

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: P922808

Luminaire Tested: DFN2DIP-SQ3F0-060D110US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922808  
REPORT IS A COMBINATION OF REPORTS P899991 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-060D110US940-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

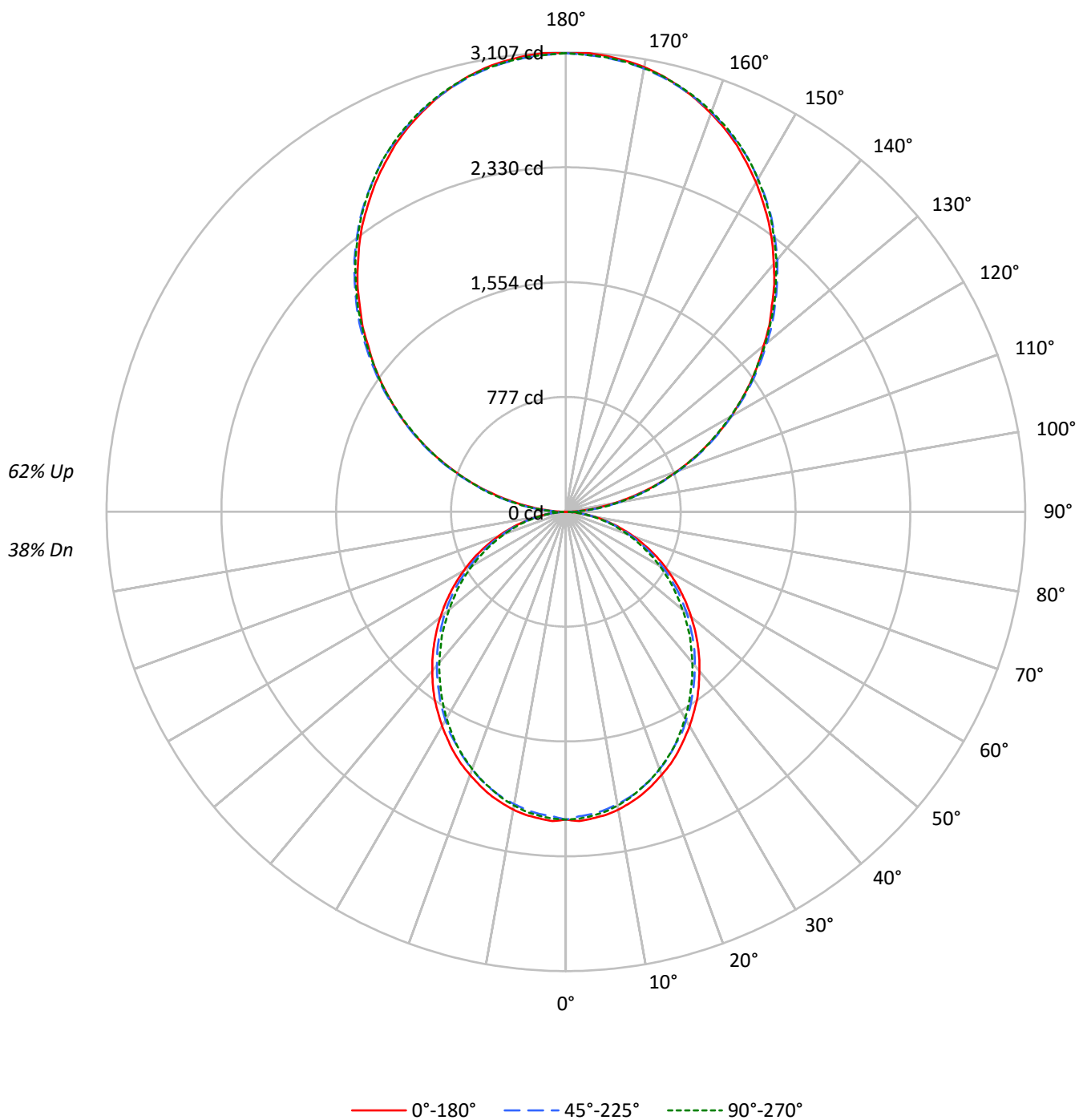
Lumens per Lamp: N/A  
Luminaire Lumens: 13977.6 lumens  
Efficiency: N/A  
Efficacy: 100.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Indirect

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



TEST NUMBER: P922808

CATALOG NUMBER: DFN2DIP-SQ3F0-060D110US940-FLLFL

**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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 79 | 76 | 67 | 65 | 63 | 53 | 51 | 50 | 40 | 39 | 38 |
| 2   | 87  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 62  | 57  | 71 | 63 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 49 | 44 | 46 | 41 | 37 | 37 | 33 | 30 | 28 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 41 | 34 | 29 | 33 | 28 | 24 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 22 | 25 | 21 | 18 | 19 | 16 | 14 |
| 9   | 48  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 17 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 14 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2385 | 2385 | 2385 |
| 5°  | 2388 | 2350 | 2367 |
| 10° | 2367 | 2317 | 2334 |
| 15° | 2330 | 2278 | 2284 |
| 20° | 2282 | 2223 | 2231 |
| 25° | 2234 | 2158 | 2171 |
| 30° | 2173 | 2097 | 2095 |
| 35° | 2116 | 2026 | 2015 |
| 40° | 2046 | 1954 | 1938 |
| 45° | 1976 | 1882 | 1860 |
| 50° | 1899 | 1806 | 1769 |
| 55° | 1819 | 1718 | 1685 |
| 60° | 1728 | 1614 | 1589 |
| 65° | 1629 | 1506 | 1476 |
| 70° | 1502 | 1375 | 1354 |
| 75° | 1327 | 1217 | 1240 |
| 80° | 1115 | 1015 | 1025 |
| 85° | 784  | 672  | 671  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3119 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 195.9   | 1.4       |
| 10°-20°   | 551.3   | 3.9       |
| 20°-30°   | 810.2   | 5.8       |
| 30°-40°   | 941.0   | 6.7       |
| 40°-50°   | 939.8   | 6.7       |
| 50°-60°   | 819.5   | 5.9       |
| 60°-70°   | 605.8   | 4.3       |
| 70°-80°   | 342.7   | 2.5       |
| 80°-90°   | 99.3    | 0.7       |
| 90°-100°  | 192.0   | 1.4       |
| 100°-110° | 609.9   | 4.4       |
| 110°-120° | 1043.8  | 7.5       |
| 120°-130° | 1372.7  | 9.8       |
| 130°-140° | 1540.8  | 11.0      |
| 140°-150° | 1511.0  | 10.8      |
| 150°-160° | 1267.5  | 9.1       |
| 160°-170° | 840.6   | 6.0       |
| 170°-180° | 293.8   | 2.1       |
| 0°-30°    | 1557.4  | 11.1      |
| 0°-40°    | 2498.4  | 17.9      |
| 0°-60°    | 4257.8  | 30.5      |
| 0°-90°    | 5305.6  | 38.0      |
| 90°-120°  | 1845.7  | 13.2      |
| 90°-150°  | 6270.1  | 44.9      |
| 90°-180°  | 8672.0  | 62.0      |
| 0°-180°   | 13977.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2082 | 2082  | 2082 | 2082  | 2082 |      |
| 5°   | 2082 | 2074  | 2052 | 2068  | 2064 | 198  |
| 15°  | 1982 | 1970  | 1944 | 1952  | 1942 | 558  |
| 25°  | 1794 | 1778  | 1744 | 1748  | 1744 | 825  |
| 35°  | 1548 | 1528  | 1495 | 1483  | 1473 | 966  |
| 45°  | 1259 | 1245  | 1215 | 1193  | 1185 | 972  |
| 55°  | 953  | 941   | 917  | 893   | 883  | 852  |
| 65°  | 643  | 631   | 611  | 592   | 583  | 635  |
| 75°  | 336  | 332   | 322  | 310   | 314  | 359  |
| 85°  | 82   | 80    | 78   | 72    | 70   | 91   |
| 90°  | 3    | 34    | 92   | 86    | 89   | 14   |
| 95°  | 136  | 163   | 167  | 167   | 163  | 152  |
| 105° | 563  | 570   | 576  | 581   | 581  | 594  |
| 115° | 1048 | 1062  | 1058 | 1055  | 1048 | 1036 |
| 125° | 1524 | 1547  | 1539 | 1531  | 1528 | 1361 |
| 135° | 1970 | 2000  | 2005 | 2002  | 1995 | 1523 |
| 145° | 2392 | 2411  | 2426 | 2429  | 2418 | 1495 |
| 155° | 2736 | 2743  | 2752 | 2765  | 2756 | 1259 |
| 165° | 2976 | 2973  | 2973 | 2992  | 2979 | 840  |
| 175° | 3097 | 3089  | 3083 | 3102  | 3086 | 294  |
| 180° | 3102 | 3102  | 3102 | 3102  | 3102 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2081.8 | 2081.8 | 2081.8 | 2081.8 | 2081.8 |
| 2.5°   | 2093.9 | 2083.9 | 2061.8 | 2081.8 | 2078.0 |
| 5°     | 2081.8 | 2073.9 | 2051.8 | 2067.8 | 2064.0 |
| 7.5°   | 2067.8 | 2055.9 | 2033.8 | 2050.0 | 2045.9 |
| 10°    | 2045.9 | 2031.9 | 2007.9 | 2023.8 | 2017.9 |
| 12.5°  | 2015.8 | 2003.9 | 1979.9 | 1989.9 | 1985.8 |
| 15°    | 1981.7 | 1969.9 | 1943.8 | 1951.9 | 1941.9 |
| 17.5°  | 1939.7 | 1927.9 | 1901.8 | 1911.6 | 1901.8 |
| 20°    | 1893.6 | 1881.8 | 1853.7 | 1859.7 | 1851.8 |
| 22.5°  | 1847.8 | 1829.7 | 1803.6 | 1803.6 | 1799.6 |
| 25°    | 1793.6 | 1777.7 | 1743.7 | 1747.5 | 1743.7 |
| 27.5°  | 1733.5 | 1719.5 | 1693.5 | 1687.7 | 1677.7 |
| 30°    | 1673.7 | 1657.4 | 1627.5 | 1621.6 | 1613.5 |
| 32.5°  | 1609.4 | 1597.6 | 1565.5 | 1553.4 | 1545.3 |
| 35°    | 1547.5 | 1527.5 | 1495.4 | 1483.3 | 1473.3 |
| 37.5°  | 1477.4 | 1459.3 | 1427.3 | 1413.2 | 1403.2 |
| 40°    | 1405.3 | 1389.2 | 1357.2 | 1339.3 | 1331.2 |
| 42.5°  | 1335.2 | 1319.1 | 1287.3 | 1267.1 | 1255.2 |
| 45°    | 1259.3 | 1245.2 | 1215.0 | 1193.2 | 1185.1 |
| 47.5°  | 1185.1 | 1171.1 | 1139.1 | 1117.0 | 1105.0 |
| 50°    | 1107.0 | 1097.0 | 1069.0 | 1040.9 | 1030.9 |
| 52.5°  | 1030.9 | 1016.9 | 991.0  | 968.9  | 954.9  |
| 55°    | 953.0  | 940.8  | 916.9  | 892.9  | 882.9  |
| 57.5°  | 874.9  | 864.9  | 838.7  | 814.8  | 806.6  |
| 60°    | 796.7  | 788.8  | 760.8  | 738.7  | 732.7  |
| 62.5°  | 720.6  | 706.6  | 686.6  | 666.6  | 658.6  |
| 65°    | 642.7  | 630.6  | 610.6  | 592.5  | 582.6  |
| 67.5°  | 562.6  | 552.4  | 534.6  | 520.6  | 512.5  |
| 70°    | 488.5  | 480.5  | 462.4  | 448.4  | 440.5  |
| 72.5°  | 412.4  | 404.4  | 394.4  | 380.4  | 374.4  |
| 75°    | 336.2  | 332.4  | 322.2  | 310.3  | 314.3  |
| 77.5°  | 268.2  | 260.2  | 256.1  | 250.2  | 244.2  |
| 80°    | 200.3  | 198.1  | 194.1  | 188.2  | 184.1  |
| 82.5°  | 136.2  | 136.2  | 134.2  | 126.2  | 126.2  |
| 85°    | 81.9   | 80.1   | 78.1   | 72.0   | 70.1   |
| 87.5°  | 36.1   | 32.1   | 28.0   | 22.1   | 20.0   |
| 90°    | 2.8    | 33.7   | 91.7   | 86.1   | 88.8   |
| 92.5°  | 58.0   | 78.6   | 81.3   | 84.2   | 84.2   |
| 95°    | 136.5  | 162.7  | 167.4  | 167.4  | 162.7  |
| 97.5°  | 227.3  | 251.6  | 261.9  | 261.9  | 261.9  |
| 100°   | 332.0  | 353.5  | 361.0  | 361.0  | 358.2  |
| 102.5° | 442.4  | 458.2  | 468.6  | 471.4  | 468.6  |
| 105°   | 563.0  | 570.5  | 576.1  | 580.8  | 580.8  |
| 107.5° | 682.7  | 693.9  | 693.9  | 695.8  | 682.7  |
| 110°   | 798.7  | 813.7  | 813.7  | 813.7  | 806.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 924.0  | 939.9  | 937.1  | 929.6  | 924.0  |
| 115°   | 1047.5 | 1062.4 | 1057.7 | 1055.0 | 1047.5 |
| 117.5° | 1170.0 | 1190.5 | 1177.4 | 1170.0 | 1162.5 |
| 120°   | 1293.4 | 1314.0 | 1293.4 | 1293.4 | 1285.0 |
| 122.5° | 1405.7 | 1431.8 | 1418.7 | 1411.2 | 1405.7 |
| 125°   | 1523.5 | 1546.8 | 1539.4 | 1531.0 | 1528.1 |
| 127.5° | 1638.5 | 1667.5 | 1657.2 | 1646.0 | 1638.5 |
| 130°   | 1746.1 | 1779.8 | 1775.0 | 1769.4 | 1759.2 |
| 132.5° | 1866.7 | 1892.9 | 1894.8 | 1881.7 | 1874.2 |
| 135°   | 1970.5 | 1999.5 | 2005.1 | 2002.3 | 1994.8 |
| 137.5° | 2086.5 | 2109.9 | 2114.5 | 2112.6 | 2101.5 |
| 140°   | 2188.4 | 2211.8 | 2224.9 | 2224.9 | 2214.7 |
| 142.5° | 2293.2 | 2316.6 | 2324.1 | 2326.8 | 2316.6 |
| 145°   | 2392.3 | 2411.0 | 2426.0 | 2428.8 | 2418.5 |
| 147.5° | 2481.2 | 2504.5 | 2515.8 | 2520.4 | 2510.2 |
| 150°   | 2572.9 | 2588.7 | 2599.0 | 2607.5 | 2599.0 |
| 152.5° | 2654.2 | 2670.0 | 2683.2 | 2693.5 | 2683.2 |
| 155°   | 2735.6 | 2743.0 | 2751.5 | 2764.6 | 2756.1 |
| 157.5° | 2805.7 | 2811.3 | 2815.9 | 2834.7 | 2821.5 |
| 160°   | 2868.4 | 2874.0 | 2876.7 | 2892.7 | 2881.5 |
| 162.5° | 2926.3 | 2926.3 | 2929.2 | 2946.9 | 2933.8 |
| 165°   | 2975.9 | 2973.1 | 2973.1 | 2991.8 | 2978.7 |
| 167.5° | 3020.8 | 3012.4 | 3012.4 | 3031.1 | 3018.0 |
| 170°   | 3054.5 | 3047.0 | 3044.2 | 3062.8 | 3047.0 |
| 172.5° | 3077.8 | 3070.3 | 3067.6 | 3086.3 | 3070.3 |
| 175°   | 3096.6 | 3089.1 | 3083.4 | 3102.2 | 3086.3 |
| 177.5° | 3106.8 | 3099.3 | 3093.7 | 3109.7 | 3093.7 |
| 180°   | 3102.2 | 3102.2 | 3102.2 | 3102.2 | 3102.2 |

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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 | 9.03             | 9.79  | 10.08 | 10.85 | 12.28 | 8.58           | 9.35  | 9.64  | 10.40 | 11.84 |
|                 | 3H   | 10.68            | 11.36 | 11.74 | 12.43 | 13.88 | 10.19          | 10.87 | 11.25 | 11.94 | 13.39 |
|                 | 4H   | 11.26            | 11.90 | 12.33 | 12.97 | 14.43 | 10.76          | 11.41 | 11.84 | 12.48 | 13.94 |
|                 | 6H   | 11.65            | 12.24 | 12.73 | 13.32 | 14.79 | 11.15          | 11.74 | 12.23 | 12.82 | 14.29 |
|                 | 8H   | 11.75            | 12.32 | 12.84 | 13.40 | 14.87 | 11.25          | 11.81 | 12.33 | 12.90 | 14.37 |
|                 | 12H  | 11.79            | 12.33 | 12.88 | 13.41 | 14.90 | 11.28          | 11.82 | 12.38 | 12.90 | 14.39 |
| 4H              | 2H   | 9.47             | 10.12 | 10.56 | 11.19 | 12.65 | 9.12           | 9.77  | 10.20 | 10.84 | 12.29 |
|                 | 3H   | 11.32            | 11.87 | 12.41 | 12.96 | 14.43 | 10.92          | 11.46 | 12.01 | 12.55 | 14.03 |
|                 | 4H   | 12.03            | 12.53 | 13.13 | 13.61 | 15.11 | 11.61          | 12.10 | 12.70 | 13.19 | 14.68 |
|                 | 6H   | 12.54            | 12.96 | 13.64 | 14.07 | 15.56 | 12.10          | 12.53 | 13.21 | 13.64 | 15.12 |
|                 | 8H   | 12.68            | 13.08 | 13.78 | 14.18 | 15.68 | 12.24          | 12.64 | 13.35 | 13.74 | 15.25 |
|                 | 12H  | 12.75            | 13.11 | 13.87 | 14.22 | 15.73 | 12.30          | 12.66 | 13.42 | 13.77 | 15.28 |
| 8H              | 4H   | 12.22            | 12.61 | 13.32 | 13.71 | 15.22 | 11.84          | 12.24 | 12.94 | 13.34 | 14.84 |
|                 | 6H   | 12.84            | 13.17 | 13.96 | 14.31 | 15.81 | 12.45          | 12.78 | 13.58 | 13.92 | 15.42 |
|                 | 8H   | 13.05            | 13.34 | 14.18 | 14.47 | 15.98 | 12.66          | 12.95 | 13.79 | 14.07 | 15.59 |
|                 | 12H  | 13.18            | 13.43 | 14.31 | 14.55 | 16.11 | 12.77          | 13.02 | 13.90 | 14.14 | 15.70 |
| 12H             | 4H   | 12.20            | 12.56 | 13.32 | 13.67 | 15.18 | 11.83          | 12.19 | 12.95 | 13.30 | 14.81 |
|                 | 6H   | 12.86            | 13.15 | 13.99 | 14.28 | 15.79 | 12.49          | 12.78 | 13.62 | 13.90 | 15.42 |
|                 | 8H   | 13.10            | 13.35 | 14.23 | 14.47 | 16.03 | 12.72          | 12.97 | 13.85 | 14.09 | 15.65 |

END OF REPORT