

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: P902620

Luminaire Tested: DFN2DIP-HX3F0-070D040US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

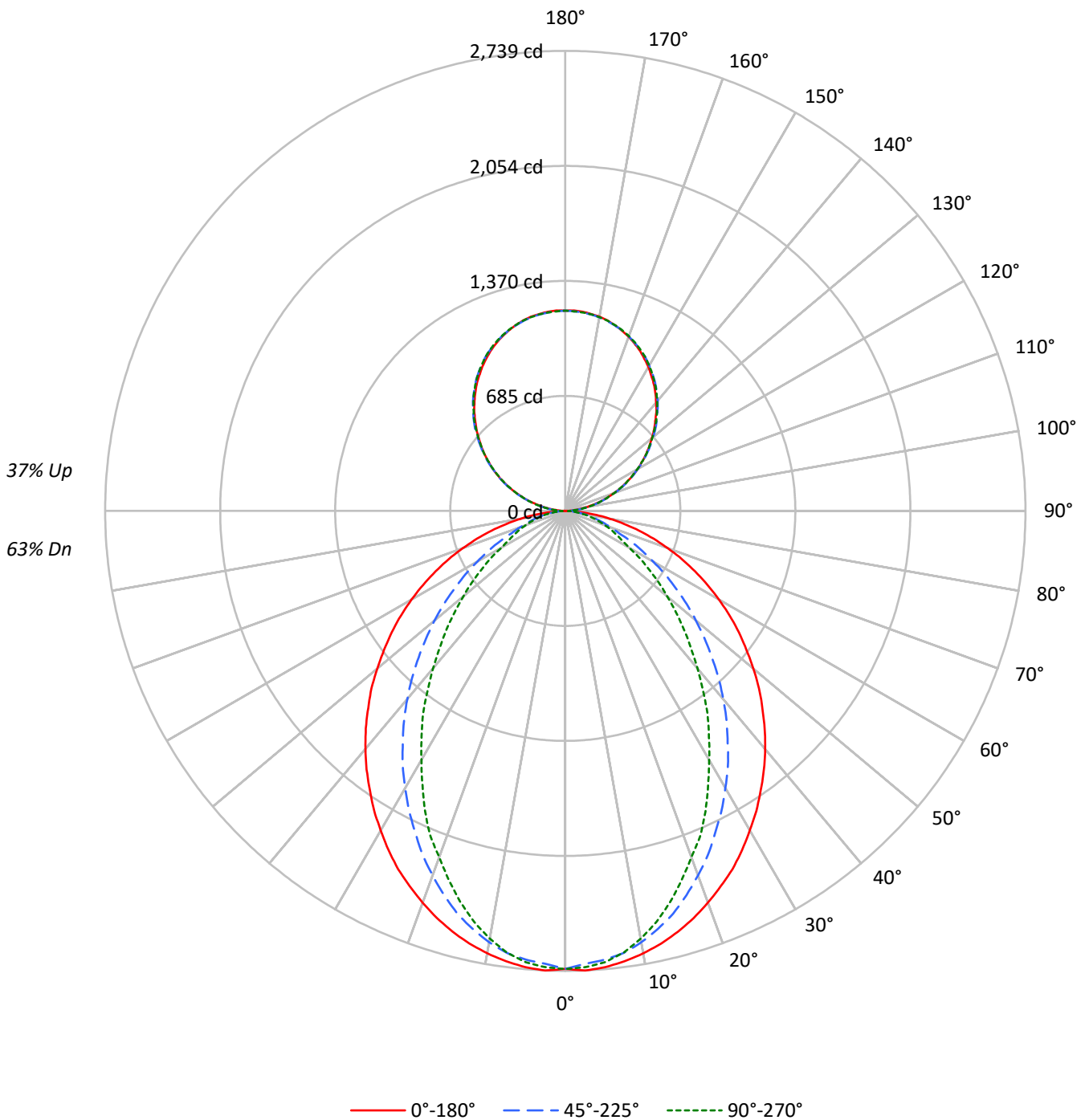
Test Method: LM-79-2019  
Report Number: P902620  
REPORT IS A COMBINATION OF REPORTS P899224 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-070D040US830-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8944.7 lumens  
Efficiency: N/A  
Efficacy: 90.4 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: Semi-Direct  
  
Input Watts (W): 98.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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





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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    |    |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 | 68 | 68 | 68 | 63 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 70 | 68 | 67 | 61 | 60 | 58 | 58 | 58 | 58 | 54 |
| 2   | 93  | 85  | 80  | 75  | 87  | 80  | 75  | 71  | 71 | 67 | 64 | 62 | 59 | 57 | 54 | 52 | 50 | 50 | 50 | 50 | 46 |
| 3   | 85  | 76  | 69  | 63  | 79  | 71  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 43 | 43 | 43 | 43 | 40 |
| 4   | 78  | 67  | 60  | 54  | 73  | 64  | 57  | 51  | 57 | 51 | 47 | 50 | 46 | 42 | 44 | 41 | 38 | 38 | 38 | 38 | 35 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 45 | 41 | 37 | 40 | 36 | 33 | 33 | 33 | 33 | 31 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 44  | 39  | 46 | 40 | 36 | 41 | 36 | 33 | 36 | 33 | 30 | 30 | 30 | 30 | 27 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 29 | 33 | 30 | 27 | 27 | 27 | 27 | 24 |
| 8   | 57  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 26 | 31 | 27 | 24 | 24 | 24 | 24 | 22 |
| 9   | 54  | 42  | 34  | 29  | 50  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 | 22 | 22 | 22 | 20 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 24 | 30 | 25 | 22 | 27 | 23 | 20 | 20 | 20 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3159 | 3159 | 3159 |
| 5°  | 3162 | 3106 | 3127 |
| 10° | 3130 | 3043 | 3023 |
| 15° | 3085 | 2941 | 2864 |
| 20° | 3027 | 2800 | 2670 |
| 25° | 2967 | 2642 | 2482 |
| 30° | 2887 | 2481 | 2245 |
| 35° | 2808 | 2308 | 2036 |
| 40° | 2729 | 2130 | 1798 |
| 45° | 2636 | 1932 | 1581 |
| 50° | 2540 | 1732 | 1370 |
| 55° | 2440 | 1519 | 1167 |
| 60° | 2324 | 1296 | 959  |
| 65° | 2190 | 1070 | 861  |
| 70° | 2028 | 859  | 777  |
| 75° | 1824 | 753  | 703  |
| 80° | 1529 | 625  | 604  |
| 85° | 1044 | 406  | 443  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2636 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 255.6  | 2.9       |
| 10°-20°   | 701.6  | 7.8       |
| 20°-30°   | 985.0  | 11.0      |
| 30°-40°   | 1073.7 | 12.0      |
| 40°-50°   | 986.9  | 11.0      |
| 50°-60°   | 775.0  | 8.7       |
| 60°-70°   | 504.5  | 5.6       |
| 70°-80°   | 259.7  | 2.9       |
| 80°-90°   | 69.7   | 0.8       |
| 90°-100°  | 73.8   | 0.8       |
| 100°-110° | 234.4  | 2.6       |
| 110°-120° | 401.2  | 4.5       |
| 120°-130° | 527.6  | 5.9       |
| 130°-140° | 592.2  | 6.6       |
| 140°-150° | 580.8  | 6.5       |
| 150°-160° | 487.2  | 5.4       |
| 160°-170° | 323.1  | 3.6       |
| 170°-180° | 112.9  | 1.3       |
| 0°-30°    | 1942.1 | 21.7      |
| 0°-40°    | 3015.8 | 33.7      |
| 0°-60°    | 4777.7 | 53.4      |
| 0°-90°    | 5611.5 | 62.7      |
| 90°-120°  | 709.4  | 7.9       |
| 90°-150°  | 2410.0 | 26.9      |
| 90°-180°  | 3333.0 | 37.3      |
| 0°-180°   | 8944.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2727 | 2727  | 2727 | 2727  | 2727 |      |
| 5°   | 2727 | 2714  | 2682 | 2705  | 2697 | 259  |
| 15°  | 2594 | 2566  | 2483 | 2436  | 2411 | 731  |
| 25°  | 2354 | 2275  | 2112 | 2011  | 1974 | 1083 |
| 35°  | 2028 | 1903  | 1686 | 1530  | 1476 | 1270 |
| 45°  | 1658 | 1493  | 1234 | 1059  | 999  | 1281 |
| 55°  | 1261 | 1068  | 802  | 654   | 607  | 1127 |
| 65°  | 851  | 651   | 429  | 346   | 338  | 844  |
| 75°  | 454  | 281   | 197  | 180   | 178  | 480  |
| 85°  | 106  | 54    | 47   | 47    | 47   | 122  |
| 90°  | 1    | 13    | 35   | 33    | 34   | 9    |
| 95°  | 52   | 63    | 64   | 64    | 63   | 58   |
| 105° | 216  | 219   | 221  | 223   | 223  | 228  |
| 115° | 403  | 408   | 406  | 406   | 403  | 398  |
| 125° | 586  | 595   | 592  | 588   | 587  | 523  |
| 135° | 757  | 768   | 771  | 770   | 767  | 585  |
| 145° | 920  | 927   | 932  | 934   | 930  | 575  |
| 155° | 1051 | 1054  | 1058 | 1063  | 1059 | 484  |
| 165° | 1144 | 1143  | 1143 | 1150  | 1145 | 323  |
| 175° | 1190 | 1187  | 1185 | 1192  | 1186 | 113  |
| 180° | 1192 | 1192  | 1192 | 1192  | 1192 |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2726.9 | 2726.9 | 2726.9 | 2726.9 | 2726.9 |
| 2.5°   | 2739.1 | 2726.9 | 2699.6 | 2724.5 | 2719.5 |
| 5°     | 2726.9 | 2714.5 | 2682.4 | 2704.6 | 2697.3 |
| 7.5°   | 2704.6 | 2689.9 | 2655.4 | 2665.0 | 2652.8 |
| 10°    | 2675.0 | 2657.8 | 2608.5 | 2600.9 | 2586.2 |
| 12.5°  | 2638.1 | 2615.8 | 2549.1 | 2534.4 | 2507.2 |
| 15°    | 2593.6 | 2566.4 | 2482.6 | 2435.7 | 2411.1 |
| 17.5°  | 2541.8 | 2502.3 | 2398.6 | 2344.3 | 2304.8 |
| 20°    | 2482.6 | 2433.1 | 2309.8 | 2248.2 | 2193.8 |
| 22.5°  | 2418.5 | 2361.6 | 2218.4 | 2134.6 | 2097.7 |
| 25°    | 2354.3 | 2275.2 | 2112.3 | 2011.3 | 1974.2 |
| 27.5°  | 2277.8 | 2193.8 | 2013.6 | 1897.7 | 1840.9 |
| 30°    | 2196.4 | 2102.4 | 1905.0 | 1779.3 | 1712.6 |
| 32.5°  | 2117.3 | 2003.8 | 1801.6 | 1653.4 | 1591.6 |
| 35°    | 2028.5 | 1902.6 | 1685.6 | 1530.1 | 1475.6 |
| 37.5°  | 1942.2 | 1806.3 | 1577.0 | 1406.5 | 1345.0 |
| 40°    | 1850.8 | 1702.9 | 1463.3 | 1288.2 | 1224.0 |
| 42.5°  | 1757.1 | 1599.2 | 1349.9 | 1167.2 | 1105.7 |
| 45°    | 1658.4 | 1492.9 | 1234.0 | 1058.6 | 999.4  |
| 47.5°  | 1564.6 | 1389.5 | 1122.9 | 947.5  | 893.3  |
| 50°    | 1460.9 | 1285.8 | 1014.3 | 843.9  | 792.3  |
| 52.5°  | 1359.6 | 1174.5 | 910.6  | 747.7  | 700.9  |
| 55°    | 1260.9 | 1068.5 | 801.9  | 654.0  | 607.2  |
| 57.5°  | 1159.9 | 962.4  | 705.9  | 567.6  | 528.1  |
| 60°    | 1056.2 | 858.8  | 604.5  | 478.9  | 439.3  |
| 62.5°  | 955.1  | 757.7  | 518.1  | 399.8  | 380.1  |
| 65°    | 851.4  | 651.4  | 429.4  | 345.6  | 338.0  |
| 67.5°  | 752.7  | 552.7  | 345.6  | 303.4  | 296.1  |
| 70°    | 649.0  | 456.6  | 286.2  | 261.6  | 251.6  |
| 72.5°  | 550.4  | 367.6  | 239.3  | 219.7  | 214.7  |
| 75°    | 454.0  | 281.2  | 197.4  | 180.1  | 177.8  |
| 77.5°  | 357.9  | 199.7  | 155.5  | 145.5  | 140.6  |
| 80°    | 268.9  | 143.2  | 118.4  | 108.7  | 108.7  |
| 82.5°  | 187.5  | 96.3   | 81.4   | 76.4   | 76.4   |
| 85°    | 106.0  | 54.2   | 46.8   | 46.8   | 46.8   |
| 87.5°  | 39.5   | 19.6   | 19.6   | 17.2   | 17.2   |
| 90°    | 1.0    | 12.9   | 35.3   | 33.1   | 34.1   |
| 92.5°  | 22.2   | 30.2   | 31.3   | 32.3   | 32.3   |
| 95°    | 52.5   | 62.6   | 64.4   | 64.4   | 62.6   |
| 97.5°  | 87.4   | 96.7   | 100.7  | 100.7  | 100.7  |
| 100°   | 127.6  | 135.9  | 138.7  | 138.7  | 137.7  |
| 102.5° | 170.0  | 176.2  | 180.1  | 181.2  | 180.1  |
| 105°   | 216.4  | 219.2  | 221.4  | 223.2  | 223.2  |
| 107.5° | 262.4  | 266.7  | 266.7  | 267.4  | 262.4  |
| 110°   | 307.0  | 312.7  | 312.7  | 312.7  | 309.9  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 355.1  | 361.3  | 360.1  | 357.3  | 355.1  |
| 115°   | 402.6  | 408.4  | 406.5  | 405.5  | 402.6  |
| 117.5° | 449.7  | 457.6  | 452.6  | 449.7  | 446.9  |
| 120°   | 497.2  | 505.0  | 497.2  | 497.2  | 493.9  |
| 122.5° | 540.3  | 550.4  | 545.4  | 542.4  | 540.3  |
| 125°   | 585.6  | 594.6  | 591.7  | 588.4  | 587.4  |
| 127.5° | 629.8  | 640.9  | 637.0  | 632.6  | 629.8  |
| 130°   | 671.1  | 684.1  | 682.3  | 680.1  | 676.2  |
| 132.5° | 717.5  | 727.5  | 728.3  | 723.2  | 720.4  |
| 135°   | 757.4  | 768.5  | 770.7  | 769.6  | 766.8  |
| 137.5° | 802.0  | 811.0  | 812.8  | 812.0  | 807.8  |
| 140°   | 841.1  | 850.2  | 855.2  | 855.2  | 851.2  |
| 142.5° | 881.5  | 890.4  | 893.2  | 894.4  | 890.4  |
| 145°   | 919.5  | 926.7  | 932.5  | 933.6  | 929.6  |
| 147.5° | 953.7  | 962.6  | 967.0  | 968.7  | 964.8  |
| 150°   | 988.9  | 995.0  | 999.0  | 1002.2 | 999.0  |
| 152.5° | 1020.2 | 1026.2 | 1031.3 | 1035.3 | 1031.3 |
| 155°   | 1051.4 | 1054.3 | 1057.5 | 1062.6 | 1059.3 |
| 157.5° | 1078.5 | 1080.5 | 1082.3 | 1089.6 | 1084.5 |
| 160°   | 1102.5 | 1104.7 | 1105.7 | 1111.8 | 1107.5 |
| 162.5° | 1124.7 | 1124.7 | 1125.9 | 1132.7 | 1127.7 |
| 165°   | 1143.9 | 1142.7 | 1142.7 | 1149.9 | 1144.9 |
| 167.5° | 1161.1 | 1157.8 | 1157.8 | 1165.1 | 1160.0 |
| 170°   | 1174.0 | 1171.1 | 1170.1 | 1177.2 | 1171.1 |
| 172.5° | 1183.0 | 1180.2 | 1179.0 | 1186.3 | 1180.2 |
| 175°   | 1190.2 | 1187.3 | 1185.2 | 1192.3 | 1186.3 |
| 177.5° | 1194.2 | 1191.3 | 1189.1 | 1195.2 | 1189.1 |
| 180°   | 1192.3 | 1192.3 | 1192.3 | 1192.3 | 1192.3 |



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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 | 12.21            | 13.16 | 13.06 | 14.02 | 15.10 | 8.19           | 9.13  | 9.03  | 10.00 | 11.08 |
|                 | 3H   | 13.89            | 14.74 | 14.75 | 15.61 | 16.72 | 9.38           | 10.23 | 10.24 | 11.10 | 12.21 |
|                 | 4H   | 14.50            | 15.30 | 15.37 | 16.18 | 17.29 | 9.83           | 10.63 | 10.71 | 11.51 | 12.63 |
|                 | 6H   | 14.92            | 15.65 | 15.81 | 16.54 | 17.67 | 10.16          | 10.89 | 11.04 | 11.78 | 12.91 |
|                 | 8H   | 15.05            | 15.75 | 15.94 | 16.65 | 17.78 | 10.25          | 10.95 | 11.14 | 11.85 | 12.98 |
|                 | 12H  | 15.11            | 15.77 | 16.01 | 16.67 | 17.83 | 10.29          | 10.96 | 11.19 | 11.86 | 13.01 |
| 4H              | 2H   | 12.24            | 13.04 | 13.12 | 13.92 | 15.04 | 8.79           | 9.59  | 9.67  | 10.47 | 11.59 |
|                 | 3H   | 14.07            | 14.74 | 14.96 | 15.65 | 16.78 | 10.15          | 10.81 | 11.04 | 11.72 | 12.86 |
|                 | 4H   | 14.76            | 15.37 | 15.67 | 16.28 | 17.43 | 10.70          | 11.30 | 11.60 | 12.21 | 13.37 |
|                 | 6H   | 15.28            | 15.80 | 16.20 | 16.73 | 17.89 | 11.12          | 11.64 | 12.03 | 12.57 | 13.73 |
|                 | 8H   | 15.45            | 15.94 | 16.37 | 16.86 | 18.04 | 11.25          | 11.73 | 12.17 | 12.66 | 13.83 |
|                 | 12H  | 15.55            | 15.98 | 16.49 | 16.93 | 18.11 | 11.31          | 11.75 | 12.25 | 12.69 | 13.87 |
| 8H              | 4H   | 14.74            | 15.22 | 15.66 | 16.15 | 17.32 | 10.98          | 11.47 | 11.90 | 12.39 | 13.57 |
|                 | 6H   | 15.30            | 15.70 | 16.25 | 16.67 | 17.84 | 11.50          | 11.90 | 12.44 | 12.87 | 14.04 |
|                 | 8H   | 15.51            | 15.87 | 16.47 | 16.83 | 18.02 | 11.68          | 12.04 | 12.64 | 13.00 | 14.19 |
|                 | 12H  | 15.65            | 15.96 | 16.61 | 16.91 | 18.16 | 11.80          | 12.12 | 12.76 | 13.07 | 14.31 |
| 12H             | 4H   | 14.70            | 15.13 | 15.63 | 16.08 | 17.26 | 10.99          | 11.43 | 11.93 | 12.37 | 13.55 |
|                 | 6H   | 15.28            | 15.63 | 16.23 | 16.59 | 17.78 | 11.54          | 11.90 | 12.50 | 12.86 | 14.05 |
|                 | 8H   | 15.50            | 15.81 | 16.45 | 16.76 | 18.00 | 11.76          | 12.07 | 12.71 | 13.02 | 14.26 |