

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: P921133

Luminaire Tested: DFN2DIP-TR4F0-100D050US935-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921133  
REPORT IS A COMBINATION OF REPORTS P901920 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-100D050US935-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

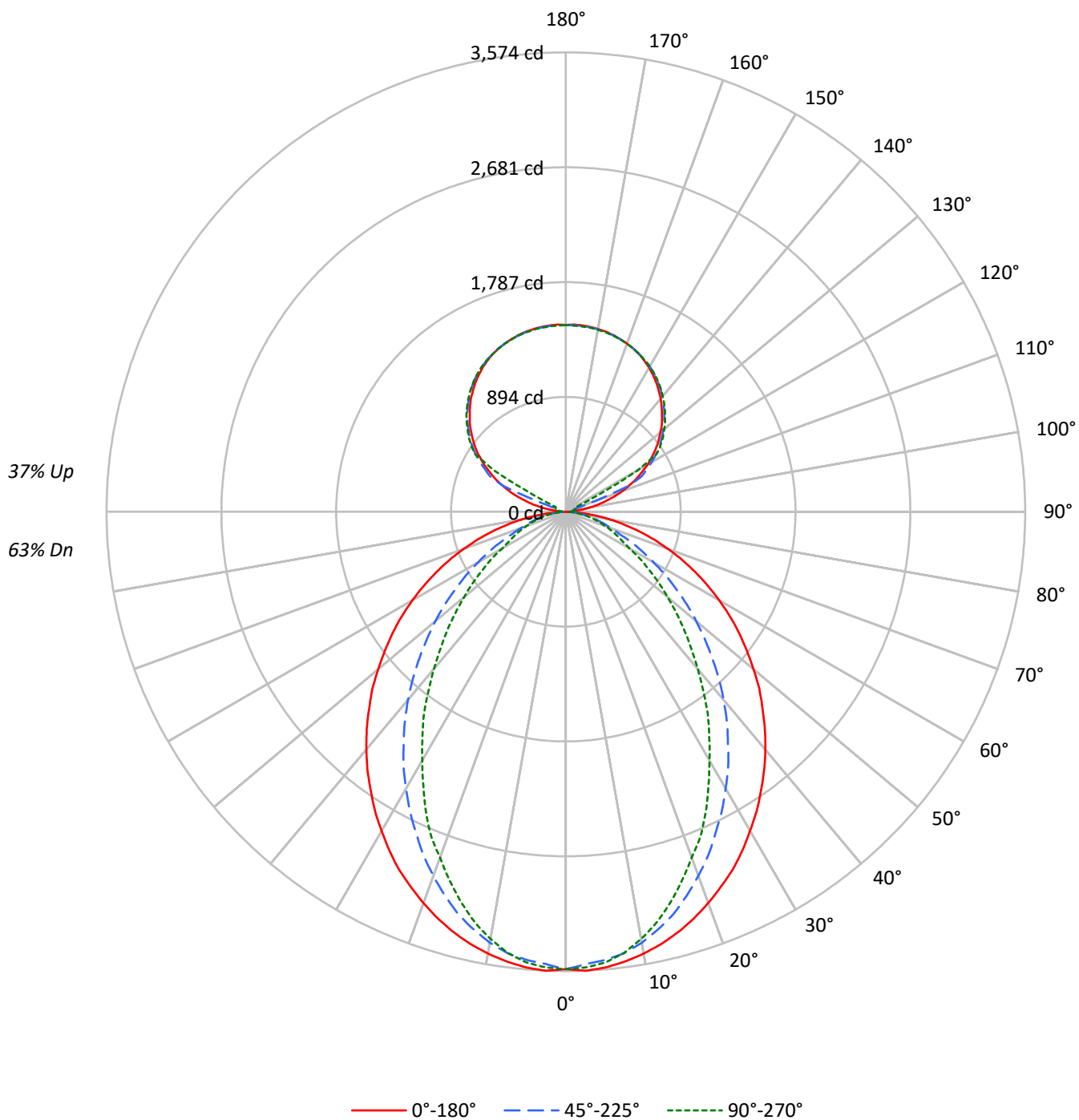
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11580.5 lumens  
Efficiency: N/A  
Efficacy: 83.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 138.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 52 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 44 |
| 4   | 78  | 68  | 60  | 54  | 73  | 64  | 57  | 52  | 57 | 51 | 47 | 50 | 46 | 43 | 44 | 41 | 38 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 46 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 30 | 34 | 30 | 27 |
| 8   | 58  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 37  | 30  | 25  | 33 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2827 | 2827 | 2827 |
| 5°  | 2832 | 2782 | 2800 |
| 10° | 2803 | 2727 | 2709 |
| 15° | 2765 | 2637 | 2568 |
| 20° | 2714 | 2513 | 2395 |
| 25° | 2662 | 2374 | 2228 |
| 30° | 2592 | 2231 | 2016 |
| 35° | 2523 | 2077 | 1830 |
| 40° | 2453 | 1918 | 1617 |
| 45° | 2371 | 1742 | 1424 |
| 50° | 2287 | 1564 | 1235 |
| 55° | 2200 | 1374 | 1053 |
| 60° | 2098 | 1175 | 867  |
| 65° | 1981 | 973  | 780  |
| 70° | 1840 | 784  | 706  |
| 75° | 1662 | 691  | 642  |
| 80° | 1404 | 580  | 557  |
| 85° | 979  | 387  | 418  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2371 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 333.5   | 2.9       |
| 10°-20°   | 915.5   | 7.9       |
| 20°-30°   | 1285.4  | 11.1      |
| 30°-40°   | 1401.2  | 12.1      |
| 40°-50°   | 1287.8  | 11.1      |
| 50°-60°   | 1011.4  | 8.7       |
| 60°-70°   | 658.3   | 5.7       |
| 70°-80°   | 338.9   | 2.9       |
| 80°-90°   | 89.1    | 0.8       |
| 90°-100°  | 47.9    | 0.4       |
| 100°-110° | 178.6   | 1.5       |
| 110°-120° | 473.7   | 4.1       |
| 120°-130° | 785.6   | 6.8       |
| 130°-140° | 834.5   | 7.2       |
| 140°-150° | 775.6   | 6.7       |
| 150°-160° | 623.5   | 5.4       |
| 160°-170° | 401.8   | 3.5       |
| 170°-180° | 138.3   | 1.2       |
| 0°-30°    | 2534.4  | 21.9      |
| 0°-40°    | 3935.6  | 34.0      |
| 0°-60°    | 6234.8  | 53.8      |
| 0°-90°    | 7321.0  | 63.2      |
| 90°-120°  | 700.2   | 6.0       |
| 90°-150°  | 3095.8  | 26.7      |
| 90°-180°  | 4259.0  | 36.8      |
| 0°-180°   | 11580.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3558 | 3558  | 3558 | 3558  | 3558 |      |
| 5°   | 3558 | 3542  | 3500 | 3530  | 3520 | 337  |
| 15°  | 3385 | 3349  | 3240 | 3178  | 3146 | 954  |
| 25°  | 3072 | 2969  | 2757 | 2625  | 2576 | 1413 |
| 35°  | 2647 | 2483  | 2200 | 1997  | 1926 | 1657 |
| 45°  | 2164 | 1948  | 1610 | 1381  | 1304 | 1671 |
| 55°  | 1646 | 1394  | 1046 | 854   | 792  | 1470 |
| 65°  | 1111 | 850   | 560  | 451   | 441  | 1102 |
| 75°  | 592  | 367   | 258  | 235   | 232  | 627  |
| 85°  | 138  | 71    | 61   | 61    | 61   | 159  |
| 90°  | 1    | 13    | 21   | 26    | 28   | 11   |
| 95°  | 68   | 34    | 41   | 46    | 45   | 81   |
| 105° | 320  | 351   | 64   | 76    | 80   | 342  |
| 115° | 604  | 622   | 649  | 162   | 86   | 595  |
| 125° | 855  | 868   | 888  | 896   | 899  | 762  |
| 135° | 1058 | 1074  | 1084 | 1094  | 1092 | 817  |
| 145° | 1227 | 1226  | 1244 | 1251  | 1246 | 767  |
| 155° | 1351 | 1342  | 1354 | 1360  | 1352 | 622  |
| 165° | 1423 | 1417  | 1420 | 1428  | 1420 | 402  |
| 175° | 1456 | 1449  | 1451 | 1458  | 1448 | 139  |
| 180° | 1453 | 1453  | 1453 | 1453  | 1453 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3558.5 | 3558.5 | 3558.5 | 3558.5 | 3558.5 |
| 2.5°   | 3574.5 | 3558.5 | 3522.9 | 3555.4 | 3548.9 |
| 5°     | 3558.5 | 3542.4 | 3500.4 | 3529.5 | 3519.8 |
| 7.5°   | 3529.5 | 3510.3 | 3465.2 | 3477.8 | 3461.8 |
| 10°    | 3490.8 | 3468.3 | 3404.0 | 3394.1 | 3375.0 |
| 12.5°  | 3442.7 | 3413.6 | 3326.5 | 3307.4 | 3271.8 |
| 15°    | 3384.6 | 3349.0 | 3239.7 | 3178.5 | 3146.4 |
| 17.5°  | 3316.9 | 3265.3 | 3130.1 | 3059.3 | 3007.7 |
| 20°    | 3239.7 | 3175.1 | 3014.2 | 2933.9 | 2862.8 |
| 22.5°  | 3156.0 | 3081.9 | 2894.9 | 2785.7 | 2737.5 |
| 25°    | 3072.3 | 2969.2 | 2756.6 | 2624.7 | 2576.2 |
| 27.5°  | 2972.5 | 2862.8 | 2627.8 | 2476.4 | 2402.3 |
| 30°    | 2866.3 | 2743.6 | 2486.0 | 2322.0 | 2234.9 |
| 32.5°  | 2763.1 | 2614.8 | 2351.0 | 2157.7 | 2077.0 |
| 35°    | 2647.2 | 2482.9 | 2199.7 | 1996.7 | 1925.6 |
| 37.5°  | 2534.5 | 2357.2 | 2057.9 | 1835.5 | 1755.1 |
| 40°    | 2415.3 | 2222.2 | 1909.6 | 1681.0 | 1597.3 |
| 42.5°  | 2292.9 | 2086.9 | 1761.7 | 1523.2 | 1442.9 |
| 45°    | 2164.1 | 1948.2 | 1610.3 | 1381.4 | 1304.2 |
| 47.5°  | 2041.9 | 1813.3 | 1465.4 | 1236.5 | 1165.8 |
| 50°    | 1906.5 | 1677.9 | 1323.6 | 1101.2 | 1033.9 |
| 52.5°  | 1774.3 | 1532.7 | 1188.3 | 975.8  | 914.6  |
| 55°    | 1645.5 | 1394.4 | 1046.5 | 853.5  | 792.3  |
| 57.5°  | 1513.6 | 1255.9 | 921.2  | 740.7  | 689.1  |
| 60°    | 1378.3 | 1120.7 | 788.9  | 624.9  | 573.3  |
| 62.5°  | 1246.4 | 988.8  | 676.1  | 521.8  | 496.1  |
| 65°    | 1111.1 | 850.1  | 560.3  | 451.0  | 441.1  |
| 67.5°  | 982.3  | 721.3  | 451.0  | 396.0  | 386.4  |
| 70°    | 847.0  | 595.9  | 373.4  | 341.3  | 328.4  |
| 72.5°  | 718.2  | 479.7  | 312.3  | 286.6  | 280.2  |
| 75°    | 592.5  | 367.0  | 257.6  | 235.1  | 232.0  |
| 77.5°  | 467.1  | 260.7  | 202.9  | 189.9  | 183.5  |
| 80°    | 350.9  | 186.9  | 154.5  | 141.8  | 141.8  |
| 82.5°  | 244.6  | 125.7  | 106.2  | 99.8   | 99.8   |
| 85°    | 138.4  | 70.7   | 61.1   | 61.1   | 61.1   |
| 87.5°  | 51.6   | 25.7   | 25.7   | 22.6   | 22.6   |
| 90°    | 1.0    | 12.6   | 21.0   | 26.3   | 28.3   |
| 92.5°  | 26.3   | 22.1   | 25.2   | 27.4   | 28.3   |
| 95°    | 68.3   | 33.6   | 41.0   | 46.3   | 45.2   |
| 97.5°  | 123.0  | 36.9   | 53.6   | 56.8   | 57.8   |
| 100°   | 186.1  | 42.1   | 59.9   | 68.3   | 70.4   |
| 102.5° | 255.5  | 253.4  | 62.1   | 73.5   | 76.8   |
| 105°   | 319.6  | 351.2  | 64.1   | 75.7   | 79.9   |
| 107.5° | 394.3  | 420.4  | 66.3   | 77.7   | 82.1   |
| 110°   | 465.8  | 487.8  | 184.0  | 78.9   | 83.0   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 533.0  | 551.9  | 534.1  | 80.9   | 84.1   |
| 115°   | 604.5  | 622.3  | 648.7  | 162.0  | 86.3   |
| 117.5° | 666.5  | 687.5  | 705.5  | 555.0  | 279.7  |
| 120°   | 735.9  | 751.7  | 770.6  | 783.2  | 641.3  |
| 122.5° | 794.7  | 811.6  | 832.7  | 839.0  | 840.1  |
| 125°   | 854.6  | 868.4  | 888.4  | 895.7  | 898.9  |
| 127.5° | 909.3  | 924.0  | 940.0  | 950.4  | 951.4  |
| 130°   | 960.9  | 977.7  | 989.2  | 1000.8 | 999.9  |
| 132.5° | 1013.5 | 1027.2 | 1038.6 | 1048.2 | 1047.1 |
| 135°   | 1057.6 | 1074.5 | 1083.8 | 1094.5 | 1092.3 |
| 137.5° | 1103.8 | 1116.5 | 1127.0 | 1137.6 | 1134.5 |
| 140°   | 1149.0 | 1157.5 | 1169.0 | 1178.4 | 1173.3 |
| 142.5° | 1187.0 | 1194.4 | 1208.0 | 1216.3 | 1211.1 |
| 145°   | 1226.9 | 1225.8 | 1243.6 | 1251.0 | 1245.8 |
| 147.5° | 1261.5 | 1258.3 | 1276.3 | 1281.5 | 1277.4 |
| 150°   | 1295.2 | 1287.9 | 1304.7 | 1311.0 | 1305.7 |
| 152.5° | 1323.5 | 1315.2 | 1330.9 | 1337.3 | 1329.9 |
| 155°   | 1350.9 | 1341.5 | 1354.1 | 1360.4 | 1352.0 |
| 157.5° | 1372.9 | 1364.6 | 1374.1 | 1381.5 | 1372.9 |
| 160°   | 1392.0 | 1385.6 | 1392.0 | 1398.2 | 1390.9 |
| 162.5° | 1408.7 | 1402.5 | 1407.6 | 1415.0 | 1405.6 |
| 165°   | 1423.4 | 1417.2 | 1420.3 | 1427.6 | 1420.3 |
| 167.5° | 1435.0 | 1428.7 | 1431.9 | 1439.2 | 1429.8 |
| 170°   | 1444.5 | 1438.1 | 1440.3 | 1447.6 | 1438.1 |
| 172.5° | 1450.8 | 1444.5 | 1446.6 | 1454.0 | 1444.5 |
| 175°   | 1456.0 | 1448.6 | 1450.8 | 1458.1 | 1447.6 |
| 177.5° | 1458.1 | 1450.8 | 1451.9 | 1459.2 | 1449.7 |
| 180°   | 1452.8 | 1452.8 | 1452.8 | 1452.8 | 1452.8 |

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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 | 11.90            | 12.86 | 12.75 | 13.71 | 14.79 | 7.88           | 8.83  | 8.72  | 9.69  | 10.76 |
|                 | 3H   | 13.59            | 14.44 | 14.45 | 15.31 | 16.41 | 9.08           | 9.93  | 9.93  | 10.80 | 11.90 |
|                 | 4H   | 14.21            | 15.01 | 15.08 | 15.88 | 16.99 | 9.53           | 10.34 | 10.41 | 11.21 | 12.32 |
|                 | 6H   | 14.63            | 15.37 | 15.52 | 16.25 | 17.38 | 9.86           | 10.60 | 10.74 | 11.48 | 12.61 |
|                 | 8H   | 14.76            | 15.47 | 15.65 | 16.37 | 17.49 | 9.96           | 10.66 | 10.85 | 11.56 | 12.68 |
|                 | 12H  | 14.83            | 15.50 | 15.72 | 16.39 | 17.54 | 10.00          | 10.67 | 10.90 | 11.57 | 12.71 |
| 4H              | 2H   | 11.94            | 12.74 | 12.81 | 13.62 | 14.73 | 8.49           | 9.29  | 9.36  | 10.17 | 11.28 |
|                 | 3H   | 13.78            | 14.44 | 14.66 | 15.35 | 16.48 | 9.85           | 10.52 | 10.74 | 11.42 | 12.55 |
|                 | 4H   | 14.47            | 15.08 | 15.37 | 15.98 | 17.14 | 10.40          | 11.01 | 11.30 | 11.91 | 13.07 |
|                 | 6H   | 15.00            | 15.52 | 15.91 | 16.45 | 17.60 | 10.83          | 11.35 | 11.74 | 12.28 | 13.43 |
|                 | 8H   | 15.17            | 15.66 | 16.09 | 16.58 | 17.75 | 10.96          | 11.45 | 11.88 | 12.37 | 13.54 |
|                 | 12H  | 15.27            | 15.71 | 16.21 | 16.65 | 17.82 | 11.03          | 11.47 | 11.97 | 12.41 | 13.58 |
| 8H              | 4H   | 14.45            | 14.94 | 15.37 | 15.86 | 17.03 | 10.69          | 11.18 | 11.61 | 12.10 | 13.27 |
|                 | 6H   | 15.02            | 15.42 | 15.96 | 16.39 | 17.55 | 11.22          | 11.62 | 12.16 | 12.58 | 13.75 |
|                 | 8H   | 15.24            | 15.60 | 16.19 | 16.55 | 17.73 | 11.41          | 11.77 | 12.36 | 12.72 | 13.90 |
|                 | 12H  | 15.38            | 15.70 | 16.34 | 16.64 | 17.88 | 11.53          | 11.85 | 12.49 | 12.79 | 14.03 |
| 12H             | 4H   | 14.41            | 14.85 | 15.34 | 15.79 | 16.96 | 10.70          | 11.14 | 11.64 | 12.08 | 13.25 |
|                 | 6H   | 15.00            | 15.35 | 15.95 | 16.31 | 17.49 | 11.27          | 11.62 | 12.22 | 12.58 | 13.76 |
|                 | 8H   | 15.22            | 15.54 | 16.18 | 16.48 | 17.72 | 11.48          | 11.80 | 12.44 | 12.74 | 13.98 |

END OF REPORT