

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: P902176

Luminaire Tested: DFN2DIP-4P3F0-020D020US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902176  
REPORT IS A COMBINATION OF REPORTS P899030 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-020D020US830-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

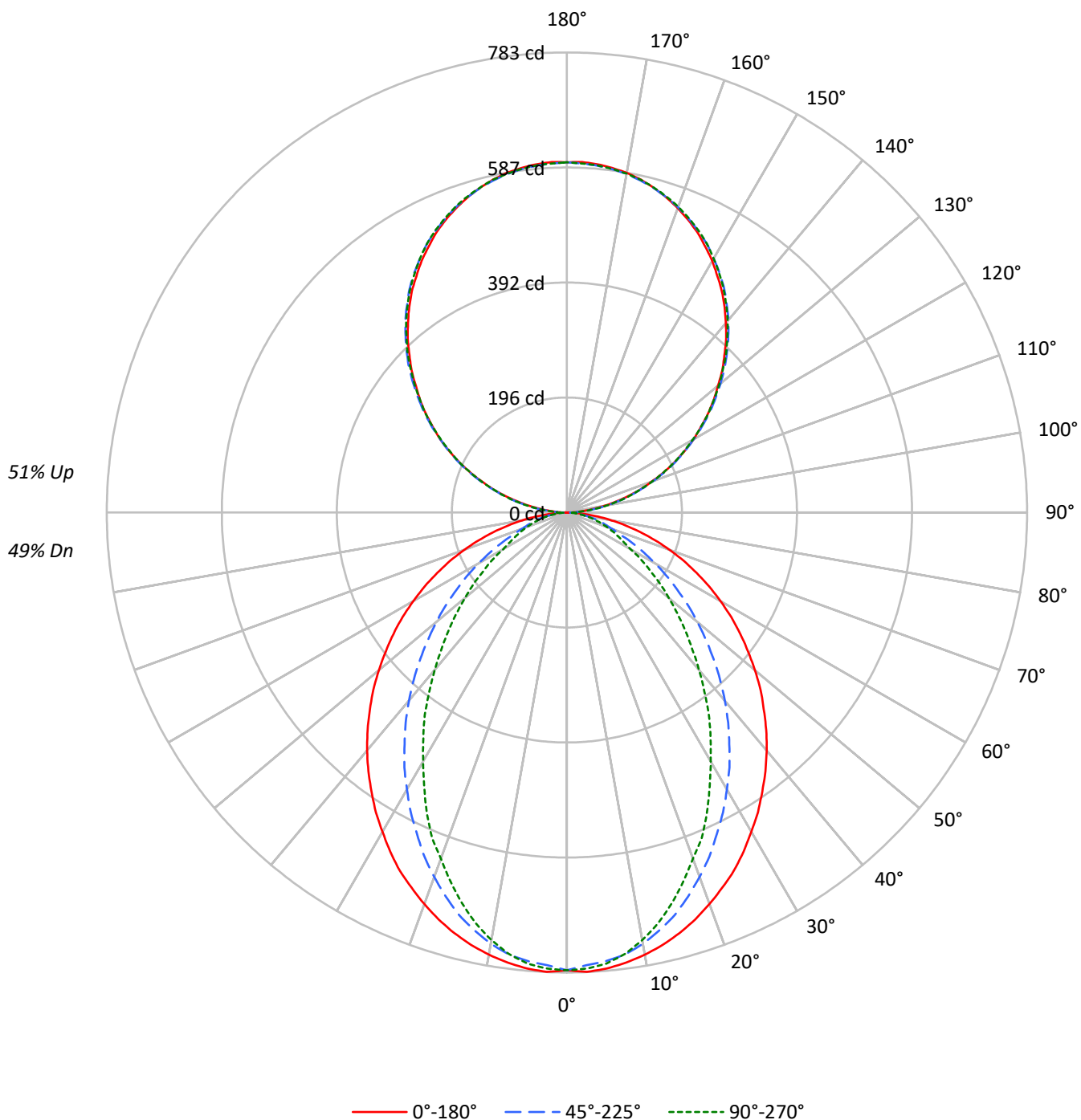
Lumens per Lamp: N/A  
Luminaire Lumens: 3270.6 lumens  
Efficiency: N/A  
Efficacy: 105.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 31  
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



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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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 888 | 888 | 888 |
| 5°  | 889 | 873 | 879 |
| 10° | 879 | 856 | 850 |
| 15° | 867 | 827 | 806 |
| 20° | 850 | 787 | 751 |
| 25° | 833 | 743 | 699 |
| 30° | 810 | 698 | 632 |
| 35° | 788 | 649 | 573 |
| 40° | 766 | 599 | 506 |
| 45° | 740 | 543 | 446 |
| 50° | 713 | 487 | 386 |
| 55° | 684 | 427 | 329 |
| 60° | 651 | 365 | 271 |
| 65° | 613 | 301 | 243 |
| 70° | 567 | 242 | 220 |
| 75° | 509 | 212 | 199 |
| 80° | 425 | 176 | 172 |
| 85° | 289 | 115 | 128 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 740 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 73.0   | 2.2       |
| 10°-20°   | 200.4  | 6.1       |
| 20°-30°   | 281.4  | 8.6       |
| 30°-40°   | 306.8  | 9.4       |
| 40°-50°   | 282.0  | 8.6       |
| 50°-60°   | 221.4  | 6.8       |
| 60°-70°   | 144.1  | 4.4       |
| 70°-80°   | 74.2   | 2.3       |
| 80°-90°   | 20.6   | 0.6       |
| 90°-100°  | 36.9   | 1.1       |
| 100°-110° | 117.2  | 3.6       |
| 110°-120° | 200.6  | 6.1       |
| 120°-130° | 263.8  | 8.1       |
| 130°-140° | 296.1  | 9.1       |
| 140°-150° | 290.4  | 8.9       |
| 150°-160° | 243.6  | 7.4       |
| 160°-170° | 161.5  | 4.9       |
| 170°-180° | 56.5   | 1.7       |
| 0°-30°    | 554.9  | 17.0      |
| 0°-40°    | 861.7  | 26.3      |
| 0°-60°    | 1365.1 | 41.7      |
| 0°-90°    | 1604.0 | 49.0      |
| 90°-120°  | 354.7  | 10.8      |
| 90°-150°  | 1205.0 | 36.8      |
| 90°-180°  | 1667.0 | 51.0      |
| 0°-180°   | 3270.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 779 | 779   | 779 | 779   | 779 |      |
| 5°   | 779 | 776   | 766 | 773   | 771 | 74   |
| 15°  | 741 | 733   | 709 | 696   | 689 | 209  |
| 25°  | 673 | 650   | 604 | 575   | 564 | 309  |
| 35°  | 580 | 544   | 482 | 437   | 422 | 363  |
| 45°  | 474 | 426   | 353 | 302   | 286 | 366  |
| 55°  | 360 | 305   | 229 | 187   | 173 | 322  |
| 65°  | 243 | 186   | 123 | 99    | 97  | 241  |
| 75°  | 130 | 80    | 56  | 52    | 51  | 137  |
| 85°  | 30  | 16    | 13  | 13    | 13  | 35   |
| 90°  | 1   | 6     | 18  | 16    | 17  | 3    |
| 95°  | 26  | 31    | 32  | 32    | 31  | 29   |
| 105° | 108 | 110   | 111 | 112   | 112 | 114  |
| 115° | 201 | 204   | 203 | 203   | 201 | 199  |
| 125° | 293 | 297   | 296 | 294   | 294 | 262  |
| 135° | 379 | 384   | 385 | 385   | 383 | 293  |
| 145° | 460 | 463   | 466 | 467   | 465 | 287  |
| 155° | 526 | 527   | 529 | 531   | 530 | 242  |
| 165° | 572 | 571   | 571 | 575   | 572 | 161  |
| 175° | 595 | 594   | 593 | 596   | 593 | 57   |
| 180° | 596 | 596   | 596 | 596   | 596 |      |

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CATALOG NUMBER: DFN2DIP-4P3F0-020D020US830-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 779.1 | 779.1 | 779.1 | 779.1 | 779.1 |
| 2.5°   | 782.6 | 779.1 | 771.3 | 778.4 | 777.0 |
| 5°     | 779.1 | 775.6 | 766.4 | 772.8 | 770.6 |
| 7.5°   | 772.8 | 768.5 | 758.7 | 761.5 | 757.9 |
| 10°    | 764.3 | 759.3 | 745.3 | 743.1 | 739.0 |
| 12.5°  | 753.8 | 747.3 | 728.3 | 724.2 | 716.3 |
| 15°    | 741.0 | 733.2 | 709.3 | 695.9 | 688.9 |
| 17.5°  | 726.2 | 714.9 | 685.3 | 669.8 | 658.6 |
| 20°    | 709.3 | 695.1 | 660.0 | 642.3 | 626.8 |
| 22.5°  | 691.0 | 674.8 | 633.9 | 609.9 | 599.4 |
| 25°    | 672.7 | 650.1 | 603.5 | 574.7 | 564.0 |
| 27.5°  | 650.8 | 626.8 | 575.3 | 542.2 | 525.9 |
| 30°    | 627.5 | 600.7 | 544.3 | 508.4 | 489.3 |
| 32.5°  | 604.9 | 572.5 | 514.7 | 472.4 | 454.8 |
| 35°    | 579.6 | 543.7 | 481.6 | 437.2 | 421.6 |
| 37.5°  | 554.9 | 516.0 | 450.5 | 401.9 | 384.3 |
| 40°    | 528.8 | 486.5 | 418.1 | 368.1 | 349.7 |
| 42.5°  | 502.0 | 456.9 | 385.7 | 333.5 | 315.9 |
| 45°    | 473.8 | 426.5 | 352.6 | 302.5 | 285.5 |
| 47.5°  | 447.0 | 397.0 | 320.8 | 270.7 | 255.2 |
| 50°    | 417.5 | 367.4 | 289.8 | 241.1 | 226.4 |
| 52.5°  | 388.4 | 335.5 | 260.1 | 213.7 | 200.3 |
| 55°    | 360.2 | 305.3 | 229.1 | 186.9 | 173.4 |
| 57.5°  | 331.4 | 274.9 | 201.7 | 162.2 | 150.9 |
| 60°    | 301.8 | 245.3 | 172.8 | 136.9 | 125.5 |
| 62.5°  | 272.9 | 216.5 | 148.1 | 114.2 | 108.6 |
| 65°    | 243.3 | 186.2 | 122.7 | 98.8  | 96.6  |
| 67.5°  | 215.1 | 157.9 | 98.8  | 86.7  | 84.6  |
| 70°    | 185.4 | 130.4 | 81.7  | 74.7  | 71.9  |
| 72.5°  | 157.2 | 105.0 | 68.3  | 62.8  | 61.4  |
| 75°    | 129.7 | 80.3  | 56.4  | 51.5  | 50.8  |
| 77.5°  | 102.3 | 57.1  | 44.4  | 41.6  | 40.2  |
| 80°    | 76.8  | 40.9  | 33.8  | 31.0  | 31.0  |
| 82.5°  | 53.5  | 27.5  | 23.3  | 21.9  | 21.9  |
| 85°    | 30.3  | 15.5  | 13.4  | 13.4  | 13.4  |
| 87.5°  | 11.3  | 5.7   | 5.7   | 4.9   | 4.9   |
| 90°    | 0.6   | 6.5   | 17.6  | 16.5  | 17.1  |
| 92.5°  | 11.1  | 15.1  | 15.6  | 16.2  | 16.2  |
| 95°    | 26.2  | 31.3  | 32.1  | 32.1  | 31.3  |
| 97.5°  | 43.6  | 48.4  | 50.3  | 50.3  | 50.3  |
| 100°   | 63.8  | 68.0  | 69.4  | 69.4  | 68.8  |
| 102.5° | 85.0  | 88.0  | 90.0  | 90.6  | 90.0  |
| 105°   | 108.2 | 109.6 | 110.7 | 111.6 | 111.6 |
| 107.5° | 131.2 | 133.4 | 133.4 | 133.7 | 131.2 |
| 110°   | 153.5 | 156.4 | 156.4 | 156.4 | 155.0 |



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CATALOG NUMBER: DFN2DIP-4P3F0-020D020US830-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 177.6 | 180.6 | 180.1 | 178.6 | 177.6 |
| 115°   | 201.3 | 204.2 | 203.3 | 202.7 | 201.3 |
| 117.5° | 224.9 | 228.8 | 226.3 | 224.9 | 223.4 |
| 120°   | 248.5 | 252.5 | 248.5 | 248.5 | 246.9 |
| 122.5° | 270.1 | 275.1 | 272.7 | 271.3 | 270.1 |
| 125°   | 292.8 | 297.3 | 295.9 | 294.3 | 293.7 |
| 127.5° | 314.9 | 320.5 | 318.5 | 316.3 | 314.9 |
| 130°   | 335.5 | 342.0 | 341.1 | 340.1 | 338.1 |
| 132.5° | 358.7 | 363.8 | 364.1 | 361.7 | 360.1 |
| 135°   | 378.7 | 384.3 | 385.3 | 384.8 | 383.3 |
| 137.5° | 401.0 | 405.5 | 406.4 | 406.0 | 403.9 |
| 140°   | 420.6 | 425.1 | 427.6 | 427.6 | 425.7 |
| 142.5° | 440.7 | 445.2 | 446.7 | 447.1 | 445.2 |
| 145°   | 459.8 | 463.4 | 466.3 | 466.7 | 464.8 |
| 147.5° | 476.8 | 481.4 | 483.5 | 484.4 | 482.4 |
| 150°   | 494.5 | 497.5 | 499.5 | 501.1 | 499.5 |
| 152.5° | 510.1 | 513.1 | 515.7 | 517.6 | 515.7 |
| 155°   | 525.8 | 527.2 | 528.8 | 531.3 | 529.7 |
| 157.5° | 539.2 | 540.3 | 541.2 | 544.8 | 542.2 |
| 160°   | 551.3 | 552.3 | 552.9 | 555.9 | 553.7 |
| 162.5° | 562.4 | 562.4 | 562.9 | 566.4 | 563.8 |
| 165°   | 571.9 | 571.4 | 571.4 | 575.0 | 572.5 |
| 167.5° | 580.5 | 578.9 | 578.9 | 582.5 | 580.0 |
| 170°   | 587.0 | 585.6 | 585.0 | 588.6 | 585.6 |
| 172.5° | 591.5 | 590.0 | 589.6 | 593.1 | 590.0 |
| 175°   | 595.1 | 593.7 | 592.6 | 596.2 | 593.1 |
| 177.5° | 597.1 | 595.7 | 594.6 | 597.6 | 594.6 |
| 180°   | 596.2 | 596.2 | 596.2 | 596.2 | 596.2 |

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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 | 6.61             | 7.43  | 7.58  | 8.41  | 9.70  | 2.57           | 3.39 | 3.54 | 4.37 | 5.66 |
|                 | 3H   | 8.28             | 9.02  | 9.26  | 10.01 | 11.32 | 3.75           | 4.49 | 4.73 | 5.48 | 6.79 |
|                 | 4H   | 8.88             | 9.58  | 9.88  | 10.57 | 11.89 | 4.20           | 4.89 | 5.19 | 5.89 | 7.20 |
|                 | 6H   | 9.30             | 9.94  | 10.31 | 10.94 | 12.27 | 4.51           | 5.15 | 5.52 | 6.15 | 7.48 |
|                 | 8H   | 9.43             | 10.04 | 10.44 | 11.05 | 12.38 | 4.60           | 5.21 | 5.61 | 6.22 | 7.55 |
|                 | 12H  | 9.49             | 10.07 | 10.50 | 11.07 | 12.42 | 4.64           | 5.22 | 5.66 | 6.23 | 7.58 |
| 4H              | 2H   | 6.62             | 7.32  | 7.63  | 8.31  | 9.63  | 3.16           | 3.86 | 4.16 | 4.85 | 6.17 |
|                 | 3H   | 8.45             | 9.02  | 9.46  | 10.05 | 11.38 | 4.50           | 5.08 | 5.51 | 6.11 | 7.44 |
|                 | 4H   | 9.13             | 9.66  | 10.15 | 10.68 | 12.03 | 5.05           | 5.57 | 6.07 | 6.59 | 7.95 |
|                 | 6H   | 9.64             | 10.10 | 10.67 | 11.14 | 12.49 | 5.46           | 5.91 | 6.49 | 6.95 | 8.30 |
|                 | 8H   | 9.82             | 10.24 | 10.85 | 11.27 | 12.64 | 5.58           | 6.01 | 6.61 | 7.04 | 8.41 |
|                 | 12H  | 9.91             | 10.29 | 10.96 | 11.34 | 12.71 | 5.64           | 6.03 | 6.69 | 7.07 | 8.45 |
| 8H              | 4H   | 9.10             | 9.52  | 10.13 | 10.56 | 11.92 | 5.32           | 5.75 | 6.35 | 6.78 | 8.14 |
|                 | 6H   | 9.66             | 10.01 | 10.71 | 11.08 | 12.45 | 5.83           | 6.18 | 6.89 | 7.26 | 8.62 |
|                 | 8H   | 9.87             | 10.18 | 10.94 | 11.24 | 12.62 | 6.02           | 6.33 | 7.08 | 7.39 | 8.77 |
|                 | 12H  | 10.01            | 10.28 | 11.07 | 11.33 | 12.76 | 6.13           | 6.40 | 7.20 | 7.46 | 8.88 |
| 12H             | 4H   | 9.05             | 9.43  | 10.10 | 10.48 | 11.85 | 5.33           | 5.71 | 6.38 | 6.76 | 8.13 |
|                 | 6H   | 9.64             | 9.94  | 10.70 | 11.00 | 12.38 | 5.88           | 6.19 | 6.94 | 7.25 | 8.63 |
|                 | 8H   | 9.85             | 10.12 | 10.92 | 11.18 | 12.60 | 6.09           | 6.36 | 7.15 | 7.41 | 8.83 |

END OF REPORT