|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table 6.15 Measurement of roundness by Dial gauge deflections of 8-mm Diameter Stainless Steel (SS) Round Bar** | | | | | | | | | | | | | | | | | | | | | | | |  |
|  | **Mean values of Dial Gauge Deflection Readings after straightening of 8 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 | 183 | 181 | 181 | 181 | 179 | 178 | 178 | 177 | 175 | 175 | 175 | 175 | 176 | 177 | 178 | 179 | 180 | 180 | 181 | 181 | 180 | 180 | 182 | 181 | 0.0244 |
| 14 | 176 | 174 | 175 | 174 | 173 | 172 | 171 | 170 | 168 | 168 | 168 | 167 | 168 | 168 | 170 | 170 | 172 | 172 | 173 | 173 | 173 | 173 | 174 | 173 | 0.0263 |
| 18 | 174 | 172 | 169 | 169 | 168 | 168 | 168 | 166 | 165 | 168 | 166 | 167 | 165 | 164 | 165 | 166 | 166 | 168 | 169 | 168 | 169 | 169 | 170 | 169 | 0.0233 |
| 21 | 168 | 164 | 165 | 163 | 164 | 165 | 166 | 165 | 163 | 165 | 168 | 165 | 164 | 165 | 165 | 166 | 167 | 166 | 167 | 167 | 165 | 165 | 165 | 165 | 0.0141 |
| 24 | 169 | 171 | 169 | 169 | 169 | 169 | 168 | 167 | 167 | 166 | 168 | 168 | 169 | 169 | 170 | 170 | 172 | 172 | 172 | 172 | 171 | 171 | 171 | 170 | 0.0168 |
| 28 | 169 | 169 | 168 | 167 | 167 | 167 | 166 | 166 | 166 | 165 | 165 | 166 | 168 | 168 | 169 | 170 | 170 | 170 | 170 | 170 | 169 | 169 | 168 | 168 | 0.0167 |
| 32 | 167 | 167 | 167 | 165 | 166 | 165 | 163 | 163 | 163 | 163 | 163 | 168 | 163 | 163 | 163 | 163 | 164 | 165 | 165 | 164 | 165 | 165 | 165 | 166 | 0.0149 |
| 35 | 167 | 166 | 165 | 165 | 164 | 163 | 163 | 163 | 165 | 164 | 165 | 166 | 164 | 165 | 166 | 163 | 164 | 164 | 164 | 164 | 163 | 164 | 165 | 165 | 0.0115 |
| 38 | 164 | 164 | 164 | 163 | 163 | 162 | 161 | 161 | 161 | 161 | 162 | 164 | 164 | 165 | 166 | 167 | 168 | 168 | 168 | 167 | 166 | 165 | 165 | 164 | 0.0216 |
| 41 | 166 | 163 | 163 | 163 | 163 | 162 | 161 | 161 | 160 | 160 | 161 | 161 | 163 | 163 | 164 | 165 | 166 | 166 | 166 | 165 | 165 | 164 | 164 | 164 | 0.0184 |
| 44 | 163 | 163 | 161 | 161 | 161 | 160 | 160 | 158 | 159 | 159 | 160 | 161 | 163 | 163 | 164 | 165 | 165 | 165 | 166 | 165 | 164 | 163 | 163 | 163 | 0.022 |
| 47 | 162 | 161 | 160 | 160 | 159 | 158 | 158 | 157 | 158 | 158 | 159 | 160 | 162 | 161 | 162 | 163 | 163 | 163 | 163 | 163 | 162 | 162 | 161 | 159 | 0.0195 |
| 50 | 164 | 164 | 159 | 159 | 158 | 156 | 156 | 156 | 157 | 157 | 158 | 159 | 160 | 160 | 161 | 162 | 162 | 162 | 162 | 162 | 160 | 160 | 159 | 159 | 0.0237 |
| 53 | 162 | 163 | 160 | 159 | 159 | 159 | 159 | 159 | 160 | 160 | 162 | 163 | 164 | 164 | 165 | 166 | 166 | 166 | 166 | 165 | 165 | 164 | 164 | 163 | 0.0271 |
| 57 | *163* | 162 | 159 | 159 | 158 | 158 | 158 | 159 | 160 | 161 | 163 | 163 | 164 | 165 | 165 | 166 | 166 | 166 | 166 | 165 | 164 | 163 | 163 | 162 | 0.0282 |
| 61 | 164 | 159 | 158 | 158 | 157 | 157 | 157 | 158 | 159 | 159 | 161 | 161 | 164 | 164 | 165 | 165 | 166 | 166 | 165 | 164 | 164 | 163 | 163 | 162 | 0.0319 |
| 65 | 162 | 158 | 157 | 156 | 156 | 156 | 155 | 156 | 156 | 157 | 158 | 160 | 162 | 162 | 163 | 164 | 165 | 165 | 165 | 164 | 164 | 163 | 162 | 161 | 0.0347 |
| 69 | 162 | 157 | 156 | 155 | 154 | 153 | 154 | 154 | 154 | 156 | 157 | 159 | 159 | 161 | 162 | 163 | 164 | 164 | 163 | 163 | 162 | 161 | 160 | 158 | 0.0361 |
| 73 | 160 | 156 | 155 | 154 | 153 | 153 | 153 | 153 | 154 | 154 | 155 | 157 | 158 | 159 | 160 | 161 | 161 | 162 | 162 | 161 | 160 | 159 | 158 | 157 | 0.032 |
| 77 | 157 | 155 | 154 | 153 | 152 | 152 | 152 | 152 | 153 | 154 | 154 | 156 | 156 | 157 | 158 | 159 | 159 | 160 | 160 | 160 | 160 | 158 | 157 | 157 | 0.0281 |
| 80 | 158 | 154 | 153 | 153 | 152 | 151 | 155 | 152 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 158 | 159 | 159 | 159 | 159 | 159 | 158 | 158 | 157 | 0.0275 |
| 84 | 154 | 153 | 152 | 154 | 153 | 153 | 154 | 151 | 153 | 151 | 153 | 153 | 154 | 156 | 157 | 157 | 158 | 158 | 158 | 158 | 158 | 157 | 156 | 155 | 0.0231 |
| 88 | 153 | 153 | 152 | 150 | 152 | 151 | 153 | 151 | 152 | 148 | 152 | 152 | 153 | 154 | 156 | 156 | 157 | 157 | 158 | 158 | 157 | 156 | 155 | 155 | 0.027 |
| 92.7 | 151 | 152 | 148 | 144 | 145 | 146 | 145 | 147 | 146 | 145 | 146 | 148 | 149 | 152 | 153 | 154 | 156 | 154 | 153 | 147 | 145 | 146 | 148 | 151 | 0.0356 |
| 95.7 | 149 | 148 | 146 | 145 | 143 | 144 | 143 | 146 | 143 | 146 | 144 | 145 | 146 | 147 | 150 | 152 | 154 | 153 | 148 | 144 | 146 | 143 | 145 | 147 | 0.0315 |
| 99.7 | 146 | 146 | 144 | 144 | 144 | 146 | 144 | 145 | 145 | 143 | 144 | 146 | 143 | 145 | 148 | 150 | 144 | 145 | 146 | 145 | 147 | 144 | 147 | 145 | 0.0162 |
|  | **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)** |
| 103.7 | 147 | 144 | 145 | 146 | 144 | 144 | 146 | 144 | 146 | 144 | 145 | 144 | 146 | 144 | 145 | 148 | 146 | 144 | 147 | 145 | 144 | 143 | 145 | 146 | 0.0125 |
| 108.2 | 146 | 145 | 143 | 144 | 145 | 146 | 143 | 144 | 145 | 143 | 146 | 144 | 145 | 147 | 144 | 145 | 145 | 146 | 144 | 144 | 143 | 145 | 144 | 145 | 0.011 |
| 111.7 | 144 | 146 | 144 | 143 | 144 | 145 | 144 | 146 | 147 | 144 | 145 | 145 | 146 | 146 | 146 | 146 | 146 | 145 | 144 | 145 | 146 | 147 | 145 | 144 | 0.0108 |
| 114.7 | 146 | 144 | 143 | 145 | 147 | 145 | 144 | 147 | 146 | 144 | 145 | 145 | 146 | 146 | 148 | 146 | 146 | 145 | 144 | 144 | 146 | 144 | 143 | 144 | 0.013 |
| 117.7 | 147 | 146 | 144 | 146 | 145 | 144 | 144 | 143 | 145 | 145 | 146 | 145 | 144 | 148 | 147 | 148 | 144 | 144 | 145 | 146 | 144 | 143 | 144 | 145 | 0.0141 |
| 120.7 | 144 | 145 | 146 | 145 | 144 | 145 | 145 | 146 | 144 | 146 | 145 | 146 | 143 | 144 | 146 | 144 | 144 | 145 | 146 | 144 | 142 | 144 | 143 | 146 | 0.0113 |
| 124.7 | 145 | 146 | 144 | 147 | 145 | 146 | 143 | 145 | 144 | 146 | 144 | 145 | 144 | 145 | 143 | 143 | 145 | 144 | 145 | 145 | 145 | 145 | 144 | 145 | 0.01 |
| 128.7 | 145 | 144 | 142 | 144 | 146 | 144 | 146 | 145 | 145 | 144 | 144 | 146 | 145 | 144 | 145 | 145 | 144 | 145 | 145 | 146 | 144 | 144 | 143 | 146 | 0.0101 |
| 132.7 | 143 | 143 | 145 | 146 | 144 | 145 | 143 | 144 | 143 | 144 | 145 | 146 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 142 | 146 | 144 | 144 | 0.0131 |
| 135.7 | 143 | 144 | 144 | 145 | 145 | 140 | 141 | 139 | 142 | 143 | 143 | 143 | 144 | 144 | 145 | 144 | 145 | 144 | 143 | 143 | 143 | 145 | 144 | 143 | 0.0159 |
| 141.7 | 145 | 144 | 143 | 143 | 143 | 142 | 142 | 142 | 143 | 143 | 144 | 144 | 144 | 145 | 145 | 145 | 145 | 144 | 144 | 145 | 143 | 142 | 141 | 143 | 0.0121 |



**Figure 6.20(a): Box Plot of dial gauge readings dataset of mean values of 8-mm diameter Stainless Steel (SS) round bar before straightening**

**Figure 6.20(b): Error Plot of dial gauge readings on 8 mm Stainless Steel Round Bar after straightening**