

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: P921280

Luminaire Tested: DFN2DIP-4P3F0-020D040US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

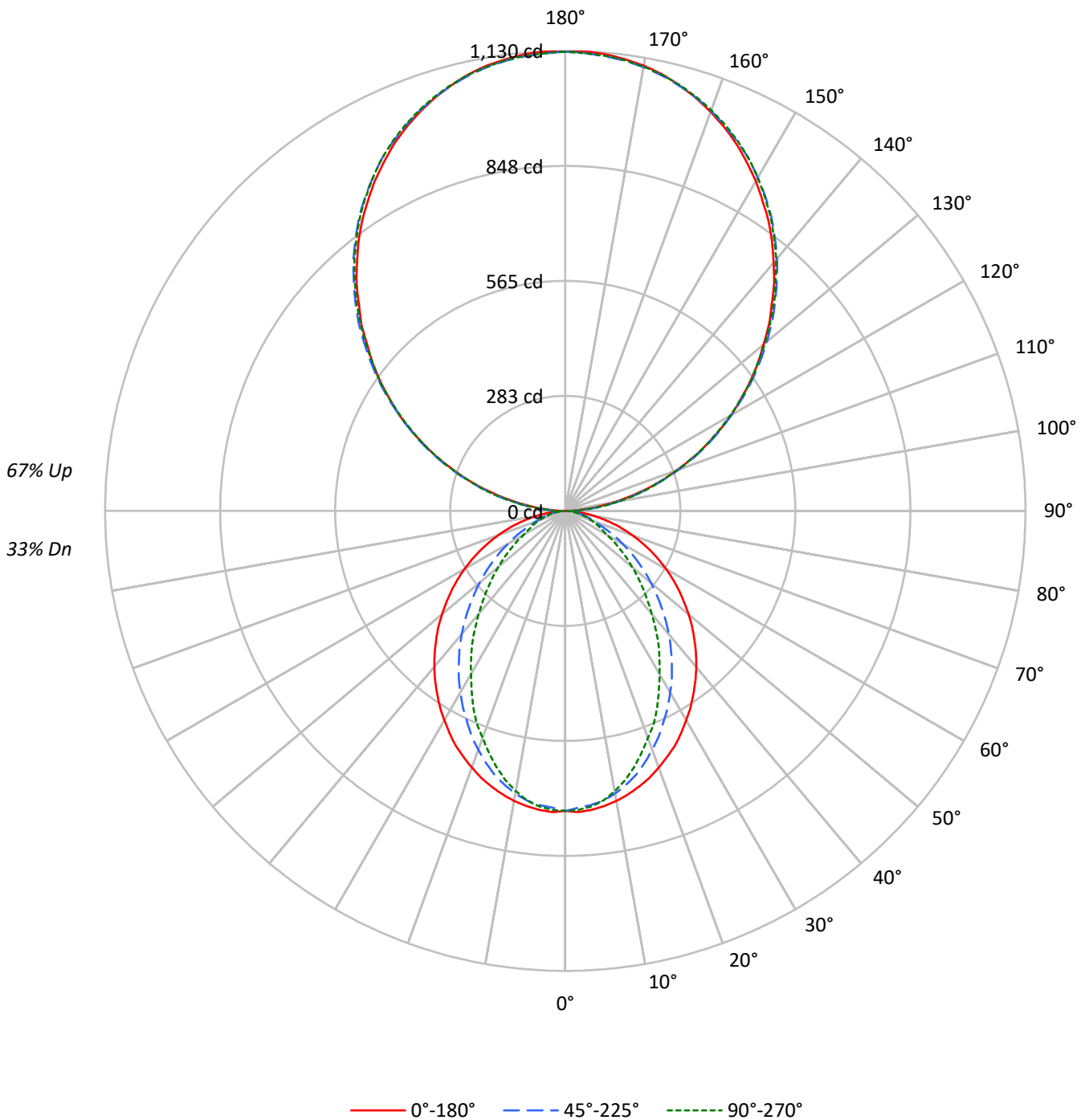
Test Method: LM-79-2019  
Report Number: P921280  
REPORT IS A COMBINATION OF REPORTS P899050 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-020D040US940-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4672.6 lumens  
Efficiency: N/A  
Efficacy: 102.9 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): 45.4  
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

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### Luminous Intensity Polar Plot





TEST NUMBER: P921280

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |    |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |    |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |    |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 56 | 56 | 56 | 40 | 40 | 40 | 33 |    |    |    | 33 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 | 28 |    |    |    | 28 |
| 2   | 86  | 79  | 73  | 68  | 77 | 71 | 67 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 32 | 31 | 29 | 24 |    |    |    | 24 |
| 3   | 79  | 70  | 63  | 57  | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 39 | 36 | 34 | 29 | 27 | 25 | 21 |    |    |    | 21 |
| 4   | 72  | 62  | 54  | 49  | 65 | 56 | 50 | 45 | 45 | 41 | 37 | 35 | 32 | 29 | 26 | 24 | 22 | 18 |    |    |    | 18 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 40 | 36 | 32 | 32 | 28 | 26 | 23 | 21 | 19 | 16 |    |    |    | 16 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 36 | 32 | 28 | 29 | 25 | 23 | 21 | 19 | 17 | 14 |    |    |    | 14 |
| 7   | 56  | 45  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 25 | 26 | 23 | 20 | 19 | 17 | 15 | 13 |    |    |    | 13 |
| 8   | 52  | 40  | 33  | 28  | 47 | 37 | 30 | 26 | 30 | 25 | 22 | 24 | 20 | 18 | 18 | 16 | 14 | 11 |    |    |    | 11 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 14 | 13 | 10 |    |    |    | 10 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 25 | 21 | 18 | 20 | 17 | 15 | 15 | 13 | 11 | 9  |    |    |    | 9  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 840 | 840 | 840 |
| 5°  | 841 | 826 | 832 |
| 10° | 832 | 809 | 804 |
| 15° | 820 | 782 | 762 |
| 20° | 804 | 745 | 711 |
| 25° | 788 | 703 | 661 |
| 30° | 767 | 660 | 598 |
| 35° | 746 | 614 | 543 |
| 40° | 724 | 567 | 479 |
| 45° | 700 | 514 | 422 |
| 50° | 674 | 461 | 366 |
| 55° | 647 | 404 | 312 |
| 60° | 616 | 345 | 256 |
| 65° | 580 | 285 | 230 |
| 70° | 536 | 229 | 208 |
| 75° | 482 | 200 | 189 |
| 80° | 403 | 167 | 162 |
| 85° | 273 | 109 | 121 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 1131 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 69.1   | 1.5       |
| 10°-20°   | 189.6  | 4.1       |
| 20°-30°   | 266.3  | 5.7       |
| 30°-40°   | 290.2  | 6.2       |
| 40°-50°   | 266.8  | 5.7       |
| 50°-60°   | 209.5  | 4.5       |
| 60°-70°   | 136.4  | 2.9       |
| 70°-80°   | 70.2   | 1.5       |
| 80°-90°   | 21.1   | 0.5       |
| 90°-100°  | 69.8   | 1.5       |
| 100°-110° | 221.8  | 4.7       |
| 110°-120° | 379.5  | 8.1       |
| 120°-130° | 499.2  | 10.7      |
| 130°-140° | 560.3  | 12.0      |
| 140°-150° | 549.4  | 11.8      |
| 150°-160° | 460.9  | 9.9       |
| 160°-170° | 305.7  | 6.5       |
| 170°-180° | 106.8  | 2.3       |
| 0°-30°    | 525.0  | 11.2      |
| 0°-40°    | 815.2  | 17.4      |
| 0°-60°    | 1291.4 | 27.6      |
| 0°-90°    | 1519.1 | 32.5      |
| 90°-120°  | 671.2  | 14.4      |
| 90°-150°  | 2280.1 | 48.8      |
| 90°-180°  | 3153.0 | 67.5      |
| 0°-180°   | 4672.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 737  | 737   | 737  | 737   | 737  |      |
| 5°   | 737  | 734   | 725  | 731   | 729  | 70   |
| 15°  | 701  | 694   | 671  | 658   | 652  | 198  |
| 25°  | 636  | 615   | 571  | 544   | 534  | 293  |
| 35°  | 548  | 514   | 456  | 414   | 399  | 343  |
| 45°  | 448  | 404   | 334  | 286   | 270  | 346  |
| 55°  | 341  | 289   | 217  | 177   | 164  | 305  |
| 65°  | 230  | 176   | 116  | 94    | 91   | 228  |
| 75°  | 123  | 76    | 53   | 49    | 48   | 130  |
| 85°  | 29   | 15    | 13   | 13    | 13   | 33   |
| 90°  | 1    | 12    | 33   | 31    | 32   | 5    |
| 95°  | 50   | 59    | 61   | 61    | 59   | 55   |
| 105° | 205  | 207   | 210  | 211   | 211  | 216  |
| 115° | 381  | 386   | 385  | 384   | 381  | 377  |
| 125° | 554  | 562   | 560  | 557   | 556  | 495  |
| 135° | 717  | 727   | 729  | 728   | 725  | 554  |
| 145° | 870  | 877   | 882  | 883   | 880  | 544  |
| 155° | 995  | 998   | 1000 | 1005  | 1002 | 458  |
| 165° | 1082 | 1081  | 1081 | 1088  | 1083 | 305  |
| 175° | 1126 | 1123  | 1121 | 1128  | 1122 | 107  |
| 180° | 1128 | 1128  | 1128 | 1128  | 1128 |      |



TEST NUMBER: P921280

CATALOG NUMBER: DFN2DIP-4P3F0-020D040US940-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 737.1 | 737.1 | 737.1 | 737.1 | 737.1 |
| 2.5°   | 740.4 | 737.1 | 729.7 | 736.5 | 735.1 |
| 5°     | 737.1 | 733.8 | 725.0 | 731.1 | 729.1 |
| 7.5°   | 731.1 | 727.1 | 717.7 | 720.4 | 717.0 |
| 10°    | 723.1 | 718.4 | 705.1 | 703.0 | 699.1 |
| 12.5°  | 713.1 | 707.0 | 689.0 | 685.1 | 677.7 |
| 15°    | 701.1 | 693.7 | 671.0 | 658.3 | 651.8 |
| 17.5°  | 687.1 | 676.4 | 648.4 | 633.6 | 623.0 |
| 20°    | 671.0 | 657.6 | 624.4 | 607.7 | 593.0 |
| 22.5°  | 653.7 | 638.4 | 599.7 | 577.0 | 567.0 |
| 25°    | 636.4 | 615.0 | 571.0 | 543.7 | 533.6 |
| 27.5°  | 615.7 | 593.0 | 544.3 | 512.9 | 497.6 |
| 30°    | 593.7 | 568.3 | 515.0 | 481.0 | 462.9 |
| 32.5°  | 572.3 | 541.6 | 487.0 | 446.9 | 430.3 |
| 35°    | 548.3 | 514.3 | 455.7 | 413.6 | 398.9 |
| 37.5°  | 524.9 | 488.2 | 426.2 | 380.2 | 363.6 |
| 40°    | 500.2 | 460.3 | 395.6 | 348.2 | 330.8 |
| 42.5°  | 474.9 | 432.3 | 364.9 | 315.5 | 298.9 |
| 45°    | 448.3 | 403.5 | 333.6 | 286.1 | 270.1 |
| 47.5°  | 422.9 | 375.6 | 303.5 | 256.1 | 241.5 |
| 50°    | 394.9 | 347.6 | 274.2 | 228.1 | 214.2 |
| 52.5°  | 367.5 | 317.4 | 246.1 | 202.2 | 189.5 |
| 55°    | 340.8 | 288.8 | 216.8 | 176.8 | 164.1 |
| 57.5°  | 313.5 | 260.1 | 190.8 | 153.5 | 142.8 |
| 60°    | 285.5 | 232.1 | 163.5 | 129.5 | 118.8 |
| 62.5°  | 258.2 | 204.8 | 140.1 | 108.1 | 102.7 |
| 65°    | 230.2 | 176.1 | 116.1 | 93.5  | 91.4  |
| 67.5°  | 203.5 | 149.4 | 93.5  | 82.0  | 80.1  |
| 70°    | 175.4 | 123.4 | 77.3  | 70.7  | 68.0  |
| 72.5°  | 148.7 | 99.3  | 64.6  | 59.4  | 58.1  |
| 75°    | 122.7 | 76.0  | 53.3  | 48.7  | 48.1  |
| 77.5°  | 96.8  | 54.0  | 42.0  | 39.3  | 38.0  |
| 80°    | 72.7  | 38.7  | 32.0  | 29.3  | 29.3  |
| 82.5°  | 50.6  | 26.0  | 22.0  | 20.7  | 20.7  |
| 85°    | 28.6  | 14.6  | 12.7  | 12.7  | 12.7  |
| 87.5°  | 10.7  | 5.4   | 5.4   | 4.6   | 4.6   |
| 90°    | 1.0   | 12.2  | 33.3  | 31.3  | 32.3  |
| 92.5°  | 21.0  | 28.5  | 29.6  | 30.6  | 30.6  |
| 95°    | 49.7  | 59.2  | 60.9  | 60.9  | 59.2  |
| 97.5°  | 82.7  | 91.5  | 95.2  | 95.2  | 95.2  |
| 100°   | 120.7 | 128.6 | 131.3 | 131.3 | 130.3 |
| 102.5° | 160.9 | 166.7 | 170.4 | 171.4 | 170.4 |
| 105°   | 204.7 | 207.4 | 209.5 | 211.2 | 211.2 |
| 107.5° | 248.3 | 252.4 | 252.4 | 253.0 | 248.3 |
| 110°   | 290.4 | 295.9 | 295.9 | 295.9 | 293.2 |



TEST NUMBER: P921280

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 336.0  | 341.8  | 340.7  | 338.0  | 336.0  |
| 115°   | 380.8  | 386.4  | 384.6  | 383.6  | 380.8  |
| 117.5° | 425.4  | 432.9  | 428.2  | 425.4  | 422.8  |
| 120°   | 470.4  | 477.8  | 470.4  | 470.4  | 467.3  |
| 122.5° | 511.1  | 520.7  | 515.9  | 513.2  | 511.1  |
| 125°   | 554.0  | 562.5  | 559.8  | 556.7  | 555.7  |
| 127.5° | 595.8  | 606.4  | 602.6  | 598.5  | 595.8  |
| 130°   | 634.9  | 647.2  | 645.5  | 643.5  | 639.7  |
| 132.5° | 678.8  | 688.3  | 689.0  | 684.2  | 681.5  |
| 135°   | 716.6  | 727.1  | 729.2  | 728.1  | 725.4  |
| 137.5° | 758.8  | 767.2  | 768.9  | 768.2  | 764.2  |
| 140°   | 795.8  | 804.3  | 809.0  | 809.0  | 805.3  |
| 142.5° | 833.9  | 842.4  | 845.1  | 846.1  | 842.4  |
| 145°   | 870.0  | 876.7  | 882.2  | 883.2  | 879.5  |
| 147.5° | 902.2  | 910.7  | 914.8  | 916.5  | 912.8  |
| 150°   | 935.6  | 941.4  | 945.1  | 948.2  | 945.1  |
| 152.5° | 965.2  | 970.9  | 975.7  | 979.5  | 975.7  |
| 155°   | 994.7  | 997.5  | 1000.5 | 1005.3 | 1002.2 |
| 157.5° | 1020.3 | 1022.3 | 1024.0 | 1030.8 | 1026.0 |
| 160°   | 1043.0 | 1045.1 | 1046.1 | 1051.9 | 1047.8 |
| 162.5° | 1064.1 | 1064.1 | 1065.1 | 1071.6 | 1066.8 |
| 165°   | 1082.2 | 1081.1 | 1081.1 | 1087.9 | 1083.2 |
| 167.5° | 1098.5 | 1095.4 | 1095.4 | 1102.2 | 1097.4 |
| 170°   | 1110.7 | 1108.0 | 1107.0 | 1113.7 | 1108.0 |
| 172.5° | 1119.2 | 1116.5 | 1115.4 | 1122.3 | 1116.5 |
| 175°   | 1126.1 | 1123.3 | 1121.2 | 1128.0 | 1122.3 |
| 177.5° | 1129.8 | 1127.0 | 1125.0 | 1130.8 | 1125.0 |
| 180°   | 1128.0 | 1128.0 | 1128.0 | 1128.0 | 1128.0 |



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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 | 4.61             | 5.31 | 5.70 | 6.40 | 7.91  | 0.57           | 1.28 | 1.67 | 2.37 | 3.87 |
|                 | 3H   | 6.27             | 6.90 | 7.38 | 8.00 | 9.52  | 1.74           | 2.37 | 2.85 | 3.47 | 4.99 |
|                 | 4H   | 6.87             | 7.47 | 7.99 | 8.57 | 10.10 | 2.18           | 2.78 | 3.30 | 3.88 | 5.41 |
|                 | 6H   | 7.28             | 7.83 | 8.41 | 8.94 | 10.47 | 2.49           | 3.04 | 3.62 | 4.15 | 5.68 |
|                 | 8H   | 7.40             | 7.92 | 8.53 | 9.05 | 10.58 | 2.57           | 3.10 | 3.70 | 4.22 | 5.75 |
|                 | 12H  | 7.46             | 7.95 | 8.59 | 9.07 | 10.62 | 2.61           | 3.11 | 3.74 | 4.22 | 5.77 |
| 4H              | 2H   | 4.61             | 5.20 | 5.73 | 6.31 | 7.83  | 1.15           | 1.75 | 2.27 | 2.85 | 4.37 |
|                 | 3H   | 6.42             | 6.92 | 7.55 | 8.05 | 9.58  | 2.48           | 2.98 | 3.61 | 4.10 | 5.64 |
|                 | 4H   | 7.10             | 7.56 | 8.24 | 8.68 | 10.24 | 3.02           | 3.47 | 4.15 | 4.59 | 6.15 |
|                 | 6H   | 7.61             | 8.00 | 8.75 | 9.14 | 10.69 | 3.42           | 3.81 | 4.56 | 4.95 | 6.50 |
|                 | 8H   | 7.78             | 8.14 | 8.92 | 9.27 | 10.84 | 3.54           | 3.91 | 4.68 | 5.04 | 6.61 |
|                 | 12H  | 7.86             | 8.19 | 9.02 | 9.34 | 10.91 | 3.60           | 3.93 | 4.76 | 5.07 | 6.64 |
| 8H              | 4H   | 7.06             | 7.42 | 8.20 | 8.56 | 10.12 | 3.28           | 3.65 | 4.42 | 4.78 | 6.35 |
|                 | 6H   | 7.62             | 7.92 | 8.78 | 9.09 | 10.65 | 3.79           | 4.09 | 4.95 | 5.26 | 6.83 |
|                 | 8H   | 7.83             | 8.09 | 8.99 | 9.25 | 10.83 | 3.97           | 4.24 | 5.14 | 5.39 | 6.97 |
|                 | 12H  | 7.96             | 8.19 | 9.13 | 9.34 | 10.96 | 4.08           | 4.31 | 5.25 | 5.46 | 7.08 |
| 12H             | 4H   | 7.01             | 7.34 | 8.16 | 8.48 | 10.05 | 3.28           | 3.61 | 4.44 | 4.76 | 6.33 |
|                 | 6H   | 7.59             | 7.85 | 8.76 | 9.01 | 10.59 | 3.83           | 4.10 | 5.00 | 5.25 | 6.83 |
|                 | 8H   | 7.80             | 8.03 | 8.97 | 9.18 | 10.80 | 4.03           | 4.27 | 5.20 | 5.42 | 7.03 |