

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: P918190

Luminaire Tested: DFN2DIP-TR4F0-040D060US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918190  
REPORT IS A COMBINATION OF REPORTS P900405 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D060US930-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

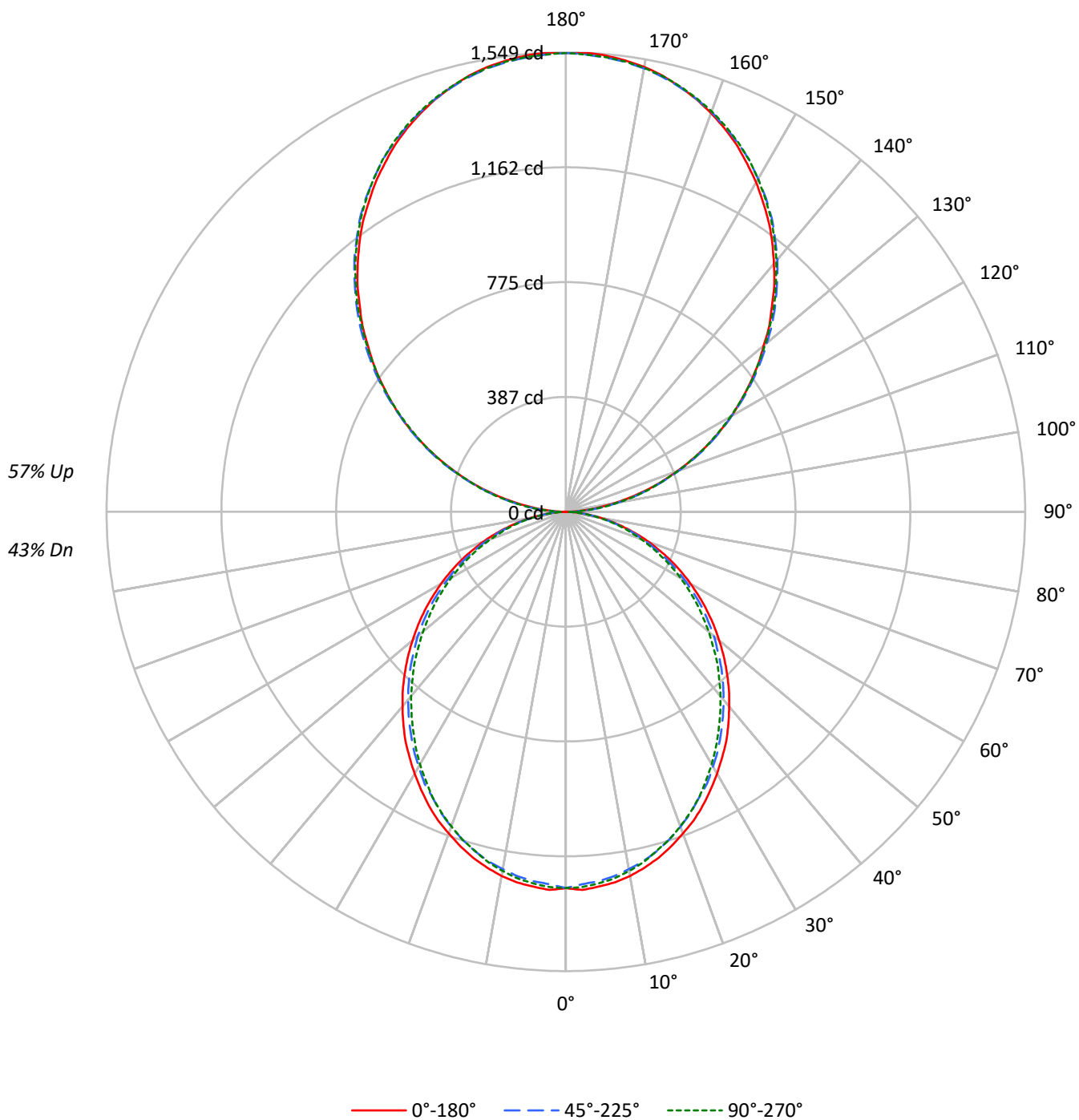
Lumens per Lamp: N/A  
Luminaire Lumens: 7557.8 lumens  
Efficiency: N/A  
Efficacy: 98.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 76.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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



TEST NUMBER: P918190

CATALOG NUMBER: DFN2DIP-TR4F0-040D060US930-FLLFL

**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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 49 | 49 | 49 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 69 | 67 | 65 | 56 | 54 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 73 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 38 | 37 | 35 |
| 3   | 80  | 70  | 63  | 57  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 37 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 30 | 28 | 26 |
| 5   | 67  | 56  | 47  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 27 | 25 | 22 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 24 | 21 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 15 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1008 | 1008 | 1008 |
| 5°  | 1010 | 994  | 1001 |
| 10° | 1002 | 981  | 987  |
| 15° | 987  | 964  | 966  |
| 20° | 967  | 942  | 944  |
| 25° | 947  | 915  | 919  |
| 30° | 922  | 890  | 887  |
| 35° | 899  | 861  | 854  |
| 40° | 870  | 831  | 821  |
| 45° | 841  | 801  | 789  |
| 50° | 809  | 770  | 751  |
| 55° | 777  | 734  | 716  |
| 60° | 739  | 691  | 675  |
| 65° | 699  | 646  | 628  |
| 70° | 647  | 592  | 577  |
| 75° | 575  | 527  | 530  |
| 80° | 489  | 444  | 441  |
| 85° | 354  | 301  | 292  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1206 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 119.4  | 1.6       |
| 10°-20°   | 336.0  | 4.4       |
| 20°-30°   | 493.8  | 6.5       |
| 30°-40°   | 573.6  | 7.6       |
| 40°-50°   | 572.9  | 7.6       |
| 50°-60°   | 499.5  | 6.6       |
| 60°-70°   | 369.3  | 4.9       |
| 70°-80°   | 208.9  | 2.8       |
| 80°-90°   | 59.5   | 0.8       |
| 90°-100°  | 95.7   | 1.3       |
| 100°-110° | 304.2  | 4.0       |
| 110°-120° | 520.6  | 6.9       |
| 120°-130° | 684.6  | 9.1       |
| 130°-140° | 768.4  | 10.2      |
| 140°-150° | 753.5  | 10.0      |
| 150°-160° | 632.1  | 8.4       |
| 160°-170° | 419.2  | 5.5       |
| 170°-180° | 146.5  | 1.9       |
| <hr/>     |        |           |
| 0°-30°    | 949.3  | 12.6      |
| 0°-40°    | 1522.9 | 20.1      |
| 0°-60°    | 2595.3 | 34.3      |
| 0°-90°    | 3233.0 | 42.8      |
| 90°-120°  | 920.5  | 12.2      |
| 90°-150°  | 3127.0 | 41.4      |
| 90°-180°  | 4325.0 | 57.2      |
| 0°-180°   | 7557.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1269 | 1269  | 1269 | 1269  | 1269 |      |
| 5°   | 1269 | 1264  | 1251 | 1260  | 1258 | 120  |
| 15°  | 1208 | 1201  | 1185 | 1190  | 1184 | 340  |
| 25°  | 1093 | 1084  | 1063 | 1065  | 1063 | 503  |
| 35°  | 943  | 931   | 912  | 904   | 898  | 589  |
| 45°  | 768  | 759   | 741  | 727   | 722  | 592  |
| 55°  | 581  | 574   | 559  | 544   | 538  | 519  |
| 65°  | 392  | 384   | 372  | 361   | 355  | 387  |
| 75°  | 205  | 203   | 196  | 189   | 192  | 219  |
| 85°  | 50   | 49    | 48   | 44    | 43   | 56   |
| 90°  | 1    | 17    | 46   | 43    | 44   | 7    |
| 95°  | 68   | 81    | 84   | 84    | 81   | 76   |
| 105° | 281  | 284   | 287  | 290   | 290  | 296  |
| 115° | 522  | 530   | 528  | 526   | 522  | 517  |
| 125° | 760  | 771   | 768  | 764   | 762  | 679  |
| 135° | 983  | 997   | 1000 | 999   | 995  | 760  |
| 145° | 1193 | 1202  | 1210 | 1211  | 1206 | 745  |
| 155° | 1364 | 1368  | 1372 | 1379  | 1374 | 628  |
| 165° | 1484 | 1483  | 1483 | 1492  | 1486 | 419  |
| 175° | 1544 | 1541  | 1538 | 1547  | 1539 | 147  |
| 180° | 1547 | 1547  | 1547 | 1547  | 1547 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1268.9 | 1268.9 | 1268.9 | 1268.9 | 1268.9 |
| 2.5°   | 1276.3 | 1270.2 | 1256.8 | 1268.9 | 1266.6 |
| 5°     | 1268.9 | 1264.1 | 1250.7 | 1260.4 | 1258.1 |
| 7.5°   | 1260.4 | 1253.1 | 1239.7 | 1249.5 | 1247.1 |
| 10°    | 1247.1 | 1238.5 | 1223.9 | 1233.6 | 1230.0 |
| 12.5°  | 1228.7 | 1221.4 | 1206.8 | 1212.9 | 1210.4 |
| 15°    | 1207.9 | 1200.7 | 1184.8 | 1189.7 | 1183.6 |
| 17.5°  | 1182.3 | 1175.1 | 1159.2 | 1165.2 | 1159.2 |
| 20°    | 1154.2 | 1147.0 | 1129.9 | 1133.5 | 1128.8 |
| 22.5°  | 1126.3 | 1115.2 | 1099.3 | 1099.3 | 1096.9 |
| 25°    | 1093.2 | 1083.5 | 1062.8 | 1065.2 | 1062.8 |
| 27.5°  | 1056.6 | 1048.1 | 1032.3 | 1028.7 | 1022.6 |
| 30°    | 1020.1 | 1010.3 | 992.1  | 988.4  | 983.5  |
| 32.5°  | 981.0  | 973.8  | 954.2  | 946.9  | 941.9  |
| 35°    | 943.2  | 931.1  | 911.5  | 904.2  | 898.1  |
| 37.5°  | 900.5  | 889.5  | 869.9  | 861.4  | 855.3  |
| 40°    | 856.6  | 846.8  | 827.2  | 816.4  | 811.5  |
| 42.5°  | 813.9  | 804.0  | 784.6  | 772.3  | 765.1  |
| 45°    | 767.5  | 759.0  | 740.6  | 727.3  | 722.4  |
| 47.5°  | 722.4  | 713.8  | 694.3  | 680.9  | 673.6  |
| 50°    | 674.7  | 668.6  | 651.6  | 634.5  | 628.4  |
| 52.5°  | 628.4  | 619.9  | 604.1  | 590.6  | 582.0  |
| 55°    | 580.9  | 573.5  | 558.9  | 544.2  | 538.2  |
| 57.5°  | 533.2  | 527.2  | 511.2  | 496.6  | 491.7  |
| 60°    | 485.6  | 480.8  | 463.7  | 450.3  | 446.6  |
| 62.5°  | 439.3  | 430.7  | 418.6  | 406.3  | 401.5  |
| 65°    | 391.8  | 384.3  | 372.2  | 361.2  | 355.1  |
| 67.5°  | 342.9  | 336.7  | 325.9  | 317.3  | 312.4  |
| 70°    | 297.7  | 292.9  | 281.8  | 273.3  | 268.5  |
| 72.5°  | 251.4  | 246.5  | 240.4  | 231.9  | 228.2  |
| 75°    | 205.0  | 202.6  | 196.4  | 189.1  | 191.6  |
| 77.5°  | 163.5  | 158.6  | 156.1  | 152.5  | 148.9  |
| 80°    | 122.1  | 120.7  | 118.3  | 114.7  | 112.3  |
| 82.5°  | 83.0   | 83.0   | 81.9   | 76.9   | 76.9   |
| 85°    | 50.0   | 48.8   | 47.6   | 43.9   | 42.7   |
| 87.5°  | 22.0   | 19.6   | 17.1   | 13.5   | 12.1   |
| 90°    | 1.4    | 16.8   | 45.7   | 42.9   | 44.3   |
| 92.5°  | 28.9   | 39.2   | 40.6   | 42.0   | 42.0   |
| 95°    | 68.1   | 81.1   | 83.5   | 83.5   | 81.1   |
| 97.5°  | 113.3  | 125.5  | 130.6  | 130.6  | 130.6  |
| 100°   | 165.6  | 176.3  | 180.0  | 180.0  | 178.6  |
| 102.5° | 220.6  | 228.5  | 233.7  | 235.1  | 233.7  |
| 105°   | 280.8  | 284.5  | 287.3  | 289.7  | 289.7  |
| 107.5° | 340.5  | 346.1  | 346.1  | 347.0  | 340.5  |
| 110°   | 398.4  | 405.8  | 405.8  | 405.8  | 402.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 460.8  | 468.7  | 467.3  | 463.6  | 460.8  |
| 115°   | 522.4  | 529.9  | 527.5  | 526.1  | 522.4  |
| 117.5° | 583.5  | 593.8  | 587.2  | 583.5  | 579.8  |
| 120°   | 645.1  | 655.3  | 645.1  | 645.1  | 640.8  |
| 122.5° | 701.0  | 714.0  | 707.5  | 703.8  | 701.0  |
| 125°   | 759.8  | 771.4  | 767.7  | 763.5  | 762.1  |
| 127.5° | 817.2  | 831.6  | 826.5  | 820.9  | 817.2  |
| 130°   | 870.8  | 887.6  | 885.3  | 882.5  | 877.3  |
| 132.5° | 931.0  | 944.0  | 944.9  | 938.4  | 934.7  |
| 135°   | 982.8  | 997.2  | 1000.0 | 998.6  | 994.8  |
| 137.5° | 1040.6 | 1052.2 | 1054.6 | 1053.6 | 1048.1 |
| 140°   | 1091.4 | 1103.1 | 1109.6 | 1109.6 | 1104.5 |
| 142.5° | 1143.6 | 1155.3 | 1159.0 | 1160.4 | 1155.3 |
| 145°   | 1193.1 | 1202.4 | 1209.9 | 1211.3 | 1206.2 |
| 147.5° | 1237.4 | 1249.0 | 1254.7 | 1256.9 | 1251.8 |
| 150°   | 1283.1 | 1291.0 | 1296.2 | 1300.3 | 1296.2 |
| 152.5° | 1323.6 | 1331.6 | 1338.1 | 1343.3 | 1338.1 |
| 155°   | 1364.2 | 1368.0 | 1372.1 | 1378.8 | 1374.5 |
| 157.5° | 1399.2 | 1402.1 | 1404.4 | 1413.7 | 1407.2 |
| 160°   | 1430.5 | 1433.3 | 1434.7 | 1442.6 | 1437.0 |
| 162.5° | 1459.4 | 1459.4 | 1460.8 | 1469.7 | 1463.1 |
| 165°   | 1484.1 | 1482.7 | 1482.7 | 1492.1 | 1485.6 |
| 167.5° | 1506.5 | 1502.4 | 1502.4 | 1511.6 | 1505.1 |
| 170°   | 1523.3 | 1519.6 | 1518.2 | 1527.5 | 1519.6 |
| 172.5° | 1535.0 | 1531.2 | 1529.8 | 1539.1 | 1531.2 |
| 175°   | 1544.3 | 1540.6 | 1537.7 | 1547.1 | 1539.1 |
| 177.5° | 1549.4 | 1545.7 | 1542.9 | 1550.8 | 1542.9 |
| 180°   | 1547.1 | 1547.1 | 1547.1 | 1547.1 | 1547.1 |

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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 | 6.59             | 7.39  | 7.60  | 8.41  | 9.78  | 6.15           | 6.95  | 7.17  | 7.98  | 9.35  |
|                 | 3H   | 8.24             | 8.96  | 9.27  | 9.99  | 11.38 | 7.77           | 8.49  | 8.80  | 9.52  | 10.91 |
|                 | 4H   | 8.83             | 9.51  | 9.87  | 10.54 | 11.94 | 8.35           | 9.03  | 9.39  | 10.07 | 11.47 |
|                 | 6H   | 9.22             | 9.85  | 10.27 | 10.89 | 12.30 | 8.75           | 9.37  | 9.80  | 10.41 | 11.83 |
|                 | 8H   | 9.33             | 9.92  | 10.38 | 10.98 | 12.38 | 8.85           | 9.45  | 9.91  | 10.50 | 11.91 |
|                 | 12H  | 9.37             | 9.94  | 10.43 | 10.99 | 12.42 | 8.89           | 9.46  | 9.95  | 10.51 | 11.94 |
| 4H              | 2H   | 7.04             | 7.72  | 8.09  | 8.76  | 10.16 | 6.70           | 7.38  | 7.74  | 8.41  | 9.81  |
|                 | 3H   | 8.90             | 9.47  | 9.95  | 10.53 | 11.94 | 8.51           | 9.08  | 9.56  | 10.14 | 11.55 |
|                 | 4H   | 9.61             | 10.13 | 10.67 | 11.19 | 12.62 | 9.21           | 9.73  | 10.27 | 10.78 | 12.22 |
|                 | 6H   | 10.12            | 10.57 | 11.19 | 11.65 | 13.08 | 9.71           | 10.16 | 10.78 | 11.24 | 12.67 |
|                 | 8H   | 10.27            | 10.69 | 11.34 | 11.76 | 13.20 | 9.86           | 10.28 | 10.93 | 11.35 | 12.79 |
|                 | 12H  | 10.34            | 10.72 | 11.43 | 11.81 | 13.25 | 9.92           | 10.30 | 11.01 | 11.38 | 12.83 |
| 8H              | 4H   | 9.80             | 10.22 | 10.87 | 11.29 | 12.74 | 9.44           | 9.86  | 10.51 | 10.93 | 12.38 |
|                 | 6H   | 10.43            | 10.78 | 11.53 | 11.89 | 13.33 | 10.07          | 10.42 | 11.16 | 11.53 | 12.97 |
|                 | 8H   | 10.65            | 10.96 | 11.75 | 12.05 | 13.51 | 10.28          | 10.59 | 11.38 | 11.68 | 13.14 |
|                 | 12H  | 10.78            | 11.05 | 11.89 | 12.14 | 13.64 | 10.40          | 10.66 | 11.50 | 11.76 | 13.26 |
| 12H             | 4H   | 9.79             | 10.16 | 10.87 | 11.25 | 12.70 | 9.43           | 9.81  | 10.52 | 10.90 | 12.35 |
|                 | 6H   | 10.46            | 10.77 | 11.56 | 11.86 | 13.32 | 10.11          | 10.41 | 11.21 | 11.51 | 12.97 |
|                 | 8H   | 10.70            | 10.97 | 11.80 | 12.06 | 13.56 | 10.34          | 10.61 | 11.45 | 11.70 | 13.20 |

END OF REPORT