

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: P913679

Luminaire Tested: DFN2DIP-HX4F0-080D080US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913679  
REPORT IS A COMBINATION OF REPORTS P899380 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D080US927-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

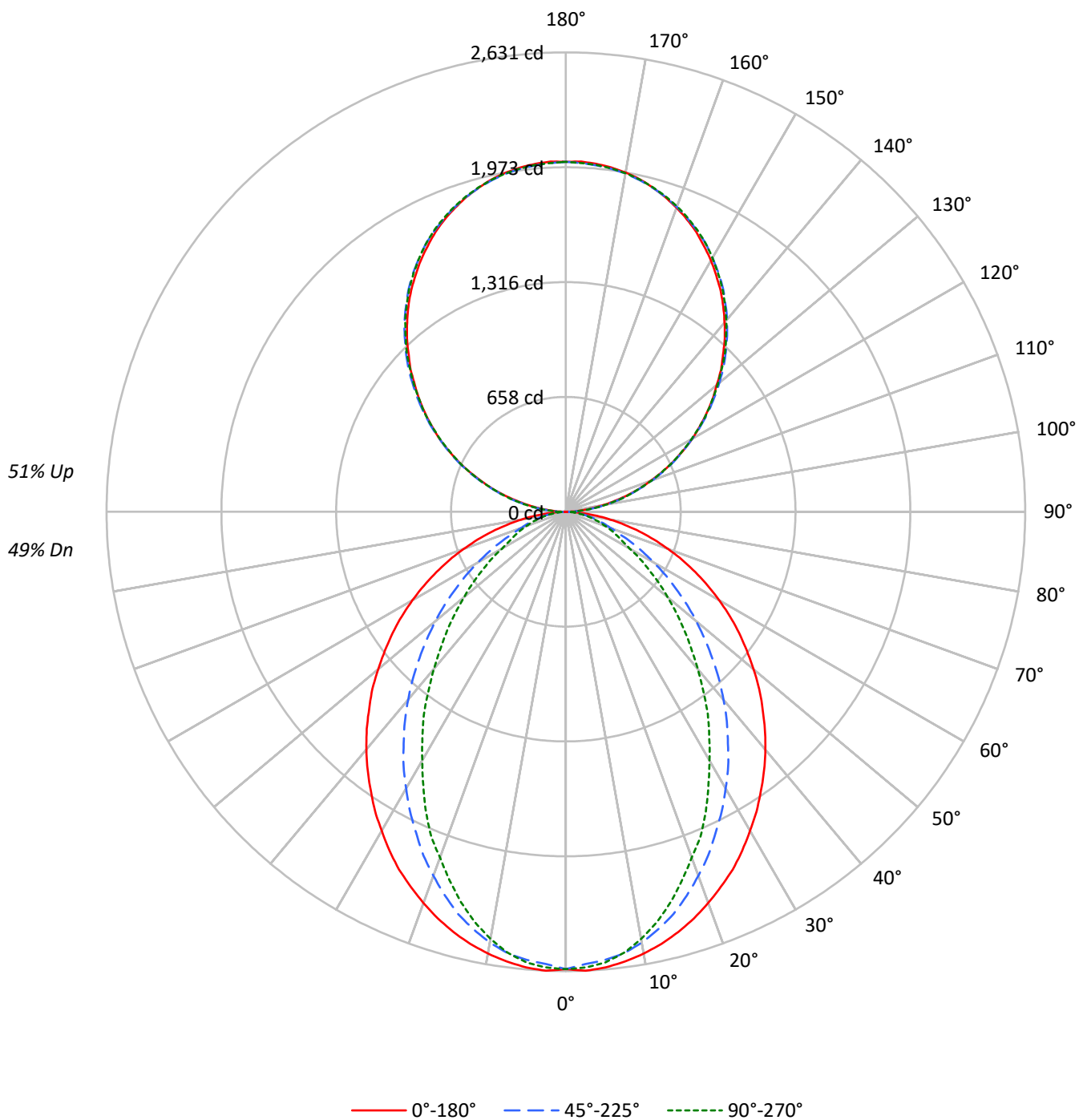
Lumens per Lamp: N/A  
Luminaire Lumens: 10995.5 lumens  
Efficiency: N/A  
Efficacy: 90.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 122  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
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: P913679

CATALOG NUMBER: DFN2DIP-HX4F0-080D080US927-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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1948 | 1948 | 1948 |
| 5°  | 1951 | 1917 | 1929 |
| 10° | 1932 | 1879 | 1866 |
| 15° | 1905 | 1818 | 1769 |
| 20° | 1870 | 1732 | 1650 |
| 25° | 1834 | 1636 | 1535 |
| 30° | 1786 | 1538 | 1390 |
| 35° | 1739 | 1432 | 1262 |
| 40° | 1691 | 1323 | 1115 |
| 45° | 1635 | 1202 | 982  |
| 50° | 1577 | 1079 | 852  |
| 55° | 1517 | 948  | 727  |
| 60° | 1447 | 811  | 598  |
| 65° | 1367 | 672  | 538  |
| 70° | 1270 | 542  | 488  |
| 75° | 1148 | 478  | 444  |
| 80° | 971  | 402  | 385  |
| 85° | 679  | 269  | 290  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1635 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 245.5   | 2.2       |
| 10°-20°   | 673.9   | 6.1       |
| 20°-30°   | 946.1   | 8.6       |
| 30°-40°   | 1031.3  | 9.4       |
| 40°-50°   | 947.9   | 8.6       |
| 50°-60°   | 744.4   | 6.8       |
| 60°-70°   | 484.5   | 4.4       |
| 70°-80°   | 249.4   | 2.3       |
| 80°-90°   | 69.4    | 0.6       |
| 90°-100°  | 124.0   | 1.1       |
| 100°-110° | 394.1   | 3.6       |
| 110°-120° | 674.4   | 6.1       |
| 120°-130° | 886.9   | 8.1       |
| 130°-140° | 995.5   | 9.1       |
| 140°-150° | 976.2   | 8.9       |
| 150°-160° | 818.9   | 7.4       |
| 160°-170° | 543.1   | 4.9       |
| 170°-180° | 189.8   | 1.7       |
| 0°-30°    | 1865.5  | 17.0      |
| 0°-40°    | 2896.8  | 26.3      |
| 0°-60°    | 4589.2  | 41.7      |
| 0°-90°    | 5392.5  | 49.0      |
| 90°-120°  | 1192.5  | 10.8      |
| 90°-150°  | 4051.1  | 36.8      |
| 90°-180°  | 5603.0  | 51.0      |
| 0°-180°   | 10995.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2619 | 2619  | 2619 | 2619  | 2619 |      |
| 5°   | 2619 | 2608  | 2576 | 2598  | 2591 | 248  |
| 15°  | 2491 | 2465  | 2385 | 2340  | 2316 | 702  |
| 25°  | 2261 | 2186  | 2029 | 1932  | 1896 | 1040 |
| 35°  | 1948 | 1828  | 1619 | 1470  | 1417 | 1220 |
| 45°  | 1593 | 1434  | 1185 | 1017  | 960  | 1230 |
| 55°  | 1211 | 1026  | 770  | 628   | 583  | 1082 |
| 65°  | 818  | 626   | 412  | 332   | 325  | 811  |
| 75°  | 436  | 270   | 190  | 173   | 171  | 461  |
| 85°  | 102  | 52    | 45   | 45    | 45   | 117  |
| 90°  | 2    | 22    | 59   | 56    | 57   | 11   |
| 95°  | 88   | 105   | 108  | 108   | 105  | 98   |
| 105° | 364  | 369   | 372  | 375   | 375  | 384  |
| 115° | 677  | 686   | 683  | 682   | 677  | 669  |
| 125° | 984  | 999   | 995  | 989   | 987  | 880  |
| 135° | 1273 | 1292  | 1296 | 1294  | 1289 | 984  |
| 145° | 1546 | 1558  | 1567 | 1569  | 1563 | 966  |
| 155° | 1767 | 1772  | 1778 | 1786  | 1781 | 813  |
| 165° | 1923 | 1921  | 1921 | 1933  | 1924 | 542  |
| 175° | 2001 | 1996  | 1992 | 2004  | 1994 | 190  |
| 180° | 2004 | 2004  | 2004 | 2004  | 2004 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2619.3 | 2619.3 | 2619.3 | 2619.3 | 2619.3 |
| 2.5°   | 2631.1 | 2619.3 | 2593.1 | 2617.0 | 2612.2 |
| 5°     | 2619.3 | 2607.5 | 2576.5 | 2597.9 | 2590.8 |
| 7.5°   | 2597.9 | 2583.8 | 2550.6 | 2559.9 | 2548.1 |
| 10°    | 2569.4 | 2552.9 | 2505.6 | 2498.3 | 2484.2 |
| 12.5°  | 2534.0 | 2512.6 | 2448.5 | 2434.4 | 2408.2 |
| 15°    | 2491.3 | 2465.1 | 2384.6 | 2339.6 | 2315.9 |
| 17.5°  | 2441.4 | 2403.5 | 2303.9 | 2251.9 | 2213.8 |
| 20°    | 2384.6 | 2337.1 | 2218.7 | 2159.6 | 2107.2 |
| 22.5°  | 2323.0 | 2268.4 | 2130.9 | 2050.4 | 2014.9 |
| 25°    | 2261.4 | 2185.5 | 2029.0 | 1932.0 | 1896.2 |
| 27.5°  | 2187.9 | 2107.2 | 1934.2 | 1822.8 | 1768.2 |
| 30°    | 2109.7 | 2019.4 | 1829.9 | 1709.1 | 1645.0 |
| 32.5°  | 2033.8 | 1924.7 | 1730.5 | 1588.2 | 1528.8 |
| 35°    | 1948.5 | 1827.6 | 1619.1 | 1469.7 | 1417.4 |
| 37.5°  | 1865.5 | 1735.0 | 1514.7 | 1351.0 | 1291.9 |
| 40°    | 1777.8 | 1635.7 | 1405.6 | 1237.3 | 1175.7 |
| 42.5°  | 1687.7 | 1536.1 | 1296.6 | 1121.2 | 1062.0 |
| 45°    | 1592.9 | 1434.0 | 1185.3 | 1016.8 | 960.0  |
| 47.5°  | 1502.9 | 1334.7 | 1078.6 | 910.1  | 858.1  |
| 50°    | 1403.3 | 1235.1 | 974.3  | 810.6  | 761.0  |
| 52.5°  | 1306.0 | 1128.1 | 874.6  | 718.3  | 673.3  |
| 55°    | 1211.2 | 1026.3 | 770.3  | 628.2  | 583.2  |
| 57.5°  | 1114.1 | 924.5  | 678.0  | 545.3  | 507.2  |
| 60°    | 1014.5 | 824.9  | 580.7  | 459.9  | 422.0  |
| 62.5°  | 917.4  | 727.8  | 497.7  | 384.0  | 365.2  |
| 65°    | 817.8  | 625.7  | 412.4  | 332.0  | 324.6  |
| 67.5°  | 723.0  | 530.9  | 332.0  | 291.4  | 284.5  |
| 70°    | 623.4  | 438.6  | 274.9  | 251.2  | 241.7  |
| 72.5°  | 528.6  | 353.1  | 229.9  | 211.0  | 206.2  |
| 75°    | 436.1  | 270.1  | 189.6  | 173.0  | 170.8  |
| 77.5°  | 343.8  | 191.9  | 149.4  | 139.8  | 135.1  |
| 80°    | 258.3  | 137.6  | 113.7  | 104.3  | 104.3  |
| 82.5°  | 180.1  | 92.5   | 78.2   | 73.4   | 73.4   |
| 85°    | 101.9  | 52.0   | 45.0   | 45.0   | 45.0   |
| 87.5°  | 37.9   | 18.9   | 18.9   | 16.6   | 16.6   |
| 90°    | 1.8    | 21.8   | 59.3   | 55.6   | 57.4   |
| 92.5°  | 37.5   | 50.8   | 52.6   | 54.3   | 54.3   |
| 95°    | 88.2   | 105.1  | 108.1  | 108.1  | 105.1  |
| 97.5°  | 146.9  | 162.6  | 169.2  | 169.2  | 169.2  |
| 100°   | 214.5  | 228.4  | 233.2  | 233.2  | 231.4  |
| 102.5° | 285.8  | 296.1  | 302.7  | 304.5  | 302.7  |
| 105°   | 363.8  | 368.6  | 372.2  | 375.3  | 375.3  |
| 107.5° | 441.1  | 448.4  | 448.4  | 449.6  | 441.1  |
| 110°   | 516.0  | 525.7  | 525.7  | 525.7  | 520.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 597.0  | 607.3  | 605.5  | 600.6  | 597.0  |
| 115°   | 676.8  | 686.4  | 683.4  | 681.6  | 676.8  |
| 117.5° | 755.9  | 769.2  | 760.7  | 755.9  | 751.1  |
| 120°   | 835.7  | 849.0  | 835.7  | 835.7  | 830.2  |
| 122.5° | 908.2  | 925.1  | 916.6  | 911.8  | 908.2  |
| 125°   | 984.3  | 999.4  | 994.6  | 989.1  | 987.4  |
| 127.5° | 1058.7 | 1077.4 | 1070.7 | 1063.5 | 1058.7 |
| 130°   | 1128.1 | 1149.9 | 1146.8 | 1143.3 | 1136.6 |
| 132.5° | 1206.1 | 1223.0 | 1224.2 | 1215.8 | 1210.9 |
| 135°   | 1273.1 | 1291.9 | 1295.5 | 1293.7 | 1288.9 |
| 137.5° | 1348.1 | 1363.2 | 1366.2 | 1365.0 | 1357.7 |
| 140°   | 1414.0 | 1429.0 | 1437.5 | 1437.5 | 1430.8 |
| 142.5° | 1481.6 | 1496.7 | 1501.6 | 1503.4 | 1496.7 |
| 145°   | 1545.7 | 1557.7 | 1567.4 | 1569.2 | 1562.6 |
| 147.5° | 1603.1 | 1618.2 | 1625.4 | 1628.5 | 1621.8 |
| 150°   | 1662.3 | 1672.5 | 1679.2 | 1684.7 | 1679.2 |
| 152.5° | 1714.8 | 1725.1 | 1733.6 | 1740.3 | 1733.6 |
| 155°   | 1767.4 | 1772.3 | 1777.7 | 1786.1 | 1780.7 |
| 157.5° | 1812.7 | 1816.4 | 1819.4 | 1831.4 | 1823.0 |
| 160°   | 1853.2 | 1856.9 | 1858.7 | 1868.9 | 1861.7 |
| 162.5° | 1890.7 | 1890.7 | 1892.5 | 1904.0 | 1895.5 |
| 165°   | 1922.7 | 1920.9 | 1920.9 | 1933.0 | 1924.5 |
| 167.5° | 1951.7 | 1946.3 | 1946.3 | 1958.4 | 1949.9 |
| 170°   | 1973.5 | 1968.6 | 1966.8 | 1978.9 | 1968.6 |
| 172.5° | 1988.6 | 1983.8 | 1982.0 | 1994.0 | 1983.8 |
| 175°   | 2000.7 | 1995.8 | 1992.2 | 2004.3 | 1994.0 |
| 177.5° | 2007.3 | 2002.5 | 1998.8 | 2009.1 | 1998.8 |
| 180°   | 2004.3 | 2004.3 | 2004.3 | 2004.3 | 2004.3 |

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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 | 9.37             | 10.19 | 10.34 | 11.18 | 12.46 | 5.35           | 6.17 | 6.32  | 7.15  | 8.44  |
|                 | 3H   | 11.05            | 11.79 | 12.03 | 12.78 | 14.09 | 6.54           | 7.27 | 7.52  | 8.26  | 9.57  |
|                 | 4H   | 11.66            | 12.35 | 12.66 | 13.35 | 14.67 | 6.99           | 7.68 | 7.98  | 8.68  | 9.99  |
|                 | 6H   | 12.08            | 12.72 | 13.09 | 13.72 | 15.05 | 7.31           | 7.95 | 8.32  | 8.95  | 10.28 |
|                 | 8H   | 12.21            | 12.82 | 13.22 | 13.83 | 15.16 | 7.40           | 8.01 | 8.41  | 9.02  | 10.35 |
|                 | 12H  | 12.27            | 12.85 | 13.29 | 13.86 | 15.21 | 7.44           | 8.02 | 8.46  | 9.03  | 10.38 |
| 4H              | 2H   | 9.39             | 10.09 | 10.39 | 11.08 | 12.40 | 5.94           | 6.64 | 6.94  | 7.63  | 8.95  |
|                 | 3H   | 11.22            | 11.80 | 12.23 | 12.82 | 14.15 | 7.29           | 7.87 | 8.30  | 8.89  | 10.22 |
|                 | 4H   | 11.91            | 12.44 | 12.93 | 13.46 | 14.81 | 7.84           | 8.37 | 8.86  | 9.38  | 10.74 |
|                 | 6H   | 12.43            | 12.88 | 13.46 | 13.92 | 15.27 | 8.26           | 8.71 | 9.29  | 9.75  | 11.11 |
|                 | 8H   | 12.60            | 13.03 | 13.63 | 14.06 | 15.42 | 8.39           | 8.81 | 9.42  | 9.85  | 11.21 |
|                 | 12H  | 12.70            | 13.08 | 13.75 | 14.13 | 15.50 | 8.46           | 8.84 | 9.51  | 9.89  | 11.26 |
| 8H              | 4H   | 11.88            | 12.30 | 12.91 | 13.34 | 14.70 | 8.12           | 8.54 | 9.15  | 9.58  | 10.94 |
|                 | 6H   | 12.45            | 12.80 | 13.50 | 13.87 | 15.23 | 8.64           | 8.99 | 9.70  | 10.06 | 11.43 |
|                 | 8H   | 12.66            | 12.97 | 13.73 | 14.03 | 15.41 | 8.83           | 9.14 | 9.90  | 10.20 | 11.58 |
|                 | 12H  | 12.80            | 13.07 | 13.87 | 14.13 | 15.55 | 8.95           | 9.22 | 10.02 | 10.28 | 11.70 |
| 12H             | 4H   | 11.83            | 12.21 | 12.88 | 13.26 | 14.63 | 8.13           | 8.51 | 9.17  | 9.55  | 10.93 |
|                 | 6H   | 12.42            | 12.73 | 13.48 | 13.79 | 15.17 | 8.69           | 9.00 | 9.75  | 10.06 | 11.44 |
|                 | 8H   | 12.64            | 12.91 | 13.71 | 13.97 | 15.39 | 8.90           | 9.17 | 9.97  | 10.23 | 11.65 |