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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table 5.11**  **Measurement of roundness by Dial gauge deflections of 12-mm Diameter Stainless Steel (SS) Round Bar** **Before Straightening** | | | | | | | | | | | | | | | | | | | | | | | |  |
|  | **Mean values of Dial Gauge Deflection Readings before straightening of 12 mm Stainless Steel (SS) 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 | 51 | 50 | 49 | 49 | 50 | 51 | 51 | 52 | 54 | 56 | 58 | 59 | 60 | 61 | 62 | 63 | 62 | 62 | 61 | 60 | 59 | 56 | 54 | 51 | 0.04899 |
| 13 | 53 | 51 | 51 | 51 | 51 | 52 | 53 | 53 | 54 | 56 | 58 | 59 | 60 | 61 | 62 | 62 | 62 | 61 | 61 | 60 | 59 | 57 | 56 | 54 | 0.04109 |
| 15 | 54 | 53 | 53 | 53 | 53 | 53 | 54 | 55 | 55 | 56 | 59 | 59 | 60 | 61 | 62 | 62 | 62 | 61 | 61 | 60 | 60 | 59 | 57 | 56 | 0.03365 |
| 17 | 53 | 52 | 52 | 52 | 52 | 52 | 53 | 53 | 54 | 55 | 57 | 57 | 59 | 59 | 60 | 60 | 60 | 59 | 59 | 58 | 57 | 56 | 55 | 54 | 0.02954 |
| 20 | 51 | 51 | 51 | 51 | 51 | 51 | 52 | 52 | 53 | 54 | 55 | 56 | 57 | 57 | 58 | 58 | 58 | 57 | 57 | 55 | 54 | 54 | 53 | 52 | 0.02601 |
| 22 | 52 | 52 | 52 | 51 | 51 | 52 | 52 | 52 | 53 | 53 | 54 | 55 | 56 | 56 | 57 | 57 | 57 | 57 | 57 | 56 | 55 | 55 | 54 | 53 | 0.02149 |
| 25 | 53 | 52 | 52 | 52 | 52 | 52 | 52 | 53 | 53 | 53 | 54 | 54 | 56 | 56 | 56 | 56 | 56 | 57 | 57 | 56 | 56 | 56 | 55 | 53 | 0.01815 |
| 27 | 52 | 52 | 52 | 51 | 51 | 52 | 52 | 52 | 53 | 53 | 53 | 53 | 55 | 55 | 55 | 56 | 56 | 56 | 55 | 55 | 55 | 54 | 54 | 53 | 0.01558 |
| 31 | 52 | 52 | 51 | 51 | 51 | 51 | 52 | 52 | 52 | 52 | 53 | 53 | 54 | 54 | 54 | 55 | 55 | 55 | 54 | 54 | 54 | 53 | 53 | 53 | 0.01342 |
| 33 | 52 | 51 | 51 | 50 | 50 | 50 | 50 | 51 | 51 | 51 | 52 | 52 | 53 | 54 | 54 | 55 | 55 | 55 | 55 | 55 | 55 | 54 | 54 | 53 | 0.01856 |
| 35 | 51 | 51 | 50 | 49 | 49 | 49 | 49 | 50 | 50 | 51 | 51 | 52 | 53 | 53 | 54 | 55 | 55 | 56 | 56 | 56 | 55 | 55 | 54 | 53 | 0.02435 |
| 37 | 51 | 51 | 50 | 50 | 49 | 49 | 49 | 50 | 50 | 50 | 50 | 51 | 51 | 52 | 52 | 53 | 53 | 54 | 54 | 54 | 54 | 53 | 53 | 52 | 0.01641 |
| 40 | 51 | 51 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 49 | 50 | 50 | 50 | 50 | 51 | 51 | 52 | 52 | 52 | 52 | 52 | 52 | 51 | 51 | 0.00961 |
| 42 | 51 | 51 | 50 | 50 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 50 | 50 | 51 | 52 | 52 | 53 | 53 | 53 | 52 | 52 | 0.01354 |
| 45 | 52 | 51 | 51 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 50 | 51 | 52 | 52 | 53 | 53 | 53 | 53 | 52 | 0.01804 |
| 46 | 54 | 53 | 53 | 51 | 51 | 50 | 50 | 50 | 50 | 50 | 51 | 51 | 51 | 52 | 52 | 53 | 54 | 55 | 55 | 56 | 56 | 56 | 56 | 55 | 0.02229 |
| 48 | 56 | 55 | 55 | 54 | 53 | 52 | 52 | 51 | 52 | 52 | 53 | 53 | 54 | 55 | 55 | 56 | 57 | 58 | 59 | 59 | 59 | 59 | 59 | 58 | 0.02725 |
| 50 | 53 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 0.00575 |
| 53 | 50 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 58 | 58 | 57 | 57 | 57 | 56 | 55 | 54 | 51 | 50 | 49 | 49 | 49 | 49 | 49 | 49 | 0.0344 |

Figure 5.9(a): Box Plot of dial gauge readings dataset of mean values of 12-mm diameter Stainless Steel (SS) round bar before straightening



Figure 5.9(b): Error Plot of 12 mm Stainless Steel Round Bar Before Straightening