

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: P916123

Luminaire Tested: DFN2DIP-HX2F0-050D030US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916123  
REPORT IS A COMBINATION OF REPORTS P900687 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-050D030US930-FLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

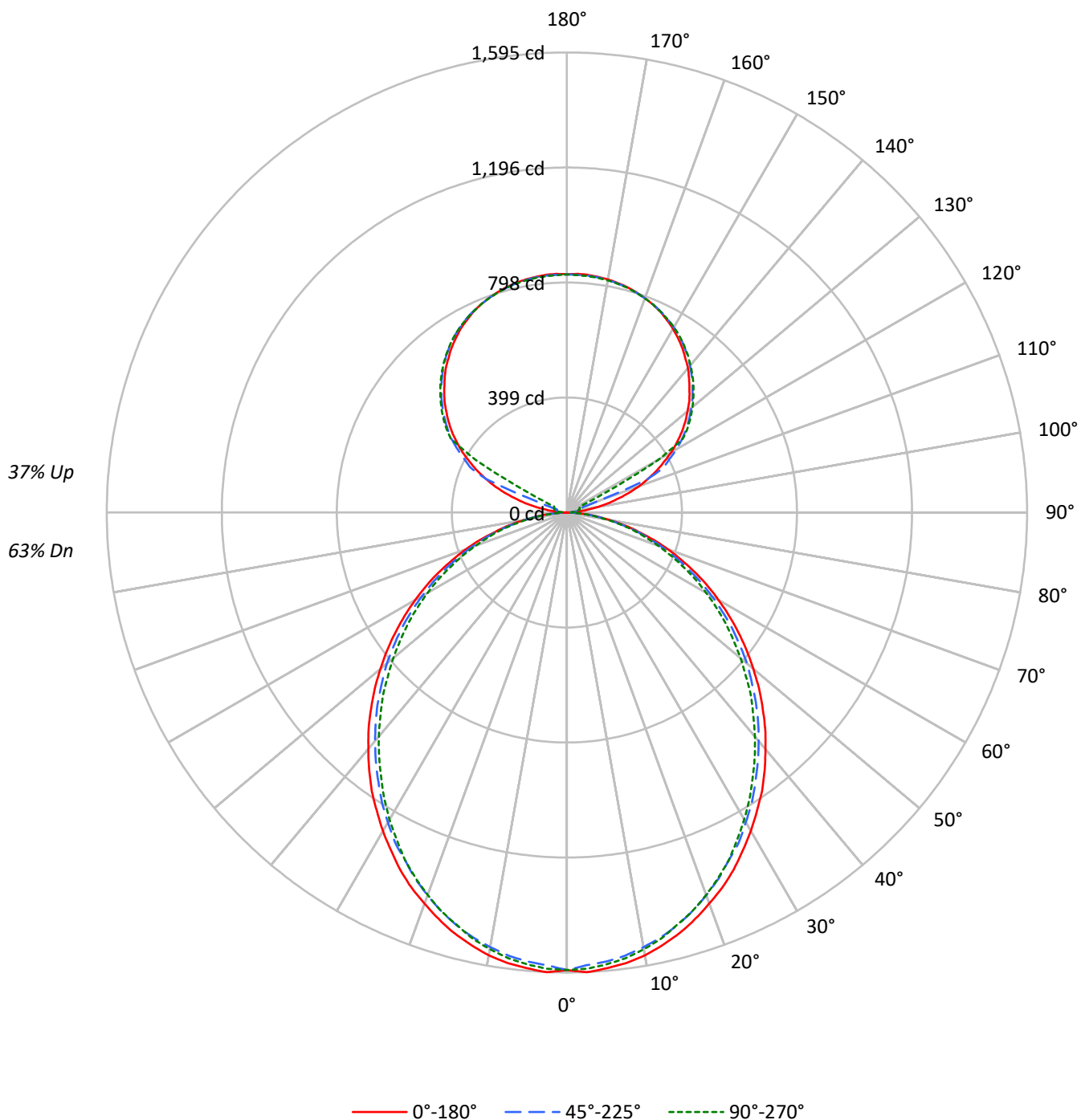
Lumens per Lamp: N/A  
Luminaire Lumens: 6457.2 lumens  
Efficiency: N/A  
Efficacy: 93.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 69.3  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 78 | 78 | 78 | 68 | 68 | 68 |
| 1   | 101 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 79 | 77 | 74 | 69 | 67 | 65 | 60 | 58 | 57 |
| 2   | 92  | 84  | 78  | 72  | 86  | 79  | 73  | 69  | 69 | 65 | 62 | 61 | 58 | 55 | 53 | 50 | 48 |
| 3   | 84  | 74  | 66  | 60  | 78  | 70  | 63  | 57  | 61 | 56 | 52 | 54 | 50 | 46 | 47 | 44 | 41 |
| 4   | 77  | 65  | 57  | 51  | 71  | 62  | 54  | 49  | 55 | 49 | 44 | 48 | 43 | 40 | 42 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 38 | 34 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 47  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 35 | 31 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 37  | 30  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 34  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3737 | 3737 | 3737 |
| 5°  | 3737 | 3676 | 3703 |
| 10° | 3701 | 3618 | 3646 |
| 15° | 3641 | 3549 | 3561 |
| 20° | 3561 | 3458 | 3474 |
| 25° | 3482 | 3350 | 3375 |
| 30° | 3384 | 3249 | 3250 |
| 35° | 3291 | 3132 | 3119 |
| 40° | 3177 | 3013 | 2993 |
| 45° | 3063 | 2893 | 2865 |
| 50° | 2939 | 2767 | 2717 |
| 55° | 2808 | 2621 | 2578 |
| 60° | 2660 | 2450 | 2420 |
| 65° | 2497 | 2271 | 2233 |
| 70° | 2290 | 2053 | 2032 |
| 75° | 2006 | 1791 | 1836 |
| 80° | 1661 | 1458 | 1481 |
| 85° | 1128 | 915  | 917  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3063 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 149.3  | 2.3       |
| 10°-20°   | 420.0  | 6.5       |
| 20°-30°   | 617.3  | 9.6       |
| 30°-40°   | 717.0  | 11.1      |
| 40°-50°   | 716.1  | 11.1      |
| 50°-60°   | 624.4  | 9.7       |
| 60°-70°   | 461.6  | 7.1       |
| 70°-80°   | 261.1  | 4.0       |
| 80°-90°   | 70.4   | 1.1       |
| 90°-100°  | 27.2   | 0.4       |
| 100°-110° | 101.5  | 1.6       |
| 110°-120° | 269.1  | 4.2       |
| 120°-130° | 446.3  | 6.9       |
| 130°-140° | 474.1  | 7.3       |
| 140°-150° | 440.6  | 6.8       |
| 150°-160° | 354.3  | 5.5       |
| 160°-170° | 228.3  | 3.5       |
| 170°-180° | 78.6   | 1.2       |
| 0°-30°    | 1186.6 | 18.4      |
| 0°-40°    | 1903.6 | 29.5      |
| 0°-60°    | 3244.1 | 50.2      |
| 0°-90°    | 4037.2 | 62.5      |
| 90°-120°  | 397.8  | 6.2       |
| 90°-150°  | 1758.9 | 27.2      |
| 90°-180°  | 2420.0 | 37.5      |
| 0°-180°   | 6457.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1586 | 1586  | 1586 | 1586  | 1586 |      |
| 5°   | 1586 | 1580  | 1563 | 1576  | 1573 | 151  |
| 15°  | 1510 | 1501  | 1481 | 1487  | 1480 | 425  |
| 25°  | 1367 | 1354  | 1328 | 1332  | 1328 | 629  |
| 35°  | 1179 | 1164  | 1139 | 1130  | 1123 | 736  |
| 45°  | 959  | 949   | 926  | 909   | 903  | 740  |
| 55°  | 726  | 717   | 698  | 680   | 673  | 649  |
| 65°  | 490  | 480   | 465  | 452   | 444  | 484  |
| 75°  | 256  | 253   | 246  | 236   | 240  | 273  |
| 85°  | 62   | 61    | 60   | 55    | 53   | 70   |
| 90°  | 1    | 7     | 12   | 15    | 16   | 6    |
| 95°  | 39   | 19    | 23   | 26    | 26   | 46   |
| 105° | 182  | 200   | 36   | 43    | 45   | 194  |
| 115° | 343  | 354   | 368  | 92    | 49   | 338  |
| 125° | 486  | 493   | 505  | 509   | 511  | 433  |
| 135° | 601  | 610   | 616  | 622   | 621  | 464  |
| 145° | 697  | 696   | 707  | 711   | 708  | 436  |
| 155° | 768  | 762   | 769  | 773   | 768  | 354  |
| 165° | 809  | 805   | 807  | 811   | 807  | 228  |
| 175° | 827  | 823   | 824  | 828   | 822  | 79   |
| 180° | 826  | 826   | 826  | 826   | 826  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1586.2 | 1586.2 | 1586.2 | 1586.2 | 1586.2 |
| 2.5°   | 1595.4 | 1587.8 | 1571.0 | 1586.2 | 1583.3 |
| 5°     | 1586.2 | 1580.2 | 1563.3 | 1575.5 | 1572.6 |
| 7.5°   | 1575.5 | 1566.4 | 1549.6 | 1561.9 | 1558.9 |
| 10°    | 1558.9 | 1548.2 | 1529.9 | 1542.0 | 1537.5 |
| 12.5°  | 1535.9 | 1526.8 | 1508.5 | 1516.1 | 1513.0 |
| 15°    | 1509.9 | 1500.9 | 1481.0 | 1487.2 | 1479.5 |
| 17.5°  | 1477.9 | 1468.8 | 1448.9 | 1456.5 | 1448.9 |
| 20°    | 1442.8 | 1433.8 | 1412.4 | 1416.9 | 1411.0 |
| 22.5°  | 1407.9 | 1394.1 | 1374.2 | 1374.2 | 1371.1 |
| 25°    | 1366.6 | 1354.5 | 1328.5 | 1331.5 | 1328.5 |
| 27.5°  | 1320.8 | 1310.1 | 1290.4 | 1285.8 | 1278.2 |
| 30°    | 1275.1 | 1262.9 | 1240.1 | 1235.5 | 1229.4 |
| 32.5°  | 1226.3 | 1217.2 | 1192.8 | 1183.6 | 1177.5 |
| 35°    | 1179.0 | 1163.8 | 1139.4 | 1130.2 | 1122.6 |
| 37.5°  | 1125.6 | 1111.9 | 1087.4 | 1076.8 | 1069.2 |
| 40°    | 1070.8 | 1058.5 | 1034.0 | 1020.4 | 1014.3 |
| 42.5°  | 1017.4 | 1005.1 | 980.8  | 965.4  | 956.3  |
| 45°    | 959.4  | 948.8  | 925.8  | 909.1  | 902.9  |
| 47.5°  | 902.9  | 892.3  | 867.9  | 851.0  | 842.0  |
| 50°    | 843.4  | 835.8  | 814.5  | 793.1  | 785.5  |
| 52.5°  | 785.5  | 774.8  | 755.0  | 738.3  | 727.6  |
| 55°    | 726.1  | 716.9  | 698.5  | 680.3  | 672.7  |
| 57.5°  | 666.5  | 658.9  | 639.0  | 620.8  | 614.6  |
| 60°    | 607.0  | 601.0  | 579.7  | 562.8  | 558.3  |
| 62.5°  | 549.1  | 538.4  | 523.2  | 507.9  | 501.8  |
| 65°    | 489.7  | 480.5  | 465.2  | 451.5  | 443.8  |
| 67.5°  | 428.7  | 420.9  | 407.3  | 396.6  | 390.4  |
| 70°    | 372.2  | 366.1  | 352.3  | 341.6  | 335.7  |
| 72.5°  | 314.3  | 308.1  | 300.5  | 289.8  | 285.3  |
| 75°    | 256.2  | 253.2  | 245.5  | 236.4  | 239.5  |
| 77.5°  | 204.4  | 198.2  | 195.2  | 190.6  | 186.1  |
| 80°    | 152.6  | 151.0  | 147.9  | 143.4  | 140.3  |
| 82.5°  | 103.7  | 103.7  | 102.2  | 96.1   | 96.1   |
| 85°    | 62.5   | 61.0   | 59.5   | 54.9   | 53.4   |
| 87.5°  | 27.5   | 24.5   | 21.4   | 16.8   | 15.2   |
| 90°    | 0.6    | 7.2    | 11.9   | 15.0   | 16.1   |
| 92.5°  | 15.0   | 12.6   | 14.3   | 15.6   | 16.1   |
| 95°    | 38.8   | 19.1   | 23.2   | 26.3   | 25.7   |
| 97.5°  | 69.9   | 21.0   | 30.4   | 32.3   | 32.9   |
| 100°   | 105.7  | 23.9   | 34.1   | 38.8   | 40.0   |
| 102.5° | 145.1  | 144.0  | 35.2   | 41.7   | 43.6   |
| 105°   | 181.6  | 199.5  | 36.4   | 43.0   | 45.4   |
| 107.5° | 224.0  | 238.9  | 37.7   | 44.2   | 46.6   |
| 110°   | 264.6  | 277.1  | 104.5  | 44.8   | 47.2   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 302.9 | 313.6 | 303.5 | 46.0  | 47.8  |
| 115°   | 343.4 | 353.6 | 368.5 | 92.0  | 49.0  |
| 117.5° | 378.7 | 390.6 | 400.8 | 315.4 | 158.9 |
| 120°   | 418.1 | 427.1 | 437.8 | 445.0 | 364.4 |
| 122.5° | 451.5 | 461.1 | 473.1 | 476.6 | 477.3 |
| 125°   | 485.6 | 493.3 | 504.8 | 508.9 | 510.7 |
| 127.5° | 516.7 | 525.0 | 534.0 | 540.0 | 540.5 |
| 130°   | 545.9 | 555.5 | 562.1 | 568.6 | 568.1 |
| 132.5° | 575.8 | 583.6 | 590.1 | 595.5 | 594.9 |
| 135°   | 600.9 | 610.5 | 615.8 | 621.8 | 620.6 |
| 137.5° | 627.1 | 634.3 | 640.3 | 646.3 | 644.5 |
| 140°   | 652.8 | 657.6 | 664.1 | 669.5 | 666.6 |
| 142.5° | 674.4 | 678.6 | 686.3 | 691.0 | 688.1 |
| 145°   | 697.1 | 696.4 | 706.6 | 710.8 | 707.8 |
| 147.5° | 716.7 | 714.9 | 725.1 | 728.1 | 725.7 |
| 150°   | 735.9 | 731.7 | 741.3 | 744.8 | 741.8 |
| 152.5° | 751.9 | 747.2 | 756.2 | 759.8 | 755.6 |
| 155°   | 767.5 | 762.2 | 769.3 | 772.9 | 768.2 |
| 157.5° | 780.1 | 775.3 | 780.7 | 784.9 | 780.1 |
| 160°   | 790.8 | 787.3 | 790.8 | 794.4 | 790.2 |
| 162.5° | 800.4 | 796.8 | 799.8 | 804.0 | 798.6 |
| 165°   | 808.7 | 805.2 | 807.0 | 811.1 | 807.0 |
| 167.5° | 815.3 | 811.7 | 813.5 | 817.7 | 812.4 |
| 170°   | 820.7 | 817.1 | 818.3 | 822.5 | 817.1 |
| 172.5° | 824.3 | 820.7 | 821.9 | 826.1 | 820.7 |
| 175°   | 827.2 | 823.0 | 824.3 | 828.4 | 822.5 |
| 177.5° | 828.4 | 824.3 | 824.9 | 829.1 | 823.7 |
| 180°   | 825.5 | 825.5 | 825.5 | 825.5 | 825.5 |

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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 | 12.80            | 13.78 | 13.64 | 14.65 | 15.73 | 12.37          | 13.36 | 13.22 | 14.22 | 15.31 |
|                 | 3H   | 14.44            | 15.33 | 15.30 | 16.20 | 17.31 | 13.98          | 14.87 | 14.84 | 15.74 | 16.85 |
|                 | 4H   | 15.02            | 15.85 | 15.89 | 16.73 | 17.85 | 14.56          | 15.40 | 15.43 | 16.28 | 17.39 |
|                 | 6H   | 15.40            | 16.18 | 16.29 | 17.06 | 18.19 | 14.95          | 15.72 | 15.83 | 16.60 | 17.74 |
|                 | 8H   | 15.50            | 16.24 | 16.39 | 17.14 | 18.27 | 15.05          | 15.78 | 15.94 | 16.69 | 17.82 |
|                 | 12H  | 15.55            | 16.25 | 16.44 | 17.15 | 18.30 | 15.08          | 15.79 | 15.98 | 16.68 | 17.84 |
| 4H              | 2H   | 13.26            | 14.10 | 14.14 | 14.98 | 16.10 | 12.93          | 13.76 | 13.80 | 14.64 | 15.76 |
|                 | 3H   | 15.11            | 15.81 | 16.00 | 16.72 | 17.86 | 14.73          | 15.43 | 15.61 | 16.34 | 17.47 |
|                 | 4H   | 15.81            | 16.45 | 16.71 | 17.36 | 18.52 | 15.42          | 16.05 | 16.32 | 16.96 | 18.12 |
|                 | 6H   | 16.31            | 16.86 | 17.22 | 17.79 | 18.95 | 15.91          | 16.46 | 16.83 | 17.40 | 18.56 |
|                 | 8H   | 16.45            | 16.96 | 17.37 | 17.89 | 19.07 | 16.05          | 16.57 | 16.97 | 17.49 | 18.67 |
|                 | 12H  | 16.52            | 16.98 | 17.45 | 17.93 | 19.11 | 16.11          | 16.58 | 17.05 | 17.52 | 18.70 |
| 8H              | 4H   | 16.01            | 16.52 | 16.92 | 17.45 | 18.62 | 15.66          | 16.17 | 16.57 | 17.10 | 18.27 |
|                 | 6H   | 16.61            | 17.04 | 17.56 | 18.01 | 19.18 | 16.26          | 16.69 | 17.21 | 17.66 | 18.83 |
|                 | 8H   | 16.82            | 17.20 | 17.77 | 18.16 | 19.35 | 16.46          | 16.84 | 17.42 | 17.80 | 18.99 |
|                 | 12H  | 16.94            | 17.27 | 17.90 | 18.22 | 19.46 | 16.57          | 16.90 | 17.53 | 17.86 | 19.10 |
| 12H             | 4H   | 16.00            | 16.46 | 16.93 | 17.40 | 18.58 | 15.65          | 16.12 | 16.59 | 17.06 | 18.24 |
|                 | 6H   | 16.64            | 17.02 | 17.59 | 17.98 | 19.17 | 16.30          | 16.68 | 17.25 | 17.64 | 18.83 |
|                 | 8H   | 16.87            | 17.20 | 17.82 | 18.15 | 19.39 | 16.52          | 16.86 | 17.48 | 17.81 | 19.05 |

END OF REPORT