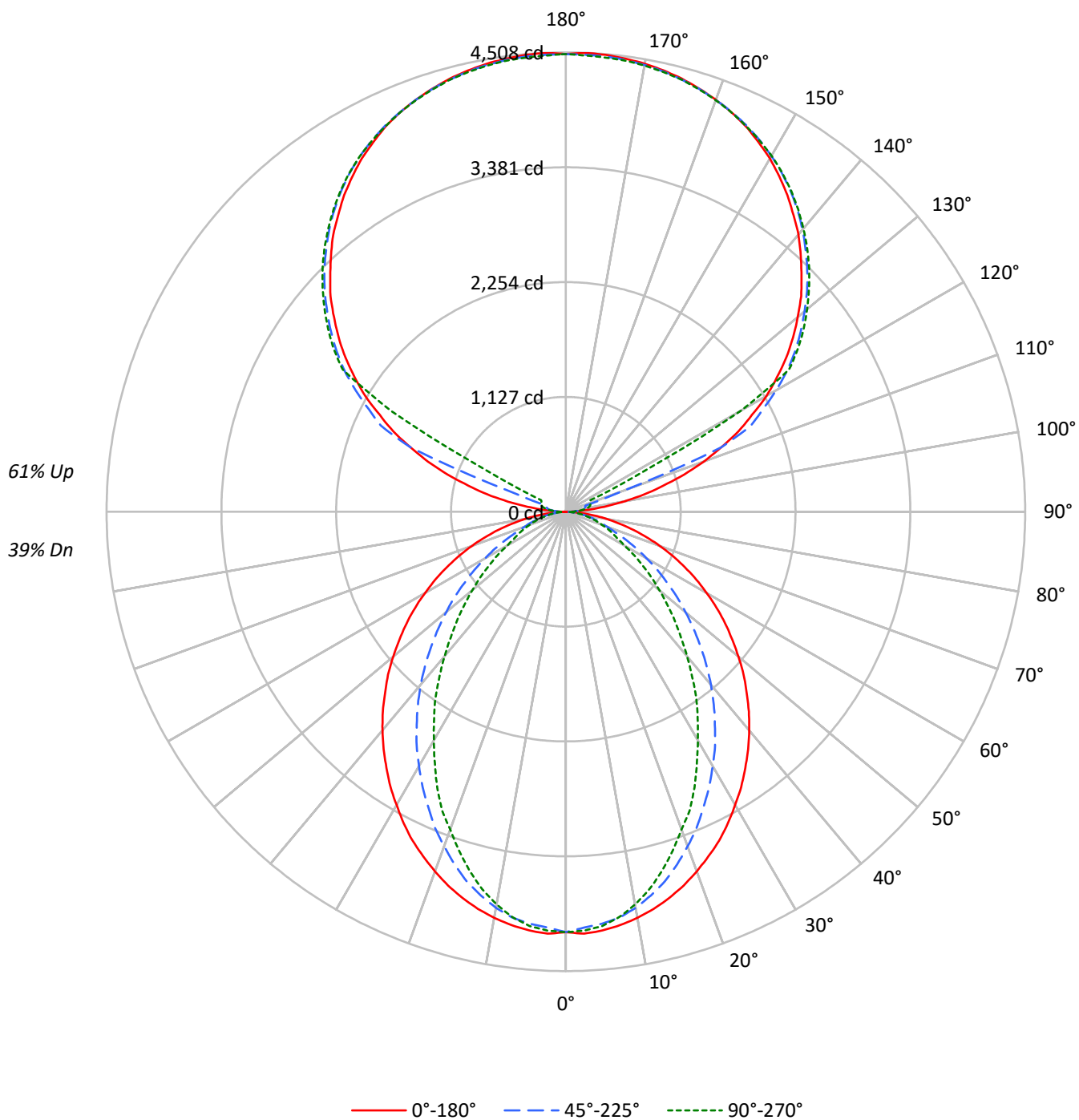
Lumens per Lamp: N/A  
Luminaire Lumens: 21658.8 lumens  
Efficiency: N/A  
Efficacy: 119.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 181.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
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: P912011

CATALOG NUMBER: DFN2DIP-SQ3F0-090D120US850-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P912011

CATALOG NUMBER: DFN2DIP-SQ3F0-090D120US850-RLLONL

**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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 96  | 92  | 88  | 85  | 87 | 83 | 80 | 78 | 68 | 66 | 64 | 54 | 53 | 52 | 41 | 41 | 40 |
| 2   | 87  | 80  | 75  | 70  | 79 | 73 | 68 | 64 | 60 | 57 | 54 | 48 | 46 | 44 | 37 | 35 | 34 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 53 | 49 | 46 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 63  | 55  | 50  | 67 | 58 | 51 | 46 | 48 | 43 | 39 | 38 | 35 | 32 | 30 | 27 | 26 |
| 5   | 67  | 56  | 48  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 28 | 27 | 25 | 23 |
| 6   | 62  | 51  | 43  | 37  | 56 | 46 | 40 | 35 | 39 | 34 | 30 | 31 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 46  | 38  | 33  | 52 | 42 | 35 | 31 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 42  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 23 | 26 | 22 | 20 | 21 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 29 | 24 | 21 | 24 | 20 | 18 | 19 | 17 | 15 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4727 | 4727 | 4727 |
| 5°  | 4731 | 4648 | 4680 |
| 10° | 4681 | 4554 | 4526 |
| 15° | 4614 | 4401 | 4289 |
| 20° | 4526 | 4190 | 3999 |
| 25° | 4435 | 3955 | 3719 |
| 30° | 4315 | 3714 | 3364 |
| 35° | 4197 | 3455 | 3053 |
| 40° | 4076 | 3188 | 2696 |
| 45° | 3937 | 2891 | 2372 |
| 50° | 3792 | 2593 | 2056 |
| 55° | 3641 | 2274 | 1753 |
| 60° | 3465 | 1941 | 1442 |
| 65° | 3264 | 1602 | 1296 |
| 70° | 3019 | 1287 | 1170 |
| 75° | 2710 | 1128 | 1061 |
| 80° | 2265 | 936  | 915  |
| 85° | 1536 | 610  | 679  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3937 cd/sqm

TEST NUMBER: P912011

CATALOG NUMBER: DFN2DIP-SQ3F0-090D120US850-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 386.6   | 1.8       |
| 10°-20°   | 1061.3  | 4.9       |
| 20°-30°   | 1490.1  | 6.9       |
| 30°-40°   | 1624.3  | 7.5       |
| 40°-50°   | 1492.9  | 6.9       |
| 50°-60°   | 1172.4  | 5.4       |
| 60°-70°   | 763.1   | 3.5       |
| 70°-80°   | 392.8   | 1.8       |
| 80°-90°   | 108.2   | 0.5       |
| 90°-100°  | 148.1   | 0.7       |
| 100°-110° | 552.1   | 2.5       |
| 110°-120° | 1464.2  | 6.8       |
| 120°-130° | 2428.5  | 11.2      |
| 130°-140° | 2579.6  | 11.9      |
| 140°-150° | 2397.5  | 11.1      |
| 150°-160° | 1927.5  | 8.9       |
| 160°-170° | 1242.0  | 5.7       |
| 170°-180° | 427.5   | 2.0       |
| 0°-30°    | 2938.0  | 13.6      |
| 0°-40°    | 4562.3  | 21.1      |
| 0°-60°    | 7227.6  | 33.4      |
| 0°-90°    | 8491.8  | 39.2      |
| 90°-120°  | 2164.4  | 10.0      |
| 90°-150°  | 9570.0  | 44.2      |
| 90°-180°  | 13167.0 | 60.8      |
| 0°-180°   | 21658.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4125 | 4125  | 4125 | 4125  | 4125 |      |
| 5°   | 4125 | 4106  | 4058 | 4091  | 4080 | 391  |
| 15°  | 3924 | 3882  | 3756 | 3685  | 3648 | 1106 |
| 25°  | 3562 | 3442  | 3196 | 3043  | 2986 | 1638 |
| 35°  | 3069 | 2878  | 2550 | 2315  | 2232 | 1921 |
| 45°  | 2509 | 2258  | 1867 | 1601  | 1512 | 1937 |
| 55°  | 1908 | 1616  | 1213 | 989   | 918  | 1705 |
| 65°  | 1288 | 986   | 650  | 523   | 511  | 1277 |
| 75°  | 687  | 425   | 299  | 272   | 269  | 726  |
| 85°  | 160  | 82    | 71   | 71    | 71   | 184  |
| 90°  | 3    | 39    | 65   | 81    | 88   | 20   |
| 95°  | 211  | 104   | 126  | 143   | 140  | 250  |
| 105° | 988  | 1086  | 198  | 234   | 247  | 1056 |
| 115° | 1869 | 1924  | 2005 | 500   | 267  | 1840 |
| 125° | 2642 | 2684  | 2746 | 2769  | 2779 | 2356 |
| 135° | 3269 | 3322  | 3350 | 3383  | 3377 | 2526 |
| 145° | 3793 | 3789  | 3844 | 3867  | 3851 | 2372 |
| 155° | 4176 | 4147  | 4186 | 4205  | 4180 | 1924 |
| 165° | 4400 | 4381  | 4390 | 4413  | 4390 | 1243 |
| 175° | 4501 | 4478  | 4485 | 4508  | 4475 | 428  |
| 180° | 4491 | 4491  | 4491 | 4491  | 4491 |      |

TEST NUMBER: P912011

CATALOG NUMBER: DFN2DIP-SQ3F0-090D120US850-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4125.1 | 4125.1 | 4125.1 | 4125.1 | 4125.1 |
| 2.5°   | 4143.8 | 4125.1 | 4083.9 | 4121.6 | 4114.1 |
| 5°     | 4125.1 | 4106.5 | 4057.8 | 4091.4 | 4080.3 |
| 7.5°   | 4091.4 | 4069.3 | 4017.0 | 4031.7 | 4013.0 |
| 10°    | 4046.7 | 4020.6 | 3946.2 | 3934.6 | 3912.4 |
| 12.5°  | 3990.8 | 3957.2 | 3856.2 | 3834.0 | 3792.8 |
| 15°    | 3923.5 | 3882.4 | 3755.6 | 3684.7 | 3647.5 |
| 17.5°  | 3845.1 | 3785.3 | 3628.4 | 3546.5 | 3486.7 |
| 20°    | 3755.6 | 3680.8 | 3494.1 | 3401.1 | 3318.7 |
| 22.5°  | 3658.6 | 3572.6 | 3355.9 | 3229.2 | 3173.4 |
| 25°    | 3561.6 | 3441.9 | 3195.6 | 3042.7 | 2986.4 |
| 27.5°  | 3445.9 | 3318.7 | 3046.2 | 2870.8 | 2784.8 |
| 30°    | 3322.7 | 3180.5 | 2881.8 | 2691.8 | 2590.7 |
| 32.5°  | 3203.0 | 3031.1 | 2725.4 | 2501.2 | 2407.7 |
| 35°    | 3068.8 | 2878.3 | 2549.9 | 2314.7 | 2232.3 |
| 37.5°  | 2938.1 | 2732.6 | 2385.6 | 2127.7 | 2034.7 |
| 40°    | 2799.9 | 2576.1 | 2213.7 | 1948.7 | 1851.7 |
| 42.5°  | 2658.1 | 2419.3 | 2042.1 | 1765.7 | 1672.6 |
| 45°    | 2508.8 | 2258.5 | 1866.7 | 1601.3 | 1511.8 |
| 47.5°  | 2366.9 | 2102.0 | 1698.8 | 1433.4 | 1351.4 |
| 50°    | 2210.1 | 1945.1 | 1534.4 | 1276.6 | 1198.5 |
| 52.5°  | 2056.9 | 1776.8 | 1377.6 | 1131.2 | 1060.3 |
| 55°    | 1907.5 | 1616.4 | 1213.1 | 989.4  | 918.5  |
| 57.5°  | 1754.7 | 1456.0 | 1067.9 | 858.7  | 798.9  |
| 60°    | 1597.7 | 1299.1 | 914.6  | 724.4  | 664.6  |
| 62.5°  | 1444.9 | 1146.3 | 783.8  | 604.8  | 575.1  |
| 65°    | 1288.0 | 985.5  | 649.5  | 522.8  | 511.4  |
| 67.5°  | 1138.7 | 836.1  | 522.8  | 459.0  | 447.9  |
| 70°    | 981.9  | 690.8  | 433.0  | 395.7  | 380.6  |
| 72.5°  | 832.5  | 556.1  | 362.0  | 332.3  | 324.8  |
| 75°    | 686.8  | 425.4  | 298.7  | 272.5  | 268.9  |
| 77.5°  | 541.4  | 302.2  | 235.2  | 220.2  | 212.7  |
| 80°    | 406.8  | 216.7  | 179.0  | 164.4  | 164.4  |
| 82.5°  | 283.6  | 145.7  | 123.2  | 115.7  | 115.7  |
| 85°    | 160.4  | 82.0   | 70.9   | 70.9   | 70.9   |
| 87.5°  | 59.8   | 29.7   | 29.7   | 26.2   | 26.2   |
| 90°    | 3.1    | 38.9   | 64.9   | 81.4   | 87.6   |
| 92.5°  | 81.4   | 68.3   | 78.0   | 84.5   | 87.6   |
| 95°    | 211.0  | 103.8  | 126.5  | 143.2  | 139.7  |
| 97.5°  | 380.2  | 113.9  | 165.6  | 175.6  | 178.7  |
| 100°   | 575.3  | 130.1  | 185.2  | 211.0  | 217.7  |
| 102.5° | 789.6  | 783.4  | 191.7  | 227.3  | 237.3  |
| 105°   | 987.9  | 1085.6 | 198.4  | 233.9  | 247.0  |
| 107.5° | 1218.7 | 1299.7 | 204.9  | 240.4  | 253.5  |
| 110°   | 1439.8 | 1507.8 | 568.8  | 243.9  | 256.6  |

TEST NUMBER: P912011

CATALOG NUMBER: DFN2DIP-SQ3F0-090D120US850-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1647.9 | 1706.1 | 1651.0 | 250.1  | 260.1  |
| 115°   | 1868.6 | 1923.8 | 2005.2 | 500.5  | 266.7  |
| 117.5° | 2060.4 | 2125.3 | 2180.8 | 1715.7 | 864.5  |
| 120°   | 2275.0 | 2323.6 | 2382.2 | 2421.3 | 1982.4 |
| 122.5° | 2456.8 | 2508.9 | 2574.1 | 2593.4 | 2596.8 |
| 125°   | 2642.0 | 2684.4 | 2746.2 | 2769.0 | 2778.6 |
| 127.5° | 2811.0 | 2856.6 | 2905.6 | 2938.0 | 2941.1 |
| 130°   | 2970.3 | 3022.5 | 3058.0 | 3093.9 | 3090.8 |
| 132.5° | 3132.8 | 3175.3 | 3210.8 | 3240.2 | 3237.1 |
| 135°   | 3269.4 | 3321.6 | 3350.5 | 3383.3 | 3376.8 |
| 137.5° | 3412.3 | 3451.2 | 3484.0 | 3516.4 | 3506.8 |
| 140°   | 3552.0 | 3578.2 | 3613.7 | 3643.1 | 3626.9 |
| 142.5° | 3669.2 | 3692.1 | 3734.1 | 3760.0 | 3743.8 |
| 145°   | 3792.8 | 3789.3 | 3844.5 | 3867.3 | 3851.0 |
| 147.5° | 3899.7 | 3890.0 | 3945.3 | 3961.5 | 3948.7 |
| 150°   | 4003.8 | 3981.1 | 4033.2 | 4052.5 | 4036.3 |
| 152.5° | 4091.4 | 4065.6 | 4114.3 | 4133.9 | 4111.2 |
| 155°   | 4175.9 | 4147.0 | 4186.0 | 4205.3 | 4179.5 |
| 157.5° | 4244.3 | 4218.4 | 4247.8 | 4270.5 | 4244.3 |
| 160°   | 4302.9 | 4283.3 | 4302.9 | 4322.2 | 4299.5 |
| 162.5° | 4354.7 | 4335.4 | 4351.6 | 4374.3 | 4345.1 |
| 165°   | 4400.2 | 4380.9 | 4390.5 | 4413.4 | 4390.5 |
| 167.5° | 4436.1 | 4416.4 | 4426.5 | 4449.2 | 4419.9 |
| 170°   | 4465.4 | 4445.8 | 4452.3 | 4475.0 | 4445.8 |
| 172.5° | 4484.7 | 4465.4 | 4472.0 | 4494.8 | 4465.4 |
| 175°   | 4500.9 | 4478.1 | 4484.7 | 4507.5 | 4475.0 |
| 177.5° | 4507.5 | 4484.7 | 4488.2 | 4511.0 | 4481.7 |
| 180°   | 4491.3 | 4491.3 | 4491.3 | 4491.3 | 4491.3 |

TEST NUMBER: P912011

CATALOG NUMBER: DFN2DIP-SQ3F0-090D120US850-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 | 11.41            | 12.16 | 12.46 | 13.21 | 14.63 | 7.37           | 8.12  | 8.42  | 9.17  | 10.59 |
|                 | 3H   | 13.08            | 13.75 | 14.14 | 14.81 | 16.25 | 8.55           | 9.22  | 9.61  | 10.28 | 11.72 |
|                 | 4H   | 13.68            | 14.31 | 14.75 | 15.38 | 16.82 | 8.99           | 9.62  | 10.06 | 10.69 | 12.13 |
|                 | 6H   | 14.09            | 14.68 | 15.17 | 15.74 | 17.20 | 9.30           | 9.88  | 10.38 | 10.95 | 12.41 |
|                 | 8H   | 14.22            | 14.77 | 15.30 | 15.85 | 17.30 | 9.39           | 9.94  | 10.47 | 11.02 | 12.47 |
|                 | 12H  | 14.27            | 14.80 | 15.36 | 15.87 | 17.35 | 9.42           | 9.95  | 10.51 | 11.03 | 12.50 |
| 4H              | 2H   | 11.42            | 12.05 | 12.50 | 13.11 | 14.56 | 7.95           | 8.59  | 9.03  | 9.65  | 11.10 |
|                 | 3H   | 13.23            | 13.76 | 14.32 | 14.85 | 16.31 | 9.29           | 9.82  | 10.38 | 10.91 | 12.36 |
|                 | 4H   | 13.92            | 14.40 | 15.01 | 15.48 | 16.96 | 9.83           | 10.31 | 10.92 | 11.39 | 12.87 |
|                 | 6H   | 14.43            | 14.84 | 15.52 | 15.94 | 17.42 | 10.24          | 10.65 | 11.34 | 11.75 | 13.23 |
|                 | 8H   | 14.60            | 14.98 | 15.69 | 16.08 | 17.57 | 10.36          | 10.75 | 11.46 | 11.84 | 13.33 |
|                 | 12H  | 14.68            | 15.03 | 15.80 | 16.14 | 17.64 | 10.42          | 10.77 | 11.53 | 11.88 | 13.37 |
| 8H              | 4H   | 13.88            | 14.27 | 14.98 | 15.36 | 16.85 | 10.10          | 10.49 | 11.20 | 11.58 | 13.07 |
|                 | 6H   | 14.44            | 14.76 | 15.56 | 15.89 | 17.38 | 10.61          | 10.93 | 11.73 | 12.06 | 13.55 |
|                 | 8H   | 14.65            | 14.93 | 15.78 | 16.05 | 17.55 | 10.79          | 11.07 | 11.92 | 12.19 | 13.70 |
|                 | 12H  | 14.78            | 15.03 | 15.91 | 16.14 | 17.68 | 10.90          | 11.15 | 12.03 | 12.26 | 13.81 |
| 12H             | 4H   | 13.83            | 14.18 | 14.94 | 15.29 | 16.78 | 10.10          | 10.45 | 11.22 | 11.56 | 13.05 |
|                 | 6H   | 14.41            | 14.69 | 15.54 | 15.81 | 17.32 | 10.66          | 10.93 | 11.78 | 12.05 | 13.56 |
|                 | 8H   | 14.63            | 14.87 | 15.76 | 15.99 | 17.53 | 10.86          | 11.10 | 11.99 | 12.22 | 13.76 |

END OF REPORT