

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: P915874

Luminaire Tested: DFN2DIP-4P3F0-050D020US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915874  
REPORT IS A COMBINATION OF REPORTS P899035 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-050D020US930-FLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

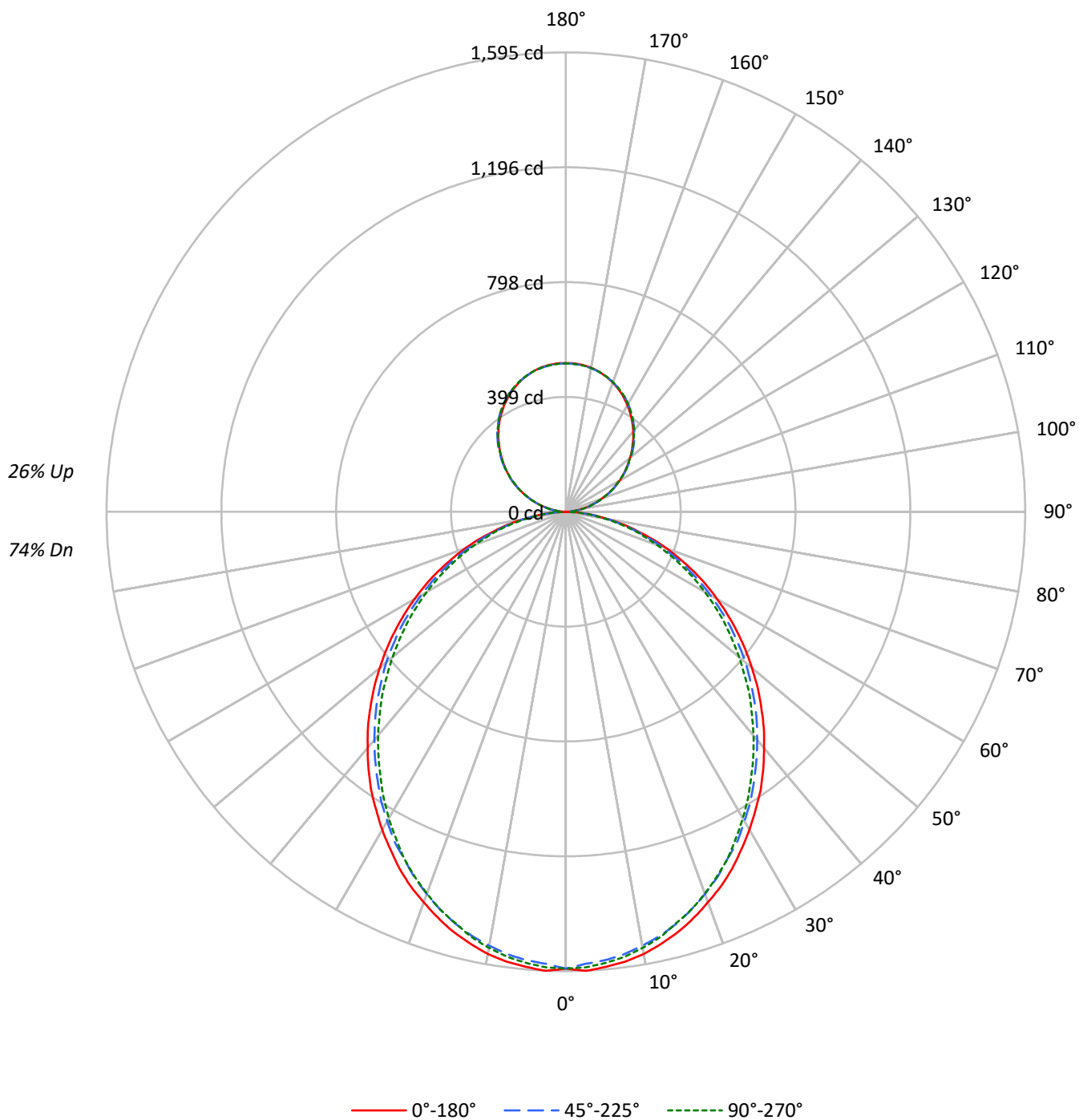
Lumens per Lamp: N/A  
Luminaire Lumens: 5478.8 lumens  
Efficiency: N/A  
Efficacy: 85.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 64.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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   | 113 | 113 | 113 | 113 | 107 | 107 | 107 | 107 | 96 | 96 | 96 | 87 | 87 | 87 | 78 | 78 | 78 |
| 1   | 103 | 99  | 95  | 91  | 98  | 94  | 90  | 87  | 85 | 82 | 80 | 77 | 74 | 72 | 69 | 67 | 66 |
| 2   | 94  | 86  | 80  | 74  | 89  | 82  | 76  | 71  | 74 | 70 | 66 | 67 | 64 | 61 | 61 | 58 | 55 |
| 3   | 86  | 76  | 68  | 62  | 81  | 72  | 65  | 60  | 66 | 60 | 55 | 59 | 55 | 51 | 54 | 50 | 47 |
| 4   | 79  | 67  | 59  | 53  | 74  | 64  | 57  | 51  | 58 | 52 | 47 | 53 | 48 | 44 | 48 | 44 | 41 |
| 5   | 72  | 60  | 52  | 45  | 68  | 57  | 50  | 44  | 52 | 46 | 41 | 48 | 42 | 38 | 43 | 39 | 36 |
| 6   | 67  | 54  | 46  | 40  | 63  | 52  | 44  | 38  | 47 | 41 | 36 | 43 | 38 | 34 | 39 | 35 | 31 |
| 7   | 62  | 49  | 41  | 35  | 58  | 47  | 39  | 34  | 43 | 37 | 32 | 39 | 34 | 30 | 36 | 31 | 28 |
| 8   | 57  | 45  | 37  | 31  | 54  | 43  | 35  | 30  | 39 | 33 | 28 | 36 | 31 | 27 | 33 | 29 | 25 |
| 9   | 54  | 41  | 33  | 28  | 51  | 39  | 32  | 27  | 36 | 30 | 26 | 33 | 28 | 24 | 31 | 26 | 23 |
| 10  | 50  | 38  | 30  | 25  | 48  | 36  | 29  | 24  | 33 | 27 | 23 | 31 | 26 | 22 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1808 | 1808 | 1808 |
| 5°  | 1809 | 1781 | 1794 |
| 10° | 1794 | 1756 | 1769 |
| 15° | 1766 | 1726 | 1730 |
| 20° | 1729 | 1685 | 1691 |
| 25° | 1693 | 1635 | 1645 |
| 30° | 1647 | 1590 | 1588 |
| 35° | 1604 | 1536 | 1527 |
| 40° | 1551 | 1481 | 1469 |
| 45° | 1497 | 1426 | 1409 |
| 50° | 1439 | 1369 | 1341 |
| 55° | 1379 | 1302 | 1277 |
| 60° | 1310 | 1224 | 1205 |
| 65° | 1234 | 1142 | 1119 |
| 70° | 1138 | 1042 | 1027 |
| 75° | 1006 | 923  | 940  |
| 80° | 845  | 770  | 777  |
| 85° | 596  | 510  | 509  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1497 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 149.3  | 2.7       |
| 10°-20°   | 420.0  | 7.7       |
| 20°-30°   | 617.3  | 11.3      |
| 30°-40°   | 717.0  | 13.1      |
| 40°-50°   | 716.1  | 13.1      |
| 50°-60°   | 624.4  | 11.4      |
| 60°-70°   | 461.6  | 8.4       |
| 70°-80°   | 261.1  | 4.8       |
| 80°-90°   | 70.4   | 1.3       |
| 90°-100°  | 31.9   | 0.6       |
| 100°-110° | 101.4  | 1.9       |
| 110°-120° | 173.5  | 3.2       |
| 120°-130° | 228.2  | 4.2       |
| 130°-140° | 256.1  | 4.7       |
| 140°-150° | 251.2  | 4.6       |
| 150°-160° | 210.7  | 3.8       |
| 160°-170° | 139.7  | 2.6       |
| 170°-180° | 48.8   | 0.9       |
| 0°-30°    | 1186.6 | 21.7      |
| 0°-40°    | 1903.6 | 34.7      |
| 0°-60°    | 3244.1 | 59.2      |
| 0°-90°    | 4037.2 | 73.7      |
| 90°-120°  | 306.8  | 5.6       |
| 90°-150°  | 1042.3 | 19.0      |
| 90°-180°  | 1442.0 | 26.3      |
| 0°-180°   | 5478.8 | 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°  | 0    | 6     | 15   | 14    | 15   | 5    |
| 95°  | 23   | 27    | 28   | 28    | 27   | 25   |
| 105° | 94   | 95    | 96   | 96    | 96   | 99   |
| 115° | 174  | 177   | 176  | 175   | 174  | 172  |
| 125° | 253  | 257   | 256  | 254   | 254  | 226  |
| 135° | 328  | 332   | 333  | 333   | 332  | 253  |
| 145° | 398  | 401   | 403  | 404   | 402  | 248  |
| 155° | 455  | 456   | 457  | 460   | 458  | 209  |
| 165° | 495  | 494   | 494  | 497   | 495  | 140  |
| 175° | 515  | 514   | 513  | 516   | 513  | 49   |
| 180° | 516  | 516   | 516  | 516   | 516  |      |

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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°    | 0.5    | 5.6    | 15.2   | 14.3   | 14.8   |
| 92.5°  | 9.6    | 13.0   | 13.5   | 14.0   | 14.0   |
| 95°    | 22.7   | 27.1   | 27.8   | 27.8   | 27.1   |
| 97.5°  | 37.7   | 41.8   | 43.5   | 43.5   | 43.5   |
| 100°   | 55.2   | 58.8   | 60.0   | 60.0   | 59.5   |
| 102.5° | 73.5   | 76.1   | 77.9   | 78.4   | 77.9   |
| 105°   | 93.6   | 94.8   | 95.8   | 96.5   | 96.5   |
| 107.5° | 113.5  | 115.4  | 115.4  | 115.7  | 113.5  |
| 110°   | 132.8  | 135.3  | 135.3  | 135.3  | 134.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 153.6 | 156.2 | 155.8 | 154.5 | 153.6 |
| 115°   | 174.1 | 176.6 | 175.9 | 175.4 | 174.1 |
| 117.5° | 194.5 | 198.0 | 195.8 | 194.5 | 193.2 |
| 120°   | 215.0 | 218.4 | 215.0 | 215.0 | 213.6 |
| 122.5° | 233.7 | 238.0 | 235.9 | 234.6 | 233.7 |
| 125°   | 253.2 | 257.1 | 255.9 | 254.5 | 254.0 |
| 127.5° | 272.4 | 277.2 | 275.5 | 273.6 | 272.4 |
| 130°   | 290.2 | 295.9 | 295.1 | 294.2 | 292.4 |
| 132.5° | 310.3 | 314.7 | 314.9 | 312.8 | 311.5 |
| 135°   | 327.6 | 332.4 | 333.3 | 332.9 | 331.6 |
| 137.5° | 346.8 | 350.7 | 351.6 | 351.2 | 349.4 |
| 140°   | 363.8 | 367.7 | 369.9 | 369.9 | 368.2 |
| 142.5° | 381.2 | 385.1 | 386.4 | 386.8 | 385.1 |
| 145°   | 397.7 | 400.8 | 403.3 | 403.7 | 402.0 |
| 147.5° | 412.5 | 416.4 | 418.2 | 419.0 | 417.3 |
| 150°   | 427.7 | 430.3 | 432.0 | 433.4 | 432.0 |
| 152.5° | 441.2 | 443.8 | 446.0 | 447.8 | 446.0 |
| 155°   | 454.8 | 456.0 | 457.4 | 459.6 | 458.2 |
| 157.5° | 466.4 | 467.3 | 468.1 | 471.2 | 469.0 |
| 160°   | 476.9 | 477.8 | 478.3 | 480.9 | 479.0 |
| 162.5° | 486.5 | 486.5 | 486.9 | 489.9 | 487.7 |
| 165°   | 494.7 | 494.2 | 494.2 | 497.3 | 495.2 |
| 167.5° | 502.1 | 500.8 | 500.8 | 503.9 | 501.7 |
| 170°   | 507.8 | 506.5 | 506.1 | 509.2 | 506.5 |
| 172.5° | 511.7 | 510.4 | 510.0 | 513.1 | 510.4 |
| 175°   | 514.8 | 513.6 | 512.6 | 515.7 | 513.1 |
| 177.5° | 516.5 | 515.3 | 514.3 | 516.9 | 514.3 |
| 180°   | 515.7 | 515.7 | 515.7 | 515.7 | 515.7 |

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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 | 11.24            | 12.37 | 11.97 | 13.11 | 14.00 | 10.80          | 11.92 | 11.52 | 12.67 | 13.55 |
|                 | 3H   | 12.92            | 13.93 | 13.65 | 14.68 | 15.60 | 12.43          | 13.44 | 13.16 | 14.19 | 15.11 |
|                 | 4H   | 13.51            | 14.47 | 14.27 | 15.23 | 16.16 | 13.02          | 13.97 | 13.78 | 14.74 | 15.67 |
|                 | 6H   | 13.92            | 14.80 | 14.69 | 15.58 | 16.52 | 13.42          | 14.30 | 14.19 | 15.08 | 16.02 |
|                 | 8H   | 14.03            | 14.87 | 14.81 | 15.67 | 16.61 | 13.53          | 14.37 | 14.31 | 15.16 | 16.11 |
|                 | 12H  | 14.09            | 14.89 | 14.87 | 15.68 | 16.65 | 13.58          | 14.38 | 14.36 | 15.17 | 16.14 |
| 4H              | 2H   | 11.73            | 12.68 | 12.49 | 13.45 | 14.38 | 11.38          | 12.33 | 12.13 | 13.09 | 14.02 |
|                 | 3H   | 13.61            | 14.41 | 14.39 | 15.21 | 16.16 | 13.21          | 14.00 | 13.98 | 14.80 | 15.75 |
|                 | 4H   | 14.34            | 15.06 | 15.12 | 15.86 | 16.84 | 13.91          | 14.64 | 14.70 | 15.44 | 16.41 |
|                 | 6H   | 14.86            | 15.49 | 15.67 | 16.31 | 17.30 | 14.43          | 15.06 | 15.23 | 15.88 | 16.86 |
|                 | 8H   | 15.02            | 15.60 | 15.82 | 16.42 | 17.42 | 14.58          | 15.16 | 15.39 | 15.98 | 16.98 |
|                 | 12H  | 15.10            | 15.63 | 15.93 | 16.47 | 17.47 | 14.65          | 15.18 | 15.48 | 16.02 | 17.02 |
| 8H              | 4H   | 14.55            | 15.14 | 15.36 | 15.96 | 16.95 | 14.17          | 14.76 | 14.98 | 15.58 | 16.57 |
|                 | 6H   | 15.19            | 15.67 | 16.02 | 16.53 | 17.53 | 14.80          | 15.29 | 15.64 | 16.15 | 17.15 |
|                 | 8H   | 15.41            | 15.84 | 16.25 | 16.70 | 17.71 | 15.01          | 15.45 | 15.86 | 16.30 | 17.32 |
|                 | 12H  | 15.55            | 15.93 | 16.40 | 16.78 | 17.84 | 15.14          | 15.52 | 15.99 | 16.37 | 17.43 |
| 12H             | 4H   | 14.55            | 15.07 | 15.37 | 15.92 | 16.92 | 14.18          | 14.71 | 15.01 | 15.55 | 16.55 |
|                 | 6H   | 15.22            | 15.65 | 16.06 | 16.51 | 17.52 | 14.84          | 15.28 | 15.69 | 16.13 | 17.15 |
|                 | 8H   | 15.47            | 15.85 | 16.32 | 16.70 | 17.77 | 15.09          | 15.47 | 15.94 | 16.32 | 17.38 |

END OF REPORT