

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: P914023

Luminaire Tested: DFN2DIP-PN3F0-080D080US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914023  
REPORT IS A COMBINATION OF REPORTS P901112 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-080D080US927-RLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

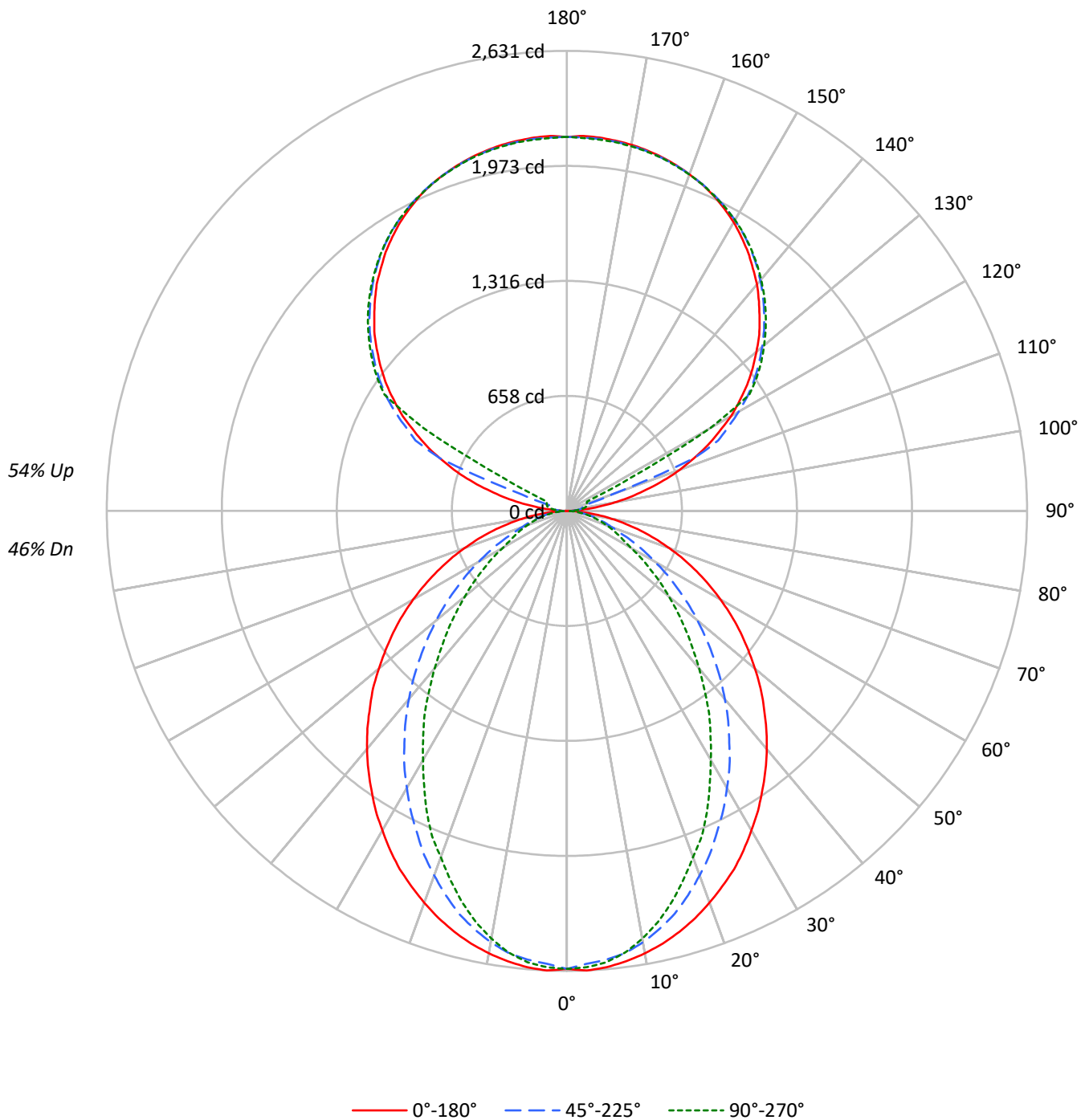
Lumens per Lamp: N/A  
Luminaire Lumens: 11660.9 lumens  
Efficiency: N/A  
Efficacy: 82.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 141.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |    |    | 46 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |    |    | 40 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |    |    | 34 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |    |    | 29 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |    |    | 26 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |    |    | 23 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |    |    | 20 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |    |    | 18 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |    |    | 16 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |    |    | 15 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |    |    | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3062 | 3062 | 3062 |
| 5°  | 3065 | 3011 | 3031 |
| 10° | 3033 | 2950 | 2931 |
| 15° | 2989 | 2850 | 2778 |
| 20° | 2932 | 2714 | 2590 |
| 25° | 2874 | 2561 | 2408 |
| 30° | 2796 | 2405 | 2178 |
| 35° | 2719 | 2238 | 1976 |
| 40° | 2642 | 2064 | 1745 |
| 45° | 2551 | 1872 | 1535 |
| 50° | 2458 | 1679 | 1330 |
| 55° | 2360 | 1472 | 1134 |
| 60° | 2247 | 1256 | 932  |
| 65° | 2116 | 1037 | 837  |
| 70° | 1958 | 833  | 756  |
| 75° | 1759 | 729  | 685  |
| 80° | 1471 | 605  | 589  |
| 85° | 1000 | 394  | 435  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2551 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 245.5   | 2.1       |
| 10°-20°   | 673.9   | 5.8       |
| 20°-30°   | 946.1   | 8.1       |
| 30°-40°   | 1031.3  | 8.8       |
| 40°-50°   | 947.9   | 8.1       |
| 50°-60°   | 744.4   | 6.4       |
| 60°-70°   | 484.5   | 4.2       |
| 70°-80°   | 249.4   | 2.1       |
| 80°-90°   | 67.4    | 0.6       |
| 90°-100°  | 70.5    | 0.6       |
| 100°-110° | 262.9   | 2.3       |
| 110°-120° | 697.3   | 6.0       |
| 120°-130° | 1156.5  | 9.9       |
| 130°-140° | 1228.4  | 10.5      |
| 140°-150° | 1141.7  | 9.8       |
| 150°-160° | 917.9   | 7.9       |
| 160°-170° | 591.5   | 5.1       |
| 170°-180° | 203.6   | 1.7       |
| 0°-30°    | 1865.5  | 16.0      |
| 0°-40°    | 2896.8  | 24.8      |
| 0°-60°    | 4589.2  | 39.4      |
| 0°-90°    | 5390.6  | 46.2      |
| 90°-120°  | 1030.7  | 8.8       |
| 90°-150°  | 4557.3  | 39.1      |
| 90°-180°  | 6270.0  | 53.8      |
| 0°-180°   | 11660.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2619 | 2619  | 2619 | 2619  | 2619 |      |
| 5°   | 2619 | 2608  | 2576 | 2598  | 2591 | 248  |
| 15°  | 2491 | 2465  | 2385 | 2340  | 2316 | 702  |
| 25°  | 2261 | 2186  | 2029 | 1932  | 1896 | 1040 |
| 35°  | 1948 | 1828  | 1619 | 1470  | 1417 | 1220 |
| 45°  | 1593 | 1434  | 1185 | 1017  | 960  | 1230 |
| 55°  | 1211 | 1026  | 770  | 628   | 583  | 1082 |
| 65°  | 818  | 626   | 412  | 332   | 325  | 811  |
| 75°  | 436  | 270   | 190  | 173   | 171  | 461  |
| 85°  | 102  | 52    | 45   | 45    | 45   | 117  |
| 90°  | 2    | 18    | 31   | 39    | 42   | 11   |
| 95°  | 100  | 49    | 60   | 68    | 66   | 119  |
| 105° | 470  | 517   | 94   | 111   | 118  | 503  |
| 115° | 890  | 916   | 955  | 238   | 127  | 876  |
| 125° | 1258 | 1278  | 1308 | 1319  | 1323 | 1122 |
| 135° | 1557 | 1582  | 1596 | 1611  | 1608 | 1203 |
| 145° | 1806 | 1804  | 1831 | 1842  | 1834 | 1130 |
| 155° | 1989 | 1975  | 1993 | 2003  | 1990 | 916  |
| 165° | 2096 | 2086  | 2091 | 2102  | 2091 | 592  |
| 175° | 2143 | 2133  | 2136 | 2146  | 2131 | 204  |
| 180° | 2139 | 2139  | 2139 | 2139  | 2139 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2619.3 | 2619.3 | 2619.3 | 2619.3 | 2619.3 |
| 2.5°   | 2631.1 | 2619.3 | 2593.1 | 2617.0 | 2612.2 |
| 5°     | 2619.3 | 2607.5 | 2576.5 | 2597.9 | 2590.8 |
| 7.5°   | 2597.9 | 2583.8 | 2550.6 | 2559.9 | 2548.1 |
| 10°    | 2569.4 | 2552.9 | 2505.6 | 2498.3 | 2484.2 |
| 12.5°  | 2534.0 | 2512.6 | 2448.5 | 2434.4 | 2408.2 |
| 15°    | 2491.3 | 2465.1 | 2384.6 | 2339.6 | 2315.9 |
| 17.5°  | 2441.4 | 2403.5 | 2303.9 | 2251.9 | 2213.8 |
| 20°    | 2384.6 | 2337.1 | 2218.7 | 2159.6 | 2107.2 |
| 22.5°  | 2323.0 | 2268.4 | 2130.9 | 2050.4 | 2014.9 |
| 25°    | 2261.4 | 2185.5 | 2029.0 | 1932.0 | 1896.2 |
| 27.5°  | 2187.9 | 2107.2 | 1934.2 | 1822.8 | 1768.2 |
| 30°    | 2109.7 | 2019.4 | 1829.9 | 1709.1 | 1645.0 |
| 32.5°  | 2033.8 | 1924.7 | 1730.5 | 1588.2 | 1528.8 |
| 35°    | 1948.5 | 1827.6 | 1619.1 | 1469.7 | 1417.4 |
| 37.5°  | 1865.5 | 1735.0 | 1514.7 | 1351.0 | 1291.9 |
| 40°    | 1777.8 | 1635.7 | 1405.6 | 1237.3 | 1175.7 |
| 42.5°  | 1687.7 | 1536.1 | 1296.6 | 1121.2 | 1062.0 |
| 45°    | 1592.9 | 1434.0 | 1185.3 | 1016.8 | 960.0  |
| 47.5°  | 1502.9 | 1334.7 | 1078.6 | 910.1  | 858.1  |
| 50°    | 1403.3 | 1235.1 | 974.3  | 810.6  | 761.0  |
| 52.5°  | 1306.0 | 1128.1 | 874.6  | 718.3  | 673.3  |
| 55°    | 1211.2 | 1026.3 | 770.3  | 628.2  | 583.2  |
| 57.5°  | 1114.1 | 924.5  | 678.0  | 545.3  | 507.2  |
| 60°    | 1014.5 | 824.9  | 580.7  | 459.9  | 422.0  |
| 62.5°  | 917.4  | 727.8  | 497.7  | 384.0  | 365.2  |
| 65°    | 817.8  | 625.7  | 412.4  | 332.0  | 324.6  |
| 67.5°  | 723.0  | 530.9  | 332.0  | 291.4  | 284.5  |
| 70°    | 623.4  | 438.6  | 274.9  | 251.2  | 241.7  |
| 72.5°  | 528.6  | 353.1  | 229.9  | 211.0  | 206.2  |
| 75°    | 436.1  | 270.1  | 189.6  | 173.0  | 170.8  |
| 77.5°  | 343.8  | 191.9  | 149.4  | 139.8  | 135.1  |
| 80°    | 258.3  | 137.6  | 113.7  | 104.3  | 104.3  |
| 82.5°  | 180.1  | 92.5   | 78.2   | 73.4   | 73.4   |
| 85°    | 101.9  | 52.0   | 45.0   | 45.0   | 45.0   |
| 87.5°  | 37.9   | 18.9   | 18.9   | 16.6   | 16.6   |
| 90°    | 1.5    | 18.5   | 30.9   | 38.7   | 41.7   |
| 92.5°  | 38.7   | 32.6   | 37.2   | 40.2   | 41.7   |
| 95°    | 100.5  | 49.4   | 60.3   | 68.2   | 66.5   |
| 97.5°  | 181.0  | 54.2   | 78.8   | 83.7   | 85.1   |
| 100°   | 274.0  | 61.9   | 88.2   | 100.5  | 103.6  |
| 102.5° | 376.0  | 373.0  | 91.3   | 108.2  | 113.0  |
| 105°   | 470.5  | 517.0  | 94.4   | 111.4  | 117.6  |
| 107.5° | 580.4  | 618.9  | 97.6   | 114.5  | 120.7  |
| 110°   | 685.7  | 718.0  | 270.9  | 116.1  | 122.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 784.7  | 812.5  | 786.2  | 119.1  | 123.9  |
| 115°   | 889.9  | 916.2  | 954.9  | 238.4  | 127.0  |
| 117.5° | 981.2  | 1012.1 | 1038.5 | 817.1  | 411.7  |
| 120°   | 1083.4 | 1106.5 | 1134.5 | 1153.0 | 944.0  |
| 122.5° | 1169.9 | 1194.8 | 1225.8 | 1235.0 | 1236.7 |
| 125°   | 1258.1 | 1278.3 | 1307.7 | 1318.6 | 1323.2 |
| 127.5° | 1338.6 | 1360.3 | 1383.7 | 1399.1 | 1400.6 |
| 130°   | 1414.5 | 1439.3 | 1456.3 | 1473.4 | 1471.9 |
| 132.5° | 1491.9 | 1512.1 | 1529.1 | 1543.0 | 1541.5 |
| 135°   | 1557.0 | 1581.7 | 1595.5 | 1611.2 | 1608.0 |
| 137.5° | 1625.0 | 1643.5 | 1659.1 | 1674.6 | 1670.0 |
| 140°   | 1691.5 | 1704.0 | 1720.9 | 1734.9 | 1727.1 |
| 142.5° | 1747.4 | 1758.2 | 1778.2 | 1790.6 | 1782.8 |
| 145°   | 1806.2 | 1804.5 | 1830.8 | 1841.7 | 1833.9 |
| 147.5° | 1857.1 | 1852.5 | 1878.7 | 1886.5 | 1880.4 |
| 150°   | 1906.7 | 1895.8 | 1920.6 | 1929.8 | 1922.1 |
| 152.5° | 1948.4 | 1936.1 | 1959.2 | 1968.6 | 1957.8 |
| 155°   | 1988.7 | 1974.9 | 1993.4 | 2002.6 | 1990.4 |
| 157.5° | 2021.2 | 2008.9 | 2022.8 | 2033.7 | 2021.2 |
| 160°   | 2049.1 | 2039.8 | 2049.1 | 2058.3 | 2047.5 |
| 162.5° | 2073.8 | 2064.6 | 2072.3 | 2083.1 | 2069.2 |
| 165°   | 2095.5 | 2086.3 | 2090.9 | 2101.7 | 2090.9 |
| 167.5° | 2112.5 | 2103.2 | 2107.9 | 2118.8 | 2104.8 |
| 170°   | 2126.5 | 2117.1 | 2120.3 | 2131.1 | 2117.1 |
| 172.5° | 2135.7 | 2126.5 | 2129.6 | 2140.5 | 2126.5 |
| 175°   | 2143.4 | 2132.6 | 2135.7 | 2146.5 | 2131.1 |
| 177.5° | 2146.5 | 2135.7 | 2137.3 | 2148.2 | 2134.2 |
| 180°   | 2138.8 | 2138.8 | 2138.8 | 2138.8 | 2138.8 |

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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 | 10.63            | 11.43 | 11.63 | 12.44 | 13.76 | 6.60           | 7.40  | 7.59  | 8.40  | 9.73  |
|                 | 3H   | 12.30            | 13.02 | 13.31 | 14.03 | 15.38 | 7.78           | 8.50  | 8.79  | 9.51  | 10.85 |
|                 | 4H   | 12.91            | 13.58 | 13.92 | 14.60 | 15.95 | 8.22           | 8.90  | 9.24  | 9.92  | 11.27 |
|                 | 6H   | 13.32            | 13.94 | 14.35 | 14.96 | 16.33 | 8.54           | 9.16  | 9.57  | 10.18 | 11.55 |
|                 | 8H   | 13.44            | 14.04 | 14.48 | 15.07 | 16.43 | 8.63           | 9.22  | 9.66  | 10.25 | 11.62 |
|                 | 12H  | 13.50            | 14.06 | 14.54 | 15.09 | 16.48 | 8.66           | 9.23  | 9.70  | 10.26 | 11.64 |
| 4H              | 2H   | 10.65            | 11.32 | 11.67 | 12.34 | 13.69 | 7.19           | 7.86  | 8.21  | 8.88  | 10.24 |
|                 | 3H   | 12.47            | 13.03 | 13.50 | 14.07 | 15.44 | 8.53           | 9.09  | 9.56  | 10.13 | 11.50 |
|                 | 4H   | 13.15            | 13.67 | 14.19 | 14.70 | 16.09 | 9.07           | 9.58  | 10.11 | 10.62 | 12.01 |
|                 | 6H   | 13.66            | 14.10 | 14.71 | 15.16 | 16.55 | 9.48           | 9.92  | 10.53 | 10.98 | 12.37 |
|                 | 8H   | 13.83            | 14.24 | 14.88 | 15.29 | 16.70 | 9.61           | 10.02 | 10.66 | 11.07 | 12.47 |
|                 | 12H  | 13.92            | 14.29 | 14.99 | 15.36 | 16.77 | 9.67           | 10.04 | 10.73 | 11.10 | 12.51 |
| 8H              | 4H   | 13.12            | 13.53 | 14.17 | 14.58 | 15.98 | 9.34           | 9.76  | 10.40 | 10.81 | 12.21 |
|                 | 6H   | 13.67            | 14.01 | 14.75 | 15.11 | 16.51 | 9.85           | 10.19 | 10.93 | 11.29 | 12.69 |
|                 | 8H   | 13.89            | 14.19 | 14.97 | 15.26 | 16.68 | 10.04          | 10.34 | 11.12 | 11.41 | 12.83 |
|                 | 12H  | 14.02            | 14.28 | 15.10 | 15.35 | 16.81 | 10.15          | 10.41 | 11.24 | 11.49 | 12.95 |
| 12H             | 4H   | 13.07            | 13.44 | 14.13 | 14.50 | 15.91 | 9.35           | 9.72  | 10.42 | 10.78 | 12.19 |
|                 | 6H   | 13.65            | 13.95 | 14.73 | 15.02 | 16.44 | 9.90           | 10.20 | 10.98 | 11.28 | 12.70 |
|                 | 8H   | 13.86            | 14.13 | 14.95 | 15.20 | 16.66 | 10.10          | 10.37 | 11.19 | 11.44 | 12.90 |

END OF REPORT