

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: P924017

Luminaire Tested: DFN2DIP-4P3F0-020D060US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924017  
REPORT IS A COMBINATION OF REPORTS P900590 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-020D060US950-RLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

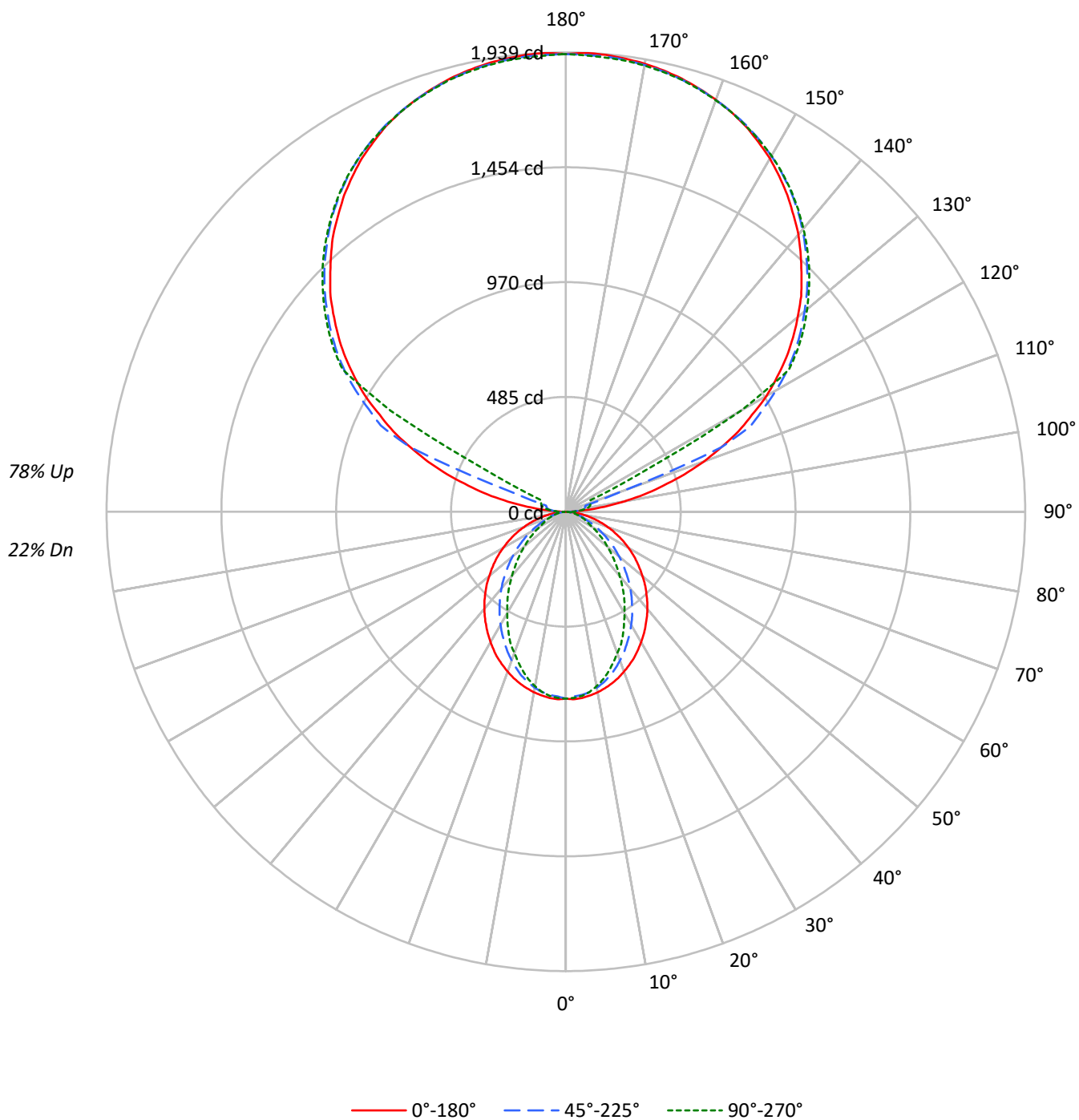
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7288.5 lumens  
Efficiency: N/A  
Efficacy: 116.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 62.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P924017

CATALOG NUMBER: DFN2DIP-4P3F0-020D060US950-RLLONL

### 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 | 89 | 89 | 89 | 89 | 68 | 68 | 68 | 49 | 49 | 49 | 31 | 31 | 31 |
| 1   | 92  | 88  | 84  | 81  | 81 | 78 | 75 | 72 | 60 | 58 | 56 | 43 | 42 | 41 | 27 | 27 | 26 |
| 2   | 84  | 77  | 71  | 66  | 74 | 68 | 64 | 60 | 52 | 49 | 47 | 38 | 36 | 34 | 24 | 23 | 22 |
| 3   | 76  | 68  | 61  | 55  | 68 | 60 | 55 | 50 | 46 | 43 | 39 | 34 | 31 | 29 | 22 | 20 | 19 |
| 4   | 70  | 60  | 52  | 47  | 62 | 53 | 47 | 42 | 41 | 37 | 34 | 30 | 27 | 25 | 20 | 18 | 17 |
| 5   | 64  | 53  | 46  | 40  | 57 | 48 | 41 | 36 | 37 | 32 | 29 | 27 | 24 | 22 | 18 | 16 | 15 |
| 6   | 59  | 48  | 40  | 35  | 52 | 43 | 36 | 31 | 33 | 29 | 25 | 24 | 21 | 19 | 16 | 14 | 13 |
| 7   | 54  | 43  | 35  | 30  | 48 | 38 | 32 | 27 | 30 | 25 | 22 | 22 | 19 | 17 | 15 | 13 | 12 |
| 8   | 50  | 39  | 32  | 27  | 45 | 35 | 29 | 24 | 27 | 23 | 20 | 20 | 17 | 15 | 14 | 12 | 10 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 25 | 20 | 17 | 19 | 16 | 13 | 12 | 11 | 9  |
| 10  | 44  | 32  | 25  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 17 | 14 | 12 | 12 | 10 | 9  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 899 | 899 | 899 |
| 5°  | 900 | 884 | 890 |
| 10° | 890 | 866 | 861 |
| 15° | 877 | 837 | 816 |
| 20° | 860 | 797 | 760 |
| 25° | 843 | 752 | 707 |
| 30° | 820 | 706 | 640 |
| 35° | 798 | 657 | 580 |
| 40° | 775 | 606 | 512 |
| 45° | 749 | 550 | 451 |
| 50° | 721 | 493 | 391 |
| 55° | 692 | 432 | 333 |
| 60° | 659 | 369 | 274 |
| 65° | 621 | 305 | 247 |
| 70° | 574 | 245 | 223 |
| 75° | 516 | 214 | 202 |
| 80° | 431 | 178 | 174 |
| 85° | 292 | 116 | 129 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1320 cd/sqm

TEST NUMBER: P924017

CATALOG NUMBER: DFN2DIP-4P3F0-020D060US950-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 73.9   | 1.0       |
| 10°-20°   | 202.9  | 2.8       |
| 20°-30°   | 284.8  | 3.9       |
| 30°-40°   | 310.5  | 4.3       |
| 40°-50°   | 285.4  | 3.9       |
| 50°-60°   | 224.1  | 3.1       |
| 60°-70°   | 145.9  | 2.0       |
| 70°-80°   | 75.1   | 1.0       |
| 80°-90°   | 22.6   | 0.3       |
| 90°-100°  | 63.7   | 0.9       |
| 100°-110° | 237.5  | 3.3       |
| 110°-120° | 629.8  | 8.6       |
| 120°-130° | 1044.5 | 14.3      |
| 130°-140° | 1109.5 | 15.2      |
| 140°-150° | 1031.2 | 14.1      |
| 150°-160° | 829.1  | 11.4      |
| 160°-170° | 534.2  | 7.3       |
| 170°-180° | 183.9  | 2.5       |
| 0°-30°    | 561.6  | 7.7       |
| 0°-40°    | 872.1  | 12.0      |
| 0°-60°    | 1381.7 | 19.0      |
| 0°-90°    | 1625.2 | 22.3      |
| 90°-120°  | 930.9  | 12.8      |
| 90°-150°  | 4116.2 | 56.5      |
| 90°-180°  | 5663.0 | 77.7      |
| 0°-180°   | 7288.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 789  | 789   | 789  | 789   | 789  |      |
| 5°   | 789  | 785   | 776  | 782   | 780  | 75   |
| 15°  | 750  | 742   | 718  | 704   | 697  | 211  |
| 25°  | 681  | 658   | 611  | 582   | 571  | 313  |
| 35°  | 587  | 550   | 488  | 442   | 427  | 367  |
| 45°  | 480  | 432   | 357  | 306   | 289  | 370  |
| 55°  | 365  | 309   | 232  | 189   | 176  | 326  |
| 65°  | 246  | 188   | 124  | 100   | 98   | 244  |
| 75°  | 131  | 81    | 57   | 52    | 51   | 139  |
| 85°  | 31   | 16    | 14   | 14    | 14   | 35   |
| 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 |      |

TEST NUMBER: P924017

CATALOG NUMBER: DFN2DIP-4P3F0-020D060US950-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 788.6 | 788.6 | 788.6 | 788.6 | 788.6 |
| 2.5°   | 792.1 | 788.6 | 780.7 | 787.9 | 786.5 |
| 5°     | 788.6 | 785.0 | 775.7 | 782.2 | 780.0 |
| 7.5°   | 782.2 | 777.9 | 767.9 | 770.7 | 767.1 |
| 10°    | 773.6 | 768.5 | 754.3 | 752.1 | 747.9 |
| 12.5°  | 762.9 | 756.4 | 737.2 | 733.0 | 725.0 |
| 15°    | 750.0 | 742.1 | 717.9 | 704.3 | 697.3 |
| 17.5°  | 735.1 | 723.6 | 693.7 | 677.9 | 666.6 |
| 20°    | 717.9 | 703.6 | 668.0 | 650.2 | 634.4 |
| 22.5°  | 699.4 | 683.0 | 641.6 | 617.3 | 606.6 |
| 25°    | 680.9 | 658.0 | 610.8 | 581.7 | 570.9 |
| 27.5°  | 658.7 | 634.4 | 582.3 | 548.7 | 532.3 |
| 30°    | 635.2 | 608.0 | 550.9 | 514.6 | 495.2 |
| 32.5°  | 612.3 | 579.5 | 521.0 | 478.1 | 460.3 |
| 35°    | 586.6 | 550.3 | 487.5 | 442.5 | 426.7 |
| 37.5°  | 561.6 | 522.3 | 456.0 | 406.8 | 388.9 |
| 40°    | 535.2 | 492.5 | 423.2 | 372.5 | 353.9 |
| 42.5°  | 508.1 | 462.5 | 390.4 | 337.5 | 319.8 |
| 45°    | 479.6 | 431.7 | 356.9 | 306.1 | 289.0 |
| 47.5°  | 452.5 | 401.8 | 324.7 | 274.0 | 258.3 |
| 50°    | 422.5 | 371.9 | 293.4 | 244.0 | 229.2 |
| 52.5°  | 393.1 | 339.6 | 263.3 | 216.3 | 202.7 |
| 55°    | 364.6 | 309.0 | 231.9 | 189.2 | 175.5 |
| 57.5°  | 335.4 | 278.3 | 204.2 | 164.2 | 152.7 |
| 60°    | 305.5 | 248.3 | 174.9 | 138.5 | 127.1 |
| 62.5°  | 276.2 | 219.1 | 149.9 | 115.6 | 109.9 |
| 65°    | 246.2 | 188.4 | 124.2 | 100.0 | 97.8  |
| 67.5°  | 217.7 | 159.8 | 100.0 | 87.8  | 85.7  |
| 70°    | 187.7 | 132.0 | 82.7  | 75.7  | 72.8  |
| 72.5°  | 159.1 | 106.3 | 69.2  | 63.5  | 62.1  |
| 75°    | 131.3 | 81.3  | 57.0  | 52.1  | 51.4  |
| 77.5°  | 103.5 | 57.8  | 44.9  | 42.1  | 40.6  |
| 80°    | 77.8  | 41.4  | 34.2  | 31.4  | 31.4  |
| 82.5°  | 54.2  | 27.9  | 23.6  | 22.1  | 22.1  |
| 85°    | 30.6  | 15.6  | 13.5  | 13.5  | 13.5  |
| 87.5°  | 11.4  | 5.7   | 5.7   | 5.0   | 5.0   |
| 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 |

TEST NUMBER: P924017

CATALOG NUMBER: DFN2DIP-4P3F0-020D060US950-RLLONL

**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 |

TEST NUMBER: P924017

CATALOG NUMBER: DFN2DIP-4P3F0-020D060US950-RLONL

**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 | 3.32             | 3.96 | 4.48 | 5.11 | 6.73 | 0.00           | 0.00 | 0.45 | 1.07 | 2.70 |
|                 | 3H   | 4.98             | 5.55 | 6.15 | 6.71 | 8.34 | 0.45           | 1.03 | 1.62 | 2.18 | 3.82 |
|                 | 4H   | 5.57             | 6.12 | 6.75 | 7.28 | 8.92 | 0.88           | 1.43 | 2.07 | 2.59 | 4.23 |
|                 | 6H   | 5.98             | 6.49 | 7.17 | 7.64 | 9.29 | 1.19           | 1.69 | 2.38 | 2.85 | 4.50 |
|                 | 8H   | 6.10             | 6.58 | 7.29 | 7.75 | 9.40 | 1.27           | 1.75 | 2.46 | 2.93 | 4.57 |
|                 | 12H  | 6.15             | 6.61 | 7.35 | 7.78 | 9.44 | 1.31           | 1.76 | 2.50 | 2.93 | 4.59 |
| 4H              | 2H   | 3.31             | 3.86 | 4.50 | 5.02 | 6.66 | 0.00           | 0.40 | 1.04 | 1.56 | 3.19 |
|                 | 3H   | 5.12             | 5.57 | 6.31 | 6.76 | 8.41 | 1.18           | 1.63 | 2.37 | 2.82 | 4.47 |
|                 | 4H   | 5.80             | 6.22 | 6.99 | 7.39 | 9.06 | 1.71           | 2.13 | 2.91 | 3.30 | 4.97 |
|                 | 6H   | 6.30             | 6.66 | 7.50 | 7.85 | 9.51 | 2.11           | 2.47 | 3.31 | 3.67 | 5.32 |
|                 | 8H   | 6.47             | 6.80 | 7.67 | 7.99 | 9.66 | 2.23           | 2.57 | 3.43 | 3.75 | 5.43 |
|                 | 12H  | 6.55             | 6.86 | 7.76 | 8.05 | 9.73 | 2.29           | 2.59 | 3.50 | 3.78 | 5.46 |
| 8H              | 4H   | 5.75             | 6.09 | 6.95 | 7.27 | 8.95 | 1.97           | 2.31 | 3.17 | 3.49 | 5.17 |
|                 | 6H   | 6.30             | 6.58 | 7.52 | 7.81 | 9.48 | 2.48           | 2.75 | 3.69 | 3.98 | 5.65 |
|                 | 8H   | 6.52             | 6.76 | 7.74 | 7.96 | 9.65 | 2.66           | 2.90 | 3.88 | 4.10 | 5.80 |
|                 | 12H  | 6.64             | 6.85 | 7.87 | 8.06 | 9.78 | 2.77           | 2.98 | 3.99 | 4.18 | 5.90 |
| 12H             | 4H   | 5.69             | 6.00 | 6.91 | 7.19 | 8.87 | 1.97           | 2.27 | 3.18 | 3.47 | 5.15 |
|                 | 6H   | 6.28             | 6.52 | 7.50 | 7.72 | 9.41 | 2.52           | 2.76 | 3.74 | 3.97 | 5.66 |
|                 | 8H   | 6.49             | 6.70 | 7.71 | 7.90 | 9.62 | 2.72           | 2.93 | 3.94 | 4.13 | 5.85 |