

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: P915937

Luminaire Tested: DFN2DIP-4P4F0-030D080US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915937  
REPORT IS A COMBINATION OF REPORTS P900660 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D080US930-RLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

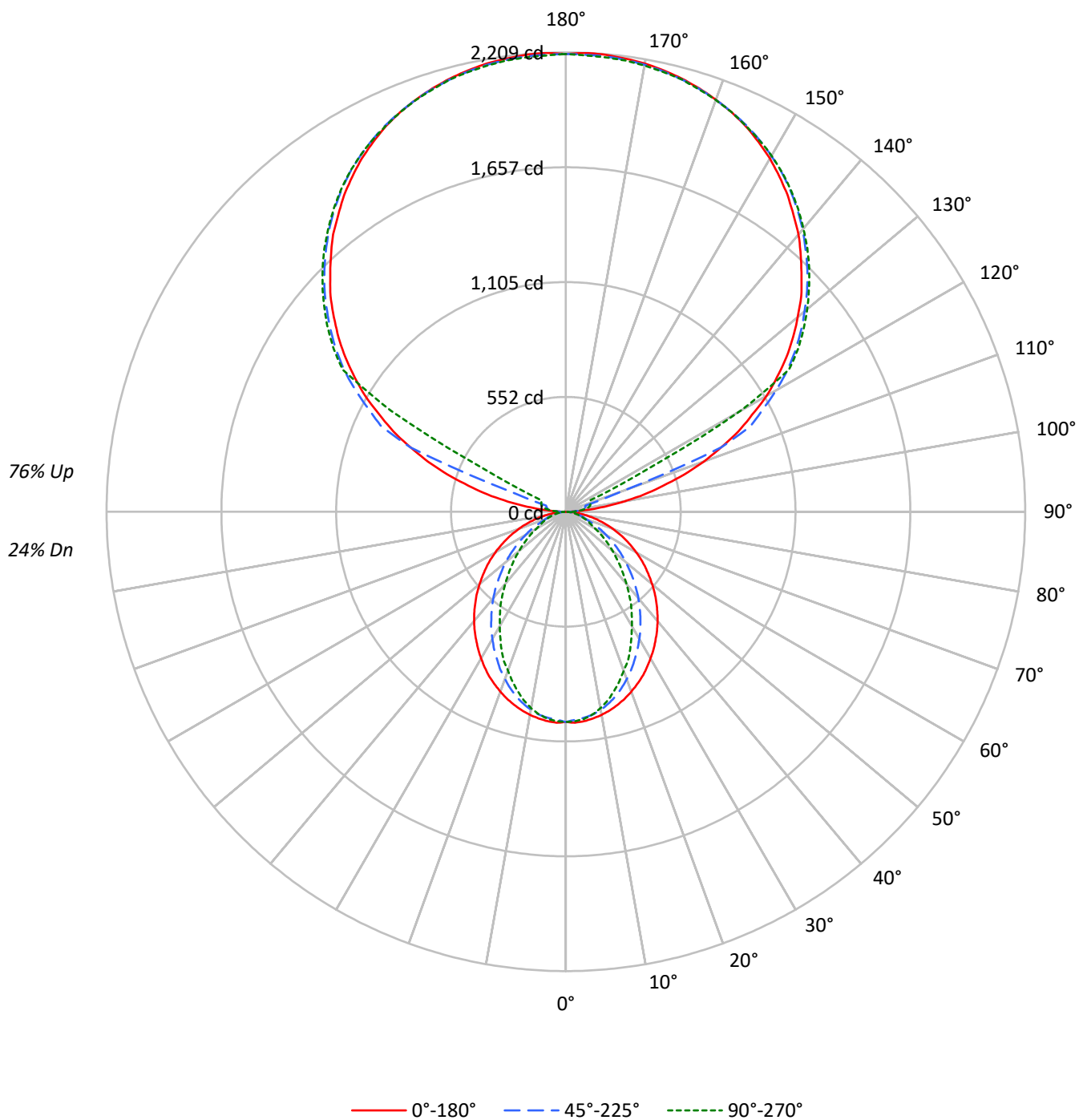
Lumens per Lamp: N/A  
Luminaire Lumens: 8536.2 lumens  
Efficiency: N/A  
Efficacy: 84.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 101.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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 | 50 | 50 | 50 | 33 | 33 | 33 |
| 1   | 92  | 88  | 85  | 81  | 82 | 79 | 76 | 73 | 61 | 59 | 57 | 44 | 43 | 42 | 29 | 28 | 28 |
| 2   | 84  | 77  | 71  | 67  | 75 | 69 | 64 | 60 | 53 | 50 | 47 | 39 | 37 | 35 | 26 | 25 | 24 |
| 3   | 77  | 68  | 61  | 56  | 68 | 61 | 55 | 50 | 47 | 43 | 40 | 35 | 32 | 30 | 23 | 22 | 21 |
| 4   | 70  | 60  | 53  | 47  | 62 | 54 | 48 | 43 | 42 | 38 | 34 | 31 | 28 | 26 | 21 | 19 | 18 |
| 5   | 65  | 54  | 46  | 40  | 57 | 48 | 42 | 37 | 38 | 33 | 30 | 28 | 25 | 23 | 19 | 17 | 16 |
| 6   | 59  | 48  | 40  | 35  | 53 | 43 | 37 | 32 | 34 | 29 | 26 | 25 | 22 | 20 | 17 | 15 | 14 |
| 7   | 55  | 43  | 36  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 23 | 20 | 17 | 16 | 14 | 12 |
| 8   | 51  | 39  | 32  | 27  | 45 | 35 | 29 | 25 | 28 | 23 | 20 | 21 | 18 | 16 | 14 | 13 | 11 |
| 9   | 47  | 36  | 29  | 24  | 42 | 32 | 26 | 22 | 25 | 21 | 18 | 19 | 16 | 14 | 13 | 11 | 10 |
| 10  | 44  | 33  | 26  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 | 12 | 11 | 9  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 656 | 656 | 656 |
| 5°  | 657 | 646 | 650 |
| 10° | 650 | 633 | 629 |
| 15° | 642 | 612 | 596 |
| 20° | 630 | 584 | 557 |
| 25° | 618 | 552 | 518 |
| 30° | 601 | 519 | 469 |
| 35° | 585 | 483 | 426 |
| 40° | 569 | 446 | 377 |
| 45° | 551 | 406 | 332 |
| 50° | 531 | 364 | 288 |
| 55° | 511 | 320 | 246 |
| 60° | 487 | 274 | 203 |
| 65° | 460 | 227 | 183 |
| 70° | 428 | 184 | 166 |
| 75° | 386 | 162 | 151 |
| 80° | 327 | 137 | 132 |
| 85° | 228 | 93  | 101 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1136 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 94.7   | 1.1       |
| 10°-20°   | 260.1  | 3.0       |
| 20°-30°   | 365.1  | 4.3       |
| 30°-40°   | 398.0  | 4.7       |
| 40°-50°   | 365.8  | 4.3       |
| 50°-60°   | 287.3  | 3.4       |
| 60°-70°   | 187.0  | 2.2       |
| 70°-80°   | 96.3   | 1.1       |
| 80°-90°   | 28.5   | 0.3       |
| 90°-100°  | 72.6   | 0.9       |
| 100°-110° | 270.6  | 3.2       |
| 110°-120° | 717.6  | 8.4       |
| 120°-130° | 1190.2 | 13.9      |
| 130°-140° | 1264.3 | 14.8      |
| 140°-150° | 1175.0 | 13.8      |
| 150°-160° | 944.7  | 11.1      |
| 160°-170° | 608.7  | 7.1       |
| 170°-180° | 209.5  | 2.5       |
| 0°-30°    | 720.0  | 8.4       |
| 0°-40°    | 1118.0 | 13.1      |
| 0°-60°    | 1771.2 | 20.7      |
| 0°-90°    | 2082.9 | 24.4      |
| 90°-120°  | 1060.8 | 12.4      |
| 90°-150°  | 4690.4 | 54.9      |
| 90°-180°  | 6453.0 | 75.6      |
| 0°-180°   | 8536.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1011 | 1011  | 1011 | 1011  | 1011 |      |
| 5°   | 1011 | 1006  | 994  | 1003  | 1000 | 96   |
| 15°  | 962  | 951   | 920  | 903   | 894  | 271  |
| 25°  | 873  | 843   | 783  | 746   | 732  | 401  |
| 35°  | 752  | 705   | 625  | 567   | 547  | 471  |
| 45°  | 615  | 553   | 458  | 392   | 370  | 475  |
| 55°  | 467  | 396   | 297  | 242   | 225  | 418  |
| 65°  | 316  | 242   | 159  | 128   | 125  | 313  |
| 75°  | 168  | 104   | 73   | 67    | 66   | 178  |
| 85°  | 39   | 20    | 17   | 17    | 17   | 45   |
| 90°  | 2    | 19    | 32   | 40    | 43   | 8    |
| 95°  | 104  | 51    | 62   | 70    | 68   | 123  |
| 105° | 484  | 532   | 97   | 115   | 121  | 517  |
| 115° | 916  | 943   | 983  | 245   | 131  | 902  |
| 125° | 1295 | 1316  | 1346 | 1357  | 1362 | 1155 |
| 135° | 1602 | 1628  | 1642 | 1658  | 1655 | 1238 |
| 145° | 1859 | 1857  | 1884 | 1895  | 1887 | 1163 |
| 155° | 2047 | 2032  | 2052 | 2061  | 2048 | 943  |
| 165° | 2157 | 2147  | 2152 | 2163  | 2152 | 609  |
| 175° | 2206 | 2195  | 2198 | 2209  | 2193 | 210  |
| 180° | 2201 | 2201  | 2201 | 2201  | 2201 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1010.9 | 1010.9 | 1010.9 | 1010.9 | 1010.9 |
| 2.5°   | 1015.5 | 1010.9 | 1000.8 | 1010.0 | 1008.2 |
| 5°     | 1010.9 | 1006.3 | 994.4  | 1002.7 | 999.9  |
| 7.5°   | 1002.7 | 997.2  | 984.4  | 988.0  | 983.4  |
| 10°    | 991.6  | 985.3  | 967.0  | 964.2  | 958.8  |
| 12.5°  | 978.0  | 969.7  | 945.0  | 939.5  | 929.4  |
| 15°    | 961.5  | 951.4  | 920.3  | 902.9  | 893.8  |
| 17.5°  | 942.2  | 927.6  | 889.2  | 869.1  | 854.4  |
| 20°    | 920.3  | 902.0  | 856.2  | 833.5  | 813.3  |
| 22.5°  | 896.6  | 875.5  | 822.4  | 791.3  | 777.6  |
| 25°    | 872.8  | 843.4  | 783.1  | 745.6  | 731.8  |
| 27.5°  | 844.4  | 813.3  | 746.5  | 703.5  | 682.4  |
| 30°    | 814.2  | 779.4  | 706.2  | 659.7  | 634.9  |
| 32.5°  | 784.9  | 742.8  | 667.9  | 612.9  | 590.0  |
| 35°    | 752.0  | 705.3  | 624.8  | 567.2  | 547.1  |
| 37.5°  | 720.0  | 669.6  | 584.6  | 521.4  | 498.6  |
| 40°    | 686.2  | 631.3  | 542.5  | 477.5  | 453.8  |
| 42.5°  | 651.3  | 592.9  | 500.4  | 432.7  | 409.9  |
| 45°    | 614.8  | 553.4  | 457.5  | 392.4  | 370.5  |
| 47.5°  | 580.0  | 515.1  | 416.3  | 351.2  | 331.2  |
| 50°    | 541.6  | 476.6  | 376.0  | 312.8  | 293.7  |
| 52.5°  | 504.0  | 435.5  | 337.6  | 277.2  | 259.8  |
| 55°    | 467.4  | 396.1  | 297.3  | 242.5  | 225.1  |
| 57.5°  | 430.0  | 356.8  | 261.7  | 210.4  | 195.8  |
| 60°    | 391.5  | 318.4  | 224.1  | 177.5  | 162.9  |
| 62.5°  | 354.1  | 280.9  | 192.1  | 148.2  | 141.0  |
| 65°    | 315.6  | 241.5  | 159.1  | 128.1  | 125.3  |
| 67.5°  | 279.1  | 204.9  | 128.1  | 112.5  | 109.7  |
| 70°    | 240.6  | 169.3  | 106.1  | 96.9   | 93.3   |
| 72.5°  | 204.0  | 136.2  | 88.7   | 81.4   | 79.6   |
| 75°    | 168.3  | 104.3  | 73.2   | 66.8   | 65.9   |
| 77.5°  | 132.6  | 74.0   | 57.6   | 54.0   | 52.1   |
| 80°    | 99.7   | 53.1   | 43.9   | 40.3   | 40.3   |
| 82.5°  | 69.5   | 35.7   | 30.2   | 28.4   | 28.4   |
| 85°    | 39.3   | 20.1   | 17.4   | 17.4   | 17.4   |
| 87.5°  | 14.7   | 7.3    | 7.3    | 6.4    | 6.4    |
| 90°    | 1.5    | 19.1   | 31.8   | 39.9   | 43.0   |
| 92.5°  | 39.9   | 33.5   | 38.2   | 41.4   | 43.0   |
| 95°    | 103.5  | 50.9   | 62.0   | 70.2   | 68.5   |
| 97.5°  | 186.3  | 55.8   | 81.1   | 86.1   | 87.6   |
| 100°   | 282.0  | 63.8   | 90.8   | 103.5  | 106.6  |
| 102.5° | 387.0  | 383.9  | 94.0   | 111.4  | 116.3  |
| 105°   | 484.2  | 532.1  | 97.2   | 114.6  | 121.1  |
| 107.5° | 597.3  | 637.0  | 100.4  | 117.8  | 124.3  |
| 110°   | 705.7  | 739.0  | 278.8  | 119.5  | 125.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 807.6  | 836.2  | 809.2  | 122.5  | 127.5  |
| 115°   | 915.8  | 942.9  | 982.8  | 245.3  | 130.7  |
| 117.5° | 1009.8 | 1041.6 | 1068.9 | 840.9  | 423.7  |
| 120°   | 1115.0 | 1138.8 | 1167.6 | 1186.7 | 971.6  |
| 122.5° | 1204.0 | 1229.6 | 1261.6 | 1271.0 | 1272.8 |
| 125°   | 1294.9 | 1315.6 | 1345.9 | 1357.1 | 1361.8 |
| 127.5° | 1377.7 | 1400.0 | 1424.1 | 1439.9 | 1441.4 |
| 130°   | 1455.8 | 1481.3 | 1498.8 | 1516.4 | 1514.8 |
| 132.5° | 1535.5 | 1556.2 | 1573.7 | 1588.0 | 1586.5 |
| 135°   | 1602.4 | 1627.9 | 1642.1 | 1658.2 | 1655.0 |
| 137.5° | 1672.4 | 1691.5 | 1707.6 | 1723.5 | 1718.7 |
| 140°   | 1740.8 | 1753.7 | 1771.2 | 1785.5 | 1777.5 |
| 142.5° | 1798.4 | 1809.5 | 1830.1 | 1842.8 | 1834.8 |
| 145°   | 1858.9 | 1857.2 | 1884.2 | 1895.4 | 1887.4 |
| 147.5° | 1911.3 | 1906.6 | 1933.6 | 1941.6 | 1935.3 |
| 150°   | 1962.3 | 1951.2 | 1976.7 | 1986.1 | 1978.2 |
| 152.5° | 2005.3 | 1992.6 | 2016.4 | 2026.1 | 2014.9 |
| 155°   | 2046.7 | 2032.5 | 2051.6 | 2061.1 | 2048.4 |
| 157.5° | 2080.2 | 2067.5 | 2081.9 | 2093.0 | 2080.2 |
| 160°   | 2108.9 | 2099.3 | 2108.9 | 2118.4 | 2107.2 |
| 162.5° | 2134.3 | 2124.8 | 2132.7 | 2143.9 | 2129.6 |
| 165°   | 2156.6 | 2147.2 | 2151.9 | 2163.0 | 2151.9 |
| 167.5° | 2174.2 | 2164.5 | 2169.4 | 2180.6 | 2166.2 |
| 170°   | 2188.6 | 2178.9 | 2182.1 | 2193.3 | 2178.9 |
| 172.5° | 2198.0 | 2188.6 | 2191.8 | 2202.9 | 2188.6 |
| 175°   | 2206.0 | 2194.8 | 2198.0 | 2209.1 | 2193.3 |
| 177.5° | 2209.1 | 2198.0 | 2199.7 | 2210.8 | 2196.5 |
| 180°   | 2201.2 | 2201.2 | 2201.2 | 2201.2 | 2201.2 |

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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 | 2.63             | 3.29 | 3.79 | 4.43 | 6.03 | 0.00           | 0.00 | 0.00 | 0.39 | 1.99 |
|                 | 3H   | 4.30             | 4.89 | 5.46 | 6.04 | 7.65 | 0.00           | 0.36 | 0.93 | 1.50 | 3.11 |
|                 | 4H   | 4.91             | 5.46 | 6.08 | 6.61 | 8.23 | 0.21           | 0.77 | 1.38 | 1.92 | 3.53 |
|                 | 6H   | 5.32             | 5.84 | 6.50 | 6.99 | 8.61 | 0.53           | 1.04 | 1.70 | 2.19 | 3.82 |
|                 | 8H   | 5.45             | 5.94 | 6.63 | 7.10 | 8.72 | 0.61           | 1.10 | 1.79 | 2.26 | 3.88 |
|                 | 12H  | 5.51             | 5.97 | 6.69 | 7.13 | 8.77 | 0.65           | 1.11 | 1.83 | 2.27 | 3.91 |
| 4H              | 2H   | 2.63             | 3.19 | 3.81 | 4.33 | 5.95 | 0.00           | 0.00 | 0.35 | 0.87 | 2.49 |
|                 | 3H   | 4.45             | 4.91 | 5.63 | 6.09 | 7.71 | 0.50           | 0.97 | 1.69 | 2.14 | 3.77 |
|                 | 4H   | 5.14             | 5.57 | 6.32 | 6.73 | 8.37 | 1.05           | 1.48 | 2.23 | 2.64 | 4.28 |
|                 | 6H   | 5.65             | 6.01 | 6.84 | 7.20 | 8.83 | 1.46           | 1.83 | 2.65 | 3.01 | 4.64 |
|                 | 8H   | 5.82             | 6.17 | 7.01 | 7.34 | 8.99 | 1.59           | 1.93 | 2.77 | 3.10 | 4.76 |
|                 | 12H  | 5.91             | 6.22 | 7.12 | 7.41 | 9.07 | 1.65           | 1.96 | 2.85 | 3.14 | 4.80 |
| 8H              | 4H   | 5.09             | 5.43 | 6.28 | 6.61 | 8.26 | 1.32           | 1.66 | 2.50 | 2.83 | 4.49 |
|                 | 6H   | 5.66             | 5.94 | 6.86 | 7.16 | 8.81 | 1.83           | 2.11 | 3.04 | 3.33 | 4.98 |
|                 | 8H   | 5.88             | 6.12 | 7.09 | 7.32 | 8.99 | 2.03           | 2.27 | 3.24 | 3.46 | 5.14 |
|                 | 12H  | 6.01             | 6.23 | 7.23 | 7.42 | 9.12 | 2.14           | 2.36 | 3.35 | 3.55 | 5.25 |
| 12H             | 4H   | 5.04             | 5.35 | 6.24 | 6.53 | 8.19 | 1.32           | 1.63 | 2.52 | 2.81 | 4.47 |
|                 | 6H   | 5.63             | 5.88 | 6.84 | 7.07 | 8.74 | 1.88           | 2.13 | 3.09 | 3.32 | 4.99 |
|                 | 8H   | 5.85             | 6.07 | 7.06 | 7.26 | 8.96 | 2.09           | 2.30 | 3.30 | 3.50 | 5.20 |