

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: P909204

Luminaire Tested: DFN2DIP-SQ3F0-070D110US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909204  
REPORT IS A COMBINATION OF REPORTS P899993 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-070D110US840-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

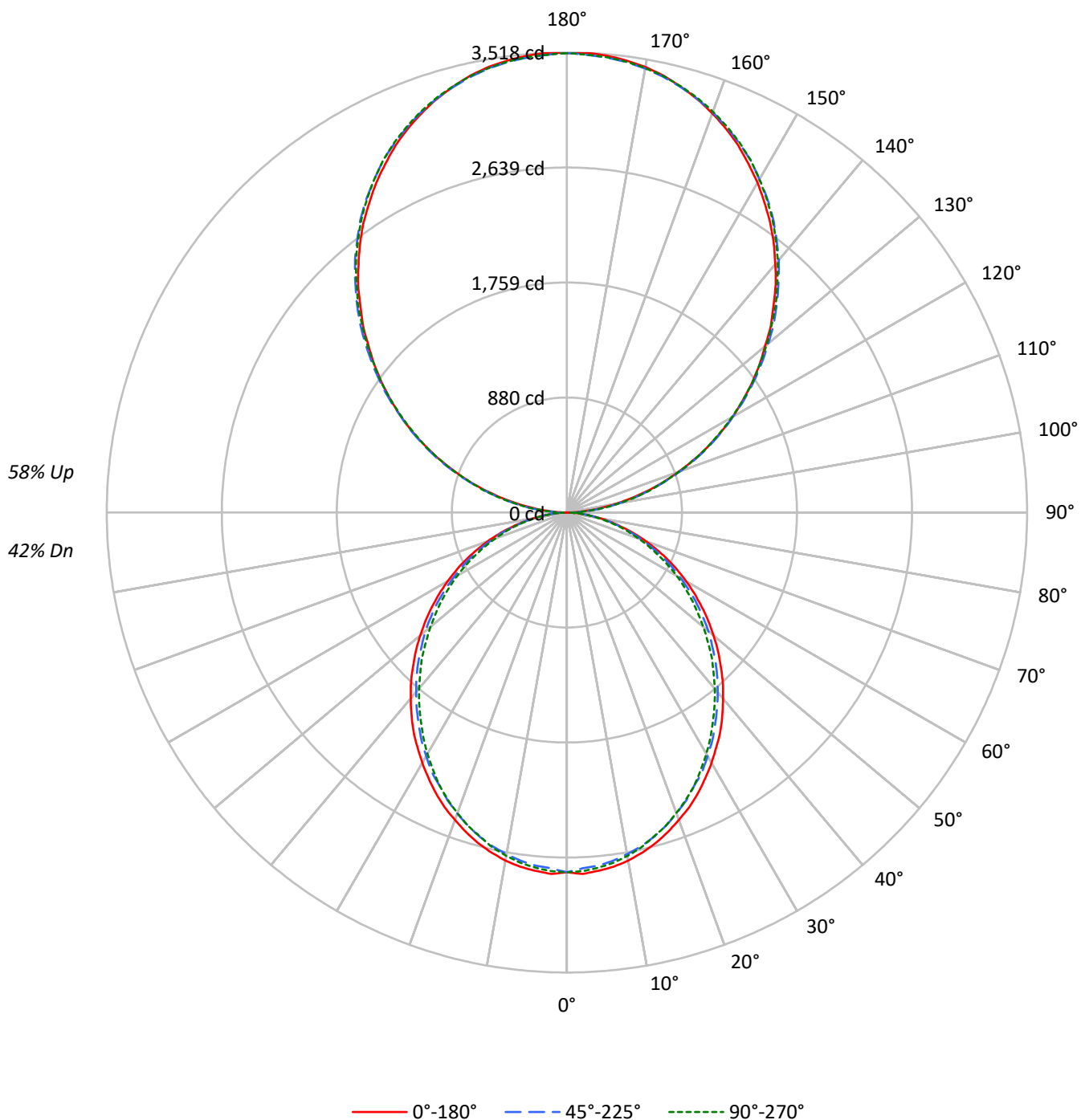
Lumens per Lamp: N/A  
Luminaire Lumens: 16829.4 lumens  
Efficiency: N/A  
Efficacy: 111.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 151.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P909204

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US840-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P909204

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US840-FLLFLL

**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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 63 | 63 | 63 | 48 | 48 | 48 |
| 1   | 96  | 92  | 88  | 84  | 87 | 84 | 80 | 78 | 69 | 67 | 65 | 55 | 54 | 52 | 43 | 42 | 41 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 57 | 53 | 49 | 46 | 44 | 38 | 36 | 34 |
| 3   | 80  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 49 | 45 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 35 | 32 | 30 | 27 | 25 |
| 5   | 67  | 55  | 47  | 41  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 27 | 27 | 24 | 22 |
| 6   | 61  | 50  | 42  | 36  | 56 | 46 | 39 | 33 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 22 | 19 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 22 | 26 | 22 | 19 | 20 | 18 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 22 | 18 | 15 | 17 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3152 | 3152 | 3152 |
| 5°  | 3155 | 3106 | 3128 |
| 10° | 3127 | 3062 | 3084 |
| 15° | 3079 | 3009 | 3017 |
| 20° | 3015 | 2937 | 2948 |
| 25° | 2951 | 2851 | 2869 |
| 30° | 2872 | 2771 | 2768 |
| 35° | 2796 | 2677 | 2662 |
| 40° | 2703 | 2582 | 2561 |
| 45° | 2611 | 2487 | 2457 |
| 50° | 2510 | 2386 | 2337 |
| 55° | 2403 | 2270 | 2227 |
| 60° | 2283 | 2133 | 2100 |
| 65° | 2152 | 1990 | 1950 |
| 70° | 1984 | 1816 | 1789 |
| 75° | 1753 | 1608 | 1639 |
| 80° | 1473 | 1341 | 1355 |
| 85° | 1038 | 889  | 887  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3533 cd/sqm

TEST NUMBER: P909204

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US840-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 258.9   | 1.5       |
| 10°-20°   | 728.4   | 4.3       |
| 20°-30°   | 1070.5  | 6.4       |
| 30°-40°   | 1243.3  | 7.4       |
| 40°-50°   | 1241.7  | 7.4       |
| 50°-60°   | 1082.8  | 6.4       |
| 60°-70°   | 800.4   | 4.8       |
| 70°-80°   | 452.9   | 2.7       |
| 80°-90°   | 129.5   | 0.8       |
| 90°-100°  | 217.4   | 1.3       |
| 100°-110° | 690.8   | 4.1       |
| 110°-120° | 1182.1  | 7.0       |
| 120°-130° | 1554.6  | 9.2       |
| 130°-140° | 1745.0  | 10.4      |
| 140°-150° | 1711.2  | 10.2      |
| 150°-160° | 1435.4  | 8.5       |
| 160°-170° | 951.9   | 5.7       |
| 170°-180° | 332.7   | 2.0       |
| 0°-30°    | 2057.8  | 12.2      |
| 0°-40°    | 3301.1  | 19.6      |
| 0°-60°    | 5625.6  | 33.4      |
| 0°-90°    | 7008.4  | 41.6      |
| 90°-120°  | 2090.2  | 12.4      |
| 90°-150°  | 7101.0  | 42.2      |
| 90°-180°  | 9821.0  | 58.4      |
| 0°-180°   | 16829.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2751 | 2751  | 2751 | 2751  | 2751 |      |
| 5°   | 2751 | 2740  | 2711 | 2732  | 2727 | 261  |
| 15°  | 2618 | 2603  | 2568 | 2579  | 2566 | 737  |
| 25°  | 2370 | 2349  | 2304 | 2309  | 2304 | 1090 |
| 35°  | 2045 | 2018  | 1976 | 1960  | 1947 | 1277 |
| 45°  | 1664 | 1645  | 1605 | 1576  | 1566 | 1284 |
| 55°  | 1259 | 1243  | 1211 | 1180  | 1166 | 1126 |
| 65°  | 849  | 833   | 807  | 783   | 770  | 840  |
| 75°  | 444  | 439   | 426  | 410   | 415  | 474  |
| 85°  | 108  | 106   | 103  | 95    | 93   | 121  |
| 90°  | 3    | 38    | 104  | 98    | 101  | 16   |
| 95°  | 155  | 184   | 190  | 190   | 184  | 172  |
| 105° | 638  | 646   | 652  | 658   | 658  | 673  |
| 115° | 1186 | 1203  | 1198 | 1195  | 1186 | 1173 |
| 125° | 1725 | 1752  | 1743 | 1734  | 1731 | 1542 |
| 135° | 2232 | 2264  | 2271 | 2268  | 2259 | 1725 |
| 145° | 2709 | 2730  | 2747 | 2751  | 2739 | 1693 |
| 155° | 3098 | 3106  | 3116 | 3131  | 3121 | 1426 |
| 165° | 3370 | 3367  | 3367 | 3388  | 3373 | 951  |
| 175° | 3507 | 3498  | 3492 | 3513  | 3495 | 333  |
| 180° | 3513 | 3513  | 3513 | 3513  | 3513 |      |

TEST NUMBER: P909204

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US840-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2750.6 | 2750.6 | 2750.6 | 2750.6 | 2750.6 |
| 2.5°   | 2766.6 | 2753.4 | 2724.2 | 2750.6 | 2745.5 |
| 5°     | 2750.6 | 2740.3 | 2711.1 | 2732.1 | 2727.0 |
| 7.5°   | 2732.1 | 2716.3 | 2687.2 | 2708.6 | 2703.2 |
| 10°    | 2703.2 | 2684.6 | 2652.9 | 2674.0 | 2666.1 |
| 12.5°  | 2663.3 | 2647.7 | 2616.0 | 2629.1 | 2623.7 |
| 15°    | 2618.5 | 2602.7 | 2568.2 | 2578.9 | 2565.7 |
| 17.5°  | 2562.8 | 2547.2 | 2512.6 | 2525.9 | 2512.6 |
| 20°    | 2501.9 | 2486.3 | 2449.2 | 2457.1 | 2446.7 |
| 22.5°  | 2441.3 | 2417.5 | 2383.0 | 2383.0 | 2377.6 |
| 25°    | 2369.9 | 2348.7 | 2303.9 | 2309.0 | 2303.9 |
| 27.5°  | 2290.4 | 2271.9 | 2237.7 | 2229.8 | 2216.6 |
| 30°    | 2211.3 | 2189.9 | 2150.4 | 2142.5 | 2131.8 |
| 32.5°  | 2126.5 | 2110.8 | 2068.4 | 2052.5 | 2041.7 |
| 35°    | 2044.6 | 2018.2 | 1975.8 | 1959.8 | 1946.6 |
| 37.5°  | 1952.0 | 1928.1 | 1885.7 | 1867.2 | 1854.0 |
| 40°    | 1856.8 | 1835.5 | 1793.1 | 1769.6 | 1758.9 |
| 42.5°  | 1764.2 | 1742.9 | 1700.8 | 1674.2 | 1658.4 |
| 45°    | 1663.8 | 1645.3 | 1605.4 | 1576.5 | 1565.8 |
| 47.5°  | 1565.8 | 1547.3 | 1504.9 | 1475.7 | 1460.1 |
| 50°    | 1462.6 | 1449.4 | 1412.3 | 1375.3 | 1362.1 |
| 52.5°  | 1362.1 | 1343.6 | 1309.4 | 1280.2 | 1261.6 |
| 55°    | 1259.1 | 1243.1 | 1211.4 | 1179.7 | 1166.5 |
| 57.5°  | 1155.9 | 1142.7 | 1108.1 | 1076.4 | 1065.8 |
| 60°    | 1052.6 | 1042.2 | 1005.2 | 976.0  | 968.2  |
| 62.5°  | 952.1  | 933.6  | 907.3  | 880.9  | 870.2  |
| 65°    | 849.2  | 833.1  | 806.8  | 782.9  | 769.7  |
| 67.5°  | 743.4  | 729.9  | 706.3  | 687.8  | 677.1  |
| 70°    | 645.4  | 634.8  | 610.9  | 592.4  | 582.0  |
| 72.5°  | 544.9  | 534.3  | 521.1  | 502.6  | 494.7  |
| 75°    | 444.2  | 439.2  | 425.7  | 410.0  | 415.4  |
| 77.5°  | 354.5  | 343.8  | 338.4  | 330.5  | 322.8  |
| 80°    | 264.6  | 261.9  | 256.5  | 248.6  | 243.3  |
| 82.5°  | 179.9  | 179.9  | 177.3  | 166.7  | 166.7  |
| 85°    | 108.4  | 105.8  | 103.3  | 95.1   | 92.6   |
| 87.5°  | 47.7   | 42.4   | 37.1   | 29.2   | 26.4   |
| 90°    | 3.1    | 38.2   | 103.8  | 97.5   | 100.6  |
| 92.5°  | 65.6   | 89.0   | 92.1   | 95.3   | 95.3   |
| 95°    | 154.6  | 184.3  | 189.6  | 189.6  | 184.3  |
| 97.5°  | 257.4  | 284.9  | 296.6  | 296.6  | 296.6  |
| 100°   | 376.0  | 400.3  | 408.8  | 408.8  | 405.7  |
| 102.5° | 501.0  | 519.0  | 530.7  | 533.8  | 530.7  |
| 105°   | 637.6  | 646.1  | 652.5  | 657.7  | 657.7  |
| 107.5° | 773.2  | 785.9  | 785.9  | 788.0  | 773.2  |
| 110°   | 904.5  | 921.5  | 921.5  | 921.5  | 913.0  |

TEST NUMBER: P909204

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US840-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1046.4 | 1064.4 | 1061.3 | 1052.8 | 1046.4 |
| 115°   | 1186.3 | 1203.2 | 1197.9 | 1194.8 | 1186.3 |
| 117.5° | 1325.0 | 1348.3 | 1333.4 | 1325.0 | 1316.6 |
| 120°   | 1464.8 | 1488.1 | 1464.8 | 1464.8 | 1455.3 |
| 122.5° | 1592.0 | 1621.5 | 1606.7 | 1598.2 | 1592.0 |
| 125°   | 1725.4 | 1751.8 | 1743.3 | 1733.8 | 1730.6 |
| 127.5° | 1855.6 | 1888.4 | 1876.8 | 1864.1 | 1855.6 |
| 130°   | 1977.4 | 2015.6 | 2010.2 | 2003.9 | 1992.3 |
| 132.5° | 2114.1 | 2143.7 | 2145.9 | 2131.0 | 2122.5 |
| 135°   | 2231.6 | 2264.4 | 2270.8 | 2267.7 | 2259.2 |
| 137.5° | 2363.0 | 2389.4 | 2394.7 | 2392.6 | 2380.0 |
| 140°   | 2478.4 | 2504.9 | 2519.7 | 2519.7 | 2508.1 |
| 142.5° | 2597.1 | 2623.5 | 2632.0 | 2635.1 | 2623.5 |
| 145°   | 2709.3 | 2730.5 | 2747.4 | 2750.6 | 2739.0 |
| 147.5° | 2810.0 | 2836.4 | 2849.1 | 2854.4 | 2842.8 |
| 150°   | 2913.8 | 2931.7 | 2943.4 | 2952.9 | 2943.4 |
| 152.5° | 3005.9 | 3023.8 | 3038.7 | 3050.4 | 3038.7 |
| 155°   | 3098.1 | 3106.4 | 3116.0 | 3130.9 | 3121.3 |
| 157.5° | 3177.4 | 3183.8 | 3189.1 | 3210.3 | 3195.4 |
| 160°   | 3248.4 | 3254.8 | 3257.9 | 3276.0 | 3263.3 |
| 162.5° | 3314.1 | 3314.1 | 3317.3 | 3337.4 | 3322.6 |
| 165°   | 3370.2 | 3367.0 | 3367.0 | 3388.2 | 3373.4 |
| 167.5° | 3421.0 | 3411.5 | 3411.5 | 3432.7 | 3417.9 |
| 170°   | 3459.2 | 3450.7 | 3447.6 | 3468.7 | 3450.7 |
| 172.5° | 3485.7 | 3477.2 | 3474.0 | 3495.2 | 3477.2 |
| 175°   | 3506.9 | 3498.4 | 3492.0 | 3513.2 | 3495.2 |
| 177.5° | 3518.5 | 3510.0 | 3503.6 | 3521.7 | 3503.6 |
| 180°   | 3513.2 | 3513.2 | 3513.2 | 3513.2 | 3513.2 |

TEST NUMBER: P909204

CATALOG NUMBER: DFN2DIP-SQ3F0-070D110US840-FLLFLL

**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 | 10.40            | 11.19 | 11.42 | 12.22 | 13.61 | 9.95           | 10.75 | 10.98 | 11.78 | 13.16 |
|                 | 3H   | 12.05            | 12.76 | 13.09 | 13.80 | 15.21 | 11.56          | 12.27 | 12.59 | 13.31 | 14.72 |
|                 | 4H   | 12.63            | 13.30 | 13.68 | 14.35 | 15.76 | 12.14          | 12.81 | 13.18 | 13.85 | 15.27 |
|                 | 6H   | 13.02            | 13.64 | 14.08 | 14.69 | 16.12 | 12.52          | 13.14 | 13.58 | 14.19 | 15.62 |
|                 | 8H   | 13.12            | 13.71 | 14.19 | 14.78 | 16.20 | 12.62          | 13.21 | 13.69 | 14.28 | 15.70 |
|                 | 12H  | 13.17            | 13.73 | 14.24 | 14.79 | 16.23 | 12.66          | 13.22 | 13.73 | 14.28 | 15.72 |
| 4H              | 2H   | 10.85            | 11.52 | 11.90 | 12.56 | 13.98 | 10.49          | 11.16 | 11.55 | 12.21 | 13.62 |
|                 | 3H   | 12.70            | 13.26 | 13.76 | 14.34 | 15.76 | 12.29          | 12.85 | 13.36 | 13.93 | 15.35 |
|                 | 4H   | 13.41            | 13.92 | 14.48 | 14.99 | 16.43 | 12.99          | 13.50 | 14.05 | 14.56 | 16.01 |
|                 | 6H   | 13.92            | 14.36 | 14.99 | 15.44 | 16.89 | 13.48          | 13.93 | 14.56 | 15.01 | 16.45 |
|                 | 8H   | 14.06            | 14.47 | 15.14 | 15.55 | 17.01 | 13.62          | 14.04 | 14.70 | 15.12 | 16.57 |
|                 | 12H  | 14.13            | 14.50 | 15.23 | 15.60 | 17.06 | 13.68          | 14.05 | 14.78 | 15.15 | 16.61 |
| 8H              | 4H   | 13.60            | 14.01 | 14.67 | 15.09 | 16.55 | 13.22          | 13.63 | 14.30 | 14.71 | 16.17 |
|                 | 6H   | 14.22            | 14.56 | 15.32 | 15.68 | 17.14 | 13.83          | 14.18 | 14.93 | 15.30 | 16.75 |
|                 | 8H   | 14.44            | 14.73 | 15.54 | 15.84 | 17.31 | 14.04          | 14.34 | 15.15 | 15.44 | 16.92 |
|                 | 12H  | 14.56            | 14.82 | 15.67 | 15.92 | 17.44 | 14.15          | 14.41 | 15.26 | 15.51 | 17.02 |
| 12H             | 4H   | 13.58            | 13.95 | 14.67 | 15.04 | 16.51 | 13.21          | 13.58 | 14.30 | 14.67 | 16.14 |
|                 | 6H   | 14.25            | 14.55 | 15.35 | 15.65 | 17.12 | 13.87          | 14.17 | 14.98 | 15.28 | 16.75 |
|                 | 8H   | 14.48            | 14.74 | 15.59 | 15.84 | 17.36 | 14.10          | 14.36 | 15.21 | 15.46 | 16.97 |