

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: P913187

Luminaire Tested: DFN2DIP-4P4F0-030D030US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913187  
REPORT IS A COMBINATION OF REPORTS P900599 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D030US927-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

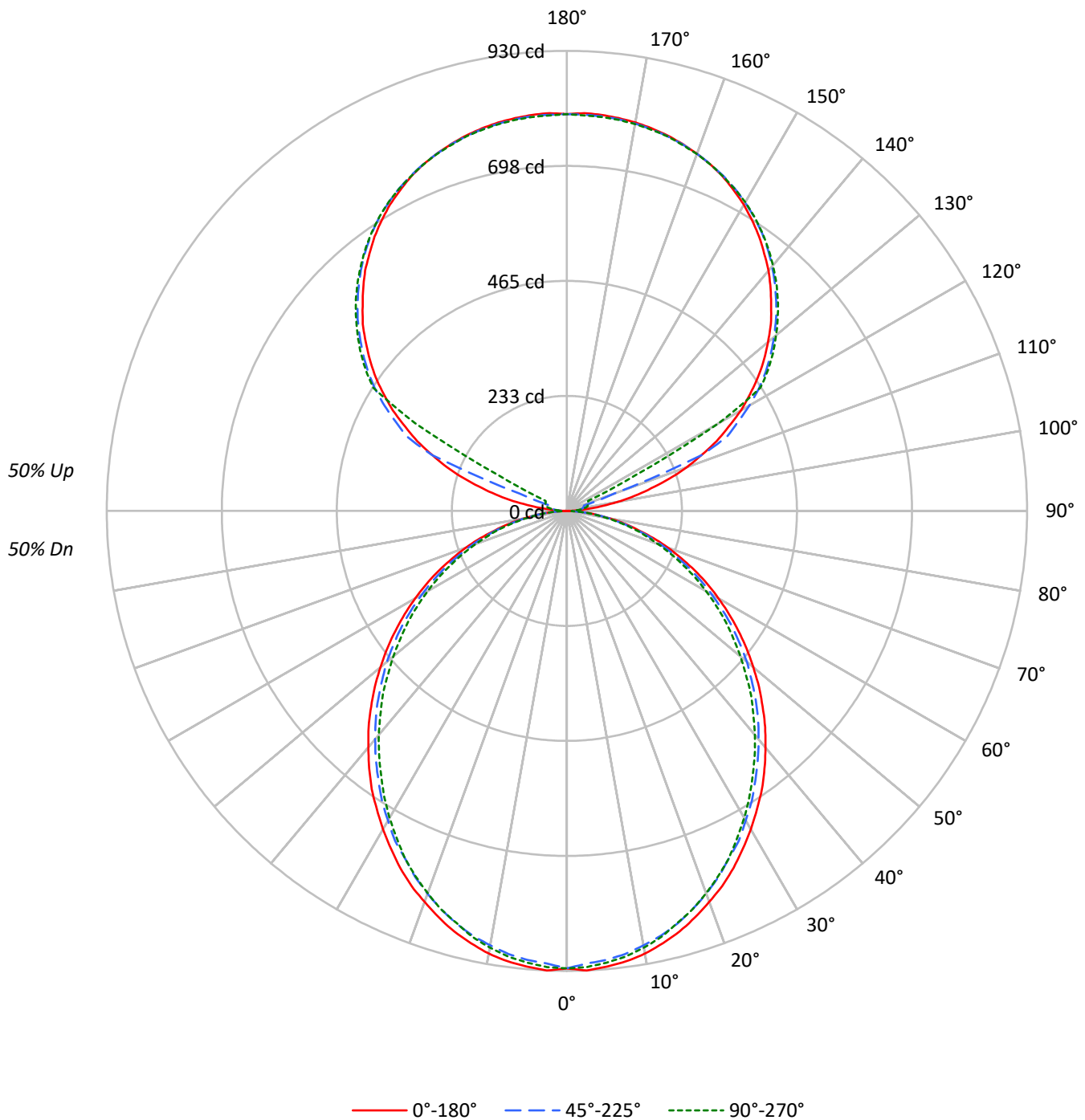
Lumens per Lamp: N/A  
Luminaire Lumens: 4705.6 lumens  
Efficiency: N/A  
Efficacy: 92.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 50.7  
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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 600 | 600 | 600 |
| 5°  | 601 | 592 | 596 |
| 10° | 596 | 584 | 588 |
| 15° | 587 | 575 | 575 |
| 20° | 576 | 561 | 563 |
| 25° | 564 | 546 | 548 |
| 30° | 549 | 531 | 529 |
| 35° | 535 | 514 | 510 |
| 40° | 518 | 496 | 491 |
| 45° | 501 | 479 | 471 |
| 50° | 482 | 460 | 449 |
| 55° | 463 | 439 | 429 |
| 60° | 440 | 414 | 405 |
| 65° | 416 | 387 | 377 |
| 70° | 386 | 356 | 348 |
| 75° | 343 | 318 | 321 |
| 80° | 292 | 269 | 268 |
| 85° | 212 | 185 | 181 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 501 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 87.0   | 1.8       |
| 10°-20°   | 244.9  | 5.2       |
| 20°-30°   | 359.9  | 7.6       |
| 30°-40°   | 418.0  | 8.9       |
| 40°-50°   | 417.5  | 8.9       |
| 50°-60°   | 364.0  | 7.7       |
| 60°-70°   | 269.1  | 5.7       |
| 70°-80°   | 152.3  | 3.2       |
| 80°-90°   | 41.6   | 0.9       |
| 90°-100°  | 26.5   | 0.6       |
| 100°-110° | 98.6   | 2.1       |
| 110°-120° | 261.5  | 5.6       |
| 120°-130° | 433.7  | 9.2       |
| 130°-140° | 460.7  | 9.8       |
| 140°-150° | 428.1  | 9.1       |
| 150°-160° | 344.2  | 7.3       |
| 160°-170° | 221.8  | 4.7       |
| 170°-180° | 76.3   | 1.6       |
| 0°-30°    | 691.8  | 14.7      |
| 0°-40°    | 1109.8 | 23.6      |
| 0°-60°    | 1891.3 | 40.2      |
| 0°-90°    | 2354.2 | 50.0      |
| 90°-120°  | 386.5  | 8.2       |
| 90°-150°  | 1709.0 | 36.3      |
| 90°-180°  | 2351.0 | 50.0      |
| 0°-180°   | 4705.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 925 | 925   | 925 | 925   | 925 |      |
| 5°   | 925 | 921   | 911 | 918   | 917 | 88   |
| 15°  | 880 | 875   | 863 | 867   | 862 | 248  |
| 25°  | 797 | 790   | 774 | 776   | 774 | 367  |
| 35°  | 687 | 678   | 664 | 659   | 654 | 429  |
| 45°  | 559 | 553   | 540 | 530   | 526 | 432  |
| 55°  | 423 | 418   | 407 | 397   | 392 | 378  |
| 65°  | 286 | 280   | 271 | 263   | 259 | 282  |
| 75°  | 149 | 148   | 143 | 138   | 140 | 159  |
| 85°  | 36  | 36    | 35  | 32    | 31  | 41   |
| 90°  | 1   | 7     | 12  | 15    | 16  | 4    |
| 95°  | 38  | 18    | 23  | 26    | 25  | 45   |
| 105° | 176 | 194   | 35  | 42    | 44  | 188  |
| 115° | 334 | 344   | 358 | 89    | 48  | 329  |
| 125° | 472 | 479   | 490 | 494   | 496 | 421  |
| 135° | 584 | 593   | 598 | 604   | 603 | 451  |
| 145° | 677 | 677   | 687 | 691   | 688 | 424  |
| 155° | 746 | 741   | 748 | 751   | 746 | 344  |
| 165° | 786 | 782   | 784 | 788   | 784 | 222  |
| 175° | 804 | 800   | 801 | 805   | 799 | 76   |
| 180° | 802 | 802   | 802 | 802   | 802 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 924.7 | 924.7 | 924.7 | 924.7 | 924.7 |
| 2.5°   | 930.1 | 925.7 | 915.8 | 924.7 | 923.0 |
| 5°     | 924.7 | 921.2 | 911.4 | 918.5 | 916.8 |
| 7.5°   | 918.5 | 913.2 | 903.4 | 910.6 | 908.8 |
| 10°    | 908.8 | 902.5 | 891.9 | 899.0 | 896.4 |
| 12.5°  | 895.4 | 890.1 | 879.5 | 883.8 | 882.1 |
| 15°    | 880.3 | 875.0 | 863.4 | 867.0 | 862.5 |
| 17.5°  | 861.6 | 856.3 | 844.7 | 849.1 | 844.7 |
| 20°    | 841.1 | 835.8 | 823.4 | 826.0 | 822.5 |
| 22.5°  | 820.8 | 812.8 | 801.1 | 801.1 | 799.3 |
| 25°    | 796.7 | 789.6 | 774.5 | 776.3 | 774.5 |
| 27.5°  | 770.0 | 763.7 | 752.3 | 749.6 | 745.2 |
| 30°    | 743.4 | 736.3 | 722.9 | 720.3 | 716.7 |
| 32.5°  | 714.9 | 709.6 | 695.4 | 690.0 | 686.4 |
| 35°    | 687.4 | 678.5 | 664.2 | 658.9 | 654.4 |
| 37.5°  | 656.2 | 648.2 | 634.0 | 627.7 | 623.3 |
| 40°    | 624.2 | 617.1 | 602.8 | 594.9 | 591.4 |
| 42.5°  | 593.1 | 586.0 | 571.8 | 562.8 | 557.5 |
| 45°    | 559.4 | 553.1 | 539.7 | 530.0 | 526.4 |
| 47.5°  | 526.4 | 520.2 | 506.0 | 496.1 | 490.8 |
| 50°    | 491.7 | 487.3 | 474.8 | 462.4 | 458.0 |
| 52.5°  | 458.0 | 451.7 | 440.2 | 430.4 | 424.1 |
| 55°    | 423.3 | 418.0 | 407.3 | 396.6 | 392.2 |
| 57.5°  | 388.6 | 384.1 | 372.6 | 361.9 | 358.3 |
| 60°    | 353.9 | 350.4 | 337.9 | 328.1 | 325.5 |
| 62.5°  | 320.1 | 313.9 | 305.0 | 296.1 | 292.6 |
| 65°    | 285.5 | 280.1 | 271.2 | 263.2 | 258.8 |
| 67.5°  | 249.9 | 245.4 | 237.4 | 231.2 | 227.7 |
| 70°    | 217.0 | 213.4 | 205.4 | 199.2 | 195.7 |
| 72.5°  | 183.2 | 179.6 | 175.2 | 169.0 | 166.4 |
| 75°    | 149.3 | 147.7 | 143.1 | 137.8 | 139.7 |
| 77.5°  | 119.1 | 115.6 | 113.8 | 111.1 | 108.5 |
| 80°    | 89.0  | 88.0  | 86.2  | 83.6  | 81.8  |
| 82.5°  | 60.4  | 60.4  | 59.7  | 56.0  | 56.0  |
| 85°    | 36.4  | 35.6  | 34.7  | 32.0  | 31.1  |
| 87.5°  | 16.0  | 14.3  | 12.4  | 9.8   | 8.9   |
| 90°    | 0.6   | 7.0   | 11.6  | 14.6  | 15.6  |
| 92.5°  | 14.6  | 12.2  | 13.9  | 15.1  | 15.6  |
| 95°    | 37.7  | 18.5  | 22.6  | 25.6  | 25.0  |
| 97.5°  | 67.9  | 20.4  | 29.5  | 31.4  | 31.9  |
| 100°   | 102.7 | 23.2  | 33.1  | 37.7  | 38.9  |
| 102.5° | 141.0 | 139.9 | 34.2  | 40.6  | 42.4  |
| 105°   | 176.4 | 193.8 | 35.4  | 41.7  | 44.1  |
| 107.5° | 217.6 | 232.1 | 36.6  | 42.9  | 45.3  |
| 110°   | 257.1 | 269.3 | 101.6 | 43.6  | 45.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 294.3 | 304.7 | 294.8 | 44.7  | 46.4  |
| 115°   | 333.7 | 343.6 | 358.1 | 89.4  | 47.6  |
| 117.5° | 368.0 | 379.5 | 389.4 | 306.4 | 154.4 |
| 120°   | 406.2 | 414.9 | 425.4 | 432.4 | 354.0 |
| 122.5° | 438.7 | 448.1 | 459.7 | 463.1 | 463.7 |
| 125°   | 471.8 | 479.3 | 490.4 | 494.5 | 496.2 |
| 127.5° | 502.0 | 510.1 | 518.9 | 524.7 | 525.2 |
| 130°   | 530.4 | 539.8 | 546.1 | 552.5 | 552.0 |
| 132.5° | 559.4 | 567.0 | 573.4 | 578.6 | 578.1 |
| 135°   | 583.8 | 593.2 | 598.3 | 604.2 | 603.0 |
| 137.5° | 609.3 | 616.3 | 622.2 | 628.0 | 626.2 |
| 140°   | 634.3 | 639.0 | 645.3 | 650.5 | 647.7 |
| 142.5° | 655.3 | 659.3 | 666.9 | 671.5 | 668.6 |
| 145°   | 677.3 | 676.7 | 686.6 | 690.6 | 687.7 |
| 147.5° | 696.4 | 694.7 | 704.6 | 707.4 | 705.1 |
| 150°   | 715.0 | 711.0 | 720.3 | 723.7 | 720.8 |
| 152.5° | 730.6 | 726.0 | 734.7 | 738.2 | 734.2 |
| 155°   | 745.8 | 740.6 | 747.5 | 751.0 | 746.4 |
| 157.5° | 758.0 | 753.4 | 758.6 | 762.6 | 758.0 |
| 160°   | 768.4 | 764.9 | 768.4 | 771.9 | 767.8 |
| 162.5° | 777.7 | 774.2 | 777.1 | 781.2 | 775.9 |
| 165°   | 785.8 | 782.4 | 784.1 | 788.1 | 784.1 |
| 167.5° | 792.2 | 788.7 | 790.4 | 794.6 | 789.3 |
| 170°   | 797.4 | 793.9 | 795.1 | 799.2 | 793.9 |
| 172.5° | 800.9 | 797.4 | 798.6 | 802.6 | 797.4 |
| 175°   | 803.7 | 799.7 | 800.9 | 804.9 | 799.2 |
| 177.5° | 804.9 | 800.9 | 801.5 | 805.6 | 800.3 |
| 180°   | 802.1 | 802.1 | 802.1 | 802.1 | 802.1 |

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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 | 5.52             | 6.38  | 6.47  | 7.35  | 8.62  | 5.07           | 5.94 | 6.03  | 6.91  | 8.18  |
|                 | 3H   | 7.18             | 7.96  | 8.15  | 8.94  | 10.23 | 6.69           | 7.47 | 7.66  | 8.45  | 9.74  |
|                 | 4H   | 7.78             | 8.51  | 8.76  | 9.49  | 10.79 | 7.28           | 8.01 | 8.26  | 9.00  | 10.30 |
|                 | 6H   | 8.18             | 8.85  | 9.17  | 9.84  | 11.16 | 7.68           | 8.35 | 8.67  | 9.34  | 10.66 |
|                 | 8H   | 8.29             | 8.93  | 9.29  | 9.94  | 11.25 | 7.79           | 8.43 | 8.78  | 9.43  | 10.75 |
|                 | 12H  | 8.34             | 8.95  | 9.34  | 9.95  | 11.28 | 7.83           | 8.44 | 8.83  | 9.44  | 10.78 |
| 4H              | 2H   | 5.98             | 6.71  | 6.97  | 7.70  | 9.00  | 5.63           | 6.36 | 6.61  | 7.34  | 8.64  |
|                 | 3H   | 7.85             | 8.46  | 8.85  | 9.48  | 10.79 | 7.45           | 8.06 | 8.44  | 9.07  | 10.39 |
|                 | 4H   | 8.57             | 9.13  | 9.58  | 10.14 | 11.48 | 8.15           | 8.71 | 9.15  | 9.71  | 11.05 |
|                 | 6H   | 9.09             | 9.57  | 10.11 | 10.60 | 11.94 | 8.66           | 9.14 | 9.68  | 10.17 | 11.51 |
|                 | 8H   | 9.24             | 9.69  | 10.26 | 10.72 | 12.07 | 8.81           | 9.26 | 9.83  | 10.28 | 11.63 |
|                 | 12H  | 9.32             | 9.73  | 10.36 | 10.77 | 12.12 | 8.87           | 9.28 | 9.91  | 10.32 | 11.67 |
| 8H              | 4H   | 8.77             | 9.22  | 9.79  | 10.24 | 11.59 | 8.39           | 8.84 | 9.41  | 9.87  | 11.22 |
|                 | 6H   | 9.41             | 9.78  | 10.45 | 10.84 | 12.19 | 9.02           | 9.40 | 10.07 | 10.46 | 11.81 |
|                 | 8H   | 9.63             | 9.96  | 10.68 | 11.01 | 12.38 | 9.24           | 9.57 | 10.29 | 10.62 | 11.98 |
|                 | 12H  | 9.77             | 10.05 | 10.82 | 11.10 | 12.51 | 9.36           | 9.64 | 10.41 | 10.69 | 12.10 |
| 12H             | 4H   | 8.76             | 9.16  | 9.79  | 10.20 | 11.56 | 8.39           | 8.79 | 9.42  | 9.83  | 11.19 |
|                 | 6H   | 9.44             | 9.76  | 10.49 | 10.82 | 12.18 | 9.07           | 9.39 | 10.12 | 10.44 | 11.81 |
|                 | 8H   | 9.68             | 9.97  | 10.74 | 11.02 | 12.43 | 9.30           | 9.59 | 10.36 | 10.64 | 12.05 |

END OF REPORT