

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: P923096

Luminaire Tested: DFN2DIP-SQ4F0-070D140US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923096  
REPORT IS A COMBINATION OF REPORTS P900187 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-070D140US940-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

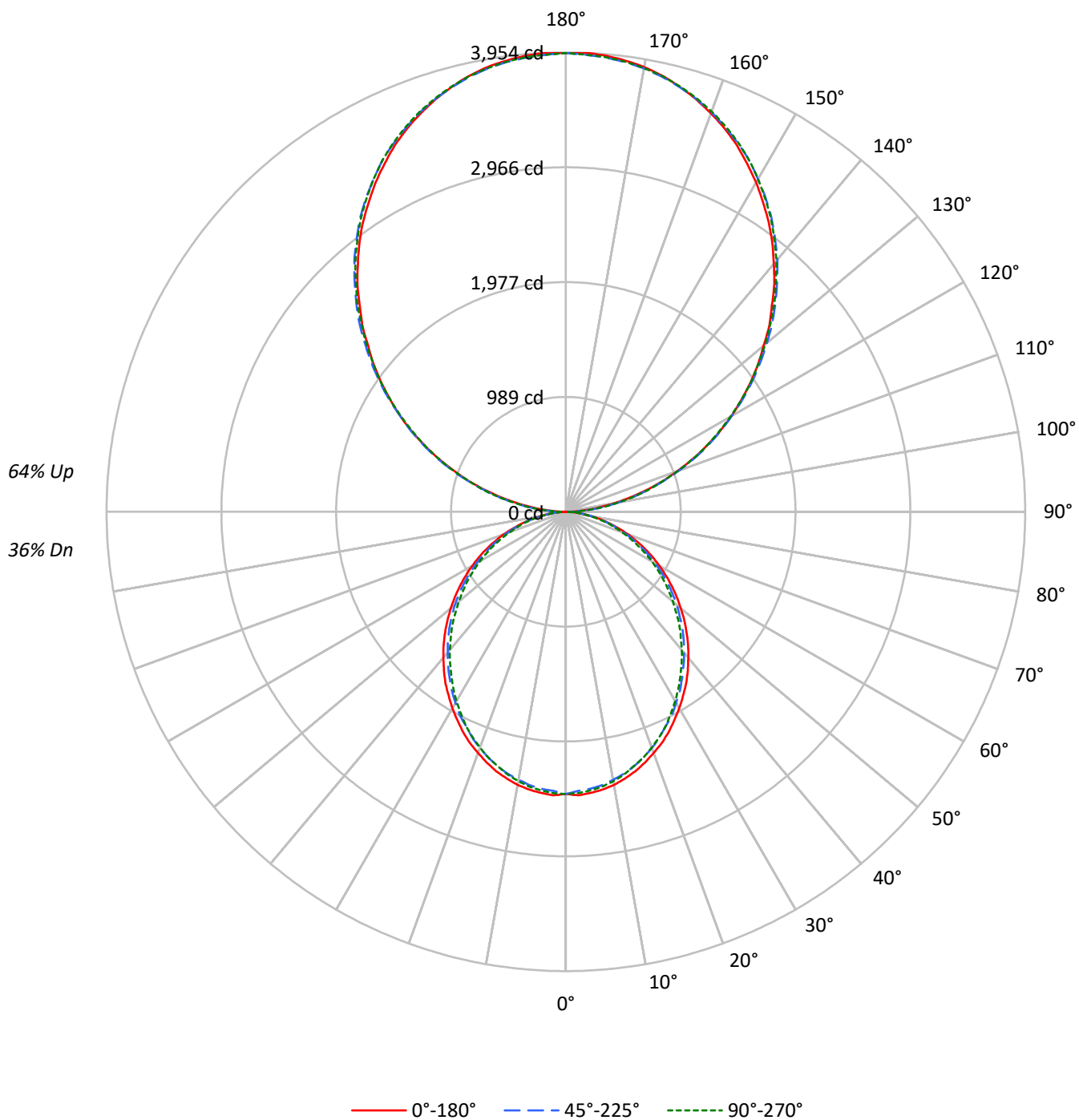
Lumens per Lamp: N/A  
Luminaire Lumens: 17227.9 lumens  
Efficiency: N/A  
Efficacy: 103.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 167.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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: P923096

CATALOG NUMBER: DFN2DIP-SQ4F0-070D140US940-FLLFL

**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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 43 | 43 | 43 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 34 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 37 | 36 | 32 | 29 | 27 | 24 | 22 |
| 5   | 66  | 54  | 47  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 36 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1704 | 1704 | 1704 |
| 5°  | 1707 | 1681 | 1692 |
| 10° | 1693 | 1658 | 1670 |
| 15° | 1668 | 1632 | 1635 |
| 20° | 1634 | 1594 | 1598 |
| 25° | 1601 | 1549 | 1556 |
| 30° | 1559 | 1507 | 1503 |
| 35° | 1519 | 1458 | 1447 |
| 40° | 1470 | 1408 | 1393 |
| 45° | 1422 | 1358 | 1338 |
| 50° | 1368 | 1305 | 1274 |
| 55° | 1312 | 1244 | 1216 |
| 60° | 1249 | 1172 | 1149 |
| 65° | 1180 | 1098 | 1070 |
| 70° | 1093 | 1007 | 985  |
| 75° | 971  | 898  | 908  |
| 80° | 825  | 760  | 758  |
| 85° | 596  | 520  | 510  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3108 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 228.6   | 1.3       |
| 10°-20°   | 643.2   | 3.7       |
| 20°-30°   | 945.2   | 5.5       |
| 30°-40°   | 1097.8  | 6.4       |
| 40°-50°   | 1096.5  | 6.4       |
| 50°-60°   | 956.1   | 5.5       |
| 60°-70°   | 706.8   | 4.1       |
| 70°-80°   | 399.9   | 2.3       |
| 80°-90°   | 116.8   | 0.7       |
| 90°-100°  | 244.3   | 1.4       |
| 100°-110° | 776.3   | 4.5       |
| 110°-120° | 1328.4  | 7.7       |
| 120°-130° | 1747.1  | 10.1      |
| 130°-140° | 1961.0  | 11.4      |
| 140°-150° | 1923.0  | 11.2      |
| 150°-160° | 1613.2  | 9.4       |
| 160°-170° | 1069.8  | 6.2       |
| 170°-180° | 373.9   | 2.2       |
| 0°-30°    | 1817.0  | 10.5      |
| 0°-40°    | 2914.9  | 16.9      |
| 0°-60°    | 4967.4  | 28.8      |
| 0°-90°    | 6190.8  | 35.9      |
| 90°-120°  | 2349.0  | 13.6      |
| 90°-150°  | 7980.2  | 46.3      |
| 90°-180°  | 11037.0 | 64.1      |
| 0°-180°   | 17227.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2429 | 2429  | 2429 | 2429  | 2429 |      |
| 5°   | 2429 | 2420  | 2394 | 2412  | 2408 | 231  |
| 15°  | 2312 | 2298  | 2268 | 2277  | 2266 | 651  |
| 25°  | 2093 | 2074  | 2034 | 2039  | 2034 | 963  |
| 35°  | 1805 | 1782  | 1745 | 1730  | 1719 | 1127 |
| 45°  | 1469 | 1453  | 1418 | 1392  | 1383 | 1134 |
| 55°  | 1112 | 1098  | 1070 | 1042  | 1030 | 994  |
| 65°  | 750  | 736   | 712  | 691   | 680  | 741  |
| 75°  | 392  | 388   | 376  | 362   | 367  | 419  |
| 85°  | 96   | 94    | 91   | 84    | 82   | 107  |
| 90°  | 4    | 43    | 117  | 110   | 113  | 17   |
| 95°  | 174  | 207   | 213  | 213   | 207  | 193  |
| 105° | 717  | 726   | 733  | 739   | 739  | 756  |
| 115° | 1333 | 1352  | 1346 | 1343  | 1333 | 1319 |
| 125° | 1939 | 1969  | 1959 | 1948  | 1945 | 1733 |
| 135° | 2508 | 2545  | 2552 | 2548  | 2539 | 1938 |
| 145° | 3045 | 3069  | 3088 | 3091  | 3078 | 1902 |
| 155° | 3482 | 3491  | 3502 | 3518  | 3508 | 1603 |
| 165° | 3788 | 3784  | 3784 | 3808  | 3791 | 1068 |
| 175° | 3941 | 3932  | 3924 | 3948  | 3928 | 374  |
| 180° | 3948 | 3948  | 3948 | 3948  | 3948 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2428.8 | 2428.8 | 2428.8 | 2428.8 | 2428.8 |
| 2.5°   | 2442.9 | 2431.2 | 2405.5 | 2428.8 | 2424.3 |
| 5°     | 2428.8 | 2419.7 | 2393.9 | 2412.4 | 2408.0 |
| 7.5°   | 2412.4 | 2398.5 | 2372.8 | 2391.7 | 2386.9 |
| 10°    | 2386.9 | 2370.5 | 2342.5 | 2361.2 | 2354.2 |
| 12.5°  | 2351.7 | 2337.9 | 2309.9 | 2321.5 | 2316.8 |
| 15°    | 2312.1 | 2298.2 | 2267.7 | 2277.2 | 2265.5 |
| 17.5°  | 2263.0 | 2249.2 | 2218.7 | 2230.3 | 2218.7 |
| 20°    | 2209.2 | 2195.4 | 2162.7 | 2169.6 | 2160.4 |
| 22.5°  | 2155.7 | 2134.7 | 2104.2 | 2104.2 | 2099.4 |
| 25°    | 2092.6 | 2073.9 | 2034.3 | 2038.8 | 2034.3 |
| 27.5°  | 2022.4 | 2006.1 | 1975.9 | 1968.9 | 1957.2 |
| 30°    | 1952.6 | 1933.7 | 1898.8 | 1891.9 | 1882.4 |
| 32.5°  | 1877.7 | 1863.9 | 1826.4 | 1812.3 | 1802.9 |
| 35°    | 1805.4 | 1782.1 | 1744.6 | 1730.5 | 1718.9 |
| 37.5°  | 1723.6 | 1702.5 | 1665.1 | 1648.8 | 1637.1 |
| 40°    | 1639.6 | 1620.8 | 1583.3 | 1562.5 | 1553.1 |
| 42.5°  | 1557.8 | 1539.0 | 1501.8 | 1478.3 | 1464.4 |
| 45°    | 1469.1 | 1452.8 | 1417.6 | 1392.0 | 1382.6 |
| 47.5°  | 1382.6 | 1366.3 | 1328.8 | 1303.1 | 1289.2 |
| 50°    | 1291.5 | 1279.8 | 1247.1 | 1214.4 | 1202.7 |
| 52.5°  | 1202.7 | 1186.4 | 1156.2 | 1130.4 | 1114.0 |
| 55°    | 1111.8 | 1097.7 | 1069.7 | 1041.7 | 1030.0 |
| 57.5°  | 1020.7 | 1009.0 | 978.5  | 950.5  | 941.1  |
| 60°    | 929.4  | 920.2  | 887.6  | 861.8  | 854.9  |
| 62.5°  | 840.7  | 824.4  | 801.1  | 777.8  | 768.4  |
| 65°    | 749.8  | 735.7  | 712.4  | 691.3  | 679.7  |
| 67.5°  | 656.4  | 644.5  | 623.7  | 607.3  | 597.9  |
| 70°    | 569.9  | 560.5  | 539.4  | 523.1  | 513.9  |
| 72.5°  | 481.2  | 471.8  | 460.1  | 443.8  | 436.8  |
| 75°    | 392.3  | 387.8  | 375.9  | 362.0  | 366.8  |
| 77.5°  | 313.0  | 303.5  | 298.8  | 291.9  | 285.0  |
| 80°    | 233.6  | 231.2  | 226.5  | 219.5  | 214.8  |
| 82.5°  | 158.8  | 158.8  | 156.6  | 147.2  | 147.2  |
| 85°    | 95.7   | 93.5   | 91.2   | 84.0   | 81.8   |
| 87.5°  | 42.1   | 37.5   | 32.7   | 25.8   | 23.3   |
| 90°    | 3.6    | 42.9   | 116.6  | 109.5  | 113.1  |
| 92.5°  | 73.8   | 100.0  | 103.5  | 107.1  | 107.1  |
| 95°    | 173.8  | 207.1  | 213.0  | 213.0  | 207.1  |
| 97.5°  | 289.3  | 320.2  | 333.3  | 333.3  | 333.3  |
| 100°   | 422.6  | 450.0  | 459.4  | 459.4  | 455.8  |
| 102.5° | 563.0  | 583.3  | 596.4  | 599.9  | 596.4  |
| 105°   | 716.6  | 726.1  | 733.3  | 739.1  | 739.1  |
| 107.5° | 868.9  | 883.2  | 883.2  | 885.6  | 868.9  |
| 110°   | 1016.5 | 1035.5 | 1035.5 | 1035.5 | 1026.0 |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1176.0 | 1196.2 | 1192.7 | 1183.1 | 1176.0 |
| 115°   | 1333.1 | 1352.2 | 1346.2 | 1342.6 | 1333.1 |
| 117.5° | 1489.1 | 1515.3 | 1498.6 | 1489.1 | 1479.5 |
| 120°   | 1646.2 | 1672.4 | 1646.2 | 1646.2 | 1635.5 |
| 122.5° | 1789.0 | 1822.3 | 1805.7 | 1796.2 | 1789.0 |
| 125°   | 1939.0 | 1968.7 | 1959.2 | 1948.5 | 1944.9 |
| 127.5° | 2085.4 | 2122.3 | 2109.2 | 2094.9 | 2085.4 |
| 130°   | 2222.2 | 2265.1 | 2259.1 | 2252.0 | 2238.9 |
| 132.5° | 2375.8 | 2409.1 | 2411.5 | 2394.9 | 2385.3 |
| 135°   | 2507.9 | 2544.9 | 2552.0 | 2548.4 | 2538.9 |
| 137.5° | 2655.5 | 2685.3 | 2691.3 | 2688.9 | 2674.6 |
| 140°   | 2785.3 | 2815.0 | 2831.7 | 2831.7 | 2818.6 |
| 142.5° | 2918.6 | 2948.4 | 2957.9 | 2961.5 | 2948.4 |
| 145°   | 3044.7 | 3068.6 | 3087.6 | 3091.2 | 3078.1 |
| 147.5° | 3157.8 | 3187.6 | 3201.9 | 3207.8 | 3194.7 |
| 150°   | 3274.4 | 3294.7 | 3307.8 | 3318.5 | 3307.8 |
| 152.5° | 3378.1 | 3398.3 | 3415.0 | 3428.0 | 3415.0 |
| 155°   | 3481.6 | 3491.1 | 3501.8 | 3518.5 | 3507.8 |
| 157.5° | 3570.9 | 3578.0 | 3584.0 | 3607.8 | 3591.1 |
| 160°   | 3650.7 | 3657.8 | 3661.4 | 3681.6 | 3667.2 |
| 162.5° | 3724.4 | 3724.4 | 3728.0 | 3750.6 | 3733.9 |
| 165°   | 3787.5 | 3784.0 | 3784.0 | 3807.8 | 3791.1 |
| 167.5° | 3844.6 | 3833.9 | 3833.9 | 3857.7 | 3841.0 |
| 170°   | 3887.5 | 3878.0 | 3874.4 | 3898.2 | 3878.0 |
| 172.5° | 3917.3 | 3907.7 | 3904.2 | 3928.0 | 3907.7 |
| 175°   | 3941.1 | 3931.6 | 3924.4 | 3948.2 | 3928.0 |
| 177.5° | 3954.1 | 3944.7 | 3937.5 | 3957.7 | 3937.5 |
| 180°   | 3948.2 | 3948.2 | 3948.2 | 3948.2 | 3948.2 |

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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 | 7.67             | 8.42  | 8.74  | 9.49  | 10.95 | 7.23           | 7.98  | 8.30  | 9.05  | 10.51 |
|                 | 3H   | 9.33             | 10.00 | 10.41 | 11.08 | 12.56 | 8.84           | 9.51  | 9.92  | 10.59 | 12.06 |
|                 | 4H   | 9.91             | 10.55 | 11.00 | 11.63 | 13.11 | 9.42           | 10.06 | 10.51 | 11.14 | 12.62 |
|                 | 6H   | 10.31            | 10.90 | 11.41 | 11.98 | 13.48 | 9.81           | 10.40 | 10.91 | 11.48 | 12.98 |
|                 | 8H   | 10.41            | 10.97 | 11.52 | 12.07 | 13.56 | 9.91           | 10.47 | 11.02 | 11.57 | 13.06 |
|                 | 12H  | 10.46            | 10.99 | 11.57 | 12.08 | 13.60 | 9.95           | 10.48 | 11.06 | 11.57 | 13.09 |
| 4H              | 2H   | 8.12             | 8.76  | 9.22  | 9.84  | 11.32 | 7.77           | 8.40  | 8.86  | 9.48  | 10.97 |
|                 | 3H   | 9.98             | 10.51 | 11.08 | 11.62 | 13.11 | 9.57           | 10.10 | 10.68 | 11.21 | 12.71 |
|                 | 4H   | 10.69            | 11.18 | 11.80 | 12.28 | 13.80 | 10.27          | 10.76 | 11.38 | 11.85 | 13.37 |
|                 | 6H   | 11.21            | 11.62 | 12.32 | 12.75 | 14.25 | 10.77          | 11.19 | 11.89 | 12.31 | 13.82 |
|                 | 8H   | 11.36            | 11.75 | 12.47 | 12.86 | 14.38 | 10.92          | 11.31 | 12.03 | 12.42 | 13.95 |
|                 | 12H  | 11.43            | 11.78 | 12.56 | 12.90 | 14.43 | 10.98          | 11.33 | 12.11 | 12.45 | 13.99 |
| 8H              | 4H   | 10.88            | 11.27 | 12.00 | 12.38 | 13.91 | 10.50          | 10.89 | 11.62 | 12.01 | 13.53 |
|                 | 6H   | 11.51            | 11.83 | 12.65 | 12.99 | 14.51 | 11.13          | 11.45 | 12.27 | 12.61 | 14.13 |
|                 | 8H   | 11.73            | 12.02 | 12.88 | 13.15 | 14.69 | 11.34          | 11.62 | 12.49 | 12.76 | 14.30 |
|                 | 12H  | 11.86            | 12.11 | 13.01 | 13.24 | 14.82 | 11.45          | 11.70 | 12.60 | 12.83 | 14.41 |
| 12H             | 4H   | 10.86            | 11.21 | 11.99 | 12.34 | 13.87 | 10.49          | 10.85 | 11.63 | 11.97 | 13.50 |
|                 | 6H   | 11.54            | 11.82 | 12.68 | 12.96 | 14.50 | 11.17          | 11.45 | 12.31 | 12.59 | 14.13 |
|                 | 8H   | 11.78            | 12.03 | 12.93 | 13.16 | 14.74 | 11.40          | 11.65 | 12.55 | 12.78 | 14.36 |