

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: P923867

Luminaire Tested: DFN2DIP-TR4F0-100D070US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923867  
REPORT IS A COMBINATION OF REPORTS P901955 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-100D070US940-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

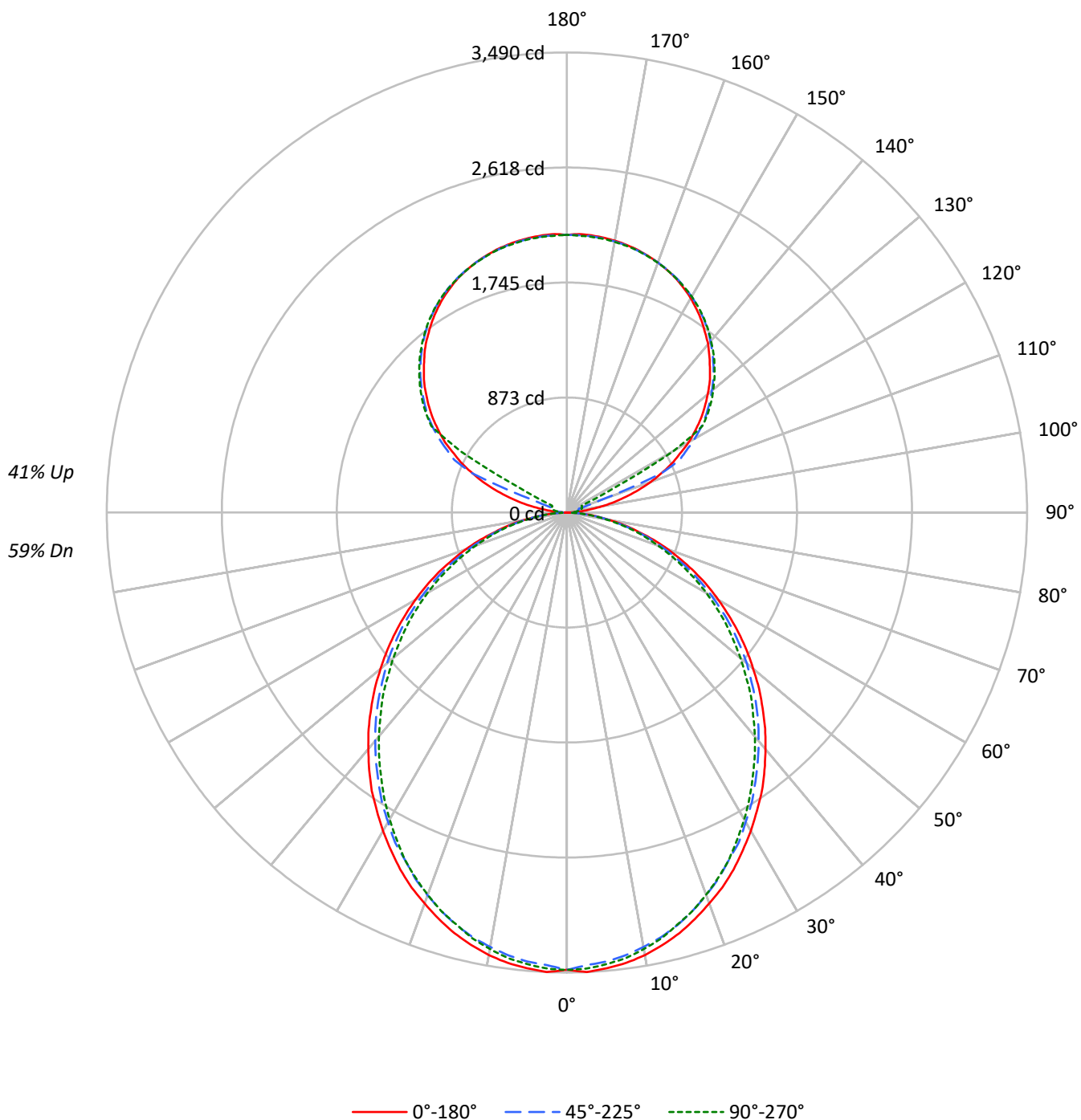
Lumens per Lamp: N/A  
Luminaire Lumens: 15007.5 lumens  
Efficiency: N/A  
Efficacy: 98.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 153.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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: P923867

CATALOG NUMBER: DFN2DIP-TR4F0-100D070US940-FLONL

**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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 76 | 76 | 76 | 64 | 64 | 64 |
| 1   | 100 | 95  | 91  | 88  | 93  | 89  | 86  | 83  | 77 | 75 | 73 | 67 | 65 | 63 | 57 | 56 | 54 |
| 2   | 91  | 83  | 77  | 72  | 85  | 78  | 72  | 68  | 68 | 64 | 60 | 59 | 55 | 53 | 50 | 48 | 46 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 41 | 39 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 53 | 48 | 43 | 46 | 42 | 38 | 40 | 36 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 54  | 47  | 41  | 48 | 42 | 37 | 42 | 37 | 33 | 36 | 32 | 29 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 41  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 32 | 29 | 26 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 29 | 34 | 29 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 31 | 27 | 23 | 27 | 23 | 21 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2756 | 2756 | 2756 |
| 5°  | 2761 | 2718 | 2736 |
| 10° | 2739 | 2681 | 2699 |
| 15° | 2698 | 2637 | 2641 |
| 20° | 2644 | 2576 | 2582 |
| 25° | 2590 | 2503 | 2513 |
| 30° | 2522 | 2434 | 2426 |
| 35° | 2458 | 2354 | 2334 |
| 40° | 2379 | 2272 | 2246 |
| 45° | 2300 | 2191 | 2156 |
| 50° | 2213 | 2105 | 2052 |
| 55° | 2123 | 2006 | 1957 |
| 60° | 2021 | 1889 | 1847 |
| 65° | 1910 | 1767 | 1718 |
| 70° | 1768 | 1619 | 1579 |
| 75° | 1572 | 1441 | 1450 |
| 80° | 1336 | 1215 | 1205 |
| 85° | 966  | 825  | 798  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2300 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 326.6   | 2.2       |
| 10°-20°   | 918.8   | 6.1       |
| 20°-30°   | 1350.3  | 9.0       |
| 30°-40°   | 1568.3  | 10.5      |
| 40°-50°   | 1566.4  | 10.4      |
| 50°-60°   | 1365.8  | 9.1       |
| 60°-70°   | 1009.7  | 6.7       |
| 70°-80°   | 571.3   | 3.8       |
| 80°-90°   | 154.5   | 1.0       |
| 90°-100°  | 69.5    | 0.5       |
| 100°-110° | 259.0   | 1.7       |
| 110°-120° | 686.8   | 4.6       |
| 120°-130° | 1139.1  | 7.6       |
| 130°-140° | 1209.9  | 8.1       |
| 140°-150° | 1124.5  | 7.5       |
| 150°-160° | 904.1   | 6.0       |
| 160°-170° | 582.6   | 3.9       |
| 170°-180° | 200.5   | 1.3       |
| 0°-30°    | 2595.7  | 17.3      |
| 0°-40°    | 4164.0  | 27.7      |
| 0°-60°    | 7096.2  | 47.3      |
| 0°-90°    | 8831.6  | 58.8      |
| 90°-120°  | 1015.2  | 6.8       |
| 90°-150°  | 4488.7  | 29.9      |
| 90°-180°  | 6176.0  | 41.2      |
| 0°-180°   | 15007.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3470 | 3470  | 3470 | 3470  | 3470 |      |
| 5°   | 3470 | 3457  | 3420 | 3446  | 3440 | 329  |
| 15°  | 3303 | 3283  | 3240 | 3253  | 3236 | 930  |
| 25°  | 2989 | 2963  | 2906 | 2912  | 2906 | 1376 |
| 35°  | 2579 | 2546  | 2492 | 2472  | 2456 | 1611 |
| 45°  | 2099 | 2075  | 2025 | 1989  | 1975 | 1620 |
| 55°  | 1588 | 1568  | 1528 | 1488  | 1472 | 1420 |
| 65°  | 1071 | 1051  | 1018 | 988   | 971  | 1059 |
| 75°  | 560  | 554   | 537  | 517   | 524  | 598  |
| 85°  | 137  | 134   | 130  | 120   | 117  | 152  |
| 90°  | 1    | 18    | 30   | 38    | 41   | 14   |
| 95°  | 99   | 49    | 59   | 67    | 66   | 117  |
| 105° | 463  | 509   | 93   | 110   | 116  | 495  |
| 115° | 876  | 902   | 940  | 235   | 125  | 863  |
| 125° | 1239 | 1259  | 1288 | 1299  | 1303 | 1105 |
| 135° | 1534 | 1558  | 1572 | 1587  | 1584 | 1185 |
| 145° | 1779 | 1777  | 1803 | 1814  | 1806 | 1113 |
| 155° | 1959 | 1945  | 1963 | 1972  | 1960 | 903  |
| 165° | 2064 | 2055  | 2059 | 2070  | 2059 | 583  |
| 175° | 2111 | 2100  | 2104 | 2114  | 2099 | 201  |
| 180° | 2107 | 2107  | 2107 | 2107  | 2107 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3469.7 | 3469.7 | 3469.7 | 3469.7 | 3469.7 |
| 2.5°   | 3489.9 | 3473.2 | 3436.4 | 3469.7 | 3463.3 |
| 5°     | 3469.7 | 3456.6 | 3419.8 | 3446.4 | 3440.0 |
| 7.5°   | 3446.4 | 3426.5 | 3389.7 | 3416.6 | 3409.9 |
| 10°    | 3409.9 | 3386.5 | 3346.5 | 3373.1 | 3363.2 |
| 12.5°  | 3359.6 | 3339.8 | 3299.8 | 3316.4 | 3309.7 |
| 15°    | 3303.0 | 3283.2 | 3239.6 | 3253.0 | 3236.5 |
| 17.5°  | 3232.9 | 3213.1 | 3169.5 | 3186.2 | 3169.5 |
| 20°    | 3156.0 | 3136.2 | 3089.5 | 3099.4 | 3086.3 |
| 22.5°  | 3079.6 | 3049.6 | 3006.0 | 3006.0 | 2999.3 |
| 25°    | 2989.4 | 2962.8 | 2906.2 | 2912.5 | 2906.2 |
| 27.5°  | 2889.1 | 2865.8 | 2822.6 | 2812.7 | 2796.0 |
| 30°    | 2789.4 | 2762.4 | 2712.5 | 2702.6 | 2689.1 |
| 32.5°  | 2682.4 | 2662.6 | 2609.1 | 2589.0 | 2575.5 |
| 35°    | 2579.1 | 2545.8 | 2492.3 | 2472.2 | 2455.5 |
| 37.5°  | 2462.3 | 2432.1 | 2378.7 | 2355.4 | 2338.7 |
| 40°    | 2342.3 | 2315.3 | 2261.9 | 2232.2 | 2218.8 |
| 42.5°  | 2225.4 | 2198.5 | 2145.5 | 2111.8 | 2092.0 |
| 45°    | 2098.7 | 2075.4 | 2025.1 | 1988.6 | 1975.2 |
| 47.5°  | 1975.2 | 1951.9 | 1898.4 | 1861.5 | 1841.7 |
| 50°    | 1844.9 | 1828.3 | 1781.5 | 1734.8 | 1718.2 |
| 52.5°  | 1718.2 | 1694.9 | 1651.6 | 1614.9 | 1591.5 |
| 55°    | 1588.3 | 1568.2 | 1528.1 | 1488.1 | 1471.5 |
| 57.5°  | 1458.0 | 1441.4 | 1397.8 | 1357.9 | 1344.4 |
| 60°    | 1327.8 | 1314.6 | 1267.9 | 1231.1 | 1221.2 |
| 62.5°  | 1201.0 | 1177.7 | 1144.4 | 1111.2 | 1097.7 |
| 65°    | 1071.1 | 1051.0 | 1017.7 | 987.6  | 971.0  |
| 67.5°  | 937.7  | 920.7  | 891.0  | 867.6  | 854.2  |
| 70°    | 814.1  | 800.7  | 770.6  | 747.3  | 734.1  |
| 72.5°  | 687.4  | 674.0  | 657.4  | 634.0  | 624.0  |
| 75°    | 560.4  | 554.0  | 537.0  | 517.2  | 523.9  |
| 77.5°  | 447.1  | 433.6  | 426.9  | 417.0  | 407.1  |
| 80°    | 333.8  | 330.3  | 323.5  | 313.6  | 306.9  |
| 82.5°  | 226.9  | 226.9  | 223.7  | 210.3  | 210.3  |
| 85°    | 136.6  | 133.5  | 130.3  | 120.0  | 116.8  |
| 87.5°  | 60.2   | 53.4   | 46.7   | 36.8   | 33.3   |
| 90°    | 1.4    | 18.3   | 30.4   | 38.2   | 41.1   |
| 92.5°  | 38.2   | 32.0   | 36.6   | 39.7   | 41.1   |
| 95°    | 99.0   | 48.7   | 59.4   | 67.1   | 65.5   |
| 97.5°  | 178.3  | 53.4   | 77.7   | 82.4   | 83.8   |
| 100°   | 269.9  | 61.0   | 86.9   | 99.0   | 102.1  |
| 102.5° | 370.3  | 367.5  | 90.0   | 106.6  | 111.3  |
| 105°   | 463.4  | 509.2  | 93.0   | 109.7  | 115.8  |
| 107.5° | 571.6  | 609.7  | 96.1   | 112.8  | 119.0  |
| 110°   | 675.4  | 707.2  | 266.8  | 114.4  | 120.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 772.9  | 800.2  | 774.4  | 117.3  | 122.0  |
| 115°   | 876.5  | 902.3  | 940.5  | 234.8  | 125.1  |
| 117.5° | 966.4  | 996.8  | 1022.9 | 804.8  | 405.5  |
| 120°   | 1067.0 | 1089.8 | 1117.4 | 1135.7 | 929.9  |
| 122.5° | 1152.3 | 1176.7 | 1207.4 | 1216.4 | 1218.0 |
| 125°   | 1239.2 | 1259.1 | 1288.1 | 1298.8 | 1303.2 |
| 127.5° | 1318.5 | 1339.8 | 1362.8 | 1378.0 | 1379.5 |
| 130°   | 1393.2 | 1417.6 | 1434.3 | 1451.2 | 1449.7 |
| 132.5° | 1469.4 | 1489.3 | 1506.0 | 1519.7 | 1518.3 |
| 135°   | 1533.5 | 1557.9 | 1571.6 | 1586.9 | 1583.9 |
| 137.5° | 1600.4 | 1618.8 | 1634.1 | 1649.4 | 1644.8 |
| 140°   | 1666.0 | 1678.3 | 1695.0 | 1708.7 | 1701.1 |
| 142.5° | 1721.0 | 1731.7 | 1751.4 | 1763.5 | 1756.0 |
| 145°   | 1779.0 | 1777.4 | 1803.2 | 1813.9 | 1806.3 |
| 147.5° | 1829.1 | 1824.6 | 1850.5 | 1858.1 | 1852.1 |
| 150°   | 1877.9 | 1867.3 | 1891.8 | 1900.8 | 1893.2 |
| 152.5° | 1919.0 | 1906.9 | 1929.8 | 1938.9 | 1928.3 |
| 155°   | 1958.7 | 1945.1 | 1963.4 | 1972.5 | 1960.3 |
| 157.5° | 1990.7 | 1978.6 | 1992.3 | 2003.0 | 1990.7 |
| 160°   | 2018.3 | 2009.0 | 2018.3 | 2027.3 | 2016.6 |
| 162.5° | 2042.6 | 2033.5 | 2041.0 | 2051.7 | 2038.0 |
| 165°   | 2063.9 | 2054.9 | 2059.3 | 2070.0 | 2059.3 |
| 167.5° | 2080.7 | 2071.4 | 2076.2 | 2086.9 | 2073.1 |
| 170°   | 2094.4 | 2085.3 | 2088.3 | 2099.0 | 2085.3 |
| 172.5° | 2103.5 | 2094.4 | 2097.6 | 2108.2 | 2094.4 |
| 175°   | 2111.1 | 2100.4 | 2103.5 | 2114.2 | 2099.0 |
| 177.5° | 2114.2 | 2103.5 | 2105.1 | 2115.9 | 2102.0 |
| 180°   | 2106.6 | 2106.6 | 2106.6 | 2106.6 | 2106.6 |

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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 | 11.57            | 12.52 | 12.45 | 13.41 | 14.55 | 11.14          | 12.08 | 12.01 | 12.98 | 14.12 |
|                 | 3H   | 13.23            | 14.08 | 14.12 | 14.99 | 16.16 | 12.76          | 13.61 | 13.65 | 14.52 | 15.68 |
|                 | 4H   | 13.83            | 14.63 | 14.73 | 15.54 | 16.72 | 13.35          | 14.16 | 14.26 | 15.07 | 16.24 |
|                 | 6H   | 14.23            | 14.97 | 15.15 | 15.89 | 17.08 | 13.76          | 14.50 | 14.67 | 15.42 | 16.60 |
|                 | 8H   | 14.34            | 15.04 | 15.26 | 15.98 | 17.17 | 13.86          | 14.57 | 14.79 | 15.51 | 16.69 |
|                 | 12H  | 14.39            | 15.06 | 15.32 | 15.99 | 17.20 | 13.91          | 14.58 | 14.84 | 15.51 | 16.72 |
| 4H              | 2H   | 12.04            | 12.84 | 12.95 | 13.76 | 14.93 | 11.70          | 12.50 | 12.61 | 13.41 | 14.59 |
|                 | 3H   | 13.91            | 14.58 | 14.83 | 15.53 | 16.72 | 13.52          | 14.19 | 14.44 | 15.14 | 16.33 |
|                 | 4H   | 14.63            | 15.24 | 15.56 | 16.18 | 17.40 | 14.23          | 14.84 | 15.16 | 15.78 | 16.99 |
|                 | 6H   | 15.15            | 15.68 | 16.10 | 16.64 | 17.86 | 14.74          | 15.27 | 15.69 | 16.23 | 17.45 |
|                 | 8H   | 15.30            | 15.80 | 16.25 | 16.75 | 17.98 | 14.89          | 15.39 | 15.84 | 16.34 | 17.57 |
|                 | 12H  | 15.38            | 15.83 | 16.35 | 16.80 | 18.03 | 14.96          | 15.40 | 15.93 | 16.38 | 17.61 |
| 8H              | 4H   | 14.84            | 15.33 | 15.78 | 16.29 | 17.51 | 14.48          | 14.97 | 15.42 | 15.93 | 17.15 |
|                 | 6H   | 15.47            | 15.88 | 16.44 | 16.88 | 18.10 | 15.11          | 15.52 | 16.08 | 16.52 | 17.74 |
|                 | 8H   | 15.69            | 16.05 | 16.67 | 17.04 | 18.29 | 15.32          | 15.68 | 16.31 | 16.67 | 17.92 |
|                 | 12H  | 15.83            | 16.15 | 16.81 | 17.13 | 18.42 | 15.44          | 15.76 | 16.43 | 16.74 | 18.04 |
| 12H             | 4H   | 14.83            | 15.27 | 15.79 | 16.25 | 17.48 | 14.47          | 14.92 | 15.44 | 15.89 | 17.13 |
|                 | 6H   | 15.50            | 15.86 | 16.48 | 16.85 | 18.10 | 15.15          | 15.51 | 16.13 | 16.50 | 17.74 |
|                 | 8H   | 15.75            | 16.06 | 16.73 | 17.05 | 18.34 | 15.39          | 15.71 | 16.38 | 16.69 | 17.98 |

END OF REPORT