|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table 5.10**  **Measurement of roundness by Dial gauge deflections of 10-mm Diameter Stainless Steel (SS) Round Bar** **Before Straightening** | | | | | | | | | | | | | | | | | | | | | | | |  |
|  | **Mean values of Dial Gauge Deflection Readings before straightening of 10 mm Stainless Steel round bar x 0.01 mm** | | | | | | | | | | | | | | | | | | | | | | | |  |
|  | Angles in Degrees | | | | | | | | | | | | | | | | | | | | | | | |  |
| Length in cm | 0o | 15o | 30o | 45o | 60o | 75o | 90o | 105o | 120o | 135o | 150o | 165o | 180o | 195o | 210o | 225o | 240o | 255o | 270o | 285o | 300o | 315o | 330o | 345o | STD  DEV (mm) |
| 11.3 | 96 | 95 | 95 | 95 | 97 | 98 | 98 | 99 | 98 | 98 | 96 | 95 | 93 | 91 | 89 | 88 | 88 | 89 | 89 | 90 | 90 | 92 | 94 | 94 | 0.0362815 |
| 11.6 | 100 | 102 | 101 | 101 | 101 | 102 | 103 | 103 | 103 | 103 | 102 | 100 | 98 | 96 | 94 | 94 | 93 | 93 | 96 | 94 | 95 | 96 | 97 | 98 | 0.0350689 |
| 13 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 105 | 105 | 105 | 103 | 103 | 102 | 101 | 99 | 98 | 96 | 95 | 94 | 93 | 94 | 95 | 97 | 99 | 0.0418468 |
| 13.7 | 100 | 101 | 101 | 102 | 102 | 101 | 104 | 102 | 102 | 103 | 102 | 100 | 100 | 97 | 95 | 94 | 92 | 91 | 108 | 92 | 93 | 94 | 96 | 102 | 0.0462836 |
| 15 | 100 | 102 | 103 | 105 | 106 | 107 | 108 | 107 | 107 | 106 | 106 | 105 | 104 | 103 | 102 | 100 | 100 | 97 | 97 | 96 | 96 | 96 | 97 | 98 | 0.0404808 |
| 15.7 | 100 | 101 | 101 | 103 | 103 | 103 | 104 | 103 | 103 | 101 | 101 | 100 | 100 | 96 | 96 | 94 | 93 | 91 | 91 | 99 | 90 | 93 | 94 | 97 | 0.0457782 |
| 17 | 100 | 101 | 104 | 105 | 106 | 106 | 108 | 108 | 108 | 108 | 108 | 107 | 105 | 104 | 103 | 101 | 98 | 98 | 97 | 96 | 97 | 96 | 96 | 98 | 0.0436513 |
| 17.7 | 100 | 102 | 103 | 102 | 104 | 106 | 107 | 106 | 105 | 103 | 103 | 100 | 98 | 97 | 96 | 93 | 93 | 92 | 93 | 93 | 93 | 94 | 96 | 97 | 0.0498409 |
| 19.7 | 101 | 100 | 100 | 102 | 104 | 105 | 106 | 105 | 105 | 104 | 103 | 100 | 98 | 94 | 92 | 90 | 91 | 90 | 90 | 92 | 92 | 93 | 96 | 97 | 0.0562056 |
| 20 | 100 | 101 | 102 | 103 | 104 | 105 | 107 | 108 | 109 | 108 | 108 | 107 | 109 | 105 | 104 | 103 | 99 | 98 | 97 | 96 | 97 | 97 | 100 | 99 | 0.0426244 |
| 21.7 | 101 | 101 | 101 | 102 | 102 | 104 | 105 | 104 | 103 | 104 | 102 | 101 | 101 | 96 | 96 | 93 | 90 | 91 | 92 | 93 | 94 | 95 | 98 | 98 | 0.0471866 |
| 23 | 100 | 100 | 101 | 103 | 104 | 105 | 106 | 107 | 107 | 108 | 111 | 111 | 111 | 107 | 107 | 104 | 105 | 101 | 102 | 98 | 98 | 97 | 100 | 99 | 0.0426005 |
| 24.7 | 100 | 101 | 104 | 104 | 106 | 105 | 105 | 104 | 103 | 102 | 101 | 101 | 100 | 95 | 94 | 92 | 93 | 92 | 91 | 90 | 92 | 94 | 97 | 99 | 0.0523695 |
| 25 | 100 | 100 | 102 | 103 | 105 | 106 | 107 | 109 | 109 | 110 | 110 | 110 | 110 | 107 | 106 | 104 | 103 | 102 | 100 | 99 | 98 | 99 | 98 | 99 | 0.042955 |
| 26.7 | 100 | 100 | 100 | 102 | 102 | 103 | 104 | 103 | 101 | 101 | 99 | 98 | 98 | 94 | 94 | 93 | 93 | 92 | 94 | 93 | 92 | 92 | 92 | 96 | 0.0427556 |
| 27 | 100 | 99 | 101 | 101 | 103 | 104 | 107 | 108 | 108 | 110 | 110 | 110 | 110 | 107 | 105 | 105 | 105 | 102 | 102 | 101 | 100 | 98 | 98 | 98 | 0.0406426 |
| 29.7 | 100 | 99 | 100 | 103 | 104 | 105 | 107 | 109 | 108 | 107 | 106 | 103 | 103 | 98 | 98 | 99 | 98 | 96 | 98 | 96 | 93 | 96 | 98 | 98 | 0.0441919 |
| 30 | 99 | 98 | 100 | 101 | 101 | 103 | 106 | 105 | 105 | 108 | 107 | 108 | 109 | 109 | 108 | 106 | 105 | 104 | 102 | 100 | 99 | 97 | 97 | 98 | 0.0394434 |
| 31.7 | 100 | 98 | 96 | 100 | 103 | 102 | 104 | 105 | 106 | 105 | 105 | 103 | 102 | 100 | 99 | 96 | 96 | 95 | 95 | 95 | 94 | 94 | 94 | 96 | 0.0401367 |
| 32 | 99 | 98 | 100 | 101 | 102 | 103 | 103 | 105 | 105 | 106 | 107 | 108 | 109 | 108 | 107 | 107 | 105 | 102 | 100 | 100 | 98 | 96 | 96 | 96 | 0.0415657 |
| 34 | 100 | 99 | 101 | 103 | 102 | 104 | 105 | 105 | 105 | 107 | 107 | 108 | 110 | 110 | 110 | 108 | 108 | 107 | 105 | 103 | 102 | 101 | 99 | 98 | 0.0370146 |
| 34.7 | 100 | 100 | 100 | 101 | 102 | 103 | 104 | 104 | 106 | 107 | 106 | 106 | 104 | 103 | 102 | 99 | 98 | 96 | 95 | 96 | 96 | 96 | 96 | 97 | 0.038563 |
| 36.7 | 100 | 101 | 102 | 103 | 104 | 106 | 108 | 108 | 108 | 106 | 107 | 107 | 108 | 106 | 104 | 102 | 102 | 98 | 98 | 99 | 95 | 96 | 97 | 98 | 0.0426008 |
| 37.5 | 100 | 101 | 103 | 103 | 104 | 107 | 109 | 110 | 111 | 112 | 112 | 119 | 113 | 114 | 115 | 114 | 112 | 111 | 111 | 109 | 106 | 101 | 100 | 100 | 0.0555045 |



**Figure 5.8(a): Box Plot of dial gauge readings dataset of mean values of 10-mm diameter Stainless Steel (SS) round bar before straightening**

**Figure 5.8(b): Error Plot of 10 mm Stainless Steel Round Bar Before Straightening**