

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: P924259

Luminaire Tested: DFN2DIP-HX2F0-020D060US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924259  
REPORT IS A COMBINATION OF REPORTS P900711 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-020D060US950-FLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

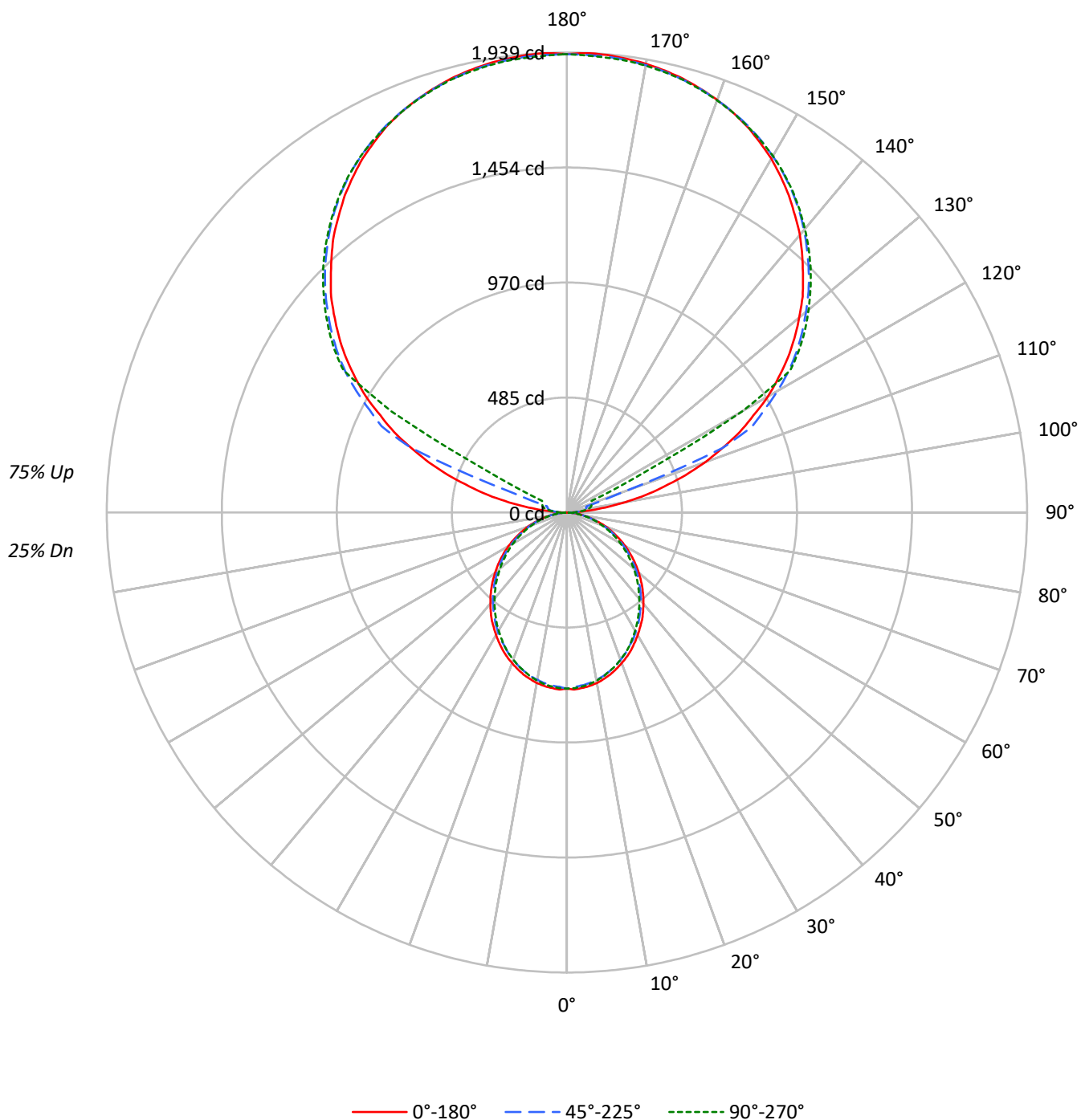
Lumens per Lamp: N/A  
Luminaire Lumens: 7555.7 lumens  
Efficiency: N/A  
Efficacy: 118.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 63.6  
Input Voltage (V): 120  
Input Current (Ain): 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

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### Luminous Intensity Polar Plot



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**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   | 101 | 101 | 101 | 101 |  | 90 | 90 | 90 | 90 |  | 69 | 69 | 69 |  | 51 | 51 | 51 |  | 33 | 33 | 33 |
| 1   | 92  | 88  | 84  | 81  |  | 82 | 79 | 75 | 73 |  | 61 | 59 | 57 |  | 44 | 43 | 42 |  | 29 | 29 | 28 |
| 2   | 84  | 77  | 71  | 66  |  | 74 | 69 | 64 | 59 |  | 53 | 50 | 47 |  | 39 | 37 | 35 |  | 26 | 25 | 24 |
| 3   | 76  | 67  | 60  | 55  |  | 68 | 60 | 54 | 50 |  | 47 | 43 | 39 |  | 34 | 32 | 30 |  | 23 | 21 | 20 |
| 4   | 70  | 60  | 52  | 46  |  | 62 | 53 | 47 | 42 |  | 42 | 37 | 33 |  | 31 | 28 | 25 |  | 20 | 19 | 17 |
| 5   | 64  | 53  | 45  | 39  |  | 57 | 47 | 41 | 36 |  | 37 | 32 | 29 |  | 27 | 24 | 22 |  | 18 | 16 | 15 |
| 6   | 59  | 47  | 40  | 34  |  | 52 | 42 | 36 | 31 |  | 33 | 28 | 25 |  | 25 | 21 | 19 |  | 17 | 15 | 13 |
| 7   | 54  | 43  | 35  | 30  |  | 48 | 38 | 32 | 27 |  | 30 | 25 | 22 |  | 22 | 19 | 17 |  | 15 | 13 | 12 |
| 8   | 50  | 38  | 31  | 26  |  | 45 | 35 | 28 | 24 |  | 27 | 23 | 19 |  | 20 | 17 | 15 |  | 14 | 12 | 10 |
| 9   | 47  | 35  | 28  | 23  |  | 41 | 31 | 25 | 21 |  | 25 | 20 | 17 |  | 19 | 15 | 13 |  | 13 | 11 | 9  |
| 10  | 43  | 32  | 25  | 20  |  | 39 | 29 | 23 | 19 |  | 23 | 18 | 15 |  | 17 | 14 | 12 |  | 12 | 10 | 8  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1749 | 1749 | 1749 |
| 5°  | 1749 | 1721 | 1733 |
| 10° | 1732 | 1693 | 1707 |
| 15° | 1704 | 1661 | 1667 |
| 20° | 1667 | 1618 | 1626 |
| 25° | 1630 | 1568 | 1579 |
| 30° | 1584 | 1521 | 1521 |
| 35° | 1540 | 1466 | 1460 |
| 40° | 1487 | 1410 | 1401 |
| 45° | 1434 | 1354 | 1341 |
| 50° | 1376 | 1295 | 1272 |
| 55° | 1314 | 1227 | 1207 |
| 60° | 1245 | 1147 | 1133 |
| 65° | 1169 | 1063 | 1046 |
| 70° | 1072 | 961  | 951  |
| 75° | 939  | 838  | 859  |
| 80° | 778  | 683  | 693  |
| 85° | 527  | 429  | 429  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1767 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 69.9   | 0.9       |
| 10°-20°   | 196.6  | 2.6       |
| 20°-30°   | 288.9  | 3.8       |
| 30°-40°   | 335.6  | 4.4       |
| 40°-50°   | 335.2  | 4.4       |
| 50°-60°   | 292.2  | 3.9       |
| 60°-70°   | 216.0  | 2.9       |
| 70°-80°   | 122.2  | 1.6       |
| 80°-90°   | 35.7   | 0.5       |
| 90°-100°  | 63.7   | 0.8       |
| 100°-110° | 237.5  | 3.1       |
| 110°-120° | 629.8  | 8.3       |
| 120°-130° | 1044.5 | 13.8      |
| 130°-140° | 1109.5 | 14.7      |
| 140°-150° | 1031.2 | 13.6      |
| 150°-160° | 829.1  | 11.0      |
| 160°-170° | 534.2  | 7.1       |
| 170°-180° | 183.9  | 2.4       |
| 0°-30°    | 555.4  | 7.4       |
| 0°-40°    | 891.0  | 11.8      |
| 0°-60°    | 1518.4 | 20.1      |
| 0°-90°    | 1892.3 | 25.0      |
| 90°-120°  | 930.9  | 12.3      |
| 90°-150°  | 4116.2 | 54.5      |
| 90°-180°  | 5663.0 | 75.0      |
| 0°-180°   | 7555.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 742  | 742   | 742  | 742   | 742  |      |
| 5°   | 742  | 740   | 732  | 737   | 736  | 70   |
| 15°  | 707  | 702   | 693  | 696   | 692  | 199  |
| 25°  | 640  | 634   | 622  | 623   | 622  | 294  |
| 35°  | 552  | 545   | 533  | 529   | 525  | 345  |
| 45°  | 449  | 444   | 433  | 426   | 423  | 347  |
| 55°  | 340  | 336   | 327  | 318   | 315  | 304  |
| 65°  | 229  | 225   | 218  | 211   | 208  | 227  |
| 75°  | 120  | 119   | 115  | 111   | 112  | 128  |
| 85°  | 29   | 28    | 28   | 26    | 25   | 33   |
| 90°  | 1    | 17    | 28   | 35    | 38   | 7    |
| 95°  | 91   | 45    | 54   | 62    | 60   | 108  |
| 105° | 425  | 467   | 85   | 101   | 106  | 454  |
| 115° | 804  | 828   | 862  | 215   | 115  | 791  |
| 125° | 1136 | 1155  | 1181 | 1191  | 1195 | 1014 |
| 135° | 1406 | 1429  | 1441 | 1455  | 1452 | 1086 |
| 145° | 1631 | 1630  | 1654 | 1663  | 1656 | 1020 |
| 155° | 1796 | 1784  | 1800 | 1809  | 1798 | 828  |
| 165° | 1893 | 1884  | 1888 | 1898  | 1888 | 535  |
| 175° | 1936 | 1926  | 1929 | 1939  | 1925 | 184  |
| 180° | 1932 | 1932  | 1932 | 1932  | 1932 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 742.4 | 742.4 | 742.4 | 742.4 | 742.4 |
| 2.5°   | 746.7 | 743.2 | 735.2 | 742.4 | 741.1 |
| 5°     | 742.4 | 739.6 | 731.7 | 737.4 | 736.0 |
| 7.5°   | 737.4 | 733.1 | 725.3 | 731.1 | 729.6 |
| 10°    | 729.6 | 724.7 | 716.1 | 721.7 | 719.6 |
| 12.5°  | 718.8 | 714.6 | 706.1 | 709.6 | 708.2 |
| 15°    | 706.7 | 702.5 | 693.2 | 696.0 | 692.5 |
| 17.5°  | 691.7 | 687.5 | 678.2 | 681.7 | 678.2 |
| 20°    | 675.3 | 671.0 | 661.0 | 663.2 | 660.4 |
| 22.5°  | 658.9 | 652.5 | 643.2 | 643.2 | 641.8 |
| 25°    | 639.7 | 633.9 | 621.8 | 623.2 | 621.8 |
| 27.5°  | 618.2 | 613.2 | 604.0 | 601.9 | 598.3 |
| 30°    | 596.8 | 591.1 | 580.4 | 578.3 | 575.4 |
| 32.5°  | 573.9 | 569.7 | 558.3 | 554.0 | 551.1 |
| 35°    | 551.9 | 544.7 | 533.3 | 529.0 | 525.4 |
| 37.5°  | 526.9 | 520.4 | 509.0 | 504.0 | 500.4 |
| 40°    | 501.1 | 495.4 | 484.0 | 477.7 | 474.7 |
| 42.5°  | 476.1 | 470.4 | 459.1 | 451.9 | 447.6 |
| 45°    | 449.0 | 444.1 | 433.3 | 425.5 | 422.6 |
| 47.5°  | 422.6 | 417.7 | 406.2 | 398.3 | 394.1 |
| 50°    | 394.8 | 391.2 | 381.2 | 371.2 | 367.7 |
| 52.5°  | 367.7 | 362.6 | 353.4 | 345.5 | 340.6 |
| 55°    | 339.8 | 335.5 | 326.9 | 318.4 | 314.8 |
| 57.5°  | 312.0 | 308.4 | 299.1 | 290.6 | 287.6 |
| 60°    | 284.1 | 281.3 | 271.3 | 263.4 | 261.3 |
| 62.5°  | 257.0 | 252.0 | 244.9 | 237.7 | 234.9 |
| 65°    | 229.2 | 224.9 | 217.8 | 211.3 | 207.8 |
| 67.5°  | 200.6 | 197.0 | 190.6 | 185.6 | 182.8 |
| 70°    | 174.2 | 171.3 | 164.9 | 159.9 | 157.1 |
| 72.5°  | 147.1 | 144.2 | 140.6 | 135.7 | 133.6 |
| 75°    | 119.9 | 118.6 | 114.9 | 110.7 | 112.1 |
| 77.5°  | 95.7  | 92.8  | 91.3  | 89.2  | 87.1  |
| 80°    | 71.5  | 70.7  | 69.3  | 67.1  | 65.6  |
| 82.5°  | 48.6  | 48.6  | 47.9  | 45.0  | 45.0  |
| 85°    | 29.2  | 28.5  | 27.9  | 25.7  | 25.0  |
| 87.5°  | 12.9  | 11.4  | 10.0  | 7.9   | 7.2   |
| 90°    | 1.3   | 16.8  | 27.9  | 35.0  | 37.7  |
| 92.5°  | 35.0  | 29.4  | 33.5  | 36.3  | 37.7  |
| 95°    | 90.8  | 44.6  | 54.5  | 61.6  | 60.1  |
| 97.5°  | 163.5 | 48.9  | 71.2  | 75.6  | 76.9  |
| 100°   | 247.5 | 55.9  | 79.7  | 90.8  | 93.6  |
| 102.5° | 339.6 | 337.0 | 82.5  | 97.8  | 102.1 |
| 105°   | 424.9 | 466.9 | 85.3  | 100.6 | 106.3 |
| 107.5° | 524.2 | 559.0 | 88.1  | 103.4 | 109.0 |
| 110°   | 619.3 | 648.5 | 244.7 | 104.9 | 110.4 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 708.7  | 733.8  | 710.1  | 107.5  | 111.9  |
| 115°   | 803.7  | 827.5  | 862.5  | 215.3  | 114.7  |
| 117.5° | 886.2  | 914.1  | 938.0  | 738.0  | 371.8  |
| 120°   | 978.5  | 999.4  | 1024.7 | 1041.4 | 852.7  |
| 122.5° | 1056.7 | 1079.1 | 1107.1 | 1115.4 | 1116.9 |
| 125°   | 1136.4 | 1154.6 | 1181.1 | 1191.0 | 1195.1 |
| 127.5° | 1209.1 | 1228.7 | 1249.7 | 1263.7 | 1265.0 |
| 130°   | 1277.6 | 1300.0 | 1315.3 | 1330.7 | 1329.4 |
| 132.5° | 1347.5 | 1365.7 | 1381.0 | 1393.6 | 1392.3 |
| 135°   | 1406.3 | 1428.7 | 1441.1 | 1455.2 | 1452.4 |
| 137.5° | 1467.6 | 1484.4 | 1498.5 | 1512.5 | 1508.4 |
| 140°   | 1527.7 | 1539.1 | 1554.4 | 1566.9 | 1560.0 |
| 142.5° | 1578.2 | 1588.0 | 1606.2 | 1617.2 | 1610.3 |
| 145°   | 1631.3 | 1629.8 | 1653.6 | 1663.4 | 1656.4 |
| 147.5° | 1677.3 | 1673.1 | 1696.9 | 1703.8 | 1698.4 |
| 150°   | 1722.2 | 1712.3 | 1734.8 | 1743.1 | 1736.1 |
| 152.5° | 1759.8 | 1748.7 | 1769.6 | 1778.1 | 1768.2 |
| 155°   | 1796.2 | 1783.7 | 1800.5 | 1808.8 | 1797.6 |
| 157.5° | 1825.6 | 1814.4 | 1827.0 | 1836.8 | 1825.6 |
| 160°   | 1850.8 | 1842.3 | 1850.8 | 1859.1 | 1849.3 |
| 162.5° | 1873.0 | 1864.7 | 1871.7 | 1881.5 | 1868.9 |
| 165°   | 1892.6 | 1884.3 | 1888.4 | 1898.3 | 1888.4 |
| 167.5° | 1908.0 | 1899.6 | 1903.9 | 1913.7 | 1901.0 |
| 170°   | 1920.7 | 1912.2 | 1915.1 | 1924.8 | 1912.2 |
| 172.5° | 1929.0 | 1920.7 | 1923.5 | 1933.3 | 1920.7 |
| 175°   | 1936.0 | 1926.1 | 1929.0 | 1938.7 | 1924.8 |
| 177.5° | 1938.7 | 1929.0 | 1930.4 | 1940.2 | 1927.7 |
| 180°   | 1931.8 | 1931.8 | 1931.8 | 1931.8 | 1931.8 |

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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 | 6.14             | 6.81  | 7.28  | 7.94  | 9.53  | 5.71           | 6.39  | 6.86  | 7.52  | 9.11  |
|                 | 3H   | 7.76             | 8.36  | 8.91  | 9.50  | 11.11 | 7.30           | 7.90  | 8.45  | 9.04  | 10.65 |
|                 | 4H   | 8.32             | 8.89  | 9.48  | 10.04 | 11.64 | 7.86           | 8.43  | 9.02  | 9.58  | 11.18 |
|                 | 6H   | 8.69             | 9.22  | 9.86  | 10.36 | 11.98 | 8.23           | 8.76  | 9.40  | 9.90  | 11.52 |
|                 | 8H   | 8.78             | 9.28  | 9.95  | 10.44 | 12.05 | 8.32           | 8.82  | 9.49  | 9.98  | 11.59 |
|                 | 12H  | 8.81             | 9.29  | 9.99  | 10.44 | 12.08 | 8.35           | 8.83  | 9.53  | 9.98  | 11.61 |
| 4H              | 2H   | 6.56             | 7.14  | 7.73  | 8.28  | 9.89  | 6.23           | 6.80  | 7.40  | 7.94  | 9.55  |
|                 | 3H   | 8.38             | 8.86  | 9.56  | 10.03 | 11.65 | 8.00           | 8.48  | 9.18  | 9.65  | 11.27 |
|                 | 4H   | 9.07             | 9.51  | 10.25 | 10.67 | 12.31 | 8.68           | 9.12  | 9.85  | 10.27 | 11.91 |
|                 | 6H   | 9.55             | 9.93  | 10.73 | 11.11 | 12.74 | 9.16           | 9.53  | 10.34 | 10.71 | 12.34 |
|                 | 8H   | 9.69             | 10.04 | 10.86 | 11.21 | 12.85 | 9.29           | 9.64  | 10.47 | 10.81 | 12.46 |
|                 | 12H  | 9.74             | 10.06 | 10.93 | 11.24 | 12.89 | 9.33           | 9.65  | 10.53 | 10.83 | 12.48 |
| 8H              | 4H   | 9.24             | 9.59  | 10.42 | 10.76 | 12.41 | 8.89           | 9.24  | 10.07 | 10.41 | 12.06 |
|                 | 6H   | 9.84             | 10.13 | 11.03 | 11.34 | 12.98 | 9.48           | 9.77  | 10.68 | 10.99 | 12.63 |
|                 | 8H   | 10.04            | 10.29 | 11.24 | 11.48 | 13.14 | 9.68           | 9.93  | 10.89 | 11.12 | 12.79 |
|                 | 12H  | 10.14            | 10.37 | 11.35 | 11.55 | 13.25 | 9.78           | 10.00 | 10.98 | 11.19 | 12.88 |
| 12H             | 4H   | 9.21             | 9.53  | 10.41 | 10.72 | 12.37 | 8.87           | 9.19  | 10.07 | 10.37 | 12.02 |
|                 | 6H   | 9.86             | 10.11 | 11.06 | 11.30 | 12.96 | 9.52           | 9.77  | 10.72 | 10.96 | 12.62 |
|                 | 8H   | 10.07            | 10.30 | 11.28 | 11.48 | 13.18 | 9.73           | 9.95  | 10.94 | 11.14 | 12.83 |