

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: P905411

Luminaire Tested: DFN2DIP-HX3F0-090D080US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905411  
REPORT IS A COMBINATION OF REPORTS P899284 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-090D080US835-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

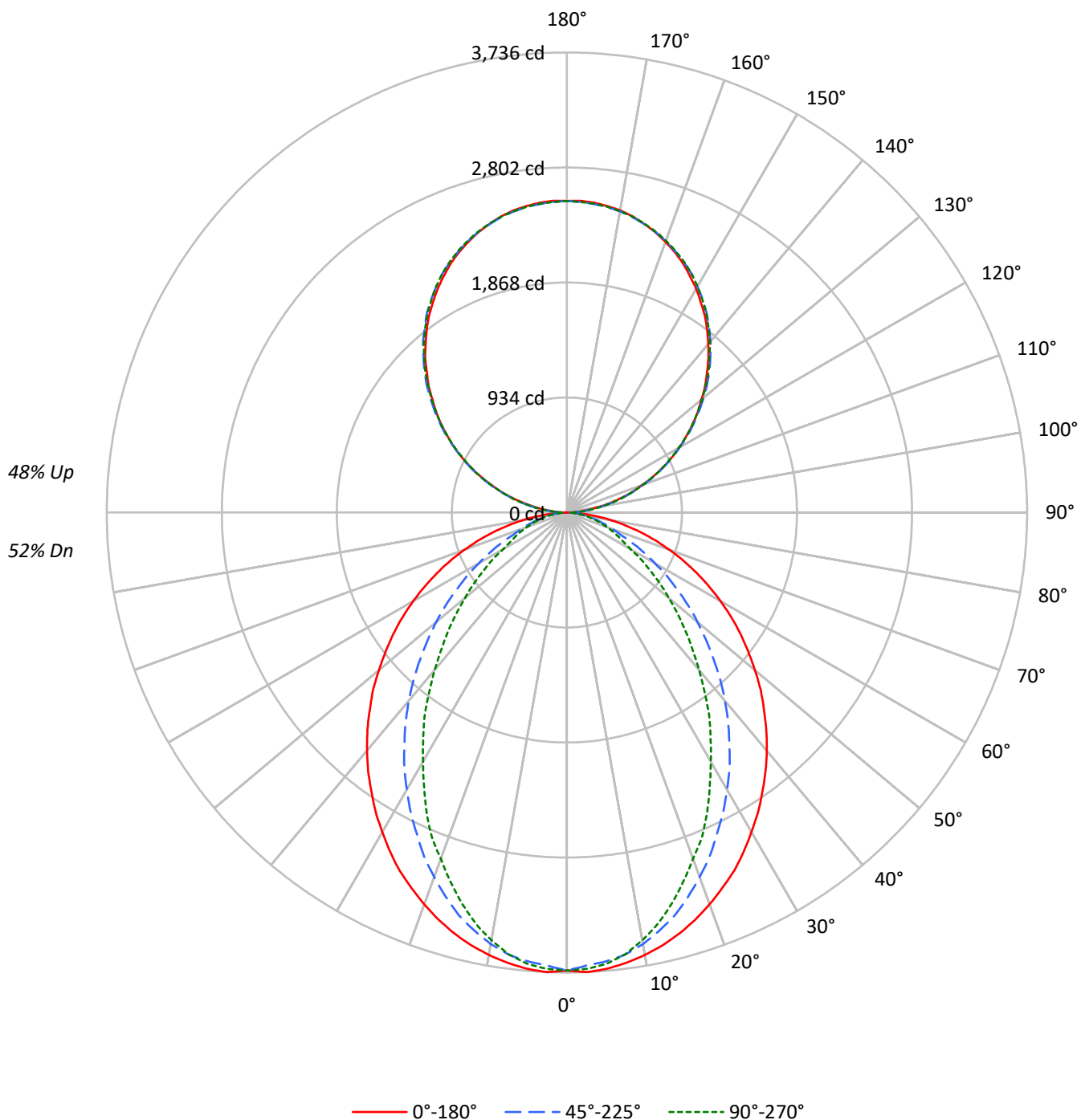
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14730.0 lumens  
Efficiency: N/A  
Efficacy: 95.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 154  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P905411

CATALOG NUMBER: DFN2DIP-HX3F0-090D080US835-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P905411

CATALOG NUMBER: DFN2DIP-HX3F0-090D080US835-RLLFLL

**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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 84 | 84 | 84 |  | 71 | 71 | 71 |  | 58 |
| 1   | 99  | 95  | 91  | 88  | 91  | 88  | 84  | 82  | 75 | 72 | 70 |  | 63 | 61 | 60 |  | 52 |
| 2   | 90  | 83  | 77  | 72  | 83  | 77  | 72  | 68  | 66 | 62 | 59 |  | 56 | 53 | 51 |  | 46 |
| 3   | 83  | 74  | 66  | 61  | 76  | 68  | 62  | 57  | 59 | 54 | 50 |  | 50 | 46 | 44 |  | 42 |
| 4   | 76  | 65  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 47 | 43 |  | 45 | 41 | 38 |  | 37 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 42  | 47 | 42 | 38 |  | 40 | 36 | 33 |  | 34 |
| 6   | 65  | 53  | 45  | 39  | 60  | 49  | 42  | 37  | 43 | 37 | 33 |  | 37 | 32 | 29 |  | 31 |
| 7   | 60  | 48  | 40  | 35  | 55  | 45  | 38  | 33  | 39 | 33 | 29 |  | 34 | 29 | 26 |  | 28 |
| 8   | 56  | 44  | 36  | 31  | 51  | 41  | 34  | 29  | 36 | 30 | 26 |  | 31 | 27 | 23 |  | 26 |
| 9   | 52  | 40  | 33  | 28  | 48  | 37  | 31  | 26  | 33 | 27 | 24 |  | 28 | 24 | 21 |  | 24 |
| 10  | 49  | 37  | 30  | 25  | 45  | 34  | 28  | 24  | 30 | 25 | 21 |  | 26 | 22 | 19 |  | 23 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4309 | 4309 | 4309 |
| 5°  | 4314 | 4237 | 4265 |
| 10° | 4269 | 4151 | 4124 |
| 15° | 4208 | 4011 | 3907 |
| 20° | 4129 | 3819 | 3642 |
| 25° | 4047 | 3605 | 3386 |
| 30° | 3938 | 3385 | 3062 |
| 35° | 3831 | 3149 | 2778 |
| 40° | 3722 | 2905 | 2452 |
| 45° | 3596 | 2635 | 2157 |
| 50° | 3465 | 2362 | 1869 |
| 55° | 3328 | 2072 | 1592 |
| 60° | 3170 | 1768 | 1309 |
| 65° | 2988 | 1460 | 1175 |
| 70° | 2767 | 1172 | 1060 |
| 75° | 2488 | 1027 | 959  |
| 80° | 2086 | 852  | 824  |
| 85° | 1425 | 554  | 605  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3596 cd/sqm

TEST NUMBER: P905411

CATALOG NUMBER: DFN2DIP-HX3F0-090D080US835-RLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 348.6   | 2.4       |
| 10°-20°   | 957.0   | 6.5       |
| 20°-30°   | 1343.6  | 9.1       |
| 30°-40°   | 1464.6  | 9.9       |
| 40°-50°   | 1346.2  | 9.1       |
| 50°-60°   | 1057.2  | 7.2       |
| 60°-70°   | 688.1   | 4.7       |
| 70°-80°   | 354.2   | 2.4       |
| 80°-90°   | 97.6    | 0.7       |
| 90°-100°  | 156.6   | 1.1       |
| 100°-110° | 497.5   | 3.4       |
| 110°-120° | 851.3   | 5.8       |
| 120°-130° | 1119.6  | 7.6       |
| 130°-140° | 1256.7  | 8.5       |
| 140°-150° | 1232.3  | 8.4       |
| 150°-160° | 1033.7  | 7.0       |
| 160°-170° | 685.6   | 4.7       |
| 170°-180° | 239.6   | 1.6       |
| 0°-30°    | 2649.2  | 18.0      |
| 0°-40°    | 4113.9  | 27.9      |
| 0°-60°    | 6517.2  | 44.2      |
| 0°-90°    | 7657.2  | 52.0      |
| 90°-120°  | 1505.3  | 10.2      |
| 90°-150°  | 5113.9  | 34.7      |
| 90°-180°  | 7073.0  | 48.0      |
| 0°-180°   | 14730.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3720 | 3720  | 3720 | 3720  | 3720 |      |
| 5°   | 3720 | 3703  | 3659 | 3689  | 3679 | 353  |
| 15°  | 3538 | 3501  | 3386 | 3322  | 3289 | 997  |
| 25°  | 3212 | 3104  | 2882 | 2744  | 2693 | 1477 |
| 35°  | 2767 | 2595  | 2299 | 2087  | 2013 | 1732 |
| 45°  | 2262 | 2036  | 1683 | 1444  | 1363 | 1747 |
| 55°  | 1720 | 1458  | 1094 | 892   | 828  | 1537 |
| 65°  | 1161 | 889   | 586  | 471   | 461  | 1151 |
| 75°  | 619  | 384   | 269  | 246   | 242  | 655  |
| 85°  | 145  | 74    | 64   | 64    | 64   | 166  |
| 90°  | 2    | 28    | 75   | 70    | 72   | 14   |
| 95°  | 111  | 133   | 136  | 136   | 133  | 124  |
| 105° | 459  | 465   | 470  | 474   | 474  | 485  |
| 115° | 854  | 866   | 863  | 860   | 854  | 845  |
| 125° | 1242 | 1262  | 1256 | 1249  | 1246 | 1110 |
| 135° | 1607 | 1631  | 1635 | 1633  | 1627 | 1242 |
| 145° | 1951 | 1966  | 1979 | 1981  | 1972 | 1219 |
| 155° | 2231 | 2237  | 2244 | 2255  | 2248 | 1027 |
| 165° | 2427 | 2425  | 2425 | 2440  | 2429 | 685  |
| 175° | 2526 | 2519  | 2515 | 2530  | 2517 | 240  |
| 180° | 2530 | 2530  | 2530 | 2530  | 2530 |      |



TEST NUMBER: P905411

CATALOG NUMBER: DFN2DIP-HX3F0-090D080US835-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3719.7 | 3719.7 | 3719.7 | 3719.7 | 3719.7 |
| 2.5°   | 3736.5 | 3719.7 | 3682.5 | 3716.5 | 3709.7 |
| 5°     | 3719.7 | 3702.9 | 3659.0 | 3689.3 | 3679.3 |
| 7.5°   | 3689.3 | 3669.3 | 3622.2 | 3635.4 | 3618.6 |
| 10°    | 3649.0 | 3625.4 | 3558.3 | 3547.9 | 3527.9 |
| 12.5°  | 3598.6 | 3568.3 | 3477.2 | 3457.2 | 3420.0 |
| 15°    | 3537.9 | 3500.8 | 3386.5 | 3322.5 | 3289.0 |
| 17.5°  | 3467.2 | 3413.3 | 3271.8 | 3197.9 | 3144.0 |
| 20°    | 3386.5 | 3319.0 | 3150.7 | 3066.8 | 2992.5 |
| 22.5°  | 3299.0 | 3221.5 | 3026.1 | 2911.8 | 2861.5 |
| 25°    | 3211.5 | 3103.6 | 2881.5 | 2743.6 | 2692.9 |
| 27.5°  | 3107.2 | 2992.5 | 2746.8 | 2588.6 | 2511.1 |
| 30°    | 2996.1 | 2867.9 | 2598.6 | 2427.2 | 2336.1 |
| 32.5°  | 2888.2 | 2733.2 | 2457.5 | 2255.4 | 2171.1 |
| 35°    | 2767.2 | 2595.4 | 2299.3 | 2087.2 | 2012.9 |
| 37.5°  | 2649.3 | 2464.0 | 2151.1 | 1918.6 | 1834.7 |
| 40°    | 2524.7 | 2322.9 | 1996.1 | 1757.2 | 1669.7 |
| 42.5°  | 2396.8 | 2181.5 | 1841.4 | 1592.2 | 1508.2 |
| 45°    | 2262.2 | 2036.5 | 1683.2 | 1443.9 | 1363.2 |
| 47.5°  | 2134.3 | 1895.4 | 1531.8 | 1292.5 | 1218.6 |
| 50°    | 1992.9 | 1753.9 | 1383.6 | 1151.1 | 1080.7 |
| 52.5°  | 1854.7 | 1602.2 | 1242.2 | 1020.0 | 956.1  |
| 55°    | 1720.0 | 1457.5 | 1093.9 | 892.2  | 828.2  |
| 57.5°  | 1582.2 | 1312.9 | 962.9  | 774.3  | 720.4  |
| 60°    | 1440.7 | 1171.4 | 824.7  | 653.2  | 599.3  |
| 62.5°  | 1302.9 | 1033.6 | 706.8  | 545.4  | 518.6  |
| 65°    | 1161.4 | 888.6  | 585.7  | 471.4  | 461.1  |
| 67.5°  | 1026.8 | 753.9  | 471.4  | 413.9  | 403.9  |
| 70°    | 885.4  | 622.9  | 390.4  | 356.8  | 343.2  |
| 72.5°  | 750.7  | 501.4  | 326.4  | 299.6  | 292.9  |
| 75°    | 619.3  | 383.6  | 269.3  | 245.7  | 242.5  |
| 77.5°  | 488.2  | 272.5  | 212.1  | 198.6  | 191.8  |
| 80°    | 366.8  | 195.4  | 161.4  | 148.2  | 148.2  |
| 82.5°  | 255.7  | 131.4  | 111.1  | 104.3  | 104.3  |
| 85°    | 144.6  | 73.9   | 63.9   | 63.9   | 63.9   |
| 87.5°  | 53.9   | 26.8   | 26.8   | 23.6   | 23.6   |
| 90°    | 2.3    | 27.5   | 74.8   | 70.2   | 72.5   |
| 92.5°  | 47.3   | 64.1   | 66.4   | 68.6   | 68.6   |
| 95°    | 111.4  | 132.7  | 136.5  | 136.5  | 132.7  |
| 97.5°  | 185.4  | 205.2  | 213.6  | 213.6  | 213.6  |
| 100°   | 270.8  | 288.3  | 294.4  | 294.4  | 292.1  |
| 102.5° | 360.8  | 373.8  | 382.1  | 384.4  | 382.1  |
| 105°   | 459.2  | 465.3  | 469.9  | 473.7  | 473.7  |
| 107.5° | 556.8  | 566.0  | 566.0  | 567.5  | 556.8  |
| 110°   | 651.4  | 663.6  | 663.6  | 663.6  | 657.5  |



TEST NUMBER: P905411

CATALOG NUMBER: DFN2DIP-HX3F0-090D080US835-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 753.6  | 766.6  | 764.3  | 758.2  | 753.6  |
| 115°   | 854.3  | 866.5  | 862.7  | 860.4  | 854.3  |
| 117.5° | 954.2  | 971.0  | 960.3  | 954.2  | 948.1  |
| 120°   | 1054.9 | 1071.7 | 1054.9 | 1054.9 | 1048.0 |
| 122.5° | 1146.4 | 1167.8 | 1157.1 | 1151.0 | 1146.4 |
| 125°   | 1242.5 | 1261.6 | 1255.5 | 1248.6 | 1246.4 |
| 127.5° | 1336.4 | 1360.0 | 1351.6 | 1342.5 | 1336.4 |
| 130°   | 1424.1 | 1451.5 | 1447.7 | 1443.2 | 1434.8 |
| 132.5° | 1522.5 | 1543.8 | 1545.4 | 1534.7 | 1528.6 |
| 135°   | 1607.1 | 1630.8 | 1635.4 | 1633.1 | 1627.0 |
| 137.5° | 1701.7 | 1720.8 | 1724.6 | 1723.1 | 1713.9 |
| 140°   | 1784.9 | 1803.9 | 1814.6 | 1814.6 | 1806.2 |
| 142.5° | 1870.3 | 1889.4 | 1895.5 | 1897.8 | 1889.4 |
| 145°   | 1951.2 | 1966.4 | 1978.6 | 1980.9 | 1972.5 |
| 147.5° | 2023.6 | 2042.7 | 2051.8 | 2055.7 | 2047.3 |
| 150°   | 2098.4 | 2111.3 | 2119.7 | 2126.6 | 2119.7 |
| 152.5° | 2164.7 | 2177.7 | 2188.4 | 2196.8 | 2188.4 |
| 155°   | 2231.1 | 2237.2 | 2244.1 | 2254.7 | 2247.9 |
| 157.5° | 2288.3 | 2292.9 | 2296.7 | 2311.9 | 2301.3 |
| 160°   | 2339.4 | 2344.0 | 2346.3 | 2359.2 | 2350.1 |
| 162.5° | 2386.7 | 2386.7 | 2389.0 | 2403.5 | 2392.8 |
| 165°   | 2427.1 | 2424.8 | 2424.8 | 2440.1 | 2429.4 |
| 167.5° | 2463.7 | 2456.9 | 2456.9 | 2472.1 | 2461.4 |
| 170°   | 2491.2 | 2485.1 | 2482.8 | 2498.1 | 2485.1 |
| 172.5° | 2510.3 | 2504.2 | 2501.9 | 2517.1 | 2504.2 |
| 175°   | 2525.5 | 2519.4 | 2514.8 | 2530.1 | 2517.1 |
| 177.5° | 2533.9 | 2527.8 | 2523.2 | 2536.2 | 2523.2 |
| 180°   | 2530.1 | 2530.1 | 2530.1 | 2530.1 | 2530.1 |

TEST NUMBER: P905411

CATALOG NUMBER: DFN2DIP-HX3F0-090D080US835-RLLFLL

**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 | 12.36            | 13.21 | 13.31 | 14.17 | 15.41 | 8.34           | 9.18  | 9.28  | 10.14 | 11.39 |
|                 | 3H   | 14.03            | 14.79 | 14.99 | 15.76 | 17.03 | 9.52           | 10.28 | 10.48 | 11.25 | 12.52 |
|                 | 4H   | 14.64            | 15.35 | 15.61 | 16.32 | 17.60 | 9.97           | 10.69 | 10.94 | 11.66 | 12.94 |
|                 | 6H   | 15.05            | 15.71 | 16.03 | 16.69 | 17.98 | 10.29          | 10.95 | 11.27 | 11.92 | 13.21 |
|                 | 8H   | 15.18            | 15.80 | 16.16 | 16.80 | 18.08 | 10.38          | 11.00 | 11.37 | 12.00 | 13.28 |
|                 | 12H  | 15.23            | 15.83 | 16.23 | 16.82 | 18.13 | 10.42          | 11.02 | 11.41 | 12.00 | 13.31 |
| 4H              | 2H   | 12.38            | 13.10 | 13.36 | 14.07 | 15.34 | 8.93           | 9.65  | 9.91  | 10.62 | 11.89 |
|                 | 3H   | 14.20            | 14.80 | 15.19 | 15.80 | 17.09 | 10.28          | 10.87 | 11.26 | 11.87 | 13.16 |
|                 | 4H   | 14.89            | 15.43 | 15.88 | 16.43 | 17.74 | 10.82          | 11.36 | 11.82 | 12.36 | 13.67 |
|                 | 6H   | 15.40            | 15.86 | 16.40 | 16.88 | 18.19 | 11.24          | 11.70 | 12.24 | 12.72 | 14.03 |
|                 | 8H   | 15.57            | 16.00 | 16.58 | 17.02 | 18.34 | 11.36          | 11.80 | 12.37 | 12.81 | 14.14 |
|                 | 12H  | 15.66            | 16.05 | 16.69 | 17.08 | 18.41 | 11.43          | 11.82 | 12.45 | 12.85 | 14.18 |
| 8H              | 4H   | 14.86            | 15.29 | 15.87 | 16.30 | 17.63 | 11.10          | 11.53 | 12.11 | 12.54 | 13.87 |
|                 | 6H   | 15.41            | 15.77 | 16.45 | 16.83 | 18.15 | 11.61          | 11.97 | 12.64 | 13.02 | 14.35 |
|                 | 8H   | 15.63            | 15.94 | 16.67 | 16.98 | 18.33 | 11.80          | 12.11 | 12.84 | 13.15 | 14.50 |
|                 | 12H  | 15.76            | 16.04 | 16.80 | 17.07 | 18.46 | 11.91          | 12.19 | 12.96 | 13.23 | 14.61 |
| 12H             | 4H   | 14.81            | 15.20 | 15.84 | 16.23 | 17.56 | 11.10          | 11.50 | 12.13 | 12.52 | 13.85 |
|                 | 6H   | 15.39            | 15.71 | 16.43 | 16.75 | 18.09 | 11.66          | 11.97 | 12.70 | 13.01 | 14.36 |
|                 | 8H   | 15.61            | 15.88 | 16.65 | 16.92 | 18.31 | 11.86          | 12.14 | 12.91 | 13.18 | 14.56 |