

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: P923957

Luminaire Tested: DFN2DIP-TR4F0-120D110US940-RLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923957  
REPORT IS A COMBINATION OF REPORTS P902032 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D110US940-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

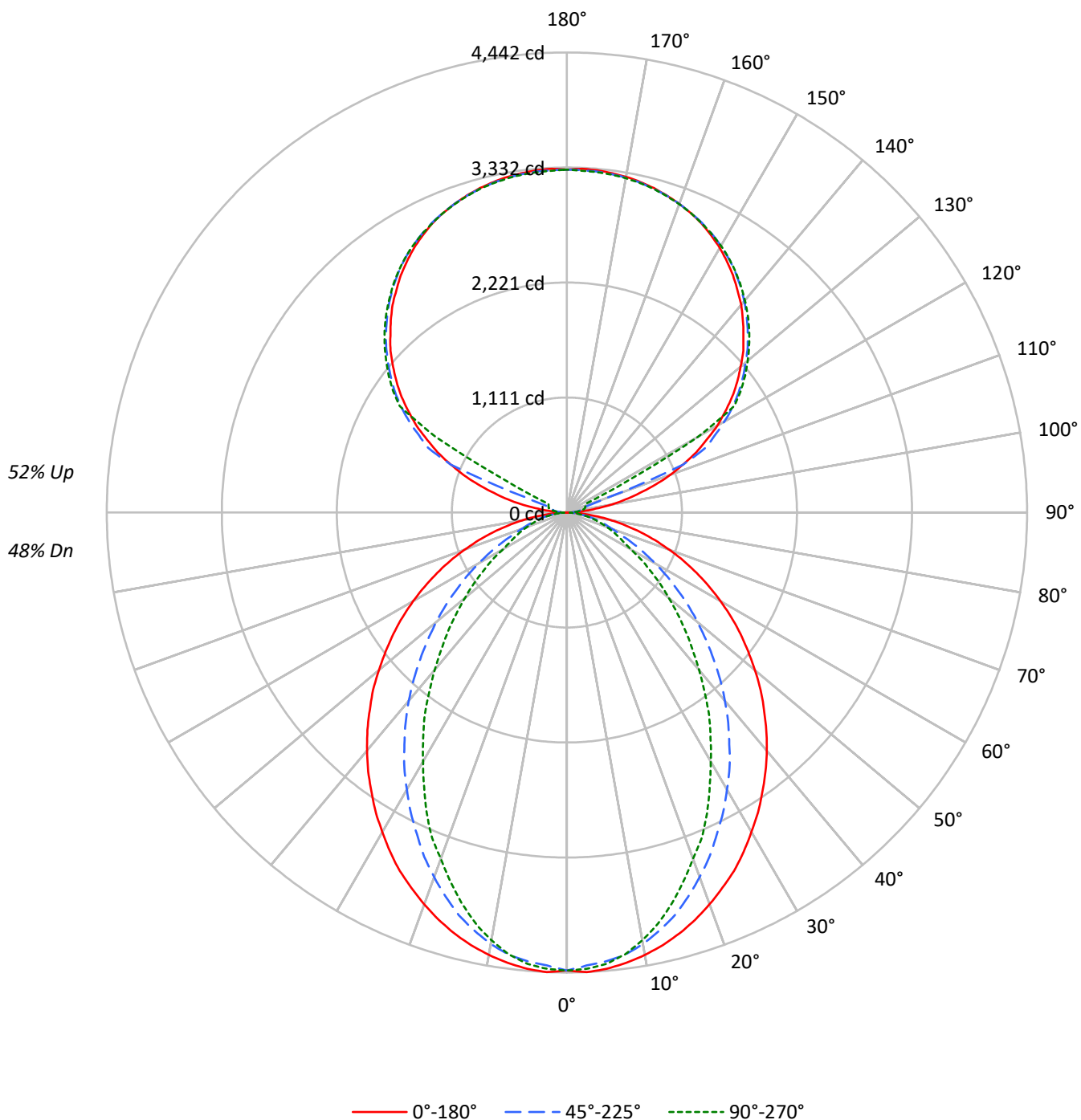
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18806.1 lumens  
Efficiency: N/A  
Efficacy: 89.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 210.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 83 | 80 | 73 | 71 | 69 | 60 | 59 | 58 | 49 | 48 | 47 |
| 2   | 90  | 82  | 77  | 72  | 82 | 76 | 71 | 67 | 64 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 40 |
| 3   | 82  | 73  | 66  | 60  | 75 | 67 | 61 | 56 | 57 | 53 | 49 | 48 | 45 | 42 | 39 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 53 | 48 | 51 | 46 | 42 | 43 | 39 | 36 | 35 | 33 | 30 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 36 | 42 | 36 | 32 | 35 | 31 | 28 | 29 | 26 | 24 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 38 | 32 | 29 | 32 | 28 | 25 | 27 | 24 | 21 |
| 8   | 55  | 43  | 35  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 | 21 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3513 | 3513 | 3513 |
| 5°  | 3519 | 3458 | 3480 |
| 10° | 3484 | 3390 | 3366 |
| 15° | 3436 | 3278 | 3191 |
| 20° | 3373 | 3123 | 2976 |
| 25° | 3308 | 2950 | 2769 |
| 30° | 3221 | 2773 | 2506 |
| 35° | 3135 | 2582 | 2274 |
| 40° | 3048 | 2384 | 2009 |
| 45° | 2947 | 2165 | 1769 |
| 50° | 2843 | 1944 | 1535 |
| 55° | 2734 | 1707 | 1309 |
| 60° | 2608 | 1460 | 1078 |
| 65° | 2462 | 1209 | 970  |
| 70° | 2286 | 975  | 877  |
| 75° | 2065 | 859  | 798  |
| 80° | 1745 | 721  | 692  |
| 85° | 1216 | 481  | 519  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2947 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 414.5   | 2.2       |
| 10°-20°   | 1137.8  | 6.1       |
| 20°-30°   | 1597.5  | 8.5       |
| 30°-40°   | 1741.4  | 9.3       |
| 40°-50°   | 1600.5  | 8.5       |
| 50°-60°   | 1256.9  | 6.7       |
| 60°-70°   | 818.2   | 4.4       |
| 70°-80°   | 421.2   | 2.2       |
| 80°-90°   | 113.3   | 0.6       |
| 90°-100°  | 109.2   | 0.6       |
| 100°-110° | 406.9   | 2.2       |
| 110°-120° | 1079.2  | 5.7       |
| 120°-130° | 1789.9  | 9.5       |
| 130°-140° | 1901.3  | 10.1      |
| 140°-150° | 1767.1  | 9.4       |
| 150°-160° | 1420.7  | 7.6       |
| 160°-170° | 915.4   | 4.9       |
| 170°-180° | 315.1   | 1.7       |
| 0°-30°    | 3149.8  | 16.7      |
| 0°-40°    | 4891.2  | 26.0      |
| 0°-60°    | 7748.6  | 41.2      |
| 0°-90°    | 9101.3  | 48.4      |
| 90°-120°  | 1595.3  | 8.5       |
| 90°-150°  | 7053.7  | 37.5      |
| 90°-180°  | 9705.0  | 51.6      |
| 0°-180°   | 18806.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4422 | 4422  | 4422 | 4422  | 4422 |      |
| 5°   | 4422 | 4403  | 4350 | 4386  | 4375 | 419  |
| 15°  | 4206 | 4162  | 4026 | 3950  | 3910 | 1185 |
| 25°  | 3818 | 3690  | 3426 | 3262  | 3202 | 1756 |
| 35°  | 3290 | 3086  | 2734 | 2482  | 2393 | 2059 |
| 45°  | 2690 | 2421  | 2001 | 1717  | 1621 | 2077 |
| 55°  | 2045 | 1733  | 1301 | 1061  | 985  | 1827 |
| 65°  | 1381 | 1056  | 696  | 560   | 548  | 1369 |
| 75°  | 736  | 456   | 320  | 292   | 288  | 779  |
| 85°  | 172  | 88    | 76   | 76    | 76   | 197  |
| 90°  | 2    | 29    | 48   | 60    | 65   | 18   |
| 95°  | 156  | 76    | 93   | 106   | 103  | 184  |
| 105° | 728  | 800   | 146  | 172   | 182  | 778  |
| 115° | 1377 | 1418  | 1478 | 369   | 196  | 1356 |
| 125° | 1947 | 1979  | 2024 | 2041  | 2048 | 1737 |
| 135° | 2410 | 2448  | 2470 | 2494  | 2489 | 1862 |
| 145° | 2796 | 2793  | 2834 | 2850  | 2838 | 1748 |
| 155° | 3078 | 3057  | 3085 | 3100  | 3080 | 1418 |
| 165° | 3243 | 3229  | 3236 | 3253  | 3236 | 916  |
| 175° | 3317 | 3301  | 3306 | 3322  | 3298 | 316  |
| 180° | 3310 | 3310  | 3310 | 3310  | 3310 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4422.5 | 4422.5 | 4422.5 | 4422.5 | 4422.5 |
| 2.5°   | 4442.5 | 4422.5 | 4378.4 | 4418.7 | 4410.6 |
| 5°     | 4422.5 | 4402.6 | 4350.3 | 4386.4 | 4374.6 |
| 7.5°   | 4386.4 | 4362.6 | 4306.6 | 4322.3 | 4302.3 |
| 10°    | 4338.4 | 4310.4 | 4230.5 | 4218.2 | 4194.5 |
| 12.5°  | 4278.5 | 4242.5 | 4134.1 | 4110.4 | 4066.3 |
| 15°    | 4206.4 | 4162.2 | 4026.3 | 3950.3 | 3910.4 |
| 17.5°  | 4122.3 | 4058.2 | 3890.0 | 3802.2 | 3738.0 |
| 20°    | 4026.3 | 3946.1 | 3746.1 | 3646.3 | 3557.9 |
| 22.5°  | 3922.3 | 3830.2 | 3597.9 | 3462.0 | 3402.1 |
| 25°    | 3818.3 | 3690.0 | 3425.9 | 3262.0 | 3201.7 |
| 27.5°  | 3694.3 | 3557.9 | 3265.8 | 3077.7 | 2985.5 |
| 30°    | 3562.2 | 3409.8 | 3089.6 | 2885.8 | 2777.5 |
| 32.5°  | 3434.0 | 3249.7 | 2921.9 | 2681.6 | 2581.3 |
| 35°    | 3290.1 | 3085.8 | 2733.7 | 2481.5 | 2393.2 |
| 37.5°  | 3149.9 | 2929.5 | 2557.5 | 2281.1 | 2181.3 |
| 40°    | 3001.7 | 2761.8 | 2373.3 | 2089.2 | 1985.1 |
| 42.5°  | 2849.6 | 2593.6 | 2189.4 | 1893.0 | 1793.2 |
| 45°    | 2689.6 | 2421.3 | 2001.3 | 1716.8 | 1620.8 |
| 47.5°  | 2537.5 | 2253.5 | 1821.2 | 1536.8 | 1448.9 |
| 50°    | 2369.5 | 2085.4 | 1645.0 | 1368.6 | 1285.0 |
| 52.5°  | 2205.1 | 1904.9 | 1476.9 | 1212.7 | 1136.8 |
| 55°    | 2045.0 | 1732.9 | 1300.6 | 1060.7 | 984.7  |
| 57.5°  | 1881.1 | 1560.9 | 1144.8 | 920.6  | 856.5  |
| 60°    | 1713.0 | 1392.8 | 980.4  | 776.7  | 712.6  |
| 62.5°  | 1549.1 | 1228.9 | 840.3  | 648.5  | 616.5  |
| 65°    | 1380.9 | 1056.5 | 696.4  | 560.5  | 548.2  |
| 67.5°  | 1220.8 | 896.3  | 560.5  | 492.1  | 480.3  |
| 70°    | 1052.7 | 740.6  | 464.1  | 424.2  | 408.0  |
| 72.5°  | 892.6  | 596.2  | 388.1  | 356.2  | 348.2  |
| 75°    | 736.3  | 456.0  | 320.2  | 292.1  | 288.3  |
| 77.5°  | 580.5  | 324.0  | 252.3  | 236.1  | 228.0  |
| 80°    | 436.1  | 232.3  | 191.9  | 176.2  | 176.2  |
| 82.5°  | 304.1  | 156.2  | 132.1  | 123.9  | 123.9  |
| 85°    | 172.0  | 87.9   | 76.0   | 76.0   | 76.0   |
| 87.5°  | 64.1   | 31.8   | 31.8   | 28.0   | 28.0   |
| 90°    | 2.3    | 28.7   | 47.8   | 60.0   | 64.6   |
| 92.5°  | 60.0   | 50.4   | 57.4   | 62.3   | 64.6   |
| 95°    | 155.6  | 76.5   | 93.3   | 105.5  | 103.0  |
| 97.5°  | 280.2  | 83.9   | 122.0  | 129.4  | 131.7  |
| 100°   | 424.1  | 95.9   | 136.5  | 155.6  | 160.4  |
| 102.5° | 581.9  | 577.4  | 141.3  | 167.6  | 175.0  |
| 105°   | 728.2  | 800.1  | 146.2  | 172.4  | 182.1  |
| 107.5° | 898.3  | 958.0  | 151.1  | 177.2  | 186.9  |
| 110°   | 1061.2 | 1111.3 | 419.3  | 179.8  | 189.1  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1214.6 | 1257.5 | 1216.8 | 184.3  | 191.7  |
| 115°   | 1377.2 | 1417.9 | 1478.0 | 368.9  | 196.5  |
| 117.5° | 1518.7 | 1566.5 | 1607.4 | 1264.6 | 637.1  |
| 120°   | 1676.8 | 1712.6 | 1755.9 | 1784.6 | 1461.2 |
| 122.5° | 1810.8 | 1849.1 | 1897.2 | 1911.5 | 1914.1 |
| 125°   | 1947.3 | 1978.6 | 2024.1 | 2040.9 | 2048.0 |
| 127.5° | 2071.9 | 2105.4 | 2141.5 | 2165.4 | 2167.7 |
| 130°   | 2189.3 | 2227.8 | 2253.9 | 2280.4 | 2278.1 |
| 132.5° | 2309.1 | 2340.4 | 2366.6 | 2388.2 | 2385.9 |
| 135°   | 2409.8 | 2448.2 | 2469.5 | 2493.8 | 2488.9 |
| 137.5° | 2515.1 | 2543.8 | 2567.9 | 2591.8 | 2584.7 |
| 140°   | 2618.1 | 2637.3 | 2663.5 | 2685.1 | 2673.2 |
| 142.5° | 2704.5 | 2721.2 | 2752.3 | 2771.3 | 2759.4 |
| 145°   | 2795.5 | 2792.9 | 2833.6 | 2850.4 | 2838.5 |
| 147.5° | 2874.3 | 2867.2 | 2907.9 | 2919.8 | 2910.5 |
| 150°   | 2951.1 | 2934.4 | 2972.7 | 2987.0 | 2975.0 |
| 152.5° | 3015.7 | 2996.6 | 3032.4 | 3047.0 | 3030.2 |
| 155°   | 3078.0 | 3056.6 | 3085.3 | 3099.6 | 3080.5 |
| 157.5° | 3128.3 | 3109.2 | 3130.9 | 3147.6 | 3128.3 |
| 160°   | 3171.5 | 3157.0 | 3171.5 | 3185.7 | 3169.0 |
| 162.5° | 3209.6 | 3195.4 | 3207.4 | 3224.2 | 3202.6 |
| 165°   | 3243.2 | 3229.0 | 3236.1 | 3252.9 | 3236.1 |
| 167.5° | 3269.6 | 3255.2 | 3262.6 | 3279.4 | 3257.8 |
| 170°   | 3291.3 | 3276.8 | 3281.6 | 3298.4 | 3276.8 |
| 172.5° | 3305.5 | 3291.3 | 3296.1 | 3312.9 | 3291.3 |
| 175°   | 3317.4 | 3300.7 | 3305.5 | 3322.3 | 3298.4 |
| 177.5° | 3322.3 | 3305.5 | 3308.1 | 3324.8 | 3303.3 |
| 180°   | 3310.4 | 3310.4 | 3310.4 | 3310.4 | 3310.4 |

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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 | 11.36            | 12.17 | 12.33 | 13.16 | 14.46 | 7.33           | 8.15  | 8.31  | 9.13  | 10.43 |
|                 | 3H   | 13.03            | 13.76 | 14.02 | 14.76 | 16.08 | 8.52           | 9.25  | 9.51  | 10.24 | 11.56 |
|                 | 4H   | 13.64            | 14.33 | 14.64 | 15.33 | 16.66 | 8.97           | 9.66  | 9.97  | 10.66 | 11.98 |
|                 | 6H   | 14.06            | 14.70 | 15.07 | 15.70 | 17.04 | 9.29           | 9.93  | 10.30 | 10.93 | 12.27 |
|                 | 8H   | 14.19            | 14.79 | 15.20 | 15.81 | 17.15 | 9.38           | 9.98  | 10.40 | 11.00 | 12.34 |
|                 | 12H  | 14.25            | 14.82 | 15.27 | 15.84 | 17.20 | 9.42           | 10.00 | 10.45 | 11.01 | 12.37 |
| 4H              | 2H   | 11.37            | 12.06 | 12.38 | 13.06 | 14.39 | 7.92           | 8.61  | 8.93  | 9.61  | 10.94 |
|                 | 3H   | 13.20            | 13.77 | 14.22 | 14.80 | 16.14 | 9.27           | 9.85  | 10.29 | 10.87 | 12.21 |
|                 | 4H   | 13.89            | 14.42 | 14.92 | 15.44 | 16.80 | 9.82           | 10.35 | 10.84 | 11.37 | 12.73 |
|                 | 6H   | 14.41            | 14.86 | 15.44 | 15.90 | 17.26 | 10.24          | 10.69 | 11.27 | 11.73 | 13.09 |
|                 | 8H   | 14.58            | 15.00 | 15.62 | 16.04 | 17.41 | 10.37          | 10.79 | 11.40 | 11.83 | 13.20 |
|                 | 12H  | 14.68            | 15.06 | 15.73 | 16.11 | 17.49 | 10.43          | 10.81 | 11.49 | 11.87 | 13.24 |
| 8H              | 4H   | 13.86            | 14.28 | 14.89 | 15.32 | 16.69 | 10.10          | 10.52 | 11.14 | 11.56 | 12.93 |
|                 | 6H   | 14.42            | 14.77 | 15.48 | 15.85 | 17.22 | 10.62          | 10.97 | 11.68 | 12.04 | 13.42 |
|                 | 8H   | 14.64            | 14.95 | 15.71 | 16.01 | 17.40 | 10.81          | 11.12 | 11.88 | 12.18 | 13.57 |
|                 | 12H  | 14.78            | 15.05 | 15.85 | 16.11 | 17.54 | 10.93          | 11.20 | 12.00 | 12.26 | 13.69 |
| 12H             | 4H   | 13.81            | 14.19 | 14.86 | 15.24 | 16.62 | 10.10          | 10.48 | 11.16 | 11.54 | 12.91 |
|                 | 6H   | 14.40            | 14.71 | 15.47 | 15.77 | 17.16 | 10.67          | 10.97 | 11.73 | 12.04 | 13.43 |
|                 | 8H   | 14.62            | 14.89 | 15.69 | 15.95 | 17.38 | 10.88          | 11.15 | 11.95 | 12.21 | 13.64 |

END OF REPORT