|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table 6.13**  **Measurement of roundness by Dial gauge deflections of 12-mm Diameter Mild Steel (MS) Round Bar After Straightening** | | | | | | | | | | | | | | | | | | | | | | | | |  | |
|  | **Mean values of Dial Gauge Deflection Readings after straightening of 12 mm Mild Steel (MS) 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)** | |
| 10.5 | 93.0 | 94 | 95.0 | 97 | 99.0 | 101 | 102.0 | 104 | 105.0 | 107 | 108.0 | 109 | 109.0 | 109 | 108.0 | 107 | 105.0 | 103 | 101.0 | 99.5 | 98.0 | 96.8 | 95.5 | 94.8 | 0.0527 | |
| 15 | 59.0 | 58.5 | 58.0 | 58.5 | 59.0 | 59 | 59.0 | 59 | 59.0 | 59 | 59.0 | 59.8 | 60.5 | 60.3 | 60.0 | 60 | 60.0 | 60 | 60.0 | 60 | 60.0 | 59.8 | 59.5 | 59.3 | 0.0065 | |
| 20 | 57.0 | 57 | 57.0 | 57 | 57.0 | 57 | 57.0 | 56.8 | 56.5 | 57 | 57.5 | 58 | 58.5 | 58.5 | 58.5 | 58.5 | 58.5 | 58.5 | 58.5 | 58.5 | 58.5 | 58.3 | 58.0 | 58 | 0.0074 | |
| 22 | 57.0 | 57.5 | 58.0 | 59.5 | 61.0 | 61.5 | 62.0 | 63 | 64.0 | 64.5 | 65.0 | 65.5 | 66.0 | 65.5 | 65.0 | 64 | 63.0 | 62.5 | 62.0 | 60.5 | 59.0 | 57.5 | 56.0 | 56 | 0.0324 | |
| 24.5 | 56.5 | 56.5 | 56.5 | 56.3 | 56.0 | 55.8 | 55.5 | 55.5 | 55.5 | 55.8 | 56.0 | 56.3 | 56.5 | 57 | 57.5 | 57.3 | 57.0 | 57 | 57.0 | 57.3 | 57.5 | 58 | 58.5 | 57.8 | 0.0083 | |
| 31 | 56.0 | 55.5 | 55.0 | 55 | 55.0 | 54.8 | 54.5 | 54.5 | 54.5 | 54.8 | 55.0 | 55.5 | 56.0 | 56.3 | 56.5 | 56.3 | 56.0 | 56.3 | 56.5 | 56.8 | 57.0 | 57 | 57.0 | 57 | 0.0089 | |
| 32 | 55.0 | 55.5 | 56.0 | 56.5 | 57.0 | 58 | 59.0 | 59 | 59.0 | 59.5 | 60.0 | 59.5 | 59.0 | 58.5 | 58.0 | 57 | 56.0 | 55.5 | 55.0 | 54.5 | 54.0 | 54 | 54.0 | 54 | 0.0206 | |
| 35 | 54.5 | 54.5 | 54.5 | 54.5 | 54.5 | 54.5 | 54.5 | 54.5 | 54.5 | 54.3 | 54.0 | 54.3 | 54.5 | 54.8 | 55.0 | 55.3 | 55.5 | 55.5 | 55.5 | 55.5 | 55.5 | 55.3 | 55.0 | 54.8 | 0.0047 | |
| 40 | 53.0 | 53.5 | 54 | 54 | 54.0 | 54 | 54.0 | 54.3 | 54.5 | 54.3 | 54.0 | 54 | 54.0 | 54 | 54.0 | 54.5 | 55.0 | 55 | 55.0 | 55 | 55.0 | 55 | 55.0 | 54.8 | 0.0055 | |
| 42 | 53.0 | 53.3 | 53.5 | 54.8 | 56.0 | 56.3 | 56.5 | 56.5 | 56.5 | 56.5 | 56.5 | 56.5 | 56.5 | 55.8 | 55.0 | 53.8 | 52.5 | 52 | 51.5 | 51.5 | 51.5 | 51.3 | 51.0 | 51 | 0.0218 | |
| 45 | 54.5 | 54 | 53.5 | 53.5 | 53.5 | 53.8 | 54.0 | 54 | 54.0 | 53.8 | 53.5 | 53.5 | 53.5 | 53.5 | 53.5 | 53.8 | 54.0 | 54 | 54.0 | 54 | 54.0 | 54 | 54.0 | 54.3 | 0.0028 | |
| 48 | 52.0 | 51.5 | 51.0 | 51 | 51.0 | 51.5 | 52.0 | 52 | 52.0 | 52.5 | 53.0 | 53 | 53.0 | 53 | 53.0 | 53 | 53.0 | 52.5 | 52.0 | 52 | 52.0 | 51.5 | 51.0 | 51 | 0.0076 | |
| 52.5 | 51.0 | 51.3 | 51.5 | 52.3 | 53.0 | 53 | 53.0 | 53 | 53.0 | 52.8 | 52.5 | 52 | 51.5 | 51 | 50.5 | 50 | 49.5 | 49.5 | 49.5 | 49.5 | 49.5 | 49.5 | 49.5 | 49.8 | 0.0142 | |
| 62 | 51.0 | 51 | 51.0 | 51.5 | 52.0 | 52.3 | 52.5 | 52.3 | 52.0 | 52 | 52.0 | 52 | 52.0 | 51.5 | 51.0 | 51 | 51.0 | 51 | 51.0 | 54 | 57.0 | 54 | 51.0 | 51 | 0.0138 | |
| 72 | 51.0 | 51.5 | 52.0 | 51 | 50.0 | 51.5 | 53.0 | 52 | 54.0 | 52 | 51.0 | 53 | 54.0 | 51 | 50.0 | 51.5 | 53.0 | 55 | 56.0 | 54 | 52.0 | 53 | 54.0 | 53 | 0.0153 | |
| 82 | 52.0 | 52.5 | 53.0 | 52 | 51.0 | 51.5 | 52.0 | 52 | 53.0 | 51 | 52.0 | 51.5 | 51.0 | 52 | 53.0 | 52 | 51.0 | 52 | 53.0 | 52.5 | 52.0 | 51.5 | 51.0 | 52 | 0.0066 | |
| 92 | 51.0 | 51.5 | 52.0 | 53 | 54.0 | 52.5 | 51.0 | 51.5 | 52.0 | 52.5 | 53.0 | 52.5 | 52.0 | 51.5 | 51.0 | 51.5 | 52.0 | 52.5 | 53.0 | 52 | 51.0 | 52 | 53.0 | 52 | 0.0078 | |
| 103 | 57.5 | 54 | 50.5 | 50.5 | 50.5 | 50.8 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 0.0147 | |
| 112 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51.3 | 51.5 | 51.8 | 52.0 | 52 | 52.0 | 52 | 52.0 | 52 | 52.0 | 51.8 | 51.5 | 51.3 | 51.0 | 51 | 51.0 | 51 | 51.0 | 51 | 0.0045 | |
| 121 | 53.0 | 53 | 53.0 | 54.3 | 55.5 | 55.8 | 56.0 | 56.3 | 56.5 | 56.5 | 56.5 | 56.8 | 57.0 | 57 | 57.0 | 56.5 | 56.0 | 55 | 54.0 | 54 | 54.0 | 53.8 | 53.5 | 53.5 | 0.0146 | |



**Figure 6.18(a): Box Plot of dial gauge readings dataset of mean values of 12-mm diameter Mild Steel (MS) round bar before straightening**

**Figure 6.18(b): Error Plot of dial gauge readings on 12 mm Mild Steel Round Bar after straightening**