

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: P911899

Luminaire Tested: DFN2DIP-SQ3F0-060D110US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911899  
REPORT IS A COMBINATION OF REPORTS P901512 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-060D110US850-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

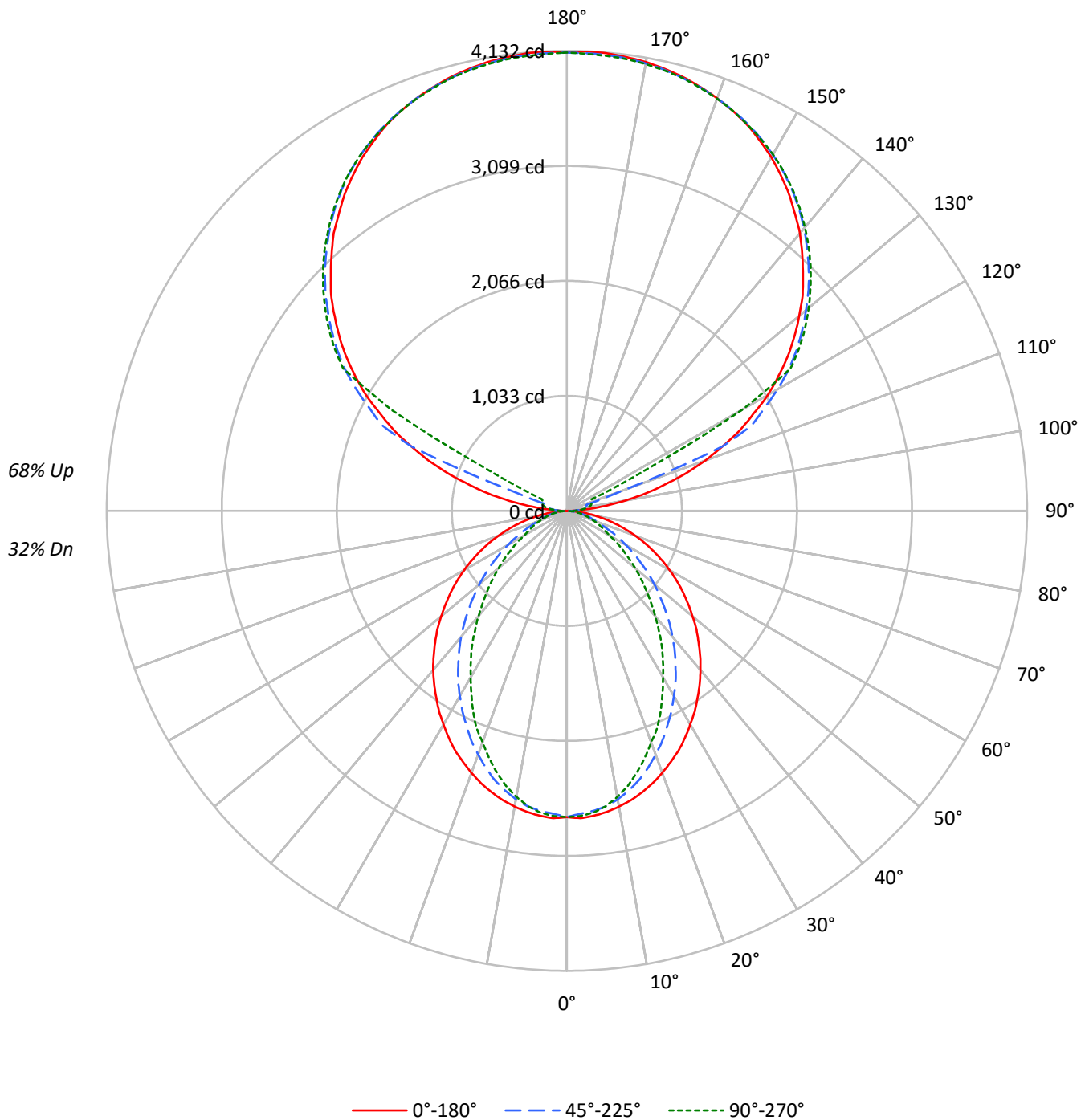
Lumens per Lamp: N/A  
Luminaire Lumens: 17732.9 lumens  
Efficiency: N/A  
Efficacy: 127.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 139.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
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 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 73 | 73 | 73 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 49 | 48 | 47 | 35 | 35 | 34 |
| 2   | 86  | 79  | 73  | 68  | 77 | 71 | 66 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 31 | 30 | 29 |
| 3   | 78  | 70  | 63  | 57  | 70 | 63 | 57 | 52 | 50 | 46 | 43 | 39 | 36 | 34 | 28 | 26 | 25 |
| 4   | 72  | 62  | 54  | 48  | 64 | 56 | 49 | 44 | 45 | 40 | 37 | 35 | 32 | 29 | 25 | 23 | 22 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 40 | 35 | 32 | 31 | 28 | 25 | 23 | 21 | 19 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 36 | 31 | 28 | 28 | 25 | 22 | 21 | 19 | 17 |
| 7   | 56  | 44  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 24 | 26 | 22 | 20 | 19 | 17 | 15 |
| 8   | 52  | 40  | 33  | 28  | 47 | 37 | 30 | 26 | 30 | 25 | 22 | 24 | 20 | 18 | 18 | 15 | 14 |
| 9   | 48  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 27 | 23 | 19 | 22 | 18 | 16 | 16 | 14 | 12 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 25 | 21 | 17 | 20 | 17 | 14 | 15 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3151 | 3151 | 3151 |
| 5°  | 3154 | 3099 | 3120 |
| 10° | 3121 | 3036 | 3017 |
| 15° | 3076 | 2934 | 2859 |
| 20° | 3017 | 2794 | 2666 |
| 25° | 2957 | 2637 | 2479 |
| 30° | 2877 | 2476 | 2243 |
| 35° | 2798 | 2303 | 2035 |
| 40° | 2718 | 2125 | 1797 |
| 45° | 2625 | 1928 | 1582 |
| 50° | 2528 | 1728 | 1371 |
| 55° | 2427 | 1516 | 1169 |
| 60° | 2310 | 1294 | 961  |
| 65° | 2176 | 1068 | 864  |
| 70° | 2012 | 858  | 780  |
| 75° | 1807 | 752  | 708  |
| 80° | 1510 | 624  | 610  |
| 85° | 1024 | 406  | 452  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2820 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 257.7   | 1.5       |
| 10°-20°   | 707.6   | 4.0       |
| 20°-30°   | 993.4   | 5.6       |
| 30°-40°   | 1082.8  | 6.1       |
| 40°-50°   | 995.2   | 5.6       |
| 50°-60°   | 781.6   | 4.4       |
| 60°-70°   | 508.8   | 2.9       |
| 70°-80°   | 261.9   | 1.5       |
| 80°-90°   | 74.1    | 0.4       |
| 90°-100°  | 135.7   | 0.8       |
| 100°-110° | 506.1   | 2.9       |
| 110°-120° | 1342.2  | 7.6       |
| 120°-130° | 2226.1  | 12.6      |
| 130°-140° | 2364.7  | 13.3      |
| 140°-150° | 2197.7  | 12.4      |
| 150°-160° | 1766.9  | 10.0      |
| 160°-170° | 1138.5  | 6.4       |
| 170°-180° | 391.9   | 2.2       |
| 0°-30°    | 1958.7  | 11.0      |
| 0°-40°    | 3041.5  | 17.2      |
| 0°-60°    | 4818.4  | 27.2      |
| 0°-90°    | 5663.2  | 31.9      |
| 90°-120°  | 1984.0  | 11.2      |
| 90°-150°  | 8772.5  | 49.5      |
| 90°-180°  | 12070.0 | 68.1      |
| 0°-180°   | 17732.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2750 | 2750  | 2750 | 2750  | 2750 |      |
| 5°   | 2750 | 2738  | 2705 | 2728  | 2720 | 261  |
| 15°  | 2616 | 2588  | 2504 | 2456  | 2432 | 737  |
| 25°  | 2374 | 2295  | 2130 | 2028  | 1991 | 1092 |
| 35°  | 2046 | 1919  | 1700 | 1543  | 1488 | 1281 |
| 45°  | 1672 | 1506  | 1244 | 1068  | 1008 | 1292 |
| 55°  | 1272 | 1078  | 809  | 660   | 612  | 1136 |
| 65°  | 859  | 657   | 433  | 349   | 341  | 851  |
| 75°  | 458  | 284   | 199  | 182   | 179  | 484  |
| 85°  | 107  | 55    | 47   | 47    | 47   | 123  |
| 90°  | 3    | 36    | 59   | 75    | 80   | 16   |
| 95°  | 194  | 95    | 116  | 131   | 128  | 229  |
| 105° | 906  | 995   | 182  | 214   | 226  | 968  |
| 115° | 1713 | 1763  | 1838 | 459   | 244  | 1686 |
| 125° | 2422 | 2461  | 2517 | 2538  | 2547 | 2160 |
| 135° | 2997 | 3045  | 3071 | 3101  | 3095 | 2315 |
| 145° | 3477 | 3474  | 3524 | 3545  | 3530 | 2174 |
| 155° | 3828 | 3801  | 3837 | 3855  | 3831 | 1764 |
| 165° | 4034 | 4016  | 4025 | 4046  | 4025 | 1140 |
| 175° | 4126 | 4105  | 4111 | 4132  | 4102 | 393  |
| 180° | 4117 | 4117  | 4117 | 4117  | 4117 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2750.1 | 2750.1 | 2750.1 | 2750.1 | 2750.1 |
| 2.5°   | 2762.5 | 2750.1 | 2722.6 | 2747.7 | 2742.7 |
| 5°     | 2750.1 | 2737.7 | 2705.2 | 2727.7 | 2720.3 |
| 7.5°   | 2727.7 | 2712.8 | 2678.0 | 2687.8 | 2675.4 |
| 10°    | 2697.8 | 2680.3 | 2630.8 | 2623.1 | 2608.3 |
| 12.5°  | 2660.6 | 2638.1 | 2570.8 | 2556.0 | 2528.5 |
| 15°    | 2615.7 | 2588.2 | 2503.7 | 2456.4 | 2431.6 |
| 17.5°  | 2563.5 | 2523.5 | 2419.0 | 2364.3 | 2324.5 |
| 20°    | 2503.7 | 2453.8 | 2329.5 | 2267.4 | 2212.5 |
| 22.5°  | 2439.0 | 2381.7 | 2237.3 | 2152.8 | 2115.5 |
| 25°    | 2374.4 | 2294.6 | 2130.4 | 2028.5 | 1991.0 |
| 27.5°  | 2297.3 | 2212.5 | 2030.8 | 1913.8 | 1856.6 |
| 30°    | 2215.1 | 2120.3 | 1921.2 | 1794.5 | 1727.2 |
| 32.5°  | 2135.4 | 2020.8 | 1817.0 | 1667.5 | 1605.2 |
| 35°    | 2045.9 | 1918.9 | 1700.0 | 1543.1 | 1488.2 |
| 37.5°  | 1958.7 | 1821.6 | 1590.4 | 1418.5 | 1356.4 |
| 40°    | 1866.6 | 1717.4 | 1475.7 | 1299.1 | 1234.4 |
| 42.5°  | 1772.1 | 1612.8 | 1361.4 | 1177.1 | 1115.1 |
| 45°    | 1672.5 | 1505.6 | 1244.5 | 1067.5 | 1007.9 |
| 47.5°  | 1578.0 | 1401.3 | 1132.5 | 955.6  | 901.0  |
| 50°    | 1473.4 | 1296.8 | 1022.9 | 851.0  | 799.0  |
| 52.5°  | 1371.2 | 1184.5 | 918.4  | 754.1  | 706.9  |
| 55°    | 1271.7 | 1077.6 | 808.8  | 659.6  | 612.3  |
| 57.5°  | 1169.8 | 970.6  | 711.9  | 572.5  | 532.5  |
| 60°    | 1065.2 | 866.1  | 609.7  | 483.0  | 443.0  |
| 62.5°  | 963.3  | 764.2  | 522.6  | 403.2  | 383.4  |
| 65°    | 858.7  | 657.0  | 433.1  | 348.6  | 340.9  |
| 67.5°  | 759.1  | 557.4  | 348.6  | 306.1  | 298.7  |
| 70°    | 654.5  | 460.5  | 288.6  | 263.8  | 253.7  |
| 72.5°  | 555.1  | 370.7  | 241.3  | 221.6  | 216.5  |
| 75°    | 457.9  | 283.6  | 199.1  | 181.7  | 179.3  |
| 77.5°  | 361.0  | 201.5  | 156.8  | 146.8  | 141.8  |
| 80°    | 271.2  | 144.4  | 119.3  | 109.6  | 109.6  |
| 82.5°  | 189.1  | 97.1   | 82.1   | 77.1   | 77.1   |
| 85°    | 106.9  | 54.7   | 47.2   | 47.2   | 47.2   |
| 87.5°  | 39.9   | 19.9   | 19.9   | 17.4   | 17.4   |
| 90°    | 2.9    | 35.7   | 59.4   | 74.6   | 80.3   |
| 92.5°  | 74.6   | 62.7   | 71.4   | 77.5   | 80.3   |
| 95°    | 193.5  | 95.2   | 116.0  | 131.2  | 128.1  |
| 97.5°  | 348.4  | 104.4  | 151.7  | 160.9  | 163.8  |
| 100°   | 527.4  | 119.2  | 169.8  | 193.5  | 199.5  |
| 102.5° | 723.7  | 718.1  | 175.8  | 208.4  | 217.6  |
| 105°   | 905.6  | 995.1  | 181.9  | 214.4  | 226.5  |
| 107.5° | 1117.2 | 1191.4 | 187.9  | 220.4  | 232.4  |
| 110°   | 1319.8 | 1382.1 | 521.5  | 223.6  | 235.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1510.6 | 1563.9 | 1513.3 | 229.2  | 238.4  |
| 115°   | 1712.9 | 1763.4 | 1838.2 | 458.8  | 244.4  |
| 117.5° | 1888.7 | 1948.2 | 1999.1 | 1572.8 | 792.4  |
| 120°   | 2085.4 | 2129.9 | 2183.7 | 2219.4 | 1817.2 |
| 122.5° | 2252.0 | 2299.7 | 2359.5 | 2377.3 | 2380.5 |
| 125°   | 2421.8 | 2460.8 | 2517.3 | 2538.2 | 2547.0 |
| 127.5° | 2576.8 | 2618.5 | 2663.4 | 2693.1 | 2696.0 |
| 130°   | 2722.8 | 2770.6 | 2803.1 | 2836.0 | 2833.3 |
| 132.5° | 2871.8 | 2910.7 | 2943.3 | 2970.1 | 2967.4 |
| 135°   | 2997.1 | 3044.8 | 3071.3 | 3101.4 | 3095.3 |
| 137.5° | 3127.9 | 3163.6 | 3193.7 | 3223.4 | 3214.5 |
| 140°   | 3256.0 | 3280.0 | 3312.6 | 3339.4 | 3324.6 |
| 142.5° | 3363.5 | 3384.3 | 3422.9 | 3446.7 | 3431.8 |
| 145°   | 3476.7 | 3473.5 | 3524.1 | 3545.0 | 3530.2 |
| 147.5° | 3574.8 | 3565.9 | 3616.4 | 3631.3 | 3619.7 |
| 150°   | 3670.2 | 3649.4 | 3697.1 | 3714.8 | 3700.0 |
| 152.5° | 3750.5 | 3726.8 | 3771.4 | 3789.5 | 3768.6 |
| 155°   | 3828.0 | 3801.4 | 3837.1 | 3854.9 | 3831.2 |
| 157.5° | 3890.6 | 3866.9 | 3893.8 | 3914.7 | 3890.6 |
| 160°   | 3944.4 | 3926.3 | 3944.4 | 3962.0 | 3941.2 |
| 162.5° | 3991.7 | 3974.1 | 3989.0 | 4009.8 | 3983.0 |
| 165°   | 4033.5 | 4015.8 | 4024.7 | 4045.5 | 4024.7 |
| 167.5° | 4066.4 | 4048.4 | 4057.6 | 4078.5 | 4051.6 |
| 170°   | 4093.3 | 4075.2 | 4081.2 | 4102.2 | 4075.2 |
| 172.5° | 4111.0 | 4093.3 | 4099.3 | 4120.2 | 4093.3 |
| 175°   | 4125.8 | 4105.0 | 4111.0 | 4131.9 | 4102.2 |
| 177.5° | 4131.9 | 4111.0 | 4114.2 | 4135.0 | 4108.2 |
| 180°   | 4117.1 | 4117.1 | 4117.1 | 4117.1 | 4117.1 |

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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 | 9.13             | 9.83  | 10.23 | 10.93 | 12.44 | 5.09           | 5.79 | 6.19 | 6.89 | 8.40  |
|                 | 3H   | 10.79            | 11.42 | 11.90 | 12.52 | 14.05 | 6.26           | 6.89 | 7.37 | 7.99 | 9.52  |
|                 | 4H   | 11.39            | 11.99 | 12.51 | 13.09 | 14.62 | 6.70           | 7.30 | 7.82 | 8.40 | 9.93  |
|                 | 6H   | 11.80            | 12.35 | 12.93 | 13.46 | 15.00 | 7.01           | 7.56 | 8.14 | 8.67 | 10.21 |
|                 | 8H   | 11.92            | 12.44 | 13.06 | 13.57 | 15.10 | 7.09           | 7.61 | 8.23 | 8.74 | 10.27 |
|                 | 12H  | 11.98            | 12.47 | 13.12 | 13.59 | 15.15 | 7.13           | 7.62 | 8.27 | 8.74 | 10.30 |
| 4H              | 2H   | 9.13             | 9.72  | 10.26 | 10.83 | 12.36 | 5.67           | 6.26 | 6.80 | 7.37 | 8.90  |
|                 | 3H   | 10.94            | 11.44 | 12.07 | 12.57 | 14.11 | 7.00           | 7.49 | 8.13 | 8.62 | 10.17 |
|                 | 4H   | 11.62            | 12.08 | 12.76 | 13.20 | 14.76 | 7.53           | 7.99 | 8.67 | 9.11 | 10.68 |
|                 | 6H   | 12.13            | 12.52 | 13.27 | 13.66 | 15.22 | 7.94           | 8.33 | 9.08 | 9.47 | 11.03 |
|                 | 8H   | 12.30            | 12.66 | 13.44 | 13.80 | 15.37 | 8.06           | 8.43 | 9.21 | 9.56 | 11.13 |
|                 | 12H  | 12.38            | 12.71 | 13.54 | 13.86 | 15.44 | 8.12           | 8.45 | 9.28 | 9.59 | 11.17 |
| 8H              | 4H   | 11.58            | 11.94 | 12.72 | 13.08 | 14.65 | 7.80           | 8.17 | 8.95 | 9.30 | 10.87 |
|                 | 6H   | 12.14            | 12.44 | 13.30 | 13.61 | 15.18 | 8.31           | 8.61 | 9.47 | 9.79 | 11.35 |
|                 | 8H   | 12.35            | 12.61 | 13.52 | 13.77 | 15.36 | 8.49           | 8.75 | 9.66 | 9.91 | 11.50 |
|                 | 12H  | 12.48            | 12.71 | 13.65 | 13.86 | 15.49 | 8.60           | 8.83 | 9.77 | 9.98 | 11.61 |
| 12H             | 4H   | 11.53            | 11.86 | 12.69 | 13.00 | 14.58 | 7.80           | 8.13 | 8.96 | 9.28 | 10.85 |
|                 | 6H   | 12.11            | 12.37 | 13.28 | 13.53 | 15.12 | 8.35           | 8.62 | 9.52 | 9.77 | 11.36 |
|                 | 8H   | 12.32            | 12.55 | 13.50 | 13.71 | 15.33 | 8.55           | 8.78 | 9.73 | 9.94 | 11.56 |

END OF REPORT