|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table 5.7**  **Measurement of roundness by Dial gauge deflections of 12-mm Diameter Mild Steel (MS) Round Bar Before Straightening** | | | | | | | | | | | | | | | | | | | | | | | |  |
|  | **Mean values of Dial Gauge Deflection Readings before straightening of 12 mm Mild 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) |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | 59 | 59 | 60 | 60 | 62 | 61 | 63 | 64 | 64 | 66 | 66 | 66 | 67 | 67 | 68 | 67 | 68 | 66 | 66 | 64 | 63 | 62 | 61 | 61 | 0.02946 |
| 17 | 60 | 61 | 62 | 62 | 63 | 63 | 65 | 66 | 67 | 68 | 68 | 68 | 69 | 69 | 69 | 68 | 69 | 67 | 67 | 65 | 64 | 64 | 60 | 62 | 0.03033 |
| 22 | 62 | 63 | 64 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 71 | 71 | 71 | 70 | 70 | 70 | 69 | 68 | 67 | 65 | 65 | 59 | 63 | 0.03294 |
| 27 | 66 | 67 | 67 | 68 | 69 | 69 | 72 | 72 | 73 | 74 | 74 | 75 | 75 | 74 | 74 | 74 | 74 | 72 | 72 | 70 | 68 | 68 | 65 | 67 | 0.0324 |
| 32 | 70 | 71 | 71 | 72 | 73 | 73 | 76 | 77 | 77 | 78 | 78 | 79 | 79 | 78 | 78 | 79 | 77 | 76 | 76 | 73 | 72 | 70 | 70 | 70 | 0.03297 |
| 37 | 66 | 67 | 67 | 68 | 69 | 69 | 71 | 72 | 73 | 74 | 74 | 75 | 75 | 74 | 74 | 75 | 74 | 72 | 72 | 69 | 69 | 68 | 67 | 67 | 0.03038 |
| 43 | 62 | 64 | 64 | 64 | 65 | 66 | 67 | 68 | 68 | 69 | 70 | 71 | 71 | 71 | 71 | 71 | 70 | 69 | 69 | 66 | 66 | 65 | 64 | 64 | 0.02864 |
| 47 | 63 | 64 | 64 | 64 | 65 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 71 | 71 | 71 | 71 | 70 | 69 | 69 | 66 | 66 | 65 | 64 | 63 | 0.02892 |
| 53 | 64 | 64 | 64 | 64 | 64 | 65 | 65 | 67 | 68 | 69 | 70 | 71 | 71 | 71 | 71 | 71 | 70 | 70 | 69 | 67 | 66 | 65 | 64 | 63 | 0.02967 |
| 57 | 62 | 62 | 62 | 63 | 63 | 63 | 64 | 65 | 66 | 68 | 69 | 69 | 69 | 70 | 69 | 70 | 69 | 69 | 67 | 66 | 65 | 64 | 63 | 62 | 0.03016 |
| 62 | 61 | 60 | 60 | 61 | 61 | 62 | 62 | 64 | 65 | 66 | 68 | 68 | 68 | 69 | 68 | 69 | 69 | 68 | 66 | 65 | 64 | 63 | 62 | 61 | 0.03098 |
| 67 | 62 | 61 | 61 | 61 | 61 | 62 | 62 | 63 | 64 | 65 | 66 | 67 | 67 | 68 | 67 | 68 | 68 | 68 | 67 | 66 | 65 | 63 | 62 | 62 | 0.02647 |
| 73 | 63 | 63 | 62 | 62 | 61 | 61 | 62 | 63 | 64 | 64 | 65 | 66 | 66 | 67 | 67 | 68 | 68 | 68 | 68 | 67 | 65 | 64 | 62 | 62 | 0.02377 |
| 77 | 61 | 60 | 60 | 59 | 59 | 59 | 59 | 60 | 61 | 61 | 62 | 62 | 63 | 63 | 63 | 64 | 65 | 65 | 64 | 63 | 62 | 61 | 60 | 60 | 0.01878 |
| 83 | 58 | 58 | 57 | 57 | 57 | 57 | 57 | 58 | 58 | 58 | 58 | 59 | 59 | 60 | 60 | 60 | 61 | 61 | 61 | 60 | 59 | 58 | 57 | 57 | 0.01402 |
| 87 | 55 | 55 | 55 | 54 | 54 | 54 | 55 | 55 | 55 | 55 | 56 | 56 | 56 | 57 | 57 | 57 | 57 | 57 | 56 | 55 | 55 | 55 | 53 | 53 | 0.01187 |
| 93 | 51 | 52 | 52 | 51 | 52 | 52 | 53 | 52 | 52 | 53 | 53 | 53 | 53 | 54 | 54 | 54 | 54 | 53 | 52 | 51 | 51 | 51 | 49 | 50 | 0.01298 |
| 98 | 55 | 55 | 55 | 54 | 54 | 55 | 55 | 55 | 56 | 56 | 57 | 57 | 57 | 57 | 58 | 58 | 58 | 58 | 57 | 56 | 55 | 55 | 54 | 53 | 0.01377 |
| 104 | 58 | 58 | 57 | 57 | 57 | 57 | 58 | 58 | 59 | 60 | 60 | 60 | 61 | 61 | 61 | 61 | 62 | 62 | 62 | 61 | 60 | 58 | 58 | 57 | 0.0178 |



Figure 5.5(a): Box Plot of dial gauge readings dataset of mean values of 12-mm diameter Mild Steel (MS) round bar before straightening

Figure 5.5(b): Error Plot of 12 mm Mild Steel Round Bar Before Straightening