|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table 6.23**  **Measurement of roundness by Dial gauge deflections of 8-mm Diameter Copper (Cu) Round Bar After Straightening** | | | | | | | | | | | | | | | | | | | | | | | |  |
|  | **Mean values of Dial Gauge Deflection Readings after straightening of 8 mm Copper (Cu) 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) |
| 11.5 | 174 | 174 | 174 | 174 | 173 | 171 | 171 | 172 | 174 | 174 | 172 | 169 | 164 | 161 | 157 | 156 | 156 | 155 | 157 | 159 | 163 | 165 | 168 | 173 | 0.0715 |
| 13 | 173 | 171 | 173 | 172 | 172 | 172 | 172 | 173 | 175 | 174 | 171 | 168 | 162 | 159 | 156 | 154 | 156 | 154 | 157 | 159 | 163 | 165 | 167 | 172 | 0.0727 |
| 15 | 170 | 172 | 173 | 171 | 173 | 172 | 174 | 172 | 172 | 171 | 167 | 163 | 158 | 155 | 155 | 156 | 155 | 155 | 158 | 162 | 164 | 165 | 167 | 170 | 0.0696 |
| 17 | 175 | 173 | 175 | 174 | 176 | 175 | 172 | 175 | 174 | 169 | 166 | 163 | 158 | 155 | 154 | 158 | 161 | 163 | 165 | 164 | 165 | 163 | 170 | 173 | 0.0691 |
| 19 | 174 | 174 | 174 | 173 | 175 | 173 | 174 | 172 | 169 | 165 | 163 | 161 | 157 | 156 | 155 | 157 | 164 | 165 | 164 | 165 | 167 | 169 | 172 | 173 | 0.065 |
| 22 | 173 | 175 | 174 | 172 | 175 | 176 | 172 | 170 | 166 | 163 | 160 | 162 | 159 | 157 | 156 | 158 | 165 | 166 | 163 | 166 | 164 | 167 | 170 | 174 | 0.0622 |
| 25 | 176 | 177 | 175 | 173 | 172 | 175 | 173 | 168 | 165 | 164 | 161 | 159 | 161 | 160 | 156 | 155 | 159 | 163 | 165 | 162 | 163 | 170 | 173 | 175 | 0.0692 |
| 28 | 172 | 173 | 173 | 171 | 172 | 173 | 174 | 169 | 166 | 163 | 162 | 158 | 158 | 159 | 156 | 161 | 163 | 164 | 162 | 165 | 166 | 168 | 170 | 173 | 0.0572 |
| 31 | 171 | 172 | 173 | 173 | 172 | 174 | 172 | 168 | 165 | 162 | 163 | 159 | 159 | 157 | 155 | 158 | 160 | 163 | 164 | 163 | 162 | 165 | 168 | 172 | 0.0582 |
| 34 | 168 | 169 | 171 | 172 | 174 | 175 | 175 | 171 | 169 | 163 | 162 | 157 | 158 | 160 | 156 | 156 | 157 | 161 | 163 | 162 | 165 | 167 | 169 | 170 | 0.0621 |
| 37 | 166 | 168 | 170 | 171 | 169 | 174 | 176 | 173 | 170 | 167 | 164 | 161 | 160 | 159 | 157 | 155 | 156 | 158 | 162 | 163 | 164 | 165 | 167 | 168 | 0.0588 |
| 40 | 164 | 163 | 164 | 167 | 170 | 173 | 173 | 170 | 171 | 167 | 165 | 164 | 163 | 162 | 158 | 159 | 157 | 160 | 164 | 162 | 163 | 161 | 163 | 165 | 0.0443 |
| 43 | 158 | 159 | 162 | 164 | 165 | 165 | 166 | 164 | 167 | 165 | 164 | 162 | 159 | 158 | 157 | 156 | 154 | 156 | 163 | 160 | 161 | 156 | 157 | 160 | 0.0382 |
| 46 | 157 | 156 | 158 | 159 | 164 | 166 | 167 | 165 | 166 | 159 | 162 | 158 | 160 | 159 | 157 | 158 | 154 | 157 | 159 | 158 | 157 | 155 | 154 | 156 | 0.0387 |
| 49 | 159 | 157 | 159 | 158 | 160 | 163 | 168 | 166 | 165 | 159 | 158 | 160 | 160 | 162 | 159 | 157 | 156 | 155 | 158 | 155 | 154 | 156 | 155 | 158 | 0.0364 |
| 52 | 157 | 153 | 155 | 159 | 157 | 160 | 164 | 163 | 164 | 159 | 159 | 158 | 161 | 159 | 158 | 156 | 154 | 158 | 159 | 157 | 155 | 154 | 153 | 155 | 0.0316 |
| 55 | 155 | 155 | 154 | 158 | 156 | 158 | 163 | 164 | 163 | 157 | 158 | 159 | 160 | 161 | 159 | 157 | 154 | 155 | 160 | 155 | 157 | 155 | 154 | 153 | 0.0315 |
| 57.5 | 165 | 164 | 168 | 164 | 166 | 176 | 172 | 167 | 165 | 163 | 162 | 158 | 159 | 157 | 158 | 157 | 160 | 164 | 163 | 161 | 162 | 164 | 162 | 158 | 0.0468 |
| 61.2 | 168 | 166 | 171 | 166 | 168 | 174 | 173 | 164 | 163 | 161 | 163 | 158 | 156 | 158 | 158 | 158 | 161 | 165 | 162 | 160 | 161 | 163 | 164 | 166 | 0.0481 |
| 64.3 | 163 | 162 | 169 | 165 | 171 | 170 | 169 | 163 | 162 | 160 | 161 | 160 | 158 | 159 | 157 | 155 | 157 | 159 | 163 | 164 | 162 | 164 | 162 | 164 | 0.0421 |
| 67.5 | 164 | 164 | 168 | 166 | 170 | 169 | 168 | 163 | 162 | 161 | 162 | 158 | 159 | 158 | 158 | 156 | 157 | 158 | 162 | 162 | 161 | 163 | 165 | 166 | 0.0397 |
| 70.5 | 163 | 163 | 165 | 163 | 163 | 164 | 166 | 162 | 163 | 160 | 159 | 157 | 158 | 159 | 159 | 158 | 158 | 158 | 163 | 161 | 162 | 164 | 163 | 164 | 0.0266 |
| 73.5 | 162 | 161 | 164 | 164 | 166 | 165 | 163 | 164 | 162 | 158 | 160 | 158 | 160 | 162 | 162 | 164 | 160 | 159 | 161 | 163 | 162 | 163 | 164 | 165 | 0.023 |
| 77 | 160 | 160 | 163 | 165 | 168 | 166 | 158 | 165 | 163 | 160 | 159 | 159 | 162 | 164 | 164 | 165 | 164 | 161 | 162 | 163 | 164 | 165 | 166 | 165 | 0.026 |
| 80.2 | 156 | 157 | 158 | 163 | 165 | 163 | 160 | 163 | 162 | 161 | 160 | 162 | 163 | 163 | 164 | 164 | 162 | 163 | 163 | 164 | 164 | 164 | 162 | 158 | 0.0243 |
| 83.2 | 157 | 156 | 160 | 162 | 163 | 161 | 164 | 167 | 164 | 163 | 163 | 165 | 164 | 166 | 165 | 168 | 165 | 168 | 164 | 161 | 159 | 158 | 155 | 159 | 0.0365 |
| 86.2 | 152 | 153 | 155 | 157 | 159 | 157 | 156 | 159 | 161 | 164 | 164 | 167 | 167 | 168 | 169 | 167 | 165 | 164 | 165 | 162 | 163 | 162 | 160 | 157 | 0.0476 |
| 90.2 | 151 | 149 | 148 | 146 | 150 | 154 | 160 | 164 | 165 | 166 | 170 | 173 | 174 | 173 | 172 | 170 | 168 | 168 | 166 | 166 | 165 | 162 | 161 | 156 | 0.0868 |



**Figure 6.28(a): Box Plot of dial gauge readings dataset of mean values of 8-mm diameter Copper (Cu) round bar before straightening**

**Figure 6.28(b): Error Plot of dial gauge readings on 8 mm Copper Round Bar after straightening**