

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: P916066

Luminaire Tested: DFN2DIP-HX2F0-020D040US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916066  
REPORT IS A COMBINATION OF REPORTS P899171 AND P896039  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-020D040US930-FLLFLL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

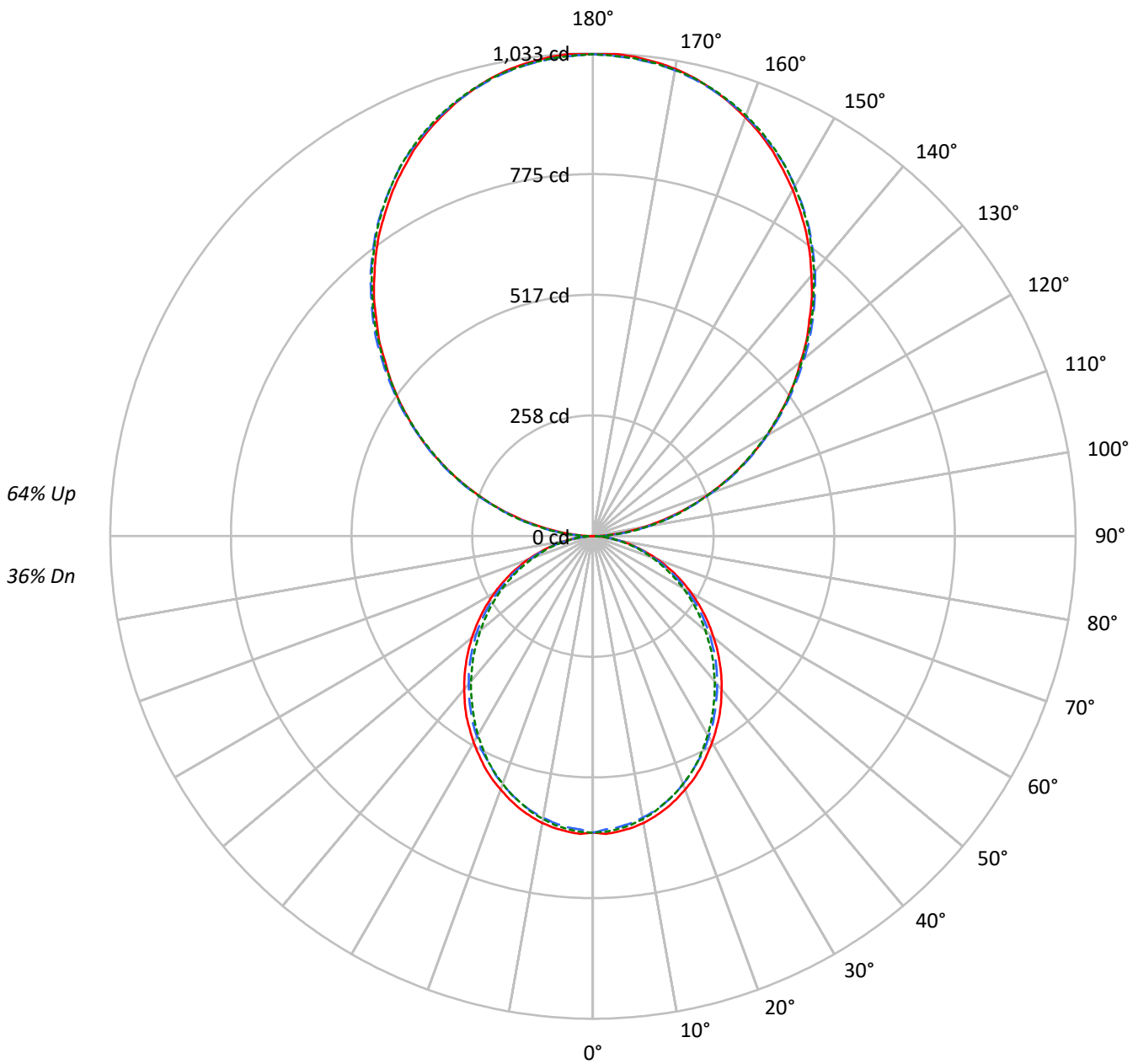
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4500.4 lumens  
Efficiency: N/A  
Efficacy: 100.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 44.6  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): 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: P916066  
CATALOG NUMBER: DFN2DIP-HX2F0-020D040US930-FLLFLL

### Luminous Intensity Polar Plot



— 0°-180°    - - 45°-225°    - - - 90°-270°



TEST NUMBER: P916066  
 CATALOG NUMBER: DFN2DIP-HX2F0-020D040US930-FLLFLL

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

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1495 | 1495 | 1495 |
| 5°  | 1495 | 1470 | 1481 |
| 10° | 1480 | 1447 | 1458 |
| 15° | 1456 | 1420 | 1424 |
| 20° | 1424 | 1383 | 1389 |
| 25° | 1393 | 1340 | 1350 |
| 30° | 1354 | 1300 | 1300 |
| 35° | 1317 | 1253 | 1248 |
| 40° | 1271 | 1205 | 1197 |
| 45° | 1225 | 1157 | 1146 |
| 50° | 1176 | 1107 | 1087 |
| 55° | 1123 | 1048 | 1031 |
| 60° | 1064 | 980  | 968  |
| 65° | 998  | 908  | 894  |
| 70° | 916  | 821  | 813  |
| 75° | 803  | 717  | 734  |
| 80° | 665  | 584  | 592  |
| 85° | 449  | 366  | 367  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 1383 cd/sqm



TEST NUMBER: P916066

CATALOG NUMBER: DFN2DIP-HX2F0-020D040US930-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 59.7   | 1.3       |
| 10°-20°   | 168.0  | 3.7       |
| 20°-30°   | 246.9  | 5.5       |
| 30°-40°   | 286.8  | 6.4       |
| 40°-50°   | 286.4  | 6.4       |
| 50°-60°   | 249.7  | 5.5       |
| 60°-70°   | 184.6  | 4.1       |
| 70°-80°   | 104.5  | 2.3       |
| 80°-90°   | 30.5   | 0.7       |
| 90°-100°  | 63.8   | 1.4       |
| 100°-110° | 202.8  | 4.5       |
| 110°-120° | 347.0  | 7.7       |
| 120°-130° | 456.4  | 10.1      |
| 130°-140° | 512.3  | 11.4      |
| 140°-150° | 502.4  | 11.2      |
| 150°-160° | 421.4  | 9.4       |
| 160°-170° | 279.5  | 6.2       |
| 170°-180° | 97.7   | 2.2       |
| 0°-30°    | 474.7  | 10.5      |
| 0°-40°    | 761.5  | 16.9      |
| 0°-60°    | 1297.6 | 28.8      |
| 0°-90°    | 1617.2 | 35.9      |
| 90°-120°  | 613.6  | 13.6      |
| 90°-150°  | 2084.7 | 46.3      |
| 90°-180°  | 2883.0 | 64.1      |
| 0°-180°   | 4500.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 634  | 634   | 634  | 634   | 634  |      |
| 5°   | 634  | 632   | 625  | 630   | 629  | 60   |
| 15°  | 604  | 600   | 592  | 595   | 592  | 170  |
| 25°  | 547  | 542   | 531  | 533   | 531  | 252  |
| 35°  | 472  | 466   | 456  | 452   | 449  | 295  |
| 45°  | 384  | 380   | 370  | 364   | 361  | 296  |
| 55°  | 290  | 287   | 279  | 272   | 269  | 260  |
| 65°  | 196  | 192   | 186  | 181   | 178  | 194  |
| 75°  | 102  | 101   | 98   | 95    | 96   | 109  |
| 85°  | 25   | 24    | 24   | 22    | 21   | 28   |
| 90°  | 1    | 11    | 30   | 29    | 30   | 4    |
| 95°  | 45   | 54    | 56   | 56    | 54   | 51   |
| 105° | 187  | 190   | 192  | 193   | 193  | 198  |
| 115° | 348  | 353   | 352  | 351   | 348  | 344  |
| 125° | 506  | 514   | 512  | 509   | 508  | 453  |
| 135° | 655  | 665   | 667  | 666   | 663  | 506  |
| 145° | 795  | 802   | 807  | 808   | 804  | 497  |
| 155° | 910  | 912   | 915  | 919   | 916  | 419  |
| 165° | 989  | 988   | 988  | 995   | 990  | 279  |
| 175° | 1030 | 1027  | 1025 | 1031  | 1026 | 98   |
| 180° | 1031 | 1031  | 1031 | 1031  | 1031 |      |



TEST NUMBER: P916066

CATALOG NUMBER: DFN2DIP-HX2F0-020D040US930-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 634.5 | 634.5 | 634.5 | 634.5 | 634.5 |
| 2.5°   | 638.1 | 635.1 | 628.4 | 634.5 | 633.3 |
| 5°     | 634.5 | 632.1 | 625.3 | 630.2 | 629.0 |
| 7.5°   | 630.2 | 626.6 | 619.9 | 624.8 | 623.5 |
| 10°    | 623.5 | 619.3 | 612.0 | 616.8 | 615.0 |
| 12.5°  | 614.3 | 610.7 | 603.4 | 606.4 | 605.2 |
| 15°    | 604.0 | 600.4 | 592.4 | 594.8 | 591.8 |
| 17.5°  | 591.2 | 587.6 | 579.6 | 582.6 | 579.6 |
| 20°    | 577.1 | 573.5 | 564.9 | 566.8 | 564.3 |
| 22.5°  | 563.1 | 557.7 | 549.7 | 549.7 | 548.5 |
| 25°    | 546.7 | 541.8 | 531.4 | 532.6 | 531.4 |
| 27.5°  | 528.3 | 524.1 | 516.2 | 514.4 | 511.3 |
| 30°    | 510.1 | 505.2 | 496.0 | 494.2 | 491.7 |
| 32.5°  | 490.5 | 486.9 | 477.1 | 473.4 | 471.0 |
| 35°    | 471.7 | 465.5 | 455.8 | 452.1 | 449.0 |
| 37.5°  | 450.3 | 444.7 | 435.0 | 430.7 | 427.6 |
| 40°    | 428.3 | 423.4 | 413.6 | 408.2 | 405.7 |
| 42.5°  | 406.9 | 402.0 | 392.3 | 386.2 | 382.5 |
| 45°    | 383.8 | 379.5 | 370.3 | 363.6 | 361.2 |
| 47.5°  | 361.2 | 356.9 | 347.2 | 340.4 | 336.8 |
| 50°    | 337.4 | 334.4 | 325.8 | 317.2 | 314.2 |
| 52.5°  | 314.2 | 309.9 | 302.0 | 295.3 | 291.1 |
| 55°    | 290.4 | 286.7 | 279.4 | 272.1 | 269.0 |
| 57.5°  | 266.6 | 263.6 | 255.6 | 248.3 | 245.8 |
| 60°    | 242.8 | 240.4 | 231.9 | 225.1 | 223.3 |
| 62.5°  | 219.6 | 215.3 | 209.3 | 203.2 | 200.7 |
| 65°    | 195.8 | 192.2 | 186.1 | 180.6 | 177.6 |
| 67.5°  | 171.5 | 168.4 | 162.9 | 158.7 | 156.2 |
| 70°    | 148.9 | 146.4 | 140.9 | 136.6 | 134.3 |
| 72.5°  | 125.7 | 123.3 | 120.2 | 115.9 | 114.1 |
| 75°    | 102.5 | 101.3 | 98.2  | 94.6  | 95.8  |
| 77.5°  | 81.8  | 79.3  | 78.0  | 76.2  | 74.4  |
| 80°    | 61.1  | 60.4  | 59.2  | 57.3  | 56.1  |
| 82.5°  | 41.5  | 41.5  | 40.9  | 38.5  | 38.5  |
| 85°    | 24.9  | 24.4  | 23.8  | 21.9  | 21.4  |
| 87.5°  | 11.0  | 9.8   | 8.6   | 6.8   | 6.1   |
| 90°    | 0.9   | 11.2  | 30.5  | 28.6  | 29.5  |
| 92.5°  | 19.2  | 26.1  | 27.1  | 28.0  | 28.0  |
| 95°    | 45.4  | 54.1  | 55.7  | 55.7  | 54.1  |
| 97.5°  | 75.6  | 83.6  | 87.1  | 87.1  | 87.1  |
| 100°   | 110.4 | 117.6 | 120.0 | 120.0 | 119.1 |
| 102.5° | 147.1 | 152.4 | 155.8 | 156.7 | 155.8 |
| 105°   | 187.2 | 189.6 | 191.5 | 193.1 | 193.1 |
| 107.5° | 227.0 | 230.7 | 230.7 | 231.3 | 227.0 |
| 110°   | 265.5 | 270.5 | 270.5 | 270.5 | 268.1 |



TEST NUMBER: P916066

CATALOG NUMBER: DFN2DIP-HX2F0-020D040US930-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 307.2  | 312.5  | 311.5  | 309.1  | 307.2  |
| 115°   | 348.2  | 353.3  | 351.6  | 350.7  | 348.2  |
| 117.5° | 389.0  | 395.8  | 391.5  | 389.0  | 386.5  |
| 120°   | 430.1  | 436.8  | 430.1  | 430.1  | 427.2  |
| 122.5° | 467.3  | 476.1  | 471.7  | 469.2  | 467.3  |
| 125°   | 506.5  | 514.3  | 511.8  | 509.0  | 508.1  |
| 127.5° | 544.8  | 554.4  | 551.0  | 547.2  | 544.8  |
| 130°   | 580.5  | 591.7  | 590.2  | 588.3  | 584.9  |
| 132.5° | 620.6  | 629.3  | 630.0  | 625.6  | 623.1  |
| 135°   | 655.2  | 664.8  | 666.7  | 665.7  | 663.2  |
| 137.5° | 693.7  | 701.5  | 703.0  | 702.4  | 698.7  |
| 140°   | 727.6  | 735.4  | 739.7  | 739.7  | 736.3  |
| 142.5° | 762.5  | 770.2  | 772.7  | 773.6  | 770.2  |
| 145°   | 795.4  | 801.6  | 806.6  | 807.6  | 804.1  |
| 147.5° | 824.9  | 832.7  | 836.4  | 838.0  | 834.5  |
| 150°   | 855.4  | 860.7  | 864.1  | 866.9  | 864.1  |
| 152.5° | 882.5  | 887.7  | 892.1  | 895.5  | 892.1  |
| 155°   | 909.5  | 912.0  | 914.8  | 919.2  | 916.3  |
| 157.5° | 932.9  | 934.7  | 936.2  | 942.5  | 938.1  |
| 160°   | 953.7  | 955.5  | 956.4  | 961.7  | 958.0  |
| 162.5° | 972.9  | 972.9  | 973.9  | 979.7  | 975.4  |
| 165°   | 989.4  | 988.5  | 988.5  | 994.7  | 990.3  |
| 167.5° | 1004.4 | 1001.5 | 1001.5 | 1007.8 | 1003.4 |
| 170°   | 1015.5 | 1013.0 | 1012.1 | 1018.3 | 1013.0 |
| 172.5° | 1023.3 | 1020.8 | 1019.9 | 1026.1 | 1020.8 |
| 175°   | 1029.6 | 1027.0 | 1025.2 | 1031.4 | 1026.1 |
| 177.5° | 1033.0 | 1030.5 | 1028.6 | 1033.9 | 1028.6 |
| 180°   | 1031.4 | 1031.4 | 1031.4 | 1031.4 | 1031.4 |



TEST NUMBER: P916066  
 CATALOG NUMBER: DFN2DIP-HX2F0-020D040US930-FLLFLL

**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 | 7.07             | 7.82  | 8.14  | 8.89  | 10.35 | 6.64           | 7.39  | 7.71  | 8.46  | 9.92  |
|                 | 3H   | 8.70             | 9.36  | 9.77  | 10.44 | 11.92 | 8.23           | 8.90  | 9.31  | 9.98  | 11.46 |
|                 | 4H   | 9.26             | 9.90  | 10.35 | 10.98 | 12.46 | 8.80           | 9.44  | 9.89  | 10.52 | 12.00 |
|                 | 6H   | 9.64             | 10.22 | 10.73 | 11.31 | 12.80 | 9.17           | 9.76  | 10.27 | 10.84 | 12.34 |
|                 | 8H   | 9.73             | 10.28 | 10.83 | 11.38 | 12.87 | 9.27           | 9.83  | 10.37 | 10.93 | 12.41 |
|                 | 12H  | 9.76             | 10.29 | 10.87 | 11.39 | 12.90 | 9.30           | 9.83  | 10.41 | 10.92 | 12.44 |
| 4H              | 2H   | 7.51             | 8.14  | 8.60  | 9.22  | 10.71 | 7.17           | 7.80  | 8.26  | 8.88  | 10.37 |
|                 | 3H   | 9.33             | 9.86  | 10.44 | 10.97 | 12.47 | 8.95           | 9.48  | 10.05 | 10.59 | 12.08 |
|                 | 4H   | 10.02            | 10.51 | 11.13 | 11.61 | 13.12 | 9.63           | 10.11 | 10.74 | 11.21 | 12.73 |
|                 | 6H   | 10.51            | 10.93 | 11.62 | 12.05 | 13.56 | 10.11          | 10.53 | 11.23 | 11.65 | 13.16 |
|                 | 8H   | 10.64            | 11.03 | 11.76 | 12.15 | 13.67 | 10.24          | 10.63 | 11.36 | 11.75 | 13.27 |
|                 | 12H  | 10.70            | 11.05 | 11.83 | 12.18 | 13.71 | 10.29          | 10.65 | 11.43 | 11.77 | 13.30 |
| 8H              | 4H   | 10.20            | 10.59 | 11.31 | 11.70 | 13.23 | 9.85           | 10.24 | 10.96 | 11.35 | 12.88 |
|                 | 6H   | 10.80            | 11.12 | 11.93 | 12.27 | 13.80 | 10.44          | 10.77 | 11.58 | 11.92 | 13.44 |
|                 | 8H   | 11.00            | 11.28 | 12.14 | 12.42 | 13.96 | 10.64          | 10.92 | 11.78 | 12.06 | 13.60 |
|                 | 12H  | 11.11            | 11.36 | 12.26 | 12.49 | 14.07 | 10.74          | 10.99 | 11.89 | 12.12 | 13.70 |
| 12H             | 4H   | 10.18            | 10.53 | 11.31 | 11.66 | 13.19 | 9.83           | 10.19 | 10.96 | 11.31 | 12.84 |
|                 | 6H   | 10.82            | 11.10 | 11.96 | 12.24 | 13.78 | 10.48          | 10.76 | 11.62 | 11.89 | 13.44 |
|                 | 8H   | 11.04            | 11.29 | 12.18 | 12.42 | 14.00 | 10.69          | 10.94 | 11.84 | 12.07 | 13.65 |