

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: P913711

Luminaire Tested: DFN2DIP-HX4F0-100D060US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

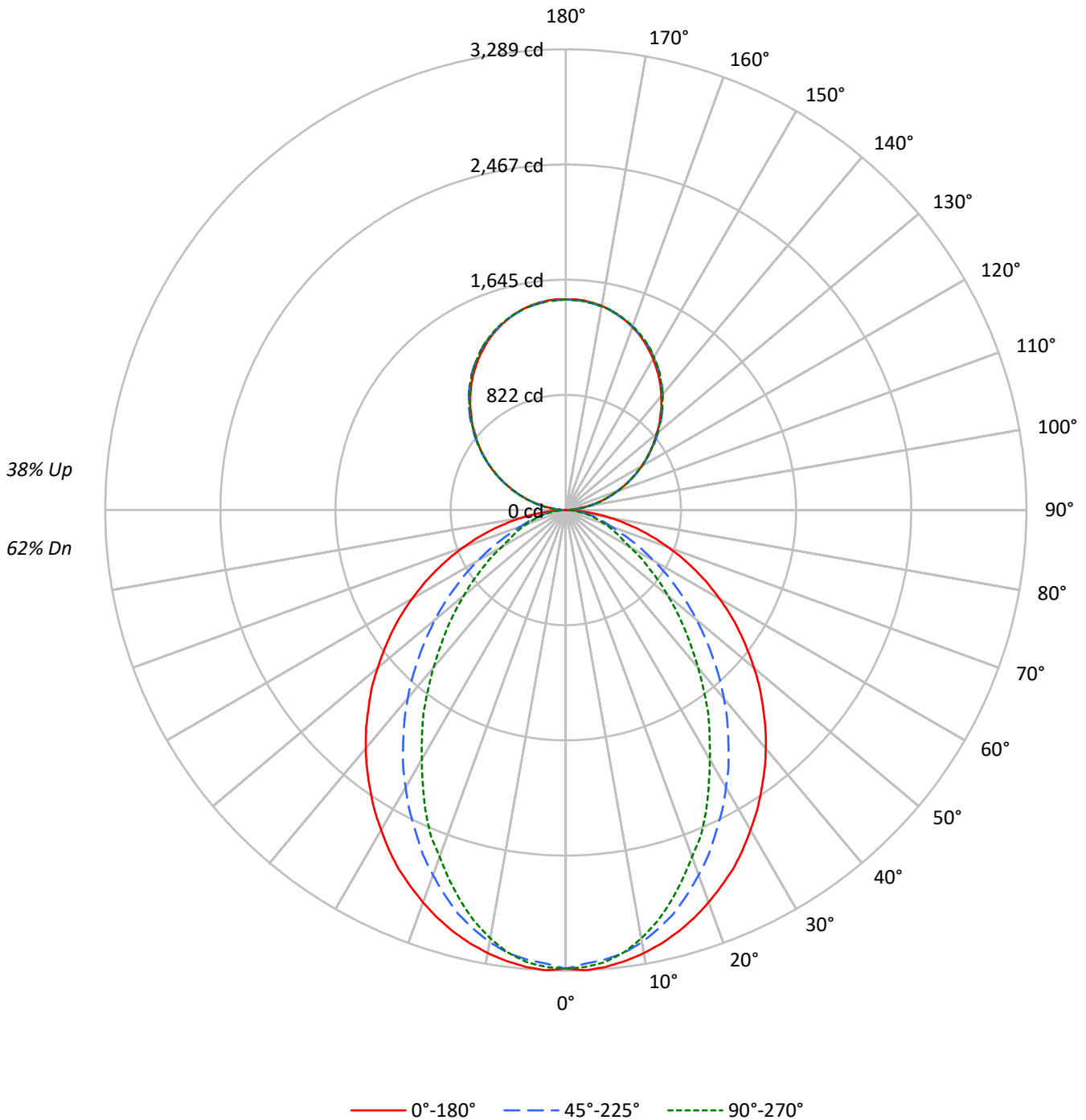
Test Method: LM-79-2019  
Report Number: P913711  
REPORT IS A COMBINATION OF REPORTS P899348 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-100D060US927-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10940.0 lumens  
Efficiency: N/A  
Efficacy: 82.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 133.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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: P913711

CATALOG NUMBER: DFN2DIP-HX4F0-100D060US927-RLFL

**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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 78 | 78 | 78 | 67 | 67 | 67 | 67 | 67 | 62 |
| 1   | 101 | 97  | 93  | 90  | 94  | 91  | 88  | 85  | 80 | 77 | 75 | 69 | 68 | 66 | 60 | 59 | 58 | 58 | 58 | 53 |
| 2   | 92  | 85  | 79  | 74  | 86  | 80  | 75  | 70  | 71 | 67 | 63 | 62 | 59 | 56 | 53 | 51 | 49 | 49 | 49 | 45 |
| 3   | 85  | 75  | 68  | 63  | 79  | 71  | 65  | 60  | 63 | 58 | 54 | 55 | 51 | 48 | 48 | 45 | 43 | 43 | 43 | 39 |
| 4   | 78  | 67  | 60  | 54  | 73  | 63  | 57  | 51  | 56 | 51 | 46 | 49 | 45 | 42 | 43 | 40 | 37 | 37 | 37 | 34 |
| 5   | 72  | 60  | 52  | 46  | 67  | 57  | 50  | 44  | 51 | 45 | 41 | 45 | 40 | 37 | 39 | 36 | 33 | 33 | 33 | 30 |
| 6   | 66  | 54  | 46  | 41  | 62  | 51  | 44  | 39  | 46 | 40 | 36 | 41 | 36 | 32 | 36 | 32 | 29 | 29 | 29 | 27 |
| 7   | 62  | 49  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 37 | 33 | 29 | 33 | 29 | 26 | 26 | 26 | 24 |
| 8   | 57  | 45  | 37  | 32  | 54  | 43  | 36  | 31  | 38 | 33 | 28 | 34 | 30 | 26 | 30 | 27 | 24 | 24 | 24 | 22 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 28  | 35 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 22 | 22 | 22 | 20 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 23 | 29 | 25 | 22 | 26 | 22 | 20 | 20 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2435 | 2435 | 2435 |
| 5°  | 2439 | 2396 | 2411 |
| 10° | 2415 | 2349 | 2333 |
| 15° | 2382 | 2272 | 2212 |
| 20° | 2338 | 2165 | 2063 |
| 25° | 2293 | 2045 | 1919 |
| 30° | 2233 | 1922 | 1737 |
| 35° | 2174 | 1790 | 1577 |
| 40° | 2114 | 1654 | 1394 |
| 45° | 2044 | 1502 | 1227 |
| 50° | 1972 | 1349 | 1065 |
| 55° | 1896 | 1185 | 908  |
| 60° | 1809 | 1014 | 748  |
| 65° | 1709 | 840  | 673  |
| 70° | 1588 | 678  | 609  |
| 75° | 1435 | 598  | 555  |
| 80° | 1214 | 502  | 482  |
| 85° | 849  | 336  | 362  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 2044 cd/sqm



TEST NUMBER: P913711

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 306.9   | 2.8       |
| 10°-20°   | 842.4   | 7.7       |
| 20°-30°   | 1182.6  | 10.8      |
| 30°-40°   | 1289.2  | 11.8      |
| 40°-50°   | 1184.9  | 10.8      |
| 50°-60°   | 930.5   | 8.5       |
| 60°-70°   | 605.7   | 5.5       |
| 70°-80°   | 311.8   | 2.8       |
| 80°-90°   | 83.9    | 0.8       |
| 90°-100°  | 93.0    | 0.9       |
| 100°-110° | 295.6   | 2.7       |
| 110°-120° | 505.8   | 4.6       |
| 120°-130° | 665.2   | 6.1       |
| 130°-140° | 746.6   | 6.8       |
| 140°-150° | 732.2   | 6.7       |
| 150°-160° | 614.2   | 5.6       |
| 160°-170° | 407.3   | 3.7       |
| 170°-180° | 142.4   | 1.3       |
| 0°-30°    | 2331.9  | 21.3      |
| 0°-40°    | 3621.0  | 33.1      |
| 0°-60°    | 5736.5  | 52.4      |
| 0°-90°    | 6737.8  | 61.6      |
| 90°-120°  | 894.4   | 8.2       |
| 90°-150°  | 3038.4  | 27.8      |
| 90°-180°  | 4202.0  | 38.4      |
| 0°-180°   | 10940.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3274 | 3274  | 3274 | 3274  | 3274 |      |
| 5°   | 3274 | 3259  | 3221 | 3247  | 3238 | 310  |
| 15°  | 3114 | 3081  | 2981 | 2924  | 2895 | 878  |
| 25°  | 2827 | 2732  | 2536 | 2415  | 2370 | 1300 |
| 35°  | 2436 | 2284  | 2024 | 1837  | 1772 | 1524 |
| 45°  | 1991 | 1792  | 1482 | 1271  | 1200 | 1538 |
| 55°  | 1514 | 1283  | 963  | 785   | 729  | 1353 |
| 65°  | 1022 | 782   | 516  | 415   | 406  | 1014 |
| 75°  | 545  | 338   | 237  | 216   | 213  | 577  |
| 85°  | 127  | 65    | 56   | 56    | 56   | 146  |
| 90°  | 1    | 16    | 44   | 42    | 43   | 11   |
| 95°  | 66   | 79    | 81   | 81    | 79   | 74   |
| 105° | 273  | 276   | 279  | 282   | 282  | 288  |
| 115° | 508  | 515   | 512  | 511   | 508  | 502  |
| 125° | 738  | 750   | 746  | 742   | 740  | 660  |
| 135° | 955  | 969   | 972  | 970   | 967  | 738  |
| 145° | 1159 | 1168  | 1176 | 1177  | 1172 | 724  |
| 155° | 1326 | 1329  | 1333 | 1340  | 1336 | 610  |
| 165° | 1442 | 1441  | 1441 | 1450  | 1443 | 407  |
| 175° | 1500 | 1497  | 1494 | 1503  | 1496 | 143  |
| 180° | 1503 | 1503  | 1503 | 1503  | 1503 |      |



TEST NUMBER: P913711

CATALOG NUMBER: DFN2DIP-HX4F0-100D060US927-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3274.1 | 3274.1 | 3274.1 | 3274.1 | 3274.1 |
| 2.5°   | 3288.8 | 3274.1 | 3241.4 | 3271.2 | 3265.3 |
| 5°     | 3274.1 | 3259.3 | 3220.6 | 3247.4 | 3238.5 |
| 7.5°   | 3247.4 | 3229.7 | 3188.2 | 3199.9 | 3185.1 |
| 10°    | 3211.8 | 3191.1 | 3132.0 | 3122.9 | 3105.3 |
| 12.5°  | 3167.5 | 3140.8 | 3060.6 | 3043.0 | 3010.3 |
| 15°    | 3114.1 | 3081.3 | 2980.7 | 2924.5 | 2894.9 |
| 17.5°  | 3051.8 | 3004.3 | 2879.9 | 2814.8 | 2767.3 |
| 20°    | 2980.7 | 2921.3 | 2773.3 | 2699.4 | 2634.0 |
| 22.5°  | 2903.7 | 2835.5 | 2663.6 | 2563.0 | 2518.7 |
| 25°    | 2826.7 | 2731.8 | 2536.2 | 2414.9 | 2370.3 |
| 27.5°  | 2734.9 | 2634.0 | 2417.7 | 2278.5 | 2210.3 |
| 30°    | 2637.2 | 2524.3 | 2287.3 | 2136.4 | 2056.3 |
| 32.5°  | 2542.3 | 2405.8 | 2163.1 | 1985.2 | 1911.0 |
| 35°    | 2435.6 | 2284.5 | 2023.9 | 1837.1 | 1771.7 |
| 37.5°  | 2331.9 | 2168.8 | 1893.4 | 1688.8 | 1614.9 |
| 40°    | 2222.2 | 2044.6 | 1757.0 | 1546.7 | 1469.7 |
| 42.5°  | 2109.7 | 1920.1 | 1620.9 | 1401.4 | 1327.5 |
| 45°    | 1991.1 | 1792.5 | 1481.6 | 1271.0 | 1199.9 |
| 47.5°  | 1878.7 | 1668.3 | 1348.3 | 1137.7 | 1072.6 |
| 50°    | 1754.1 | 1543.8 | 1217.8 | 1013.2 | 951.3  |
| 52.5°  | 1632.4 | 1410.2 | 1093.4 | 897.8  | 841.5  |
| 55°    | 1513.9 | 1282.9 | 962.9  | 785.3  | 729.0  |
| 57.5°  | 1392.7 | 1155.6 | 847.6  | 681.5  | 634.1  |
| 60°    | 1268.1 | 1031.1 | 725.9  | 575.0  | 527.5  |
| 62.5°  | 1146.8 | 909.7  | 622.1  | 480.1  | 456.5  |
| 65°    | 1022.3 | 782.1  | 515.6  | 414.9  | 405.8  |
| 67.5°  | 903.8  | 663.6  | 414.9  | 364.3  | 355.5  |
| 70°    | 779.3  | 548.3  | 343.6  | 314.0  | 302.1  |
| 72.5°  | 660.8  | 441.3  | 287.3  | 263.7  | 257.8  |
| 75°    | 545.1  | 337.6  | 237.0  | 216.3  | 213.4  |
| 77.5°  | 429.8  | 239.9  | 186.7  | 174.8  | 168.8  |
| 80°    | 322.8  | 172.0  | 142.1  | 130.5  | 130.5  |
| 82.5°  | 225.1  | 115.7  | 97.8   | 91.8   | 91.8   |
| 85°    | 127.3  | 65.0   | 56.2   | 56.2   | 56.2   |
| 87.5°  | 47.5   | 23.6   | 23.6   | 20.8   | 20.8   |
| 90°    | 1.3    | 16.3   | 44.4   | 41.7   | 43.0   |
| 92.5°  | 28.1   | 38.1   | 39.5   | 40.8   | 40.8   |
| 95°    | 66.1   | 78.8   | 81.1   | 81.1   | 78.8   |
| 97.5°  | 110.1  | 121.9  | 126.9  | 126.9  | 126.9  |
| 100°   | 160.9  | 171.3  | 174.9  | 174.9  | 173.6  |
| 102.5° | 214.4  | 222.0  | 227.0  | 228.4  | 227.0  |
| 105°   | 272.8  | 276.5  | 279.2  | 281.5  | 281.5  |
| 107.5° | 330.8  | 336.3  | 336.3  | 337.2  | 330.8  |
| 110°   | 387.1  | 394.3  | 394.3  | 394.3  | 390.6  |



TEST NUMBER: P913711

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 447.7  | 455.4  | 454.1  | 450.4  | 447.7  |
| 115°   | 507.6  | 514.8  | 512.5  | 511.2  | 507.6  |
| 117.5° | 567.0  | 576.9  | 570.5  | 567.0  | 563.3  |
| 120°   | 626.8  | 636.8  | 626.8  | 626.8  | 622.7  |
| 122.5° | 681.1  | 693.8  | 687.5  | 683.9  | 681.1  |
| 125°   | 738.2  | 749.6  | 745.9  | 741.9  | 740.5  |
| 127.5° | 794.0  | 808.0  | 803.0  | 797.6  | 794.0  |
| 130°   | 846.1  | 862.4  | 860.2  | 857.5  | 852.5  |
| 132.5° | 904.6  | 917.3  | 918.1  | 911.8  | 908.2  |
| 135°   | 954.9  | 968.9  | 971.6  | 970.3  | 966.6  |
| 137.5° | 1011.1 | 1022.4 | 1024.7 | 1023.7 | 1018.3 |
| 140°   | 1060.5 | 1071.8 | 1078.2 | 1078.2 | 1073.2 |
| 142.5° | 1111.2 | 1122.5 | 1126.2 | 1127.5 | 1122.5 |
| 145°   | 1159.3 | 1168.3 | 1175.6 | 1176.9 | 1172.0 |
| 147.5° | 1202.3 | 1213.6 | 1219.1 | 1221.3 | 1216.3 |
| 150°   | 1246.7 | 1254.4 | 1259.4 | 1263.4 | 1259.4 |
| 152.5° | 1286.1 | 1293.9 | 1300.2 | 1305.2 | 1300.2 |
| 155°   | 1325.6 | 1329.2 | 1333.2 | 1339.7 | 1335.5 |
| 157.5° | 1359.5 | 1362.3 | 1364.5 | 1373.6 | 1367.3 |
| 160°   | 1390.0 | 1392.7 | 1394.0 | 1401.7 | 1396.3 |
| 162.5° | 1418.0 | 1418.0 | 1419.4 | 1428.0 | 1421.6 |
| 165°   | 1442.0 | 1440.7 | 1440.7 | 1449.8 | 1443.4 |
| 167.5° | 1463.8 | 1459.8 | 1459.8 | 1468.8 | 1462.4 |
| 170°   | 1480.1 | 1476.5 | 1475.1 | 1484.2 | 1476.5 |
| 172.5° | 1491.4 | 1487.8 | 1486.4 | 1495.5 | 1487.8 |
| 175°   | 1500.5 | 1496.9 | 1494.1 | 1503.2 | 1495.5 |
| 177.5° | 1505.5 | 1501.9 | 1499.1 | 1506.8 | 1499.1 |
| 180°   | 1503.2 | 1503.2 | 1503.2 | 1503.2 | 1503.2 |



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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 | 11.26            | 12.19 | 12.11 | 13.07 | 14.16 | 7.23           | 8.16  | 8.09  | 9.04  | 10.14 |
|                 | 3H   | 12.94            | 13.78 | 13.81 | 14.66 | 15.79 | 8.43           | 9.26  | 9.30  | 10.15 | 11.27 |
|                 | 4H   | 13.56            | 14.35 | 14.44 | 15.24 | 16.37 | 8.88           | 9.67  | 9.77  | 10.56 | 11.70 |
|                 | 6H   | 13.98            | 14.71 | 14.88 | 15.61 | 16.76 | 9.21           | 9.94  | 10.11 | 10.84 | 11.98 |
|                 | 8H   | 14.11            | 14.81 | 15.02 | 15.72 | 16.87 | 9.31           | 10.00 | 10.21 | 10.91 | 12.06 |
|                 | 12H  | 14.18            | 14.84 | 15.09 | 15.75 | 16.92 | 9.35           | 10.01 | 10.27 | 10.92 | 12.09 |
| 4H              | 2H   | 11.29            | 12.08 | 12.18 | 12.97 | 14.10 | 7.84           | 8.63  | 8.73  | 9.52  | 10.65 |
|                 | 3H   | 13.13            | 13.78 | 14.03 | 14.71 | 15.86 | 9.20           | 9.85  | 10.10 | 10.78 | 11.93 |
|                 | 4H   | 13.82            | 14.42 | 14.74 | 15.34 | 16.52 | 9.75           | 10.35 | 10.67 | 11.27 | 12.44 |
|                 | 6H   | 14.35            | 14.86 | 15.27 | 15.80 | 16.98 | 10.18          | 10.69 | 11.11 | 11.64 | 12.81 |
|                 | 8H   | 14.52            | 15.00 | 15.45 | 15.94 | 17.13 | 10.31          | 10.79 | 11.24 | 11.73 | 12.92 |
|                 | 12H  | 14.62            | 15.06 | 15.57 | 16.01 | 17.21 | 10.38          | 10.81 | 11.33 | 11.77 | 12.96 |
| 8H              | 4H   | 13.80            | 14.28 | 14.73 | 15.22 | 16.41 | 10.04          | 10.52 | 10.97 | 11.46 | 12.65 |
|                 | 6H   | 14.37            | 14.77 | 15.33 | 15.75 | 16.94 | 10.57          | 10.96 | 11.52 | 11.94 | 13.13 |
|                 | 8H   | 14.59            | 14.94 | 15.55 | 15.91 | 17.12 | 10.76          | 11.11 | 11.72 | 12.08 | 13.29 |
|                 | 12H  | 14.73            | 15.04 | 15.70 | 16.00 | 17.26 | 10.88          | 11.19 | 11.85 | 12.15 | 13.41 |
| 12H             | 4H   | 13.76            | 14.19 | 14.71 | 15.14 | 16.34 | 10.05          | 10.48 | 11.00 | 11.44 | 12.63 |
|                 | 6H   | 14.35            | 14.70 | 15.31 | 15.67 | 16.87 | 10.62          | 10.97 | 11.58 | 11.94 | 13.14 |
|                 | 8H   | 14.57            | 14.88 | 15.54 | 15.84 | 17.10 | 10.83          | 11.14 | 11.80 | 12.10 | 13.36 |