

Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State
Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P27864

Luminaire Tested: **TRO11-LD4-20W-50-OPL-BK-UNV-EDC1**

Test Date: 05/21/16



Test Information

Test Method: LM-79-08
Report Number: P27864
Test Lab: INNOVATION CENTER(G2)
Test Date: 05/21/16
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1
Description: TERRAPIN 11" LED WALL MOUNT WITH OPEN OPAL LENS
Light Source: (56) NICHIA 5000
NF2L757DRT
Ballast/Driver: (1) OSRAM ELECTRONIC DRIVER PROGRAMMED AT 450mA
OT40W

Summary

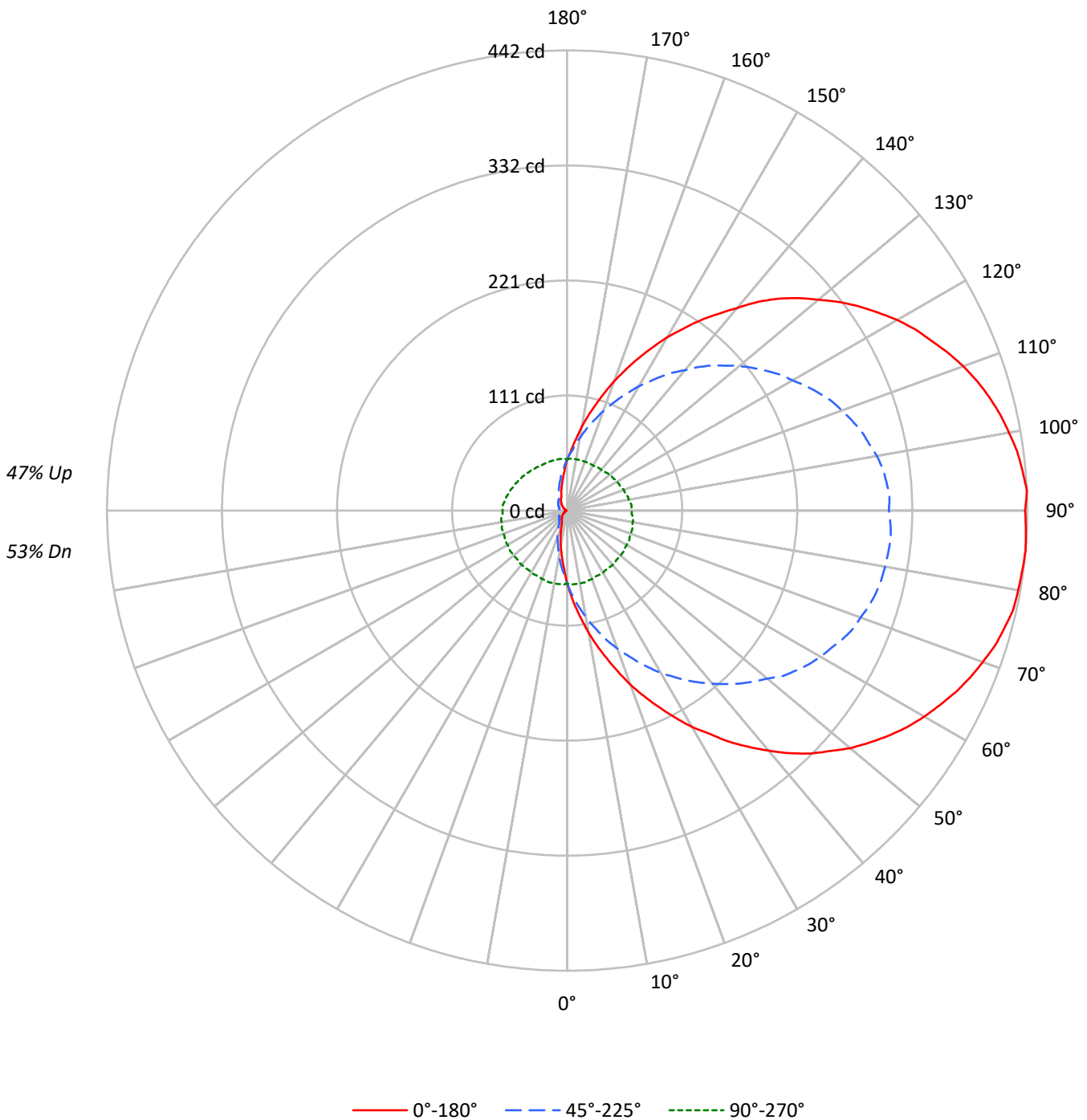
Lumens per Lamp: N/A
Luminaire Lumens: 1546.1 lumens
Efficiency: N/A
Efficacy: 70.3 lumens/watt
Spacing Criteria (0/90/45): 2.9 / 1.49 / 2.5
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')
CIE Type: General Diffuse

Input Watts (W): 22
Input Voltage (V): 120.0
Input Current (Ain): 0.184
Voltage Rise (V): NR
Power Factor: 0.9976
Total Harmonic Distortion (THDi): 6.77%
Frequency (hertz): 60
Stabilization Time: 0.5 HR
Operation Time: 24 HR
Ambient Temperature (°C): 24.3
Test Distance: 25 FT

TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

Luminous Intensity Polar Plot





TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| RF | 20 | | | | 20 | | | | 20 | | | | 20 | | | | 20 | |
| RC | 80 | | | | 70 | | | | 50 | | | | 30 | | | | 10 | 0 |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | |
| 0 | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 58 | 58 | 58 | 53 |
| 1 | 93 | 86 | 80 | 75 | 85 | 79 | 74 | 69 | 66 | 62 | 58 | 54 | 51 | 48 | 43 | 41 | 39 | 33 |
| 2 | 83 | 72 | 64 | 57 | 75 | 66 | 59 | 53 | 55 | 49 | 44 | 45 | 40 | 36 | 35 | 32 | 29 | 24 |
| 3 | 74 | 62 | 53 | 45 | 67 | 57 | 48 | 42 | 47 | 40 | 35 | 38 | 33 | 28 | 29 | 26 | 22 | 18 |
| 4 | 67 | 54 | 44 | 37 | 61 | 49 | 41 | 34 | 41 | 34 | 28 | 33 | 27 | 23 | 25 | 21 | 18 | 14 |
| 5 | 61 | 47 | 38 | 31 | 55 | 43 | 35 | 28 | 36 | 29 | 24 | 29 | 23 | 19 | 22 | 18 | 15 | 11 |
| 6 | 56 | 42 | 33 | 26 | 51 | 38 | 30 | 24 | 32 | 25 | 20 | 26 | 20 | 16 | 20 | 16 | 12 | 9 |
| 7 | 51 | 38 | 28 | 22 | 47 | 34 | 26 | 20 | 29 | 22 | 17 | 23 | 18 | 14 | 18 | 14 | 10 | 8 |
| 8 | 48 | 34 | 25 | 19 | 43 | 31 | 23 | 18 | 26 | 19 | 15 | 21 | 16 | 12 | 16 | 12 | 9 | 7 |
| 9 | 44 | 31 | 22 | 17 | 40 | 28 | 21 | 15 | 24 | 17 | 13 | 19 | 14 | 10 | 15 | 11 | 8 | 6 |
| 10 | 41 | 28 | 20 | 15 | 38 | 26 | 18 | 14 | 22 | 16 | 11 | 18 | 13 | 9 | 14 | 10 | 7 | 5 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 90° | 180° |
|-----|------|------|------|
| 0° | 2818 | 2818 | 2818 |
| 5° | 2948 | 2639 | 1553 |
| 10° | 3130 | 2467 | 921 |
| 15° | 3326 | 2334 | 543 |
| 20° | 3557 | 2199 | 320 |
| 25° | 3748 | 2090 | 216 |
| 30° | 3964 | 2034 | 165 |
| 35° | 4161 | 1966 | 138 |
| 40° | 4349 | 1943 | 116 |
| 45° | 4535 | 1907 | 82 |
| 50° | 4685 | 1915 | 66 |
| 55° | 4821 | 1937 | 51 |
| 60° | 4948 | 1945 | 37 |
| 65° | 5071 | 1999 | 25 |
| 70° | 5192 | 2042 | 12 |
| 75° | 5316 | 2137 | 12 |
| 80° | 5419 | 2224 | 12 |
| 85° | 5530 | 2341 | 13 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 6.9 | 0.4 |
| 10°-20° | 22.4 | 1.4 |
| 20°-30° | 41.9 | 2.7 |
| 30°-40° | 66.2 | 4.3 |
| 40°-50° | 93.2 | 6.0 |
| 50°-60° | 119.4 | 7.7 |
| 60°-70° | 141.6 | 9.2 |
| 70°-80° | 157.2 | 10.2 |
| 80°-90° | 163.8 | 10.6 |
| 90°-100° | 161.8 | 10.5 |
| 100°-110° | 149.9 | 9.7 |
| 110°-120° | 130.2 | 8.4 |
| 120°-130° | 105.8 | 6.8 |
| 130°-140° | 79.2 | 5.1 |
| 140°-150° | 53.5 | 3.5 |
| 150°-160° | 32.2 | 2.1 |
| 160°-170° | 16.3 | 1.1 |
| 170°-180° | 4.8 | 0.3 |
| 0°-30° | 71.1 | 4.6 |
| 0°-40° | 137.3 | 8.9 |
| 0°-60° | 350.0 | 22.6 |
| 0°-90° | 812.6 | 52.6 |
| 90°-120° | 441.8 | 28.6 |
| 90°-150° | 680.2 | 44.0 |
| 90°-180° | 734.0 | 47.5 |
| 0°-180° | 1546.1 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 45° | 90° | 135° | 180° | Flux |
|------|-----|-----|-----|------|------|------|
| 0° | 70 | 70 | 70 | 70 | 70 | |
| 5° | 93 | 87 | 71 | 56 | 49 | 10 |
| 15° | 147 | 122 | 71 | 34 | 24 | 43 |
| 25° | 208 | 160 | 69 | 20 | 12 | 97 |
| 35° | 271 | 199 | 68 | 13 | 9 | 171 |
| 45° | 330 | 235 | 67 | 11 | 6 | 255 |
| 55° | 377 | 268 | 67 | 9 | 4 | 338 |
| 65° | 412 | 292 | 66 | 8 | 2 | 409 |
| 75° | 435 | 307 | 65 | 8 | 1 | 460 |
| 85° | 442 | 312 | 63 | 7 | 1 | 360 |
| 90° | 440 | 309 | 62 | 7 | 1 | 242 |
| 95° | 439 | 308 | 62 | 7 | 1 | 357 |
| 105° | 420 | 293 | 59 | 8 | 1 | 444 |
| 115° | 386 | 267 | 56 | 9 | 1 | 384 |
| 125° | 342 | 234 | 54 | 10 | 4 | 307 |
| 135° | 288 | 197 | 52 | 12 | 7 | 223 |
| 145° | 223 | 157 | 51 | 14 | 10 | 141 |
| 155° | 161 | 119 | 50 | 19 | 13 | 75 |
| 165° | 105 | 86 | 50 | 28 | 21 | 31 |
| 175° | 62 | 58 | 50 | 40 | 36 | 7 |
| 180° | 49 | 49 | 49 | 49 | 49 | |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 22.5° | 25° | 30° | 35° | 40° | 45° |
|--------|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|
| 0° | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| 2.5° | 81 | 80 | 81 | 80 | 80 | 79 | 79 | 79 | 79 | 78 | 78 |
| 5° | 93 | 92 | 92 | 92 | 91 | 91 | 90 | 90 | 89 | 87 | 87 |
| 7.5° | 105 | 105 | 105 | 104 | 103 | 102 | 102 | 100 | 98 | 97 | 95 |
| 10° | 119 | 118 | 117 | 117 | 115 | 114 | 114 | 111 | 109 | 106 | 104 |
| 12.5° | 133 | 132 | 131 | 129 | 128 | 126 | 125 | 123 | 120 | 116 | 113 |
| 15° | 147 | 147 | 146 | 144 | 142 | 141 | 139 | 136 | 131 | 127 | 122 |
| 17.5° | 162 | 162 | 161 | 158 | 156 | 154 | 152 | 148 | 143 | 137 | 132 |
| 20° | 178 | 177 | 175 | 173 | 170 | 168 | 165 | 160 | 154 | 148 | 141 |
| 22.5° | 193 | 192 | 190 | 187 | 183 | 181 | 178 | 172 | 166 | 158 | 150 |
| 25° | 208 | 207 | 205 | 202 | 197 | 195 | 192 | 186 | 178 | 169 | 160 |
| 27.5° | 224 | 223 | 221 | 218 | 212 | 210 | 206 | 199 | 190 | 180 | 170 |
| 30° | 240 | 239 | 236 | 232 | 226 | 224 | 220 | 211 | 202 | 192 | 180 |
| 32.5° | 254 | 254 | 251 | 246 | 240 | 237 | 233 | 224 | 213 | 202 | 189 |
| 35° | 271 | 271 | 268 | 263 | 254 | 251 | 246 | 236 | 225 | 212 | 199 |
| 37.5° | 286 | 286 | 282 | 277 | 271 | 267 | 262 | 249 | 236 | 223 | 208 |
| 40° | 301 | 301 | 298 | 292 | 284 | 280 | 274 | 263 | 248 | 233 | 217 |
| 42.5° | 316 | 315 | 311 | 306 | 298 | 292 | 287 | 275 | 261 | 243 | 226 |
| 45° | 330 | 329 | 325 | 319 | 310 | 305 | 299 | 287 | 272 | 253 | 235 |
| 47.5° | 342 | 341 | 337 | 331 | 322 | 317 | 311 | 297 | 282 | 264 | 243 |
| 50° | 355 | 354 | 350 | 343 | 334 | 327 | 322 | 308 | 292 | 274 | 251 |
| 52.5° | 366 | 365 | 361 | 354 | 344 | 338 | 332 | 318 | 300 | 282 | 261 |
| 55° | 377 | 376 | 371 | 364 | 354 | 348 | 342 | 327 | 309 | 289 | 268 |
| 57.5° | 387 | 385 | 381 | 374 | 364 | 357 | 351 | 335 | 317 | 297 | 275 |
| 60° | 396 | 394 | 390 | 383 | 372 | 366 | 359 | 343 | 324 | 304 | 281 |
| 62.5° | 404 | 403 | 398 | 391 | 380 | 373 | 367 | 350 | 331 | 310 | 286 |
| 65° | 412 | 411 | 406 | 398 | 387 | 380 | 374 | 357 | 338 | 316 | 292 |
| 67.5° | 419 | 418 | 413 | 405 | 394 | 388 | 380 | 363 | 344 | 321 | 297 |
| 70° | 425 | 423 | 418 | 411 | 399 | 393 | 385 | 368 | 349 | 326 | 300 |
| 72.5° | 431 | 429 | 424 | 416 | 405 | 398 | 391 | 373 | 352 | 329 | 304 |
| 75° | 435 | 433 | 429 | 420 | 409 | 402 | 394 | 377 | 356 | 333 | 307 |
| 77.5° | 439 | 436 | 432 | 423 | 412 | 405 | 397 | 379 | 359 | 335 | 309 |
| 80° | 440 | 439 | 434 | 425 | 414 | 408 | 399 | 381 | 360 | 337 | 310 |
| 82.5° | 441 | 440 | 435 | 426 | 416 | 409 | 400 | 383 | 362 | 338 | 311 |
| 85° | 442 | 441 | 436 | 428 | 416 | 409 | 401 | 383 | 362 | 339 | 312 |
| 87.5° | 441 | 440 | 436 | 427 | 416 | 409 | 401 | 383 | 362 | 338 | 311 |
| 90° | 440 | 439 | 434 | 426 | 414 | 407 | 399 | 381 | 360 | 336 | 309 |
| 92.5° | 442 | 440 | 435 | 427 | 415 | 408 | 401 | 382 | 361 | 337 | 310 |
| 95° | 439 | 438 | 433 | 424 | 413 | 406 | 398 | 380 | 359 | 335 | 308 |
| 97.5° | 436 | 435 | 429 | 421 | 410 | 402 | 395 | 377 | 355 | 332 | 306 |
| 100° | 431 | 430 | 424 | 416 | 404 | 398 | 390 | 372 | 351 | 328 | 302 |
| 102.5° | 426 | 424 | 419 | 411 | 400 | 393 | 385 | 367 | 346 | 323 | 297 |
| 105° | 420 | 418 | 413 | 405 | 394 | 387 | 379 | 362 | 342 | 318 | 293 |
| 107.5° | 413 | 411 | 406 | 397 | 387 | 380 | 372 | 355 | 335 | 312 | 287 |
| 110° | 405 | 403 | 399 | 390 | 379 | 373 | 365 | 348 | 328 | 306 | 281 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

| | 0° | 5° | 10° | 15° | 20° | 22.5° | 25° | 30° | 35° | 40° | 45° |
|--------|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|
| 112.5° | 396 | 394 | 389 | 381 | 371 | 364 | 357 | 340 | 321 | 299 | 275 |
| 115° | 386 | 385 | 380 | 372 | 362 | 355 | 348 | 331 | 312 | 291 | 267 |
| 117.5° | 377 | 375 | 370 | 363 | 352 | 346 | 339 | 323 | 305 | 284 | 259 |
| 120° | 366 | 364 | 360 | 353 | 342 | 336 | 329 | 314 | 295 | 275 | 250 |
| 122.5° | 354 | 352 | 348 | 341 | 331 | 325 | 319 | 304 | 286 | 266 | 243 |
| 125° | 342 | 340 | 336 | 330 | 320 | 314 | 308 | 293 | 276 | 256 | 234 |
| 127.5° | 329 | 327 | 324 | 317 | 308 | 302 | 296 | 282 | 265 | 245 | 225 |
| 130° | 315 | 314 | 310 | 304 | 295 | 289 | 283 | 270 | 252 | 235 | 216 |
| 132.5° | 302 | 300 | 297 | 291 | 282 | 277 | 272 | 258 | 241 | 224 | 206 |
| 135° | 288 | 286 | 283 | 277 | 269 | 264 | 257 | 244 | 230 | 214 | 197 |
| 137.5° | 272 | 271 | 268 | 263 | 252 | 248 | 243 | 232 | 218 | 203 | 187 |
| 140° | 254 | 252 | 250 | 245 | 238 | 233 | 229 | 218 | 205 | 191 | 176 |
| 142.5° | 238 | 237 | 234 | 230 | 223 | 219 | 214 | 205 | 193 | 180 | 167 |
| 145° | 223 | 221 | 219 | 215 | 209 | 205 | 201 | 192 | 181 | 169 | 157 |
| 147.5° | 207 | 206 | 204 | 200 | 194 | 191 | 187 | 179 | 169 | 159 | 147 |
| 150° | 192 | 191 | 188 | 185 | 180 | 177 | 173 | 166 | 157 | 148 | 138 |
| 152.5° | 176 | 175 | 172 | 170 | 165 | 163 | 159 | 153 | 145 | 137 | 128 |
| 155° | 161 | 160 | 157 | 155 | 151 | 149 | 146 | 141 | 134 | 127 | 119 |
| 157.5° | 146 | 145 | 144 | 142 | 138 | 136 | 134 | 129 | 123 | 117 | 110 |
| 160° | 132 | 131 | 130 | 128 | 125 | 124 | 122 | 118 | 113 | 107 | 102 |
| 162.5° | 118 | 117 | 116 | 115 | 112 | 111 | 110 | 107 | 102 | 98 | 93 |
| 165° | 105 | 104 | 103 | 103 | 100 | 100 | 99 | 96 | 92 | 89 | 86 |
| 167.5° | 93 | 92 | 92 | 91 | 90 | 89 | 88 | 86 | 84 | 81 | 78 |
| 170° | 82 | 82 | 81 | 81 | 80 | 79 | 79 | 77 | 75 | 73 | 71 |
| 172.5° | 71 | 71 | 71 | 71 | 70 | 70 | 70 | 69 | 67 | 66 | 65 |
| 175° | 62 | 62 | 62 | 62 | 61 | 61 | 61 | 61 | 60 | 59 | 58 |
| 177.5° | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 54 |
| 180° | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

| | 50° | 55° | 60° | 65° | 67.5° | 70° | 75° | 80° | 85° | 90° | 95° |
|--------|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| 0° | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| 2.5° | 77 | 77 | 76 | 76 | 75 | 75 | 74 | 73 | 72 | 71 | 70 |
| 5° | 85 | 84 | 82 | 81 | 80 | 79 | 77 | 75 | 73 | 71 | 70 |
| 7.5° | 92 | 90 | 88 | 85 | 84 | 83 | 80 | 77 | 74 | 71 | 69 |
| 10° | 100 | 97 | 93 | 90 | 88 | 86 | 82 | 79 | 75 | 71 | 68 |
| 12.5° | 108 | 104 | 99 | 95 | 92 | 90 | 85 | 80 | 75 | 71 | 66 |
| 15° | 117 | 111 | 106 | 100 | 97 | 94 | 88 | 82 | 76 | 71 | 66 |
| 17.5° | 125 | 119 | 112 | 105 | 101 | 98 | 90 | 84 | 77 | 70 | 64 |
| 20° | 133 | 126 | 118 | 109 | 105 | 101 | 93 | 85 | 77 | 70 | 63 |
| 22.5° | 142 | 133 | 123 | 114 | 109 | 105 | 95 | 86 | 78 | 69 | 62 |
| 25° | 150 | 140 | 130 | 119 | 114 | 108 | 98 | 88 | 78 | 69 | 61 |
| 27.5° | 159 | 148 | 136 | 124 | 118 | 112 | 101 | 90 | 79 | 69 | 60 |
| 30° | 167 | 155 | 142 | 129 | 122 | 116 | 103 | 91 | 79 | 69 | 59 |
| 32.5° | 176 | 162 | 148 | 133 | 126 | 119 | 105 | 92 | 80 | 68 | 58 |
| 35° | 184 | 169 | 154 | 138 | 130 | 122 | 108 | 94 | 80 | 68 | 57 |
| 37.5° | 192 | 176 | 159 | 142 | 134 | 126 | 110 | 95 | 81 | 68 | 57 |
| 40° | 200 | 183 | 165 | 147 | 138 | 129 | 112 | 96 | 81 | 68 | 56 |
| 42.5° | 208 | 189 | 170 | 151 | 142 | 133 | 114 | 98 | 82 | 68 | 55 |
| 45° | 216 | 196 | 176 | 155 | 145 | 136 | 117 | 99 | 82 | 67 | 55 |
| 47.5° | 223 | 202 | 181 | 159 | 149 | 138 | 118 | 100 | 82 | 67 | 54 |
| 50° | 230 | 208 | 186 | 163 | 152 | 141 | 120 | 101 | 83 | 67 | 53 |
| 52.5° | 237 | 214 | 190 | 167 | 155 | 144 | 122 | 102 | 83 | 67 | 53 |
| 55° | 243 | 219 | 194 | 170 | 158 | 146 | 124 | 103 | 83 | 67 | 52 |
| 57.5° | 249 | 224 | 198 | 173 | 161 | 148 | 125 | 103 | 84 | 66 | 52 |
| 60° | 254 | 229 | 202 | 176 | 163 | 151 | 126 | 104 | 84 | 66 | 51 |
| 62.5° | 261 | 233 | 205 | 178 | 165 | 152 | 127 | 105 | 84 | 66 | 51 |
| 65° | 265 | 236 | 208 | 181 | 167 | 154 | 129 | 105 | 84 | 66 | 50 |
| 67.5° | 270 | 240 | 211 | 183 | 169 | 156 | 129 | 106 | 84 | 65 | 50 |
| 70° | 273 | 243 | 214 | 185 | 171 | 157 | 130 | 106 | 84 | 65 | 49 |
| 72.5° | 277 | 245 | 216 | 186 | 172 | 158 | 131 | 106 | 84 | 65 | 49 |
| 75° | 279 | 247 | 217 | 187 | 173 | 158 | 131 | 106 | 84 | 65 | 49 |
| 77.5° | 281 | 249 | 218 | 188 | 173 | 159 | 131 | 106 | 84 | 64 | 48 |
| 80° | 282 | 250 | 219 | 189 | 174 | 159 | 131 | 106 | 83 | 64 | 48 |
| 82.5° | 283 | 251 | 219 | 189 | 174 | 159 | 131 | 106 | 83 | 64 | 48 |
| 85° | 283 | 250 | 219 | 188 | 173 | 158 | 130 | 105 | 82 | 63 | 47 |
| 87.5° | 282 | 249 | 218 | 187 | 172 | 157 | 129 | 104 | 81 | 62 | 46 |
| 90° | 281 | 248 | 217 | 186 | 171 | 156 | 129 | 103 | 81 | 62 | 46 |
| 92.5° | 281 | 249 | 217 | 186 | 171 | 156 | 129 | 103 | 81 | 62 | 46 |
| 95° | 280 | 247 | 216 | 185 | 170 | 155 | 128 | 103 | 80 | 62 | 46 |
| 97.5° | 277 | 244 | 213 | 183 | 168 | 153 | 126 | 101 | 80 | 61 | 46 |
| 100° | 273 | 241 | 211 | 180 | 166 | 151 | 125 | 100 | 79 | 60 | 45 |
| 102.5° | 269 | 238 | 208 | 178 | 163 | 149 | 123 | 99 | 78 | 60 | 45 |
| 105° | 265 | 234 | 204 | 175 | 161 | 147 | 121 | 97 | 77 | 59 | 44 |
| 107.5° | 259 | 229 | 200 | 172 | 158 | 144 | 119 | 96 | 76 | 58 | 44 |
| 110° | 252 | 224 | 196 | 168 | 155 | 142 | 117 | 94 | 75 | 58 | 44 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

| | 50° | 55° | 60° | 65° | 67.5° | 70° | 75° | 80° | 85° | 90° | 95° |
|--------|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| 112.5° | 246 | 219 | 191 | 164 | 151 | 139 | 114 | 93 | 73 | 57 | 43 |
| 115° | 240 | 214 | 187 | 161 | 148 | 136 | 112 | 91 | 72 | 56 | 43 |
| 117.5° | 234 | 208 | 182 | 157 | 144 | 133 | 110 | 89 | 72 | 56 | 43 |
| 120° | 227 | 202 | 177 | 152 | 141 | 129 | 107 | 88 | 70 | 55 | 43 |
| 122.5° | 219 | 196 | 171 | 148 | 137 | 126 | 105 | 86 | 69 | 55 | 43 |
| 125° | 212 | 189 | 166 | 144 | 133 | 122 | 102 | 84 | 68 | 54 | 43 |
| 127.5° | 204 | 182 | 160 | 139 | 129 | 119 | 99 | 82 | 67 | 54 | 43 |
| 130° | 195 | 175 | 154 | 134 | 124 | 115 | 97 | 80 | 66 | 53 | 43 |
| 132.5° | 187 | 168 | 148 | 129 | 120 | 111 | 94 | 79 | 65 | 53 | 43 |
| 135° | 179 | 161 | 143 | 125 | 116 | 107 | 92 | 77 | 64 | 52 | 43 |
| 137.5° | 170 | 154 | 136 | 120 | 112 | 104 | 89 | 75 | 63 | 52 | 43 |
| 140° | 161 | 145 | 130 | 115 | 107 | 100 | 86 | 73 | 62 | 51 | 43 |
| 142.5° | 153 | 138 | 124 | 110 | 103 | 96 | 83 | 71 | 61 | 51 | 43 |
| 145° | 144 | 131 | 118 | 105 | 98 | 92 | 80 | 70 | 60 | 51 | 43 |
| 147.5° | 136 | 124 | 112 | 100 | 94 | 88 | 78 | 68 | 59 | 50 | 43 |
| 150° | 128 | 117 | 106 | 95 | 90 | 85 | 75 | 66 | 58 | 50 | 44 |
| 152.5° | 119 | 110 | 100 | 91 | 86 | 81 | 73 | 64 | 57 | 50 | 44 |
| 155° | 111 | 103 | 94 | 86 | 82 | 78 | 70 | 63 | 56 | 50 | 44 |
| 157.5° | 104 | 96 | 89 | 82 | 79 | 75 | 68 | 62 | 56 | 50 | 45 |
| 160° | 96 | 90 | 84 | 78 | 75 | 72 | 66 | 60 | 55 | 50 | 46 |
| 162.5° | 89 | 84 | 79 | 74 | 71 | 69 | 64 | 59 | 54 | 50 | 46 |
| 165° | 82 | 78 | 74 | 70 | 68 | 66 | 61 | 58 | 54 | 50 | 47 |
| 167.5° | 75 | 72 | 69 | 66 | 64 | 63 | 59 | 56 | 53 | 50 | 47 |
| 170° | 69 | 67 | 65 | 63 | 61 | 60 | 58 | 55 | 53 | 50 | 48 |
| 172.5° | 64 | 62 | 61 | 59 | 58 | 57 | 56 | 54 | 52 | 50 | 48 |
| 175° | 58 | 57 | 56 | 55 | 55 | 54 | 53 | 52 | 51 | 50 | 49 |
| 177.5° | 53 | 53 | 53 | 53 | 52 | 52 | 52 | 51 | 51 | 50 | 50 |
| 180° | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

| | 100° | 105° | 110° | 112.5° | 115° | 120° | 125° | 130° | 135° | 140° | 145° |
|--------|------|------|------|--------|------|------|------|------|------|------|------|
| 0° | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| 2.5° | 69 | 68 | 67 | 67 | 66 | 65 | 64 | 63 | 62 | 61 | 60 |
| 5° | 68 | 66 | 64 | 63 | 62 | 61 | 59 | 57 | 56 | 54 | 53 |
| 7.5° | 66 | 63 | 61 | 60 | 58 | 56 | 54 | 52 | 50 | 48 | 47 |
| 10° | 64 | 60 | 57 | 56 | 54 | 52 | 49 | 47 | 44 | 42 | 40 |
| 12.5° | 62 | 58 | 54 | 52 | 51 | 47 | 44 | 42 | 39 | 37 | 35 |
| 15° | 60 | 56 | 51 | 49 | 47 | 44 | 40 | 37 | 34 | 32 | 30 |
| 17.5° | 59 | 53 | 48 | 46 | 44 | 40 | 36 | 33 | 30 | 28 | 26 |
| 20° | 57 | 51 | 46 | 43 | 41 | 37 | 33 | 29 | 27 | 24 | 22 |
| 22.5° | 55 | 48 | 43 | 40 | 38 | 33 | 29 | 26 | 23 | 21 | 19 |
| 25° | 53 | 46 | 41 | 38 | 35 | 31 | 27 | 23 | 20 | 18 | 16 |
| 27.5° | 52 | 45 | 38 | 35 | 33 | 28 | 24 | 21 | 18 | 16 | 14 |
| 30° | 50 | 43 | 36 | 33 | 30 | 26 | 22 | 18 | 16 | 14 | 13 |
| 32.5° | 49 | 41 | 34 | 31 | 28 | 24 | 20 | 16 | 14 | 13 | 12 |
| 35° | 48 | 40 | 32 | 29 | 26 | 22 | 18 | 15 | 13 | 12 | 11 |
| 37.5° | 46 | 38 | 31 | 28 | 25 | 20 | 16 | 14 | 12 | 11 | 11 |
| 40° | 45 | 37 | 29 | 26 | 23 | 19 | 15 | 13 | 12 | 11 | 10 |
| 42.5° | 44 | 35 | 28 | 25 | 22 | 17 | 14 | 12 | 11 | 10 | 10 |
| 45° | 43 | 34 | 27 | 23 | 21 | 16 | 13 | 12 | 11 | 10 | 9 |
| 47.5° | 42 | 33 | 25 | 22 | 19 | 15 | 12 | 11 | 10 | 9 | 9 |
| 50° | 42 | 32 | 24 | 21 | 19 | 14 | 12 | 11 | 10 | 9 | 8 |
| 52.5° | 41 | 31 | 23 | 20 | 18 | 14 | 12 | 11 | 10 | 9 | 8 |
| 55° | 40 | 30 | 23 | 20 | 17 | 13 | 12 | 11 | 9 | 9 | 7 |
| 57.5° | 39 | 30 | 22 | 19 | 16 | 13 | 11 | 10 | 9 | 8 | 7 |
| 60° | 39 | 29 | 21 | 18 | 16 | 12 | 11 | 10 | 9 | 8 | 7 |
| 62.5° | 38 | 28 | 21 | 18 | 15 | 12 | 11 | 10 | 9 | 8 | 6 |
| 65° | 38 | 28 | 20 | 17 | 15 | 12 | 11 | 10 | 8 | 7 | 6 |
| 67.5° | 37 | 27 | 20 | 17 | 14 | 12 | 11 | 10 | 8 | 7 | 6 |
| 70° | 37 | 27 | 19 | 16 | 14 | 12 | 11 | 9 | 8 | 7 | 6 |
| 72.5° | 36 | 26 | 19 | 16 | 14 | 12 | 11 | 9 | 8 | 7 | 5 |
| 75° | 36 | 26 | 19 | 16 | 14 | 12 | 11 | 9 | 8 | 6 | 5 |
| 77.5° | 36 | 25 | 18 | 16 | 14 | 12 | 10 | 9 | 8 | 6 | 5 |
| 80° | 35 | 25 | 18 | 15 | 13 | 12 | 10 | 9 | 8 | 6 | 5 |
| 82.5° | 35 | 25 | 18 | 15 | 13 | 12 | 11 | 9 | 8 | 6 | 5 |
| 85° | 34 | 25 | 18 | 15 | 13 | 12 | 10 | 9 | 7 | 6 | 4 |
| 87.5° | 34 | 24 | 17 | 15 | 13 | 11 | 10 | 9 | 7 | 6 | 4 |
| 90° | 34 | 24 | 17 | 15 | 13 | 11 | 10 | 8 | 7 | 5 | 4 |
| 92.5° | 34 | 24 | 17 | 15 | 13 | 12 | 10 | 9 | 7 | 6 | 4 |
| 95° | 34 | 24 | 18 | 15 | 13 | 12 | 10 | 9 | 7 | 6 | 4 |
| 97.5° | 34 | 24 | 18 | 15 | 13 | 12 | 10 | 9 | 7 | 6 | 4 |
| 100° | 33 | 24 | 18 | 15 | 13 | 12 | 10 | 9 | 7 | 6 | 4 |
| 102.5° | 33 | 24 | 18 | 15 | 14 | 12 | 11 | 9 | 8 | 6 | 5 |
| 105° | 33 | 24 | 18 | 15 | 14 | 12 | 11 | 9 | 8 | 6 | 5 |
| 107.5° | 33 | 24 | 18 | 16 | 14 | 12 | 11 | 9 | 8 | 7 | 5 |
| 110° | 33 | 24 | 18 | 16 | 14 | 12 | 11 | 10 | 8 | 7 | 6 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

| | 100° | 105° | 110° | 112.5° | 115° | 120° | 125° | 130° | 135° | 140° | 145° |
|--------|------|------|------|--------|------|------|------|------|------|------|------|
| 112.5° | 33 | 24 | 18 | 16 | 14 | 12 | 11 | 10 | 8 | 7 | 6 |
| 115° | 33 | 25 | 19 | 17 | 15 | 13 | 11 | 10 | 9 | 8 | 6 |
| 117.5° | 33 | 25 | 19 | 17 | 15 | 13 | 12 | 11 | 9 | 8 | 7 |
| 120° | 33 | 25 | 20 | 17 | 16 | 13 | 12 | 11 | 10 | 8 | 7 |
| 122.5° | 33 | 26 | 20 | 18 | 16 | 14 | 12 | 11 | 10 | 9 | 8 |
| 125° | 34 | 26 | 21 | 18 | 17 | 14 | 13 | 11 | 10 | 9 | 8 |
| 127.5° | 34 | 27 | 21 | 19 | 17 | 14 | 13 | 12 | 11 | 10 | 9 |
| 130° | 34 | 27 | 22 | 20 | 18 | 15 | 13 | 12 | 11 | 10 | 9 |
| 132.5° | 34 | 28 | 22 | 20 | 18 | 15 | 14 | 13 | 12 | 11 | 10 |
| 135° | 35 | 28 | 23 | 21 | 19 | 16 | 14 | 13 | 12 | 11 | 10 |
| 137.5° | 35 | 29 | 24 | 22 | 20 | 17 | 15 | 13 | 12 | 12 | 11 |
| 140° | 36 | 30 | 25 | 23 | 21 | 18 | 15 | 14 | 13 | 12 | 11 |
| 142.5° | 36 | 30 | 26 | 24 | 22 | 19 | 16 | 15 | 13 | 13 | 12 |
| 145° | 37 | 31 | 27 | 25 | 23 | 20 | 17 | 16 | 14 | 13 | 13 |
| 147.5° | 37 | 32 | 28 | 26 | 24 | 21 | 18 | 17 | 15 | 14 | 13 |
| 150° | 38 | 33 | 29 | 27 | 25 | 22 | 20 | 18 | 16 | 15 | 14 |
| 152.5° | 39 | 34 | 30 | 28 | 27 | 24 | 21 | 19 | 18 | 16 | 15 |
| 155° | 40 | 35 | 31 | 30 | 28 | 25 | 23 | 21 | 19 | 18 | 16 |
| 157.5° | 41 | 36 | 33 | 31 | 30 | 27 | 25 | 23 | 21 | 19 | 18 |
| 160° | 42 | 38 | 35 | 33 | 32 | 29 | 27 | 25 | 23 | 21 | 20 |
| 162.5° | 43 | 39 | 36 | 35 | 33 | 31 | 29 | 27 | 25 | 24 | 22 |
| 165° | 44 | 41 | 38 | 37 | 35 | 33 | 31 | 29 | 28 | 26 | 25 |
| 167.5° | 45 | 42 | 40 | 38 | 37 | 35 | 34 | 32 | 30 | 29 | 28 |
| 170° | 46 | 44 | 42 | 41 | 40 | 38 | 36 | 35 | 34 | 32 | 31 |
| 172.5° | 47 | 45 | 44 | 43 | 42 | 41 | 39 | 38 | 37 | 36 | 35 |
| 175° | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 40 | 39 |
| 177.5° | 49 | 48 | 48 | 48 | 47 | 47 | 46 | 45 | 45 | 44 | 44 |
| 180° | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

| | 150° | 155° | 157.5° | 160° | 165° | 170° | 175° | 180° |
|--------|------|------|--------|------|------|------|------|------|
| 0° | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| 2.5° | 60 | 59 | 59 | 59 | 58 | 58 | 58 | 58 |
| 5° | 52 | 51 | 51 | 51 | 50 | 49 | 49 | 49 |
| 7.5° | 45 | 44 | 44 | 43 | 42 | 42 | 42 | 41 |
| 10° | 39 | 38 | 37 | 36 | 36 | 35 | 35 | 35 |
| 12.5° | 33 | 32 | 31 | 31 | 30 | 29 | 29 | 29 |
| 15° | 28 | 27 | 26 | 26 | 25 | 24 | 24 | 24 |
| 17.5° | 24 | 23 | 22 | 22 | 21 | 20 | 20 | 19 |
| 20° | 20 | 19 | 18 | 18 | 17 | 17 | 16 | 16 |
| 22.5° | 17 | 16 | 15 | 15 | 14 | 14 | 14 | 13 |
| 25° | 15 | 14 | 13 | 13 | 12 | 12 | 12 | 12 |
| 27.5° | 13 | 12 | 12 | 12 | 11 | 11 | 11 | 11 |
| 30° | 12 | 11 | 11 | 11 | 11 | 11 | 10 | 10 |
| 32.5° | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 10 |
| 35° | 11 | 10 | 10 | 10 | 9 | 9 | 9 | 9 |
| 37.5° | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| 40° | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 |
| 42.5° | 9 | 8 | 8 | 8 | 8 | 7 | 7 | 7 |
| 45° | 8 | 8 | 8 | 7 | 7 | 7 | 6 | 6 |
| 47.5° | 8 | 7 | 7 | 7 | 6 | 6 | 6 | 6 |
| 50° | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 5 |
| 52.5° | 7 | 6 | 6 | 6 | 5 | 5 | 4 | 4 |
| 55° | 7 | 6 | 5 | 5 | 5 | 4 | 4 | 4 |
| 57.5° | 6 | 5 | 5 | 5 | 4 | 4 | 3 | 3 |
| 60° | 6 | 5 | 5 | 4 | 4 | 3 | 3 | 3 |
| 62.5° | 5 | 5 | 4 | 4 | 3 | 3 | 2 | 2 |
| 65° | 5 | 4 | 4 | 3 | 3 | 2 | 2 | 2 |
| 67.5° | 5 | 4 | 3 | 3 | 2 | 2 | 2 | 1 |
| 70° | 4 | 3 | 3 | 3 | 2 | 2 | 1 | 1 |
| 72.5° | 4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 |
| 75° | 4 | 3 | 3 | 2 | 2 | 1 | 2 | 1 |
| 77.5° | 4 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| 80° | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| 82.5° | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| 85° | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| 87.5° | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 90° | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 92.5° | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 95° | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 97.5° | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 100° | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 102.5° | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 105° | 4 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 107.5° | 4 | 3 | 2 | 2 | 1 | 1 | 1 | 1 |
| 110° | 4 | 3 | 3 | 2 | 2 | 1 | 1 | 1 |



TEST NUMBER: P27864

CATALOG NUMBER: TRO11-LD4-20W-50-OPL-BK-UNV-EDC1

CANDELA DISTRIBUTION (continued):

| | 150° | 155° | 157.5° | 160° | 165° | 170° | 175° | 180° |
|--------|------|------|--------|------|------|------|------|------|
| 112.5° | 5 | 4 | 3 | 2 | 2 | 1 | 1 | 1 |
| 115° | 5 | 4 | 4 | 3 | 2 | 2 | 2 | 1 |
| 117.5° | 6 | 5 | 4 | 4 | 3 | 3 | 2 | 2 |
| 120° | 6 | 5 | 5 | 4 | 4 | 3 | 3 | 3 |
| 122.5° | 7 | 6 | 5 | 5 | 4 | 4 | 3 | 3 |
| 125° | 7 | 6 | 6 | 6 | 5 | 4 | 4 | 4 |
| 127.5° | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 5 |
| 130° | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 5 |
| 132.5° | 9 | 8 | 8 | 8 | 7 | 7 | 6 | 6 |
| 135° | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 137.5° | 10 | 10 | 9 | 9 | 8 | 8 | 8 | 8 |
| 140° | 11 | 10 | 10 | 10 | 9 | 9 | 9 | 9 |
| 142.5° | 11 | 11 | 11 | 10 | 10 | 10 | 9 | 9 |
| 145° | 12 | 12 | 11 | 11 | 11 | 11 | 10 | 10 |
| 147.5° | 13 | 12 | 12 | 12 | 11 | 11 | 11 | 11 |
| 150° | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 12 |
| 152.5° | 14 | 14 | 13 | 13 | 13 | 13 | 13 | 13 |
| 155° | 16 | 15 | 15 | 14 | 14 | 14 | 13 | 13 |
| 157.5° | 17 | 17 | 16 | 16 | 15 | 15 | 15 | 15 |
| 160° | 19 | 18 | 18 | 18 | 17 | 17 | 17 | 16 |
| 162.5° | 21 | 20 | 20 | 20 | 19 | 19 | 19 | 19 |
| 165° | 24 | 23 | 23 | 22 | 22 | 21 | 21 | 21 |
| 167.5° | 27 | 26 | 26 | 25 | 25 | 24 | 24 | 24 |
| 170° | 30 | 29 | 29 | 29 | 28 | 28 | 28 | 27 |
| 172.5° | 34 | 33 | 33 | 32 | 32 | 32 | 32 | 31 |
| 175° | 38 | 37 | 37 | 37 | 37 | 36 | 36 | 36 |
| 177.5° | 43 | 43 | 42 | 42 | 42 | 42 | 42 | 42 |
| 180° | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |

(END OF REPORT)