

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: P911970

Luminaire Tested: DFN2DIP-SQ3F0-080D110US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911970  
REPORT IS A COMBINATION OF REPORTS P899996 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-080D110US850-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

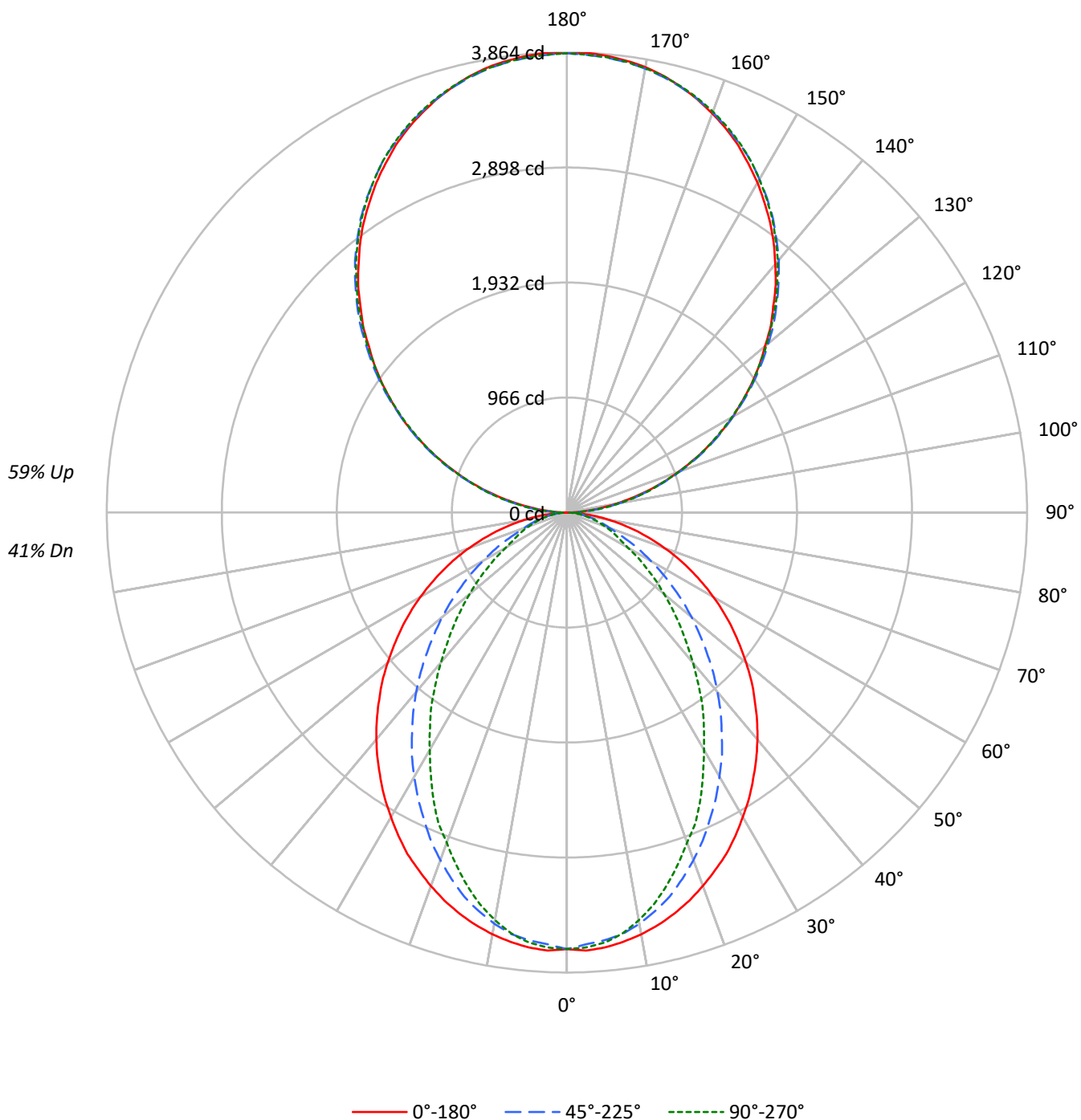
Lumens per Lamp: N/A  
Luminaire Lumens: 18337.3 lumens  
Efficiency: N/A  
Efficacy: 113.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 162.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P911970

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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 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |  |    |    |    |  |    |
| 0   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 78 | 78 | 78 |  | 63 | 63 | 63 |  | 48 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 69 | 67 | 65 |  | 56 | 54 | 53 |  | 43 |
| 2   | 88  | 81  | 75  | 70  | 80 | 74 | 69 | 65 | 61 | 58 | 55 |  | 49 | 47 | 45 |  | 38 |
| 3   | 80  | 71  | 64  | 59  | 73 | 65 | 59 | 55 | 54 | 50 | 46 |  | 44 | 41 | 38 |  | 34 |
| 4   | 74  | 63  | 56  | 50  | 67 | 58 | 52 | 47 | 48 | 44 | 40 |  | 39 | 36 | 33 |  | 31 |
| 5   | 68  | 57  | 49  | 43  | 62 | 52 | 45 | 40 | 43 | 38 | 34 |  | 36 | 32 | 29 |  | 28 |
| 6   | 63  | 51  | 43  | 37  | 57 | 47 | 40 | 35 | 39 | 34 | 30 |  | 32 | 28 | 25 |  | 26 |
| 7   | 58  | 46  | 38  | 33  | 53 | 42 | 36 | 31 | 36 | 31 | 27 |  | 29 | 26 | 23 |  | 23 |
| 8   | 54  | 42  | 34  | 29  | 49 | 39 | 32 | 27 | 33 | 27 | 24 |  | 27 | 23 | 20 |  | 22 |
| 9   | 50  | 38  | 31  | 26  | 46 | 35 | 29 | 24 | 30 | 25 | 21 |  | 25 | 21 | 18 |  | 20 |
| 10  | 47  | 35  | 28  | 23  | 43 | 32 | 26 | 22 | 28 | 23 | 19 |  | 23 | 19 | 17 |  | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4201 | 4201 | 4201 |
| 5°  | 4205 | 4132 | 4160 |
| 10° | 4161 | 4048 | 4023 |
| 15° | 4101 | 3912 | 3813 |
| 20° | 4023 | 3725 | 3555 |
| 25° | 3942 | 3515 | 3306 |
| 30° | 3835 | 3301 | 2990 |
| 35° | 3730 | 3071 | 2713 |
| 40° | 3623 | 2833 | 2396 |
| 45° | 3499 | 2570 | 2109 |
| 50° | 3371 | 2305 | 1828 |
| 55° | 3236 | 2021 | 1558 |
| 60° | 3080 | 1725 | 1281 |
| 65° | 2901 | 1424 | 1152 |
| 70° | 2683 | 1144 | 1040 |
| 75° | 2409 | 1003 | 944  |
| 80° | 2013 | 832  | 814  |
| 85° | 1365 | 542  | 603  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3881 cd/sqm

TEST NUMBER: P911970

CATALOG NUMBER: DFN2DIP-SQ3F0-080D110US850-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 343.7   | 1.9       |
| 10°-20°   | 943.4   | 5.1       |
| 20°-30°   | 1324.5  | 7.2       |
| 30°-40°   | 1443.8  | 7.9       |
| 40°-50°   | 1327.0  | 7.2       |
| 50°-60°   | 1042.1  | 5.7       |
| 60°-70°   | 678.3   | 3.7       |
| 70°-80°   | 349.2   | 1.9       |
| 80°-90°   | 100.1   | 0.5       |
| 90°-100°  | 238.7   | 1.3       |
| 100°-110° | 758.6   | 4.1       |
| 110°-120° | 1298.1  | 7.1       |
| 120°-130° | 1707.2  | 9.3       |
| 130°-140° | 1916.3  | 10.5      |
| 140°-150° | 1879.1  | 10.2      |
| 150°-160° | 1576.3  | 8.6       |
| 160°-170° | 1045.4  | 5.7       |
| 170°-180° | 365.4   | 2.0       |
| 0°-30°    | 2611.6  | 14.2      |
| 0°-40°    | 4055.4  | 22.1      |
| 0°-60°    | 6424.5  | 35.0      |
| 0°-90°    | 7552.2  | 41.2      |
| 90°-120°  | 2295.4  | 12.5      |
| 90°-150°  | 7798.0  | 42.5      |
| 90°-180°  | 10785.0 | 58.8      |
| 0°-180°   | 18337.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3667 | 3667  | 3667 | 3667  | 3667 |      |
| 5°   | 3667 | 3650  | 3607 | 3637  | 3627 | 348  |
| 15°  | 3488 | 3451  | 3338 | 3275  | 3242 | 983  |
| 25°  | 3166 | 3060  | 2840 | 2705  | 2655 | 1456 |
| 35°  | 2728 | 2558  | 2267 | 2058  | 1984 | 1707 |
| 45°  | 2230 | 2008  | 1659 | 1423  | 1344 | 1722 |
| 55°  | 1696 | 1437  | 1078 | 879   | 816  | 1515 |
| 65°  | 1145 | 876   | 577  | 465   | 454  | 1135 |
| 75°  | 610  | 378   | 266  | 242   | 239  | 646  |
| 85°  | 143  | 73    | 63   | 63    | 63   | 164  |
| 90°  | 3    | 42    | 114  | 107   | 110  | 18   |
| 95°  | 170  | 202   | 208  | 208   | 202  | 189  |
| 105° | 700  | 710   | 716  | 722   | 722  | 739  |
| 115° | 1303 | 1321  | 1316 | 1312  | 1303 | 1288 |
| 125° | 1895 | 1924  | 1914 | 1904  | 1900 | 1693 |
| 135° | 2451 | 2487  | 2494 | 2490  | 2481 | 1894 |
| 145° | 2975 | 2998  | 3017 | 3021  | 3008 | 1859 |
| 155° | 3402 | 3411  | 3422 | 3438  | 3428 | 1566 |
| 165° | 3701 | 3698  | 3698 | 3721  | 3704 | 1044 |
| 175° | 3851 | 3842  | 3835 | 3858  | 3838 | 366  |
| 180° | 3858 | 3858  | 3858 | 3858  | 3858 |      |

TEST NUMBER: P911970

CATALOG NUMBER: DFN2DIP-SQ3F0-080D110US850-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3666.8 | 3666.8 | 3666.8 | 3666.8 | 3666.8 |
| 2.5°   | 3683.3 | 3666.8 | 3630.2 | 3663.6 | 3656.9 |
| 5°     | 3666.8 | 3650.3 | 3606.9 | 3636.9 | 3627.0 |
| 7.5°   | 3636.9 | 3617.1 | 3570.6 | 3583.7 | 3567.1 |
| 10°    | 3597.0 | 3573.9 | 3507.7 | 3497.5 | 3477.7 |
| 12.5°  | 3547.5 | 3517.5 | 3427.7 | 3408.0 | 3371.4 |
| 15°    | 3487.6 | 3451.0 | 3338.3 | 3275.3 | 3242.2 |
| 17.5°  | 3417.8 | 3364.7 | 3225.3 | 3152.4 | 3099.2 |
| 20°    | 3338.3 | 3271.8 | 3106.0 | 3023.2 | 2949.9 |
| 22.5°  | 3252.0 | 3175.6 | 2983.1 | 2870.4 | 2820.7 |
| 25°    | 3165.8 | 3059.5 | 2840.5 | 2704.6 | 2654.6 |
| 27.5°  | 3062.9 | 2949.9 | 2707.7 | 2551.8 | 2475.4 |
| 30°    | 2953.5 | 2827.1 | 2561.7 | 2392.7 | 2302.8 |
| 32.5°  | 2847.1 | 2694.4 | 2422.6 | 2223.3 | 2140.3 |
| 35°    | 2727.8 | 2558.5 | 2266.6 | 2057.5 | 1984.2 |
| 37.5°  | 2611.6 | 2428.9 | 2120.5 | 1891.3 | 1808.6 |
| 40°    | 2488.8 | 2289.9 | 1967.7 | 1732.1 | 1645.9 |
| 42.5°  | 2362.7 | 2150.5 | 1815.2 | 1569.6 | 1486.7 |
| 45°    | 2230.0 | 2007.5 | 1659.3 | 1423.4 | 1343.9 |
| 47.5°  | 2104.0 | 1868.4 | 1510.0 | 1274.1 | 1201.3 |
| 50°    | 1964.5 | 1729.0 | 1364.0 | 1134.7 | 1065.3 |
| 52.5°  | 1828.3 | 1579.3 | 1224.4 | 1005.5 | 942.5  |
| 55°    | 1695.6 | 1436.8 | 1078.4 | 879.4  | 816.4  |
| 57.5°  | 1559.7 | 1294.2 | 949.2  | 763.3  | 710.1  |
| 60°    | 1420.2 | 1154.8 | 812.9  | 643.9  | 590.8  |
| 62.5°  | 1284.3 | 1018.8 | 696.8  | 537.6  | 511.2  |
| 65°    | 1144.9 | 875.9  | 577.3  | 464.8  | 454.5  |
| 67.5°  | 1012.2 | 743.3  | 464.8  | 408.0  | 398.2  |
| 70°    | 872.8  | 614.1  | 384.8  | 351.7  | 338.4  |
| 72.5°  | 740.0  | 494.3  | 321.8  | 295.4  | 288.7  |
| 75°    | 610.5  | 378.2  | 265.5  | 242.2  | 239.1  |
| 77.5°  | 481.3  | 268.6  | 209.2  | 195.7  | 189.1  |
| 80°    | 361.5  | 192.6  | 159.1  | 146.1  | 146.1  |
| 82.5°  | 252.1  | 129.5  | 109.5  | 102.8  | 102.8  |
| 85°    | 142.6  | 72.9   | 63.0   | 63.0   | 63.0   |
| 87.5°  | 53.1   | 26.4   | 26.4   | 23.3   | 23.3   |
| 90°    | 3.4    | 41.9   | 114.0  | 107.0  | 110.5  |
| 92.5°  | 72.1   | 97.7   | 101.1  | 104.7  | 104.7  |
| 95°    | 169.8  | 202.4  | 208.2  | 208.2  | 202.4  |
| 97.5°  | 282.7  | 312.8  | 325.7  | 325.7  | 325.7  |
| 100°   | 412.9  | 439.6  | 448.9  | 448.9  | 445.5  |
| 102.5° | 550.2  | 569.9  | 582.8  | 586.2  | 582.8  |
| 105°   | 700.2  | 709.5  | 716.5  | 722.3  | 722.3  |
| 107.5° | 849.1  | 863.0  | 863.0  | 865.4  | 849.1  |
| 110°   | 993.3  | 1012.0 | 1012.0 | 1012.0 | 1002.6 |

TEST NUMBER: P911970

CATALOG NUMBER: DFN2DIP-SQ3F0-080D110US850-RLFL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1149.1 | 1168.9 | 1165.4 | 1156.1 | 1149.1 |
| 115°   | 1302.7 | 1321.3 | 1315.5 | 1312.1 | 1302.7 |
| 117.5° | 1455.1 | 1480.6 | 1464.3 | 1455.1 | 1445.8 |
| 120°   | 1608.6 | 1634.2 | 1608.6 | 1608.6 | 1598.2 |
| 122.5° | 1748.2 | 1780.7 | 1764.4 | 1755.1 | 1748.2 |
| 125°   | 1894.7 | 1923.8 | 1914.5 | 1904.0 | 1900.5 |
| 127.5° | 2037.8 | 2073.8 | 2061.1 | 2047.1 | 2037.8 |
| 130°   | 2171.5 | 2213.5 | 2207.6 | 2200.6 | 2187.8 |
| 132.5° | 2321.6 | 2354.2 | 2356.5 | 2340.2 | 2330.9 |
| 135°   | 2450.7 | 2486.7 | 2493.7 | 2490.3 | 2480.9 |
| 137.5° | 2594.9 | 2624.0 | 2629.8 | 2627.4 | 2613.6 |
| 140°   | 2721.7 | 2750.8 | 2767.1 | 2767.1 | 2754.3 |
| 142.5° | 2852.0 | 2881.1 | 2890.4 | 2893.8 | 2881.1 |
| 145°   | 2975.2 | 2998.5 | 3017.1 | 3020.6 | 3007.8 |
| 147.5° | 3085.8 | 3114.8 | 3128.8 | 3134.6 | 3121.8 |
| 150°   | 3199.8 | 3219.5 | 3232.3 | 3242.8 | 3232.3 |
| 152.5° | 3300.9 | 3320.7 | 3337.0 | 3349.8 | 3337.0 |
| 155°   | 3402.2 | 3411.4 | 3421.9 | 3438.2 | 3427.7 |
| 157.5° | 3489.4 | 3496.3 | 3502.1 | 3525.4 | 3509.1 |
| 160°   | 3567.3 | 3574.3 | 3577.7 | 3597.6 | 3583.6 |
| 162.5° | 3639.4 | 3639.4 | 3643.0 | 3665.0 | 3648.7 |
| 165°   | 3701.1 | 3697.5 | 3697.5 | 3720.8 | 3704.5 |
| 167.5° | 3756.8 | 3746.4 | 3746.4 | 3769.7 | 3753.4 |
| 170°   | 3798.8 | 3789.5 | 3786.0 | 3809.2 | 3789.5 |
| 172.5° | 3827.8 | 3818.5 | 3815.1 | 3838.4 | 3818.5 |
| 175°   | 3851.1 | 3841.8 | 3834.8 | 3858.1 | 3838.4 |
| 177.5° | 3863.9 | 3854.6 | 3847.6 | 3867.4 | 3847.6 |
| 180°   | 3858.1 | 3858.1 | 3858.1 | 3858.1 | 3858.1 |



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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 | 11.22            | 11.98 | 12.25 | 13.02 | 14.41 | 7.18           | 7.94  | 8.21  | 8.98  | 10.37 |
|                 | 3H   | 12.88            | 13.57 | 13.93 | 14.61 | 16.03 | 8.35           | 9.04  | 9.40  | 10.08 | 11.50 |
|                 | 4H   | 13.49            | 14.13 | 14.54 | 15.18 | 16.60 | 8.80           | 9.44  | 9.85  | 10.49 | 11.91 |
|                 | 6H   | 13.90            | 14.49 | 14.97 | 15.55 | 16.98 | 9.11           | 9.70  | 10.17 | 10.76 | 12.19 |
|                 | 8H   | 14.02            | 14.59 | 15.09 | 15.66 | 17.08 | 9.19           | 9.76  | 10.26 | 10.83 | 12.26 |
|                 | 12H  | 14.08            | 14.62 | 15.16 | 15.68 | 17.13 | 9.23           | 9.77  | 10.31 | 10.83 | 12.28 |
| 4H              | 2H   | 11.22            | 11.87 | 12.29 | 12.92 | 14.34 | 7.76           | 8.41  | 8.82  | 9.46  | 10.88 |
|                 | 3H   | 13.04            | 13.58 | 14.11 | 14.66 | 16.09 | 9.10           | 9.63  | 10.17 | 10.71 | 12.15 |
|                 | 4H   | 13.73            | 14.22 | 14.80 | 15.29 | 16.74 | 9.64           | 10.13 | 10.71 | 11.20 | 12.65 |
|                 | 6H   | 14.23            | 14.66 | 15.32 | 15.75 | 17.20 | 10.05          | 10.47 | 11.13 | 11.56 | 13.01 |
|                 | 8H   | 14.41            | 14.80 | 15.49 | 15.88 | 17.35 | 10.17          | 10.56 | 11.26 | 11.65 | 13.11 |
|                 | 12H  | 14.49            | 14.85 | 15.60 | 15.95 | 17.42 | 10.23          | 10.58 | 11.33 | 11.68 | 13.15 |
| 8H              | 4H   | 13.69            | 14.08 | 14.77 | 15.17 | 16.63 | 9.91           | 10.30 | 11.00 | 11.39 | 12.85 |
|                 | 6H   | 14.25            | 14.57 | 15.35 | 15.70 | 17.16 | 10.42          | 10.74 | 11.52 | 11.87 | 13.33 |
|                 | 8H   | 14.46            | 14.74 | 15.57 | 15.85 | 17.33 | 10.60          | 10.89 | 11.72 | 12.00 | 13.48 |
|                 | 12H  | 14.59            | 14.84 | 15.71 | 15.95 | 17.47 | 10.71          | 10.96 | 11.83 | 12.07 | 13.59 |
| 12H             | 4H   | 13.64            | 13.99 | 14.74 | 15.09 | 16.56 | 9.91           | 10.27 | 11.01 | 11.36 | 12.83 |
|                 | 6H   | 14.22            | 14.51 | 15.34 | 15.61 | 17.10 | 10.46          | 10.75 | 11.58 | 11.86 | 13.34 |
|                 | 8H   | 14.44            | 14.69 | 15.55 | 15.79 | 17.31 | 10.67          | 10.92 | 11.78 | 12.02 | 13.54 |