

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: P927654

Luminaire Tested: DFN2DIP-HX4F0-070D100US840-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927654  
REPORT IS A COMBINATION OF REPORTS P900934 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-070D100US840-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

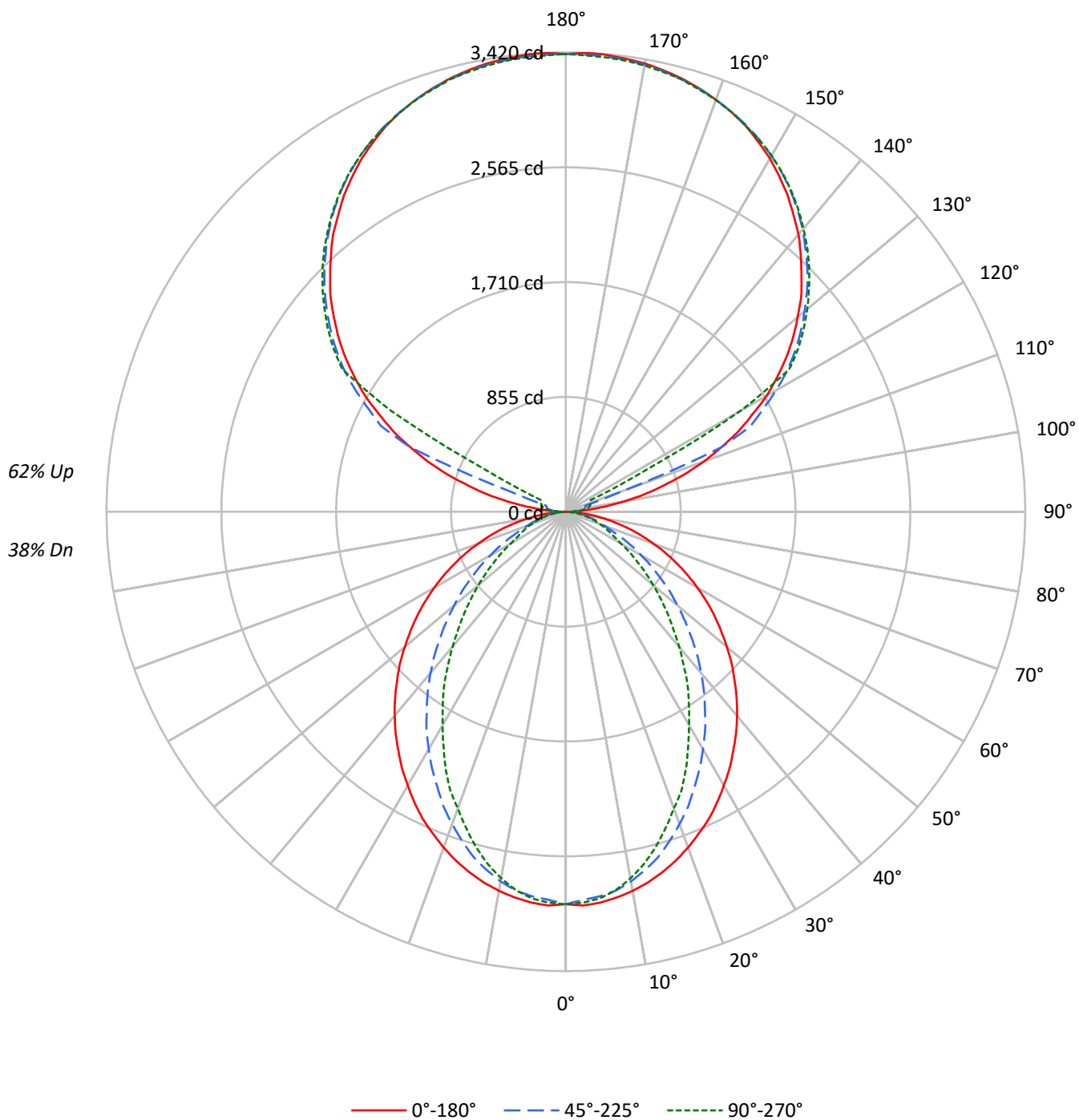
Lumens per Lamp: N/A  
Luminaire Lumens: 16005.3 lumens  
Efficiency: N/A  
Efficacy: 112.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 142.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 | 38 |    |    |
| 1   | 95  | 91  | 88  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 53 | 52 | 51 | 40 | 39 | 38 | 32 |    |    |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 56 | 53 | 47 | 45 | 43 | 36 | 34 | 33 | 28 |    |    |
| 3   | 80  | 71  | 64  | 58  | 72 | 64 | 58 | 54 | 53 | 48 | 45 | 42 | 39 | 37 | 32 | 30 | 28 | 24 |    |    |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 39 | 38 | 34 | 32 | 29 | 27 | 25 | 21 |    |    |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 28 | 26 | 24 | 22 | 18 |    |    |
| 6   | 62  | 50  | 43  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 21 | 19 | 16 |    |    |
| 7   | 57  | 45  | 38  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 28 | 24 | 22 | 22 | 19 | 17 | 15 |    |    |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 32 | 27 | 23 | 26 | 22 | 19 | 20 | 18 | 16 | 13 |    |    |
| 9   | 49  | 38  | 30  | 26  | 45 | 35 | 28 | 24 | 29 | 24 | 21 | 24 | 20 | 17 | 19 | 16 | 14 | 12 |    |    |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 15 | 13 | 11 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2172 | 2172 | 2172 |
| 5°  | 2176 | 2138 | 2152 |
| 10° | 2155 | 2096 | 2082 |
| 15° | 2125 | 2027 | 1974 |
| 20° | 2086 | 1932 | 1841 |
| 25° | 2046 | 1825 | 1713 |
| 30° | 1992 | 1715 | 1550 |
| 35° | 1940 | 1598 | 1407 |
| 40° | 1886 | 1476 | 1243 |
| 45° | 1824 | 1340 | 1095 |
| 50° | 1759 | 1204 | 950  |
| 55° | 1692 | 1057 | 811  |
| 60° | 1614 | 905  | 667  |
| 65° | 1525 | 750  | 601  |
| 70° | 1416 | 605  | 544  |
| 75° | 1280 | 533  | 495  |
| 80° | 1083 | 448  | 430  |
| 85° | 757  | 300  | 324  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1824 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 273.8   | 1.7       |
| 10°-20°   | 751.6   | 4.7       |
| 20°-30°   | 1055.3  | 6.6       |
| 30°-40°   | 1150.3  | 7.2       |
| 40°-50°   | 1057.3  | 6.6       |
| 50°-60°   | 830.3   | 5.2       |
| 60°-70°   | 540.5   | 3.4       |
| 70°-80°   | 278.2   | 1.7       |
| 80°-90°   | 77.0    | 0.5       |
| 90°-100°  | 112.4   | 0.7       |
| 100°-110° | 418.9   | 2.6       |
| 110°-120° | 1111.0  | 6.9       |
| 120°-130° | 1842.7  | 11.5      |
| 130°-140° | 1957.4  | 12.2      |
| 140°-150° | 1819.2  | 11.4      |
| 150°-160° | 1462.6  | 9.1       |
| 160°-170° | 942.4   | 5.9       |
| 170°-180° | 324.4   | 2.0       |
| 0°-30°    | 2080.7  | 13.0      |
| 0°-40°    | 3231.0  | 20.2      |
| 0°-60°    | 5118.6  | 32.0      |
| 0°-90°    | 6014.3  | 37.6      |
| 90°-120°  | 1642.3  | 10.3      |
| 90°-150°  | 7261.7  | 45.4      |
| 90°-180°  | 9991.0  | 62.4      |
| 0°-180°   | 16005.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2922 | 2922  | 2922 | 2922  | 2922 |      |
| 5°   | 2922 | 2908  | 2874 | 2898  | 2890 | 277  |
| 15°  | 2779 | 2750  | 2660 | 2610  | 2583 | 783  |
| 25°  | 2522 | 2438  | 2263 | 2155  | 2115 | 1160 |
| 35°  | 2173 | 2038  | 1806 | 1639  | 1581 | 1360 |
| 45°  | 1777 | 1599  | 1322 | 1134  | 1071 | 1372 |
| 55°  | 1351 | 1145  | 859  | 701   | 650  | 1207 |
| 65°  | 912  | 698   | 460  | 370   | 362  | 904  |
| 75°  | 486  | 301   | 212  | 193   | 190  | 514  |
| 85°  | 114  | 58    | 50   | 50    | 50   | 130  |
| 90°  | 2    | 30    | 49   | 62    | 66   | 15   |
| 95°  | 160  | 79    | 96   | 109   | 106  | 190  |
| 105° | 750  | 824   | 151  | 177   | 187  | 801  |
| 115° | 1418 | 1460  | 1522 | 380   | 202  | 1396 |
| 125° | 2005 | 2037  | 2084 | 2101  | 2108 | 1788 |
| 135° | 2481 | 2520  | 2542 | 2567  | 2562 | 1916 |
| 145° | 2878 | 2875  | 2917 | 2934  | 2922 | 1800 |
| 155° | 3169 | 3147  | 3176 | 3191  | 3171 | 1460 |
| 165° | 3339 | 3324  | 3332 | 3349  | 3332 | 943  |
| 175° | 3415 | 3398  | 3403 | 3420  | 3396 | 325  |
| 180° | 3408 | 3408  | 3408 | 3408  | 3408 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2921.5 | 2921.5 | 2921.5 | 2921.5 | 2921.5 |
| 2.5°   | 2934.6 | 2921.5 | 2892.3 | 2918.9 | 2913.6 |
| 5°     | 2921.5 | 2908.2 | 2873.8 | 2897.6 | 2889.7 |
| 7.5°   | 2897.6 | 2881.9 | 2844.9 | 2855.2 | 2842.1 |
| 10°    | 2865.9 | 2847.4 | 2794.6 | 2786.5 | 2770.8 |
| 12.5°  | 2826.3 | 2802.5 | 2731.0 | 2715.3 | 2686.1 |
| 15°    | 2778.7 | 2749.5 | 2659.7 | 2609.5 | 2583.2 |
| 17.5°  | 2723.1 | 2680.8 | 2569.7 | 2511.6 | 2469.3 |
| 20°    | 2659.7 | 2606.7 | 2474.6 | 2408.7 | 2350.3 |
| 22.5°  | 2591.0 | 2530.2 | 2376.7 | 2286.9 | 2247.4 |
| 25°    | 2522.3 | 2437.6 | 2263.1 | 2154.8 | 2115.0 |
| 27.5°  | 2440.4 | 2350.3 | 2157.3 | 2033.1 | 1972.2 |
| 30°    | 2353.1 | 2252.5 | 2040.9 | 1906.3 | 1834.8 |
| 32.5°  | 2268.4 | 2146.7 | 1930.1 | 1771.4 | 1705.1 |
| 35°    | 2173.3 | 2038.4 | 1805.9 | 1639.3 | 1580.9 |
| 37.5°  | 2080.8 | 1935.2 | 1689.5 | 1506.8 | 1441.0 |
| 40°    | 1982.8 | 1824.4 | 1567.7 | 1380.1 | 1311.3 |
| 42.5°  | 1882.5 | 1713.3 | 1446.2 | 1250.4 | 1184.6 |
| 45°    | 1776.7 | 1599.4 | 1322.0 | 1134.1 | 1070.7 |
| 47.5°  | 1676.3 | 1488.6 | 1203.1 | 1015.2 | 957.1  |
| 50°    | 1565.2 | 1377.6 | 1086.6 | 904.1  | 848.8  |
| 52.5°  | 1456.6 | 1258.3 | 975.6  | 801.1  | 750.9  |
| 55°    | 1350.9 | 1144.7 | 859.1  | 700.7  | 650.5  |
| 57.5°  | 1242.7 | 1031.1 | 756.2  | 608.1  | 565.8  |
| 60°    | 1131.6 | 920.0  | 647.7  | 513.1  | 470.7  |
| 62.5°  | 1023.2 | 811.8  | 555.1  | 428.4  | 407.3  |
| 65°    | 912.2  | 697.9  | 460.1  | 370.3  | 362.1  |
| 67.5°  | 806.4  | 592.1  | 370.3  | 325.1  | 317.3  |
| 70°    | 695.3  | 489.1  | 306.6  | 280.2  | 269.5  |
| 72.5°  | 589.6  | 393.8  | 256.4  | 235.4  | 230.0  |
| 75°    | 486.4  | 301.2  | 211.5  | 193.0  | 190.4  |
| 77.5°  | 383.4  | 214.0  | 166.6  | 155.9  | 150.7  |
| 80°    | 288.1  | 153.4  | 126.8  | 116.4  | 116.4  |
| 82.5°  | 200.8  | 103.2  | 87.2   | 81.9   | 81.9   |
| 85°    | 113.6  | 58.1   | 50.2   | 50.2   | 50.2   |
| 87.5°  | 42.3   | 21.0   | 21.0   | 18.5   | 18.5   |
| 90°    | 2.3    | 29.6   | 49.2   | 61.8   | 66.4   |
| 92.5°  | 61.8   | 51.8   | 59.2   | 64.1   | 66.4   |
| 95°    | 160.2  | 78.8   | 96.0   | 108.7  | 106.0  |
| 97.5°  | 288.4  | 86.3   | 125.6  | 133.2  | 135.6  |
| 100°   | 436.6  | 98.7   | 140.6  | 160.2  | 165.2  |
| 102.5° | 599.1  | 594.5  | 145.5  | 172.5  | 180.0  |
| 105°   | 749.7  | 823.7  | 150.6  | 177.4  | 187.4  |
| 107.5° | 924.8  | 986.3  | 155.5  | 182.5  | 192.4  |
| 110°   | 1092.5 | 1144.1 | 431.6  | 185.1  | 194.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1250.3 | 1294.6 | 1252.8 | 189.7  | 197.4  |
| 115°   | 1417.9 | 1459.8 | 1521.6 | 379.8  | 202.4  |
| 117.5° | 1563.4 | 1612.7 | 1654.8 | 1301.9 | 656.0  |
| 120°   | 1726.3 | 1763.1 | 1807.6 | 1837.2 | 1504.3 |
| 122.5° | 1864.2 | 1903.7 | 1953.2 | 1967.8 | 1970.4 |
| 125°   | 2004.8 | 2037.0 | 2083.8 | 2101.1 | 2108.4 |
| 127.5° | 2133.0 | 2167.5 | 2204.7 | 2229.3 | 2231.7 |
| 130°   | 2253.9 | 2293.5 | 2320.4 | 2347.6 | 2345.3 |
| 132.5° | 2377.2 | 2409.4 | 2436.3 | 2458.6 | 2456.2 |
| 135°   | 2480.9 | 2520.4 | 2542.4 | 2567.2 | 2562.3 |
| 137.5° | 2589.2 | 2618.8 | 2643.7 | 2668.3 | 2660.9 |
| 140°   | 2695.2 | 2715.2 | 2742.0 | 2764.3 | 2752.0 |
| 142.5° | 2784.2 | 2801.5 | 2833.4 | 2853.0 | 2840.8 |
| 145°   | 2877.9 | 2875.3 | 2917.2 | 2934.5 | 2922.2 |
| 147.5° | 2959.0 | 2951.7 | 2993.6 | 3005.9 | 2996.3 |
| 150°   | 3038.1 | 3020.8 | 3060.4 | 3075.0 | 3062.7 |
| 152.5° | 3104.5 | 3084.9 | 3121.9 | 3136.7 | 3119.5 |
| 155°   | 3168.8 | 3146.7 | 3176.3 | 3191.0 | 3171.4 |
| 157.5° | 3220.6 | 3201.0 | 3223.2 | 3240.4 | 3220.6 |
| 160°   | 3265.1 | 3250.1 | 3265.1 | 3279.7 | 3262.5 |
| 162.5° | 3304.3 | 3289.6 | 3301.9 | 3319.2 | 3297.0 |
| 165°   | 3338.8 | 3324.2 | 3331.5 | 3348.8 | 3331.5 |
| 167.5° | 3366.1 | 3351.1 | 3358.8 | 3376.1 | 3353.7 |
| 170°   | 3388.3 | 3373.4 | 3378.4 | 3395.7 | 3373.4 |
| 172.5° | 3402.9 | 3388.3 | 3393.3 | 3410.6 | 3388.3 |
| 175°   | 3415.2 | 3398.0 | 3402.9 | 3420.3 | 3395.7 |
| 177.5° | 3420.3 | 3402.9 | 3405.7 | 3422.9 | 3400.6 |
| 180°   | 3408.0 | 3408.0 | 3408.0 | 3408.0 | 3408.0 |

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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 | 8.56             | 9.30  | 9.62  | 10.36 | 11.80 | 4.53           | 5.27 | 5.60 | 6.33 | 7.77  |
|                 | 3H   | 10.23            | 10.89 | 11.30 | 11.96 | 13.42 | 5.72           | 6.38 | 6.79 | 7.45 | 8.91  |
|                 | 4H   | 10.84            | 11.46 | 11.92 | 12.53 | 14.00 | 6.16           | 6.79 | 7.25 | 7.86 | 9.33  |
|                 | 6H   | 11.25            | 11.83 | 12.35 | 12.90 | 14.38 | 6.48           | 7.06 | 7.57 | 8.13 | 9.61  |
|                 | 8H   | 11.38            | 11.93 | 12.47 | 13.02 | 14.49 | 6.57           | 7.12 | 7.67 | 8.21 | 9.68  |
|                 | 12H  | 11.44            | 11.96 | 12.54 | 13.04 | 14.54 | 6.61           | 7.13 | 7.71 | 8.22 | 9.71  |
| 4H              | 2H   | 8.57             | 9.19  | 9.66  | 10.26 | 11.73 | 5.12           | 5.74 | 6.21 | 6.82 | 8.28  |
|                 | 3H   | 10.39            | 10.91 | 11.49 | 12.01 | 13.49 | 6.46           | 6.98 | 7.56 | 8.08 | 9.56  |
|                 | 4H   | 11.08            | 11.56 | 12.18 | 12.64 | 14.14 | 7.01           | 7.48 | 8.11 | 8.57 | 10.07 |
|                 | 6H   | 11.59            | 12.00 | 12.70 | 13.11 | 14.60 | 7.42           | 7.83 | 8.53 | 8.94 | 10.44 |
|                 | 8H   | 11.76            | 12.15 | 12.87 | 13.25 | 14.76 | 7.55           | 7.93 | 8.66 | 9.04 | 10.55 |
|                 | 12H  | 11.85            | 12.20 | 12.98 | 13.32 | 14.83 | 7.61           | 7.96 | 8.74 | 9.08 | 10.59 |
| 8H              | 4H   | 11.04            | 11.42 | 12.15 | 12.53 | 14.03 | 7.28           | 7.66 | 8.39 | 8.77 | 10.28 |
|                 | 6H   | 11.60            | 11.92 | 12.73 | 13.07 | 14.57 | 7.80           | 8.11 | 8.93 | 9.26 | 10.76 |
|                 | 8H   | 11.82            | 12.10 | 12.96 | 13.22 | 14.75 | 7.99           | 8.27 | 9.13 | 9.39 | 10.92 |
|                 | 12H  | 11.96            | 12.20 | 13.10 | 13.32 | 14.88 | 8.11           | 8.35 | 9.25 | 9.47 | 11.03 |
| 12H             | 4H   | 10.99            | 11.33 | 12.11 | 12.45 | 13.96 | 7.28           | 7.63 | 8.41 | 8.74 | 10.26 |
|                 | 6H   | 11.58            | 11.85 | 12.72 | 12.98 | 14.51 | 7.85           | 8.12 | 8.98 | 9.25 | 10.78 |
|                 | 8H   | 11.80            | 12.04 | 12.94 | 13.16 | 14.72 | 8.06           | 8.30 | 9.20 | 9.42 | 10.98 |

END OF REPORT