

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: P903656

Luminaire Tested: DFN2DIP-SQ3F0-050D060US830-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903656  
REPORT IS A COMBINATION OF REPORTS P899899 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-050D060US830-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

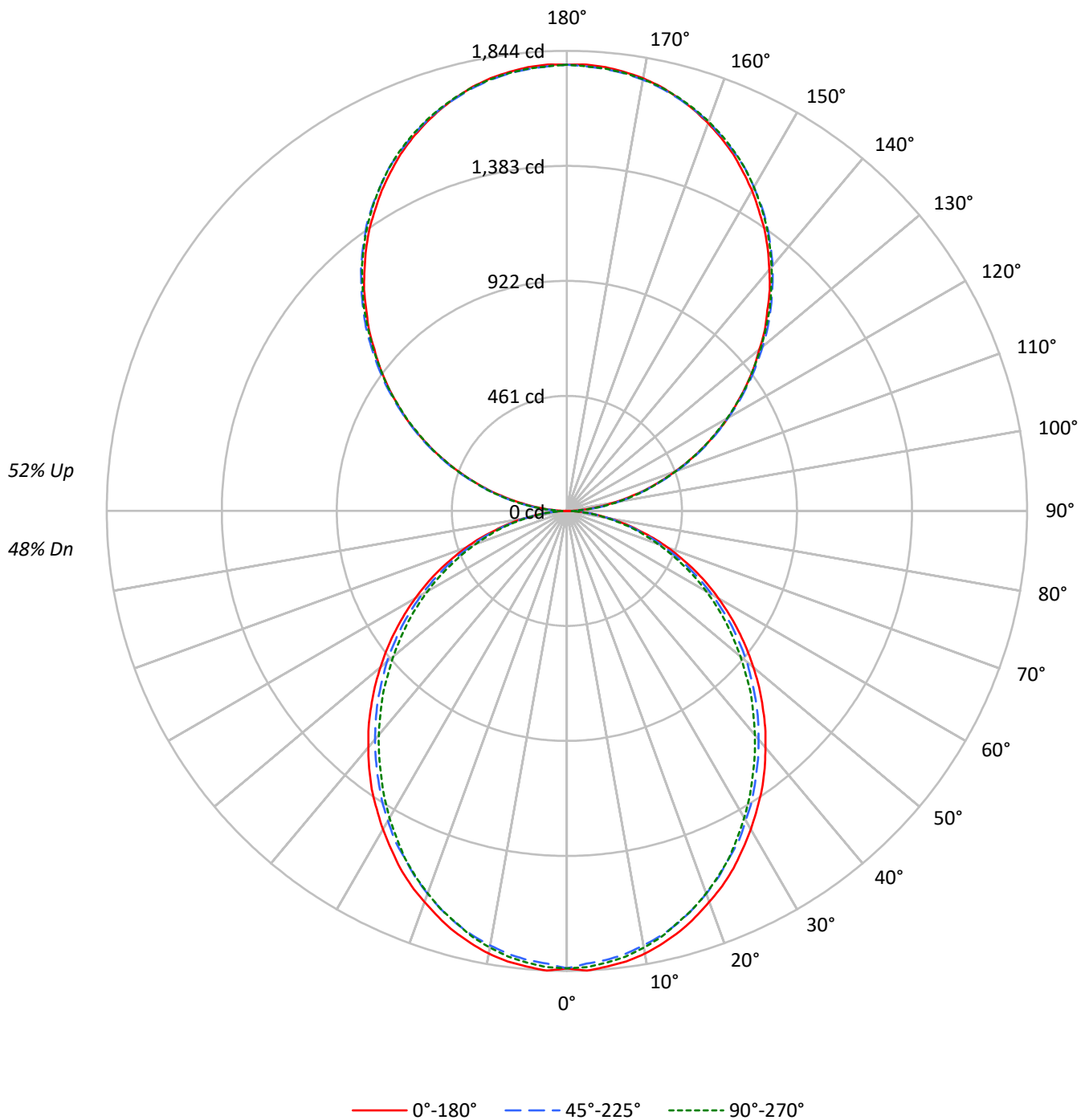
Lumens per Lamp: N/A  
Luminaire Lumens: 9670.5 lumens  
Efficiency: N/A  
Efficacy: 110.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 87.3  
Input Voltage (V): 120  
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

TEST NUMBER: P903656

CATALOG NUMBER: DFN2DIP-SQ3F0-050D060US830-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P903656

CATALOG NUMBER: DFN2DIP-SQ3F0-050D060US830-FLLFL

**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 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 79 | 72 | 70 | 68 | 60 | 58 | 57 | 48 | 47 | 46 |
| 2   | 89  | 81  | 75  | 70  | 81 | 75 | 70 | 65 | 63 | 59 | 56 | 52 | 50 | 47 | 42 | 41 | 39 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 60 | 54 | 56 | 51 | 47 | 46 | 43 | 40 | 38 | 35 | 33 |
| 4   | 74  | 63  | 55  | 49  | 68 | 59 | 52 | 46 | 50 | 44 | 40 | 41 | 37 | 34 | 34 | 31 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 37 | 33 | 30 | 30 | 27 | 25 |
| 6   | 63  | 51  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 34 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 31 | 27 | 30 | 26 | 23 | 25 | 22 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 20 | 23 | 20 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 16 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2101 | 2101 | 2101 |
| 5°  | 2103 | 2070 | 2085 |
| 10° | 2085 | 2041 | 2056 |
| 15° | 2053 | 2006 | 2011 |
| 20° | 2010 | 1958 | 1966 |
| 25° | 1967 | 1901 | 1913 |
| 30° | 1914 | 1848 | 1846 |
| 35° | 1864 | 1785 | 1775 |
| 40° | 1802 | 1721 | 1707 |
| 45° | 1741 | 1658 | 1638 |
| 50° | 1673 | 1591 | 1558 |
| 55° | 1602 | 1514 | 1484 |
| 60° | 1522 | 1422 | 1400 |
| 65° | 1434 | 1327 | 1300 |
| 70° | 1323 | 1211 | 1193 |
| 75° | 1169 | 1072 | 1093 |
| 80° | 982  | 894  | 903  |
| 85° | 691  | 592  | 591  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1798 cd/sqm

TEST NUMBER: P903656

CATALOG NUMBER: DFN2DIP-SQ3F0-050D060US830-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 172.6  | 1.8       |
| 10°-20°   | 485.6  | 5.0       |
| 20°-30°   | 713.7  | 7.4       |
| 30°-40°   | 828.9  | 8.6       |
| 40°-50°   | 827.8  | 8.6       |
| 50°-60°   | 721.8  | 7.5       |
| 60°-70°   | 533.6  | 5.5       |
| 70°-80°   | 301.9  | 3.1       |
| 80°-90°   | 84.8   | 0.9       |
| 90°-100°  | 110.7  | 1.1       |
| 100°-110° | 351.6  | 3.6       |
| 110°-120° | 601.8  | 6.2       |
| 120°-130° | 791.4  | 8.2       |
| 130°-140° | 888.4  | 9.2       |
| 140°-150° | 871.1  | 9.0       |
| 150°-160° | 730.8  | 7.6       |
| 160°-170° | 484.6  | 5.0       |
| 170°-180° | 169.4  | 1.8       |
| 0°-30°    | 1371.9 | 14.2      |
| 0°-40°    | 2200.7 | 22.8      |
| 0°-60°    | 3750.4 | 38.8      |
| 0°-90°    | 4670.7 | 48.3      |
| 90°-120°  | 1064.1 | 11.0      |
| 90°-150°  | 3615.0 | 37.4      |
| 90°-180°  | 5000.0 | 51.7      |
| 0°-180°   | 9670.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1834 | 1834  | 1834 | 1834  | 1834 |      |
| 5°   | 1834 | 1827  | 1807 | 1821  | 1818 | 174  |
| 15°  | 1746 | 1735  | 1712 | 1719  | 1710 | 492  |
| 25°  | 1580 | 1566  | 1536 | 1539  | 1536 | 727  |
| 35°  | 1363 | 1346  | 1317 | 1307  | 1298 | 851  |
| 45°  | 1109 | 1097  | 1070 | 1051  | 1044 | 856  |
| 55°  | 839  | 829   | 808  | 786   | 778  | 750  |
| 65°  | 566  | 555   | 538  | 522   | 513  | 560  |
| 75°  | 296  | 293   | 284  | 273   | 277  | 316  |
| 85°  | 72   | 70    | 69   | 63    | 62   | 81   |
| 90°  | 2    | 19    | 53   | 50    | 51   | 9    |
| 95°  | 79   | 94    | 96   | 96    | 94   | 88   |
| 105° | 325  | 329   | 332  | 335   | 335  | 343  |
| 115° | 604  | 613   | 610  | 608   | 604  | 597  |
| 125° | 878  | 892   | 888  | 883   | 881  | 785  |
| 135° | 1136 | 1153  | 1156 | 1154  | 1150 | 878  |
| 145° | 1379 | 1390  | 1399 | 1400  | 1394 | 862  |
| 155° | 1577 | 1582  | 1586 | 1594  | 1589 | 726  |
| 165° | 1716 | 1714  | 1714 | 1725  | 1717 | 484  |
| 175° | 1785 | 1781  | 1778 | 1789  | 1779 | 170  |
| 180° | 1789 | 1789  | 1789 | 1789  | 1789 |      |

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CATALOG NUMBER: DFN2DIP-SQ3F0-050D060US830-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1833.7 | 1833.7 | 1833.7 | 1833.7 | 1833.7 |
| 2.5°   | 1844.4 | 1835.6 | 1816.2 | 1833.7 | 1830.4 |
| 5°     | 1833.7 | 1826.8 | 1807.3 | 1821.4 | 1818.1 |
| 7.5°   | 1821.4 | 1810.9 | 1791.5 | 1805.7 | 1802.1 |
| 10°    | 1802.1 | 1789.8 | 1768.7 | 1782.6 | 1777.4 |
| 12.5°  | 1775.6 | 1765.1 | 1744.0 | 1752.8 | 1749.2 |
| 15°    | 1745.6 | 1735.1 | 1712.1 | 1719.3 | 1710.4 |
| 17.5°  | 1708.5 | 1698.1 | 1675.1 | 1683.9 | 1675.1 |
| 20°    | 1668.0 | 1657.6 | 1632.9 | 1638.0 | 1631.2 |
| 22.5°  | 1627.6 | 1611.7 | 1588.7 | 1588.7 | 1585.1 |
| 25°    | 1579.9 | 1565.8 | 1535.9 | 1539.3 | 1535.9 |
| 27.5°  | 1526.9 | 1514.6 | 1491.8 | 1486.5 | 1477.7 |
| 30°    | 1474.1 | 1460.0 | 1433.6 | 1428.3 | 1421.3 |
| 32.5°  | 1417.7 | 1407.2 | 1378.9 | 1368.3 | 1361.2 |
| 35°    | 1363.0 | 1345.5 | 1317.2 | 1306.6 | 1297.8 |
| 37.5°  | 1301.3 | 1285.4 | 1257.2 | 1244.8 | 1236.0 |
| 40°    | 1237.9 | 1223.7 | 1195.4 | 1179.7 | 1172.6 |
| 42.5°  | 1176.2 | 1162.0 | 1133.9 | 1116.1 | 1105.6 |
| 45°    | 1109.2 | 1096.8 | 1070.3 | 1051.0 | 1043.9 |
| 47.5°  | 1043.9 | 1031.5 | 1003.3 | 983.8  | 973.4  |
| 50°    | 975.1  | 966.3  | 941.6  | 916.9  | 908.0  |
| 52.5°  | 908.0  | 895.7  | 872.9  | 853.5  | 841.1  |
| 55°    | 839.4  | 828.8  | 807.6  | 786.5  | 777.7  |
| 57.5°  | 770.5  | 761.8  | 738.8  | 717.7  | 710.5  |
| 60°    | 701.7  | 694.8  | 670.1  | 650.6  | 645.5  |
| 62.5°  | 634.8  | 622.5  | 604.8  | 587.2  | 580.1  |
| 65°    | 566.1  | 555.4  | 537.8  | 522.0  | 513.1  |
| 67.5°  | 495.6  | 486.6  | 470.9  | 458.5  | 451.4  |
| 70°    | 430.3  | 423.2  | 407.3  | 394.9  | 388.0  |
| 72.5°  | 363.4  | 356.2  | 347.4  | 335.1  | 329.8  |
| 75°    | 296.1  | 292.8  | 283.8  | 273.3  | 276.9  |
| 77.5°  | 236.3  | 229.1  | 225.6  | 220.4  | 215.2  |
| 80°    | 176.4  | 174.6  | 171.0  | 165.8  | 162.2  |
| 82.5°  | 119.9  | 119.9  | 118.2  | 111.1  | 111.1  |
| 85°    | 72.2   | 70.5   | 68.8   | 63.4   | 61.7   |
| 87.5°  | 31.8   | 28.3   | 24.7   | 19.4   | 17.6   |
| 90°    | 1.6    | 19.4   | 52.9   | 49.6   | 51.2   |
| 92.5°  | 33.5   | 45.3   | 46.9   | 48.5   | 48.5   |
| 95°    | 78.7   | 93.8   | 96.5   | 96.5   | 93.8   |
| 97.5°  | 131.0  | 145.1  | 151.0  | 151.0  | 151.0  |
| 100°   | 191.4  | 203.8  | 208.1  | 208.1  | 206.5  |
| 102.5° | 255.1  | 264.2  | 270.1  | 271.7  | 270.1  |
| 105°   | 324.6  | 328.9  | 332.2  | 334.9  | 334.9  |
| 107.5° | 393.6  | 400.1  | 400.1  | 401.1  | 393.6  |
| 110°   | 460.5  | 469.1  | 469.1  | 469.1  | 464.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 532.7  | 541.9  | 540.3  | 535.9  | 532.7  |
| 115°   | 603.9  | 612.6  | 609.8  | 608.2  | 603.9  |
| 117.5° | 674.6  | 686.5  | 678.8  | 674.6  | 670.2  |
| 120°   | 745.7  | 757.6  | 745.7  | 745.7  | 740.8  |
| 122.5° | 810.4  | 825.5  | 817.9  | 813.7  | 810.4  |
| 125°   | 878.4  | 891.8  | 887.5  | 882.7  | 881.1  |
| 127.5° | 944.7  | 961.4  | 955.5  | 949.0  | 944.7  |
| 130°   | 1006.7 | 1026.1 | 1023.4 | 1020.2 | 1014.3 |
| 132.5° | 1076.3 | 1091.4 | 1092.4 | 1084.9 | 1080.5 |
| 135°   | 1136.1 | 1152.8 | 1156.0 | 1154.4 | 1150.1 |
| 137.5° | 1203.0 | 1216.4 | 1219.2 | 1218.0 | 1211.6 |
| 140°   | 1261.8 | 1275.3 | 1282.8 | 1282.8 | 1276.9 |
| 142.5° | 1322.1 | 1335.6 | 1339.9 | 1341.5 | 1335.6 |
| 145°   | 1379.3 | 1390.1 | 1398.7 | 1400.3 | 1394.4 |
| 147.5° | 1430.5 | 1444.0 | 1450.5 | 1453.1 | 1447.2 |
| 150°   | 1483.4 | 1492.5 | 1498.5 | 1503.3 | 1498.5 |
| 152.5° | 1530.2 | 1539.5 | 1547.0 | 1552.9 | 1547.0 |
| 155°   | 1577.2 | 1581.5 | 1586.3 | 1593.9 | 1589.0 |
| 157.5° | 1617.6 | 1620.9 | 1623.5 | 1634.4 | 1626.8 |
| 160°   | 1653.8 | 1657.0 | 1658.6 | 1667.7 | 1661.3 |
| 162.5° | 1687.2 | 1687.2 | 1688.8 | 1699.0 | 1691.5 |
| 165°   | 1715.7 | 1714.1 | 1714.1 | 1724.9 | 1717.4 |
| 167.5° | 1741.6 | 1736.8 | 1736.8 | 1747.6 | 1740.0 |
| 170°   | 1761.0 | 1756.7 | 1755.1 | 1765.9 | 1756.7 |
| 172.5° | 1774.5 | 1770.2 | 1768.6 | 1779.3 | 1770.2 |
| 175°   | 1785.3 | 1781.0 | 1777.7 | 1788.6 | 1779.3 |
| 177.5° | 1791.2 | 1787.0 | 1783.7 | 1792.8 | 1783.7 |
| 180°   | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 |

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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 | 9.66             | 10.50 | 10.63 | 11.49 | 12.78 | 9.21           | 10.06 | 10.18 | 11.04 | 12.34 |
|                 | 3H   | 11.31            | 12.07 | 12.29 | 13.06 | 14.38 | 10.82          | 11.58 | 11.80 | 12.57 | 13.89 |
|                 | 4H   | 11.89            | 12.61 | 12.89 | 13.61 | 14.94 | 11.40          | 12.12 | 12.40 | 13.12 | 14.44 |
|                 | 6H   | 12.29            | 12.95 | 13.30 | 13.96 | 15.29 | 11.79          | 12.45 | 12.80 | 13.46 | 14.79 |
|                 | 8H   | 12.39            | 13.02 | 13.41 | 14.04 | 15.38 | 11.89          | 12.52 | 12.90 | 13.54 | 14.88 |
|                 | 12H  | 12.44            | 13.04 | 13.46 | 14.05 | 15.41 | 11.93          | 12.53 | 12.95 | 13.54 | 14.90 |
| 4H              | 2H   | 10.11            | 10.83 | 11.11 | 11.83 | 13.15 | 9.76           | 10.48 | 10.76 | 11.47 | 12.80 |
|                 | 3H   | 11.97            | 12.57 | 12.98 | 13.60 | 14.94 | 11.56          | 12.16 | 12.57 | 13.19 | 14.53 |
|                 | 4H   | 12.68            | 13.23 | 13.70 | 14.25 | 15.61 | 12.26          | 12.81 | 13.28 | 13.82 | 15.19 |
|                 | 6H   | 13.19            | 13.66 | 14.22 | 14.71 | 16.06 | 12.76          | 13.23 | 13.79 | 14.27 | 15.63 |
|                 | 8H   | 13.34            | 13.78 | 14.37 | 14.81 | 16.19 | 12.90          | 13.34 | 13.93 | 14.38 | 15.75 |
|                 | 12H  | 13.41            | 13.81 | 14.46 | 14.86 | 16.24 | 12.96          | 13.36 | 14.01 | 14.41 | 15.79 |
| 8H              | 4H   | 12.87            | 13.31 | 13.90 | 14.35 | 15.72 | 12.49          | 12.94 | 13.53 | 13.97 | 15.35 |
|                 | 6H   | 13.50            | 13.86 | 14.55 | 14.94 | 16.31 | 13.11          | 13.48 | 14.17 | 14.56 | 15.93 |
|                 | 8H   | 13.71            | 14.03 | 14.78 | 15.10 | 16.49 | 13.32          | 13.64 | 14.38 | 14.70 | 16.09 |
|                 | 12H  | 13.84            | 14.12 | 14.91 | 15.18 | 16.61 | 13.43          | 13.71 | 14.50 | 14.77 | 16.20 |
| 12H             | 4H   | 12.86            | 13.25 | 13.90 | 14.31 | 15.68 | 12.49          | 12.89 | 13.54 | 13.94 | 15.32 |
|                 | 6H   | 13.52            | 13.85 | 14.59 | 14.91 | 16.30 | 13.15          | 13.47 | 14.21 | 14.54 | 15.93 |
|                 | 8H   | 13.76            | 14.04 | 14.83 | 15.10 | 16.53 | 13.38          | 13.66 | 14.45 | 14.72 | 16.15 |