

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: P902445

Luminaire Tested: DFN2DIP-HX2F0-030D030US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902445  
REPORT IS A COMBINATION OF REPORTS P900684 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-030D030US830-RLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

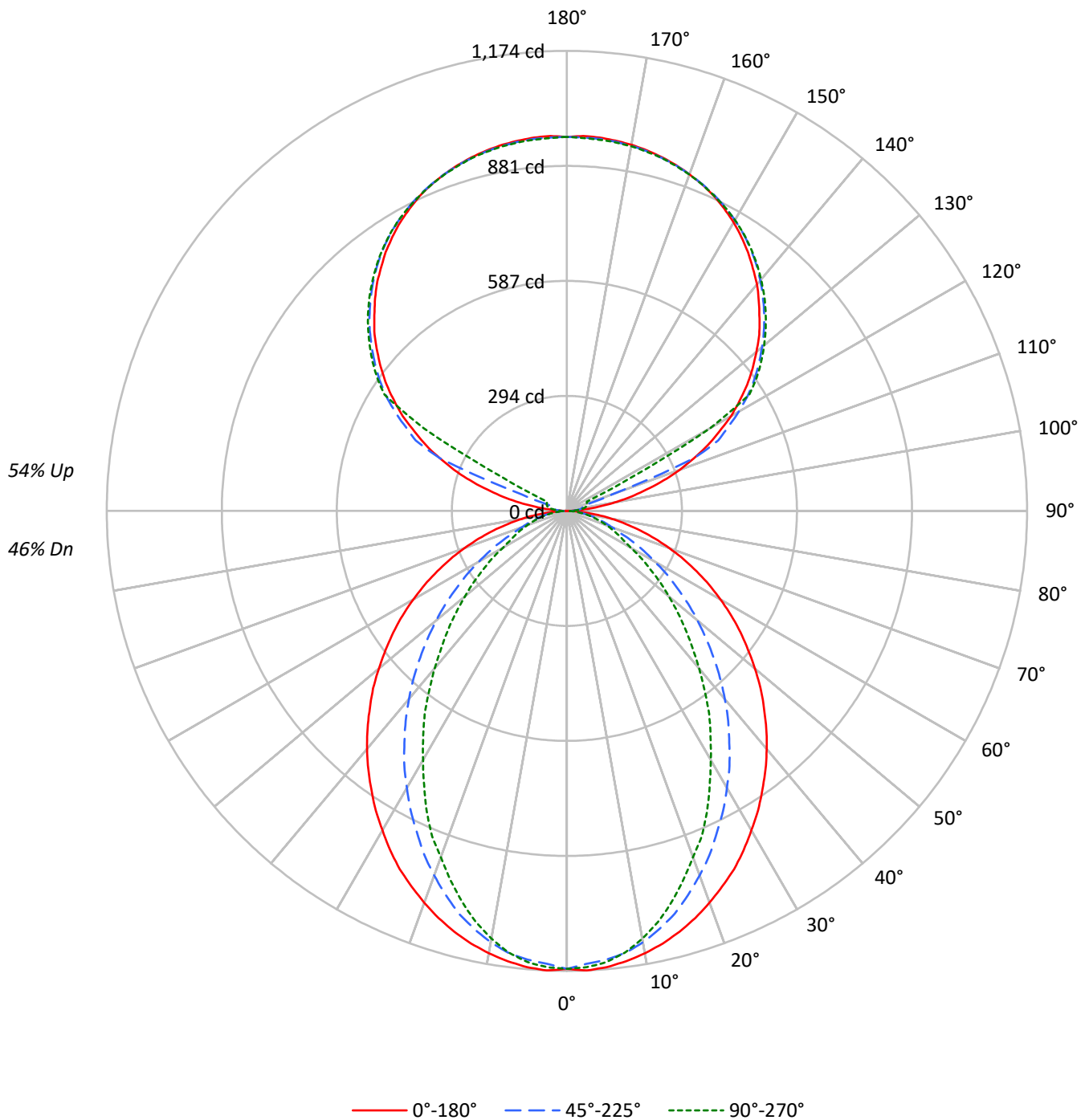
Lumens per Lamp: N/A  
Luminaire Lumens: 5202.9 lumens  
Efficiency: N/A  
Efficacy: 110.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 47  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P902445

CATALOG NUMBER: DFN2DIP-HX2F0-030D030US830-RLLONL

### 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 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 | 46 |    |    |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 | 40 |    |    |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 | 34 |    |    |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 | 29 |    |    |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 | 26 |    |    |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | 23 |    |    |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 | 20 |    |    |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 | 18 |    |    |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 | 16 |    |    |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 | 15 |    |    |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 | 13 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2754 | 2754 | 2754 |
| 5°  | 2754 | 2703 | 2722 |
| 10° | 2722 | 2644 | 2629 |
| 15° | 2680 | 2550 | 2487 |
| 20° | 2626 | 2424 | 2315 |
| 25° | 2571 | 2283 | 2149 |
| 30° | 2498 | 2139 | 1941 |
| 35° | 2427 | 1986 | 1757 |
| 40° | 2354 | 1827 | 1548 |
| 45° | 2270 | 1653 | 1359 |
| 50° | 2182 | 1477 | 1174 |
| 55° | 2090 | 1290 | 997  |
| 60° | 1983 | 1095 | 816  |
| 65° | 1861 | 898  | 729  |
| 70° | 1711 | 714  | 652  |
| 75° | 1523 | 617  | 584  |
| 80° | 1255 | 500  | 492  |
| 85° | 819  | 309  | 345  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2270 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 109.5  | 2.1       |
| 10°-20°   | 300.7  | 5.8       |
| 20°-30°   | 422.1  | 8.1       |
| 30°-40°   | 460.2  | 8.8       |
| 40°-50°   | 422.9  | 8.1       |
| 50°-60°   | 332.2  | 6.4       |
| 60°-70°   | 216.2  | 4.2       |
| 70°-80°   | 111.3  | 2.1       |
| 80°-90°   | 30.1   | 0.6       |
| 90°-100°  | 31.5   | 0.6       |
| 100°-110° | 117.3  | 2.3       |
| 110°-120° | 311.1  | 6.0       |
| 120°-130° | 516.0  | 9.9       |
| 130°-140° | 548.1  | 10.5      |
| 140°-150° | 509.4  | 9.8       |
| 150°-160° | 409.6  | 7.9       |
| 160°-170° | 263.9  | 5.1       |
| 170°-180° | 90.8   | 1.7       |
| <hr/>     |        |           |
| 0°-30°    | 832.3  | 16.0      |
| 0°-40°    | 1292.5 | 24.8      |
| 0°-60°    | 2047.6 | 39.4      |
| 0°-90°    | 2405.2 | 46.2      |
| 90°-120°  | 459.9  | 8.8       |
| 90°-150°  | 2033.4 | 39.1      |
| 90°-180°  | 2798.0 | 53.8      |
| 0°-180°   | 5202.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1169 | 1169  | 1169 | 1169  | 1169 |      |
| 5°   | 1169 | 1163  | 1150 | 1159  | 1156 | 111  |
| 15°  | 1112 | 1100  | 1064 | 1044  | 1033 | 313  |
| 25°  | 1009 | 975   | 905  | 862   | 846  | 464  |
| 35°  | 869  | 815   | 722  | 656   | 632  | 544  |
| 45°  | 711  | 640   | 529  | 454   | 428  | 549  |
| 55°  | 540  | 458   | 344  | 280   | 260  | 483  |
| 65°  | 365  | 279   | 184  | 148   | 145  | 362  |
| 75°  | 194  | 121   | 85   | 77    | 76   | 206  |
| 85°  | 45   | 23    | 20   | 20    | 20   | 52   |
| 90°  | 1    | 8     | 14   | 17    | 19   | 5    |
| 95°  | 45   | 22    | 27   | 30    | 30   | 53   |
| 105° | 210  | 231   | 42   | 50    | 52   | 224  |
| 115° | 397  | 409   | 426  | 106   | 57   | 391  |
| 125° | 561  | 570   | 584  | 588   | 590  | 501  |
| 135° | 695  | 706   | 712  | 719   | 718  | 537  |
| 145° | 806  | 805   | 817  | 822   | 818  | 504  |
| 155° | 887  | 881   | 889  | 894   | 888  | 409  |
| 165° | 935  | 931   | 933  | 938   | 933  | 264  |
| 175° | 956  | 952   | 953  | 958   | 951  | 91   |
| 180° | 954  | 954   | 954  | 954   | 954  |      |

TEST NUMBER: P902445

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1168.7 | 1168.7 | 1168.7 | 1168.7 | 1168.7 |
| 2.5°   | 1173.9 | 1168.7 | 1157.0 | 1167.6 | 1165.5 |
| 5°     | 1168.7 | 1163.4 | 1149.6 | 1159.1 | 1155.9 |
| 7.5°   | 1159.1 | 1152.8 | 1138.0 | 1142.2 | 1136.9 |
| 10°    | 1146.4 | 1139.1 | 1117.9 | 1114.7 | 1108.4 |
| 12.5°  | 1130.6 | 1121.1 | 1092.5 | 1086.2 | 1074.5 |
| 15°    | 1111.5 | 1099.9 | 1063.9 | 1043.9 | 1033.3 |
| 17.5°  | 1089.3 | 1072.4 | 1027.9 | 1004.8 | 987.8  |
| 20°    | 1063.9 | 1042.7 | 989.9  | 963.6  | 940.2  |
| 22.5°  | 1036.5 | 1012.1 | 950.7  | 914.8  | 899.0  |
| 25°    | 1009.0 | 975.1  | 905.3  | 862.0  | 846.0  |
| 27.5°  | 976.2  | 940.2  | 863.0  | 813.3  | 788.9  |
| 30°    | 941.3  | 901.1  | 816.4  | 762.6  | 734.0  |
| 32.5°  | 907.4  | 858.8  | 772.1  | 708.6  | 682.1  |
| 35°    | 869.4  | 815.4  | 722.4  | 655.7  | 632.4  |
| 37.5°  | 832.4  | 774.1  | 675.8  | 602.8  | 576.5  |
| 40°    | 793.2  | 729.8  | 627.2  | 552.0  | 524.6  |
| 42.5°  | 753.0  | 685.4  | 578.5  | 500.2  | 473.8  |
| 45°    | 710.8  | 639.8  | 528.9  | 453.6  | 428.3  |
| 47.5°  | 670.5  | 595.5  | 481.3  | 406.0  | 382.9  |
| 50°    | 626.1  | 551.0  | 434.7  | 361.7  | 339.5  |
| 52.5°  | 582.7  | 503.4  | 390.3  | 320.5  | 300.4  |
| 55°    | 540.4  | 457.9  | 343.7  | 280.3  | 260.2  |
| 57.5°  | 497.1  | 412.5  | 302.6  | 243.3  | 226.3  |
| 60°    | 452.6  | 368.1  | 259.1  | 205.2  | 188.3  |
| 62.5°  | 409.3  | 324.7  | 222.1  | 171.4  | 163.0  |
| 65°    | 364.9  | 279.2  | 184.0  | 148.1  | 144.9  |
| 67.5°  | 322.6  | 236.9  | 148.1  | 130.1  | 126.9  |
| 70°    | 278.1  | 195.7  | 122.6  | 112.1  | 107.8  |
| 72.5°  | 235.8  | 157.5  | 102.5  | 94.2   | 92.0   |
| 75°    | 194.5  | 120.6  | 84.6   | 77.2   | 76.2   |
| 77.5°  | 153.4  | 85.6   | 66.6   | 62.4   | 60.2   |
| 80°    | 115.3  | 61.4   | 50.7   | 46.6   | 46.6   |
| 82.5°  | 80.3   | 41.3   | 34.9   | 32.8   | 32.8   |
| 85°    | 45.4   | 23.2   | 20.1   | 20.1   | 20.1   |
| 87.5°  | 17.0   | 8.4    | 8.4    | 7.4    | 7.4    |
| 90°    | 0.7    | 8.3    | 13.8   | 17.3   | 18.6   |
| 92.5°  | 17.3   | 14.5   | 16.6   | 18.0   | 18.6   |
| 95°    | 44.9   | 22.1   | 26.9   | 30.4   | 29.7   |
| 97.5°  | 80.8   | 24.2   | 35.2   | 37.3   | 38.0   |
| 100°   | 122.2  | 27.6   | 39.4   | 44.9   | 46.3   |
| 102.5° | 167.8  | 166.5  | 40.7   | 48.3   | 50.4   |
| 105°   | 209.9  | 230.6  | 42.1   | 49.7   | 52.5   |
| 107.5° | 258.9  | 276.2  | 43.5   | 51.1   | 53.9   |
| 110°   | 305.9  | 320.4  | 120.8  | 51.8   | 54.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 350.2 | 362.5 | 350.8 | 53.2  | 55.2  |
| 115°   | 397.0 | 408.8 | 426.0 | 106.3 | 56.6  |
| 117.5° | 437.8 | 451.6 | 463.4 | 364.6 | 183.7 |
| 120°   | 483.3 | 493.7 | 506.1 | 514.4 | 421.2 |
| 122.5° | 522.0 | 533.1 | 547.0 | 551.0 | 551.8 |
| 125°   | 561.4 | 570.3 | 583.5 | 588.3 | 590.4 |
| 127.5° | 597.3 | 606.9 | 617.4 | 624.2 | 624.9 |
| 130°   | 631.1 | 642.2 | 649.8 | 657.3 | 656.8 |
| 132.5° | 665.6 | 674.7 | 682.2 | 688.4 | 687.8 |
| 135°   | 694.7 | 705.8 | 711.9 | 718.9 | 717.5 |
| 137.5° | 725.0 | 733.3 | 740.3 | 747.2 | 745.1 |
| 140°   | 754.7 | 760.3 | 767.8 | 774.0 | 770.6 |
| 142.5° | 779.7 | 784.5 | 793.4 | 798.9 | 795.5 |
| 145°   | 805.9 | 805.1 | 816.9 | 821.7 | 818.2 |
| 147.5° | 828.6 | 826.5 | 838.3 | 841.7 | 839.0 |
| 150°   | 850.7 | 845.9 | 857.0 | 861.0 | 857.6 |
| 152.5° | 869.3 | 863.8 | 874.2 | 878.4 | 873.5 |
| 155°   | 887.3 | 881.2 | 889.4 | 893.5 | 888.1 |
| 157.5° | 901.8 | 896.4 | 902.6 | 907.4 | 901.8 |
| 160°   | 914.3 | 910.1 | 914.3 | 918.4 | 913.5 |
| 162.5° | 925.3 | 921.1 | 924.6 | 929.4 | 923.2 |
| 165°   | 934.9 | 930.9 | 932.9 | 937.7 | 932.9 |
| 167.5° | 942.5 | 938.4 | 940.5 | 945.4 | 939.1 |
| 170°   | 948.8 | 944.6 | 946.0 | 950.8 | 944.6 |
| 172.5° | 952.9 | 948.8 | 950.2 | 955.0 | 948.8 |
| 175°   | 956.3 | 951.5 | 952.9 | 957.7 | 950.8 |
| 177.5° | 957.7 | 952.9 | 953.7 | 958.5 | 952.3 |
| 180°   | 954.3 | 954.3 | 954.3 | 954.3 | 954.3 |

TEST NUMBER: P902445

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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 | 10.17            | 10.97 | 11.16 | 11.97 | 13.30 | 6.15           | 6.95 | 7.14  | 7.95  | 9.28  |
|                 | 3H   | 11.82            | 12.53 | 12.82 | 13.54 | 14.89 | 7.32           | 8.03 | 8.32  | 9.05  | 10.39 |
|                 | 4H   | 12.41            | 13.08 | 13.43 | 14.10 | 15.45 | 7.76           | 8.43 | 8.77  | 9.45  | 10.80 |
|                 | 6H   | 12.81            | 13.43 | 13.84 | 14.45 | 15.82 | 8.06           | 8.68 | 9.09  | 9.70  | 11.07 |
|                 | 8H   | 12.92            | 13.51 | 13.96 | 14.55 | 15.91 | 8.14           | 8.73 | 9.18  | 9.77  | 11.13 |
|                 | 12H  | 12.97            | 13.53 | 14.01 | 14.56 | 15.95 | 8.18           | 8.74 | 9.22  | 9.77  | 11.16 |
| 4H              | 2H   | 10.18            | 10.85 | 11.20 | 11.87 | 13.22 | 6.73           | 7.40 | 7.75  | 8.42  | 9.77  |
|                 | 3H   | 11.97            | 12.54 | 13.01 | 13.58 | 14.95 | 8.05           | 8.62 | 9.09  | 9.66  | 11.03 |
|                 | 4H   | 12.65            | 13.16 | 13.69 | 14.20 | 15.59 | 8.59           | 9.10 | 9.63  | 10.14 | 11.53 |
|                 | 6H   | 13.14            | 13.58 | 14.19 | 14.64 | 16.02 | 8.99           | 9.43 | 10.04 | 10.49 | 11.87 |
|                 | 8H   | 13.30            | 13.71 | 14.35 | 14.76 | 16.16 | 9.10           | 9.52 | 10.16 | 10.57 | 11.97 |
|                 | 12H  | 13.38            | 13.75 | 14.44 | 14.81 | 16.22 | 9.16           | 9.53 | 10.23 | 10.60 | 12.00 |
| 8H              | 4H   | 12.61            | 13.02 | 13.66 | 14.07 | 15.47 | 8.85           | 9.26 | 9.90  | 10.31 | 11.71 |
|                 | 6H   | 13.15            | 13.49 | 14.22 | 14.58 | 15.98 | 9.34           | 9.68 | 10.42 | 10.78 | 12.18 |
|                 | 8H   | 13.35            | 13.64 | 14.43 | 14.72 | 16.14 | 9.52           | 9.82 | 10.60 | 10.90 | 12.32 |
|                 | 12H  | 13.47            | 13.73 | 14.55 | 14.80 | 16.26 | 9.63           | 9.89 | 10.71 | 10.96 | 12.42 |
| 12H             | 4H   | 12.56            | 12.93 | 13.63 | 13.99 | 15.40 | 8.85           | 9.22 | 9.92  | 10.29 | 11.69 |
|                 | 6H   | 13.12            | 13.42 | 14.20 | 14.50 | 15.91 | 9.39           | 9.69 | 10.47 | 10.76 | 12.18 |
|                 | 8H   | 13.32            | 13.58 | 14.41 | 14.66 | 16.12 | 9.58           | 9.84 | 10.66 | 10.91 | 12.38 |

END OF REPORT