

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: P922986

Luminaire Tested: DFN2DIP-SQ3F0-110D100US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922986  
REPORT IS A COMBINATION OF REPORTS P899984 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D100US940-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

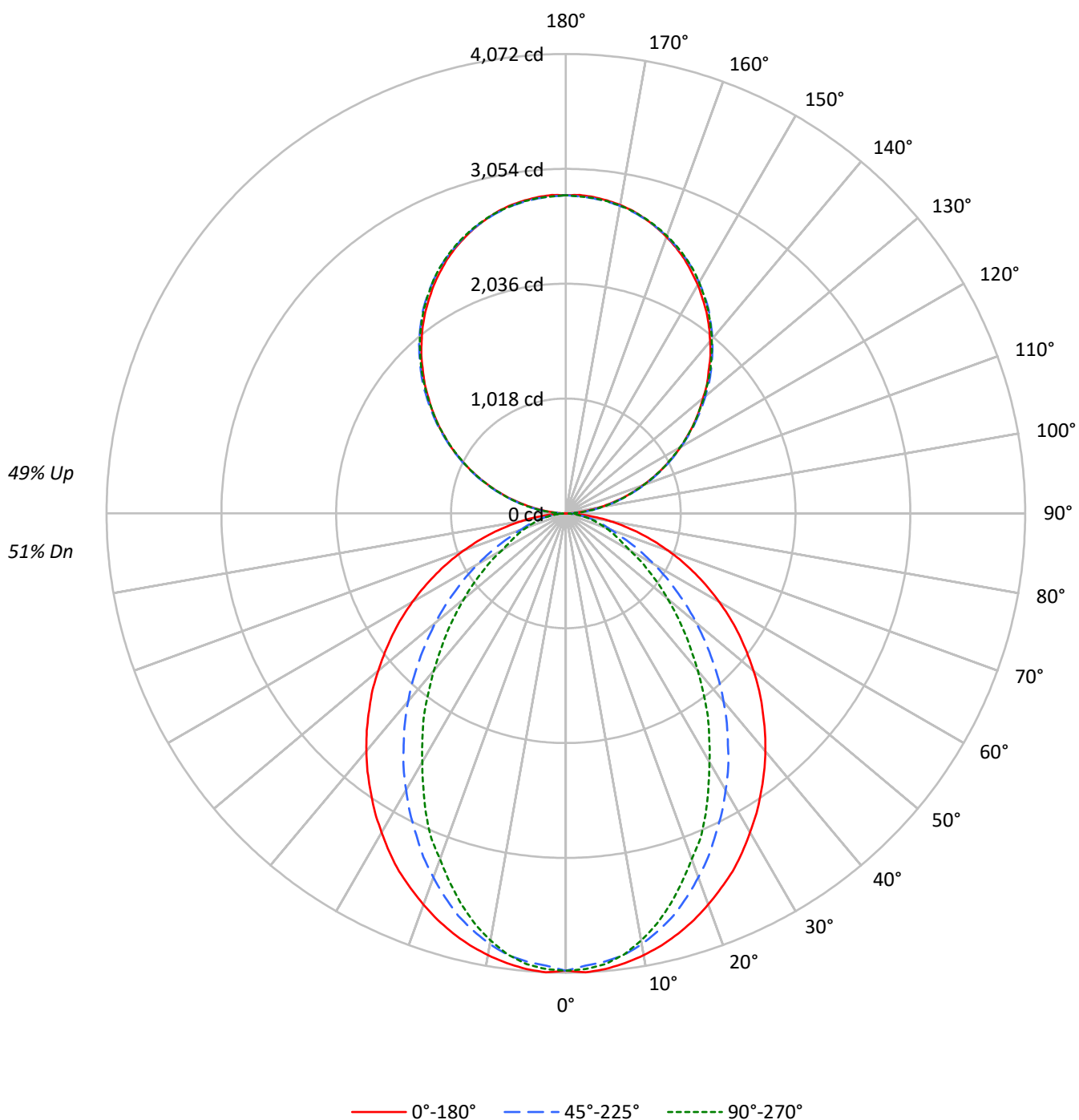
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16229.1 lumens  
Efficiency: N/A  
Efficacy: 85.7 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): 189.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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: P922986

CATALOG NUMBER: DFN2DIP-SQ3F0-110D100US940-RLFL

**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 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 99  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 50 | 49 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 56 | 53 | 50 | 46 | 44 | 42 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 59 | 54 | 50 | 50 | 46 | 43 | 41 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 44 | 41 | 37 | 37 | 34 | 32 |
| 5   | 70  | 58  | 51  | 45  | 64 | 55 | 48 | 42 | 47 | 42 | 38 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 43 | 37 | 33 | 36 | 32 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 23 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 36 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 18 |
| 10  | 48  | 37  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4645 | 4645 | 4645 |
| 5°  | 4650 | 4568 | 4599 |
| 10° | 4601 | 4476 | 4448 |
| 15° | 4534 | 4325 | 4215 |
| 20° | 4448 | 4118 | 3930 |
| 25° | 4359 | 3887 | 3655 |
| 30° | 4240 | 3650 | 3306 |
| 35° | 4124 | 3396 | 3000 |
| 40° | 4006 | 3133 | 2649 |
| 45° | 3869 | 2842 | 2332 |
| 50° | 3727 | 2548 | 2021 |
| 55° | 3578 | 2234 | 1723 |
| 60° | 3406 | 1907 | 1417 |
| 65° | 3207 | 1575 | 1273 |
| 70° | 2967 | 1265 | 1150 |
| 75° | 2663 | 1108 | 1043 |
| 80° | 2226 | 920  | 900  |
| 85° | 1510 | 599  | 666  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3869 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 379.9   | 2.3       |
| 10°-20°   | 1043.0  | 6.4       |
| 20°-30°   | 1464.4  | 9.0       |
| 30°-40°   | 1596.2  | 9.8       |
| 40°-50°   | 1467.1  | 9.0       |
| 50°-60°   | 1152.2  | 7.1       |
| 60°-70°   | 750.0   | 4.6       |
| 70°-80°   | 386.0   | 2.4       |
| 80°-90°   | 106.6   | 0.7       |
| 90°-100°  | 174.5   | 1.1       |
| 100°-110° | 554.5   | 3.4       |
| 110°-120° | 948.9   | 5.8       |
| 120°-130° | 1247.9  | 7.7       |
| 130°-140° | 1400.8  | 8.6       |
| 140°-150° | 1373.6  | 8.5       |
| 150°-160° | 1152.3  | 7.1       |
| 160°-170° | 764.1   | 4.7       |
| 170°-180° | 267.1   | 1.6       |
| 0°-30°    | 2887.3  | 17.8      |
| 0°-40°    | 4483.6  | 27.6      |
| 0°-60°    | 7102.9  | 43.8      |
| 0°-90°    | 8345.5  | 51.4      |
| 90°-120°  | 1677.9  | 10.3      |
| 90°-150°  | 5700.1  | 35.1      |
| 90°-180°  | 7884.0  | 48.6      |
| 0°-180°   | 16229.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4054 | 4054  | 4054 | 4054  | 4054 |      |
| 5°   | 4054 | 4036  | 3988 | 4021  | 4010 | 384  |
| 15°  | 3856 | 3815  | 3691 | 3621  | 3584 | 1087 |
| 25°  | 3500 | 3382  | 3140 | 2990  | 2935 | 1610 |
| 35°  | 3016 | 2829  | 2506 | 2275  | 2194 | 1888 |
| 45°  | 2466 | 2220  | 1834 | 1574  | 1486 | 1904 |
| 55°  | 1875 | 1588  | 1192 | 972   | 903  | 1675 |
| 65°  | 1266 | 968   | 638  | 514   | 502  | 1255 |
| 75°  | 675  | 418   | 294  | 268   | 264  | 714  |
| 85°  | 158  | 81    | 70   | 70    | 70   | 181  |
| 90°  | 3    | 31    | 83   | 78    | 81   | 16   |
| 95°  | 124  | 148   | 152  | 152   | 148  | 138  |
| 105° | 512  | 519   | 524  | 528   | 528  | 540  |
| 115° | 952  | 966   | 962  | 959   | 952  | 942  |
| 125° | 1385 | 1406  | 1400 | 1392  | 1389 | 1238 |
| 135° | 1791 | 1818  | 1823 | 1820  | 1814 | 1385 |
| 145° | 2175 | 2192  | 2206 | 2208  | 2199 | 1359 |
| 155° | 2487 | 2494  | 2501 | 2513  | 2506 | 1145 |
| 165° | 2705 | 2703  | 2703 | 2720  | 2708 | 763  |
| 175° | 2815 | 2808  | 2803 | 2820  | 2806 | 267  |
| 180° | 2820 | 2820  | 2820 | 2820  | 2820 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4054.0 | 4054.0 | 4054.0 | 4054.0 | 4054.0 |
| 2.5°   | 4072.3 | 4054.0 | 4013.5 | 4050.5 | 4043.1 |
| 5°     | 4054.0 | 4035.7 | 3987.8 | 4020.9 | 4010.0 |
| 7.5°   | 4020.9 | 3999.1 | 3947.7 | 3962.1 | 3943.8 |
| 10°    | 3976.9 | 3951.2 | 3878.0 | 3866.7 | 3845.0 |
| 12.5°  | 3922.0 | 3888.9 | 3789.7 | 3767.8 | 3727.3 |
| 15°    | 3855.8 | 3815.4 | 3690.8 | 3621.1 | 3584.5 |
| 17.5°  | 3778.8 | 3720.0 | 3565.9 | 3485.2 | 3426.5 |
| 20°    | 3690.8 | 3617.2 | 3433.9 | 3342.4 | 3261.4 |
| 22.5°  | 3595.5 | 3510.9 | 3298.1 | 3173.5 | 3118.6 |
| 25°    | 3500.1 | 3382.5 | 3140.4 | 2990.2 | 2934.9 |
| 27.5°  | 3386.4 | 3261.4 | 2993.7 | 2821.2 | 2736.7 |
| 30°    | 3265.4 | 3125.6 | 2832.2 | 2645.3 | 2546.0 |
| 32.5°  | 3147.8 | 2978.8 | 2678.3 | 2458.1 | 2366.2 |
| 35°    | 3015.9 | 2828.6 | 2506.0 | 2274.8 | 2193.8 |
| 37.5°  | 2887.4 | 2685.4 | 2344.4 | 2091.0 | 1999.6 |
| 40°    | 2751.6 | 2531.7 | 2175.5 | 1915.0 | 1819.7 |
| 42.5°  | 2612.2 | 2377.5 | 2007.0 | 1735.3 | 1643.8 |
| 45°    | 2465.5 | 2219.5 | 1834.5 | 1573.7 | 1485.8 |
| 47.5°  | 2326.1 | 2065.7 | 1669.5 | 1408.6 | 1328.1 |
| 50°    | 2171.9 | 1911.6 | 1508.0 | 1254.5 | 1177.9 |
| 52.5°  | 2021.3 | 1746.1 | 1353.8 | 1111.7 | 1042.0 |
| 55°    | 1874.6 | 1588.5 | 1192.2 | 972.3  | 902.7  |
| 57.5°  | 1724.4 | 1430.8 | 1049.4 | 843.9  | 785.1  |
| 60°    | 1570.2 | 1276.8 | 898.8  | 711.9  | 653.2  |
| 62.5°  | 1420.0 | 1126.5 | 770.3  | 594.4  | 565.2  |
| 65°    | 1265.8 | 968.4  | 638.4  | 513.8  | 502.5  |
| 67.5°  | 1119.1 | 821.7  | 513.8  | 451.1  | 440.2  |
| 70°    | 964.9  | 678.9  | 425.4  | 388.9  | 374.1  |
| 72.5°  | 818.1  | 546.5  | 355.8  | 326.5  | 319.1  |
| 75°    | 674.9  | 418.0  | 293.5  | 267.8  | 264.3  |
| 77.5°  | 532.1  | 297.0  | 231.2  | 216.4  | 209.0  |
| 80°    | 399.8  | 212.9  | 175.9  | 161.6  | 161.6  |
| 82.5°  | 278.7  | 143.2  | 121.1  | 113.7  | 113.7  |
| 85°    | 157.7  | 80.6   | 69.6   | 69.6   | 69.6   |
| 87.5°  | 58.8   | 29.2   | 29.2   | 25.7   | 25.7   |
| 90°    | 2.6    | 30.6   | 83.3   | 78.2   | 80.8   |
| 92.5°  | 52.7   | 71.4   | 74.0   | 76.5   | 76.5   |
| 95°    | 124.1  | 147.9  | 152.2  | 152.2  | 147.9  |
| 97.5°  | 206.6  | 228.7  | 238.1  | 238.1  | 238.1  |
| 100°   | 301.8  | 321.4  | 328.1  | 328.1  | 325.7  |
| 102.5° | 402.2  | 416.6  | 426.0  | 428.5  | 426.0  |
| 105°   | 511.8  | 518.6  | 523.7  | 528.0  | 528.0  |
| 107.5° | 620.6  | 630.9  | 630.9  | 632.6  | 620.6  |
| 110°   | 726.1  | 739.7  | 739.7  | 739.7  | 732.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 840.0  | 854.4  | 851.9  | 845.1  | 840.0  |
| 115°   | 952.3  | 965.8  | 961.6  | 959.0  | 952.3  |
| 117.5° | 1063.6 | 1082.4 | 1070.4 | 1063.6 | 1056.8 |
| 120°   | 1175.8 | 1194.5 | 1175.8 | 1175.8 | 1168.2 |
| 122.5° | 1277.8 | 1301.6 | 1289.8 | 1283.0 | 1277.8 |
| 125°   | 1385.0 | 1406.2 | 1399.5 | 1391.8 | 1389.3 |
| 127.5° | 1489.6 | 1515.9 | 1506.5 | 1496.4 | 1489.6 |
| 130°   | 1587.3 | 1617.9 | 1613.7 | 1608.6 | 1599.3 |
| 132.5° | 1697.0 | 1720.8 | 1722.5 | 1710.7 | 1703.8 |
| 135°   | 1791.4 | 1817.8 | 1822.8 | 1820.3 | 1813.5 |
| 137.5° | 1896.8 | 1918.1 | 1922.3 | 1920.7 | 1910.4 |
| 140°   | 1989.5 | 2010.7 | 2022.7 | 2022.7 | 2013.3 |
| 142.5° | 2084.7 | 2106.0 | 2112.7 | 2115.3 | 2106.0 |
| 145°   | 2174.8 | 2191.8 | 2205.5 | 2208.0 | 2198.6 |
| 147.5° | 2255.6 | 2276.9 | 2287.1 | 2291.3 | 2282.0 |
| 150°   | 2339.0 | 2353.4 | 2362.8 | 2370.3 | 2362.8 |
| 152.5° | 2412.9 | 2427.3 | 2439.3 | 2448.6 | 2439.3 |
| 155°   | 2486.9 | 2493.7 | 2501.3 | 2513.2 | 2505.5 |
| 157.5° | 2550.6 | 2555.7 | 2560.0 | 2577.0 | 2565.1 |
| 160°   | 2607.6 | 2612.7 | 2615.2 | 2629.7 | 2619.5 |
| 162.5° | 2660.3 | 2660.3 | 2662.8 | 2679.0 | 2667.1 |
| 165°   | 2705.4 | 2702.8 | 2702.8 | 2719.8 | 2707.9 |
| 167.5° | 2746.2 | 2738.5 | 2738.5 | 2755.6 | 2743.6 |
| 170°   | 2776.8 | 2770.0 | 2767.4 | 2784.5 | 2770.0 |
| 172.5° | 2798.0 | 2791.2 | 2788.6 | 2805.7 | 2791.2 |
| 175°   | 2815.0 | 2808.3 | 2803.2 | 2820.1 | 2805.7 |
| 177.5° | 2824.4 | 2817.6 | 2812.5 | 2826.9 | 2812.5 |
| 180°   | 2820.1 | 2820.1 | 2820.1 | 2820.1 | 2820.1 |

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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 | 12.58            | 13.42 | 13.53 | 14.38 | 15.64 | 8.54           | 9.38  | 9.49  | 10.35 | 11.60 |
|                 | 3H   | 14.25            | 15.01 | 15.22 | 15.98 | 17.26 | 9.72           | 10.48 | 10.69 | 11.45 | 12.73 |
|                 | 4H   | 14.86            | 15.57 | 15.84 | 16.55 | 17.83 | 10.17          | 10.88 | 11.15 | 11.86 | 13.14 |
|                 | 6H   | 15.28            | 15.93 | 16.27 | 16.91 | 18.21 | 10.49          | 11.14 | 11.47 | 12.12 | 13.42 |
|                 | 8H   | 15.40            | 16.03 | 16.40 | 17.02 | 18.32 | 10.57          | 11.20 | 11.57 | 12.19 | 13.49 |
|                 | 12H  | 15.46            | 16.06 | 16.46 | 17.05 | 18.37 | 10.61          | 11.21 | 11.61 | 12.20 | 13.52 |
| 4H              | 2H   | 12.60            | 13.31 | 13.58 | 14.29 | 15.57 | 9.14           | 9.85  | 10.12 | 10.82 | 12.11 |
|                 | 3H   | 14.42            | 15.01 | 15.41 | 16.02 | 17.32 | 10.48          | 11.07 | 11.47 | 12.08 | 13.37 |
|                 | 4H   | 15.11            | 15.65 | 16.11 | 16.65 | 17.97 | 11.02          | 11.56 | 12.02 | 12.56 | 13.88 |
|                 | 6H   | 15.62            | 16.09 | 16.63 | 17.11 | 18.43 | 11.44          | 11.90 | 12.45 | 12.92 | 14.24 |
|                 | 8H   | 15.80            | 16.23 | 16.81 | 17.24 | 18.58 | 11.56          | 11.99 | 12.57 | 13.01 | 14.34 |
|                 | 12H  | 15.89            | 16.28 | 16.92 | 17.31 | 18.65 | 11.62          | 12.01 | 12.65 | 13.04 | 14.38 |
| 8H              | 4H   | 15.08            | 15.51 | 16.09 | 16.53 | 17.86 | 11.30          | 11.73 | 12.31 | 12.75 | 14.08 |
|                 | 6H   | 15.64            | 16.00 | 16.68 | 17.05 | 18.39 | 11.81          | 12.17 | 12.85 | 13.23 | 14.56 |
|                 | 8H   | 15.85            | 16.17 | 16.90 | 17.21 | 18.56 | 12.00          | 12.31 | 13.04 | 13.35 | 14.71 |
|                 | 12H  | 15.99            | 16.27 | 17.04 | 17.30 | 18.70 | 12.11          | 12.39 | 13.16 | 13.43 | 14.82 |
| 12H             | 4H   | 15.03            | 15.42 | 16.06 | 16.45 | 17.79 | 11.30          | 11.70 | 12.34 | 12.73 | 14.07 |
|                 | 6H   | 15.61            | 15.93 | 16.66 | 16.97 | 18.32 | 11.86          | 12.17 | 12.90 | 13.22 | 14.57 |
|                 | 8H   | 15.83            | 16.11 | 16.88 | 17.15 | 18.54 | 12.06          | 12.34 | 13.11 | 13.38 | 14.77 |