









## Control Limits

Sample					means	ranges
1	140.5	139.9	140.0	140.5	140.22	0.6
2	139.7	140.0	139.8	140.2	139.93	0.5
3	139.5	139.8	139.8	140.6	139.93	1.1
⋮	⋮	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	⋮	⋮
98	138.5	140.5	139.0	139.3	139.33	2.0
99	140.5	140.6	140.1	141.4	140.65	1.3
100	140.1	140.3	139.7	139.4	139.88	0.9
					$\bar{\bar{x}} = 140.00$	$\bar{R} = 1.21$

# Control Limits

- Process Mean

$$\bar{\bar{x}} \pm 3 \frac{\bar{s}}{c_4 \sqrt{n}}$$

- Process Standard Deviation

$$\bar{s} \pm 3 \frac{c_5 \bar{s}}{c_4}$$

- Process Range

$$[\bar{RD}_3, \bar{RD}_4]$$

# Control Limits

Sample size n	c4	c5	d2	d3	D3	D4
2	0.7979	0.6028	1.128	0.853	0	3.267
3	0.8862	0.4633	1.693	0.888	0	2.574
4	0.9213	0.3889	2.059	0.88	0	2.282
5	0.94	0.3412	2.326	0.864	0	2.114
6	0.9515	0.3076	2.534	0.848	0	2.004
7	0.9594	0.282	2.704	0.833	0.076	1.924
8	0.965	0.2622	2.847	0.82	0.136	1.864

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