|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table 5.4**  **Measurement of roundness by Dial gauge deflections of 6-mm Diameter Mild Steel (MS) Round Bar** **Before Straightening** | | | | | | | | | | | | | | | | | | | | | | | |  |
|  | Mean values of Dial Gauge Deflection Readings before straightening of 6 mm 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) |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16.3 | 191 | 191 | 194 | 194 | 193 | 194 | 193 | 192 | 190 | 189 | 185 | 184 | 181 | 179 | 179 | 178 | 181 | 182 | 181 | 183 | 187 | 189 | 191 | 190 | 0.05431 |
| 20.0 | 180 | 181 | 182 | 183 | 184 | 186 | 184 | 185 | 187 | 190 | 189 | 183 | 183 | 182 | 177 | 175 | 174 | 171 | 172 | 168 | 167 | 166 | 169 | 173 | 0.07055 |
| 25.0 | 163 | 168 | 171 | 173 | 174 | 176 | 178 | 182 | 183 | 182 | 185 | 182 | 181 | 182 | 178 | 175 | 173 | 172 | 173 | 168 | 167 | 165 | 165 | 166 | 0.05431 |
| 30.0 | 174 | 174 | 176 | 176 | 178 | 182 | 183 | 183 | 185 | 186 | 185 | 188 | 187 | 185 | 186 | 184 | 184 | 185 | 181 | 176 | 177 | 176 | 174 | 174 | 0.05128 |
| 35.0 | 178 | 175 | 176 | 175 | 182 | 184 | 185 | 184 | 182 | 184 | 184 | 185 | 185 | 187 | 187 | 185 | 183 | 180 | 182 | 182 | 176 | 177 | 174 | 175 | 0.04505 |
| 40.0 | 165 | 166 | 164 | 170 | 166 | 171 | 175 | 174 | 176 | 180 | 183 | 183 | 182 | 183 | 185 | 183 | 182 | 176 | 175 | 174 | 176 | 172 | 172 | 167 | 0.06652 |
| 45.0 | 168 | 165 | 166 | 166 | 166 | 165 | 165 | 172 | 175 | 174 | 175 | 176 | 182 | 180 | 182 | 181 | 184 | 184 | 181 | 175 | 176 | 174 | 172 | 169 | 0.06528 |
| 50.0 | 165 | 165 | 167 | 166 | 169 | 171 | 174 | 176 | 176 | 177 | 178 | 180 | 179 | 181 | 183 | 181 | 178 | 172 | 169 | 167 | 167 | 165 | 164 | 161 | 0.06718 |
| 55.0 | 172 | 168 | 163 | 162 | 164 | 165 | 168 | 170 | 173 | 173 | 177 | 178 | 181 | 185 | 181 | 183 | 183 | 183 | 181 | 178 | 180 | 178 | 177 | 175 | 0.06727 |
| 60.0 | 164 | 162 | 163 | 162 | 163 | 168 | 168 | 168 | 170 | 173 | 172 | 175 | 177 | 174 | 179 | 178 | 178 | 177 | 177 | 172 | 168 | 168 | 167 | 166 | 0.05681 |
| 65.0 | 158 | 158 | 158 | 158 | 155 | 157 | 156 | 156 | 156 | 162 | 163 | 166 | 168 | 170 | 172 | 176 | 174 | 175 | 172 | 173 | 169 | 164 | 164 | 163 | 0.06949 |
| 70.0 | 162 | 163 | 158 | 159 | 155 | 153 | 158 | 157 | 156 | 162 | 166 | 171 | 171 | 173 | 175 | 176 | 177 | 176 | 175 | 176 | 175 | 171 | 167 | 165 | 0.07757 |
| 75.0 | 168 | 168 | 166 | 165 | 163 | 165 | 164 | 164 | 167 | 167 | 171 | 173 | 174 | 175 | 180 | 181 | 179 | 179 | 182 | 181 | 175 | 178 | 177 | 175 | 0.06331 |
| 80.0 | 185 | 186 | 185 | 185 | 184 | 184 | 185 | 183 | 178 | 177 | 183 | 182 | 185 | 192 | 191 | 193 | 195 | 196 | 202 | 203 | 200 | 199 | 195 | 196 | 0.07348 |
| 85.0 | 204 | 208 | 205 | 204 | 203 | 200 | 200 | 197 | 192 | 195 | 193 | 193 | 185 | 190 | 192 | 193 | 195 | 198 | 202 | 203 | 205 | 204 | 202 | 203 | 0.05946 |
| 93.0 | 204 | 205 | 203 | 199 | 191 | 192 | 187 | 187 | 183 | 184 | 183 | 182 | 182 | 184 | 188 | 193 | 196 | 199 | 203 | 204 | 205 | 206 | 211 | 208 | 0.09622 |



Figure 5.2(a): Box Plot of dial gauge readings dataset of mean values of 6-mm diameter Mild Steel (MS) round bar before straightening

Figure 5.2(b): Error Plot of dial gauge deflection readings on 6 mm Mild Steel Round Bar before straightening