

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: P924563

Luminaire Tested: DFN2DIP-HX4F0-060D120US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924563  
REPORT IS A COMBINATION OF REPORTS P899448 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D120US950-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

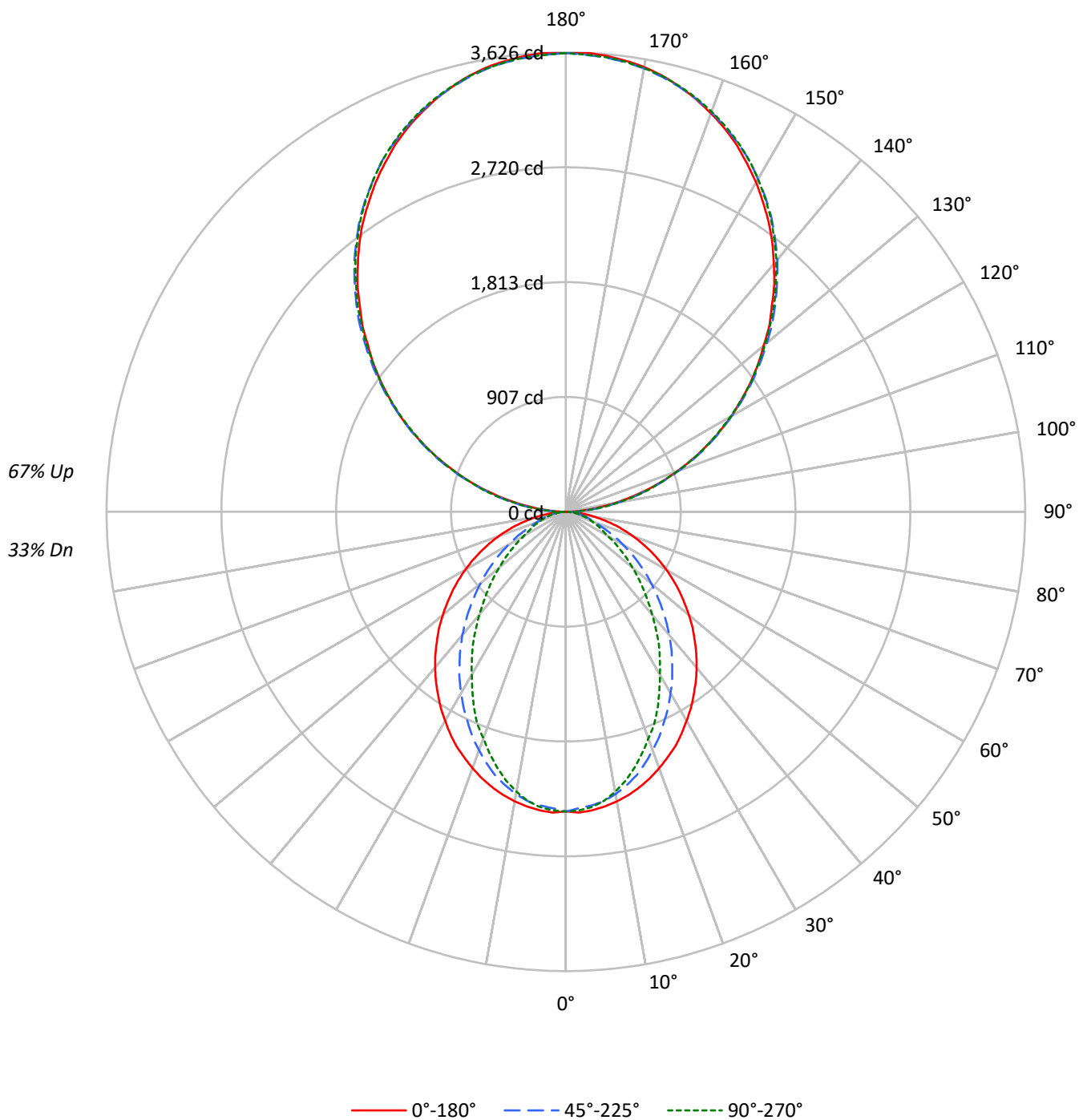
Lumens per Lamp: N/A  
Luminaire Lumens: 14996.9 lumens  
Efficiency: N/A  
Efficacy: 117.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 127.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 79  | 73  | 68  | 77 | 71 | 67 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 32 | 31 | 29 |
| 3   | 79  | 70  | 63  | 57  | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 39 | 36 | 34 | 29 | 27 | 25 |
| 4   | 72  | 62  | 54  | 49  | 65 | 56 | 50 | 45 | 45 | 41 | 37 | 35 | 32 | 29 | 26 | 24 | 22 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 40 | 36 | 32 | 32 | 28 | 26 | 23 | 21 | 19 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 36 | 32 | 28 | 29 | 25 | 23 | 21 | 19 | 17 |
| 7   | 56  | 45  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 25 | 26 | 23 | 20 | 19 | 17 | 15 |
| 8   | 52  | 40  | 33  | 28  | 47 | 37 | 30 | 26 | 30 | 25 | 22 | 24 | 20 | 18 | 18 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 14 | 13 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 25 | 21 | 18 | 20 | 17 | 15 | 15 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1759 | 1759 | 1759 |
| 5°  | 1762 | 1731 | 1742 |
| 10° | 1745 | 1698 | 1686 |
| 15° | 1721 | 1642 | 1598 |
| 20° | 1689 | 1564 | 1491 |
| 25° | 1657 | 1478 | 1387 |
| 30° | 1613 | 1389 | 1255 |
| 35° | 1571 | 1294 | 1140 |
| 40° | 1527 | 1195 | 1007 |
| 45° | 1477 | 1085 | 887  |
| 50° | 1425 | 975  | 769  |
| 55° | 1370 | 856  | 656  |
| 60° | 1307 | 733  | 540  |
| 65° | 1235 | 607  | 487  |
| 70° | 1147 | 489  | 440  |
| 75° | 1037 | 432  | 401  |
| 80° | 877  | 363  | 348  |
| 85° | 613  | 243  | 262  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2730 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.7   | 1.5       |
| 10°-20°   | 608.7   | 4.1       |
| 20°-30°   | 854.5   | 5.7       |
| 30°-40°   | 931.5   | 6.2       |
| 40°-50°   | 856.2   | 5.7       |
| 50°-60°   | 672.4   | 4.5       |
| 60°-70°   | 437.7   | 2.9       |
| 70°-80°   | 225.3   | 1.5       |
| 80°-90°   | 67.8    | 0.5       |
| 90°-100°  | 224.0   | 1.5       |
| 100°-110° | 711.8   | 4.7       |
| 110°-120° | 1218.2  | 8.1       |
| 120°-130° | 1602.1  | 10.7      |
| 130°-140° | 1798.3  | 12.0      |
| 140°-150° | 1763.5  | 11.8      |
| 150°-160° | 1479.3  | 9.9       |
| 160°-170° | 981.0   | 6.5       |
| 170°-180° | 342.9   | 2.3       |
| 0°-30°    | 1684.9  | 11.2      |
| 0°-40°    | 2616.4  | 17.4      |
| 0°-60°    | 4144.9  | 27.6      |
| 0°-90°    | 4875.7  | 32.5      |
| 90°-120°  | 2154.1  | 14.4      |
| 90°-150°  | 7318.0  | 48.8      |
| 90°-180°  | 10121.0 | 67.5      |
| 0°-180°   | 14996.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2366 | 2366  | 2366 | 2366  | 2366 |      |
| 5°   | 2366 | 2355  | 2327 | 2346  | 2340 | 224  |
| 15°  | 2250 | 2226  | 2154 | 2113  | 2092 | 634  |
| 25°  | 2042 | 1974  | 1833 | 1745  | 1713 | 939  |
| 35°  | 1760 | 1651  | 1462 | 1327  | 1280 | 1102 |
| 45°  | 1439 | 1295  | 1071 | 918   | 867  | 1111 |
| 55°  | 1094 | 927   | 696  | 567   | 527  | 978  |
| 65°  | 739  | 565   | 372  | 300   | 293  | 732  |
| 75°  | 394  | 244   | 171  | 156   | 154  | 417  |
| 85°  | 92   | 47    | 41   | 41    | 41   | 106  |
| 90°  | 3    | 39    | 107  | 100   | 104  | 15   |
| 95°  | 159  | 190   | 195  | 195   | 190  | 177  |
| 105° | 657  | 666   | 672  | 678   | 678  | 693  |
| 115° | 1222 | 1240  | 1234 | 1231  | 1222 | 1209 |
| 125° | 1778 | 1805  | 1797 | 1787  | 1784 | 1589 |
| 135° | 2300 | 2334  | 2340 | 2337  | 2328 | 1778 |
| 145° | 2792 | 2814  | 2831 | 2835  | 2823 | 1745 |
| 155° | 3193 | 3201  | 3211 | 3226  | 3217 | 1470 |
| 165° | 3473 | 3470  | 3470 | 3492  | 3476 | 980  |
| 175° | 3614 | 3605  | 3599 | 3620  | 3602 | 343  |
| 180° | 3620 | 3620  | 3620 | 3620  | 3620 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2365.7 | 2365.7 | 2365.7 | 2365.7 | 2365.7 |
| 2.5°   | 2376.4 | 2365.7 | 2342.1 | 2363.6 | 2359.3 |
| 5°     | 2365.7 | 2355.0 | 2327.1 | 2346.5 | 2340.1 |
| 7.5°   | 2346.5 | 2333.7 | 2303.7 | 2312.1 | 2301.4 |
| 10°    | 2320.7 | 2305.7 | 2263.1 | 2256.5 | 2243.7 |
| 12.5°  | 2288.7 | 2269.4 | 2211.5 | 2198.8 | 2175.1 |
| 15°    | 2250.1 | 2226.4 | 2153.8 | 2113.1 | 2091.7 |
| 17.5°  | 2205.2 | 2170.8 | 2080.9 | 2033.8 | 1999.6 |
| 20°    | 2153.8 | 2110.8 | 2003.9 | 1950.5 | 1903.2 |
| 22.5°  | 2098.1 | 2048.8 | 1924.6 | 1851.9 | 1819.9 |
| 25°    | 2042.5 | 1973.9 | 1832.6 | 1745.0 | 1712.7 |
| 27.5°  | 1976.2 | 1903.2 | 1747.0 | 1646.3 | 1597.1 |
| 30°    | 1905.5 | 1824.0 | 1652.7 | 1543.7 | 1485.8 |
| 32.5°  | 1836.9 | 1738.4 | 1563.0 | 1434.4 | 1380.8 |
| 35°    | 1759.9 | 1650.7 | 1462.4 | 1327.4 | 1280.2 |
| 37.5°  | 1685.0 | 1567.0 | 1368.1 | 1220.3 | 1166.8 |
| 40°    | 1605.7 | 1477.4 | 1269.5 | 1117.5 | 1061.9 |
| 42.5°  | 1524.4 | 1387.4 | 1171.1 | 1012.6 | 959.2  |
| 45°    | 1438.7 | 1295.2 | 1070.6 | 918.3  | 867.0  |
| 47.5°  | 1357.4 | 1205.5 | 974.2  | 822.1  | 775.0  |
| 50°    | 1267.5 | 1115.5 | 880.0  | 732.1  | 687.4  |
| 52.5°  | 1179.5 | 1019.0 | 790.0  | 648.7  | 608.1  |
| 55°    | 1094.0 | 927.0  | 695.8  | 567.4  | 526.7  |
| 57.5°  | 1006.3 | 834.9  | 612.4  | 492.5  | 458.1  |
| 60°    | 916.3  | 745.1  | 524.5  | 415.5  | 381.1  |
| 62.5°  | 828.6  | 657.4  | 449.5  | 346.9  | 329.8  |
| 65°    | 738.7  | 565.1  | 372.5  | 299.8  | 293.3  |
| 67.5°  | 653.0  | 479.5  | 299.8  | 263.3  | 256.9  |
| 70°    | 563.1  | 396.1  | 248.2  | 227.0  | 218.3  |
| 72.5°  | 477.5  | 318.9  | 207.6  | 190.6  | 186.2  |
| 75°    | 393.9  | 243.9  | 171.2  | 156.3  | 154.3  |
| 77.5°  | 310.5  | 173.3  | 134.9  | 126.3  | 122.0  |
| 80°    | 233.3  | 124.2  | 102.7  | 94.3   | 94.3   |
| 82.5°  | 162.7  | 83.6   | 70.6   | 66.3   | 66.3   |
| 85°    | 92.0   | 47.0   | 40.6   | 40.6   | 40.6   |
| 87.5°  | 34.3   | 17.1   | 17.1   | 15.0   | 15.0   |
| 90°    | 3.2    | 39.3   | 106.9  | 100.5  | 103.7  |
| 92.5°  | 67.6   | 91.7   | 94.9   | 98.3   | 98.3   |
| 95°    | 159.3  | 189.9  | 195.4  | 195.4  | 189.9  |
| 97.5°  | 265.2  | 293.6  | 305.7  | 305.7  | 305.7  |
| 100°   | 387.5  | 412.6  | 421.3  | 421.3  | 418.0  |
| 102.5° | 516.3  | 534.8  | 546.8  | 550.2  | 546.8  |
| 105°   | 657.1  | 665.8  | 672.4  | 677.8  | 677.8  |
| 107.5° | 796.8  | 809.9  | 809.9  | 812.0  | 796.8  |
| 110°   | 932.2  | 949.6  | 949.6  | 949.6  | 940.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1078.4 | 1097.0 | 1093.7 | 1085.0 | 1078.4 |
| 115°   | 1222.5 | 1240.0 | 1234.5 | 1231.2 | 1222.5 |
| 117.5° | 1365.5 | 1389.5 | 1374.2 | 1365.5 | 1356.8 |
| 120°   | 1509.6 | 1533.6 | 1509.6 | 1509.6 | 1499.8 |
| 122.5° | 1640.6 | 1671.1 | 1655.9 | 1647.1 | 1640.6 |
| 125°   | 1778.1 | 1805.3 | 1796.7 | 1786.8 | 1783.5 |
| 127.5° | 1912.4 | 1946.2 | 1934.1 | 1921.1 | 1912.4 |
| 130°   | 2037.8 | 2077.1 | 2071.7 | 2065.1 | 2053.1 |
| 132.5° | 2178.6 | 2209.3 | 2211.4 | 2196.1 | 2187.4 |
| 135°   | 2299.8 | 2333.7 | 2340.3 | 2336.9 | 2328.2 |
| 137.5° | 2435.2 | 2462.5 | 2467.9 | 2465.7 | 2452.6 |
| 140°   | 2554.1 | 2581.4 | 2596.7 | 2596.7 | 2584.7 |
| 142.5° | 2676.4 | 2703.7 | 2712.4 | 2715.7 | 2703.7 |
| 145°   | 2792.1 | 2813.9 | 2831.4 | 2834.7 | 2822.7 |
| 147.5° | 2895.8 | 2923.1 | 2936.2 | 2941.7 | 2929.6 |
| 150°   | 3002.8 | 3021.3 | 3033.3 | 3043.2 | 3033.3 |
| 152.5° | 3097.7 | 3116.2 | 3131.6 | 3143.6 | 3131.6 |
| 155°   | 3192.7 | 3201.4 | 3211.3 | 3226.5 | 3216.7 |
| 157.5° | 3274.6 | 3281.1 | 3286.5 | 3308.4 | 3293.1 |
| 160°   | 3347.7 | 3354.3 | 3357.5 | 3376.1 | 3362.9 |
| 162.5° | 3415.3 | 3415.3 | 3418.7 | 3439.4 | 3424.1 |
| 165°   | 3473.2 | 3470.0 | 3470.0 | 3491.7 | 3476.5 |
| 167.5° | 3525.6 | 3515.8 | 3515.8 | 3537.6 | 3522.4 |
| 170°   | 3564.9 | 3556.1 | 3552.9 | 3574.7 | 3556.1 |
| 172.5° | 3592.2 | 3583.4 | 3580.2 | 3602.0 | 3583.4 |
| 175°   | 3614.0 | 3605.3 | 3598.8 | 3620.5 | 3602.0 |
| 177.5° | 3626.1 | 3617.3 | 3610.7 | 3629.3 | 3610.7 |
| 180°   | 3620.5 | 3620.5 | 3620.5 | 3620.5 | 3620.5 |

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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 | 7.21             | 7.91  | 8.31  | 9.01  | 10.51 | 3.18           | 3.89 | 4.28 | 4.98 | 6.48 |
|                 | 3H   | 8.88             | 9.51  | 9.99  | 10.61 | 12.13 | 4.36           | 4.99 | 5.47 | 6.10 | 7.62 |
|                 | 4H   | 9.48             | 10.08 | 10.60 | 11.18 | 12.71 | 4.81           | 5.41 | 5.93 | 6.51 | 8.04 |
|                 | 6H   | 9.90             | 10.45 | 11.02 | 11.55 | 13.09 | 5.13           | 5.68 | 6.25 | 6.78 | 8.32 |
|                 | 8H   | 10.02            | 10.54 | 11.15 | 11.66 | 13.19 | 5.21           | 5.74 | 6.34 | 6.86 | 8.39 |
|                 | 12H  | 10.08            | 10.57 | 11.21 | 11.69 | 13.24 | 5.25           | 5.75 | 6.39 | 6.86 | 8.42 |
| 4H              | 2H   | 7.21             | 7.81  | 8.34  | 8.91  | 10.44 | 3.76           | 4.36 | 4.89 | 5.46 | 6.99 |
|                 | 3H   | 9.03             | 9.53  | 10.16 | 10.66 | 12.20 | 5.10           | 5.60 | 6.23 | 6.73 | 8.27 |
|                 | 4H   | 9.72             | 10.18 | 10.85 | 11.29 | 12.85 | 5.65           | 6.11 | 6.78 | 7.22 | 8.78 |
|                 | 6H   | 10.23            | 10.62 | 11.37 | 11.76 | 13.31 | 6.06           | 6.45 | 7.20 | 7.60 | 9.14 |
|                 | 8H   | 10.40            | 10.77 | 11.54 | 11.90 | 13.47 | 6.19           | 6.56 | 7.33 | 7.69 | 9.25 |
|                 | 12H  | 10.49            | 10.82 | 11.65 | 11.97 | 13.54 | 6.25           | 6.58 | 7.41 | 7.73 | 9.30 |
| 8H              | 4H   | 9.68             | 10.04 | 10.82 | 11.18 | 12.74 | 5.92           | 6.28 | 7.06 | 7.42 | 8.98 |
|                 | 6H   | 10.24            | 10.54 | 11.40 | 11.72 | 13.28 | 6.44           | 6.74 | 7.60 | 7.91 | 9.47 |
|                 | 8H   | 10.46            | 10.72 | 11.62 | 11.87 | 13.46 | 6.63           | 6.89 | 7.79 | 8.05 | 9.63 |
|                 | 12H  | 10.59            | 10.82 | 11.76 | 11.97 | 13.59 | 6.74           | 6.97 | 7.91 | 8.12 | 9.74 |
| 12H             | 4H   | 9.62             | 9.95  | 10.78 | 11.10 | 12.67 | 5.92           | 6.25 | 7.08 | 7.39 | 8.96 |
|                 | 6H   | 10.22            | 10.48 | 11.38 | 11.63 | 13.22 | 6.48           | 6.75 | 7.65 | 7.90 | 9.49 |
|                 | 8H   | 10.43            | 10.66 | 11.60 | 11.81 | 13.43 | 6.69           | 6.92 | 7.86 | 8.07 | 9.69 |

END OF REPORT