

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: P903313

Luminaire Tested: DFN2DIP-PN4F0-080D100US830-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903313  
REPORT IS A COMBINATION OF REPORTS P901245 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-080D100US830-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

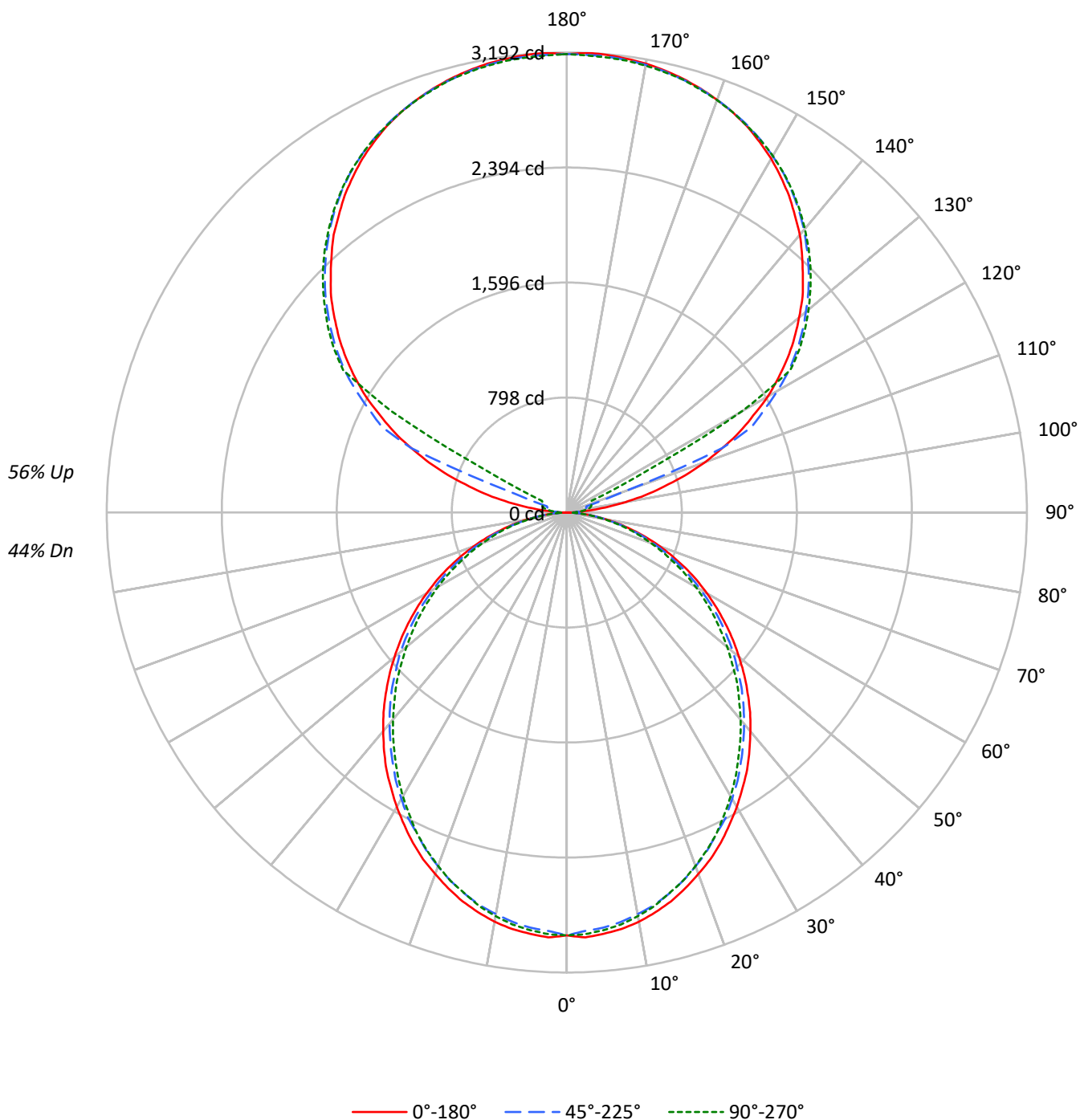
Lumens per Lamp: N/A  
Luminaire Lumens: 16796.1 lumens  
Efficiency: N/A  
Efficacy: 110.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 152.1  
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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 65 | 65 | 65 | 51 | 51 | 51 |
| 1   | 97  | 92  | 88  | 85  | 88 | 85 | 81 | 78 | 70 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 |
| 2   | 88  | 81  | 74  | 69  | 80 | 74 | 69 | 64 | 62 | 58 | 55 | 50 | 48 | 45 | 40 | 38 | 36 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 54 | 50 | 46 | 44 | 41 | 38 | 35 | 33 | 31 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 48 | 43 | 39 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 38 | 34 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 33 | 29 | 32 | 28 | 25 | 26 | 23 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 35 | 28 | 23 | 29 | 24 | 20 | 25 | 20 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 | 23 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2142 | 2142 | 2142 |
| 5°  | 2145 | 2112 | 2127 |
| 10° | 2128 | 2084 | 2098 |
| 15° | 2096 | 2050 | 2054 |
| 20° | 2054 | 2003 | 2008 |
| 25° | 2012 | 1946 | 1955 |
| 30° | 1959 | 1893 | 1888 |
| 35° | 1909 | 1831 | 1816 |
| 40° | 1848 | 1768 | 1749 |
| 45° | 1787 | 1705 | 1679 |
| 50° | 1720 | 1639 | 1599 |
| 55° | 1649 | 1562 | 1525 |
| 60° | 1570 | 1471 | 1441 |
| 65° | 1484 | 1377 | 1341 |
| 70° | 1373 | 1263 | 1234 |
| 75° | 1221 | 1126 | 1136 |
| 80° | 1037 | 951  | 947  |
| 85° | 750  | 649  | 634  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1787 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.1   | 1.6       |
| 10°-20°   | 777.0   | 4.6       |
| 20°-30°   | 1141.8  | 6.8       |
| 30°-40°   | 1326.2  | 7.9       |
| 40°-50°   | 1324.5  | 7.9       |
| 50°-60°   | 1155.0  | 6.9       |
| 60°-70°   | 853.8   | 5.1       |
| 70°-80°   | 483.0   | 2.9       |
| 80°-90°   | 133.1   | 0.8       |
| 90°-100°  | 104.9   | 0.6       |
| 100°-110° | 391.0   | 2.3       |
| 110°-120° | 1037.0  | 6.2       |
| 120°-130° | 1720.0  | 10.2      |
| 130°-140° | 1827.0  | 10.9      |
| 140°-150° | 1698.0  | 10.1      |
| 150°-160° | 1365.2  | 8.1       |
| 160°-170° | 879.7   | 5.2       |
| 170°-180° | 302.8   | 1.8       |
| 0°-30°    | 2195.0  | 13.1      |
| 0°-40°    | 3521.1  | 21.0      |
| 0°-60°    | 6000.6  | 35.7      |
| 0°-90°    | 7470.5  | 44.5      |
| 90°-120°  | 1532.9  | 9.1       |
| 90°-150°  | 6778.0  | 40.4      |
| 90°-180°  | 9326.0  | 55.5      |
| 0°-180°   | 16796.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2934 | 2934  | 2934 | 2934  | 2934 |      |
| 5°   | 2934 | 2923  | 2892 | 2914  | 2909 | 279  |
| 15°  | 2793 | 2776  | 2739 | 2751  | 2737 | 787  |
| 25°  | 2528 | 2505  | 2458 | 2463  | 2458 | 1163 |
| 35°  | 2181 | 2153  | 2108 | 2090  | 2076 | 1362 |
| 45°  | 1775 | 1755  | 1712 | 1682  | 1670 | 1370 |
| 55°  | 1343 | 1326  | 1292 | 1258  | 1244 | 1201 |
| 65°  | 906  | 889   | 860  | 835   | 821  | 896  |
| 75°  | 474  | 468   | 454  | 437   | 443  | 506  |
| 85°  | 116  | 113   | 110  | 102   | 99   | 129  |
| 90°  | 2    | 28    | 46   | 58    | 62   | 15   |
| 95°  | 150  | 74    | 90   | 101   | 99   | 177  |
| 105° | 700  | 769   | 140  | 166   | 175  | 748  |
| 115° | 1323 | 1362  | 1420 | 354   | 189  | 1303 |
| 125° | 1871 | 1901  | 1945 | 1961  | 1968 | 1669 |
| 135° | 2316 | 2352  | 2373 | 2396  | 2392 | 1789 |
| 145° | 2686 | 2684  | 2723 | 2739  | 2728 | 1680 |
| 155° | 2958 | 2937  | 2965 | 2978  | 2960 | 1363 |
| 165° | 3116 | 3103  | 3110 | 3126  | 3110 | 880  |
| 175° | 3188 | 3172  | 3176 | 3192  | 3170 | 303  |
| 180° | 3181 | 3181  | 3181 | 3181  | 3181 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2933.9 | 2933.9 | 2933.9 | 2933.9 | 2933.9 |
| 2.5°   | 2951.0 | 2937.0 | 2905.9 | 2933.9 | 2928.6 |
| 5°     | 2933.9 | 2922.9 | 2891.8 | 2914.2 | 2908.9 |
| 7.5°   | 2914.2 | 2897.5 | 2866.4 | 2889.1 | 2883.4 |
| 10°    | 2883.4 | 2863.6 | 2829.8 | 2852.2 | 2843.9 |
| 12.5°  | 2840.9 | 2824.1 | 2790.3 | 2804.3 | 2798.7 |
| 15°    | 2793.0 | 2776.3 | 2739.4 | 2750.8 | 2736.8 |
| 17.5°  | 2733.7 | 2717.0 | 2680.1 | 2694.3 | 2680.1 |
| 20°    | 2668.8 | 2652.0 | 2612.5 | 2620.9 | 2609.8 |
| 22.5°  | 2604.2 | 2578.7 | 2541.8 | 2541.8 | 2536.2 |
| 25°    | 2527.8 | 2505.4 | 2457.5 | 2462.9 | 2457.5 |
| 27.5°  | 2443.1 | 2423.4 | 2386.8 | 2378.4 | 2364.4 |
| 30°    | 2358.7 | 2335.9 | 2293.8 | 2285.4 | 2274.0 |
| 32.5°  | 2268.3 | 2251.5 | 2206.3 | 2189.2 | 2177.9 |
| 35°    | 2180.9 | 2152.8 | 2107.5 | 2090.5 | 2076.4 |
| 37.5°  | 2082.1 | 2056.6 | 2011.5 | 1991.7 | 1977.6 |
| 40°    | 1980.7 | 1957.8 | 1912.7 | 1887.5 | 1876.1 |
| 42.5°  | 1881.9 | 1859.1 | 1814.2 | 1785.7 | 1769.1 |
| 45°    | 1774.7 | 1754.9 | 1712.4 | 1681.6 | 1670.3 |
| 47.5°  | 1670.3 | 1650.5 | 1605.2 | 1574.1 | 1557.4 |
| 50°    | 1560.1 | 1546.1 | 1506.5 | 1467.0 | 1452.9 |
| 52.5°  | 1452.9 | 1433.1 | 1396.7 | 1365.6 | 1345.8 |
| 55°    | 1343.0 | 1326.0 | 1292.2 | 1258.4 | 1244.3 |
| 57.5°  | 1232.9 | 1218.9 | 1182.0 | 1148.2 | 1136.8 |
| 60°    | 1122.8 | 1111.7 | 1072.1 | 1041.0 | 1032.6 |
| 62.5°  | 1015.6 | 995.9  | 967.7  | 939.6  | 928.2  |
| 65°    | 905.8  | 888.7  | 860.5  | 835.1  | 821.0  |
| 67.5°  | 792.9  | 778.5  | 753.4  | 733.7  | 722.3  |
| 70°    | 688.4  | 677.0  | 651.7  | 631.9  | 620.8  |
| 72.5°  | 581.3  | 570.0  | 555.8  | 536.1  | 527.7  |
| 75°    | 473.8  | 468.4  | 454.1  | 437.3  | 443.0  |
| 77.5°  | 378.1  | 366.6  | 361.0  | 352.6  | 344.2  |
| 80°    | 282.3  | 279.3  | 273.6  | 265.2  | 259.5  |
| 82.5°  | 191.9  | 191.9  | 189.2  | 177.8  | 177.8  |
| 85°    | 115.6  | 112.8  | 110.2  | 101.5  | 98.8   |
| 87.5°  | 50.9   | 45.2   | 39.5   | 31.1   | 28.2   |
| 90°    | 2.2    | 27.6   | 45.9   | 57.7   | 62.0   |
| 92.5°  | 57.7   | 48.4   | 55.2   | 59.9   | 62.0   |
| 95°    | 149.5  | 73.5   | 89.6   | 101.4  | 99.0   |
| 97.5°  | 269.2  | 80.6   | 117.3  | 124.3  | 126.6  |
| 100°   | 407.6  | 92.1   | 131.2  | 149.5  | 154.2  |
| 102.5° | 559.2  | 554.9  | 135.8  | 161.0  | 168.1  |
| 105°   | 699.7  | 768.8  | 140.5  | 165.6  | 174.9  |
| 107.5° | 863.2  | 920.6  | 145.2  | 170.3  | 179.6  |
| 110°   | 1019.7 | 1067.9 | 402.8  | 172.8  | 181.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1167.1 | 1208.3 | 1169.3 | 177.1  | 184.3  |
| 115°   | 1323.4 | 1362.5 | 1420.2 | 354.5  | 188.9  |
| 117.5° | 1459.2 | 1505.2 | 1544.5 | 1215.2 | 612.3  |
| 120°   | 1611.3 | 1645.7 | 1687.2 | 1714.9 | 1404.1 |
| 122.5° | 1740.0 | 1776.9 | 1823.1 | 1836.7 | 1839.2 |
| 125°   | 1871.2 | 1901.3 | 1945.0 | 1961.1 | 1967.9 |
| 127.5° | 1990.9 | 2023.2 | 2057.9 | 2080.9 | 2083.0 |
| 130°   | 2103.8 | 2140.7 | 2165.9 | 2191.2 | 2189.1 |
| 132.5° | 2218.8 | 2248.9 | 2274.1 | 2294.8 | 2292.6 |
| 135°   | 2315.6 | 2352.5 | 2373.0 | 2396.2 | 2391.6 |
| 137.5° | 2416.8 | 2444.4 | 2467.6 | 2490.6 | 2483.7 |
| 140°   | 2515.6 | 2534.3 | 2559.4 | 2580.2 | 2568.7 |
| 142.5° | 2598.8 | 2614.9 | 2644.7 | 2663.0 | 2651.6 |
| 145°   | 2686.2 | 2683.8 | 2722.9 | 2739.0 | 2727.5 |
| 147.5° | 2761.9 | 2755.1 | 2794.2 | 2805.7 | 2796.7 |
| 150°   | 2835.7 | 2819.6 | 2856.6 | 2870.2 | 2858.7 |
| 152.5° | 2897.8 | 2879.5 | 2914.0 | 2927.8 | 2911.7 |
| 155°   | 2957.7 | 2937.2 | 2964.8 | 2978.4 | 2960.1 |
| 157.5° | 3006.1 | 2987.8 | 3008.5 | 3024.6 | 3006.1 |
| 160°   | 3047.6 | 3033.7 | 3047.6 | 3061.3 | 3045.2 |
| 162.5° | 3084.2 | 3070.5 | 3082.0 | 3098.1 | 3077.4 |
| 165°   | 3116.4 | 3102.8 | 3109.6 | 3125.8 | 3109.6 |
| 167.5° | 3141.9 | 3127.9 | 3135.1 | 3151.2 | 3130.4 |
| 170°   | 3162.6 | 3148.8 | 3153.4 | 3169.5 | 3148.8 |
| 172.5° | 3176.3 | 3162.6 | 3167.3 | 3183.4 | 3162.6 |
| 175°   | 3187.8 | 3171.7 | 3176.3 | 3192.5 | 3169.5 |
| 177.5° | 3192.5 | 3176.3 | 3178.8 | 3194.9 | 3174.1 |
| 180°   | 3181.0 | 3181.0 | 3181.0 | 3181.0 | 3181.0 |

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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 | 9.39             | 10.21 | 10.40 | 11.22 | 12.57 | 8.95           | 9.77  | 9.95  | 10.78 | 12.13 |
|                 | 3H   | 11.05            | 11.78 | 12.07 | 12.80 | 14.17 | 10.57          | 11.30 | 11.58 | 12.32 | 13.69 |
|                 | 4H   | 11.64            | 12.33 | 12.67 | 13.36 | 14.73 | 11.15          | 11.84 | 12.18 | 12.87 | 14.24 |
|                 | 6H   | 12.04            | 12.68 | 13.08 | 13.71 | 15.09 | 11.55          | 12.18 | 12.58 | 13.21 | 14.60 |
|                 | 8H   | 12.14            | 12.75 | 13.19 | 13.80 | 15.18 | 11.65          | 12.26 | 12.69 | 13.30 | 14.69 |
|                 | 12H  | 12.19            | 12.77 | 13.24 | 13.81 | 15.22 | 11.69          | 12.27 | 12.74 | 13.31 | 14.72 |
| 4H              | 2H   | 9.85             | 10.54 | 10.88 | 11.56 | 12.94 | 9.50           | 10.19 | 10.53 | 11.21 | 12.59 |
|                 | 3H   | 11.71            | 12.29 | 12.75 | 13.34 | 14.73 | 11.31          | 11.89 | 12.35 | 12.94 | 14.33 |
|                 | 4H   | 12.43            | 12.96 | 13.47 | 14.00 | 15.41 | 12.01          | 12.54 | 13.06 | 13.58 | 14.99 |
|                 | 6H   | 12.94            | 13.40 | 14.00 | 14.47 | 15.87 | 12.52          | 12.97 | 13.58 | 14.04 | 15.45 |
|                 | 8H   | 13.09            | 13.52 | 14.15 | 14.58 | 16.00 | 12.66          | 13.09 | 13.72 | 14.15 | 15.57 |
|                 | 12H  | 13.16            | 13.55 | 14.24 | 14.62 | 16.05 | 12.72          | 13.11 | 13.80 | 14.18 | 15.61 |
| 8H              | 4H   | 12.62            | 13.04 | 13.68 | 14.11 | 15.53 | 12.25          | 12.67 | 13.31 | 13.73 | 15.16 |
|                 | 6H   | 13.25            | 13.60 | 14.33 | 14.71 | 16.13 | 12.88          | 13.23 | 13.96 | 14.33 | 15.75 |
|                 | 8H   | 13.48            | 13.78 | 14.56 | 14.87 | 16.31 | 13.09          | 13.40 | 14.18 | 14.48 | 15.92 |
|                 | 12H  | 13.61            | 13.88 | 14.70 | 14.96 | 16.44 | 13.20          | 13.48 | 14.30 | 14.56 | 16.04 |
| 12H             | 4H   | 12.60            | 12.99 | 13.68 | 14.06 | 15.49 | 12.24          | 12.62 | 13.32 | 13.70 | 15.13 |
|                 | 6H   | 13.28            | 13.59 | 14.37 | 14.68 | 16.12 | 12.92          | 13.23 | 14.01 | 14.31 | 15.75 |
|                 | 8H   | 13.52            | 13.80 | 14.62 | 14.88 | 16.36 | 13.15          | 13.42 | 14.24 | 14.50 | 15.98 |

END OF REPORT