

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: P927726

Luminaire Tested: DFN2DIP-HX4F0-090D100US840-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927726  
REPORT IS A COMBINATION OF REPORTS P900938 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-090D100US840-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

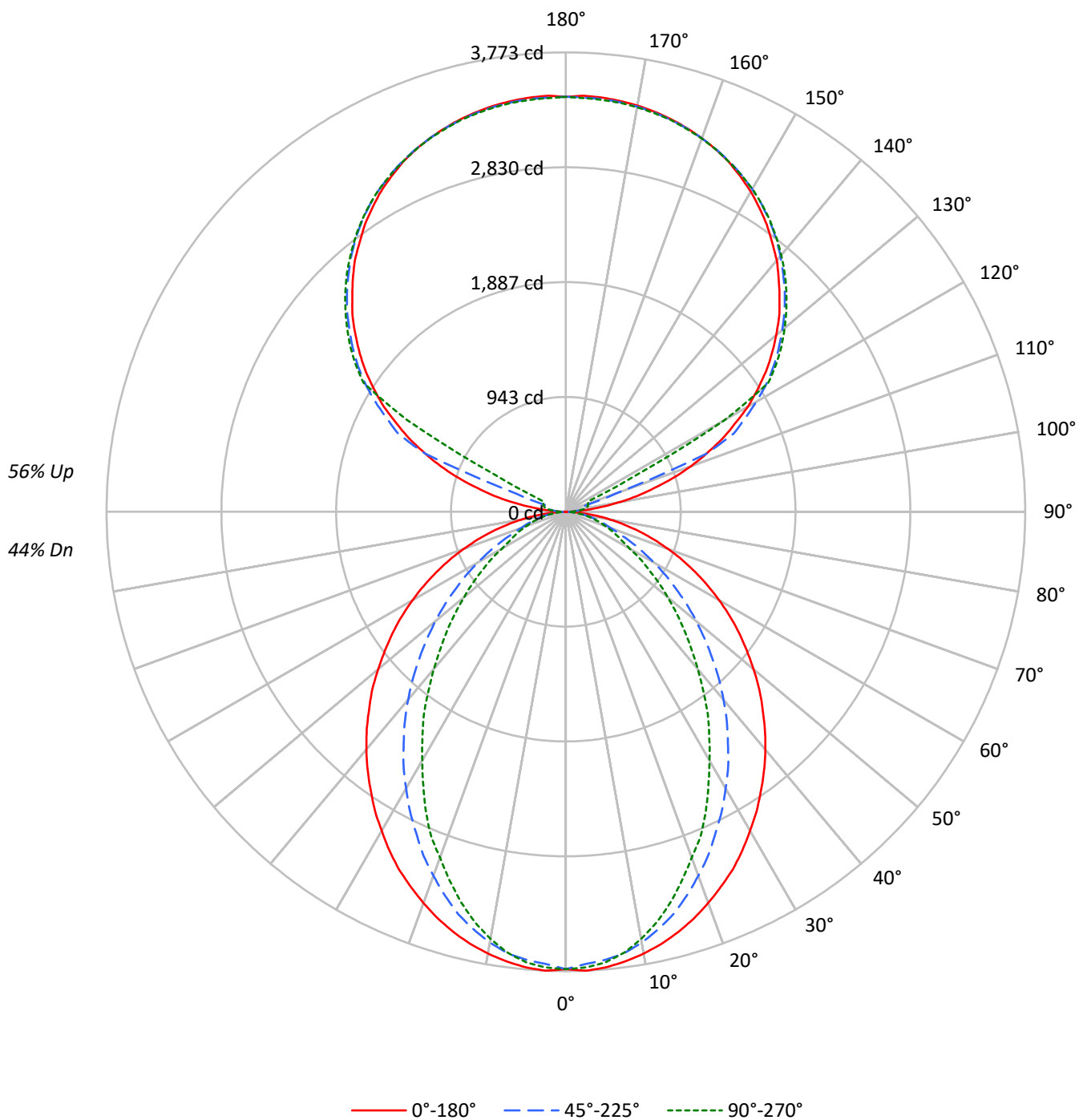
Lumens per Lamp: N/A  
Luminaire Lumens: 17722.1 lumens  
Efficiency: N/A  
Efficacy: 107.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 164.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 97  | 93  | 89  | 86  | 88 | 85 | 82 | 79 | 71 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 |
| 2   | 88  | 81  | 76  | 71  | 81 | 75 | 70 | 65 | 62 | 59 | 56 | 51 | 48 | 46 | 40 | 39 | 37 |
| 3   | 81  | 72  | 65  | 59  | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 45 | 42 | 39 | 36 | 34 | 32 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 49 | 44 | 41 | 41 | 37 | 34 | 32 | 30 | 28 |
| 5   | 68  | 57  | 49  | 43  | 62 | 53 | 46 | 41 | 44 | 39 | 35 | 37 | 33 | 30 | 29 | 27 | 25 |
| 6   | 63  | 51  | 43  | 38  | 58 | 47 | 41 | 36 | 40 | 35 | 31 | 33 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 39  | 33  | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 25 | 22 | 20 |
| 8   | 54  | 42  | 35  | 30  | 50 | 39 | 32 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 |
| 9   | 50  | 39  | 31  | 26  | 46 | 36 | 29 | 25 | 31 | 25 | 22 | 26 | 22 | 19 | 21 | 18 | 16 |
| 10  | 47  | 35  | 28  | 24  | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2793 | 2793 | 2793 |
| 5°  | 2798 | 2749 | 2766 |
| 10° | 2770 | 2695 | 2676 |
| 15° | 2732 | 2606 | 2537 |
| 20° | 2682 | 2484 | 2367 |
| 25° | 2631 | 2346 | 2202 |
| 30° | 2562 | 2206 | 1993 |
| 35° | 2494 | 2054 | 1809 |
| 40° | 2425 | 1897 | 1599 |
| 45° | 2345 | 1723 | 1408 |
| 50° | 2262 | 1548 | 1221 |
| 55° | 2176 | 1360 | 1042 |
| 60° | 2076 | 1163 | 858  |
| 65° | 1961 | 964  | 772  |
| 70° | 1821 | 777  | 699  |
| 75° | 1646 | 686  | 636  |
| 80° | 1393 | 576  | 553  |
| 85° | 973  | 386  | 416  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2345 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 352.0   | 2.0       |
| 10°-20°   | 966.4   | 5.5       |
| 20°-30°   | 1356.8  | 7.7       |
| 30°-40°   | 1479.0  | 8.3       |
| 40°-50°   | 1359.4  | 7.7       |
| 50°-60°   | 1067.6  | 6.0       |
| 60°-70°   | 694.9   | 3.9       |
| 70°-80°   | 357.7   | 2.0       |
| 80°-90°   | 97.3    | 0.5       |
| 90°-100°  | 112.4   | 0.6       |
| 100°-110° | 418.9   | 2.4       |
| 110°-120° | 1111.0  | 6.3       |
| 120°-130° | 1842.7  | 10.4      |
| 130°-140° | 1957.4  | 11.0      |
| 140°-150° | 1819.2  | 10.3      |
| 150°-160° | 1462.6  | 8.3       |
| 160°-170° | 942.4   | 5.3       |
| 170°-180° | 324.4   | 1.8       |
| 0°-30°    | 2675.2  | 15.1      |
| 0°-40°    | 4154.2  | 23.4      |
| 0°-60°    | 6581.1  | 37.1      |
| 0°-90°    | 7731.0  | 43.6      |
| 90°-120°  | 1642.3  | 9.3       |
| 90°-150°  | 7261.7  | 41.0      |
| 90°-180°  | 9991.0  | 56.4      |
| 0°-180°   | 17722.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3756 | 3756  | 3756 | 3756  | 3756 |      |
| 5°   | 3756 | 3739  | 3695 | 3726  | 3715 | 356  |
| 15°  | 3573 | 3535  | 3420 | 3355  | 3321 | 1007 |
| 25°  | 3243 | 3134  | 2910 | 2770  | 2719 | 1491 |
| 35°  | 2794 | 2621  | 2322 | 2108  | 2033 | 1749 |
| 45°  | 2284 | 2056  | 1700 | 1458  | 1377 | 1764 |
| 55°  | 1737 | 1472  | 1105 | 901   | 836  | 1552 |
| 65°  | 1173 | 897   | 591  | 476   | 466  | 1163 |
| 75°  | 625  | 387   | 272  | 248   | 245  | 661  |
| 85°  | 146  | 75    | 64   | 64    | 64   | 168  |
| 90°  | 2    | 30    | 49   | 62    | 66   | 17   |
| 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°     | 3756.2 | 3756.2 | 3756.2 | 3756.2 | 3756.2 |
| 2.5°   | 3773.1 | 3756.2 | 3718.6 | 3752.9 | 3746.1 |
| 5°     | 3756.2 | 3739.2 | 3694.9 | 3725.5 | 3715.4 |
| 7.5°   | 3725.5 | 3705.3 | 3657.7 | 3671.0 | 3654.1 |
| 10°    | 3684.8 | 3660.9 | 3593.2 | 3582.7 | 3562.5 |
| 12.5°  | 3633.9 | 3603.3 | 3511.3 | 3491.1 | 3453.5 |
| 15°    | 3572.6 | 3535.1 | 3419.7 | 3355.1 | 3321.2 |
| 17.5°  | 3501.2 | 3446.8 | 3303.9 | 3229.2 | 3174.8 |
| 20°    | 3419.7 | 3351.5 | 3181.6 | 3096.9 | 3021.8 |
| 22.5°  | 3331.3 | 3253.1 | 3055.8 | 2940.3 | 2889.5 |
| 25°    | 3243.0 | 3134.0 | 2909.7 | 2770.5 | 2719.3 |
| 27.5°  | 3137.7 | 3021.8 | 2773.7 | 2614.0 | 2535.7 |
| 30°    | 3025.5 | 2896.0 | 2624.1 | 2451.0 | 2359.0 |
| 32.5°  | 2916.5 | 2760.0 | 2481.6 | 2277.5 | 2192.4 |
| 35°    | 2794.3 | 2620.8 | 2321.8 | 2107.7 | 2032.6 |
| 37.5°  | 2675.3 | 2488.1 | 2172.2 | 1937.4 | 1852.7 |
| 40°    | 2549.4 | 2345.7 | 2015.7 | 1774.4 | 1686.1 |
| 42.5°  | 2420.3 | 2202.9 | 1859.4 | 1607.8 | 1523.0 |
| 45°    | 2284.4 | 2056.5 | 1699.7 | 1458.1 | 1376.6 |
| 47.5°  | 2155.2 | 1914.0 | 1546.8 | 1305.2 | 1230.5 |
| 50°    | 2012.4 | 1771.1 | 1397.2 | 1162.4 | 1091.3 |
| 52.5°  | 1872.9 | 1617.9 | 1254.4 | 1030.0 | 965.5  |
| 55°    | 1736.9 | 1471.8 | 1104.6 | 900.9  | 836.3  |
| 57.5°  | 1597.7 | 1325.8 | 972.3  | 781.9  | 727.5  |
| 60°    | 1454.8 | 1182.9 | 832.8  | 659.6  | 605.2  |
| 62.5°  | 1315.7 | 1043.7 | 713.7  | 550.7  | 523.7  |
| 65°    | 1172.8 | 897.3  | 591.4  | 476.0  | 465.6  |
| 67.5°  | 1036.9 | 761.3  | 476.0  | 418.0  | 407.9  |
| 70°    | 894.1  | 629.0  | 394.2  | 360.3  | 346.6  |
| 72.5°  | 758.1  | 506.3  | 329.6  | 302.5  | 295.8  |
| 75°    | 625.4  | 387.4  | 271.9  | 248.1  | 244.9  |
| 77.5°  | 493.0  | 275.2  | 214.2  | 200.5  | 193.7  |
| 80°    | 370.4  | 197.3  | 163.0  | 149.7  | 149.7  |
| 82.5°  | 258.2  | 132.7  | 112.2  | 105.3  | 105.3  |
| 85°    | 146.0  | 74.6   | 64.5   | 64.5   | 64.5   |
| 87.5°  | 54.4   | 27.1   | 27.1   | 23.8   | 23.8   |
| 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 | 10.09            | 10.87 | 11.11 | 11.89 | 13.25 | 6.06           | 6.84 | 7.08  | 7.87  | 9.23  |
|                 | 3H   | 11.77            | 12.46 | 12.79 | 13.49 | 14.88 | 7.25           | 7.95 | 8.28  | 8.98  | 10.36 |
|                 | 4H   | 12.37            | 13.03 | 13.41 | 14.07 | 15.46 | 7.70           | 8.36 | 8.74  | 9.39  | 10.78 |
|                 | 6H   | 12.79            | 13.40 | 13.84 | 14.44 | 15.84 | 8.02           | 8.63 | 9.07  | 9.66  | 11.07 |
|                 | 8H   | 12.92            | 13.50 | 13.97 | 14.55 | 15.95 | 8.11           | 8.69 | 9.16  | 9.74  | 11.14 |
|                 | 12H  | 12.98            | 13.53 | 14.04 | 14.57 | 15.99 | 8.15           | 8.70 | 9.21  | 9.75  | 11.17 |
| 4H              | 2H   | 10.10            | 10.76 | 11.15 | 11.80 | 13.19 | 6.65           | 7.31 | 7.70  | 8.35  | 9.74  |
|                 | 3H   | 11.93            | 12.48 | 12.98 | 13.54 | 14.94 | 8.00           | 8.55 | 9.05  | 9.61  | 11.01 |
|                 | 4H   | 12.62            | 13.12 | 13.68 | 14.18 | 15.60 | 8.55           | 9.05 | 9.61  | 10.10 | 11.53 |
|                 | 6H   | 13.13            | 13.56 | 14.20 | 14.64 | 16.06 | 8.97           | 9.40 | 10.04 | 10.47 | 11.89 |
|                 | 8H   | 13.31            | 13.71 | 14.38 | 14.78 | 16.21 | 9.10           | 9.50 | 10.17 | 10.57 | 12.00 |
|                 | 12H  | 13.40            | 13.77 | 14.49 | 14.85 | 16.29 | 9.16           | 9.52 | 10.25 | 10.61 | 12.05 |
| 8H              | 4H   | 12.58            | 12.99 | 13.65 | 14.05 | 15.49 | 8.83           | 9.23 | 9.89  | 10.30 | 11.73 |
|                 | 6H   | 13.15            | 13.48 | 14.24 | 14.59 | 16.02 | 9.34           | 9.68 | 10.44 | 10.79 | 12.22 |
|                 | 8H   | 13.37            | 13.66 | 14.47 | 14.75 | 16.20 | 9.54           | 9.83 | 10.64 | 10.92 | 12.37 |
|                 | 12H  | 13.50            | 13.76 | 14.61 | 14.85 | 16.34 | 9.66           | 9.91 | 10.76 | 11.00 | 12.49 |
| 12H             | 4H   | 12.53            | 12.90 | 13.62 | 13.98 | 15.42 | 8.83           | 9.19 | 9.91  | 10.27 | 11.71 |
|                 | 6H   | 13.13            | 13.42 | 14.22 | 14.51 | 15.96 | 9.39           | 9.69 | 10.49 | 10.78 | 12.23 |
|                 | 8H   | 13.34            | 13.60 | 14.45 | 14.69 | 16.18 | 9.60           | 9.86 | 10.71 | 10.95 | 12.44 |

END OF REPORT