

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: P904833

Luminaire Tested: DFN2DIP-TR4F0-120D040US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904833  
REPORT IS A COMBINATION OF REPORTS P901906 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D040US830-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

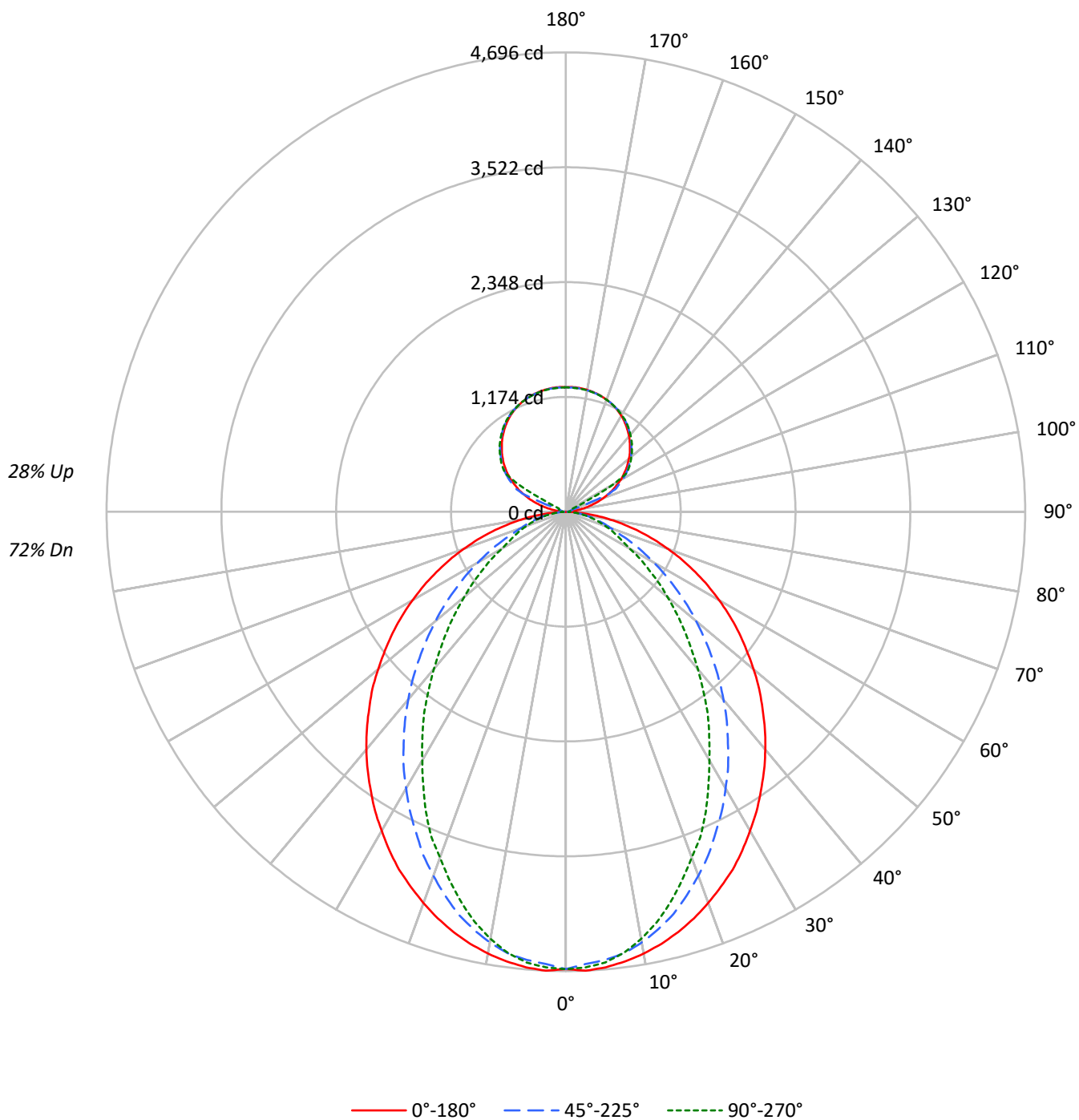
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13346.4 lumens  
Efficiency: N/A  
Efficacy: 85.6 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): 156  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P904833

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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   | 112 | 112 | 112 | 112 | 107 | 107 | 107 | 107 | 96 | 96 | 96 | 86 | 86 | 86 | 76 | 76 | 76 |
| 1   | 103 | 99  | 95  | 92  | 98  | 94  | 91  | 88  | 85 | 82 | 80 | 76 | 75 | 73 | 69 | 67 | 66 |
| 2   | 95  | 87  | 81  | 76  | 90  | 83  | 78  | 73  | 75 | 71 | 68 | 68 | 65 | 62 | 61 | 59 | 57 |
| 3   | 87  | 78  | 70  | 65  | 82  | 74  | 67  | 62  | 67 | 62 | 58 | 61 | 57 | 53 | 55 | 52 | 49 |
| 4   | 80  | 69  | 61  | 55  | 76  | 66  | 59  | 54  | 60 | 54 | 50 | 55 | 50 | 46 | 50 | 46 | 43 |
| 5   | 74  | 62  | 54  | 48  | 70  | 59  | 52  | 47  | 54 | 48 | 44 | 50 | 45 | 41 | 45 | 41 | 38 |
| 6   | 68  | 56  | 48  | 42  | 65  | 54  | 46  | 41  | 49 | 43 | 39 | 45 | 40 | 36 | 41 | 37 | 34 |
| 7   | 63  | 51  | 43  | 38  | 60  | 49  | 42  | 36  | 45 | 39 | 34 | 41 | 36 | 32 | 38 | 34 | 30 |
| 8   | 59  | 47  | 39  | 34  | 56  | 45  | 38  | 33  | 41 | 35 | 31 | 38 | 33 | 29 | 35 | 31 | 27 |
| 9   | 55  | 43  | 35  | 30  | 52  | 41  | 34  | 30  | 38 | 32 | 28 | 35 | 30 | 26 | 32 | 28 | 25 |
| 10  | 52  | 40  | 32  | 28  | 49  | 38  | 31  | 27  | 35 | 29 | 25 | 33 | 28 | 24 | 30 | 26 | 23 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3714 | 3714 | 3714 |
| 5°  | 3720 | 3655 | 3678 |
| 10° | 3683 | 3583 | 3558 |
| 15° | 3632 | 3465 | 3373 |
| 20° | 3565 | 3301 | 3146 |
| 25° | 3497 | 3118 | 2927 |
| 30° | 3404 | 2931 | 2648 |
| 35° | 3314 | 2729 | 2404 |
| 40° | 3222 | 2520 | 2124 |
| 45° | 3115 | 2288 | 1870 |
| 50° | 3005 | 2055 | 1622 |
| 55° | 2890 | 1805 | 1384 |
| 60° | 2756 | 1544 | 1139 |
| 65° | 2603 | 1278 | 1025 |
| 70° | 2417 | 1030 | 927  |
| 75° | 2183 | 908  | 843  |
| 80° | 1845 | 761  | 731  |
| 85° | 1286 | 508  | 549  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3115 cd/sqm

TEST NUMBER: P904833

CATALOG NUMBER: DFN2DIP-TR4F0-120D040US830-RLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 438.1   | 3.3       |
| 10°-20°   | 1202.7  | 9.0       |
| 20°-30°   | 1688.5  | 12.7      |
| 30°-40°   | 1840.6  | 13.8      |
| 40°-50°   | 1691.7  | 12.7      |
| 50°-60°   | 1328.6  | 10.0      |
| 60°-70°   | 864.8   | 6.5       |
| 70°-80°   | 445.2   | 3.3       |
| 80°-90°   | 115.9   | 0.9       |
| 90°-100°  | 41.9    | 0.3       |
| 100°-110° | 156.4   | 1.2       |
| 110°-120° | 414.8   | 3.1       |
| 120°-130° | 688.0   | 5.2       |
| 130°-140° | 730.8   | 5.5       |
| 140°-150° | 679.2   | 5.1       |
| 150°-160° | 546.1   | 4.1       |
| 160°-170° | 351.9   | 2.6       |
| 170°-180° | 121.1   | 0.9       |
| 0°-30°    | 3329.4  | 24.9      |
| 0°-40°    | 5170.0  | 38.7      |
| 0°-60°    | 8190.3  | 61.4      |
| 0°-90°    | 9616.1  | 72.1      |
| 90°-120°  | 613.2   | 4.6       |
| 90°-150°  | 2711.2  | 20.3      |
| 90°-180°  | 3730.0  | 27.9      |
| 0°-180°   | 13346.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4675 | 4675  | 4675 | 4675  | 4675 |      |
| 5°   | 4675 | 4654  | 4598 | 4636  | 4624 | 443  |
| 15°  | 4446 | 4400  | 4256 | 4176  | 4133 | 1253 |
| 25°  | 4036 | 3900  | 3621 | 3448  | 3384 | 1856 |
| 35°  | 3478 | 3262  | 2890 | 2623  | 2530 | 2177 |
| 45°  | 2843 | 2559  | 2115 | 1815  | 1713 | 2195 |
| 55°  | 2162 | 1832  | 1375 | 1121  | 1041 | 1932 |
| 65°  | 1460 | 1117  | 736  | 592   | 580  | 1447 |
| 75°  | 778  | 482   | 338  | 309   | 305  | 823  |
| 85°  | 182  | 93    | 80   | 80    | 80   | 209  |
| 90°  | 1    | 11    | 18   | 23    | 25   | 13   |
| 95°  | 60   | 29    | 36   | 40    | 40   | 71   |
| 105° | 280  | 308   | 56   | 66    | 70   | 299  |
| 115° | 529  | 545   | 568  | 142   | 76   | 521  |
| 125° | 748  | 760   | 778  | 784   | 787  | 668  |
| 135° | 926  | 941   | 949  | 958   | 957  | 715  |
| 145° | 1074 | 1074  | 1089 | 1096  | 1091 | 672  |
| 155° | 1183 | 1175  | 1186 | 1191  | 1184 | 545  |
| 165° | 1247 | 1241  | 1244 | 1250  | 1244 | 352  |
| 175° | 1275 | 1269  | 1270 | 1277  | 1268 | 121  |
| 180° | 1272 | 1272  | 1272 | 1272  | 1272 |      |

TEST NUMBER: P904833

CATALOG NUMBER: DFN2DIP-TR4F0-120D040US830-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4674.6 | 4674.6 | 4674.6 | 4674.6 | 4674.6 |
| 2.5°   | 4695.7 | 4674.6 | 4628.0 | 4670.6 | 4662.0 |
| 5°     | 4674.6 | 4653.5 | 4598.3 | 4636.5 | 4623.9 |
| 7.5°   | 4636.5 | 4611.3 | 4552.1 | 4568.7 | 4547.6 |
| 10°    | 4585.8 | 4556.2 | 4471.7 | 4458.7 | 4433.6 |
| 12.5°  | 4522.4 | 4484.3 | 4369.8 | 4344.7 | 4298.1 |
| 15°    | 4446.2 | 4399.5 | 4255.9 | 4175.5 | 4133.3 |
| 17.5°  | 4357.3 | 4289.5 | 4111.7 | 4018.9 | 3951.1 |
| 20°    | 4255.9 | 4171.0 | 3959.6 | 3854.1 | 3760.7 |
| 22.5°  | 4145.9 | 4048.5 | 3803.0 | 3659.3 | 3596.1 |
| 25°    | 4036.0 | 3900.3 | 3621.2 | 3447.9 | 3384.2 |
| 27.5°  | 3904.9 | 3760.7 | 3452.0 | 3253.2 | 3155.7 |
| 30°    | 3765.3 | 3604.2 | 3265.7 | 3050.3 | 2935.8 |
| 32.5°  | 3629.7 | 3434.9 | 3088.4 | 2834.4 | 2728.5 |
| 35°    | 3477.6 | 3261.7 | 2889.6 | 2623.0 | 2529.6 |
| 37.5°  | 3329.4 | 3096.5 | 2703.3 | 2411.1 | 2305.6 |
| 40°    | 3172.8 | 2919.2 | 2508.6 | 2208.3 | 2098.3 |
| 42.5°  | 3012.1 | 2741.5 | 2314.2 | 2000.9 | 1895.5 |
| 45°    | 2842.9 | 2559.3 | 2115.3 | 1814.7 | 1713.2 |
| 47.5°  | 2682.2 | 2382.0 | 1925.0 | 1624.4 | 1531.4 |
| 50°    | 2504.5 | 2204.2 | 1738.8 | 1446.6 | 1358.2 |
| 52.5°  | 2330.8 | 2013.5 | 1561.0 | 1281.9 | 1201.6 |
| 55°    | 2161.6 | 1831.7 | 1374.8 | 1121.2 | 1040.8 |
| 57.5°  | 1988.3 | 1649.9 | 1210.0 | 973.1  | 905.3  |
| 60°    | 1810.6 | 1472.2 | 1036.3 | 821.0  | 753.2  |
| 62.5°  | 1637.4 | 1298.9 | 888.3  | 685.4  | 651.7  |
| 65°    | 1459.6 | 1116.7 | 736.1  | 592.5  | 579.5  |
| 67.5°  | 1290.4 | 947.4  | 592.5  | 520.2  | 507.7  |
| 70°    | 1112.7 | 782.8  | 490.6  | 448.4  | 431.3  |
| 72.5°  | 943.5  | 630.2  | 410.2  | 376.5  | 368.1  |
| 75°    | 778.3  | 482.0  | 338.5  | 308.8  | 304.7  |
| 77.5°  | 613.6  | 342.4  | 266.6  | 249.6  | 241.0  |
| 80°    | 461.0  | 245.5  | 202.8  | 186.2  | 186.2  |
| 82.5°  | 321.4  | 165.1  | 139.6  | 131.0  | 131.0  |
| 85°    | 181.8  | 92.9   | 80.3   | 80.3   | 80.3   |
| 87.5°  | 67.8   | 33.6   | 33.6   | 29.6   | 29.6   |
| 90°    | 0.8    | 11.0   | 18.4   | 23.1   | 24.8   |
| 92.5°  | 23.1   | 19.3   | 22.1   | 23.9   | 24.8   |
| 95°    | 59.8   | 29.4   | 35.8   | 40.5   | 39.6   |
| 97.5°  | 107.7  | 32.2   | 46.9   | 49.8   | 50.6   |
| 100°   | 163.0  | 36.9   | 52.5   | 59.8   | 61.6   |
| 102.5° | 223.7  | 222.0  | 54.3   | 64.4   | 67.2   |
| 105°   | 279.8  | 307.6  | 56.2   | 66.3   | 69.9   |
| 107.5° | 345.3  | 368.3  | 58.1   | 68.1   | 71.8   |
| 110°   | 407.9  | 427.2  | 161.2  | 69.1   | 72.7   |

TEST NUMBER: P904833

CATALOG NUMBER: DFN2DIP-TR4F0-120D040US830-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 466.8  | 483.3  | 467.7  | 70.9   | 73.7   |
| 115°   | 529.3  | 545.0  | 568.1  | 141.8  | 75.6   |
| 117.5° | 583.7  | 602.1  | 617.8  | 486.1  | 244.9  |
| 120°   | 644.5  | 658.3  | 674.9  | 686.0  | 561.7  |
| 122.5° | 696.0  | 710.8  | 729.2  | 734.7  | 735.7  |
| 125°   | 748.5  | 760.5  | 778.0  | 784.5  | 787.2  |
| 127.5° | 796.4  | 809.3  | 823.1  | 832.4  | 833.2  |
| 130°   | 841.5  | 856.3  | 866.3  | 876.5  | 875.6  |
| 132.5° | 887.5  | 899.6  | 909.6  | 917.9  | 917.1  |
| 135°   | 926.2  | 941.0  | 949.2  | 958.5  | 956.7  |
| 137.5° | 966.7  | 977.7  | 987.0  | 996.2  | 993.4  |
| 140°   | 1006.3 | 1013.7 | 1023.8 | 1032.1 | 1027.5 |
| 142.5° | 1039.5 | 1045.9 | 1057.9 | 1065.2 | 1060.6 |
| 145°   | 1074.5 | 1073.6 | 1089.1 | 1095.6 | 1091.0 |
| 147.5° | 1104.8 | 1102.0 | 1117.7 | 1122.3 | 1118.7 |
| 150°   | 1134.3 | 1127.8 | 1142.6 | 1148.1 | 1143.5 |
| 152.5° | 1159.1 | 1151.8 | 1165.5 | 1171.1 | 1164.7 |
| 155°   | 1183.1 | 1174.9 | 1185.9 | 1191.4 | 1184.0 |
| 157.5° | 1202.4 | 1195.0 | 1203.4 | 1209.8 | 1202.4 |
| 160°   | 1219.0 | 1213.4 | 1219.0 | 1224.5 | 1218.0 |
| 162.5° | 1233.7 | 1228.2 | 1232.8 | 1239.3 | 1231.0 |
| 165°   | 1246.6 | 1241.1 | 1243.9 | 1250.3 | 1243.9 |
| 167.5° | 1256.8 | 1251.1 | 1254.1 | 1260.5 | 1252.2 |
| 170°   | 1265.1 | 1259.5 | 1261.3 | 1267.8 | 1259.5 |
| 172.5° | 1270.5 | 1265.1 | 1267.0 | 1273.4 | 1265.1 |
| 175°   | 1275.1 | 1268.7 | 1270.5 | 1277.0 | 1267.8 |
| 177.5° | 1277.0 | 1270.5 | 1271.5 | 1278.0 | 1269.7 |
| 180°   | 1272.4 | 1272.4 | 1272.4 | 1272.4 | 1272.4 |

TEST NUMBER: P904833

CATALOG NUMBER: DFN2DIP-TR4F0-120D040US830-RLONL

**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 | 13.55            | 14.60 | 14.30 | 15.37 | 16.29 | 9.53           | 10.58 | 10.27 | 11.34 | 12.26 |
|                 | 3H   | 15.25            | 16.18 | 16.01 | 16.96 | 17.91 | 10.73          | 11.67 | 11.49 | 12.45 | 13.40 |
|                 | 4H   | 15.86            | 16.75 | 16.64 | 17.53 | 18.50 | 11.19          | 12.08 | 11.97 | 12.86 | 13.82 |
|                 | 6H   | 16.30            | 17.11 | 17.09 | 17.90 | 18.88 | 11.53          | 12.34 | 12.32 | 13.13 | 14.11 |
|                 | 8H   | 16.43            | 17.20 | 17.23 | 18.02 | 18.99 | 11.62          | 12.40 | 12.43 | 13.21 | 14.19 |
|                 | 12H  | 16.50            | 17.24 | 17.31 | 18.04 | 19.05 | 11.67          | 12.41 | 12.48 | 13.22 | 14.22 |
| 4H              | 2H   | 13.60            | 14.48 | 14.38 | 15.27 | 16.23 | 10.15          | 11.03 | 10.93 | 11.82 | 12.78 |
|                 | 3H   | 15.45            | 16.18 | 16.24 | 17.00 | 17.98 | 11.52          | 12.25 | 12.31 | 13.07 | 14.05 |
|                 | 4H   | 16.15            | 16.81 | 16.96 | 17.63 | 18.64 | 12.08          | 12.74 | 12.89 | 13.56 | 14.57 |
|                 | 6H   | 16.67            | 17.25 | 17.50 | 18.09 | 19.10 | 12.51          | 13.08 | 13.33 | 13.93 | 14.94 |
|                 | 8H   | 16.85            | 17.39 | 17.68 | 18.23 | 19.25 | 12.64          | 13.18 | 13.47 | 14.02 | 15.04 |
|                 | 12H  | 16.96            | 17.44 | 17.81 | 18.30 | 19.33 | 12.72          | 13.20 | 13.57 | 14.06 | 15.09 |
| 8H              | 4H   | 16.13            | 16.67 | 16.96 | 17.51 | 18.53 | 12.37          | 12.91 | 13.20 | 13.75 | 14.77 |
|                 | 6H   | 16.70            | 17.15 | 17.56 | 18.03 | 19.05 | 12.90          | 13.34 | 13.76 | 14.22 | 15.25 |
|                 | 8H   | 16.92            | 17.32 | 17.79 | 18.19 | 19.23 | 13.09          | 13.49 | 13.96 | 14.36 | 15.40 |
|                 | 12H  | 17.07            | 17.42 | 17.94 | 18.28 | 19.38 | 13.22          | 13.57 | 14.09 | 14.43 | 15.53 |
| 12H             | 4H   | 16.09            | 16.57 | 16.94 | 17.43 | 18.46 | 12.39          | 12.87 | 13.24 | 13.73 | 14.76 |
|                 | 6H   | 16.68            | 17.07 | 17.55 | 17.95 | 18.99 | 12.95          | 13.34 | 13.82 | 14.22 | 15.26 |
|                 | 8H   | 16.91            | 17.26 | 17.78 | 18.12 | 19.22 | 13.17          | 13.52 | 14.04 | 14.38 | 15.48 |

END OF REPORT