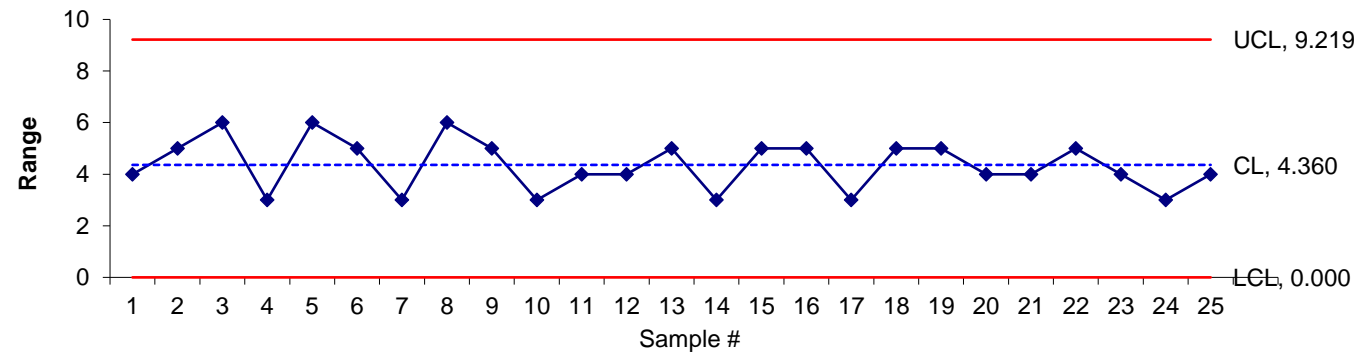
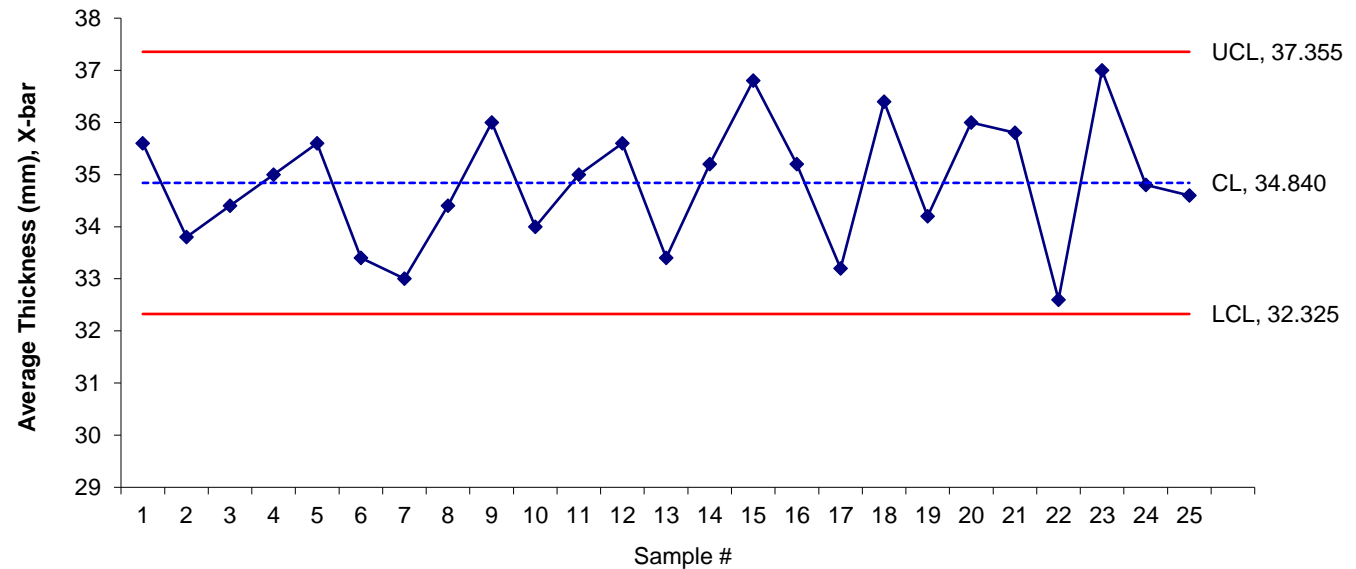


Control Chart for Mean and Range

[Title or Process]
[Date]

Quality Characteristic	Average Thickness (mm), X-bar
Sample Size, n	5
k	3



Statistics from Data Table

R-bar	4.360
Process Mean, μ -hat	34.840
Process St.Dev., σ -hat	1.874
$\sigma_{X\text{-bar}}$	0.838

Process Capability

Upper Spec Limit, USL	40
Lower Spec Limit, LSL	30
C_p	0.889
CPU	0.918
CPL	0.861
C_{pk}	0.861
Percent Yield	99.21%

Control Limits for X-bar Chart

$CL_{X\text{-bar}}$	34.840
$UCL_{X\text{-bar}}$	37.355 $CL+k\sigma_{X\text{-bar}}$
$LCL_{X\text{-bar}}$	32.325 $CL-k\sigma_{X\text{-bar}}$
α	0.0027
ARL	370.4 samples

Control Limits for R Chart

CL_R	4.360
UCL_R	9.219
LCL_R	0.000

Data Table**X-bar Chart****R Chart**

<i>Sample</i>	<i>X-bar</i>	<i>Range</i>	CL	UCL	LCL	CL	UCL	LCL
1	35.6	4	34.840	37.355	32.325	4.360	9.219	0.000
2	33.8	5	34.840	37.355	32.325	4.360	9.219	0.000
3	34.4	6	34.840	37.355	32.325	4.360	9.219	0.000
4	35	3	34.840	37.355	32.325	4.360	9.219	0.000
5	35.6	6	34.840	37.355	32.325	4.360	9.219	0.000
6	33.4	5	34.840	37.355	32.325	4.360	9.219	0.000
7	33	3	34.840	37.355	32.325	4.360	9.219	0.000
8	34.4	6	34.840	37.355	32.325	4.360	9.219	0.000
9	36	5	34.840	37.355	32.325	4.360	9.219	0.000
10	34	3	34.840	37.355	32.325	4.360	9.219	0.000
11	35	4	34.840	37.355	32.325	4.360	9.219	0.000
12	35.6	4	34.840	37.355	32.325	4.360	9.219	0.000
13	33.4	5	34.840	37.355	32.325	4.360	9.219	0.000
14	35.2	3	34.840	37.355	32.325	4.360	9.219	0.000
15	36.8	5	34.840	37.355	32.325	4.360	9.219	0.000
16	35.2	5	34.840	37.355	32.325	4.360	9.219	0.000
17	33.2	3	34.840	37.355	32.325	4.360	9.219	0.000
18	36.4	5	34.840	37.355	32.325	4.360	9.219	0.000
19	34.2	5	34.840	37.355	32.325	4.360	9.219	0.000
20	36	4	34.840	37.355	32.325	4.360	9.219	0.000
21	35.8	4	34.840	37.355	32.325	4.360	9.219	0.000
22	32.6	5	34.840	37.355	32.325	4.360	9.219	0.000
23	37	4	34.840	37.355	32.325	4.360	9.219	0.000
24	34.8	3	34.840	37.355	32.325	4.360	9.219	0.000
25	34.6	4	34.840	37.355	32.325	4.360	9.219	0.000

Control Chart for Mean and Standard Deviation

[Title or Process]

[Date]

Quality Characteristic

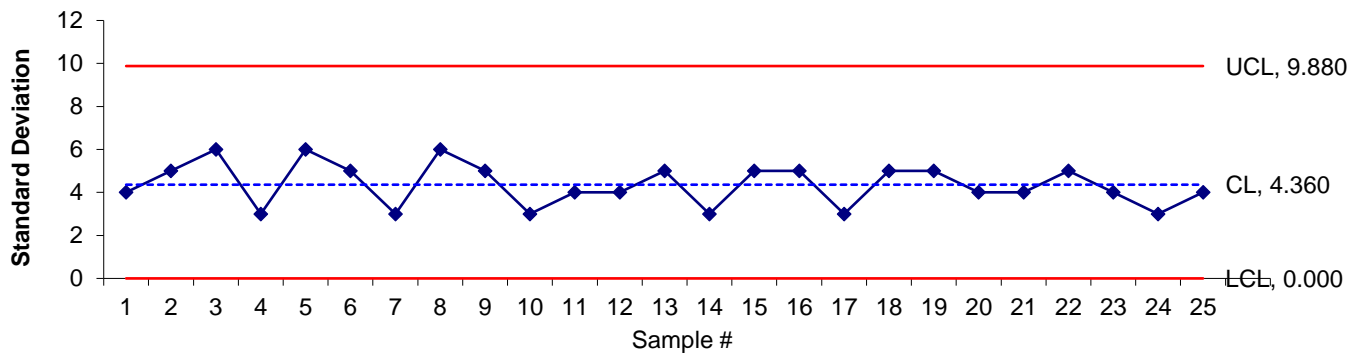
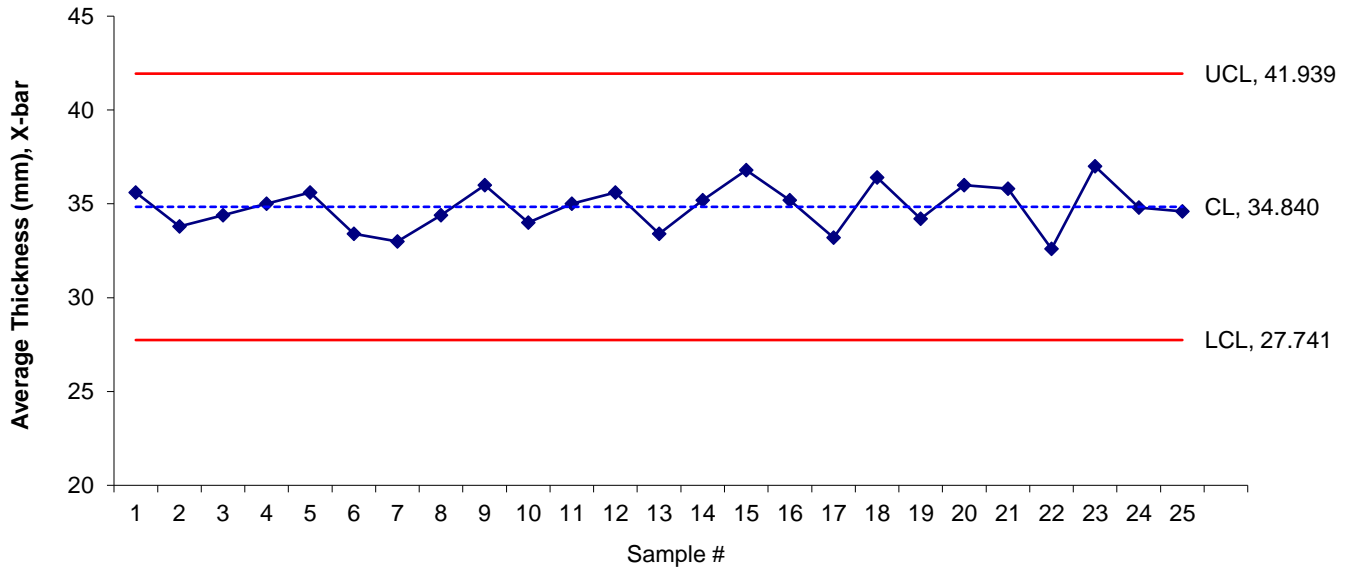
Sample Size, n

k

Average Thickness (mm), \bar{X} -bar

4

3



Statistics from Data Table

\bar{s} -bar	4.360
c_4	0.9213
Process St.Dev., $\hat{\sigma}$	4.732
Process Mean, $\hat{\mu}$	34.840
$\hat{\sigma}_{\bar{X}}$	2.366
σ_s	1.840

Process Capability

Upper Spec Limit, USL	45
Lower Spec Limit, LSL	25
C_p	0.704
CPU	0.716
CPL	0.693
C_{pk}	0.693
Percent Yield	96.53%

Control Limits for X-bar Chart

$CL_{\bar{X}}$	34.840
$UCL_{\bar{X}}$	41.939
$LCL_{\bar{X}}$	27.741
α	0.0027
ARL	370.4 samples

Control Limits for S Chart

CL_s	4.360
UCL_s	9.880
LCL_s	0.000

Data Table**X-bar Chart****R Chart**

<i>Sample</i>	<i>X-bar</i>	<i>St. Dev., s</i>	CL	UCL	LCL	CL	UCL	LCL
1	35.6	4	34.840	41.939	27.741	4.360	9.880	0.000
2	33.8	5	34.840	41.939	27.741	4.360	9.880	0.000
3	34.4	6	34.840	41.939	27.741	4.360	9.880	0.000
4	35	3	34.840	41.939	27.741	4.360	9.880	0.000
5	35.6	6	34.840	41.939	27.741	4.360	9.880	0.000
6	33.4	5	34.840	41.939	27.741	4.360	9.880	0.000
7	33	3	34.840	41.939	27.741	4.360	9.880	0.000
8	34.4	6	34.840	41.939	27.741	4.360	9.880	0.000
9	36	5	34.840	41.939	27.741	4.360	9.880	0.000
10	34	3	34.840	41.939	27.741	4.360	9.880	0.000
11	35	4	34.840	41.939	27.741	4.360	9.880	0.000
12	35.6	4	34.840	41.939	27.741	4.360	9.880	0.000
13	33.4	5	34.840	41.939	27.741	4.360	9.880	0.000
14	35.2	3	34.840	41.939	27.741	4.360	9.880	0.000
15	36.8	5	34.840	41.939	27.741	4.360	9.880	0.000
16	35.2	5	34.840	41.939	27.741	4.360	9.880	0.000
17	33.2	3	34.840	41.939	27.741	4.360	9.880	0.000
18	36.4	5	34.840	41.939	27.741	4.360	9.880	0.000
19	34.2	5	34.840	41.939	27.741	4.360	9.880	0.000
20	36	4	34.840	41.939	27.741	4.360	9.880	0.000
21	35.8	4	34.840	41.939	27.741	4.360	9.880	0.000
22	32.6	5	34.840	41.939	27.741	4.360	9.880	0.000
23	37	4	34.840	41.939	27.741	4.360	9.880	0.000
24	34.8	3	34.840	41.939	27.741	4.360	9.880	0.000
25	34.6	4	34.840	41.939	27.741	4.360	9.880	0.000

Control Chart Template



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