

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: P919868

Luminaire Tested: DFN2DIP-SQ2F0-040D050US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919868  
REPORT IS A COMBINATION OF REPORTS P899797 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-040D050US935-FLLFLL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

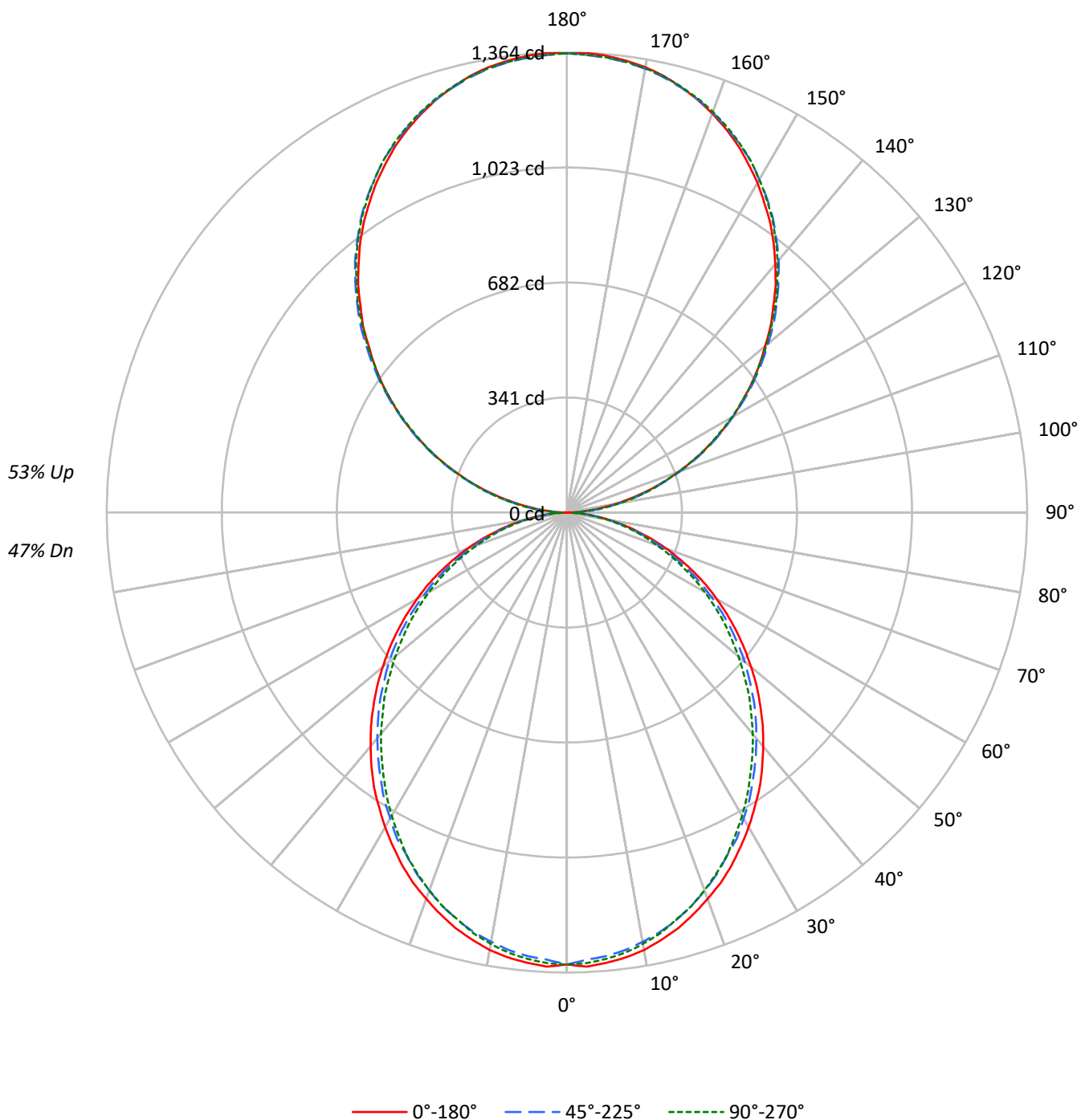
Lumens per Lamp: N/A  
Luminaire Lumens: 7219.4 lumens  
Efficiency: N/A  
Efficacy: 101.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 71.2  
Input Voltage (V): 120  
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



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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   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 67 | 67 | 67 | 54 | 54 | 54 |
| 1   | 97  | 93  | 89  | 85  | 89 | 85 | 82 | 79 | 72 | 69 | 67 | 59 | 57 | 56 | 47 | 46 | 45 |
| 2   | 88  | 81  | 75  | 70  | 81 | 75 | 69 | 65 | 63 | 59 | 56 | 52 | 49 | 47 | 42 | 40 | 38 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 59 | 54 | 55 | 51 | 47 | 46 | 42 | 39 | 37 | 35 | 32 |
| 4   | 74  | 63  | 55  | 49  | 68 | 58 | 51 | 46 | 49 | 44 | 40 | 41 | 37 | 34 | 33 | 30 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 39 | 44 | 39 | 34 | 37 | 33 | 29 | 30 | 27 | 24 |
| 6   | 62  | 50  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 33 | 29 | 26 | 27 | 24 | 21 |
| 7   | 58  | 45  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 30 | 26 | 30 | 26 | 23 | 25 | 21 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 38 | 31 | 27 | 33 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 25 | 21 | 18 | 21 | 18 | 15 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 22 | 19 | 23 | 19 | 16 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2947 | 2947 | 2947 |
| 5°  | 2946 | 2899 | 2921 |
| 10° | 2917 | 2854 | 2877 |
| 15° | 2869 | 2800 | 2812 |
| 20° | 2806 | 2729 | 2744 |
| 25° | 2743 | 2644 | 2667 |
| 30° | 2666 | 2565 | 2570 |
| 35° | 2592 | 2473 | 2468 |
| 40° | 2502 | 2380 | 2370 |
| 45° | 2411 | 2286 | 2270 |
| 50° | 2313 | 2187 | 2154 |
| 55° | 2209 | 2073 | 2047 |
| 60° | 2091 | 1939 | 1924 |
| 65° | 1962 | 1798 | 1779 |
| 70° | 1798 | 1627 | 1621 |
| 75° | 1574 | 1423 | 1471 |
| 80° | 1299 | 1161 | 1195 |
| 85° | 878  | 733  | 750  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2411 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 126.1  | 1.7       |
| 10°-20°   | 354.9  | 4.9       |
| 20°-30°   | 521.5  | 7.2       |
| 30°-40°   | 605.7  | 8.4       |
| 40°-50°   | 605.0  | 8.4       |
| 50°-60°   | 527.5  | 7.3       |
| 60°-70°   | 389.9  | 5.4       |
| 70°-80°   | 220.6  | 3.1       |
| 80°-90°   | 62.1   | 0.9       |
| 90°-100°  | 84.2   | 1.2       |
| 100°-110° | 267.7  | 3.7       |
| 110°-120° | 458.1  | 6.3       |
| 120°-130° | 602.5  | 8.3       |
| 130°-140° | 676.3  | 9.4       |
| 140°-150° | 663.1  | 9.2       |
| 150°-160° | 556.3  | 7.7       |
| 160°-170° | 368.9  | 5.1       |
| 170°-180° | 128.9  | 1.8       |
| 0°-30°    | 1002.5 | 13.9      |
| 0°-40°    | 1608.3 | 22.3      |
| 0°-60°    | 2740.7 | 38.0      |
| 0°-90°    | 3413.4 | 47.3      |
| 90°-120°  | 810.0  | 11.2      |
| 90°-150°  | 2751.9 | 38.1      |
| 90°-180°  | 3806.0 | 52.7      |
| 0°-180°   | 7219.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1340 | 1340  | 1340 | 1340  | 1340 |      |
| 5°   | 1340 | 1335  | 1321 | 1331  | 1329 | 127  |
| 15°  | 1276 | 1268  | 1251 | 1256  | 1250 | 359  |
| 25°  | 1154 | 1144  | 1122 | 1125  | 1122 | 531  |
| 35°  | 996  | 983   | 963  | 955   | 948  | 622  |
| 45°  | 810  | 802   | 782  | 768   | 763  | 626  |
| 55°  | 614  | 606   | 590  | 575   | 568  | 548  |
| 65°  | 414  | 406   | 393  | 381   | 375  | 409  |
| 75°  | 216  | 214   | 207  | 200   | 202  | 231  |
| 85°  | 53   | 52    | 50   | 46    | 45   | 59   |
| 90°  | 1    | 15    | 40   | 38    | 39   | 7    |
| 95°  | 60   | 72    | 73   | 73    | 72   | 67   |
| 105° | 247  | 250   | 253  | 255   | 255  | 261  |
| 115° | 460  | 466   | 464  | 463   | 460  | 455  |
| 125° | 669  | 679   | 676  | 672   | 671  | 598  |
| 135° | 865  | 878   | 880  | 879   | 876  | 669  |
| 145° | 1050 | 1058  | 1065 | 1066  | 1061 | 656  |
| 155° | 1201 | 1204  | 1208 | 1213  | 1210 | 553  |
| 165° | 1306 | 1305  | 1305 | 1313  | 1307 | 368  |
| 175° | 1359 | 1356  | 1353 | 1362  | 1354 | 129  |
| 180° | 1362 | 1362  | 1362 | 1362  | 1362 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1340.1 | 1340.1 | 1340.1 | 1340.1 | 1340.1 |
| 2.5°   | 1347.9 | 1341.4 | 1327.2 | 1340.1 | 1337.6 |
| 5°     | 1340.1 | 1335.0 | 1320.8 | 1331.0 | 1328.6 |
| 7.5°   | 1331.0 | 1323.4 | 1309.1 | 1319.6 | 1317.0 |
| 10°    | 1317.0 | 1307.9 | 1292.5 | 1302.8 | 1298.9 |
| 12.5°  | 1297.5 | 1289.9 | 1274.4 | 1280.9 | 1278.2 |
| 15°    | 1275.7 | 1268.0 | 1251.2 | 1256.4 | 1250.0 |
| 17.5°  | 1248.6 | 1241.0 | 1224.2 | 1230.5 | 1224.2 |
| 20°    | 1218.9 | 1211.3 | 1193.3 | 1197.0 | 1192.1 |
| 22.5°  | 1189.4 | 1177.8 | 1161.0 | 1161.0 | 1158.4 |
| 25°    | 1154.5 | 1144.3 | 1122.4 | 1124.9 | 1122.4 |
| 27.5°  | 1115.9 | 1106.8 | 1090.2 | 1086.3 | 1079.9 |
| 30°    | 1077.3 | 1066.9 | 1047.7 | 1043.8 | 1038.6 |
| 32.5°  | 1036.0 | 1028.4 | 1007.7 | 1000.0 | 994.7  |
| 35°    | 996.1  | 983.3  | 962.6  | 954.8  | 948.4  |
| 37.5°  | 951.0  | 939.3  | 918.7  | 909.7  | 903.3  |
| 40°    | 904.7  | 894.2  | 873.6  | 862.1  | 857.0  |
| 42.5°  | 859.5  | 849.1  | 828.6  | 815.6  | 808.0  |
| 45°    | 810.5  | 801.6  | 782.1  | 768.1  | 762.8  |
| 47.5°  | 762.8  | 753.8  | 733.2  | 719.0  | 711.4  |
| 50°    | 712.6  | 706.1  | 688.1  | 670.0  | 663.6  |
| 52.5°  | 663.6  | 654.6  | 637.9  | 623.7  | 614.7  |
| 55°    | 613.5  | 605.6  | 590.2  | 574.7  | 568.3  |
| 57.5°  | 563.1  | 556.7  | 539.8  | 524.4  | 519.3  |
| 60°    | 512.8  | 507.7  | 489.7  | 475.5  | 471.7  |
| 62.5°  | 463.9  | 454.9  | 442.0  | 429.1  | 424.0  |
| 65°    | 413.7  | 405.9  | 393.0  | 381.4  | 375.1  |
| 67.5°  | 362.1  | 355.6  | 344.1  | 335.1  | 329.9  |
| 70°    | 314.4  | 309.3  | 297.6  | 288.6  | 283.5  |
| 72.5°  | 265.5  | 260.3  | 253.9  | 244.9  | 241.0  |
| 75°    | 216.5  | 214.0  | 207.4  | 199.8  | 202.3  |
| 77.5°  | 172.6  | 167.5  | 164.9  | 161.0  | 157.2  |
| 80°    | 128.9  | 127.5  | 124.9  | 121.1  | 118.6  |
| 82.5°  | 87.6   | 87.6   | 86.4   | 81.2   | 81.2   |
| 85°    | 52.8   | 51.6   | 50.3   | 46.3   | 45.1   |
| 87.5°  | 23.2   | 20.7   | 18.1   | 14.2   | 12.8   |
| 90°    | 1.2    | 14.8   | 40.2   | 37.8   | 39.0   |
| 92.5°  | 25.5   | 34.4   | 35.7   | 36.9   | 36.9   |
| 95°    | 59.9   | 71.5   | 73.4   | 73.4   | 71.5   |
| 97.5°  | 99.7   | 110.4  | 114.9  | 114.9  | 114.9  |
| 100°   | 145.7  | 155.2  | 158.4  | 158.4  | 157.2  |
| 102.5° | 194.2  | 201.1  | 205.6  | 206.9  | 205.6  |
| 105°   | 247.1  | 250.4  | 252.9  | 254.9  | 254.9  |
| 107.5° | 299.6  | 304.5  | 304.5  | 305.4  | 299.6  |
| 110°   | 350.5  | 357.1  | 357.1  | 357.1  | 353.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 405.5  | 412.5  | 411.3  | 408.0  | 405.5  |
| 115°   | 459.7  | 466.3  | 464.3  | 463.0  | 459.7  |
| 117.5° | 513.5  | 522.5  | 516.8  | 513.5  | 510.2  |
| 120°   | 567.7  | 576.7  | 567.7  | 567.7  | 564.0  |
| 122.5° | 616.9  | 628.4  | 622.7  | 619.4  | 616.9  |
| 125°   | 668.7  | 678.9  | 675.6  | 671.9  | 670.7  |
| 127.5° | 719.1  | 731.8  | 727.4  | 722.4  | 719.1  |
| 130°   | 766.4  | 781.1  | 779.0  | 776.6  | 772.1  |
| 132.5° | 819.3  | 830.8  | 831.6  | 825.9  | 822.6  |
| 135°   | 864.9  | 877.5  | 880.0  | 878.8  | 875.5  |
| 137.5° | 915.8  | 926.0  | 928.1  | 927.2  | 922.3  |
| 140°   | 960.4  | 970.8  | 976.5  | 976.5  | 972.0  |
| 142.5° | 1006.4 | 1016.8 | 1020.0 | 1021.2 | 1016.8 |
| 145°   | 1050.0 | 1058.2 | 1064.7 | 1066.0 | 1061.4 |
| 147.5° | 1089.0 | 1099.2 | 1104.1 | 1106.2 | 1101.6 |
| 150°   | 1129.2 | 1136.2 | 1140.6 | 1144.4 | 1140.6 |
| 152.5° | 1164.9 | 1171.9 | 1177.6 | 1182.2 | 1177.6 |
| 155°   | 1200.6 | 1203.8 | 1207.5 | 1213.3 | 1209.6 |
| 157.5° | 1231.4 | 1233.8 | 1235.9 | 1244.1 | 1238.4 |
| 160°   | 1258.9 | 1261.4 | 1262.6 | 1269.5 | 1264.6 |
| 162.5° | 1284.4 | 1284.4 | 1285.6 | 1293.4 | 1287.6 |
| 165°   | 1306.1 | 1304.8 | 1304.8 | 1313.1 | 1307.3 |
| 167.5° | 1325.8 | 1322.1 | 1322.1 | 1330.3 | 1324.6 |
| 170°   | 1340.6 | 1337.3 | 1336.1 | 1344.3 | 1337.3 |
| 172.5° | 1350.8 | 1347.5 | 1346.3 | 1354.5 | 1347.5 |
| 175°   | 1359.1 | 1355.7 | 1353.3 | 1361.5 | 1354.5 |
| 177.5° | 1363.6 | 1360.3 | 1357.8 | 1364.8 | 1357.8 |
| 180°   | 1361.5 | 1361.5 | 1361.5 | 1361.5 | 1361.5 |

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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 | 10.65            | 11.49 | 11.63 | 12.48 | 13.79 | 10.21          | 11.05 | 11.19 | 12.04 | 13.35 |
|                 | 3H   | 12.29            | 13.04 | 13.28 | 14.05 | 15.38 | 11.80          | 12.55 | 12.79 | 13.56 | 14.89 |
|                 | 4H   | 12.87            | 13.58 | 13.87 | 14.58 | 15.92 | 12.37          | 13.08 | 13.38 | 14.09 | 15.43 |
|                 | 6H   | 13.25            | 13.90 | 14.26 | 14.91 | 16.27 | 12.75          | 13.40 | 13.76 | 14.41 | 15.77 |
|                 | 8H   | 13.35            | 13.97 | 14.37 | 15.00 | 16.34 | 12.84          | 13.47 | 13.86 | 14.50 | 15.84 |
|                 | 12H  | 13.39            | 13.98 | 14.41 | 15.00 | 16.37 | 12.88          | 13.47 | 13.90 | 14.49 | 15.86 |
| 4H              | 2H   | 11.10            | 11.81 | 12.11 | 12.82 | 14.16 | 10.74          | 11.46 | 11.75 | 12.46 | 13.80 |
|                 | 3H   | 12.94            | 13.53 | 13.96 | 14.57 | 15.92 | 12.53          | 13.13 | 13.55 | 14.16 | 15.51 |
|                 | 4H   | 13.64            | 14.18 | 14.67 | 15.21 | 16.58 | 13.21          | 13.76 | 14.24 | 14.78 | 16.16 |
|                 | 6H   | 14.13            | 14.60 | 15.17 | 15.65 | 17.02 | 13.70          | 14.17 | 14.74 | 15.22 | 16.59 |
|                 | 8H   | 14.27            | 14.71 | 15.31 | 15.75 | 17.14 | 13.84          | 14.27 | 14.87 | 15.32 | 16.70 |
|                 | 12H  | 14.34            | 14.73 | 15.39 | 15.79 | 17.18 | 13.89          | 14.28 | 14.94 | 15.34 | 16.73 |
| 8H              | 4H   | 13.82            | 14.26 | 14.86 | 15.30 | 16.69 | 13.44          | 13.88 | 14.48 | 14.92 | 16.31 |
|                 | 6H   | 14.43            | 14.79 | 15.49 | 15.87 | 17.26 | 14.04          | 14.40 | 15.11 | 15.49 | 16.87 |
|                 | 8H   | 14.63            | 14.95 | 15.70 | 16.02 | 17.43 | 14.24          | 14.56 | 15.31 | 15.63 | 17.03 |
|                 | 12H  | 14.75            | 15.03 | 15.83 | 16.10 | 17.54 | 14.34          | 14.62 | 15.42 | 15.69 | 17.13 |
| 12H             | 4H   | 13.80            | 14.20 | 14.86 | 15.26 | 16.65 | 13.43          | 13.83 | 14.49 | 14.89 | 16.28 |
|                 | 6H   | 14.45            | 14.77 | 15.52 | 15.84 | 17.24 | 14.08          | 14.40 | 15.15 | 15.47 | 16.87 |
|                 | 8H   | 14.68            | 14.96 | 15.75 | 16.02 | 17.47 | 14.30          | 14.58 | 15.37 | 15.64 | 17.09 |

END OF REPORT