

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: P914312

Luminaire Tested: DFN2DIP-PN4F0-110D050US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914312  
REPORT IS A COMBINATION OF REPORTS P899641 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D050US927-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

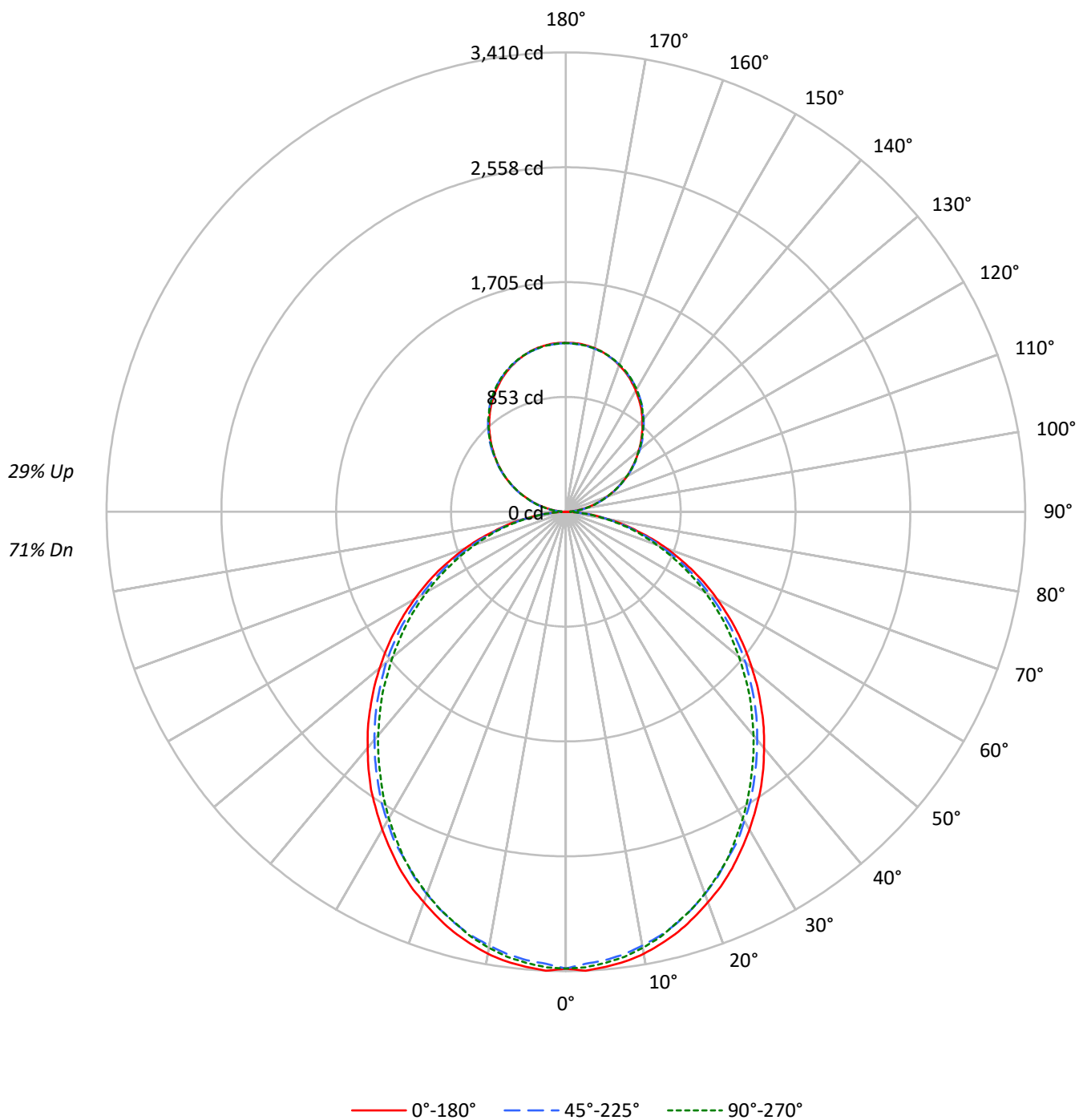
Lumens per Lamp: N/A  
Luminaire Lumens: 12132.3 lumens  
Efficiency: N/A  
Efficacy: 79.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 151.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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: P914312

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US927-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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 95 | 95 | 95 | 85 | 85 | 85 | 76 | 76 | 76 |
| 1   | 103 | 98  | 94  | 90  | 97  | 93  | 89  | 86  | 84 | 81 | 78 | 75 | 73 | 71 | 67 | 65 | 64 |
| 2   | 93  | 86  | 79  | 74  | 88  | 81  | 76  | 71  | 73 | 69 | 65 | 66 | 62 | 59 | 59 | 56 | 54 |
| 3   | 85  | 75  | 68  | 62  | 80  | 72  | 65  | 59  | 65 | 59 | 55 | 58 | 54 | 50 | 52 | 49 | 46 |
| 4   | 78  | 67  | 59  | 52  | 74  | 64  | 56  | 50  | 58 | 51 | 47 | 52 | 47 | 43 | 47 | 43 | 40 |
| 5   | 72  | 60  | 51  | 45  | 68  | 57  | 49  | 43  | 52 | 45 | 40 | 47 | 41 | 37 | 42 | 38 | 34 |
| 6   | 66  | 54  | 45  | 39  | 63  | 51  | 44  | 38  | 47 | 40 | 35 | 42 | 37 | 33 | 38 | 34 | 30 |
| 7   | 61  | 49  | 40  | 35  | 58  | 46  | 39  | 33  | 42 | 36 | 31 | 39 | 33 | 29 | 35 | 30 | 27 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 39 | 32 | 28 | 35 | 30 | 26 | 32 | 28 | 24 |
| 9   | 53  | 41  | 33  | 28  | 50  | 39  | 32  | 27  | 36 | 29 | 25 | 33 | 27 | 24 | 30 | 25 | 22 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 33 | 27 | 23 | 30 | 25 | 21 | 28 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2475 | 2475 | 2475 |
| 5°  | 2479 | 2441 | 2457 |
| 10° | 2459 | 2408 | 2425 |
| 15° | 2423 | 2369 | 2373 |
| 20° | 2374 | 2314 | 2320 |
| 25° | 2325 | 2249 | 2259 |
| 30° | 2264 | 2188 | 2181 |
| 35° | 2207 | 2116 | 2099 |
| 40° | 2136 | 2043 | 2021 |
| 45° | 2065 | 1970 | 1941 |
| 50° | 1987 | 1894 | 1848 |
| 55° | 1906 | 1805 | 1763 |
| 60° | 1814 | 1700 | 1665 |
| 65° | 1715 | 1592 | 1550 |
| 70° | 1587 | 1459 | 1426 |
| 75° | 1411 | 1301 | 1313 |
| 80° | 1199 | 1099 | 1095 |
| 85° | 867  | 750  | 733  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2065 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 319.1   | 2.6       |
| 10°-20°   | 897.9   | 7.4       |
| 20°-30°   | 1319.6  | 10.9      |
| 30°-40°   | 1532.6  | 12.6      |
| 40°-50°   | 1530.7  | 12.6      |
| 50°-60°   | 1334.7  | 11.0      |
| 60°-70°   | 986.7   | 8.1       |
| 70°-80°   | 558.2   | 4.6       |
| 80°-90°   | 150.9   | 1.2       |
| 90°-100°  | 77.5    | 0.6       |
| 100°-110° | 246.3   | 2.0       |
| 110°-120° | 421.5   | 3.5       |
| 120°-130° | 554.3   | 4.6       |
| 130°-140° | 622.2   | 5.1       |
| 140°-150° | 610.1   | 5.0       |
| 150°-160° | 511.8   | 4.2       |
| 160°-170° | 339.4   | 2.8       |
| 170°-180° | 118.6   | 1.0       |
| 0°-30°    | 2536.6  | 20.9      |
| 0°-40°    | 4069.2  | 33.5      |
| 0°-60°    | 6934.6  | 57.2      |
| 0°-90°    | 8630.4  | 71.1      |
| 90°-120°  | 745.3   | 6.1       |
| 90°-150°  | 2532.0  | 20.9      |
| 90°-180°  | 3502.0  | 28.9      |
| 0°-180°   | 12132.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3391 | 3391  | 3391 | 3391  | 3391 |      |
| 5°   | 3391 | 3378  | 3342 | 3368  | 3362 | 322  |
| 15°  | 3228 | 3208  | 3166 | 3179  | 3163 | 909  |
| 25°  | 2921 | 2895  | 2840 | 2846  | 2840 | 1344 |
| 35°  | 2520 | 2488  | 2436 | 2416  | 2400 | 1574 |
| 45°  | 2051 | 2028  | 1979 | 1943  | 1930 | 1583 |
| 55°  | 1552 | 1532  | 1493 | 1454  | 1438 | 1388 |
| 65°  | 1047 | 1027  | 994  | 965   | 949  | 1035 |
| 75°  | 548  | 541   | 525  | 505   | 512  | 585  |
| 85°  | 134  | 130   | 127  | 117   | 114  | 149  |
| 90°  | 1    | 14    | 37   | 35    | 36   | 12   |
| 95°  | 55   | 66    | 68   | 68    | 66   | 61   |
| 105° | 227  | 230   | 233  | 234   | 234  | 240  |
| 115° | 423  | 429   | 427  | 426   | 423  | 418  |
| 125° | 615  | 625   | 622  | 618   | 617  | 550  |
| 135° | 796  | 807   | 810  | 809   | 806  | 615  |
| 145° | 966  | 974   | 980  | 981   | 977  | 604  |
| 155° | 1105 | 1108  | 1111 | 1116  | 1113 | 508  |
| 165° | 1202 | 1201  | 1201 | 1208  | 1203 | 339  |
| 175° | 1250 | 1247  | 1245 | 1253  | 1246 | 119  |
| 180° | 1253 | 1253  | 1253 | 1253  | 1253 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3390.7 | 3390.7 | 3390.7 | 3390.7 | 3390.7 |
| 2.5°   | 3410.3 | 3394.1 | 3358.1 | 3390.7 | 3384.4 |
| 5°     | 3390.7 | 3377.9 | 3341.9 | 3367.8 | 3361.6 |
| 7.5°   | 3367.8 | 3348.5 | 3312.5 | 3338.8 | 3332.2 |
| 10°    | 3332.2 | 3309.3 | 3270.3 | 3296.2 | 3286.5 |
| 12.5°  | 3283.1 | 3263.7 | 3224.7 | 3240.9 | 3234.3 |
| 15°    | 3227.7 | 3208.3 | 3165.8 | 3178.9 | 3162.7 |
| 17.5°  | 3159.2 | 3139.9 | 3097.3 | 3113.6 | 3097.3 |
| 20°    | 3084.2 | 3064.8 | 3019.2 | 3028.8 | 3016.1 |
| 22.5°  | 3009.5 | 2980.0 | 2937.5 | 2937.5 | 2930.9 |
| 25°    | 2921.2 | 2895.3 | 2840.0 | 2846.2 | 2840.0 |
| 27.5°  | 2823.3 | 2800.5 | 2758.3 | 2748.6 | 2732.4 |
| 30°    | 2725.8 | 2699.5 | 2650.7 | 2641.1 | 2627.9 |
| 32.5°  | 2621.3 | 2602.0 | 2549.7 | 2530.0 | 2516.8 |
| 35°    | 2520.3 | 2487.8 | 2435.6 | 2415.8 | 2399.6 |
| 37.5°  | 2406.2 | 2376.8 | 2324.6 | 2301.7 | 2285.4 |
| 40°    | 2288.9 | 2262.6 | 2210.4 | 2181.4 | 2168.2 |
| 42.5°  | 2174.8 | 2148.5 | 2096.6 | 2063.7 | 2044.4 |
| 45°    | 2051.0 | 2028.1 | 1978.9 | 1943.4 | 1930.2 |
| 47.5°  | 1930.2 | 1907.4 | 1855.1 | 1819.2 | 1799.8 |
| 50°    | 1802.9 | 1786.7 | 1741.0 | 1695.3 | 1679.1 |
| 52.5°  | 1679.1 | 1656.2 | 1614.1 | 1578.0 | 1555.2 |
| 55°    | 1552.1 | 1532.4 | 1493.3 | 1454.2 | 1438.0 |
| 57.5°  | 1424.8 | 1408.6 | 1366.0 | 1326.9 | 1313.8 |
| 60°    | 1297.5 | 1284.8 | 1239.1 | 1203.1 | 1193.4 |
| 62.5°  | 1173.7 | 1150.9 | 1118.3 | 1085.8 | 1072.7 |
| 65°    | 1046.7 | 1027.0 | 994.5  | 965.1  | 948.9  |
| 67.5°  | 916.3  | 899.8  | 870.7  | 847.9  | 834.7  |
| 70°    | 795.6  | 782.4  | 753.0  | 730.2  | 717.4  |
| 72.5°  | 671.8  | 658.6  | 642.4  | 619.6  | 609.8  |
| 75°    | 547.6  | 541.4  | 524.7  | 505.4  | 512.0  |
| 77.5°  | 436.9  | 423.7  | 417.2  | 407.5  | 397.8  |
| 80°    | 326.2  | 322.7  | 316.2  | 306.5  | 299.9  |
| 82.5°  | 221.7  | 221.7  | 218.6  | 205.5  | 205.5  |
| 85°    | 133.6  | 130.4  | 127.3  | 117.2  | 114.2  |
| 87.5°  | 58.8   | 52.2   | 45.6   | 36.0   | 32.5   |
| 90°    | 1.1    | 13.6   | 37.0   | 34.8   | 35.9   |
| 92.5°  | 23.4   | 31.7   | 32.9   | 34.0   | 34.0   |
| 95°    | 55.1   | 65.8   | 67.6   | 67.6   | 65.8   |
| 97.5°  | 91.7   | 101.6  | 105.8  | 105.8  | 105.8  |
| 100°   | 134.0  | 142.8  | 145.8  | 145.8  | 144.7  |
| 102.5° | 178.6  | 185.1  | 189.2  | 190.4  | 189.2  |
| 105°   | 227.4  | 230.4  | 232.7  | 234.5  | 234.5  |
| 107.5° | 275.7  | 280.2  | 280.2  | 281.0  | 275.7  |
| 110°   | 322.5  | 328.6  | 328.6  | 328.6  | 325.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 373.1  | 379.5  | 378.4  | 375.4  | 373.1  |
| 115°   | 422.9  | 429.0  | 427.1  | 426.0  | 422.9  |
| 117.5° | 472.5  | 480.8  | 475.5  | 472.5  | 469.4  |
| 120°   | 522.3  | 530.6  | 522.3  | 522.3  | 518.9  |
| 122.5° | 567.6  | 578.2  | 572.9  | 569.9  | 567.6  |
| 125°   | 615.2  | 624.6  | 621.6  | 618.2  | 617.1  |
| 127.5° | 661.6  | 673.4  | 669.2  | 664.6  | 661.6  |
| 130°   | 705.1  | 718.7  | 716.8  | 714.5  | 710.3  |
| 132.5° | 753.8  | 764.4  | 765.2  | 759.9  | 756.8  |
| 135°   | 795.7  | 807.4  | 809.7  | 808.6  | 805.6  |
| 137.5° | 842.6  | 852.0  | 853.9  | 853.1  | 848.6  |
| 140°   | 883.7  | 893.2  | 898.4  | 898.4  | 894.3  |
| 142.5° | 926.0  | 935.5  | 938.5  | 939.6  | 935.5  |
| 145°   | 966.1  | 973.6  | 979.6  | 980.8  | 976.6  |
| 147.5° | 1002.0 | 1011.4 | 1015.9 | 1017.8 | 1013.6 |
| 150°   | 1038.9 | 1045.4 | 1049.5 | 1052.9 | 1049.5 |
| 152.5° | 1071.8 | 1078.2 | 1083.5 | 1087.7 | 1083.5 |
| 155°   | 1104.6 | 1107.6 | 1111.0 | 1116.3 | 1112.9 |
| 157.5° | 1133.0 | 1135.2 | 1137.1 | 1144.7 | 1139.4 |
| 160°   | 1158.2 | 1160.5 | 1161.7 | 1168.1 | 1163.6 |
| 162.5° | 1181.7 | 1181.7 | 1182.8 | 1190.0 | 1184.7 |
| 165°   | 1201.7 | 1200.6 | 1200.6 | 1208.2 | 1202.8 |
| 167.5° | 1219.8 | 1216.4 | 1216.4 | 1224.0 | 1218.7 |
| 170°   | 1233.4 | 1230.4 | 1229.3 | 1236.8 | 1230.4 |
| 172.5° | 1242.9 | 1239.8 | 1238.7 | 1246.3 | 1239.8 |
| 175°   | 1250.5 | 1247.4 | 1245.2 | 1252.7 | 1246.3 |
| 177.5° | 1254.6 | 1251.6 | 1249.3 | 1255.7 | 1249.3 |
| 180°   | 1252.7 | 1252.7 | 1252.7 | 1252.7 | 1252.7 |

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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 | 12.18            | 13.27 | 12.93 | 14.05 | 14.98 | 11.74          | 12.83 | 12.49 | 13.61 | 14.54 |
|                 | 3H   | 13.86            | 14.84 | 14.63 | 15.63 | 16.59 | 13.38          | 14.36 | 14.14 | 15.14 | 16.11 |
|                 | 4H   | 14.46            | 15.39 | 15.25 | 16.18 | 17.16 | 13.98          | 14.90 | 14.76 | 15.69 | 16.67 |
|                 | 6H   | 14.88            | 15.73 | 15.67 | 16.53 | 17.52 | 14.38          | 15.24 | 15.18 | 16.04 | 17.03 |
|                 | 8H   | 14.99            | 15.80 | 15.79 | 16.62 | 17.61 | 14.50          | 15.31 | 15.30 | 16.13 | 17.12 |
|                 | 12H  | 15.05            | 15.82 | 15.86 | 16.64 | 17.65 | 14.55          | 15.32 | 15.36 | 16.14 | 17.15 |
| 4H              | 2H   | 12.67            | 13.60 | 13.46 | 14.39 | 15.36 | 12.32          | 13.24 | 13.11 | 14.04 | 15.01 |
|                 | 3H   | 14.56            | 15.33 | 15.36 | 16.16 | 17.15 | 14.16          | 14.93 | 14.96 | 15.76 | 16.75 |
|                 | 4H   | 15.29            | 15.99 | 16.10 | 16.82 | 17.84 | 14.87          | 15.57 | 15.68 | 16.40 | 17.42 |
|                 | 6H   | 15.82            | 16.43 | 16.65 | 17.28 | 18.30 | 15.39          | 16.00 | 16.22 | 16.85 | 17.88 |
|                 | 8H   | 15.97            | 16.54 | 16.81 | 17.39 | 18.43 | 15.55          | 16.11 | 16.38 | 16.96 | 18.00 |
|                 | 12H  | 16.06            | 16.57 | 16.91 | 17.44 | 18.48 | 15.62          | 16.13 | 16.47 | 17.00 | 18.04 |
| 8H              | 4H   | 15.50            | 16.07 | 16.34 | 16.92 | 17.95 | 15.13          | 15.70 | 15.96 | 16.55 | 17.58 |
|                 | 6H   | 16.15            | 16.62 | 17.01 | 17.50 | 18.54 | 15.77          | 16.24 | 16.63 | 17.13 | 18.17 |
|                 | 8H   | 16.37            | 16.79 | 17.24 | 17.67 | 18.73 | 15.99          | 16.40 | 16.86 | 17.29 | 18.34 |
|                 | 12H  | 16.51            | 16.88 | 17.39 | 17.76 | 18.87 | 16.11          | 16.48 | 16.99 | 17.36 | 18.47 |
| 12H             | 4H   | 15.50            | 16.01 | 16.35 | 16.88 | 17.92 | 15.14          | 15.65 | 15.99 | 16.51 | 17.56 |
|                 | 6H   | 16.18            | 16.60 | 17.05 | 17.48 | 18.54 | 15.81          | 16.23 | 16.69 | 17.12 | 18.17 |
|                 | 8H   | 16.43            | 16.80 | 17.31 | 17.68 | 18.79 | 16.06          | 16.43 | 16.94 | 17.30 | 18.41 |