

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: P913108

Luminaire Tested: DFN2DIP-4P3F0-030D020US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913108  
REPORT IS A COMBINATION OF REPORTS P899032 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-030D020US927-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

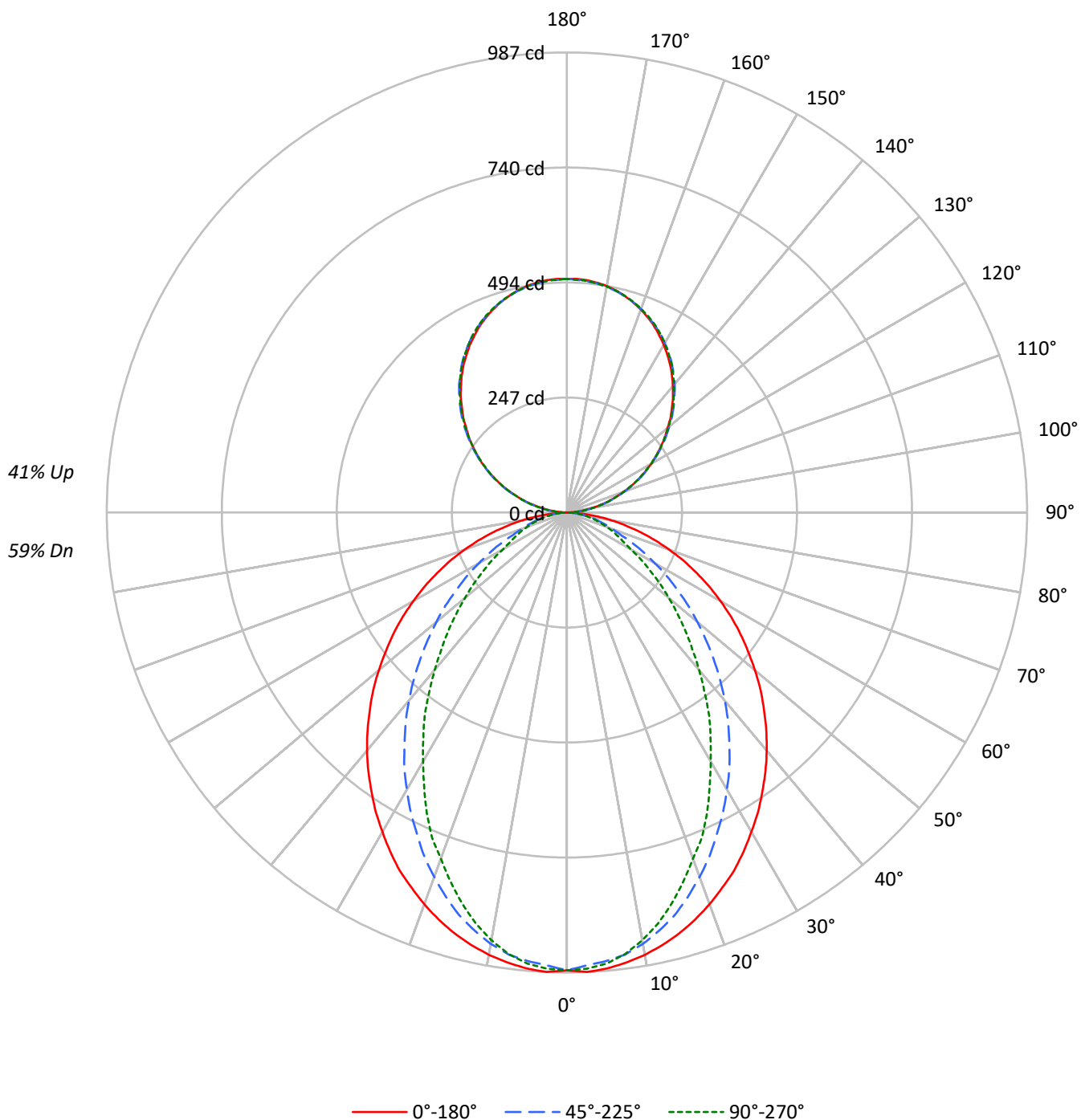
Lumens per Lamp: N/A  
Luminaire Lumens: 3422.2 lumens  
Efficiency: N/A  
Efficacy: 82.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 41.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 76 | 76 | 76 | 64 | 64 | 64 |
| 1   | 100 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 78 | 76 | 74 | 68 | 66 | 64 | 58 | 57 | 56 |
| 2   | 92  | 85  | 79  | 74  | 86  | 79  | 74  | 70  | 69 | 65 | 62 | 60 | 57 | 55 | 52 | 50 | 48 |
| 3   | 84  | 75  | 68  | 62  | 78  | 70  | 64  | 59  | 62 | 57 | 53 | 54 | 50 | 47 | 46 | 44 | 41 |
| 4   | 77  | 67  | 59  | 53  | 72  | 63  | 56  | 51  | 55 | 50 | 46 | 48 | 44 | 41 | 42 | 39 | 36 |
| 5   | 71  | 60  | 52  | 46  | 66  | 56  | 49  | 44  | 50 | 44 | 40 | 44 | 39 | 36 | 38 | 34 | 32 |
| 6   | 66  | 54  | 46  | 40  | 61  | 51  | 44  | 39  | 45 | 39 | 35 | 40 | 35 | 32 | 35 | 31 | 28 |
| 7   | 61  | 49  | 41  | 36  | 57  | 46  | 39  | 34  | 41 | 35 | 31 | 36 | 32 | 28 | 32 | 28 | 25 |
| 8   | 57  | 45  | 37  | 32  | 53  | 42  | 35  | 30  | 38 | 32 | 28 | 33 | 29 | 25 | 29 | 26 | 23 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 27  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 24 | 21 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 27 | 23 | 29 | 24 | 21 | 25 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1119 | 1119 | 1119 |
| 5°  | 1120 | 1101 | 1108 |
| 10° | 1109 | 1079 | 1072 |
| 15° | 1093 | 1042 | 1016 |
| 20° | 1072 | 992  | 947  |
| 25° | 1050 | 937  | 881  |
| 30° | 1022 | 880  | 797  |
| 35° | 994  | 818  | 723  |
| 40° | 965  | 755  | 638  |
| 45° | 932  | 685  | 562  |
| 50° | 898  | 614  | 487  |
| 55° | 862  | 538  | 415  |
| 60° | 821  | 460  | 342  |
| 65° | 773  | 379  | 307  |
| 70° | 715  | 305  | 277  |
| 75° | 642  | 267  | 251  |
| 80° | 537  | 222  | 217  |
| 85° | 364  | 145  | 161  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 932 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 92.1   | 2.7       |
| 10°-20°   | 252.7  | 7.4       |
| 20°-30°   | 354.8  | 10.4      |
| 30°-40°   | 386.8  | 11.3      |
| 40°-50°   | 355.5  | 10.4      |
| 50°-60°   | 279.2  | 8.2       |
| 60°-70°   | 181.7  | 5.3       |
| 70°-80°   | 93.5   | 2.7       |
| 80°-90°   | 25.3   | 0.7       |
| 90°-100°  | 31.0   | 0.9       |
| 100°-110° | 98.5   | 2.9       |
| 110°-120° | 168.6  | 4.9       |
| 120°-130° | 221.7  | 6.5       |
| 130°-140° | 248.9  | 7.3       |
| 140°-150° | 244.1  | 7.1       |
| 150°-160° | 204.7  | 6.0       |
| 160°-170° | 135.8  | 4.0       |
| 170°-180° | 47.5   | 1.4       |
| <hr/>     |        |           |
| 0°-30°    | 699.6  | 20.4      |
| 0°-40°    | 1086.3 | 31.7      |
| 0°-60°    | 1720.9 | 50.3      |
| 0°-90°    | 2021.5 | 59.1      |
| 90°-120°  | 298.1  | 8.7       |
| 90°-150°  | 1012.8 | 29.6      |
| 90°-180°  | 1401.0 | 40.9      |
| 0°-180°   | 3422.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 982 | 982   | 982 | 982   | 982 |      |
| 5°   | 982 | 978   | 966 | 974   | 972 | 93   |
| 15°  | 934 | 924   | 894 | 877   | 868 | 263  |
| 25°  | 848 | 820   | 761 | 724   | 711 | 390  |
| 35°  | 731 | 685   | 607 | 551   | 532 | 457  |
| 45°  | 597 | 538   | 444 | 381   | 360 | 461  |
| 55°  | 454 | 385   | 289 | 236   | 219 | 406  |
| 65°  | 307 | 235   | 155 | 124   | 122 | 304  |
| 75°  | 164 | 101   | 71  | 65    | 64  | 173  |
| 85°  | 38  | 20    | 17  | 17    | 17  | 44   |
| 90°  | 0   | 6     | 15  | 14    | 14  | 3    |
| 95°  | 22  | 26    | 27  | 27    | 26  | 25   |
| 105° | 91  | 92    | 93  | 94    | 94  | 96   |
| 115° | 169 | 172   | 171 | 170   | 169 | 167  |
| 125° | 246 | 250   | 249 | 247   | 247 | 220  |
| 135° | 318 | 323   | 324 | 323   | 322 | 246  |
| 145° | 386 | 389   | 392 | 392   | 391 | 241  |
| 155° | 442 | 443   | 444 | 447   | 445 | 203  |
| 165° | 481 | 480   | 480 | 483   | 481 | 136  |
| 175° | 500 | 499   | 498 | 501   | 498 | 48   |
| 180° | 501 | 501   | 501 | 501   | 501 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 982.2 | 982.2 | 982.2 | 982.2 | 982.2 |
| 2.5°   | 986.7 | 982.2 | 972.4 | 981.4 | 979.6 |
| 5°     | 982.2 | 977.8 | 966.2 | 974.2 | 971.5 |
| 7.5°   | 974.2 | 968.9 | 956.5 | 960.0 | 955.5 |
| 10°    | 963.5 | 957.4 | 939.6 | 936.8 | 931.6 |
| 12.5°  | 950.2 | 942.2 | 918.2 | 912.9 | 903.1 |
| 15°    | 934.2 | 924.4 | 894.2 | 877.3 | 868.5 |
| 17.5°  | 915.5 | 901.3 | 864.0 | 844.5 | 830.2 |
| 20°    | 894.2 | 876.4 | 831.9 | 809.8 | 790.2 |
| 22.5°  | 871.2 | 850.6 | 799.1 | 768.9 | 755.6 |
| 25°    | 848.0 | 819.5 | 760.9 | 724.4 | 711.1 |
| 27.5°  | 820.5 | 790.2 | 725.3 | 683.6 | 663.1 |
| 30°    | 791.2 | 757.3 | 686.2 | 641.0 | 616.9 |
| 32.5°  | 762.6 | 721.8 | 649.0 | 595.6 | 573.3 |
| 35°    | 730.7 | 685.3 | 607.1 | 551.1 | 531.6 |
| 37.5°  | 699.6 | 650.6 | 568.0 | 506.6 | 484.5 |
| 40°    | 666.7 | 613.4 | 527.1 | 464.0 | 440.9 |
| 42.5°  | 632.9 | 576.1 | 486.2 | 420.4 | 398.2 |
| 45°    | 597.4 | 537.7 | 444.5 | 381.3 | 360.0 |
| 47.5°  | 563.6 | 500.5 | 404.5 | 341.3 | 321.8 |
| 50°    | 526.2 | 463.1 | 365.4 | 304.0 | 285.3 |
| 52.5°  | 489.7 | 423.1 | 328.0 | 269.3 | 252.5 |
| 55°    | 454.2 | 384.8 | 288.8 | 235.6 | 218.7 |
| 57.5°  | 417.8 | 346.7 | 254.3 | 204.5 | 190.2 |
| 60°    | 380.4 | 309.3 | 217.8 | 172.5 | 158.3 |
| 62.5°  | 344.0 | 272.9 | 186.6 | 144.0 | 137.0 |
| 65°    | 306.7 | 234.6 | 154.6 | 124.5 | 121.8 |
| 67.5°  | 271.2 | 199.1 | 124.5 | 109.3 | 106.6 |
| 70°    | 233.8 | 164.5 | 103.1 | 94.2  | 90.6  |
| 72.5°  | 198.2 | 132.4 | 86.2  | 79.1  | 77.3  |
| 75°    | 163.5 | 101.3 | 71.1  | 64.9  | 64.0  |
| 77.5°  | 128.9 | 71.9  | 56.0  | 52.4  | 50.6  |
| 80°    | 96.9  | 51.6  | 42.6  | 39.1  | 39.1  |
| 82.5°  | 67.5  | 34.7  | 29.3  | 27.6  | 27.6  |
| 85°    | 38.2  | 19.5  | 16.9  | 16.9  | 16.9  |
| 87.5°  | 14.3  | 7.1   | 7.1   | 6.3   | 6.3   |
| 90°    | 0.5   | 5.5   | 14.8  | 13.9  | 14.3  |
| 92.5°  | 9.3   | 12.7  | 13.2  | 13.6  | 13.6  |
| 95°    | 22.0  | 26.3  | 27.0  | 27.0  | 26.3  |
| 97.5°  | 36.7  | 40.6  | 42.3  | 42.3  | 42.3  |
| 100°   | 53.6  | 57.1  | 58.3  | 58.3  | 57.8  |
| 102.5° | 71.5  | 74.0  | 75.7  | 76.1  | 75.7  |
| 105°   | 90.9  | 92.1  | 93.1  | 93.8  | 93.8  |
| 107.5° | 110.3 | 112.1 | 112.1 | 112.4 | 110.3 |
| 110°   | 129.0 | 131.4 | 131.4 | 131.4 | 130.2 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 149.2 | 151.8 | 151.4 | 150.1 | 149.2 |
| 115°   | 169.2 | 171.6 | 170.9 | 170.4 | 169.2 |
| 117.5° | 189.0 | 192.3 | 190.2 | 189.0 | 187.7 |
| 120°   | 208.9 | 212.2 | 208.9 | 208.9 | 207.6 |
| 122.5° | 227.0 | 231.2 | 229.2 | 228.0 | 227.0 |
| 125°   | 246.1 | 249.9 | 248.7 | 247.3 | 246.8 |
| 127.5° | 264.7 | 269.3 | 267.7 | 265.9 | 264.7 |
| 130°   | 282.0 | 287.5 | 286.7 | 285.8 | 284.2 |
| 132.5° | 301.5 | 305.8 | 306.0 | 304.0 | 302.7 |
| 135°   | 318.3 | 323.0 | 323.8 | 323.4 | 322.2 |
| 137.5° | 337.0 | 340.8 | 341.6 | 341.3 | 339.4 |
| 140°   | 353.5 | 357.3 | 359.4 | 359.4 | 357.7 |
| 142.5° | 370.4 | 374.1 | 375.4 | 375.8 | 374.1 |
| 145°   | 386.4 | 389.4 | 391.9 | 392.3 | 390.6 |
| 147.5° | 400.8 | 404.6 | 406.4 | 407.1 | 405.4 |
| 150°   | 415.6 | 418.1 | 419.8 | 421.1 | 419.8 |
| 152.5° | 428.7 | 431.3 | 433.4 | 435.1 | 433.4 |
| 155°   | 441.9 | 443.1 | 444.4 | 446.6 | 445.2 |
| 157.5° | 453.2 | 454.1 | 454.9 | 457.9 | 455.7 |
| 160°   | 463.3 | 464.2 | 464.7 | 467.2 | 465.4 |
| 162.5° | 472.7 | 472.7 | 473.1 | 476.0 | 473.9 |
| 165°   | 480.7 | 480.2 | 480.2 | 483.2 | 481.2 |
| 167.5° | 487.9 | 486.6 | 486.6 | 489.6 | 487.5 |
| 170°   | 493.4 | 492.2 | 491.7 | 494.7 | 492.2 |
| 172.5° | 497.2 | 495.9 | 495.5 | 498.5 | 495.9 |
| 175°   | 500.2 | 499.0 | 498.0 | 501.1 | 498.5 |
| 177.5° | 501.8 | 500.7 | 499.7 | 502.2 | 499.7 |
| 180°   | 501.1 | 501.1 | 501.1 | 501.1 | 501.1 |

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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 | 8.31             | 9.22  | 9.19  | 10.12 | 11.26 | 4.27           | 5.18 | 5.16 | 6.08 | 7.22  |
|                 | 3H   | 9.99             | 10.81 | 10.89 | 11.71 | 12.88 | 5.46           | 6.27 | 6.36 | 7.18 | 8.35  |
|                 | 4H   | 10.60            | 11.37 | 11.51 | 12.28 | 13.46 | 5.91           | 6.68 | 6.82 | 7.59 | 8.77  |
|                 | 6H   | 11.02            | 11.73 | 11.94 | 12.65 | 13.84 | 6.23           | 6.94 | 7.15 | 7.86 | 9.04  |
|                 | 8H   | 11.15            | 11.82 | 12.08 | 12.76 | 13.94 | 6.32           | 6.99 | 7.25 | 7.93 | 9.11  |
|                 | 12H  | 11.21            | 11.85 | 12.15 | 12.78 | 13.99 | 6.36           | 7.00 | 7.30 | 7.93 | 9.14  |
| 4H              | 2H   | 8.34             | 9.11  | 9.25  | 10.02 | 11.19 | 4.87           | 5.64 | 5.79 | 6.56 | 7.73  |
|                 | 3H   | 10.17            | 10.81 | 11.09 | 11.75 | 12.94 | 6.22           | 6.86 | 7.15 | 7.81 | 9.00  |
|                 | 4H   | 10.86            | 11.44 | 11.80 | 12.38 | 13.60 | 6.77           | 7.35 | 7.71 | 8.29 | 9.51  |
|                 | 6H   | 11.38            | 11.88 | 12.33 | 12.84 | 14.05 | 7.19           | 7.69 | 8.14 | 8.65 | 9.86  |
|                 | 8H   | 11.55            | 12.02 | 12.50 | 12.97 | 14.20 | 7.31           | 7.78 | 8.27 | 8.74 | 9.97  |
|                 | 12H  | 11.65            | 12.07 | 12.62 | 13.04 | 14.27 | 7.38           | 7.80 | 8.35 | 8.77 | 10.01 |
| 8H              | 4H   | 10.83            | 11.30 | 11.78 | 12.26 | 13.48 | 7.05           | 7.52 | 8.00 | 8.48 | 9.71  |
|                 | 6H   | 11.40            | 11.78 | 12.37 | 12.78 | 14.01 | 7.57           | 7.95 | 8.54 | 8.95 | 10.18 |
|                 | 8H   | 11.61            | 11.95 | 12.60 | 12.94 | 14.18 | 7.75           | 8.09 | 8.74 | 9.08 | 10.33 |
|                 | 12H  | 11.75            | 12.05 | 12.74 | 13.03 | 14.32 | 7.87           | 8.17 | 8.86 | 9.15 | 10.44 |
| 12H             | 4H   | 10.79            | 11.21 | 11.76 | 12.18 | 13.42 | 7.06           | 7.48 | 8.03 | 8.46 | 9.69  |
|                 | 6H   | 11.37            | 11.71 | 12.36 | 12.70 | 13.95 | 7.61           | 7.95 | 8.60 | 8.94 | 10.19 |
|                 | 8H   | 11.59            | 11.89 | 12.58 | 12.87 | 14.17 | 7.82           | 8.12 | 8.81 | 9.10 | 10.40 |