

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: P918795

Luminaire Tested: DFN2DIP-HX2F0-020D040US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918795  
REPORT IS A COMBINATION OF REPORTS P900691 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-020D040US935-FLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

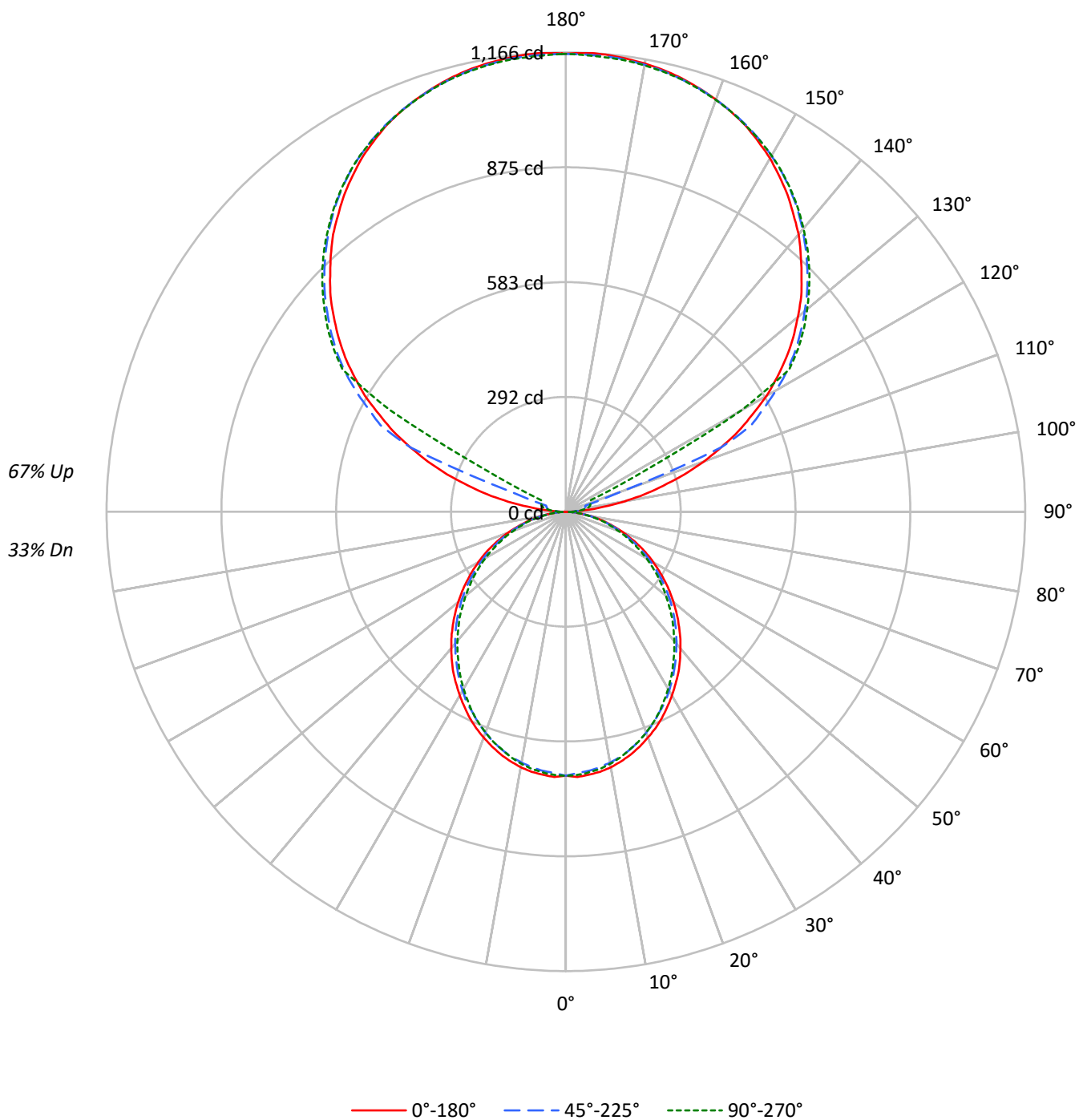
Lumens per Lamp: N/A  
Luminaire Lumens: 5114.3 lumens  
Efficiency: N/A  
Efficacy: 114.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 44.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 78  | 72  | 67  | 77 | 71 | 66 | 62 | 57 | 53 | 50 | 44 | 41 | 39 | 32 | 30 | 29 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 46 | 42 | 39 | 36 | 33 | 28 | 26 | 25 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 49 | 43 | 44 | 40 | 36 | 34 | 31 | 28 | 25 | 23 | 21 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 40 | 35 | 31 | 31 | 27 | 25 | 23 | 20 | 18 |
| 6   | 60  | 48  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 28 | 24 | 21 | 20 | 18 | 16 |
| 7   | 56  | 44  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 25 | 22 | 19 | 19 | 16 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 15 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1579 | 1579 | 1579 |
| 5°  | 1579 | 1553 | 1564 |
| 10° | 1563 | 1528 | 1540 |
| 15° | 1538 | 1499 | 1504 |
| 20° | 1504 | 1461 | 1468 |
| 25° | 1471 | 1415 | 1426 |
| 30° | 1429 | 1373 | 1373 |
| 35° | 1390 | 1323 | 1318 |
| 40° | 1342 | 1273 | 1264 |
| 45° | 1294 | 1222 | 1210 |
| 50° | 1242 | 1169 | 1147 |
| 55° | 1186 | 1107 | 1089 |
| 60° | 1123 | 1035 | 1022 |
| 65° | 1054 | 960  | 944  |
| 70° | 967  | 867  | 858  |
| 75° | 847  | 757  | 776  |
| 80° | 702  | 616  | 625  |
| 85° | 475  | 386  | 388  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1294 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 63.1   | 1.2       |
| 10°-20°   | 177.4  | 3.5       |
| 20°-30°   | 260.8  | 5.1       |
| 30°-40°   | 302.9  | 5.9       |
| 40°-50°   | 302.5  | 5.9       |
| 50°-60°   | 263.8  | 5.2       |
| 60°-70°   | 195.0  | 3.8       |
| 70°-80°   | 110.3  | 2.2       |
| 80°-90°   | 31.1   | 0.6       |
| 90°-100°  | 38.3   | 0.7       |
| 100°-110° | 142.9  | 2.8       |
| 110°-120° | 378.9  | 7.4       |
| 120°-130° | 628.5  | 12.3      |
| 130°-140° | 667.6  | 13.1      |
| 140°-150° | 620.4  | 12.1      |
| 150°-160° | 498.8  | 9.8       |
| 160°-170° | 321.4  | 6.3       |
| 170°-180° | 110.6  | 2.2       |
| 0°-30°    | 501.3  | 9.8       |
| 0°-40°    | 804.1  | 15.7      |
| 0°-60°    | 1370.4 | 26.8      |
| 0°-90°    | 1706.8 | 33.4      |
| 90°-120°  | 560.1  | 11.0      |
| 90°-150°  | 2476.6 | 48.4      |
| 90°-180°  | 3407.0 | 66.6      |
| 0°-180°   | 5114.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 670  | 670   | 670  | 670   | 670  |      |
| 5°   | 670  | 668   | 660  | 666   | 664  | 64   |
| 15°  | 638  | 634   | 626  | 628   | 625  | 180  |
| 25°  | 577  | 572   | 561  | 562   | 561  | 266  |
| 35°  | 498  | 492   | 481  | 477   | 474  | 311  |
| 45°  | 405  | 401   | 391  | 384   | 381  | 313  |
| 55°  | 307  | 303   | 295  | 287   | 284  | 274  |
| 65°  | 207  | 203   | 197  | 191   | 188  | 205  |
| 75°  | 108  | 107   | 104  | 100   | 101  | 116  |
| 85°  | 26   | 26    | 25   | 23    | 23   | 29   |
| 90°  | 1    | 10    | 17   | 21    | 23   | 5    |
| 95°  | 55   | 27    | 33   | 37    | 36   | 65   |
| 105° | 256  | 281   | 51   | 60    | 64   | 273  |
| 115° | 484  | 498   | 519  | 130   | 69   | 476  |
| 125° | 684  | 695   | 711  | 717   | 719  | 610  |
| 135° | 846  | 860   | 867  | 876   | 874  | 654  |
| 145° | 982  | 981   | 995  | 1001  | 997  | 614  |
| 155° | 1081 | 1073  | 1083 | 1088  | 1082 | 498  |
| 165° | 1139 | 1134  | 1136 | 1142  | 1136 | 322  |
| 175° | 1165 | 1159  | 1161 | 1166  | 1158 | 111  |
| 180° | 1162 | 1162  | 1162 | 1162  | 1162 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 670.0 | 670.0 | 670.0 | 670.0 | 670.0 |
| 2.5°   | 673.9 | 670.7 | 663.6 | 670.0 | 668.8 |
| 5°     | 670.0 | 667.5 | 660.4 | 665.6 | 664.3 |
| 7.5°   | 665.6 | 661.7 | 654.6 | 659.8 | 658.5 |
| 10°    | 658.5 | 654.0 | 646.3 | 651.3 | 649.5 |
| 12.5°  | 648.8 | 645.0 | 637.2 | 640.4 | 639.1 |
| 15°    | 637.8 | 634.0 | 625.6 | 628.2 | 625.0 |
| 17.5°  | 624.3 | 620.5 | 612.1 | 615.3 | 612.1 |
| 20°    | 609.5 | 605.6 | 596.6 | 598.6 | 596.0 |
| 22.5°  | 594.7 | 588.9 | 580.5 | 580.5 | 579.2 |
| 25°    | 577.3 | 572.1 | 561.2 | 562.4 | 561.2 |
| 27.5°  | 557.9 | 553.4 | 545.1 | 543.2 | 539.9 |
| 30°    | 538.6 | 533.5 | 523.8 | 521.9 | 519.3 |
| 32.5°  | 518.0 | 514.2 | 503.9 | 500.0 | 497.4 |
| 35°    | 498.1 | 491.6 | 481.3 | 477.4 | 474.2 |
| 37.5°  | 475.5 | 469.7 | 459.3 | 454.9 | 451.6 |
| 40°    | 452.3 | 447.1 | 436.8 | 431.1 | 428.4 |
| 42.5°  | 429.7 | 424.6 | 414.3 | 407.9 | 404.0 |
| 45°    | 405.3 | 400.8 | 391.1 | 384.0 | 381.4 |
| 47.5°  | 381.4 | 376.9 | 366.6 | 359.5 | 355.7 |
| 50°    | 356.3 | 353.1 | 344.1 | 335.0 | 331.8 |
| 52.5°  | 331.8 | 327.3 | 318.9 | 311.9 | 307.4 |
| 55°    | 306.7 | 302.8 | 295.1 | 287.4 | 284.1 |
| 57.5°  | 281.5 | 278.4 | 269.9 | 262.3 | 259.6 |
| 60°    | 256.4 | 253.9 | 244.9 | 237.7 | 235.8 |
| 62.5°  | 232.0 | 227.4 | 221.0 | 214.6 | 212.0 |
| 65°    | 206.8 | 202.9 | 196.6 | 190.7 | 187.5 |
| 67.5°  | 181.1 | 177.8 | 172.0 | 167.6 | 165.0 |
| 70°    | 157.2 | 154.6 | 148.8 | 144.3 | 141.8 |
| 72.5°  | 132.8 | 130.2 | 126.9 | 122.4 | 120.5 |
| 75°    | 108.2 | 107.0 | 103.7 | 99.9  | 101.2 |
| 77.5°  | 86.4  | 83.8  | 82.4  | 80.5  | 78.6  |
| 80°    | 64.5  | 63.8  | 62.5  | 60.5  | 59.2  |
| 82.5°  | 43.8  | 43.8  | 43.2  | 40.6  | 40.6  |
| 85°    | 26.3  | 25.7  | 25.1  | 23.2  | 22.6  |
| 87.5°  | 11.6  | 10.3  | 9.0   | 7.1   | 6.5   |
| 90°    | 0.8   | 10.1  | 16.8  | 21.1  | 22.6  |
| 92.5°  | 21.1  | 17.7  | 20.1  | 21.9  | 22.6  |
| 95°    | 54.6  | 26.9  | 32.7  | 37.0  | 36.2  |
| 97.5°  | 98.4  | 29.4  | 42.9  | 45.5  | 46.2  |
| 100°   | 148.9 | 33.7  | 48.0  | 54.6  | 56.3  |
| 102.5° | 204.3 | 202.8 | 49.6  | 58.8  | 61.4  |
| 105°   | 255.6 | 280.9 | 51.3  | 60.5  | 63.9  |
| 107.5° | 315.4 | 336.4 | 53.0  | 62.3  | 65.6  |
| 110°   | 372.6 | 390.2 | 147.2 | 63.1  | 66.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 426.5  | 441.5  | 427.2  | 64.7   | 67.3   |
| 115°   | 483.5  | 497.8  | 518.9  | 129.5  | 69.1   |
| 117.5° | 533.2  | 550.0  | 564.4  | 444.0  | 223.7  |
| 120°   | 588.8  | 601.3  | 616.5  | 626.6  | 513.1  |
| 122.5° | 635.8  | 649.3  | 666.2  | 671.1  | 672.0  |
| 125°   | 683.7  | 694.7  | 710.7  | 716.6  | 719.1  |
| 127.5° | 727.5  | 739.3  | 751.9  | 760.3  | 761.1  |
| 130°   | 768.7  | 782.2  | 791.3  | 800.6  | 799.9  |
| 132.5° | 810.7  | 821.7  | 830.9  | 838.5  | 837.8  |
| 135°   | 846.1  | 859.6  | 867.1  | 875.5  | 873.9  |
| 137.5° | 883.0  | 893.1  | 901.6  | 910.0  | 907.5  |
| 140°   | 919.2  | 926.0  | 935.2  | 942.8  | 938.6  |
| 142.5° | 949.6  | 955.4  | 966.4  | 973.0  | 968.9  |
| 145°   | 981.5  | 980.7  | 994.9  | 1000.8 | 996.6  |
| 147.5° | 1009.2 | 1006.7 | 1021.0 | 1025.2 | 1021.9 |
| 150°   | 1036.1 | 1030.3 | 1043.8 | 1048.8 | 1044.6 |
| 152.5° | 1058.9 | 1052.1 | 1064.7 | 1069.8 | 1063.9 |
| 155°   | 1080.7 | 1073.2 | 1083.3 | 1088.3 | 1081.6 |
| 157.5° | 1098.4 | 1091.7 | 1099.3 | 1105.2 | 1098.4 |
| 160°   | 1113.5 | 1108.4 | 1113.5 | 1118.5 | 1112.7 |
| 162.5° | 1127.0 | 1122.0 | 1126.2 | 1132.0 | 1124.5 |
| 165°   | 1138.8 | 1133.8 | 1136.3 | 1142.1 | 1136.3 |
| 167.5° | 1148.1 | 1142.9 | 1145.6 | 1151.4 | 1143.8 |
| 170°   | 1155.6 | 1150.6 | 1152.2 | 1158.1 | 1150.6 |
| 172.5° | 1160.6 | 1155.6 | 1157.4 | 1163.2 | 1155.6 |
| 175°   | 1164.8 | 1158.9 | 1160.6 | 1166.5 | 1158.1 |
| 177.5° | 1166.5 | 1160.6 | 1161.5 | 1167.4 | 1159.9 |
| 180°   | 1162.3 | 1162.3 | 1162.3 | 1162.3 | 1162.3 |

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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 | 6.95             | 7.68  | 8.04  | 8.77  | 10.26 | 6.53           | 7.26  | 7.62  | 8.34  | 9.83  |
|                 | 3H   | 8.57             | 9.23  | 9.67  | 10.32 | 11.83 | 8.11           | 8.77  | 9.21  | 9.86  | 11.37 |
|                 | 4H   | 9.14             | 9.76  | 10.25 | 10.86 | 12.37 | 8.68           | 9.30  | 9.79  | 10.40 | 11.91 |
|                 | 6H   | 9.51             | 10.08 | 10.63 | 11.18 | 12.71 | 9.05           | 9.62  | 10.17 | 10.72 | 12.25 |
|                 | 8H   | 9.60             | 10.15 | 10.72 | 11.26 | 12.78 | 9.15           | 9.69  | 10.27 | 10.80 | 12.32 |
|                 | 12H  | 9.64             | 10.15 | 10.76 | 11.26 | 12.81 | 9.18           | 9.69  | 10.30 | 10.80 | 12.34 |
| 4H              | 2H   | 7.39             | 8.01  | 8.50  | 9.10  | 10.62 | 7.05           | 7.67  | 8.16  | 8.76  | 10.28 |
|                 | 3H   | 9.21             | 9.73  | 10.33 | 10.85 | 12.38 | 8.83           | 9.34  | 9.95  | 10.47 | 11.99 |
|                 | 4H   | 9.90             | 10.37 | 11.02 | 11.49 | 13.03 | 9.51           | 9.98  | 10.63 | 11.09 | 12.64 |
|                 | 6H   | 10.38            | 10.79 | 11.51 | 11.93 | 13.46 | 9.99           | 10.39 | 11.12 | 11.53 | 13.07 |
|                 | 8H   | 10.52            | 10.90 | 11.65 | 12.03 | 13.58 | 10.12          | 10.50 | 11.25 | 11.63 | 13.18 |
|                 | 12H  | 10.57            | 10.92 | 11.72 | 12.06 | 13.62 | 10.17          | 10.51 | 11.32 | 11.65 | 13.21 |
| 8H              | 4H   | 10.07            | 10.45 | 11.20 | 11.58 | 13.14 | 9.72           | 10.10 | 10.85 | 11.23 | 12.79 |
|                 | 6H   | 10.67            | 10.98 | 11.82 | 12.15 | 13.71 | 10.32          | 10.63 | 11.47 | 11.80 | 13.35 |
|                 | 8H   | 10.87            | 11.15 | 12.03 | 12.30 | 13.87 | 10.52          | 10.79 | 11.67 | 11.94 | 13.51 |
|                 | 12H  | 10.98            | 11.22 | 12.14 | 12.37 | 13.98 | 10.61          | 10.85 | 11.77 | 12.00 | 13.61 |
| 12H             | 4H   | 10.05            | 10.39 | 11.20 | 11.53 | 13.09 | 9.71           | 10.05 | 10.85 | 11.19 | 12.75 |
|                 | 6H   | 10.69            | 10.97 | 11.85 | 12.12 | 13.69 | 10.35          | 10.63 | 11.51 | 11.78 | 13.35 |
|                 | 8H   | 10.91            | 11.15 | 12.07 | 12.30 | 13.90 | 10.56          | 10.81 | 11.73 | 11.95 | 13.56 |

END OF REPORT