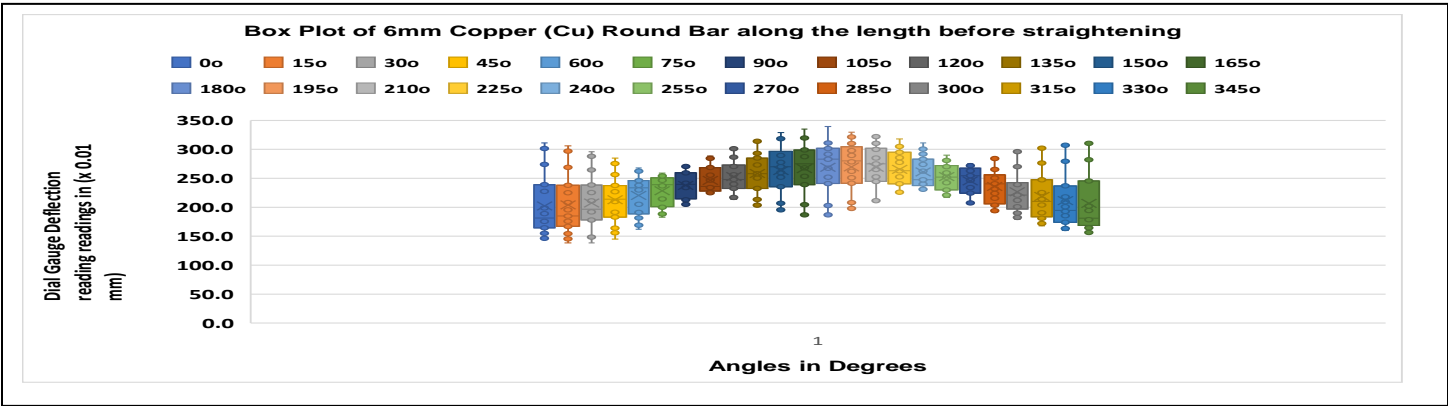


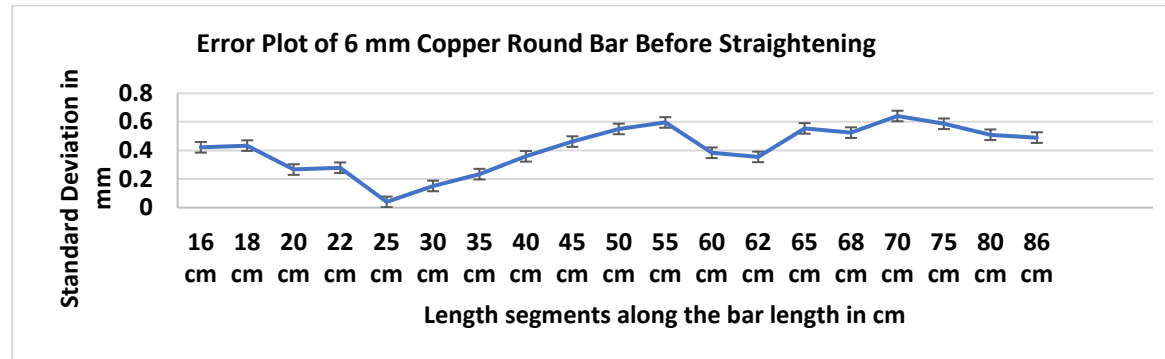
**Table 5.16**                      **Measurement of roundness by Dial gauge deflections of 6-mm Diameter Copper (Cu) Round Bar**

Mean values of Dial Gauge Deflection Readings before straightening of 6 mm Copper round bar x 0.01 mm

Length in cm	Angles in Degrees																								STD DEV (mm)
	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°	195°	210°	225°	240°	255°	270°	285°	300°	315°	330°	345°	
16.0	301.5	297.0	288.0	275.5	262.5	251.0	239.5	225.0	213.5	202.0	195.5	187.0	187.0	197.0	210.0	225.0	241.5	256.0	269.0	284.0	296.0	302.5	308.5	310.5	0.4221
18.0	311.0	306.0	296.0	285.0	268.0	253.5	241.5	230.0	217.0	203.5	195.5	187.0	187.0	198.0	211.5	228.0	244.5	259.5	272.0	285.5	297.0	302.0	307.0	312.0	0.4339
20.0	274.0	269.0	264.5	256.5	248.0	241.0	234.0	227.0	219.0	210.0	207.0	205.0	203.0	208.0	217.5	226.0	237.0	245.5	259.0	265.5	270.0	276.5	279.5	282.0	0.2664
22.0	281.0	276.0	270.0	260.0	251.0	243.5	238.0	228.0	221.5	213.5	207.5	204.5	203.0	208.5	218.5	228.5	240.0	252.0	260.0	268.0	274.5	279.5	282.5	283.5	0.2791
25.0	239.0	238.0	238.5	237.5	238.0	237.0	236.0	236.0	232.5	232.5	235.5	239.0	241.0	241.5	244.5	245.0	245.0	242.5	241.0	240.5	239.0	247.5	237.0	245.5	0.0398
30.0	227.5	225.0	225.5	229.0	235.5	239.0	243.5	247.0	249.5	250.5	252.0	253.5	252.0	251.0	248.0	243.5	237.0	230.0	224.5	218.0	212.0	210.0	209.5	209.0	0.1515
35.0	199.0	208.0	217.5	227.0	231.0	238.5	245.5	250.5	254.5	256.5	256.0	254.5	256.0	254.0	247.0	240.5	230.5	221.0	211.5	203.5	197.0	194.5	193.0	194.5	0.2342
40.0	181.5	195.5	211.0	227.0	239.0	250.0	260.0	268.5	273.0	276.0	274.5	273.5	267.5	262.0	252.5	243.5	231.0	217.0	205.0	194.0	185.0	181.0	178.0	178.5	0.3588
45.0	175.5	196.0	212.0	228.5	246.0	259.0	271.0	284.5	292.0	297.0	296.5	293.0	289.5	280.0	265.5	252.5	237.5	222.0	207.5	191.5	179.0	172.0	168.5	169.5	0.4620
50.0	158.0	176.0	193.0	214.0	234.0	252.0	271.5	288.5	303.0	314.0	318.5	319.5	317.0	310.0	302.0	285.5	269.0	252.0	234.0	215.5	201.0	183.5	174.0	171.0	0.5507
55.0	165.0	177.5	192.0	210.0	233.5	254.0	270.5	284.5	301.0	315.5	329.0	335.0	339.5	329.5	322.0	309.5	292.0	272.0	254.5	232.0	208.0	190.5	176.0	168.5	0.5959
60.0	189.0	185.0	184.5	185.0	191.0	202.5	213.0	234.0	248.0	258.0	267.0	275.0	283.0	289.5	291.5	289.0	283.0	275.0	267.0	256.0	242.5	230.0	218.0	205.0	0.3837
62.0	193.0	182.5	178.0	183.0	188.5	201.0	214.5	229.0	240.0	251.5	260.0	268.0	273.0	278.5	281.0	277.5	274.0	270.0	263.0	252.0	240.0	225.5	214.5	202.0	0.3548
65.0	164.5	158.5	155.5	156.0	169.0	188.5	205.0	225.0	241.0	253.5	270.0	287.5	302.0	304.5	310.5	305.0	311.0	290.0	275.0	255.0	239.5	210.0	201.0	181.0	0.5544
68.0	170.0	154.5	155.0	158.0	173.5	190.5	209.0	229.0	246.5	261.5	278.0	291.0	291.5	298.0	300.0	298.0	296.5	281.0	267.5	250.5	221.0	214.0	194.5	178.5	0.5246
70.0	146.0	138.5	138.5	145.0	162.0	183.0	203.0	224.5	242.5	261.5	277.5	292.0	314.5	321.5	323.5	318.0	300.5	286.0	268.0	246.0	226.5	204.0	185.5	164.5	0.6410
75.0	146.5	145.5	148.5	164.0	181.5	200.0	219.0	238.5	256.0	273.0	289.5	303.5	311.0	312.5	305.0	295.0	280.5	264.5	246.5	224.0	205.0	187.5	168.0	155.0	0.5868
80.0	155.0	167.0	178.0	191.5	205.0	214.5	241.5	255.5	270.5	285.0	296.5	301.0	301.5	295.5	285.0	270.0	262.5	243.0	224.5	206.0	190.0	175.5	163.5	156.5	0.5099
86.0	165.5	181.5	196.5	213.5	230.0	246.5	259.5	275.0	286.5	293.0	296.5	299.0	295.0	285.0	275.0	263.0	247.5	228.0	213.0	196.0	182.5	168.0	160.0	159.0	0.4899



**Figure 5.14(a): Box Plot of dial gauge readings dataset of mean values of 6-mm diameter Copper (Cu) round bar before straightening**



**Figure 5.14(b): Error Plot of 6 mm Copper Round Bar Before Straightening**