

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: P902460

Luminaire Tested: DFN2DIP-HX2F0-040D020US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902460  
REPORT IS A COMBINATION OF REPORTS P899156 AND P896039  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-040D020US830-RLLFLL  
Description: 2 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

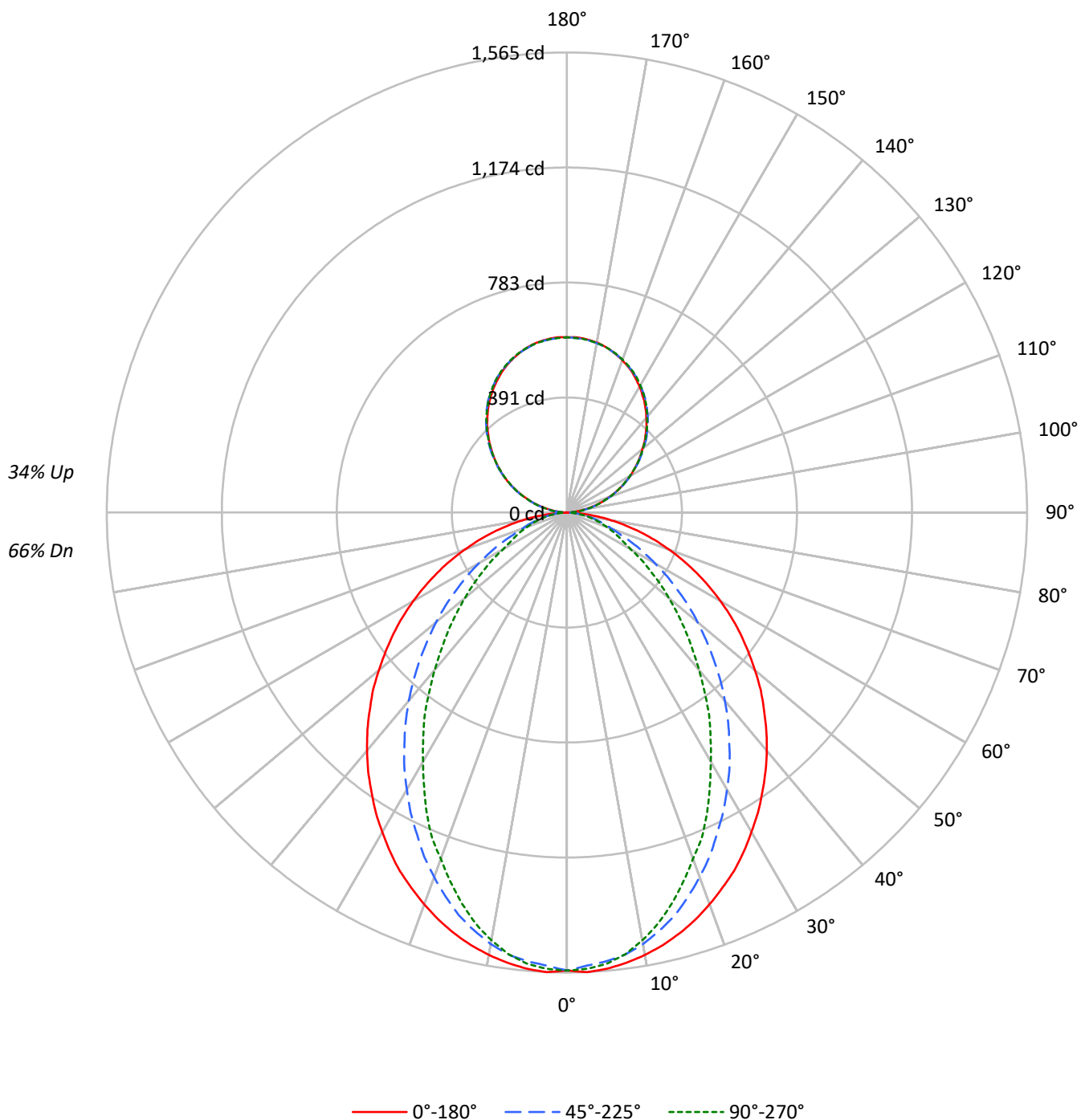
Lumens per Lamp: N/A  
Luminaire Lumens: 4872.9 lumens  
Efficiency: N/A  
Efficacy: 95.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 51.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-HX2F0-040D020US830-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P902460

CATALOG NUMBER: DFN2DIP-HX2F0-040D020US830-RLFL

**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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 70 | 69 | 63 | 62 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 72 | 68 | 65 | 64 | 61 | 58 | 57 | 54 | 52 |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 65 | 59 | 55 | 57 | 53 | 50 | 51 | 48 | 45 |
| 4   | 79  | 68  | 60  | 54  | 74  | 65  | 58  | 52  | 58 | 52 | 48 | 52 | 47 | 44 | 46 | 42 | 40 |
| 5   | 73  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 42 | 38 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 35  | 29  | 51  | 40  | 33  | 29  | 36 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 31  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3671 | 3671 | 3671 |
| 5°  | 3671 | 3604 | 3629 |
| 10° | 3629 | 3525 | 3505 |
| 15° | 3574 | 3400 | 3316 |
| 20° | 3501 | 3231 | 3087 |
| 25° | 3428 | 3044 | 2865 |
| 30° | 3331 | 2852 | 2587 |
| 35° | 3236 | 2647 | 2343 |
| 40° | 3138 | 2436 | 2064 |
| 45° | 3026 | 2203 | 1812 |
| 50° | 2909 | 1969 | 1566 |
| 55° | 2787 | 1720 | 1330 |
| 60° | 2644 | 1460 | 1088 |
| 65° | 2481 | 1197 | 972  |
| 70° | 2282 | 953  | 870  |
| 75° | 2031 | 823  | 779  |
| 80° | 1671 | 666  | 656  |
| 85° | 1094 | 412  | 460  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3026 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 146.0  | 3.0       |
| 10°-20°   | 400.9  | 8.2       |
| 20°-30°   | 562.8  | 11.6      |
| 30°-40°   | 613.5  | 12.6      |
| 40°-50°   | 563.9  | 11.6      |
| 50°-60°   | 442.9  | 9.1       |
| 60°-70°   | 288.3  | 5.9       |
| 70°-80°   | 148.4  | 3.0       |
| 80°-90°   | 39.6   | 0.8       |
| 90°-100°  | 36.9   | 0.8       |
| 100°-110° | 117.2  | 2.4       |
| 110°-120° | 200.6  | 4.1       |
| 120°-130° | 263.8  | 5.4       |
| 130°-140° | 296.1  | 6.1       |
| 140°-150° | 290.4  | 6.0       |
| 150°-160° | 243.6  | 5.0       |
| 160°-170° | 161.5  | 3.3       |
| 170°-180° | 56.5   | 1.2       |
| 0°-30°    | 1109.8 | 22.8      |
| 0°-40°    | 1723.3 | 35.4      |
| 0°-60°    | 2730.1 | 56.0      |
| 0°-90°    | 3206.3 | 65.8      |
| 90°-120°  | 354.7  | 7.3       |
| 90°-150°  | 1205.0 | 24.7      |
| 90°-180°  | 1667.0 | 34.2      |
| 0°-180°   | 4872.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1558 | 1558  | 1558 | 1558  | 1558 |      |
| 5°   | 1558 | 1551  | 1533 | 1546  | 1541 | 148  |
| 15°  | 1482 | 1466  | 1419 | 1392  | 1378 | 418  |
| 25°  | 1345 | 1300  | 1207 | 1149  | 1128 | 619  |
| 35°  | 1159 | 1087  | 963  | 874   | 843  | 726  |
| 45°  | 948  | 853   | 705  | 605   | 571  | 732  |
| 55°  | 721  | 611   | 458  | 374   | 347  | 644  |
| 65°  | 486  | 372   | 245  | 198   | 193  | 482  |
| 75°  | 259  | 161   | 113  | 103   | 102  | 274  |
| 85°  | 61   | 31    | 27   | 27    | 27   | 70   |
| 90°  | 1    | 6     | 18   | 16    | 17   | 5    |
| 95°  | 26   | 31    | 32   | 32    | 31   | 29   |
| 105° | 108  | 110   | 111  | 112   | 112  | 114  |
| 115° | 201  | 204   | 203  | 203   | 201  | 199  |
| 125° | 293  | 297   | 296  | 294   | 294  | 262  |
| 135° | 379  | 384   | 385  | 385   | 383  | 293  |
| 145° | 460  | 463   | 466  | 467   | 465  | 287  |
| 155° | 526  | 527   | 529  | 531   | 530  | 242  |
| 165° | 572  | 571   | 571  | 575   | 572  | 161  |
| 175° | 595  | 594   | 593  | 596   | 593  | 57   |
| 180° | 596  | 596   | 596  | 596   | 596  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1558.2 | 1558.2 | 1558.2 | 1558.2 | 1558.2 |
| 2.5°   | 1565.3 | 1558.2 | 1542.7 | 1556.9 | 1554.0 |
| 5°     | 1558.2 | 1551.1 | 1532.8 | 1545.5 | 1541.3 |
| 7.5°   | 1545.5 | 1537.1 | 1517.4 | 1522.9 | 1515.9 |
| 10°    | 1528.6 | 1518.7 | 1490.5 | 1486.2 | 1477.9 |
| 12.5°  | 1507.5 | 1494.8 | 1456.6 | 1448.2 | 1432.7 |
| 15°    | 1482.1 | 1466.5 | 1418.6 | 1391.9 | 1377.8 |
| 17.5°  | 1452.5 | 1429.8 | 1370.6 | 1339.6 | 1317.0 |
| 20°    | 1418.6 | 1390.3 | 1319.8 | 1284.7 | 1253.6 |
| 22.5°  | 1382.0 | 1349.5 | 1267.6 | 1219.7 | 1198.7 |
| 25°    | 1345.3 | 1300.1 | 1207.0 | 1149.3 | 1128.0 |
| 27.5°  | 1301.7 | 1253.6 | 1150.7 | 1084.4 | 1051.9 |
| 30°    | 1255.1 | 1201.4 | 1088.5 | 1016.7 | 978.6  |
| 32.5°  | 1209.9 | 1145.0 | 1029.4 | 944.8  | 909.5  |
| 35°    | 1159.2 | 1087.2 | 963.2  | 874.3  | 843.2  |
| 37.5°  | 1109.8 | 1032.2 | 901.1  | 803.7  | 768.5  |
| 40°    | 1057.6 | 973.1  | 836.2  | 736.1  | 699.5  |
| 42.5°  | 1004.0 | 913.8  | 771.4  | 666.9  | 631.8  |
| 45°    | 947.6  | 853.1  | 705.1  | 604.9  | 571.1  |
| 47.5°  | 894.1  | 794.0  | 641.7  | 541.5  | 510.5  |
| 50°    | 834.8  | 734.7  | 579.6  | 482.2  | 452.7  |
| 52.5°  | 776.9  | 671.2  | 520.4  | 427.3  | 400.5  |
| 55°    | 720.6  | 610.6  | 458.3  | 373.7  | 346.9  |
| 57.5°  | 662.8  | 550.0  | 403.3  | 324.3  | 301.8  |
| 60°    | 603.5  | 490.7  | 345.4  | 273.6  | 251.1  |
| 62.5°  | 545.8  | 433.0  | 296.1  | 228.5  | 217.3  |
| 65°    | 486.5  | 372.2  | 245.3  | 197.5  | 193.1  |
| 67.5°  | 430.2  | 315.8  | 197.5  | 173.4  | 169.2  |
| 70°    | 370.9  | 260.9  | 163.5  | 149.5  | 143.7  |
| 72.5°  | 314.5  | 210.1  | 136.8  | 125.5  | 122.7  |
| 75°    | 259.4  | 160.7  | 112.8  | 102.9  | 101.6  |
| 77.5°  | 204.5  | 114.1  | 88.9   | 83.2   | 80.3   |
| 80°    | 153.6  | 81.8   | 67.6   | 62.1   | 62.1   |
| 82.5°  | 107.2  | 55.0   | 46.6   | 43.6   | 43.6   |
| 85°    | 60.6   | 31.0   | 26.8   | 26.8   | 26.8   |
| 87.5°  | 22.6   | 11.2   | 11.2   | 9.9    | 9.9    |
| 90°    | 0.6    | 6.5    | 17.6   | 16.5   | 17.1   |
| 92.5°  | 11.1   | 15.1   | 15.6   | 16.2   | 16.2   |
| 95°    | 26.2   | 31.3   | 32.1   | 32.1   | 31.3   |
| 97.5°  | 43.6   | 48.4   | 50.3   | 50.3   | 50.3   |
| 100°   | 63.8   | 68.0   | 69.4   | 69.4   | 68.8   |
| 102.5° | 85.0   | 88.0   | 90.0   | 90.6   | 90.0   |
| 105°   | 108.2  | 109.6  | 110.7  | 111.6  | 111.6  |
| 107.5° | 131.2  | 133.4  | 133.4  | 133.7  | 131.2  |
| 110°   | 153.5  | 156.4  | 156.4  | 156.4  | 155.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 177.6 | 180.6 | 180.1 | 178.6 | 177.6 |
| 115°   | 201.3 | 204.2 | 203.3 | 202.7 | 201.3 |
| 117.5° | 224.9 | 228.8 | 226.3 | 224.9 | 223.4 |
| 120°   | 248.5 | 252.5 | 248.5 | 248.5 | 246.9 |
| 122.5° | 270.1 | 275.1 | 272.7 | 271.3 | 270.1 |
| 125°   | 292.8 | 297.3 | 295.9 | 294.3 | 293.7 |
| 127.5° | 314.9 | 320.5 | 318.5 | 316.3 | 314.9 |
| 130°   | 335.5 | 342.0 | 341.1 | 340.1 | 338.1 |
| 132.5° | 358.7 | 363.8 | 364.1 | 361.7 | 360.1 |
| 135°   | 378.7 | 384.3 | 385.3 | 384.8 | 383.3 |
| 137.5° | 401.0 | 405.5 | 406.4 | 406.0 | 403.9 |
| 140°   | 420.6 | 425.1 | 427.6 | 427.6 | 425.7 |
| 142.5° | 440.7 | 445.2 | 446.7 | 447.1 | 445.2 |
| 145°   | 459.8 | 463.4 | 466.3 | 466.7 | 464.8 |
| 147.5° | 476.8 | 481.4 | 483.5 | 484.4 | 482.4 |
| 150°   | 494.5 | 497.5 | 499.5 | 501.1 | 499.5 |
| 152.5° | 510.1 | 513.1 | 515.7 | 517.6 | 515.7 |
| 155°   | 525.8 | 527.2 | 528.8 | 531.3 | 529.7 |
| 157.5° | 539.2 | 540.3 | 541.2 | 544.8 | 542.2 |
| 160°   | 551.3 | 552.3 | 552.9 | 555.9 | 553.7 |
| 162.5° | 562.4 | 562.4 | 562.9 | 566.4 | 563.8 |
| 165°   | 571.9 | 571.4 | 571.4 | 575.0 | 572.5 |
| 167.5° | 580.5 | 578.9 | 578.9 | 582.5 | 580.0 |
| 170°   | 587.0 | 585.6 | 585.0 | 588.6 | 585.6 |
| 172.5° | 591.5 | 590.0 | 589.6 | 593.1 | 590.0 |
| 175°   | 595.1 | 593.7 | 592.6 | 596.2 | 593.1 |
| 177.5° | 597.1 | 595.7 | 594.6 | 597.6 | 594.6 |
| 180°   | 596.2 | 596.2 | 596.2 | 596.2 | 596.2 |

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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 | 12.89            | 13.87 | 13.71 | 14.70 | 15.73 | 8.87           | 9.85  | 9.69  | 10.68 | 11.71 |
|                 | 3H   | 14.55            | 15.43 | 15.38 | 16.27 | 17.33 | 10.05          | 10.93 | 10.88 | 11.77 | 12.83 |
|                 | 4H   | 15.15            | 15.98 | 16.00 | 16.83 | 17.90 | 10.50          | 11.32 | 11.35 | 12.17 | 13.24 |
|                 | 6H   | 15.56            | 16.32 | 16.42 | 17.18 | 18.26 | 10.81          | 11.57 | 11.67 | 12.43 | 13.51 |
|                 | 8H   | 15.68            | 16.40 | 16.55 | 17.28 | 18.36 | 10.90          | 11.62 | 11.77 | 12.50 | 13.58 |
|                 | 12H  | 15.74            | 16.42 | 16.61 | 17.29 | 18.40 | 10.94          | 11.63 | 11.81 | 12.50 | 13.60 |
| 4H              | 2H   | 12.92            | 13.75 | 13.77 | 14.60 | 15.67 | 9.47           | 10.30 | 10.32 | 11.15 | 12.21 |
|                 | 3H   | 14.74            | 15.42 | 15.60 | 16.30 | 17.39 | 10.81          | 11.50 | 11.68 | 12.38 | 13.47 |
|                 | 4H   | 15.41            | 16.04 | 16.29 | 16.92 | 18.03 | 11.35          | 11.98 | 12.23 | 12.86 | 13.97 |
|                 | 6H   | 15.91            | 16.45 | 16.80 | 17.35 | 18.47 | 11.76          | 12.30 | 12.65 | 13.20 | 14.32 |
|                 | 8H   | 16.08            | 16.58 | 16.97 | 17.48 | 18.60 | 11.88          | 12.39 | 12.78 | 13.28 | 14.41 |
|                 | 12H  | 16.16            | 16.62 | 17.08 | 17.53 | 18.67 | 11.95          | 12.40 | 12.86 | 13.31 | 14.45 |
| 8H              | 4H   | 15.39            | 15.89 | 16.28 | 16.79 | 17.92 | 11.63          | 12.13 | 12.52 | 13.03 | 14.16 |
|                 | 6H   | 15.93            | 16.35 | 16.85 | 17.29 | 18.41 | 12.13          | 12.54 | 13.05 | 13.48 | 14.61 |
|                 | 8H   | 16.13            | 16.50 | 17.06 | 17.43 | 18.58 | 12.31          | 12.67 | 13.24 | 13.61 | 14.75 |
|                 | 12H  | 16.26            | 16.58 | 17.19 | 17.51 | 18.70 | 12.42          | 12.74 | 13.35 | 13.67 | 14.86 |
| 12H             | 4H   | 15.35            | 15.80 | 16.26 | 16.72 | 17.85 | 11.64          | 12.09 | 12.55 | 13.01 | 14.14 |
|                 | 6H   | 15.91            | 16.27 | 16.84 | 17.21 | 18.35 | 12.17          | 12.54 | 13.10 | 13.47 | 14.62 |
|                 | 8H   | 16.12            | 16.44 | 17.05 | 17.36 | 18.56 | 12.37          | 12.70 | 13.30 | 13.62 | 14.82 |